

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

Section 1: Overview

Date: 11/21/2023

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 in this water year, Delta Smelt are unlikely to be prevalent in the Central and South Delta. Limited detection data from the past month supports Delta Smelt presence in the lower Sacramento River. The last Delta Smelt observations were on 10/24/23 and 11/15/23 in the lower Sacramento River. The likelihood of Delta Smelt entrainment is low due to seasonal timing. The regulations for Integrated Early Winter Pulse Protection do not go into effect until 12/1/23.

Longfin Smelt: Adult and sub-adult LFS have been detected by Enhanced Delta Smelt Monitoring Program (EDSM) in Suisun Marsh and Suisun Bay. One adult and one sub-adult LFS have been detected by Chipps Island Trawl on 10/20/23 and 10/02/23 respectively. Fall Midwater Trawl (FMWT) detected adult LFS in Suisun Bay and sub-adult LFS in the Confluence, Suisun Bay, and San Pablo Bay in the last two months. San Francisco Bay Study (SFBS) November survey detected three adult LFS west of Suisun Bay, and 86 sub-adult LFS in the Bay-Delta including six sub-adult LFS in the Lower Sacramento River. Water temperature around the Delta is approaching levels that are conducive for spawning (14°C). Based on distribution data and life history, adults and sub-adults are not expected to be present in the Central or South Delta and therefore are not expected to be at risk of entrainment.

Section 1-A: Sacramento River and Confluence

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 subadults and adults	Exposure Risk (Hydrology)	Low	Water temperature is not conducive for spawning. Turbidity and flow are not conducive of population scale migration.
DS subadults and adults	Routing Risk (Behavior and life history)	Low	One sub-adult DS was detected in the Lower Sacramento River by EDSM on 11/15/23.
DS	Overall Entrainment Risk	Low	As above

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 sub-adults and adults	Routing Risk (Behavior and life history)	Low	Several sub-adults and adults have been detected near or east of Chipps Island and X2 is relatively high (~88km). Water temperature is approaching levels conducive for spawning (14°C). Overall detection rate remains relatively low, thus entrainment risk remains low.
LFS	Overall Entrainment Risk	Low	As above

Section 1-B: Central Delta

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	No detections and unlikely to be present.

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	No detections and unlikely to be present.

- 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: No changes
 - LFS: No changes
- 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.
 - Expected daily OMRI range this week: -1,000 to -6,000 cfs

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: Closing on 11/20/23 and opening on 11/22/23.
 - OMR management has not been initiated.
- Controlling Factors: Delta outflow
- Water Temperature:
 - Clifton Court Forebay (CCF) Daily Average Water Temperature = NA
 - 3 Station Average = 14.1°C
- Tidal Cycle: Full moon on 11/27/23.
- Turbidity:
 - 8.3.1 Freeport 3-day average = 2.41 formazin nephelometric units (FNU)
 - 8.5.1 Old River at Bacon Island (OBI) Turbidity = 2.5 FNU

- Salinity: X2 = ~88.3 km
- 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):
 - 11/13/23 (1150-1300): No salvage due to power outage
 - Central Valley Project (CVP):
 - 11/16/23 (0800-1200): No salvage due to zero pumping
- Exports:
 - CCF: 1,500 cfs. Anticipated range: 800 to 4,000 cfs
 - Jones: 1,800 cfs. Anticipated range: 1,800 to 2,700 cfs
- Meteorological Forecast: Gusty winds on Monday; dry and warmer expected through rest of week.
- Six-day Storm Event Projection: NA

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

- DCC Gates position: Planned to close on 11/27/23 for remainder of the season.
- Sacramento River flow at Freeport: 8,920 cfs as of 11/20/23.
 - Anticipated range: 7,500 to 10,500 cfs
- San Joaquin River flow at Vernalis: 1,460 cfs as of 11/12/23.
 - Anticipated range: 1,250 to 1,750 cfs
- Qwest: 2,120 cfs as of 11/19/23. Anticipated to become negative when DCC gates are closed, and positive when the gates are open.
- OBI Turbidity: No anticipated changes.
- NDOI: 5,030 cfs as of 11/19/23. Anticipated range: 4,000 to 5,000 cfs.
- Upstream releases:
 - Keswick = 5,000 cfs. No anticipated changes.
 - Nimbus = 2,000 cfs. No anticipated changes.
 - Goodwin = 200 cfs. No anticipated changes.
 - Oroville = 1,750 cfs. No anticipated changes.

Table 1: Comparison of OMR and OMR Index (5-day and 14-day averages for OMR Index and USGS gauge were reported on [SacPAS website](#), accessed 21 November 2023.

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
11/17/23	Daily	-3,450	-2,770
11/17/23	5-day	-3,700	-3,130
11/17/23	14-day	-4,470	-3,870

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 (Fork length (FL): 57mm) DS was detected in the Lower Sacramento River on 11/15/23. One adult (FL: 60mm) and one sub-adult (FL: 53mm) DS were detected in Lower Sacramento River in October.
- FMWT September to October Index for Delta Smelt: 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 12/11/23.
- Experimental release: 14,104 cultured DS marked with green VIE on the left anterior dorsal side were released at Sacramento River near Rio Vista on 11/15/23.
- 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 September to October Index: 84.5 (preliminary)
- Other Surveys:
 - EDSM: Two sub-adult (FL: 55-57mm) LFS were detected in Suisun Bay during the week of 11/13/23 (Table 1).
 - Chipps Island Trawl: The last detection was one adult (FL: 95mm) LFS on 10/20/23.
 - Bay Study: Three adult (FL: 97-103mm) and 86 sub-adult (FL: 44-75mm) LFS were detected between the Lower Sacramento River and the South Bay in November (Table 2).
 - SLS: Sampling will begin 12/11/23.
- 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:

Attachments: Table 1: EDSM Catch Table, Table 2: SFBS Catch Table, and Figure 1: Map of SFBS stations.

Table 1. Delta Smelt (DSM) and Longfin Smelt (LFS) catch for EDSM 2023 Phase 3 Kodiak trawls on the week of 11/13/23. Only stations with DSM or LFS catch are reported here. These data are preliminary and subject to change.

Date	Stratum	Subregion	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/13/2023	Suisun Bay	West Suisun Bay	24-16-SB02	LFS	None	55	1	UC Davis/DOP
11/15/2023	Lower Sacramento	Lower Sacramento River	24-16-LSR02	DSM	None	57	1	UC Davis/DOP
11/16/2023	Suisun Marsh	Grizzly Bay	24-16-SM06	LFS	None	57	1	UC Davis/DOP

Table 2: LFS catch for San Francisco Bay Study (SFBS) November survey. Only stations with DS or LFS catch are reported here. These data are preliminary and subject to change. * indicates individual that were collected in multiple pieces but the field staff was able to confirm that the FL was well over the adult LFS threshold (FL >84mm).

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency	Plus Count
2023	11	108	2	1	LFS	64	1	NA
2023	11	108	2	1	LFS	58	2	NA
2023	11	108	2	1	LFS	62	3	NA
2023	11	108	2	1	LFS	61	1	NA
2023	11	108	2	1	LFS	51	1	NA
2023	11	108	2	1	LFS	55	1	NA
2023	11	109	2	1	LFS	56	1	NA
2023	11	110	2	1	LFS	59	1	NA
2023	11	110	2	1	LFS	68	1	NA
2023	11	140	2	1	LFS	68	1	NA
2023	11	214	2	1	LFS	58	2	NA
2023	11	216	2	1	LFS	57	1	NA
2023	11	216	2	1	LFS	51	2	NA
2023	11	216	2	1	LFS	56	1	NA
2023	11	243	2	1	LFS	NA	NA	1*
2023	11	321	2	1	LFS	69	1	NA
2023	11	321	2	1	LFS	63	1	NA
2023	11	321	2	1	LFS	48	1	NA
2023	11	321	2	1	LFS	67	1	NA
2023	11	321	2	1	LFS	60	1	NA
2023	11	321	2	1	LFS	56	1	NA
2023	11	321	2	1	LFS	49	1	NA
2023	11	323	2	1	LFS	69	1	NA
2023	11	323	2	1	LFS	62	1	NA
2023	11	323	2	1	LFS	58	1	NA

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency	Plus Count
2023	11	323	2	1	LFS	56	1	NA
2023	11	323	2	1	LFS	57	1	NA
2023	11	325	2	1	LFS	103	1	NA
2023	11	346	2	1	LFS	46	1	NA
2023	11	427	1	1	LFS	56	1	NA
2023	11	427	1	1	LFS	53	1	NA
2023	11	427	1	1	LFS	55	3	NA
2023	11	427	1	1	LFS	44	1	NA
2023	11	427	1	1	LFS	54	1	NA
2023	11	427	1	1	LFS	50	1	NA
2023	11	427	2	1	LFS	46	1	NA
2023	11	427	2	1	LFS	50	1	NA
2023	11	427	2	1	LFS	51	1	NA
2023	11	427	2	1	LFS	52	4	NA
2023	11	427	2	1	LFS	53	1	NA
2023	11	427	2	1	LFS	54	2	NA
2023	11	427	2	1	LFS	55	3	NA
2023	11	427	2	1	LFS	56	3	NA
2023	11	427	2	1	LFS	57	1	NA
2023	11	427	2	1	LFS	61	2	NA
2023	11	427	2	1	LFS	62	1	NA
2023	11	427	2	1	LFS	64	2	NA
2023	11	427	2	1	LFS	65	1	NA
2023	11	427	2	1	LFS	68	1	NA
2023	11	427	2	1	LFS	70	1	NA
2023	11	427	2	1	LFS	74	1	NA
2023	11	427	2	1	LFS	97	1	NA
2023	11	427	2	1	LFS	NA	NA	3
2023	11	428	2	1	LFS	64	1	NA
2023	11	430	2	1	LFS	51	1	NA
2023	11	430	2	1	LFS	75	1	NA
2023	11	432	2	1	LFS	58	1	NA
2023	11	432	2	1	LFS	57	1	NA
2023	11	432	2	1	LFS	50	1	NA
2023	11	433	1	1	LFS	59	1	NA
2023	11	534	1	1	LFS	69	1	NA
2023	11	534	1	1	LFS	61	1	NA
2023	11	534	1	1	LFS	55	1	NA
2023	11	534	1	1	LFS	56	1	NA
2023	11	736	1	1	LFS	67	1	NA

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency	Plus Count
2023	11	736	1	1	LFS	61	1	NA
2023	11	736	1	1	LFS	73	1	NA
2023	11	736	1	1	LFS	68	1	NA
2023	11	736	1	1	LFS	57	1	NA
2023	11	736	2	1	LFS	66	1	NA

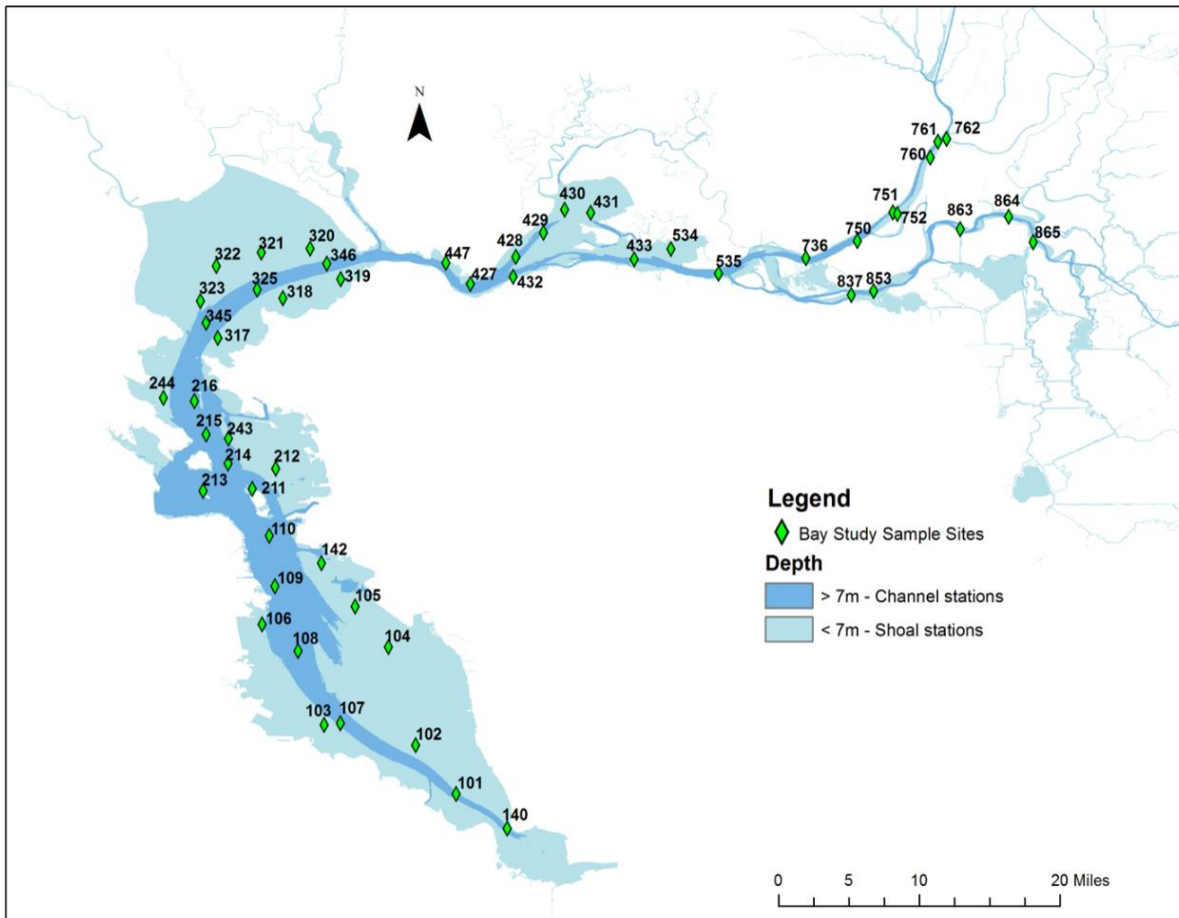


Figure 1: Map of SFBS stations.