

# Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species

## 1. Operational Conditions

See Weekly Fish and Water Operation Outlook document for December 1 – December 7.

## 2. Executive Summary

### a. CVP and SWP Delta Operations

The DCC gates were closed on 12/1/20 and are expected to remain closed through mid-May 2021. A positive impact of the DCC gate closure is to prevent entrainment through the DCC route of any juvenile CCV steelhead, winter-run Chinook salmon, and young of year (YOY) spring-run Chinook salmon into the Delta interior.

### b. Winter-run Chinook Salmon

No loss of natural winter-run Chinook salmon (by length at date, LAD) has occurred in the past week at the State or Federal fish salvage facilities. Loss of natural winter-run Chinook salmon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. 1-4% of juvenile natural winter-run Chinook salmon from brood year (BY) 20 are estimated to be present in the Delta. The Delta Cross Channel (DCC) gates closure for the season reduces exposure of winter-run Chinook salmon juveniles that are potentially present in the Sacramento River near the DCC gates into the interior Delta. The effects of DCC closure for the season would be positive, if juveniles are present. SaMT also discussed thiamin issue and effects on survival. The agencies in SaMT had questions on how this may be addressed in the JPE.

### c. Spring-run Chinook salmon

No loss of natural Central Valley (CV) YOY spring-run Chinook salmon has occurred in the past week at the State and Federal fish salvage facilities. Loss of Central Valley spring-run Chinook salmon at the CVP and SWP fish collection facilities is unlikely to occur over the next week. 0-1% of spring-run Chinook salmon are estimated to be in the Delta. It is unlikely that juvenile natural spring-run Chinook salmon from BY 20 near the DCC gates based on regional monitoring data; CV spring-run Chinook salmon adults spawning is ending in mid-November in upstream spawning reaches. YOY spring-run Chinook salmon are emerging and beginning to move downstream. The agencies at SaMT discussed the effects of DCC closure to spring-run Chinook salmon are similar to the effects on winter-run Chinook salmon and exposure is unlikely for natural YOY spring-run Chinook salmon. Yearling spring-run are being detected in the Butte Creek (rotary screw trap) RST and the fyke trap at Parrot Phelan Dam and float conditions are suitable based on tributary flows in Mill and Deer Creek to simulate the movement in

Sacramento River tributaries. If present near the DCC would benefit from closure of the DCC gates for the season.

**d. Central Valley Steelhead**

No loss of natural California CV (CCV) steelhead has occurred in the past week at the State and Federal fish salvage facilities. Loss of CCV steelhead at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. 0-1% of juvenile CCV Steelhead are estimated to be present in the Delta. DCC closure for the season reduces exposure into the Interior Delta to CCV steelhead juveniles that are potentially present in the Sacramento River near the DCC gates. The effects of DCC gate closure are likely to be positive if juvenile CCV steelhead are present.

**e. Green Sturgeon**

No loss of green sturgeon has occurred in the past week at the State and Federal fish salvage facilities. Loss of green sturgeon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. Green sturgeon are more likely to be salvaged during the summer although salvage may occur at any time of year.

**f. Delta smelt**

Based on distribution patterns over the past decade and limited recent detection data, Delta Smelt are unlikely to be prevalent in the South Delta. Limited detection data support Delta Smelt being present in Suisun Marsh and west of the Sacramento-San Joaquin confluence. High X2 position could mean the distribution of Delta Smelt extends further upstream of the confluence. However, the projected less negative OMR Index limits and low turbidity create a low risk of entrainment based on the lack of detections in the South Delta. No precipitation is anticipated and changes to the Freeport flows and turbidity are not expected to reach “First Flush” conditions within the next seven days.

### 3. Winter-run Chinook salmon

- **How much loss has occurred in the past week?**

No loss of juvenile winter-run Chinook salmon has occurred in the past week at the CVP and SWP fish salvage facilities.

- **What is the distribution of fish within the Delta?**

On 12/01/2020 SaMT estimated 1-4% of juvenile winter-run Chinook salmon were present in the Delta. In October, the Glenn Colusa Irrigation District (GCID) rotary screw traps (RSTs) observed 583 winter-run Chinook salmon juveniles (by length at date criteria) in their daily catches. In November (through 11/30/2020), the GCID RSTs have observed 138 winter-run Chinook salmon juveniles (by length at date criteria) in daily catches. Since few winter-run Chinook salmon have been observed in RST monitoring locations farther downstream (0 at Tisdale 11/24-11/30 and 1 at Knights Landing 11/24-11/30, sampling did not occur Thanksgiving holiday or 11/27), the fish appear to still be holding in the middle reaches of the Sacramento River. Movement of winter-run Chinook salmon juveniles into the lower reaches of the Sacramento River and upper Delta are likely to occur with precipitation events and increasing river flows and

turbidity. However, significant precipitation events are unlikely to occur over the next week (see Ops Outlook).

- What is the exposure to winter-run Chinook salmon due to DCC gate closure?**  
 Juvenile winter-run Chinook salmon have not been observed this year near the DCC gates; historical monitoring data indicates that approximately 20% juvenile winter-run Chinook salmon in the Delta (downstream of Knights Landing) at this time (SacPAS accessed 11/30/2020). One winter-run LAD was observed in the beach seines at Sherwood Harbor on 11/9/20. Closure of the DCC gates for the season will reduce exposure and possible entrainment of juvenile winter-run Chinook salmon into the Interior Delta via the DCC gates.
- What are the effects to winter-run Chinook salmon due to DCC gate closure?**  
 It is unlikely that many juvenile winter-run Chinook salmon are present near the DCC gates. Closure of the gates for the season will positively impact any present juvenile winter-run Chinook salmon.
- What is the status of winter-run Chinook salmon?**  
 The Juvenile Production Estimate (JPE) for winter-run Chinook salmon has not yet been established for BY 2020. However, observed winter-run Chinook salmon at Red Bluff Diversion dam (RBDD) is greater than recent years (BY 2014 – 2018) with the exception of BY 2019. On 11-17-20, approximately 1.8 million winter-run Chinook salmon were estimated to have passed RBDD compared to a cumulative passage of 3.5 million winter-run Chinook salmon RBDD on 11-18-19. Thiamine vitamin deficiency is being observed again in broodstock at the Livingston Stone NFH similar to last year’s observations. Last year the thiamine vitamin deficiency appeared to negatively affect survival of juvenile fish as they migrate downstream towards the Delta
- What is the likelihood of exceeding a fish catch trigger?**  
 The agencies in the SaMT assessed the likelihood of exceeding a fish catch trigger and believes that it is unlikely unless there is a precipitation event that triggers a migration. Significant precipitation events are in not in the forecast for this week.

Supporting Information regarding Exposure of winter-run Chinook salmon

**Natural winter-run Chinook salmon distribution estimate for 12/01/2020**

<b>Yet to Enter Delta</b>	<b>In Delta</b>	<b>Exited Delta past Chipps Island</b>
96-99%	1-4%	0%

**Natural winter-run Chinook salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities by 11/29 between 2010 - 2019 (with 95% CI)**

*Assessment*  
 12/01/2020

<b>Species</b>	<b>Red Bluff Diversion Dam</b>	<b>Tisdale RST</b>	<b>Knights Landing RST</b>	<b>Sac Trawl (Sherwood) Catch Index</b>	<b>Chipps Island Trawl Catch Index</b>	<b>Salvage</b>
Chinook, Winter-run, Unclipped	89.9% (85.4%, 94.5%)	25.8% (8.1%, 43.5%)	27.5% (6.9%, 48.1%)	9.1% (-5.1%, 23.3%)	0% (0%, 0%)	0% (0%, 0%)

Assessment  
12/01/2020

**Knight's Landing (KLCI) and Sacramento Seine and Trawl (SCI)**

No catch indices for juvenile salmonid migration were triggered during the past week.

<b>Date</b>	<b><u>KLCI</u> <u>Winter</u> <u>Chinook</u></b>	<b><u>KLCI Older</u> <u>Chinook</u></b>	<b><u>SCI</u> <u>Trawl</u></b>	<b><u>SCI</u> <u>Beach Seines</u></b>	<b><u>Trigger</u> <u>Exceeded:</u> <u>Catch Index &gt; 5</u></b>	<b><u>Trigger Exceeded:</u> <u>Catch Index 3 &lt; X ≤ 5</u></b>
2020-11-29						
2020-11-28	0.465	0.465				
2020-11-27				0		
2020-11-26						
2020-11-25			0	0		
2020-11-24	0	0				

Assessment  
12/01/2020

**Mean daily flow and percent change (Wilkins Slough, Deer Creek, Mill Creek; cfs from CDEC) and temperature and percent change (Knights Landing; °F from RST)**

Mill and Deer Creek Alerts for juvenile salmonid migration were triggered during the past week.

<b>Date</b>	<b>Mill Creek (MLM): mean daily flow (cfs)</b>	<b>Mill Creek (MLM): flow percent change</b>	<b>Mill Creek (MLM): Alert</b>	<b>Deer Creek (DCV): mean daily flow (cfs)</b>	<b>Deer Creek (DCV): flow percent change</b>	<b>Deer Creek (DCV): Alert</b>	<b>Wilkins Slough (WLK): mean daily flow (cfs)</b>	<b>Knights Landing RST: water temperature (f)</b>	<b>WLK-KNL: Alert</b>
11/29/2020	104.6	-0.2%	Flow>95cfs	90.2	0.2%		4216.3		
11/28/2020	104.8	-0.1%	Flow>95cfs	90.1	-0.6%		4304.3	49.5	
11/27/2020	104.8	-1.6%	Flow>95cfs	90.6	-1.5%		4392.2		
11/26/2020	106.5	-0.1%	Flow>95cfs	92.0	-0.1%		4403.9		
11/25/2020	106.6	-0.2%	Flow>95cfs	92.1	-1.8%		4413.7		
11/24/2020	106.8	-0.7%	Flow>95cfs	93.8	-1.1%		4419.4	51.4	
11/23/2020	107.6	-0.3%	Flow>95cfs	94.8	-0.3%		4236.0	51.6	

Supporting Information regarding DCC Management Effects on winter-run Chinook salmon

- **STARS model simulations for route-specific entrainment, travel times, and survival for 11/29/2020. Freeport flows for 11/29/2020 were 8,702 cfs.** The DCC gate routing is not representative of routing through the DCC for the entire week. DCC gates were open 11/25-11/30/20 but were closed 12/1/20 and are expected to remain closed through mid-May 2021.

	<b>DCC</b>	<b>Georgiana Slough</b>	<b>Sacramento River</b>	<b>Sutter and Steamboat</b>
Proportion of Entrainment	NA	28%	41%	25%
Survival	NA	17%	48%	37%
Travel Time	NA	18.4 d	11.3 d	11.7 d

#### 4. Spring-run Chinook salmon

- **How much loss has occurred in the past week?**  
No loss of juvenile CV spring-run Chinook salmon has occurred in the past week at the CVP and SWP fish salvage facilities.
- **What is the distribution of fish within the Delta?**  
On 12/01/2020 SaMT estimated 0-1% of juvenile CV spring-run Chinook salmon were present in the Delta. Mill Creek flows were recorded higher than 95 cfs seven times over the past week and Deer Creek flows were recorded higher than 95 cfs four times over the past week (11/23/2020 – 11/29/2020). This is indicative yearling spring-run Chinook salmon may begin to move out of tributaries into the mainstem Sacramento River, yearling spring-run Chinook salmon have also been detected in the Butte Creek monitoring locations. No unmarked spring-run Chinook salmon were observed at the Knights Landing RST or Tisdale in the past week.
- **What is the exposure to CV spring-run Chinook salmon due to DCC gate closure?**  
No juvenile young-of-year CV spring-run Chinook salmon (LAD) have been observed near the DCC gates. Yearling CV spring run Chinook salmon may be migrating downstream based on increased flows in the Sacramento River tributaries and have been observed at the Butte Creek monitoring locations. Historical monitoring data does not detect YOY spring-run Chinook salmon in the Delta at this time. Mill Creek and Deer Creek flows were greater than 95 during the past week indicating that downstream migration of yearling spring-run Chinook salmon may occur soon.
- **What are the effects to CV spring-run Chinook salmon due to DCC gate closure?**  
The exposure and effects of DCC closure on natural CV spring-run Chinook salmon are similar to winter-run Chinook salmon. Closure of the gates would reduce entrainment of any juvenile CV spring-run Chinook salmon near the DCC gates into the interior Delta.
- **What is the status of spring-run Chinook salmon?**  
The thiamine deficiency issue is also likely impacting spring-run Chinook Salmon. The Feather River Fish Hatchery is currently experiencing issues with infertile males. It is unlikely that they will meet their production goals. On the Feather River, a larger than

historical number of spring-run adults that entered the system and were tagged appear to be spawning in-river instead of returning to the hatchery. This is one reason that low returns are being observed at the hatcheries.

- **What is the likelihood of exceeding a fish catch trigger?**

The agencies in the SaMT discussed the likelihood of exceeding a fish catch trigger and agreed that it was unlikely that a catch index trigger would be exceeded. Yearling spring-run Chinook salmon are unlikely to be observed in the rotary screw traps.

Supporting Information regarding Exposure of natural YOY spring-run Chinook salmon

**Natural spring-run Chinook salmon distribution estimate for 12/01/2020**

Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
99-100%	0-1%	0%

**Natural YOY spring-run Chinook salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities by 11/29 between 2010 – 2019 (with 95% CI)**

Species	Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood) Catch Index	Chipps Island Trawl Catch Index	Salvage
Chinook, Spring-run, Unclipped	15.9% (2.4%,29.4%)	0.7% (-0.1%,1.6%)	3.3% (-3.4%,10.1%)	0.0% (-0.0%,0.0%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%)

See additional supporting information found in winter-run Chinook salmon section (section 3.b.).

Supporting Information regarding DCC Management Effects on spring-run Chinook salmon

See additional supporting information in winter-run Chinook salmon section (section 3.b.).

## 5. California Central Valley Steelhead

- **How much loss has occurred in the past week?**

No loss of juvenile CCV steelhead has occurred in the past week at the CVP or SWP fish salvage facilities.

- **What is the distribution of fish within the Delta?**

On 12/01/2020 SaMT estimated 0-1% of juvenile CCV steelhead were present in the Delta.

- **What is the exposure to CCV steelhead due to DCC gate closure?**

No juvenile Central Valley steelhead have been observed near the DCC gates in regional monitoring efforts and historical monitoring data does not detect juvenile steelhead in the



Delta at this time. However, SaMT estimated that 0-1% of the population of CCV steelhead may be present in the Delta at this time. Closure of the DCC gates would reduce exposure and possible entrainment of juvenile CCV steelhead into the interior Delta via the DCC gates.

- **What are the effects to CCV steelhead due to DCC gate closure?**

It is unlikely juvenile Central Valley steelhead are present near the DCC gates. Closure of the gates would positively impact any present juvenile Central Valley steelhead by preventing routing into the Delta interior through the open gates.

- **What is the status of CCV steelhead?**

Not enough information. To be developed at a later date.

- **What is the likelihood of exceeding a fish catch trigger?**

Not applicable. No DCC gate fish catch index associated with steelhead.

Supporting Information regarding Exposure of CCV Steelhead

**Central Valley steelhead distribution estimate for 12/01/2020**

<b>Yet to Enter Delta</b>	<b>In Delta</b>	<b>Exited Delta past Chipps Island</b>
99-100%	0-1%	0%

See “Additional supporting information found in winter-run Chinook salmon” (section 3.b.).

Supporting Information regarding DCC Management Effects on Central Valley steelhead

See additional supporting information found in winter-run Chinook salmon (section 3.b.).

## 6. Delta Smelt

### a. Weekly Evaluation for Delta Smelt

#### i. **Between December 1 and January 31, has any first flush condition been exceeded?**

The running 3-day average flows and running 3-day average turbidity at Freeport (Table 6) have not exceeded the triggers for “First Flush” conditions. Based on the weather forecast “First Flush” conditions are not expected in the next seven days.

#### ii. **Do DSM have a high risk of migration and dispersal into areas at high risk of future entrainment? (December 1- January 31)**

Based on distribution patterns over the past decade and limited recent detection data, Delta Smelt are unlikely to be prevalent in the South Delta. Limited detection data support Delta Smelt being present in Suisun Marsh and west of the Sacramento-San Joaquin confluence. Based on Sommer et al. (2011), the centroid of Delta Smelt distribution is anticipated to be near X2 which is currently estimated to be at 90 km which indicates they could be upstream of the Sacramento-San Joaquin confluence. Since “First Flush” conditions are not expected to be met within the next seven days, it is unlikely that Delta Smelt will migrate into areas with a high risk of entrainment. The range of OMR is not expected to become more negative than -3600 cfs and QWEST is expected to become more negative over the next seven days. As the season progresses, the risk that Delta Smelt may migrate even if “First Flush” conditions are not met will increase.

Sommer, T., Mejia, F. H., Nobriga, M. L., Feyrer, F., & Grimaldo, L. (2011). The Spawning Migration of Delta Smelt in the Upper San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 9(2). doi:<https://doi.org/10.15447/sfews.2014v9iss2art2>  
Retrieved from <https://escholarship.org/uc/item/86m0g5sz>

#### iii. **Has a spent female been collected?**

This question is not applicable until Turbidity Bridge Avoidance begins.

#### iv. **Is OBI turbidity likely to exceed 12NTU during the next week? What conditions are likely to create this turbidity event?**

This question is not applicable until Turbidity Bridge Avoidance begins.

#### v. **After March 15 and if QWEST is negative, are larval or juvenile Delta Smelt within the entrainment zone of the CVP and SWP pumps based on surveys?**

This question is not applicable until March 15th.

#### vi. **Based on real-time spatial distribution of Delta Smelt and currently available turbidity information, what is the OMR level between -3,500 and -5,000 cfs that manages weekly entrainment in the context of annual larval and juvenile entrainment levels?**

This question is not applicable until March 15th.

#### vii. **What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DSM that could be entrained may be?**

This question is not applicable until March 15th.

**b. Supporting Information regarding Exposure of Delta Smelt**

**Delta Smelt Life Stage:** Subadult/Adult

**Brood Year 2020**

- **Abundance estimate:** The most recent population abundance estimate for Delta Smelt was 1,249. This was calculated from the sampling between 11/9/2020-11/13/2020. EDSM last collected juvenile Delta Smelt (57mm) on 11/9/2020 in the Suisun Marsh stratum.
- **Biological Conditions:** The Smelt Monitoring Team discussed the most recent monitoring data (Table 4), and considered professional opinion on the historical trends in regional distribution. Based on those discussions, the agency participants on SMT estimate Delta Smelt subadult/adults should be holding in the Suisun Marsh and west of the Sacramento-San Joaquin confluence in anticipation of migration.

**Delta Smelt Distribution Estimates**

Real time detection data is currently limited to EDSM sampling, FMWT and the Bay Study, and the Smelt Monitoring Team, has limited capacity to estimate where Delta Smelt are within the Delta. Larval sampling is not being conducted at the state or federal salvage facilities.

Table 4. Summary of recently reported detections of Delta Smelt by Region and Salvage Facilities. Start and End dates reflect period of time between updates to SMT. Regional categories are determined from EDSM sampling (Updated 12/1/2020).

Start Date	End Date	Life Stage	North	South	West	Far West	Salvage
11/24/2020	12/1/2020	Adult	0	0	0	0	0
		Larvae/Juvenile	0	0	0	0	0

Table 5. Summary of recent Delta Smelt detections reported since last assessment and the total detections for the current water year. Notes reflect latest information on reported detections or completion of survey for the water year and now include both larval and adult detections (Updated 12/1/2020).

Sampling Method	New Detections	WY2021	Notes
EDSM	0	1	Phase 1 begins 11/30/20 Last Detection: 11/9/2020
SKT	0		No Dec. SKT. Begin 01/4/2021
SLS	0		Begins: 12/14/2020 Only South and Central Delta
20-mm	0	0	Begins: March
Bay Study	0	0	Nov. complete Dec. Begins: 12/1/2020 Ends 12/9/2020
FMWT	0	0	Updated 11/24/2020 Nov. Complete Tentative End: 12/11/2020
Chipps Island Trawl	0	0	5 day sampling Tentative Start: 12/6/2020

The Smelt Monitoring Team expects environmental conditions (i.e. flow, turbidity, temperatures) for the next week to remain stable with continued seasonally decreasing temperatures. No precipitation is predicted, and changes in Freeport flows and turbidity (Table 6) that would create “First Flush” conditions are not expected by the agency representatives of the SMT. The Fish and Water Operation Outlook OMR Index values are expected to range between -1,500 and -4,000 cfs between 12/1/2020 and 12/7/2020. Turbidity at Clifton Court Forebay (station ID CLC) reached 11.1 NTU as of 12/1/2020. Real time tracking of environmental conditions, relevant thresholds and Delta Smelt catch data are updated daily and available [online](#).

Table 6. Relevant Environmental Factors to the current management actions for Delta Smelt.

<b>Date Reported</b>	<b>FPT 3 Day Running Avg. of Daily Flows (cfs)</b>	<b>FPT 3 Day Running Avg. of Turbidity (FNU)</b>
12/1/2020	8594	2.86

### **Supporting Information regarding OMR Management Effects on Delta Smelt**

Electrical conductivity and concern level criteria for water quality monitoring locations

<b>Location</b>	<b>Current EC (umhos/cm)</b>	<b>Concern Level (umhos/cm)</b>	<b>Date of Current Value</b>
<b>Bacon Island</b>	746	700	11/30/20
<b>Jersey Point</b>	1741	1800	11/30/20
<b>Bethel Island</b>	1034	1000	11/30/20
<b>Holland Cut</b>	772	800	11/30/20

**Fish Monitoring Gear Efficiency/Disruptions: COVID-19 or air quality impacts.**

<b>Monitoring Survey</b>	<b>Status (as of 12/01/20)</b>
Delta	
SWP regular counts, CWT reading, and larval sampling	Ongoing
CVP regular counts, CWT reading, and larval sampling	Ongoing
Smelt Larval Survey	Begins 12/14 (south and central Delta in early Dec)
20mm Survey	Begins in March
Bay Study	
DJFMP- Chipps and Sacramento Trawls	Ongoing
DJFMP- Seines	Suspended with the exception of the seine locations that inform the SCI
EDSM	Ongoing
EMP	
Mossdale	Ongoing (sporadically miss a few days)
USGS Flow monitoring	Continuous monitoring continues
Sacramento River	
Red Bluff Diversion Dam screw trap	Ongoing
Knights Landing screw trap	Ongoing through modified staffing
Tisdale screw trap	Ongoing through modified staffing
Redd dewatering and stranding surveys	Ongoing
Sacramento Carcass and Redd Surveys	Continuing
Spring Kodiak Trawl	Typically sample in Dec but starting in Jan this year
San Joaquin River	
SJRRP CDFW Field Monitoring	Start 10/6/20
SJRRP USFWS and USBR Field Monitoring	Since 8/31 with some interruption due to air quality