Final Assessment
11/10/2020

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

1. Operational Conditions

See Weekly Fish and Water Operation Outlook document for November 10 – November 16.

2. Executive Summary

a. 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. 0-2% 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 (Monday – Friday weekly through 11/17) 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 would be positive, if juveniles are present. DCC gates closure has the potential to impact water quality.

b. Spring-run Chinook salmon

No loss of natural Central Valley (CV) 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 are building redds and spawning upstream. The exposure and effects of DCC closure are unlikely for natural spring-run Chinook salmon.

c. 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 Central Valley 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 reduces exposure to Central Valley 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 juveniles CCV steelheads are present.

d. 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.

e. DCC gates recommendation

The DCC gates are scheduled to be cycled open during the weekends and closed during the week during the month of November (closed: November 2 to November 6; open:

November 7 and November 8; closed: November 9 to November 13). Any juvenile CCV steelhead and winter-run Chinook salmon migrating past the DCC during the closure would benefit from the closure.

f. Delta smelt

Based on recent distribution patterns over the past decade and limited detection data that Delta Smelt are unlikely to be prevalent in the South Delta. Within the projected OMR Index limits there is a low risk of entrainment. First Flush conditions are not anticipated to occur within the next seven days. A Delta Smelt (57mm) was collected by EDSM on 11/09/2020 in Montezuma Slough within the Suisun Marsh Stratum. No Delta Smelt had been collected since September.

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 11/10/2020 SaMT estimated 0-2% of juvenile winter-run Chinook salmon were present in the Delta. In October, the Glenn Colusa Irrigation District (GCID) rotary screw traps (RSTs) have observed 583 winter-run Chinook salmon juveniles (by length at date criteria) in their daily catches. In November (through 11/9/2020), the GCID RSTs have observed 26 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 and 1 at Knights Landing in the past week), 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.
- **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 and historical monitoring data indicates that juvenile winter-run Chinook salmon are not in the Delta at this time. Closure of the DCC gates would 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 juvenile winter-run Chinook salmon are present near the DCC gates. Closure of the gates would 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 11-3-20, approximately 1.7 million winter-run Chinook salmon had been captured at RBDD compared to a cumulative passage of 3.4 million winter-run Chinook salmon RBDD on 11-4-19. Thiamin deficiency is being observed again in broodstock and Livingston Stone NFH similar to last year. Last year the thiamin deficiency appeared to affect survival.
- **What is the likelihood of exceeding a fish catch trigger?**
  It is unlikely unless there is a precipitation event that triggers a migration. Precipitation is in the forecast.

Supporting Information regarding Exposure of winter-run Chinook salmon

Natural winter-run Chinook salmon distribution estimate for 11/10/2020

Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
98-100%	0-2%	0%

Natural winter-run Chinook salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities by 11/08 between 2010 - 2019

Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chipps Island Trawl	Salvaged at Delta Facilities
78.8%	16.4%	20.4%	2.1%	0%	0%

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

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

Date	KLCI Winter Chinook	KLCI Older Chinook	SCI Trawl	SCI Beach Seines	Trigger Exceeded: Catch Index > 5	Trigger Exceeded: Catch Index 3 < X ≤ 5
2020-11-08						
2020-11-07	0	0				
2020-11-06	0.743	0.743	0	0		
2020-11-05	0	0				
2020-11-04	0	0	0	0		
2020-11-03	0	0				
2020-11-02	0	0	0	0		

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)

No warning alerts for juvenile salmonid migration were triggered during the past week.

Date	Mill Creek flow (MLM)	MLM Δ	MLM Alert	Deer Creek flow (DCV)	DCV Δ	DCV Alert	Wilkins Slough (WLK)	Knights Landing temperature (°F)
11/8/2020	104.4	-0.5%	Flow>95cfs	87.0	-1.1%		3803.2	53.7
11/7/2020	104.9	2.4%	Flow>95cfs	88.0	5.9%		3880.4	56
11/6/2020	102.5	1.3%	Flow>95cfs	83.1	1.6%		3980.2	56.7
11/5/2020	101.2	0.0%	Flow>95cfs	81.8	1.0%		4031.9	57.7
11/4/2020	101.1	0.5%	Flow>95cfs	80.9	0.1%		4042.0	57.4
11/3/2020	100.6	0.2%	Flow>95cfs	80.8	0.8%		4018.9	57.5
11/2/2020	100.3	-0.2%	Flow>95cfs	80.2	-0.3%		3884.0	57.5

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

STARS model simulations for route-specific entrainment, travel times, and survival for 11/09/2020. Freeport flows for 11//2020 were 8523 cfs.

	DCC	Georgiana Slough	Sacramento River	Sutter and Steamboat
Proportion of Entrainment	6%	27%	40%	24%
Survival	11%	15%	41%	32%
Travel Time	24.4 d	19.3 d	10.1 d	10.5 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 11/10/2020 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 (11/02/2020 – 11/08/2020). This is indicative yearling spring-run Chinook salmon may begin to move out of tributaries into the mainstem Sacramento River.
- **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 and spawning is declining. Yearling CV spring run Chinook salmon remain in natal tributaries and no environmental criteria indicating the initiation of fish migration behavior has been exceeded. Historical monitoring data does not detect spring-run Chinook salmon in the Delta at this time. Flows greater than 95 cfs indicate that downstream migration may occur soon. Mill Creek flows are currently greater than 95 cfs.
- **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 thiamin deficiency issue is also likely impacting spring-run Chinook Salmon. Hatcheries are 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 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?**
  Unlikely. Yearlings are unlikely to be observed in the rotary screw traps.

Supporting Information regarding Exposure of spring-run Chinook salmon

Natural spring-run Chinook salmon distribution estimate for 11/10/2020

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

Natural spring-run Chinook salmon average percent of annual emigrating

population (LAD) captured at following locations and salvaged at Delta fish facilities by 11/08 between 2010 – 2019

Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chipps Island Trawl	Salvaged at Delta Facilities
11.7%	0.2%	1.3%	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 11/10/2020 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 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.
- **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 11/10/2020

Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
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. <u>Weekly Evaluation for Delta Smelt</u>

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

The question is not applicable until Dec. 1st

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

The question is not applicable until Dec. 1st

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. <u>Supporting Information regarding Exposure of Delta Smelt</u>

Delta Smelt Life Stage: Adult

Brood Year 2020 (adult delta smelt)

- **Abundance estimate**: The most recent population abundance estimate for Delta Smelt was 2,490. This was calculated from the sampling between 9/21/2020-9/24/2020. EDSM last collected juvenile Delta Smelt (57mm) on 11/9/2020 in the Suisun Marsh stratum.
- **Biological Conditions**: Based on our understanding of life history and limited distribution data Delta Smelt adults would be holding below the confluence in anticipation of migration

Delta Smelt Distribution Estimates

Real time detection data is currently limited to EDSM sampling and FMWT, 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 all 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 11/10/2020).

Start Date	End Date	Life Stage	North	South	West	Far West	Salvage
11/3/2020	11/10/2020	Adult					
		Larvae/Juvenile			1		

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 11/10/2020).

Sampling Method	New Detections	WY2021	Notes
EDSM	0	1	Last Detection: 11/9/2020
SKT	0		No Dec. SKT. Begin 01/4/2021
SLS	0		Begins: 12/7/2020 Only South and Central Delta
20-mm	0	0	Begins: March
Bay Study	0	0	
FMWT	0	0	Updated 11/10/2020 Tentative End: 12/11/2020

The Smelt Monitoring Team expects environmental conditions (i.e. flow, turbidity, temperatures) for the next week to remain stable with continued seasonally decreasing temperatures. A chance of rain is predicted, but unlikely to cause to first flush conditions. The Fish and Water Operation Outlook OMR Index values are expected to range between 1,000 and –2,500 between 11/10/2020 and 11/17/2020.

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

Date Reported	FPT 3 Day Running Avg. of Daily Flows (cfs)	FPT 3 Day Running Avg. of Turbidity (FNU)
11/9/2020	8292	1.97

Supporting Information regarding OMR Management Effects on Delta Smelt

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

Monitoring Survey	Status (as of 11/10/20)
Delta	
SWP regular counts, CWT reading, and larval sampling	Ongoing
CVP regular counts, CWT reading, and larval sampling	Ongoing
Smelt Larval Survey	Begins 12/7 (south and central Delta in early Dec)
20mm Survey	Begins in March
Bay Study	
DJFMP- Chipps and Sacramento Trawls	Ongoing
DJFMP- Seines	Ongoing (sporadically miss a few sites)
EDSM	Ongoing
EMP	
Mossdale	Ongoing (sporadically miss a few sites)
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