United States Department of the Interior

BUREAU OF RECLAMATION
Central Valley Operations Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY
REFER TO:

CVO-100
ENV-7.00

SEP 26 2014

MEMORANDUM

To: Field Supervisor, U.S. Fish and Wildlife Service
Attn: Michael A. Chotkowski

From: Ronald Milligan
Manager, Operations

Subject: Continuing Drought Response Measures Under the 2008 Coordinated Long-term Operations of the Central Valley Project (CVP) and State Water Project (SWP) Biological Opinion (2008 BiOp)

The Bureau of Reclamation (Reclamation) is submitting modifications to the *Central Valley Project and State Water Project Drought Operations Plan and Operational Forecast* (Plan) that describes the proposed drought response measures for April 2014, through November 15, 2014, consistent with the Re-initiation Statement for consecutive dry or critically dry years in the 2008 BiOp. We are seeking concurrence of the U.S. Fish and Wildlife Service (Service) that the modified drought response actions currently proposed by Reclamation during the beginning of water year (WY) 2015 will result in no additional adverse effects to delta smelt or its critical habitat beyond those analyzed in the 2008 BiOp.

The proposed modifications to the Plan include adding the following under Section VII Proposed Delta Operations – June Through November 15:

E. San Joaquin River Flows at Vernalis and Water Transfer Window

- D-1641 San Joaquin River flows at Vernalis
  - Reduce the month-long average fall attraction base flows from 1,000 cfs to 800 cfs for 31 days
  - Action to occur between October 1 and November 15, 2014 (release schedule starting date to be based on fish agency recommendations)
- Water transfer window
  - Extend the transfer window through November 15, 2014, to allow the conveyance of approximately 75 to 90 TAF of transfer water (excluding carriage water) that has been retained in Shasta and Folsom reservoirs for diversion from the south Delta at the Jones Pumping Plant
  - Include alerts and triggers related to the presence of listed threatened or endangered fish species that will reduce or suspend conveyance of transfer water

while fish movement is assessed (based on fish agency recommendations using monitoring alert and triggers in NMFS 2009 BiOp Action IV.1.1)

The Plan was developed in April 2014, in coordination with the California Department of Water Resources (DWR), the Service, the National Marine Fisheries Service, the California Department of Fish and Wildlife, and the State Water Resources Control Board, and outlined proposed actions and a likely range of coordinated operation of the CVP and SWP through November 15, 2014. As you are aware, severe drought conditions continue in California and Reclamation and DWR are currently operating the CVP and SWP to provide for, at a minimum, essential human health and safety needs for the remainder of WY 2014 and the beginning of WY 2015. In addition to health and safety needs, the Plan's purposes include controlling salinity intrusion in the Sacramento-San Joaquin Delta, preserving cold water storage in project reservoirs, and maintaining minimum protections for endangered species and other fish and wildlife resources suffering from the ongoing drought.

The Plan anticipated the potential need for modifications based on evolving information as additional hydrological and biological information became available. The proposed modifications are additional measures that focus on fall operation of the CVP and SWP based on current conditions that were unknown in spring 2014 when the Plan was developed. CVP water transfers that were contemplated in the spring of 2014 could not occur during the summer due to restrictive operations that were required to address worsening drought conditions and cold-water pool management at Folsom and Shasta reservoirs. It is anticipated that DWR will complete diversion of SWP transfer water by October 1, 2014, therefore the proposed modifications related to extending the transfer window only apply to diversion of transfer water at the federal facilities.

Reclamation will be submitting a revised Temporary Urgency Change Petition to the State Water Resources Control Board specific to modification of the San Joaquin River flows at Vernalis. Conditions at New Melones Reservoir have not met March 2014 forecasted conditions and the reservoir is currently at 37% of historical average and 22% of its capacity. Some forecasts assumed additional inflow to New Melones Reservoir in October 2014, but current weather forecasts are that any early season or near-term rains appear unlikely.

The attached analysis demonstrates that the proposed drought response modifications will have no additional adverse effects on delta smelt or its critical habitat that were not previously analyzed in the 2008 BiOp. The proposed modifications will not affect Reclamation's ability to meet the RPA actions included in the 2008 BiOp. Reclamation seeks the Service's concurrence in this determination.

Similar to WY 2014, the Real Time Drought Operations Management Team will be utilized for management of the proposed drought response modifications described herein and during WY 2015, as conditions warrant.

We appreciate the assistance we have received from the Service during this extreme drought year and look forward to your response. Please contact me at 916-979-2199, if you have any questions.

Attachment

cc: Mr. Chuck Bonham
Director
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Mr. Dean Messer
Chief, Environmental Services
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Ms. Maria Rea
Assistant Regional Administrator
California Central Valley Area Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-110
Sacramento, CA 95814

Mr. David Murillo
Regional Director
Mid-Pacific Region
Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825
(w/att to each)

Mr. Mark Cowin
Director
California Department of Water Resources
1416 Ninth Street
Sacramento, CA 95814

Mr. John Leahigh
Operations Control Office
California Department of Water Resources
3310 El Camino Avenue, Suite 300
Sacramento, CA 95821

Mr. Ren Lohoefener
Regional Director
Pacific Southwest Region
U. S. Fish and Wildlife Service
2800 Cottage Way
Sacramento, CA 95825

E. San Joaquin River Flows at Vernalis and Water Transfer Window

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Conceptual Model, Life History, and Status of Species

Life History

Delta Smelt (*Hypomesusm transpacificus*) is a northern smelt endemic to the San Francisco Estuary. Most individuals die after one year, although a small percentage of the population can reach two years old. It is a slender-bodied fish, typically ~70 mm long, with a maximum length of ~120 mm. It is considered a 'semi-anadromous' species that spawns in freshwater and rears in fresh to brackish waters of the Delta and Suisun Bay. Based on the distribution of spent females, larvae and other indirect indications, most spawning is thought to occur during April through mid-May with highest densities in recent years observed in the Cache Slough/Sacramento Deepwater Ship Channel complex (Cache Slough complex) and the north Delta. Some juveniles remain in these areas to complete their life cycle, whereas most are thought to move downstream to over summer in the Low Salinity Zone (2-6 psu) of the western Delta and Suisun Bay. During the September-November period addressed by this biological review, the smelt population tends to hold in the lower Sacramento River near its confluence with the San Joaquin River until individuals approach sexual maturity. The population begins to move upstream to spawning areas in the December-February period, depending in part on water temperature and the timing of the first flush.

Current status

Delta smelt abundance, as indexed by the California Department of Fish and Wildlife (CDFW) Fall Mid-Water Trawl survey, has declined precipitously since 1967 (Figure 1). A short-lived rebound in the FMWT index in 2011 indicates that the population can respond to

favorable conditions, but the most recent index (2013) was the second lowest on record and the results of juvenile surveys indicate that relative abundance in 2014 is likely to also be very low.

Analytical Framework

Methods and Metrics

Evaluation of the potential effects of the proposed action on Delta smelt habitat, abundance, and spatial distribution was based primarily on data on the population's historical distribution during the September-December period from 2008 through 2013. This range of years includes one critical year (2008), two dry years (2009, 2013), two below- normal years (2010, 2012) and one wet year (2011). The assessment was also based on reviews of peer-reviewed literature and the biological rationale of the RPA actions in the FWS BiOp.

Biological Analysis of Action

Delta Habitat Effect

During the expanded water transfer window and the period of reduced base flow at Vernalis (~October 1-November 15), the delta smelt population will continue to reside in the lower Sacramento River near Decker Island and Grizzly Bay and in the Cache Slough/Sacramento Deepwater Ship Channel areas. Here they will grow and mature in preparation for movement to upstream spawning areas. Historically, this movement does not occur until well into December or until the first flush event of the winter. During first flush conditions, the chances that some of the population will move into the central and south Delta are increased due to a combination of factors, particularly higher turbidity and lower water temperature. The most recent 60-day weather forecast predicts continued DRY weather conditions for northern California. If these dry conditions persist, there is an extremely low probability that the low turbidity/high water temperature conditions that currently prevail in the central and south Delta will improve enough to attract smelt into any areas of the Delta subject to entrainment, particularly at the moderate projected levels of export pumping. There is a low level of uncertainty in this conclusion.

The Net Delta Outflow Index (NDOI) is presently (9/25/14) ~3500 cfs. The nominal center of the Delta smelt population's distribution (as indicated by X2) is thus ~10 km upstream of the confluence of the Sacramento and San Joaquin rivers, but still well outside the zone of entrainment by the project export facilities. The September 90% exceedence forecast estimates that Old and Middle River (OMR) flow will average -3000 cfs without transfers. This estimate assumes that the Head of Old River Barrier is in place. To accomplish the water transfers, CVP pumping will need to increase by some 1100 to 1200 cfs. This incremental increase in CVP export pumping will increase OMR flow from -3000 cfs to -4000 cfs. Given

the very low probability that smelt will move into the Central Delta during November, a -1000 cfs increase in OMR flow over the no-transfer operation will not appreciably increase entrainment risk (see Figure B-16, p. 397 in FWS BiOp).

The projects will be operated to continue meeting the NDOI objectives in D-1641. During the October Vernalis pulse flow reduction period, NDOI will average ~3000 cfs and during November, NDOI will average ~3500 cfs. The proposed actions will therefore not affect the area of Low Salinity Zone (LSZ) habitat

Predicted Effect

The just-completed 2014 California Department of Fish and Wildlife (CDFW) Summer Tow Net Survey indicates that the delta smelt population continues to reside in the western Delta and Grizzly Bay and in the Cache Slough-Sacramento Deepwater ship channel area. No delta smelt were captured in the central and south delta. This spatial distribution is typical for late summer and fall months. Fall Mid-Water Trawl (FMWT) surveys conducted during September, October, November and December from 2008 through 2013 (see tables below) had zero captures at stations located in the central and south Delta. Given that smelt will not be mature enough to begin moving upstream to spawn by November 15 and the extremely low probability of a first flush event before Novembr 15, the proposed action is unlikely to adversely affect the Delta smelt population as a result of direct or indirect entrainment effects. Similarly, the proposed action is not likely to affect X2 or the extent of the LSZ and is therefore not likely to impose any additional adverse effect on Delta smelt critical habitat.

Conclusion

The analysis demonstrates that the proposed drought response modifications will have no additional adverse effects on delta smelt or its critical habitat that were not previously analyzed in the 2008 BiOp. The proposed modifications will not affect Reclamation's ability to meet the RPA actions included in the 2008 BiOp.

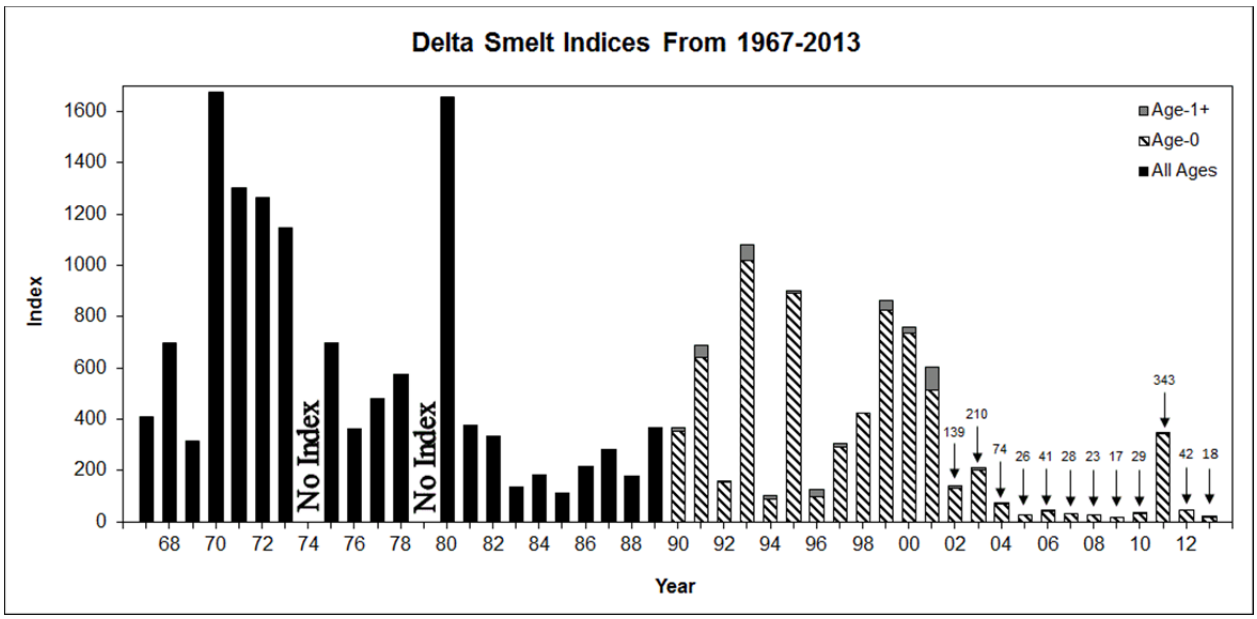

Figure 1. Fall Mid-Water Trawl index, 1967-2013.

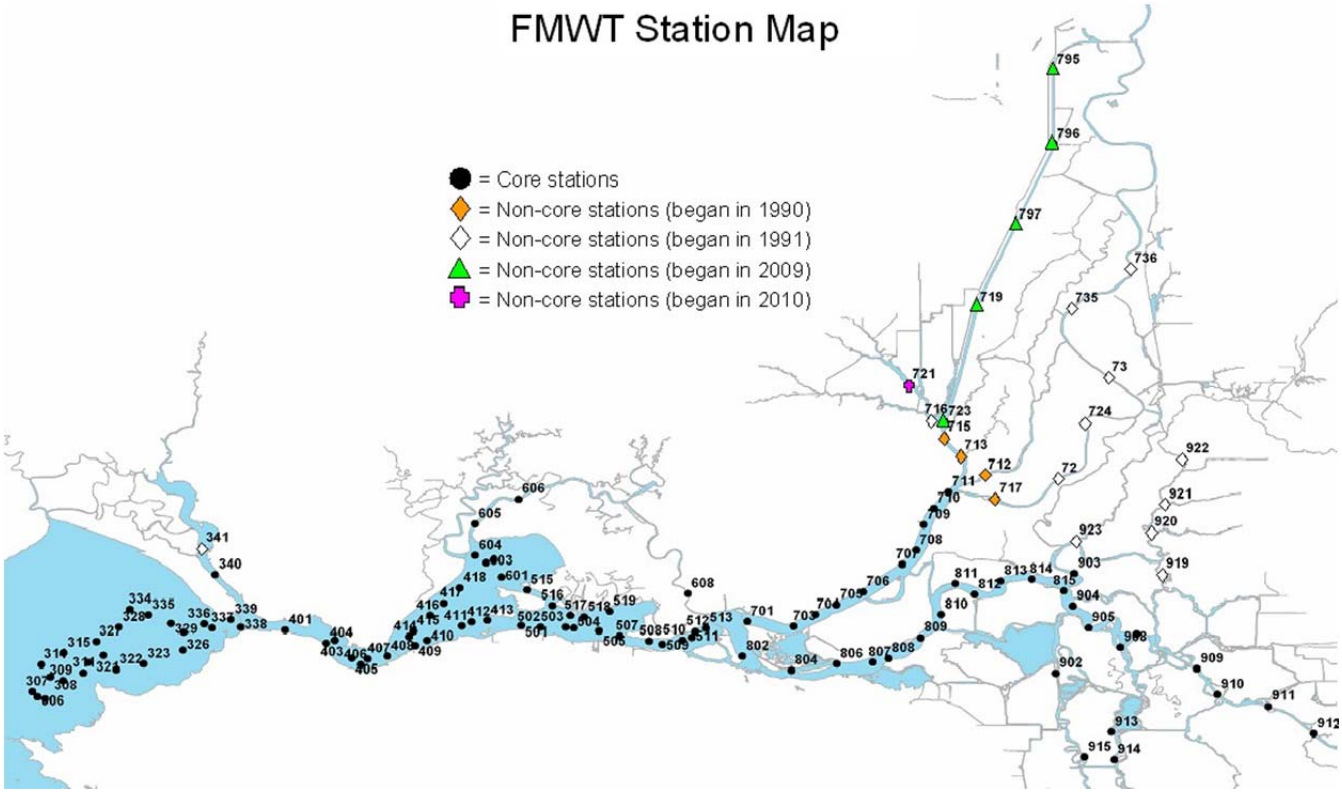

Figure 2. Location of Fall Mid-Water Trawl sampling stations.

Attachment: Biological Review for Endangered Species Act Compliance for Extended Water Transfer Period DELTA SMELT

Table 1. Location of non-zero Delta Smelt catches in Fall Mid-Water Trawl surveys, 2008-2013.

Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
9/17/2008	706	18.6	1230	0.6	2
9/17/2008	716	19.3	270	0.1	1
10/9/2008	606	20.1	13490	7.8	2
10/16/2008	704	16.1	4774	2.5	2
10/16/2008	706	16.4	2594	1.3	1
10/16/2008	715	16.7	251	0.1	1
11/10/2008	515	14.5	15470	9.0	1
11/7/2008	703	14.8	1352	0.7	2
11/7/2008	704	15.1	1173	0.6	3
11/7/2008	706	15.3	422	0.2	4
12/16/2008	704	9.3	6310	3.4	2
12/16/2008	707	9.5	3101	1.6	1

Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
09/14/2009	601	20	17030	10.0	1
09/14/2009	606	20.5	16230	9.5	1
09/30/2009	795	21.8	876	0.4	1
09/30/2009	797	20.9	690	0.3	1
10/14/2009	516	16.5	16000	9.3	1
10/19/2009	704	17.1	2450	1.2	2
10/19/2009	713	17.2	180	0.1	1
10/28/2009	719	15.8	453	0.2	1
10/28/2009	796	16.2	784	0.4	1
11/09/2009	518	16.6	10540	5.9	1
11/10/2009	704	15.1	2812	1.4	2
12/07/2009	517	10.7	13440	7.7	1
12/07/2009	518	10.7	11990	6.8	1
12/07/2009	519	10.5	14140	8.2	6
12/07/2009	601	10.4	18900	11.2	1
12/10/2009	703	9.2	4492	2.4	1

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Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
09/16/2010	510	18.9	3398	1.8	1
09/16/2010	511	19	2983	1.5	1
09/16/2010	513	18.8	1979	1.0	1
09/15/2010	515	18.4	15890	9.3	1
09/14/2010	601	18.7	15780	9.2	1
09/20/2010	707	19.8	183	0.1	1
09/20/2010	713	20.3	208	0.1	1
09/20/2010	716	20.2	224	0.1	1
09/29/2010	721	24	201	0.1	5
09/29/2010	796	22.7	816	0.4	1
10/12/2010	703	20	811	0.4	7
10/12/2010	704	19.8	820	0.4	1
10/12/2010	706	19.6	200	0.1	2
10/19/2010	721	18.3	176	0.1	5
10/19/2010	796	19.3	833	0.4	1
12/07/2010	73	11.5	153	0.1	1
12/07/2010	507	10.7	4684	2.5	1
12/06/2010	515	11.6	12230	7.0	3
12/07/2010	518	10.9	9190	5.1	2
12/07/2010	519	10.4	7140	3.9	1
12/06/2010	601	11.4	15860	9.2	1
12/06/2010	603	11.2	12650	7.2	2
12/06/2010	605	11.3	9910	5.6	1
12/06/2010	606	11.5	5610	3.0	1
12/06/2010	721	11.3	249	0.1	7

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Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
09/08/2011	405	19.1	10490	5.9	5
09/08/2011	413	20	7380	4.0	3
09/08/2011	501	20	6960	3.8	1
09/08/2011	502	20.1	6550	3.6	4
09/08/2011	504	20.6	5120	2.7	3
09/13/2011	507	20.5	700	0.3	5
09/13/2011	512	20.9	440	0.2	1
09/13/2011	515	19.4	6220	3.4	2
09/13/2011	516	19.6	4021	2.1	1
09/13/2011	518	19.9	2140	1.1	4
09/13/2011	519	19.6	2244	1.1	10
09/14/2011	715	21.2	173	0.1	2
09/12/2011	802	21.2	462	0.2	1
10/05/2011	411	18.6	8600	4.8	1
10/05/2011	413	19.1	9300	5.2	1
10/06/2011	414	17.7	8010	4.4	1
10/06/2011	417	18.4	9730	5.5	1
10/06/2011	418	18.1	7990	4.4	2
10/05/2011	505	18.9	3423	1.8	1
10/07/2011	507	18.8	576	0.3	24
10/07/2011	508	18.3	490	0.2	2
10/07/2011	509	18.2	377	0.2	3
10/07/2011	510	17.9	206	0.1	1
10/07/2011	511	17.5	166	0.1	1
10/07/2011	517	18.5	4315	2.3	1
10/07/2011	518	19	2967	1.5	7
10/07/2011	519	18.8	1628	0.8	2
10/06/2011	602	18.2	7380	4.0	1
10/10/2011	721	17.4	198	0.1	3
11/09/2011	407	14	15370	8.9	1
11/09/2011	412	14.5	13360	7.7	2
11/14/2011	517	13.5	10820	6.1	2
11/14/2011	518	13.5	10290	5.8	1
11/10/2011	601	14.4	13990	8.1	1
11/10/2011	606	13.5	9820	5.5	10
11/15/2011	703	13.3	2591	1.3	1
11/15/2011	704	13.4	1988	1.0	4
11/15/2011	705	13	883	0.4	1
11/21/2011	719	12.6	365	0.2	10
11/21/2011	797	12.5	527	0.2	7
12/08/2011	417	10.3	18050	10.6	1
12/07/2011	502	10.6	13570	7.8	1
12/09/2011	507	9.8	7840	4.3	2
12/09/2011	509	10.2	6110	3.3	1
12/09/2011	515	9.3	12800	7.3	1
12/09/2011	516	9.5	10300	5.8	1
12/09/2011	517	9.4	7500	4.1	3

12/09/2011	518	9.8	8200	4.5	6
12/09/2011	519	9.6	9390	5.2	6
12/08/2011	605	10.2	12460	7.1	1
12/08/2011	606	10.1	12380	7.1	12
12/12/2011	703	9.7	4268	2.2	12
12/12/2011	704	9.5	1233	0.6	7
12/12/2011	705	9.3	700	0.3	22
12/12/2011	706	9.4	211	0.1	109
12/16/2011	719	8.9	309	0.1	6
12/16/2011	797	9.1	517	0.2	2
12/13/2011	806	8.5	1187	0.6	1
12/13/2011	807	8.9	1364	0.7	2

Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
10/11/2012	511	18.1	4990	02.7	1
10/11/2012	512	18.2	4854	02.6	4
10/11/2012	513	17.9	3442	01.8	3
10/15/2012	703	17.7	205	00.1	8
10/15/2012	704	18.1	139	00.1	3
10/15/2012	705	18	200	00.1	1
10/18/2012	719	18.6	327	00.1	1
10/18/2012	797	19.2	592	00.3	1
11/14/2012	703	14.6	2935	01.5	3
11/14/2012	704	14.7	3004	01.5	6
11/14/2012	705	14.9	1460	00.7	1
11/15/2012	719	14.5	361	00.2	1
11/15/2012	796	15.3	802	00.4	1
11/15/2012	797	14.9	611	00.3	1
12/05/2012	505	13.7	1896	00.9	1
12/07/2012	515	13.1	2311	01.2	1
12/07/2012	517	13.2	2467	01.2	2
12/07/2012	519	13.3	1042	00.5	2
12/06/2012	602	13.9	5530	03.0	1
12/12/2012	716	11.5	206	00.1	1
12/11/2012	719	12.9	331	00.1	1
12/11/2012	796	13.4	777	00.4	1
12/11/2012	797	13.3	589	00.3	1

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Date	Station	Temp (˚C)	Top EC (µS/cm)	Surface Salinity (ppt)	Delta smelt catch
9/10/2013	510	22.6	6298	3.41	1
9/10/2013	515	20.4	18528	10.95	2
9/11/2013	704	21.1	3060	1.57	1
10/8/2013	512	18.4	6610	3.59	1
10/9/2013	703	17.4	6415	3.48	1
10/9/2013	705	17.3	4671	2.47	1
11/13/2013	701	14.4	4434	2.34	1
11/13/2013	703	14.3	2329	1.17	1
11/19/2013	797	13.6	575	0.26	2
12/9/2013	513	10	10078	5.66	1
12/9/2013	515	8.1	19035	11.28	1
12/9/2013	517	8.3	18668	11.04	1
12/9/2013	519	8.6	16903	9.91	1
12/5/2013	603	10.2	19994	11.90	1
12/5/2013	605	10.6	13349	7.67	1
12/10/2013	703	8.5	5363	2.87	1
12/10/2013	704	8.4	3789	1.98	1
12/11/2013	806	8.2	2246	1.13	1