

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

Section 1: Overview

Date: 11/8/2022

Life Stages Present:

Delta Smelt (DS): Sub-adults and Adults

Longfin Smelt (LFS): Sub-adults and Adults

Advice to Water Operations Management Team (WOMT):

No Advice.

Risk Assessment:

Delta Smelt: Based on distribution patterns over the past decade and low detections this water year, DS are unlikely to be prevalent in the Central and South Delta. Limited detection data from the past three months support DS being present in the Sacramento Deep Water Ship Channel (SDWSC), Suisun Marsh, and the lower Sacramento River. The last DS observations were on 11/3/22 and 11/7/22 in the lower Sacramento River (Table 1). These detections may be an indication that DS are starting to stage downstream of X2 in preparation for seasonal migration into freshwater. The likelihood of DS entrainment is low due to seasonal timing. First flush conditions are not anticipated to occur within the next seven days. The regulations for Integrated Early Winter Pulse Protection does not go into effect until 12/1/2022.

Longfin Smelt: No adult LFS have been detected in Chipps Island Trawl or Enhanced Delta Smelt Monitoring (EDSM) in the Delta in recent sampling. LFS adults are expected to move into spawning habitat by November and December. Adult and sub-adult LFS have been detected by EDSM in Suisun Marsh and Suisun Bay (Table 1). Chipps Island detected one sub-adult LFS on 10/14/2022, but none have been detected since. Based on distribution data and life history, adults and sub-adults are not expected to be prevalent in the Central or South Delta and therefore are expected to be at low risk of entrainment.

Section 1-A: Sacramento River and Confluence

Table 1: Risk of entrainment into the central Delta and export facilities for Delta Smelt in the Sacramento River and confluence:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
DS larvae and juveniles	Exposure Risk (Hydrology)	N/A	Spawning hasn't started, no larvae present.
DS subadults and adults	Routing Risk (Behavior and life history)	Low	Turbidity remains low, staging below X2 may be starting soon, water temperatures declining quickly.
DS	Overall Entrainment Risk	Low	NA

Table 2: Risk of entrainment into the central Delta and export facilities for Longfin Smelt in the Sacramento River and confluence:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
LFS larvae and juveniles	Exposure Risk (Hydrology)	N/A	Spawning hasn't started, no larvae present.
LFS sub-adults and adults	Routing Risk (Behavior and life history)	Low	Migration into fresher water may be starting soon.
LFS	Overall Entrainment Risk	Low	NA

Section 1-B: Central Delta

Table 3: Risk of entrainment into the export facilities for Delta Smelt in the central Delta:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
DS subadults and adults	Exposure Risk (Hydrology)	Low	NA

Table 4: Risk of entrainment into the export facilities for Longfin Smelt in the central Delta:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
LFS sub-adults and adults	Exposure Risk (Hydrology)	Low	NA

- Change in exposure from previous week: *(Note: The change in risk compared to previous weeks is not required by the Incidental Take Permit [ITP]).*
 - DS: Risk remains low, though last week there were two fish detected by EDSM in the lower Sacramento River, indicating that staging may be starting soon.
 - LFS: No change, migration into fresher water may be starting soon.
- Reporting Old and Middle River Index (OMRI) *(Number and range of OMRI bins will vary based on anticipated hydrology and operations)*
 - Relevant Conditions of Approval (COAs) are not active.

Section 2: Basis for Advice

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

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

Discussion of Conditions of Approval

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

COAs relevant to OMR management go into effect December 1st. The Smelt Monitoring Team (SMT) conducted a Risk Assessment based on COA 8.1.5.2 and noted that there is no regulatory mechanism in place to provide advice until December 1st.

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. Delta Cross Channel [DCC] gate closure and actions such as integrated early winter pulse protection, etc.)*
 - DCC is closed as of 11/7.
 - OMR management has not been initiated.
- Controlling Factors: Water Quality
- Water Temperature:
 - Clifton Court Forebay (CCF) Daily Average Water Temperature = NA
 - 3 Station Average = 14.61°C
- Tidal Cycle: NA
- Turbidity:
 - 8.3.1 Freeport 3-day average = 1.55 formazin nephelometric units (FNU)
 - 8.5.1 Old River at Bacon Island (OBI) Turbidity = 2.95 FNU

- Salinity: X2 > 81 km, estimated at 95.3 km for Sacramento River and 94.9 km for San Joaquin River.
- Hydrologic Footprint: No Particle Tracking Models were requested.

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

- Outages
 - State Water Project (SWP): None
 - Central Valley Project (CVP): None
- Exports:
 - CCF: 500 to 3,000 cfs
 - Jones: 900 to 1,800 cfs
- Meteorological Forecast: Widespread rain, mountain snow and gusty winds on Monday and Tuesday, with scattered showers on Wednesday. Colder and drier conditions for rest of week.
- Storm Event Projection: Precipitation expected on Tuesday.

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

- DCC Gates position: Scheduled to open 11/11 and close 11/14. Closed during the weekdays and open on weekends
- Sacramento River flow at Freeport: 7,306 cfs
- San Joaquin River flow at Vernalis: 684 cfs
- Qwest: 3,327 cfs
- OBI Turbidity: 2.95 FNU
- NDOI: 6,188 cfs
- Upstream releases:
 - Keswick = 3,900 cfs
 - Nimbus = 1,400 cfs
 - Goodwin = 200 cfs
 - Oroville = 2,300 cfs

Table 5: Comparison of OMR and OMR Index (5-day and 14-day averages for OMR Index and USGS gauge were reported on [SacPAS website](#), accessed 8 November 2022.

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
11/04/2022	Daily	-1,882	-1,400
11/04/2022	5-day	-1,680	-1,250
11/04/2022	14-day	-1,940	-1,180

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: One subadult DS (Fork-length (FL): 55mm) and one adult DS (FL: 62mm) were detected in lower Sacramento River on November 3rd and 7th respectively (Table 1).
- Fall Mid-water Trawl (FMWT) Index for Delta Smelt: September Index: 0
- Delta Smelt life cycle model (LCM) discussion: NA
- Biological Conditions: NA
- % of population in Delta zones: NA
- Smelt Larva Survey (SLS) or 20mm Survey: SLS sampling will begin 12/5/2022.
- Salvage: No DS have been salvaged at either facility this water year.

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

- FMWT Index: September Index = 7 (catch data in Table 2).
- Other Surveys:
 - EDSM: Eight sub-adult LFS (FL: 57-84mm) were detected in Suisun Bay and Suisun Marsh during the week of October 31st to November 4th (Table 1). One adult LFS (FL: 93mm) was detected in Suisun Marsh on November 3rd (Table 1).
 - Chipps Island Trawl: One sub-adult LFS (62mm) was detected in Chipps Island on 10/14/22, none have been detected since.
 - Bay Study: In September, 36 sub-adult LFS (20-84mm) were detected from south of Bay Bridge (station 110) to San Pablo Bay (station 322). Distribution shifted further upstream in October with 47 sub-adult LFS (FL: 20-84mm) and five adult LFS (FL: 86-97mm) detected from near the San Mateo Bridge (station 101) to the lower Sacramento River (station 750).
- Salvage: No LFS have been salvaged at either facility this water year.

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

Notes:

- Spring Kodiak Trawl (SKT) will start on 1/9/23.
- 20mm Survey will start on 3/13/23.
- The two DS caught by EDSM were transferred to Fish Conservation and Culture Laboratory (FCCL) for broodstock, but neither survived.
- One adult LFS caught by EDSM on 11/3/22 was sent to FCCL for broodstock. This is the first LFS to be included in the new broodstock permit.

Attachments: Table 1: EDSM Catch Table, Table 2: FMWT September 2022 LFS catch table, Figure 1 Map of FMWT sampling locations.

Table 1: DS and LFS catch for EDSM 2022 Phase 3 Kodiak trawls November 1st- November 4th. These data are preliminary and subject to change.

Date	Stratum	Subregion	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/01/2022	Suisun Bay	Confluence	23-14-SB07	LFS	None	68	1	Released
11/01/2022	Suisun Bay	Honker Bay	23-14-SB01	LFS	None	68	1	Released
11/01/2022	Suisun Bay	Mid Suisun Bay	23-14-SB02	LFS	None	84	1	Released
11/02/2022	Suisun Marsh	Suisun Marsh	23-14-SM06	LFS	None	57	1	Released
11/03/2022	Suisun Marsh	Suisun Marsh	23-14-SM01	LFS	None	59	1	Released
11/03/2022	Suisun Marsh	Suisun Marsh	23-14-SM01	LFS	None	61	1	Released
11/03/2022	Suisun Marsh	Suisun Marsh	23-14-SM01	LFS	None	67	1	Released
11/03/2022	Suisun Marsh	Suisun Marsh	23-14-SM01	LFS	None	68	1	Released
11/03/2022	Suisun Marsh	Suisun Marsh	23-14-SM01	LFS	None	93	1	Released
11/03/2022	Lower Sac River	Lower Sac River	23-14-LSR06	DSM	None	55	1	FCCL
11/07/2022	Lower Sac River	Lower Sac River	23-15-LSR04	DSM	None	62	1	FCCL

Table 2: FMWT September 2022 LFS catch table. These data are preliminary and subject to change.

Sample Date	Station Code	Common Name	Catch	Fork Length (mm)
08-Sep-22	408	Longfin Smelt	1	54
08-Sep-22	418	Longfin Smelt	1	61
08-Sep-22	503	Longfin Smelt	1	101
14-Sep-22	704	Longfin Smelt	1	50
14-Sep-22	705	Longfin Smelt	1	57

FMWT Station Map

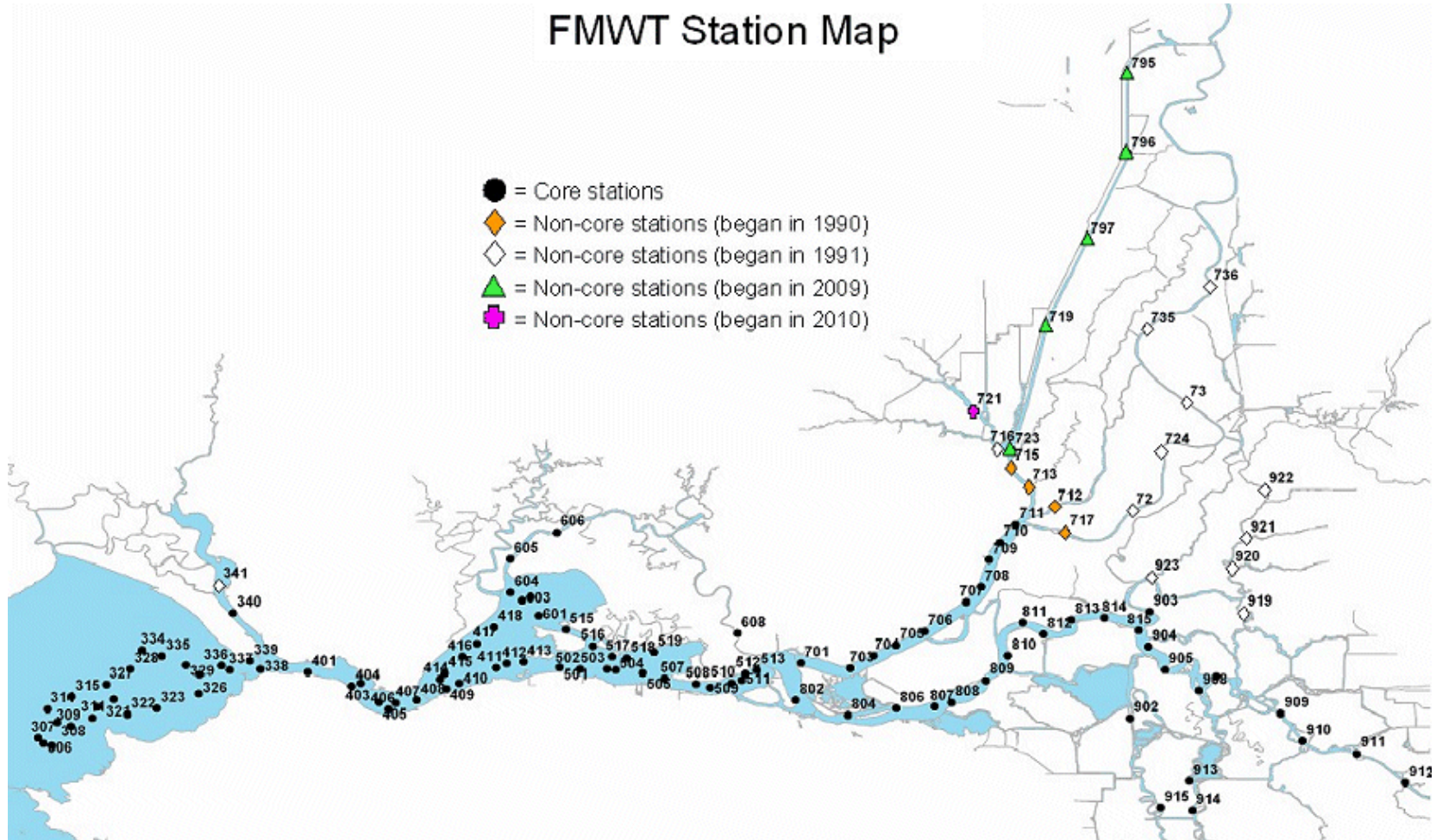


Figure 1: Map of FMWT sampling locations