

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

Section 1: Overview

Date: January 19, 2021

Life Stages Present:

Delta Smelt: Adult, Juvenile (EDSM collected one Delta Smelt in the juvenile size bin)

Longfin Smelt: Adult, Larvae

Advice to WOMET:

One larval Longfin Smelt was collected at SLS station 716, which triggers Condition of Approval 8.12. This Condition of Approval limits Barker Slough Pumping Plant exports to be less than 60 cfs on a 7-day running average. No advice is warranted for south Delta 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 Longfin Smelt across the range of expected OMR Index levels.

Delta Smelt: Based on distribution patterns over the past decade and two recent detections, Delta Smelt are unlikely to be prevalent in the South Delta. Limited detection data in January supports Delta Smelt being present in Suisun Marsh, west of the Sacramento-San Joaquin confluence, and within the Sacramento Deep Water Ship Channel. The distribution of Delta Smelt is expected to extend upstream of the confluence which is supported by historical Spring Kodiak Trawl data analysis. Light precipitation is anticipated later this week in the coming week, however, changes to the 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 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 of Delta smelt. The wind driven turbidity event in the central Delta adjacent to Franks Tract [Holland near Bethel Island (HOL), Franks Tract – mid (FRK), Old River at Franks Tract (OSJ)] has not reached Old River at Bacon Island (OBI) as of 1/19/2021. On 1/15/2021, a Delta Smelt was collected in the Sacramento Deep Water Ship Channel for use as Fish Conservation and Culture Facility (FCCL) broodstock.

Longfin Smelt: Evaluation of recent catch data indicates that Longfin Smelt (LFS) larvae are present in the lower San Joaquin River near Jersey Point, Suisun Bay and Marsh, and the Cache Slough complex. Adults and age 1 individuals have been detected in Suisun Marsh and Bay and in the Sacramento Deep Water Ship Channel (DWSC). A Particle Tracking Model (PTM) run was evaluated during the previous meeting, and it was determined the lower export scenario

(OMR= – 2,500 cfs) still reflected projected operations for the coming week. Projected operations and hydrology are expected to result in an OMR Index no more negative than -3,500 cfs which is considered sufficiently protective for Longfin Smelt near the confluence of the Sacramento and San Joaquin Rivers and in the lower San Joaquin River. Smelt Larva Survey 1 (SLS 1) reported 6 LFS larvae near Jersey Point (station 809) and 2 at station 812 in the lower San Joaquin River. All 12 criteria stations listed in Condition of Approval 8.4.2 were sampled. LFS larvae were detected at 2 of the criteria stations, however, Condition of Approval 8.4.2 was not triggered. SLS 1 also reported LFS larvae at station 716, which triggers Condition of Approval 8.12 and limits Barker Slough Pumping Plant operations to be no greater than 60 cfs on a 7 day running average. A LFS larva was also collected at station 723 where the Sacramento DWSC meets Cache Slough and adults were collected further up the DWSC by the Spring Kodiak Trawl (SKT) at station 719, indicating that spawning has occurred in the region. January SKT collected a total of 11 Longfin Smelt in Suisun Bay and Marsh and the Sacramento DWSC. The second December Smelt Larva Survey (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 = 107 mm) during recent sampling last week. EDSM collected 6 LFS (FL = 59 – 82 mm) in Suisun Marsh on 1/4/2021, 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. The 2020 annual Fall Midwater Trawl (FMWT) index for LFS is 28. 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 (Hydrology):
 - Delta Smelt: Low
 - Longfin Smelt: Low
- Routing Risk (Behavior and life history):
 - Delta Smelt: Low
 - Longfin Smelt: Moderate risk of adults moving from the confluence into the Central Delta of their own volition. Adults have been detected in the Sacramento DWSC (SKT 1) which indicates that migration is well underway, and presence of larvae in the lower San Joaquin River indicates that adults have entered the Lower San Joaquin and successfully spawned.
- 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: Risk is similar to last week. Onset of hatching in the lower San Joaquin River exposes larvae to entrainment, however, anticipated OMR Index levels are sufficiently protective.
- 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 -1,000 cfs to -3,500 cfs.
 - OMRI (Export Scenario OMRI = -2,500 cfs)
 - Delta Smelt: Low Risk
 - Longfin Smelt: Low Risk

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 index¹ 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 ≥ 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 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:

¹ 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.

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).

8.5.2 Larval and Juvenile Delta Smelt Protection.

If the five-day cumulative salvage of juvenile DS at the CVP and SWP facilities is greater than or equal to one plus the average prior three years' FMWT index (rounded down), 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. Additionally, if the five-day cumulative salvage threshold is met or exceeded, Permittee shall immediately convene the Smelt Monitoring Team to conduct a risk assessment (Condition of Approval 8.1.5.2) and determine the future risk of entrainment and take of larval and juvenile DS. The Smelt Monitoring Team may provide advice to further restrict south Delta exports to maintain a more positive OMR than -5,000 cfs. The Smelt Monitoring Team may provide advice for further restrictions within three risk categories:

- Low risk: Limit OMR between -4,000 cfs to -5,000 cfs
- Medium risk: Limit OMR between -2,500 cfs to -4,000 cfs
- High risk: Limit OMR between -1,250 cfs to -2,500 cfs

The duration and magnitude of operational advice shall be provided to the WOMT (Condition of Approval 8.1.3) and decisions shall be made following the process described in Condition of Approval 8.1.4 (Collaborative Real Time Risk Assessment). When conducting risk assessments to evaluate the risk of entrainment and take of juvenile DS the Smelt Monitoring Team shall evaluate the following information sources, in addition to any other models or surveys they deem appropriate and those listed in Condition of Approval 8.1.5.2:

- Results from a CDFW approved DS life cycle model.
- DS recruitment levels identified by the Smelt Monitoring Team using the CDFW-approved life cycle model that links environmental conditions to recruitment, including factors related to loss as a result of entrainment such as OMR flows. In this context, recruitment is defined as the estimated number of post-larval DS in June per number of spawning adults in the prior February-March period.

- Hydrodynamic models and forecasts of entrainment informed by the EDSM or other relevant survey data to estimate the percentage of larval and juvenile DS that could be entrained.

If expanded salvage at the CVP and SWP facilities of juvenile DS exceeds 11 within a three-day period under this condition, Permittee shall restrict south Delta exports for seven consecutive days to maintain a seven-day average OMR index no more negative than -3,500 cfs. If juvenile DS continue to be salvaged at the CVP and SWP facilities during the seven days of OMR restrictions, then Permittee shall continue restrictions and request a risk assessment by the Smelt Monitoring Team to determine if additional advice and subsequent restrictions are warranted and provide advice to WOMT (see Condition of Approval 8.1.3) and follow the decision-making process described in Condition of Approval 8.1.4.

8.12 Barker Slough Pumping Plant Longfin and Delta Smelt Protection.

Permittee shall operate the Barker Slough Pumping Plant (BSPP) to protect larval LFS from January 15 through March 31 of dry and critical water years. Permittee shall operate to protect larval DS from March 1 through June 30 of dry and critical years. If the water year type changes after January 1 to below normal, above normal or wet, this action will be suspended. If the water year type changes after January to dry or critical, Permittee shall operate according to this Condition of Approval.

From January 15 through March 31 of dry and critical water years, Permittee shall reduce the maximum seven-day average diversion rate at BSPP to less than 60 cfs when larval LFS are detected at station 716. In addition, in its weekly meetings from January 15 through March 31, the Smelt Monitoring Team shall review LFS abundance and distribution survey data and other pertinent abiotic and biotic factors that influence the entrainment risk of larval LFS at the BSPP. When recommended by the Smelt Monitoring Team, and as approved through the decision-making processes described in Conditions of Approval 8.1.3 and 8.1.4, Permittee shall reduce the maximum seven-day average diversion rate at BSPP according to the advice provided by the Smelt Monitoring Team.

From March 1 through June 30 of dry and critical water years, Permittee shall reduce the maximum seven-day average diversion rate at BSPP to less than 60 cfs when larval DS are detected at station 716. In addition, in its weekly meetings from March 1 through June 30, the Smelt Monitoring Team shall review DS abundance and distribution survey data and other pertinent abiotic and biotic factors that influence the entrainment risk of larval DS at the BSPP (including temperature and turbidity). When recommended by the Smelt Monitoring Team, and as approved through the decision-making processes described in Conditions of Approval 8.1.3 and 8.1.4, Permittee shall reduce the maximum seven-day average diversion rate at BSPP to less than 60 cfs. The DS requirements described in this condition may be adjusted to align with USFWS requirements to minimize take of DS through an amendment to this ITP.

8.13 Water Year Type Definition.

All references to water year type in this ITP shall be defined based on the Sacramento Valley Index unless otherwise noted.

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 3 based on the most recently available FMWT Index. The annual index for 2020 is 28 and was reported to the SMT via email on 1/4/2020. The SMT examined abiotic conditions and determined that risk is low to moderate 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 and 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 terminated this Condition of Approval.

8.4.2 This Condition of Approval began on January 1st. The criteria have not been met to trigger this Condition of Approval. Data from two criteria stations is pending for SLS 1. There were detections at two of the criteria stations and catch per tow was greater than 5 at one criteria station. SMT will reconvene if pending data from SLS 1 triggers this Condition of Approval. December SLS survey 13 detected 3 larval LFS at station 809 near Jersey Point in the lower San Joaquin River.

8.5.2 The three-year average FMWT Index for Delta Smelt is zero, resulting in a salvage threshold of one for juvenile Delta Smelt. Young of year Delta Smelt are not expected to be present at this time of year.

8.12 This condition was triggered by the detection of one LFS larva at station 716 which was collected during SLS 1. The detection of an additional larva at station 723, and adults detected during SKT 1 in the Sacramento DWSC suggest that spawning has occurred in the region and more individuals are likely present. This Condition of Approval is in effect during dry and critically dry years, as defined by the [Sacramento River Valley Water Year Type Index](#). LFS are exposed to greater risk of entrainment at Barker Slough during dry and critical years due to the proximity to low salinity habitat at multiple life stages.

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.*)
 - ITP Condition of Approval 8.3.2 Salmonid Presence limits exports to maintain a 14-day running average no more negative than -5,000 cfs as of 1/1/2021.
 - 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. If DCC gates are opened between December 1 and January 31, the CVP and SWP will divert at Health and Safety pumping levels.
 - 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 = 11.3°C
- Tidal Cycle: Currently in a neap cycle.
- Turbidity:
 - 8.3.1 Freeport 3-day average = 4.97 FNU
 - 8.5.1 Turbidity at OBI Feb 1 to April 1
- Salinity: X2 is upstream of Collinsville and was estimated to be 90.7 km on the Sacramento River and 93.6 km on the San Joaquin River.
- Hydrologic Footprint:
 - No new PTM runs were conducted. The SMT received the PTM models requested by CDFW to inform risk of entrainment for larval Longfin Smelt present in the lower San Joaquin River near Jersey Point. The PTM run included 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 detected larvae at these stations. Larvae have been detected at SLS station 809 (Jersey Point) and 812, the inclusion of additional insertion points does not imply the presence of larvae. The SMT received results via email on 1/8/2021. Operations are not expected to result in and OMR Index as negative as -5,000 cfs. Hydrologic conditions are expected to remain relatively stable over the next week, therefore no new PTM run was requested this week.
- Wind driven turbidity is localized around Franks Tract and Bethel Island. Elevated turbidity has not reached Bacon Island. SMT will continue to monitor turbidity.

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

- Outages
 - SWP: No export or salvage outages reported for the period of 1/12/2021 to 1/19/2021
 - CVP: No export or salvage outages reported for the period of 1/12/2021 to 1/19/2021
- Exports
 - CCF: 1,500 cfs
 - CVP: 800 cfs
 - Barker Slough: Seven-day running average = 64 cfs as of 1/18/2021.
- Meteorological Forecast: Seven-day weather forecast for Antioch mostly sunny with high winds tapering off. Chance of precipitation on Friday and Monday
- Storm Event Projection: No substantial precipitation is expected in the near future.

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: 8,460 cfs
- San Joaquin River flow at Vernalis: 850 cfs
- Qwest: Qwest is expected to become negative and range between -800 cfs and -1,000 cfs.
- Old River at Bacon Island Turbidity: Not reported.
- Freeport Turbidity (3-day average): 4.97 FNU.
- Expected changes in South Delta Exports: CVP exports are expected to increase to 1650 cfs if water quality allows.
- OMR Index is projected to reach from -2,500 cfs to -2,600 cfs when CVP increases exports.
- NDOI: 6650 cfs and is expected to decrease to 5,500 cfs to 5,000 cfs

Table 1: Comparison of OMR and OMR Index (5-day and 14-day averages for USGS gauge data were not reported on [SacPAS website](#), accessed 1/20/2021)

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
1/19/2021	Daily	Not Reported	-1,900 cfs
1/17/2021	5-day	Not Reported	-1,930 cfs
1/17/2021	14-day	Not Reported	-2,570 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 collected 1 Delta Smelt in the Sacramento DWSC on 1/15/2021. This fish was collected during FCCL broodstock collection. As a result, it will not contribute to an abundance estimate and additional information such as fork length was not collected to reduce handling. Previously, EDSM collected 1 Delta Smelt (FL = 51 mm) in the Sacramento DWSC on 1/6/2021.
- The 2021 Annual FMWT Index for Delta Smelt is zero for the third consecutive year.
- Delta Smelt LCM discussion. Not Discussed.
- Biological Conditions: The Delta Smelt collected in the Sacramento DWSC, on 1/6/2021, was below the 58mm cutoff used to distinguish between adults (> 58mm) and juveniles. It may be a pre-spawn adult and is likely a freshwater resident.
- % of population in Delta zones: SMT did not discuss distribution in terms of percentage in Delta zones.
- Other Surveys: Other than EDSM and FCCL broodstock collection, no Delta Smelt detections were reported in recent sampling including FMWT, Chipps Island Trawl, SLS, and SKT.
- 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 FMWT Annual Index for Longfin Smelt is 28. Monthly indices for September and October are zero, the index for November is 22 and index for December is 6.
- Bay Study: Bay Study is off the water due to COVID restrictions. 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 two adult LFS (FL = 107 mm and 111 mm) on 1/4/2021 and 1/5/2021, respectively. EDSM collected 6 LFS (FL = 59 – 82 mm) in Suisun Marsh on 1/4/2021, 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.
- SLS 1 sampled from 1/11/2021 to 1/13/2021. Of the stations processed to date, 6 LFS larvae were collected in the Lower San Joaquin River at station 809, near Jersey Point, and 2 were collected at station 812, approximately halfway between Jersey Point and Prisoner's Point. Yolk sacs were present on 4 of the larvae collected at 809. SLS 1 also collected one LFS larvae at station 716 (listed in Condition of Approval 8.12) and one at station 723 at the base of the Sacramento Deep Water Ship Channel. 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 LFS larvae (Total Length = 7 mm) with yolk sacks intact at station 809 near Jersey Point in the lower San Joaquin River.

- Spring Kodiak Trawl (SKT) collected 11 Longfin Smelt in Suisun Bay and Marsh and the Sacramento Deep Water Ship Channel. See Attachments for catch details.
- 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.
- SMT referenced an unpublished USFWS analysis of Delta Smelt and Longfin Smelt. The analysis showed that Delta Smelt catch in SKT was not correlated with X2 and distributed upstream of the confluence from January through May (2002 through 2014). Longfin Smelt SKT catch exhibited a statistically significant correlation with X2.

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

Bay Study has been delayed due to staffing limitations in associated with COVID-19.

EDSM was delayed due to high winds but is scheduled to resume sampling on 1/20/2021. One of the three EDSM crews was redirected to assist with FCCL broodstock collection. EDSM will sample 6 of the 8 strata to accommodate the delay and staff redirection. The far west and Cache Slough strata will not be sampled this week. EDSM is expected to resume normal sampling next week.

Attachments:

Attachment 1: Spring Kodiak Trawl Longfin Smelt catch for Survey 1, 2021 (1/5-1/8). Data is preliminary and subject to change.

Station	Number of Longfin Smelt collected	Range of Fork Lengths (mm)
340	0	NA
405	0	NA
411	0	NA
418	0	NA
501	0	NA
504	1	115
519	0	NA
602	1	71
606	4	51 – 82
609	0	NA
610	0	NA
508	0	NA
513	0	NA
520	0	NA
801	0	NA
804	0	NA
704	0	NA
706	0	NA
707	0	NA
711	0	NA
712	0	NA
713	0	NA
715	0	NA
716	0	NA
719	5	90 – 100
724	0	NA
809	0	NA
812	0	NA
815	0	NA
902	0	NA
906	0	NA
910	0	NA
912	0	NA
914	0	NA
915	0	NA
919	0	NA
920	0	NA
921	0	NA
922	0	NA
923	0	NA

Spring Kodiak Trawl Sampling Stations

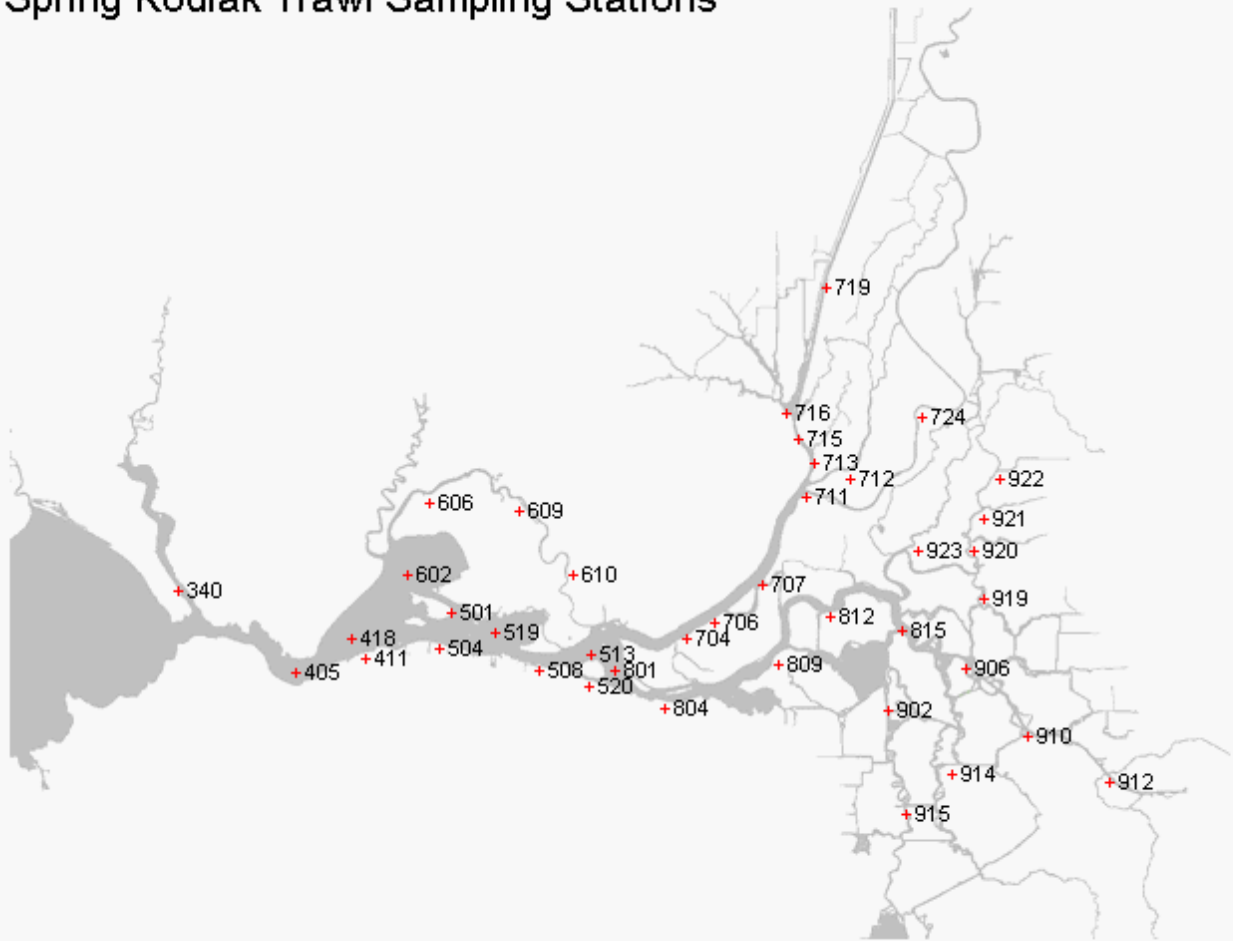


Figure 1. CDFW's Spring Kodiak Trawl Station Locations

Attachment 2: Longfin Smelt catch per station from 2021 Smelt Larva Survey, Survey 1,
1/11/2021 - 1/13/2021

Study Year	Survey #	SLS Station	Turbidity	Sample Status	Species	Smelt Catch	Minimum Length	Maximum Length	Average Length
2021	1	405	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	411	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	418	10.2	Processed	Longfin Smelt	1	8	8	8
2021	1	501	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	504	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	508	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	513	9.4	Processed	Longfin Smelt	27	6	8	7.0
2021	1	519	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	520	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	602	25.4	Processed	Longfin Smelt	2	8	8	8
2021	1	606	25.4	Processed	Longfin Smelt	4	7	9	8
2021	1	609	21.9	Processed	Longfin Smelt	3	7	8	7.7
2021	1	610	14.6	Processed	Longfin Smelt	6	6	7	6.333333
2021	1	703	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	704	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	705	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	706	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	707	5.9	Processed	Longfin Smelt	2	8	8	8
2021	1	711	5.4	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	716	6.4	Processed	Longfin Smelt	1	6	6	6
2021	1	723	6.7	Processed	Longfin Smelt	1	6	6	6
2021	1	801 ²	NA	Not yet processed	NA	NA	NA	NA	NA
2021	1	804	NA	Not yet processed	NA	NA	NA	NA	NA

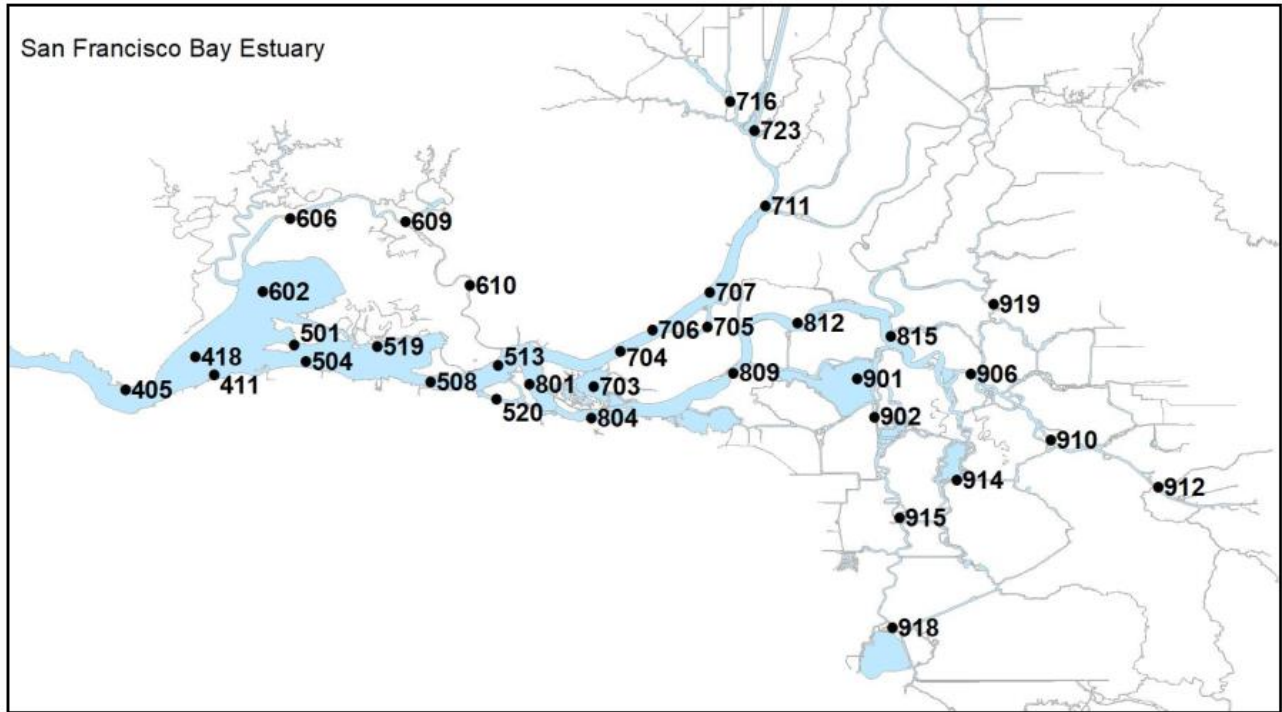
² Reduced tow time

Study Year	Survey #	SLS Station	Turbidity	Sample Status	Species	Smelt Catch	Minimum Length	Maximum Length	Average Length
2021	1	809	8.7	Processed	Longfin Smelt	6	6	8	6.7
2021	1	812	4.7	Processed	Longfin Smelt	2	6	7	6.5
2021	1	815	3.4	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	901	6.5	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	902	3.3	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	906	5.7	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	910 ³	5.9	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	912	4.6	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	914 ⁴	2.0	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	915	2.2	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	918	2.7	Processed	NA	No Smelt Catch	NA	NA	NA
2021	1	919	2.6	Processed	NA	No Smelt Catch	NA	NA	NA

Processing is complete through 1/19/2021.

³ Reduced tow time

⁴ Reduced tow time



Smelt Larva Survey station locations.