

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

Section 1: Overview

Date: 11/1/2022

Life Stages Present:

Delta Smelt (DS): Sub-Adults and Adults

Longfin Smelt (LFS): Adults are not likely to be present within the Delta. Sub-adults have been detected in the lower Sacramento River, confluence, Suisun Bay, Suisun Marsh, and San Pablo and Central Bays. Adults have been detected in Suisun Bay and Suisun Marsh.

Advice to Water Operations Management Team (WOMT):

No Advice.

Risk Assessment:

Delta Smelt: Based on distribution patterns over the past decade and no 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) and Suisun Marsh. The last DS observed was on 9/21/22 in Grizzly Bay (Table 1). The likelihood of DS subadult 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. Adult LFS have been detected by EDSM in Suisun Marsh and Suisun Bay (Table 1). LFS adults are expected to move into the Delta beginning in December. Chipps Island detected one sub-adult LFS on 10/14/2022 (Table 2), EDSM detected sub-adult LFS in Suisun Bay and Suisun Marsh (Table 1). San Francisco Bay Study Survey detected sub-adult LFS in the lower Sacramento River, the confluence, and Suisun Bay (Table 3). 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	NA
DS subadults and adults	Routing Risk (Behavior and life history)	Low	NA
DS	Overall Entrainment Risk	Low	NA

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	NA
LFS	Overall Entrainment Risk	Low	NA

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	NA

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: Not discussed

- LFS: Not discussed
- 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 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 10/31.
 - OMR management has not been initiated.
- Controlling Factors: Water Quality (salinity)
- Water Temperature:
 - Clifton Court Forebay (CCF) Daily Average Water Temperature = NA
 - 3 Station Average = 16.68°C
- Tidal Cycle: NA
- Turbidity:
 - 8.3.1 Freeport 3-day average = 1.87 formazin nephelometric units (FNU)
 - 8.5.1 Old River at Bacon Island (OBI) Turbidity = 1.79 FNU
- Salinity: X2 = >82 km, estimated at 95.8 km for Sacramento River and 96.6 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: 300 to 500 cfs
 - Jones: 900 to 1,800 cfs
- Meteorological Forecast: Pattern change brings significant cooling, breezy winds and widespread rain and mountain snow mainly Tuesday and Wednesday. Possible morning frost for remainder of week.
- Storm Event Projection: Precipitation expected on Tuesday, Wednesday, and the weekend.

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

- DCC Gates position: Scheduled to open 11/4 and close 11/7. Closed during the weekdays and open on weekends
- Sacramento River flow at Freeport: 7,335 cfs on 11/1/22
- San Joaquin River flow at Vernalis: 1,859 cfs on 11/1/22.
- Qwest: 3,500 cfs. May change with this storm event as well as removal of barriers.
- OBI Turbidity: 1.79 FNU
- NDOI: 6,200 cfs
- Upstream releases:
 - Keswick = 3,900 cfs
 - Nimbus = 1,400 cfs
 - Goodwin = 200 cfs
 - Oroville = 2,400 cfs

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 1 November 2022.

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
10/29/2022	Daily	-2,560	-1,800
10/29/2022	5-day	-2,400	-1,180
10/29/2022	14-day	-1,810	-1,240

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: Two adult DS (Fork-length (FL): 63-75mm) were detected in Sacramento Deepwater Shipping Channel and Grizzly Bay in August and September. Four sub-adult DS (FL: 47-57mm) were detected in Lower Sacramento River and Sacramento Deepwater Shipping Channel in August (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
- Other Surveys:
 - EDSM: Five sub-adult LFS (FL: 51-70) were detected in Suisun Bay and Suisun Marsh in September and October (Table 1). Two adult LFS (FL: 87-97mm) were detected in Suisun Bay and Suisun Marsh in September and October (Table 1).
 - Chipps Island Trawl: One sub-adult LFS (62mm) was detected in Chipps Island on 10/14/22 (Table 2).
 - 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) (Table 3). 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:

- SLS will start on 12/5/22 and will be sampling their full suite of stations including San Pablo Bay.
- The first sub-adult LFS (FL: > 60mm) near Chipps Island was detected about a month earlier (10/14/22) than the previous water year (11/15/21). This may be indicative of earlier migration this year or a result of X2 being further upstream compared to last year.
- The first experimental release of water year 2023 is currently planned for the week of November 28th. Both hard and soft releases are planned south of Rio Vista. Two additional releases are scheduled for January.

Attachments: Table 1: EDSM Catch Table, Table 2: Chipps Island Catch Table, Table 3: San Francisco Bay Study Catch Table, Figure 1: Bay Study Station Locations

Table 1. Delta Smelt (DSM) and Longfin Smelt (LFS) catch for EDSM 2022 Phase 3 Kodiak trawls. DSM data is from August through September, there was no catch of DSM in October. LFS data is from September and October. Only stations with DSM or LFS catch are reported here. These data are preliminary and subject to change.

Water Year	Phase	Date	Station Code	Sub-Region	# Tows	Species	Fork Length (mm)	Stratum
2023	3	08/02/22	23-01-LSR05	Lower Sacramento River	3	DSM	55	Lower Sacramento
2023	3	08/02/22	23-01-LSR06	Lower Sacramento River	4	DSM	57	Lower Sacramento
2023	3	08/10/22	23-02-LSR06	Lower Sacramento River	3	DSM	47	Lower Sacramento
2023	3	08/15/22	23-03-SSC06	Lower Sacramento River Shipping Channel	3	DSM	52	Sac Deep Water Shipping Channel
2023	3	08/16/22	23-03-SSC01	Lower Sacramento River Shipping Channel	2	DSM	63	Sac Deep Water Shipping Channel
2023	3	09/21/22	23-08-SM01	Grizzly Bay	2	DSM	75	Suisun Marsh
2023	3	09/06/22	23-06-SB07	West Suisun Bay	4	LFS	87	Suisun Bay
2023	3	09/09/22	23-06-SM04	Grizzly Bay	4	LFS	51	Suisun Marsh
2023	3	10/04/22	23-10-SM02	Grizzly Bay	4	LFS	63	Suisun Marsh
2023	3	10/04/22	23-10-SM02	Grizzly Bay	4	LFS	58	Suisun Marsh
2023	3	10/20/22	23-12-SM03	Suisun Marsh	4	LFS	70	Suisun Marsh
2023	3	10/20/22	23-12-SM03	Suisun Marsh	4	LFS	65	Suisun Marsh

Water Year	Phase	Date	Station Code	Sub-Region	# Tows	Species	Fork Length (mm)	Stratum
2023	3	10/20/22	23-12-SM03	Suisun Marsh	4	LFS	97	Suisun Marsh

Table 2. Delta Smelt (DSM) and Longfin Smelt (LFS) catch in Chipps Island mid-water trawls from September and October, there was no catch in September. Only tows with catch of these species are reported here. These data are preliminary and subject to change.

Water Year	Station Code	Date	Species	Fork Length (mm)	Total Catch	Location
2023	SB018N	10/14/22	LFS	62	1	Chipps Island

Table 3. Delta Smelt (DSM) and Longfin Smelt (LFS) catch in San Francisco Bay Study, only stations with catch of these species are reported here. These data are preliminary and subject to change.

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency
2022	9	110	2	1	LFS	50	1
2022	9	110	2	1	LFS	52	2
2022	9	110	2	1	LFS	53	1
2022	9	110	2	1	LFS	54	1
2022	9	214	2	1	LFS	50	1
2022	9	214	2	1	LFS	60	1
2022	9	215	2	1	LFS	45	1
2022	9	215	2	1	LFS	48	2
2022	9	215	2	1	LFS	50	3
2022	9	215	2	1	LFS	51	1
2022	9	215	2	1	LFS	52	4
2022	9	215	2	1	LFS	53	2
2022	9	215	2	1	LFS	55	2
2022	9	215	2	1	LFS	56	1
2022	9	215	2	1	LFS	57	1
2022	9	215	2	1	LFS	60	1

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency
2022	9	215	2	1	LFS	78	1
2022	9	322	1	1	LFS	60	1
2022	9	322	2	1	LFS	52	1
2022	9	322	2	1	LFS	56	1
2022	9	323	1	1	LFS	51	1
2022	9	323	1	1	LFS	69	1
2022	9	323	2	1	LFS	54	3
2022	9	345	2	1	LFS	44	1
2022	9	345	2	1	LFS	54	1
2022	10	101	2	1	LFS	56	1
2022	10	107	2	1	LFS	86	1
2022	10	110	2	1	LFS	52	1
2022	10	110	2	1	LFS	55	1
2022	10	110	2	1	LFS	56	1
2022	10	211	2	1	LFS	65	1
2022	10	211	2	1	LFS	96	1
2022	10	214	2	1	LFS	50	1
2022	10	214	2	1	LFS	51	1
2022	10	214	2	1	LFS	52	1
2022	10	214	2	1	LFS	64	1
2022	10	215	2	1	LFS	50	1
2022	10	215	2	1	LFS	52	1
2022	10	215	2	1	LFS	54	1
2022	10	215	2	1	LFS	55	1
2022	10	215	2	1	LFS	56	1
2022	10	215	2	1	LFS	57	1
2022	10	215	2	1	LFS	60	1
2022	10	215	2	1	LFS	64	1
2022	10	215	2	1	LFS	73	1
2022	10	215	2	1	LFS	76	1
2022	10	215	2	1	LFS	88	1
2022	10	215	2	1	LFS	97	2
2022	10	216	2	1	LFS	50	1
2022	10	216	2	1	LFS	51	1
2022	10	216	2	1	LFS	52	2
2022	10	216	2	1	LFS	53	4
2022	10	216	2	1	LFS	55	2
2022	10	216	2	1	LFS	57	1
2022	10	216	2	1	LFS	59	1
2022	10	216	2	1	LFS	60	1

Year	Survey	Station	Net	Tow	Species	Fork Length (mm)	Frequency
2022	10	216	2	1	LFS	61	1
2022	10	216	2	1	LFS	68	1
2022	10	244	2	1	LFS	52	1
2022	10	317	2	1	LFS	49	1
2022	10	317	2	1	LFS	54	1
2022	10	321	2	1	LFS	70	1
2022	10	323	1	1	LFS	48	1
2022	10	323	1	1	LFS	83	1
2022	10	323	2	1	LFS	56	1
2022	10	323	2	1	LFS	67	1
2022	10	345	1	1	LFS	42	1
2022	10	433	1	1	LFS	64	1
2022	10	535	2	1	LFS	58	1
2022	10	750	1	1	LFS	62	1
2022	10	750	1	1	LFS	68	1

Figure 1. San Francisco Bay Study Station Locations

