

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

Section 1: Overview

Date: 11/22/2022

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 month and the position of X2 in the Sacramento River support DS presence in the lower Sacramento River. The last DS observations were on 11/3/22 and 11/7/22 in the lower Sacramento River. 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 Central or South Delta in recent sampling. LFS adults are expected to move into spawning habitat by November and December, and water temperatures are now suitable for spawning. Adult and sub-adult LFS have been detected by EDSM in Suisun Marsh and Suisun Bay (Table 1). One adult was detected by EDSM yesterday in Broad Slough near the confluence. Chipps Island detected one sub-adult LFS on 11/18/2022. 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. Regulations for adult LFS protection go into effect 12/1/2022.

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)	NA	Spawning hasn't started, no larvae present.
DS subadults and adults	Routing Risk (Behavior and life history)	Low	Turbidity remains low, staging near X2 may be starting soon, water temperatures are declining.
DS	Overall Entrainment Risk	Low	Same as above.

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)	NA	Conditions are now suitable for spawning, and spawning may have started, however no larvae or ripe adults have been detected yet (no sampling for larvae is occurring yet, sampling for larvae will begin 12/5).
LFS sub-adults and adults	Routing Risk (Behavior and life history)	Low	Conditions are now suitable for spawning, and spawning may have started. Staging downstream of X2 is continuing. Additionally, FCCL reported a mature male expressing milt was collected in the Lower Sacramento River near Sherman Island by the Broodstock Collection Effort.
LFS	Overall Entrainment Risk	Low	Same as above.

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	No subadults or adults have been detected in the Central Delta in field surveys.

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	No subadults or adults have been detected in the Central Delta in field surveys.

- 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 two fish were detected by EDSM in the lower Sacramento River in early November, indicating that staging may be starting soon.
 - LFS: Risk remains low, conditions are now suitable for spawning.
- 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 11/21/22.
 - OMR management has not been initiated.
- Controlling Factors: Water Quality

- Water Temperature:
 - Clifton Court Forebay (CCF) Daily Average Water Temperature = NA
 - 3 Station Average = 11.50°C
- Tidal Cycle: NA
- Turbidity:
 - 8.3.1 Freeport 3-day average = 1.72 formazin nephelometric units (FNU)
 - 8.5.1 Old River at Bacon Island (OBI) Turbidity = 2.44 FNU
- Salinity: X2 > 81 km, estimated at 95.2 km for Sacramento River as of 11/20/22, and 94.3 km for San Joaquin River as of 11/10/22.
- 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 1,000 cfs
 - Jones: 900 to 1,800 cfs
- Meteorological Forecast: Dry weather with a slight warming trend through the week. Pattern change possible late in post-Thanksgiving weekend.
- Storm Event Projection: NA

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

- DCC Gates position: Scheduled to open 11/25 and close 11/28. Closed during the weekdays and open on weekends
- Sacramento River flow at Freeport: 6,240 cfs
- San Joaquin River flow at Vernalis: 676 cfs
- Qwest: 1,661 cfs
- OBI Turbidity: 2.44 FNU
- NDOI: 4,075 cfs
- Upstream releases:
 - Keswick = 3,250 cfs
 - Nimbus = 1,300 cfs
 - Goodwin = 200 cfs
 - Oroville = 1,600 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 22 November 2022.

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
11/19/2022	Daily	-2,600	-2,090
11/19/2022	5-day	-2,500	-2,150
11/19/2022	14-day	-2,660	-2,270

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.
- Fall Mid-water Trawl (FMWT) Index for Delta Smelt: October 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: October Index = 261
- Other Surveys:
 - EDSM: 18 sub-adult LFS (FL: 60-80mm) and two adult LFS (FL: 95-104mm) were detected in Grizzly Bay during the week of November 14th to November 18th (Table 1). One adult LFS (FL: 96mm) was detected in Broad Slough near the confluence on November 21st.
 - Chipps Island Trawl: One sub-adult LFS (72mm) was detected on 11/18/22 (Table 2). Only one other sub-adult LFS has been detected this WY on 10/14/22.
 - 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). In November, the center of distribution continued to move upstream from Central Bay to San Pablo and Suisun Bay with a total of 73 sub-adult LFS (FL: 20-84mm) and three adult LFS (FL: 87-89mm) detected (Table 3).
 - FMWT: In October, 97 sub-adults and three adults were detected (Table 4).
- 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:

- The four LFS that were caught and sent to FCCL on November 7th and 9th were confirmed to not be sexually mature.
- The first DS experimental release of this water year will occur 11/28-12/2.

Attachments: Table 1: EDSM Catch Table, Table2: Chipps Island Trawl Catch Table, Table 3: San Francisco Bay Study Catch Table, Table 4: FMWT Catch Table, Figure 1: San Francisco Bay Study Station Location, and Figure 2: FMWT Station Location.

Table 1: DS and LFS catch for EDSM 2022 Phase 3 Kodiak trawls November 14th- November 18th. Only stations with catch of these species are reported here. FCCL = Fish Conservation and Culture Lab. These data are preliminary and subject to change.

Date	Stratum	Subregion	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	60	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	63	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	65	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	66	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	68	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	70	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	74	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	78	1	Released
11/16/2022	Suisun Marsh	Grizzly Bay	23-16-SM06	LFS	None	80	1	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	63	1	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	65	2	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	66	1	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	69	2	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	70	2	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	74	1	Released
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	95	1	FCCL
11/17/2022	Suisun Marsh	Grizzly Bay	23-16-SM03	LFS	None	104	1	FCCL

Table 2: LFS catch for Chipps Island Trawls November 14th – November 18th. These data are preliminary and subject to change.

Date	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/18/2022	SB018M	LFS	None	72	1	Released

Table 3: DS and 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	Length	Frequency
2022	11	101	1	1	LONSME	62	1
2022	11	101	1	1	LONSME	65	1
2022	11	101	2	1	LONSME	87	1
2022	11	102	1	1	LONSME	58	1
2022	11	103	2	1	LONSME	54	2
2022	11	103	2	1	LONSME	56	1
2022	11	103	2	1	LONSME	69	2
2022	11	103	2	1	LONSME	72	1
2022	11	106	2	1	LONSME	54	1
2022	11	106	2	1	LONSME	56	1
2022	11	107	1	1	LONSME	56	1
2022	11	107	2	1	LONSME	58	1
2022	11	107	2	1	LONSME	69	1
2022	11	108	1	1	LONSME	47	1
2022	11	108	1	1	LONSME	50	1
2022	11	108	1	1	LONSME	66	1
2022	11	108	2	1	LONSME	57	1
2022	11	108	2	1	LONSME	61	1
2022	11	110	1	1	LONSME	54	1
2022	11	110	1	1	LONSME	56	1
2022	11	110	1	1	LONSME	58	1
2022	11	243	1	1	LONSME	57	1
2022	11	319	2	1	LONSME	62	1
2022	11	319	2	1	LONSME	72	1
2022	11	320	1	1	LONSME	53	1
2022	11	320	1	1	LONSME	57	1
2022	11	320	1	1	LONSME	65	2
2022	11	320	1	1	LONSME	68	1
2022	11	320	1	1	LONSME	89	1
2022	11	320	2	1	LONSME	76	1
2022	11	321	2	1	LONSME	59	1
2022	11	321	2	1	LONSME	66	1
2022	11	322	2	1	LONSME	51	1
2022	11	322	2	1	LONSME	52	1
2022	11	322	2	1	LONSME	53	2
2022	11	322	2	1	LONSME	55	4
2022	11	322	2	1	LONSME	56	1
2022	11	322	2	1	LONSME	58	1

Year	Survey	Station	Net	Tow	Species	Length	Frequency
2022	11	323	1	1	LONSME	51	1
2022	11	323	1	1	LONSME	52	1
2022	11	323	1	1	LONSME	54	2
2022	11	323	1	1	LONSME	55	3
2022	11	323	1	1	LONSME	56	3
2022	11	323	1	1	LONSME	57	3
2022	11	323	1	1	LONSME	61	1
2022	11	323	1	1	LONSME	62	1
2022	11	323	2	1	LONSME	52	1
2022	11	323	2	1	LONSME	58	1
2022	11	325	1	1	LONSME	57	1
2022	11	325	2	1	LONSME	56	1
2022	11	346	2	1	LONSME	65	1
2022	11	429	1	1	LONSME	58	2
2022	11	429	1	1	LONSME	65	2
2022	11	429	1	1	LONSME	70	1
2022	11	429	1	1	LONSME	72	1
2022	11	430	1	1	LONSME	58	1
2022	11	430	1	1	LONSME	62	1
2022	11	430	2	1	LONSME	88	1
2022	11	431	1	1	LONSME	64	1
2022	11	751	1	1	LONSME	64	1

Table 4: FMWT October 2022 LFS catch table. These data are preliminary and subject to change.

Sample Date	Station Code	Common Name	Fork Length	Length Frequency
10/6/2022	606	Longfin Smelt	61	1
10/6/2022	603	Longfin Smelt	83	1
10/6/2022	601	Longfin Smelt	68	1
10/10/2022	515	Longfin Smelt	80	1
10/4/2022	325	Longfin Smelt	53	1
10/3/2022	314	Longfin Smelt	64	1
10/3/2022	314	Longfin Smelt	57	1
10/3/2022	314	Longfin Smelt	55	1
10/3/2022	311	Longfin Smelt	65	1
10/3/2022	311	Longfin Smelt	57	1
10/3/2022	311	Longfin Smelt	56	1
10/3/2022	309	Longfin Smelt	56	1
10/3/2022	309	Longfin Smelt	55	1
10/3/2022	307	Longfin Smelt	95	1

Sample Date	Station Code	Common Name	Fork Length	Length Frequency
10/3/2022	307	Longfin Smelt	91	1
10/3/2022	307	Longfin Smelt	66	1
10/3/2022	307	Longfin Smelt	62	6
10/3/2022	307	Longfin Smelt	61	1
10/3/2022	307	Longfin Smelt	60	3
10/3/2022	307	Longfin Smelt	59	1
10/3/2022	307	Longfin Smelt	58	2
10/3/2022	307	Longfin Smelt	57	6
10/3/2022	307	Longfin Smelt	56	2
10/3/2022	307	Longfin Smelt	55	2
10/3/2022	307	Longfin Smelt	54	7
10/3/2022	307	Longfin Smelt	53	9
10/3/2022	307	Longfin Smelt	52	4
10/3/2022	307	Longfin Smelt	50	1
10/3/2022	307	Longfin Smelt	49	2
10/3/2022	307	Longfin Smelt	44	1
10/3/2022	307	Longfin Smelt	NA	36

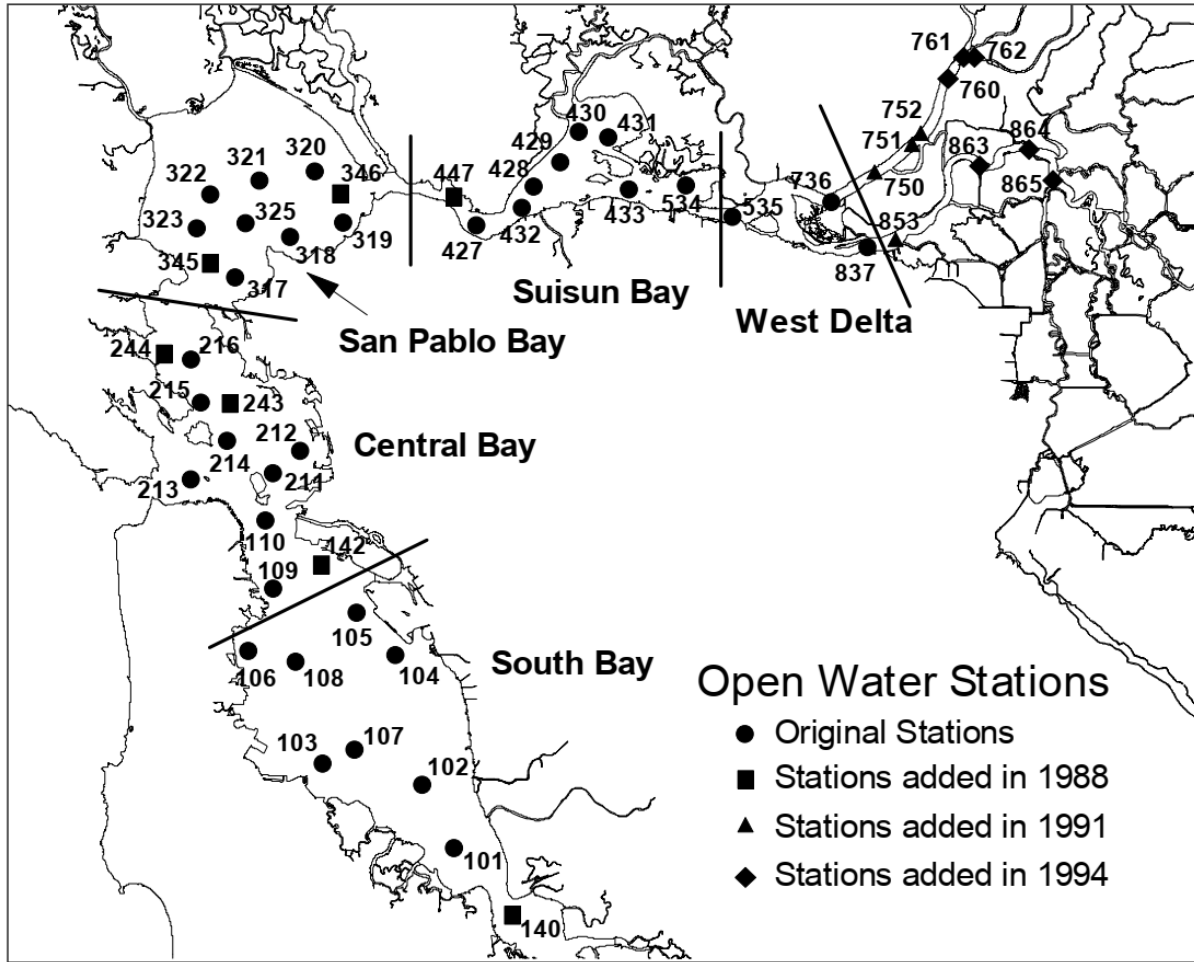


Figure 1. San Francisco Bay Study Station Locations

FMWT Station Map

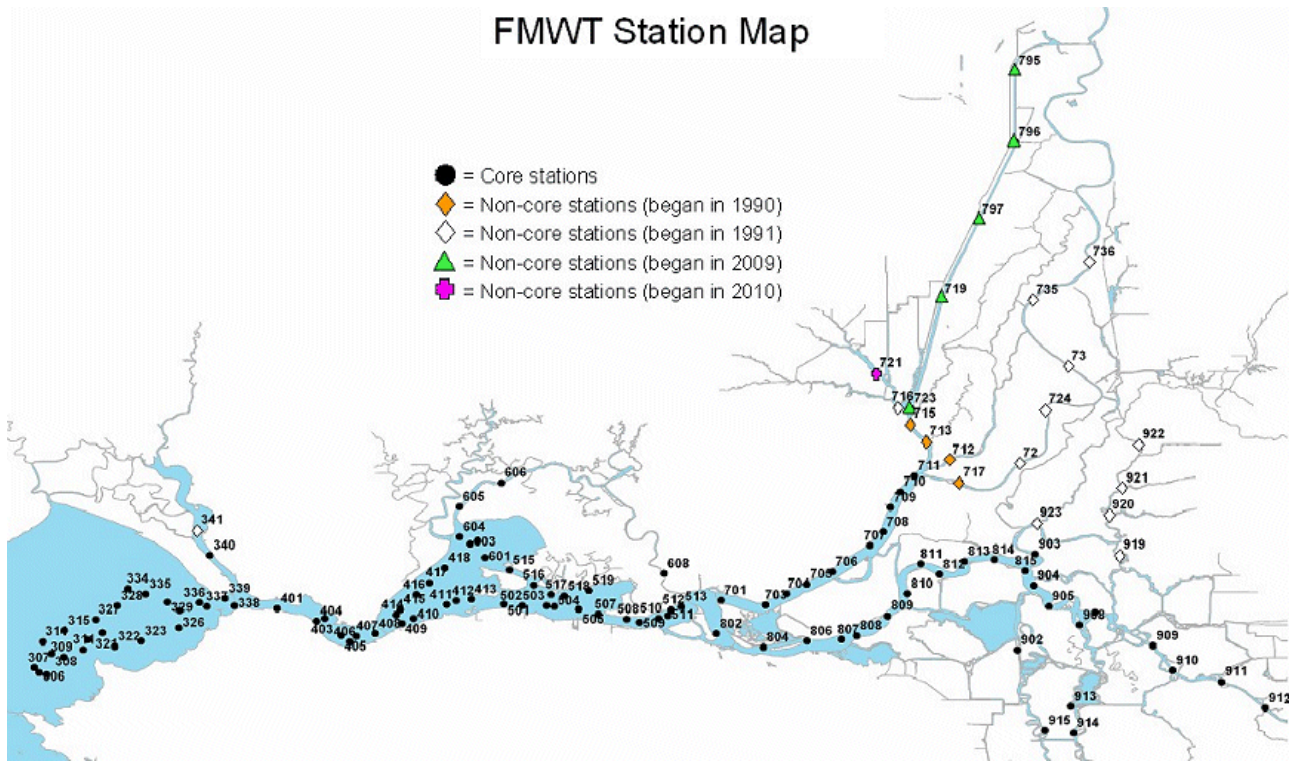


Figure 2: Map of FMWT sampling locations