

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

1. Operational Conditions

See Weekly Fish and Water Operation Outlook document for October 19 – October 25.
See Attachment A for hydrological conditions.

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) 21 are estimated to be present in the Delta. The Delta Cross Channel (DCC) gates closure for the Lower Mokelumne River pulse flow 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

There are no juvenile natural spring-run Chinook Salmon from BY 21 near the DCC gates; 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% 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. DCC gates recommendation

Open the DCC gates at 1000 on October 15 and close at 1000 on October 18 to reduce straying of Mokelumne River fall-run Chinook Salmon, attracted by lower Mokelumne River pulse flows, into the Sacramento River through the DCC. DCC Gates will continue to open on the weekends and close during the week (i.e., open 10/22 and close 10/25). Additionally, the recommendation is to meet the Delta Rio Vista requirement, salinity / seasonal weekend operation, and to allow boaters passage to the interior Delta. Any juvenile CCV steelhead and winter-run Chinook Salmon migrating past the DCC during the closure would benefit from the closure.

3. Winter-run Chinook Salmon

a. 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.

Proposed Action Assessment
10/19/2021

b. What is the distribution of fish within the Delta?

On 10/19/2021 SaMT estimated 0-2% of juvenile winter-run Chinook Salmon were present in the Delta.

c. 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 present in the Delta in significant numbers 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.

d. 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.

Supporting Information regarding Exposure of winter-run Chinook Salmon

Since 8/17/2021, the Glenn Colusa Irrigation District (GCID) rotary screw traps (RSTs) have observed 52 winter-run Chinook Salmon juveniles (by length at date criteria) in their daily catches. Fish have been steadily arriving, but in low numbers, since the beginning of October. Since few winter-run Chinook Salmon have been observed in RST monitoring locations farther downstream (Tisdale and Knights Landing), the fish appear to 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 will occur with precipitation events and increasing river flows and turbidity. Mill Creek daily flows were recorded higher than 95 cfs over the past week on 10/18/2021. Deer Creek mean daily flow did not exceed 95 cfs. This is indicative YOY spring-run Chinook Salmon may still be holding in tributaries and not migrating into the mainstem Sacramento River.

Toxic runoff from the Dixie fire may impact the Deer and Mill Creek headwaters.

Natural winter-run Chinook salmon distribution estimate

<u>Date</u>	<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
10/19/2021	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 for Brood Years 2011 - 2020

<u>Date</u>	<u>Red Bluff Diversion Dam</u>	<u>Tisdale RST</u>	<u>Knights Landing RST</u>	<u>Sac Trawl (Sherwood)</u>	<u>Chipps Island Trawl</u>	<u>Salvaged at Delta Facilities</u>
10/18	59.1% (50.3%,67.9%)	7.4% (2.6%,12.3%)	5.2% (0.8%,9.7%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%) WY: 2012 - 2021

Knights Landing (KLCI) and Sacramento Seine and Trawl (SCI)

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

<u>Date</u>	<u>KLCI</u>	<u>SCI Trawl</u>	<u>SCI Seine</u>	<u>Trigger Exceeded?</u>
10/13/2021	0	0	0	N/A
10/14/2021	0	N/A	N/A	N/A
10/15/2021	0	0	0	N/A
10/16/2021	0	N/A	N/A	N/A
10/17/2021	0	N/A	N/A	N/A

*Proposed Action Assessment
10/19/2021*

<u>Date</u>	<u>KLCI</u>	<u>SCI Trawl</u>	<u>SCI Seine</u>	<u>Trigger Exceeded?</u>
10/18/2021	0	0	1.3	

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 Creek flows exceeded 95 cfs on 10/18/2021. However, there was a data discrepancy on the value of the mean daily flow on 10/18/2021 so data are excluded to avoid incorrect data reporting.

<u>Date</u>	<u>Mill Creek flow (MLM)</u>	<u>MLM Δ Change</u>	<u>MLM Alert</u>	<u>Deer Creek flow (DCV)</u>	<u>DCV Δ Change</u>	<u>DCV Alert</u>	<u>Wilkins Slough flow (WLK)</u>	<u>Knights Landing temperature (°C)</u>	<u>Alert Triggered</u>
10/18/2021	N/A	N/A	N/A	85.4	32.5%	N/A	5831.0	N/A	N/A
10/17/2021	72.7	0.3%	N/A	64.5	1.2%	N/A	5822.1	15.1	N/A
10/16/2021	72.4	0.6%	N/A	63.7	0.1%	N/A	5811.2	15.3	N/A
10/15/2021	72.0	-2.3%	N/A	63.6	-0.5%	N/A	5818.2	14.8	N/A
10/14/2021	73.7	1.0%	N/A	64.0	0.2%	N/A	5875.0	14.4	N/A
10/13/2021	73.0	0.4%	N/A	63.8	1.3%	N/A	5900.6	14.2	N/A
10/12/2021	72.7	1.2%	N/A	63.0	0.4%	N/A	5937.5	14.4	N/A

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

DCC gate operations are not affected by the Mokelumne River pulse and will continue with a weekday closed / weekend open pattern. There are no modeling alternatives for water quality due to the Rio Vista flow requirement and a case where the DCC gates left open would likely cause a violation to D-1641.

See Attachment A – Mokelumne River pulse flow plan plot and data.

STARS model simulations for route-specific entrainment, travel times, and survival.

<u>Date</u>	10/18/2021			
	<u>DCC</u>	<u>Georgiana Slough</u>	<u>Sacramento River</u>	<u>Sutter and Steamboat</u>
Proportion of Entrainment	23%	19%	33%	24%
Survival	10%	13%	33%	30%
Travel Time	22.2 days	20.5 days	10.2 days	10.3 days

4. Spring-run Chinook Salmon

a. How much loss has occurred in the past week?

No loss of juvenile CV YOY spring-run Chinook Salmon has occurred in the past week at the CVP and SWP fish salvage facilities.

b. What is the distribution of fish within the Delta?

On 10/19/2021 SaMT noted that juvenile CV YOY spring-run Chinook Salmon have yet to emerge.

- c. What is the exposure to CV spring-run Chinook Salmon due to DCC gate closure?**
No juvenile CV YOY spring-run Chinook Salmon (LAD) have been observed near the DCC gates and adults are building redds and spawning upstream. 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.
- d. 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.

Supporting Information regarding Exposure of spring-run Chinook Salmon

Natural spring-run Chinook salmon distribution estimate

<u>Date</u>	<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
10/19/2021	NA	NA	NA

Natural spring-run Chinook Salmon average percent of annual emigrating population (LAD) captured at following locations and salvaged at Delta fish facilities for Brood Years 2011 - 2020

<u>Date</u>	<u>Red Bluff Diversion Dam</u>	<u>Tisdale RST</u>	<u>Knights Landing RST</u>	<u>Sac Trawl (Sherwood)</u>	<u>Chipps Island Trawl</u>	<u>Salvaged at Delta Facilities</u>
10/18	0.4% (-0.2%,1.0%)	0.0% (-0.0%,0.0%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%)	0.0% (0.0%,0.0%) WY: 2012 - 2021

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

- a. 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.
- b. What is the distribution of fish within the Delta?**
On 10/19/2021 SaMT estimated 0% of juvenile CCV steelhead were present in the Delta.
- c. 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% 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.
- d. 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.

Supporting Information regarding Exposure of CCV Steelhead

Central Valley steelhead distribution estimate

<u>Date</u>	<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
10/19/2021	100%	0%	0%

Central Valley steelhead average percent of annual emigrating population (LAD) salvaged at Delta fish facilities for Brood Years 2011 - 2020

<u>Date</u>	<u>Salvaged at Delta Facilities</u>
10/18	0.0% (0.0%,0.0%) WY: 2013 - 2021

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

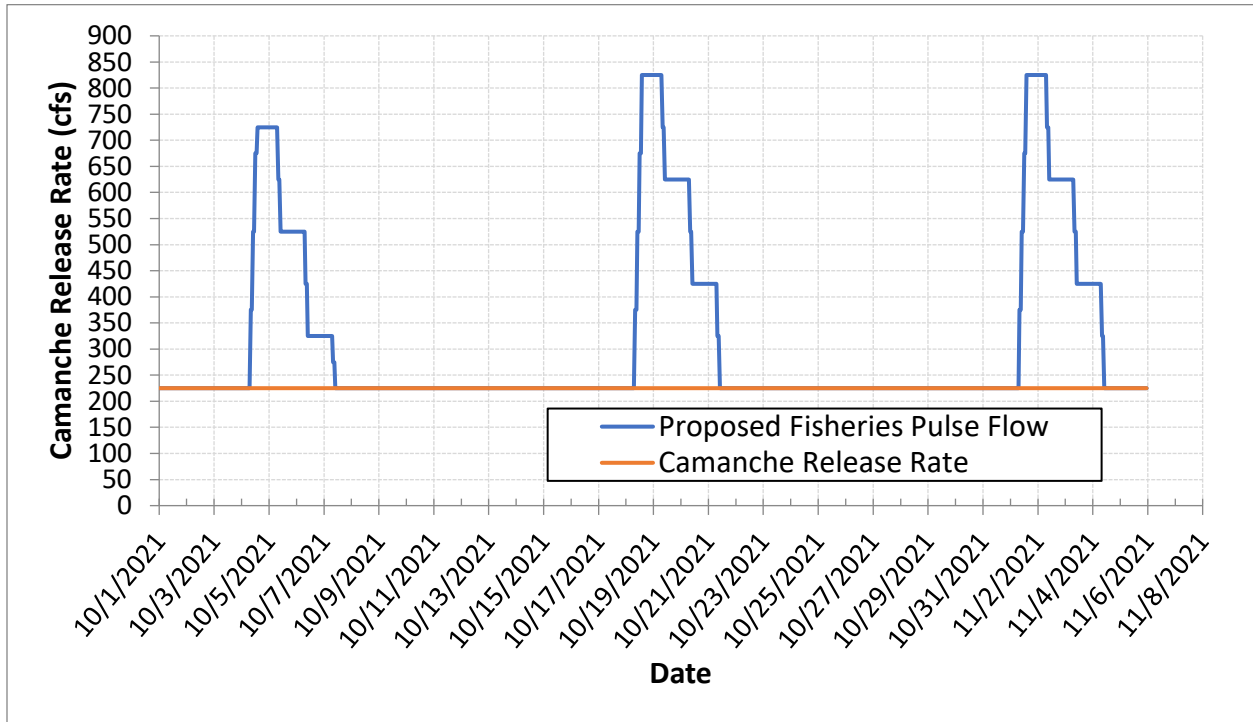
Supporting Information regarding DCC Management Effects on Central Valley steelhead

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

Attachment A.

Mokelumne River Pulse Flow Plan

Figure A1. October 2021 Mokelumne River Pulse Flow plan (source: 2021 *Camanche Pulse Flow Plan_Schedule*; tab: *Pulse Flow – Hourly INPUT*)



Proposed Action Assessment
10/19/2021

Table A1. October 2021 Mokelumne River Pulse Flows Accounting (source: 2021 *Camanche Pulse Flow Plan_Schedule*; tab: *Pulse Flow Accounting*)

Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)	Add. Pulse Flow (AF)
10/1/2021	220	225	0	225	446	446	N/A
10/2/2021	220	225	0	225	446	893	N/A
10/3/2021	220	225	0	225	446	1,339	N/A
10/4/2021	220	225	283	508	1,008	2,347	562
10/5/2021	220	225	375	600	1,190	3,537	744
10/6/2021	220	225	175	400	793	4,331	347
10/7/2021	220	225	38	263	521	4,851	74
10/8/2021	220	225	0	225	446	5,298	N/A
10/9/2021	220	225	0	225	446	5,744	N/A
10/10/2021	220	225	0	225	446	6,190	N/A
10/11/2021	220	225	0	225	446	6,636	N/A
10/12/2021	220	225	0	225	446	7,083	N/A
10/13/2021	220	225	0	225	446	7,529	N/A
10/14/2021	220	225	0	225	446	7,975	N/A
10/15/2021	220	225	0	225	446	8,421	N/A
10/16/2021	220	225	0	225	446	8,868	N/A
10/17/2021	220	225	0	225	446	9,314	N/A
10/18/2021	220	225	325	550	1,091	10,405	645
10/19/2021	220	225	475	700	1,388	11,793	942
10/20/2021	220	225	275	500	992	12,785	545

Proposed Action Assessment
10/19/2021

Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)	Add. Pulse Flow (AF)
10/21/2021	220	225	75	300	595	13,380	149
10/22/2021	220	225	0	225	446	13,826	N/A
10/23/2021	220	225	0	225	446	14,273	N/A
10/24/2021	220	225	0	225	446	14,719	N/A
10/25/2021	220	225	0	225	446	15,165	N/A
10/26/2021	220	225	0	225	446	15,612	N/A
10/27/2021	220	225	0	225	446	16,058	N/A
10/28/2021	220	225	0	225	446	16,504	N/A
10/29/2021	220	225	0	225	446	16,950	N/A
10/30/2021	220	225	0	225	446	17,397	N/A
10/31/2021	220	225	0	225	446	17,843	N/A
11/1/2021	220	225	325	550	1,091	18,934	645
11/2/2021	220	225	475	700	1,388	20,322	942
11/3/2021	220	225	275	500	992	21,314	545
11/4/2021	220	225	75	300	595	21,909	149
11/5/2021	220	225	0	225	446	22,355	N/A