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

Operational Conditions

See Weekly Fish and Water Operation Outlook document for October 12 – October 18. See Attachment A for hydrological conditions.

Executive Summary

1. **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. 0-1% 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.
2. **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.
3. **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.
4. **DCC gates recommendation**. Open the DCC gates at 1000 on October 8 and close at 1000 on October 11 to reduce straying of Mokelumne River fall-run Chinook Salmon, attracted by lower Mokelumne River pulse flows, into the Sacramento River through the DCC. 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.

Winter-run Chinook Salmon

1. **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.
2. **What is the distribution of fish within the Delta?** On 10/12/2021 SaMT estimated 0-1% of juvenile winter-run Chinook Salmon were present in the Delta.
3. **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.
4. **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

In last week's assessment, there was a transposition error in the below table where the SaMT estimated 99-100% winter-run Chinook in the Delta and 0-1% having yet to enter the Delta. The information below is accurate for this week and last week.

Since 8/17/2021, the Glenn Colusa Irrigation District (GCID) rotary screw traps (RSTs) have observed 48 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 and Deer Creek flows were not recorded higher than 95 cfs over the past week. This indicates that yearling spring-run Chinook Salmon may still be holding in tributaries and not migrating into the mainstem Sacramento River.

Natural winter-run Chinook salmon distribution estimate

Date	Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
10/12/2021	99-100%	0-1%	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

Date	Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chipps Island Trawl	Salvaged at Delta Facilities
10/10	50% (41.5%, 58.6%)	64% (1.8%, 11.0 %)	4.7 % (0.7%, 8.8%)	0.0% (0.0 %, 0.0%)	0.0% (0.0 %, 0.0%)	0.0% (0.0 %, 0.0%) WY: 2012-2021

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	SCI Trawl	SCI Seine	Trigger Exceeded
10/6/2021	0	0	0	N/A
10/7/2021	0	0	N/A	N/A
10/8/2021	0	N/A	2.67	N/A
10/9/2021	0	N/A	N/A	N/A
10/10/2021	0	N/A	N/A	N/A
10/11/2021	0	N/A	N/A	N/A

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 Change	MLM Alert	Deer Creek flow (DVC)	DCV Δ Change	DCV Alert	Wilkins Slough flow (WLK)	Knights Landing tempera-ture (°F)	Alert Triggered
10/11/21	72.2	-0.3%	63.2	-0.3%	5925.0	N/A	N/A	10/11/21	72.2
10/10/21	72.4	-0.7%	63.3	-0.1%	5906.6	N/A	N/A	10/10/21	72.4
10/9/21	72.9	0.2%	63.4	-1.1%	5919.2	16.1	N/A	10/9/21	72.9
10/8/21	72.8	-7.1%	64.1	-6.3%	5889.2	16	N/A	10/8/21	72.8
10/7/21	78.3	0.1%	68.4	1.8%	5898.3	16.8	N/A	10/7/21	78.3
10/6/21	78.2	-0.4%	67.2	0.1%	5884.1	17.5	N/A	10/6/21	78.2

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; Date: 10/6/2021

Simulations	DCC	Georgiana Slough	Sacramento River	Sutter and Steamboat
Proportion of Entrainment	0.22	0.19	0.33	0.24
Survival	10%	13%	33%	30%
Travel Time	21.9 days	20.5 days	10.3 days	10.4 days

Spring-run Chinook Salmon

1. **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.
2. **What is the distribution of fish within the Delta?** On 10/12/2021 SaMT noted that juvenile CV YOY spring-run Chinook Salmon have yet to emerge.
3. **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.
4. **What are the effects to CV spring-run Chinook Salmon due to DCC gate closure? T**he 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

Date	Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
10/12/2021	N/A	N/A	N/A

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

Date	Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chipps Island Trawl	Salvaged at Delta Facilities
10/11	100.0% (100.0%,100.0%) BY: 2011 -2019	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.).

California Central Valley Steelhead

1. **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.
2. **What is the distribution of fish within the Delta?** On 10/12/2021 SaMT estimated 0% of juvenile CCV steelhead were present in the Delta.
3. **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.
4. **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

Date	Yet to Enter Delta	In Delta	Exited Delta past Chipps Island
10/12/2021	100%	0%	0%

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

Date	Salvaged at Delta Facilities
10/10	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

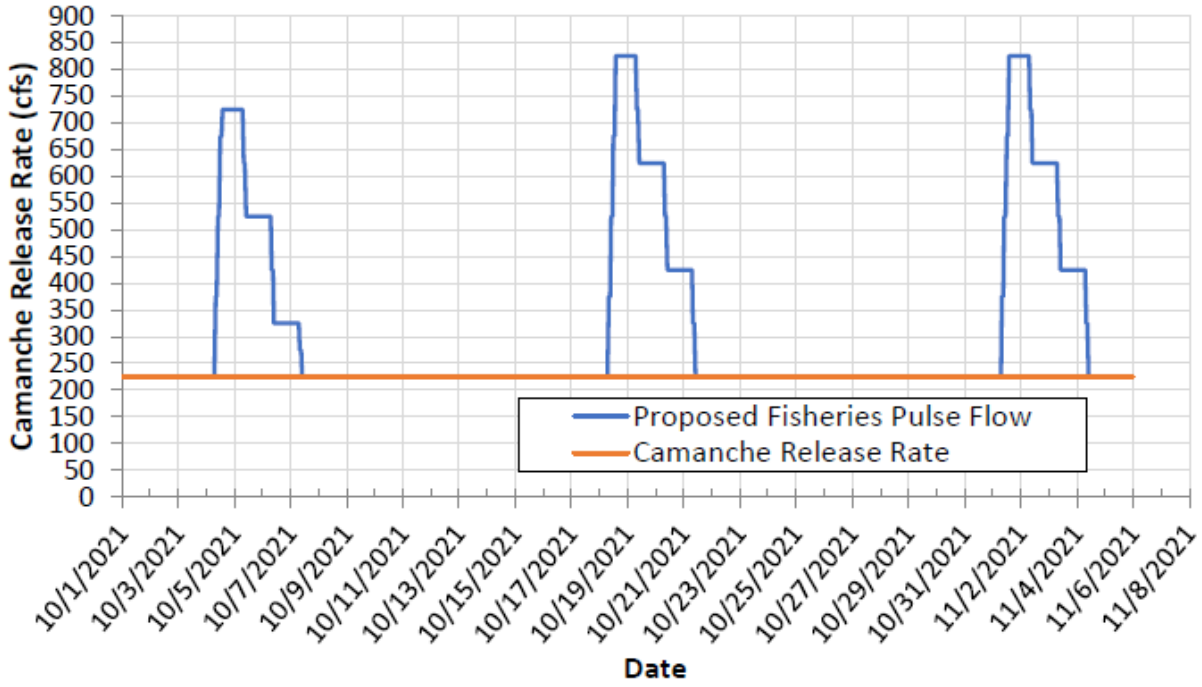

Figure A1. October 2021 Mokelumne River Pulse Flow plan
(source: *2021 Camanche Pulse Flow Plan_Schedule; tab: Pulse Flow – Hourly INPUT*)

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	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

Date	JSA Minimum Release (cfs)	INPUT – Base Flow – JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release	Daily Release Volume (AF)	Cumulative Release Volume (AF)	Add. Pulse Flow (AF)
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
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
10/4/2021	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