

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 27 – November 2 and Attachments A and B for hydrological conditions.

2. Executive Summary

Since August, the Glenn Colusa Irrigation District (GCID) rotary screw traps (RSTs) have observed over 820 winter-run Chinook salmon juveniles (by length at date criteria) in their daily catches. A second pulse of fish has arrived 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 flows were recorded higher than 95 cfs four times over the past week. This is indicative yearling spring-run Chinook salmon may begin to move out of tributaries into the mainstem Sacramento River.

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. 0-1% 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 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

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. There are no juvenile natural spring-run Chinook salmon from BY 20 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. 0-1% 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. DCC gates recommendation

Close the DCC gates at 1600 on October 28 and open at 1000 on October 31 to reduce straying of Mokelumne River fall-run Chinook salmon, attracted by lower Mokelumne River pulse flows, into the Sacramento River through the DCC. 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

- **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 10/27/2020 SaMT estimated 0-1% of juvenile winter-run Chinook salmon were present in the Delta.
- **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.

Supporting Information regarding Exposure of winter-run Chinook salmon

Natural winter-run Chinook salmon distribution estimate for 10/27/2020

<u>Yet to Enter Delta</u>	<u>In Delta</u>	<u>Exited Delta past Chipps Island</u>
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 by 10/25 between 2005 - 2019

<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>
75.5%	9.2%	8.1%	1.5%	0%	0%

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 Seine</u>	<u>SCI Trawl</u>	<u>Trigger Exceeded?</u>
10/26/2020		0	0	
10/25/2020	0			
10/24/2020	0			

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Date	KLCI	SCI Seine	SCI Trawl	Trigger Exceeded?
10/23/2020	0	0	0	
10/22/2020	0			
10/21/2020	0.559			
10/20/2020	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	Wilkins Slough flow (WLK)	Deer Creek flow (DCV)	DCV Δ	Mill Creek flow (MLM)	MLM Δ	Knights Landing temperature (°F)	Alert Triggered
10/26/2020							
10/25/2020	3713.5	78.7	1.9%	99.8	0.7%		MLM > 95 cfs
10/24/2020	3709.5	77.2	1.9%	99.1	1.4%	60.2	MLM > 95 cfs
10/23/2020	3617.0	75.8	-0.5%	97.8	-0.4%	61	MLM > 95 cfs
10/22/2020	3663.8	76.2	0.6%	98.1	4.3%	62.4	MLM > 95 cfs
10/21/2020	3780.7	75.8	0.1%	94.0	3.2%	64.3	
10/20/2020	3815.8	75.7	1.1%	91.1	1.7%	64.7	

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

10/13/2020 Water Quality Modeling Assumptions:

- 2 DCC closures:
 - e. Closed at 1600 on October 13 and Open at 1000 on October 17
 - f. Closed at 1600 on October 20 and Open at 1000 on October 24
- See Attachment A – Mokelumne River pulse flow plan plot and data

No water quality criteria were exceeded (Attachment B figures 1-4).

STARS model simulations for route-specific entrainment, travel times, and survival for 10/26/2020. Freeport flows for 10/26/2020 were 6860.9 cfs.

	DCC	Georgiana Slough	Sacramento River	Sutter and Steamboat
Proportion of Entrainment	11%	26%	38%	24%
Survival	11%	14%	39%	31%
Travel Time	22.31 d	19.57 d	10.72 d	11.04 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 10/27/2020 SaMT estimated 0-1% of juvenile CV spring-run Chinook salmon were present in the Delta.
- **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 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.

- **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 for 10/27/2020

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 10/25 between 2005 - 2019

Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chipps Island Trawl	Salvaged at Delta Facilities
7.1%	0%	0.1%	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.).

2. 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 10/27/2020 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.

Supporting Information regarding Exposure of CCV Steelhead

Central Valley steelhead distribution estimate for 10/27/2020

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

Central Valley steelhead average percent of annual emigrating population (LAD) salvaged at Delta fish facilities by 10/25 between 2005 - 2019

<u>Salvaged at Delta Facilities</u>
0.2%

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

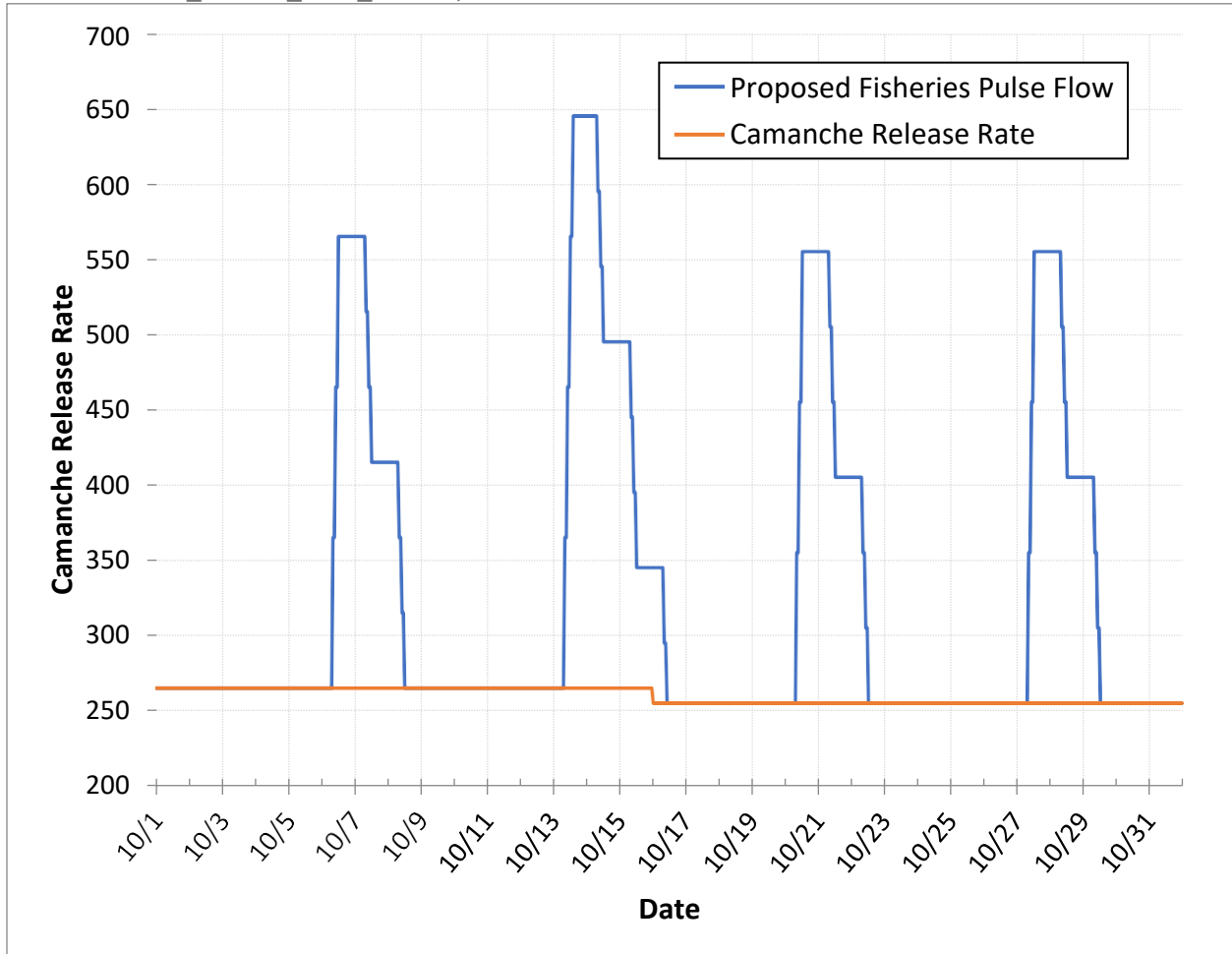
Supporting Information regarding DCC Management Effects on Central Valley steelhead

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

Attachment A.

Mokelumne River Pulse Flow Plan

Figure A1. October 2020 Mokelumne River Pulse Flow plan (source: 2020 DRAFT – Camanche Pulse Flows Scenario_4 Pulse_PCC_modelb)



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Table A1. Alternative considered, October 2020 Mokelumne River Pulse Flows (source: 2020 DRAFT – Camanche Pulse Flows Scenario_4 Pulse_PCC_modelb)

Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	DCC Gate Position
10/1/2020	250	265	0	265	526	Open
10/2/2020	250	265	0	265	526	Open
10/3/2020	250	265	0	265	526	Open
10/4/2020	250	265	0	265	526	Open
10/5/2020	250	265	0	265	526	Open
10/6/2020	250	265	175	440	873	Open
10/7/2020	250	265	213	478	947	Open
10/8/2020	250	265	63	328	650	Open
10/9/1010	250	265	0	265	526	Open
10/10/2020	250	265	0	265	526	Open
10/11/2020	250	265	0	265	526	Open
10/12/2020	250	265	208	473	939	Open
10/13/2020	250	265	293	558	1,106	<i>Closed at 1600</i>
10/14/2020	250	265	143	408	808	<i>Closed</i>
10/15/2020	250	265	33	288	572	<i>Closed</i>
10/16/2020	250	255	33	288	572	<i>Closed</i>
10/17/2020	250	255	0	255	506	Open at 1000
10/18/2020	250	255	0	255	506	Open
10/19/2020	250	255	175	430	853	Open
10/20/2020	250	255	213	468	927	<i>Closed</i>
10/21/2020	250	255	63	318	630	<i>Closed</i>
10/22/2020	250	255	63	318	630	<i>Closed</i>
10/23/2020	250	255	0	255	506	<i>Closed</i>
10/24/2020	250	255	0	255	506	Open
10/25/2020	250	255	0	255	506	Open
10/26/2020	250	255	0	255	506	Open

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Date	JSA Minimum Release (cfs)	INPUT - Base Flow - JSA Min + Buffer (cfs)	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	DCC Gate Position
10/27/2020	250	255	175	430	853	Open
10/28/2020	250	255	213	468	927	<i>Closed</i>
10/29/2020	250	255	63	318	630	<i>Closed</i>
10/30/2020	250	255	0	255	506	<i>Closed</i>
10/31/2020	250	255	0	255	506	<i>Closed</i>

Attachment B

10/13/2020 Water Quality Modeling Results

Alternatives include a base case assuming no closure and an alternative assuming the closures described below:

- Closed at 1600 on October 20 and Open at 1000 on October 24
- Closed at 1600 on October 28 and open at 1000 on October 31
- Generally concurrent with second pulse flow planned for the Mokelumne River.

Conclusion:

Model results indicate that no water quality concern level targets will be exceeded. However, observed daily EC exceeded the criteria at Jersey Point. DCC gates should be closed during time period described above.

Figure B1. Water quality modeling at Jersey Point conducted on 10/20/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 1800 umhos/cm. Observed EC values have exceeded the concern level.

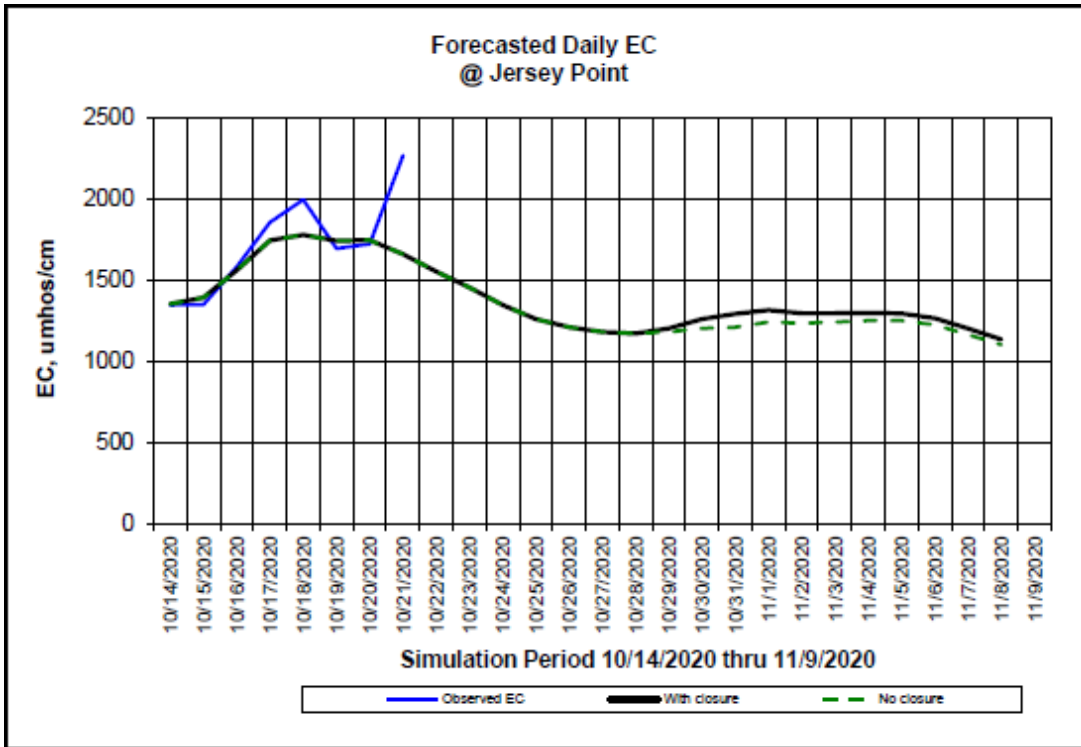


Figure B2. Water quality modeling Bethel Island conducted on 10/20/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 1000 umhos/cm.

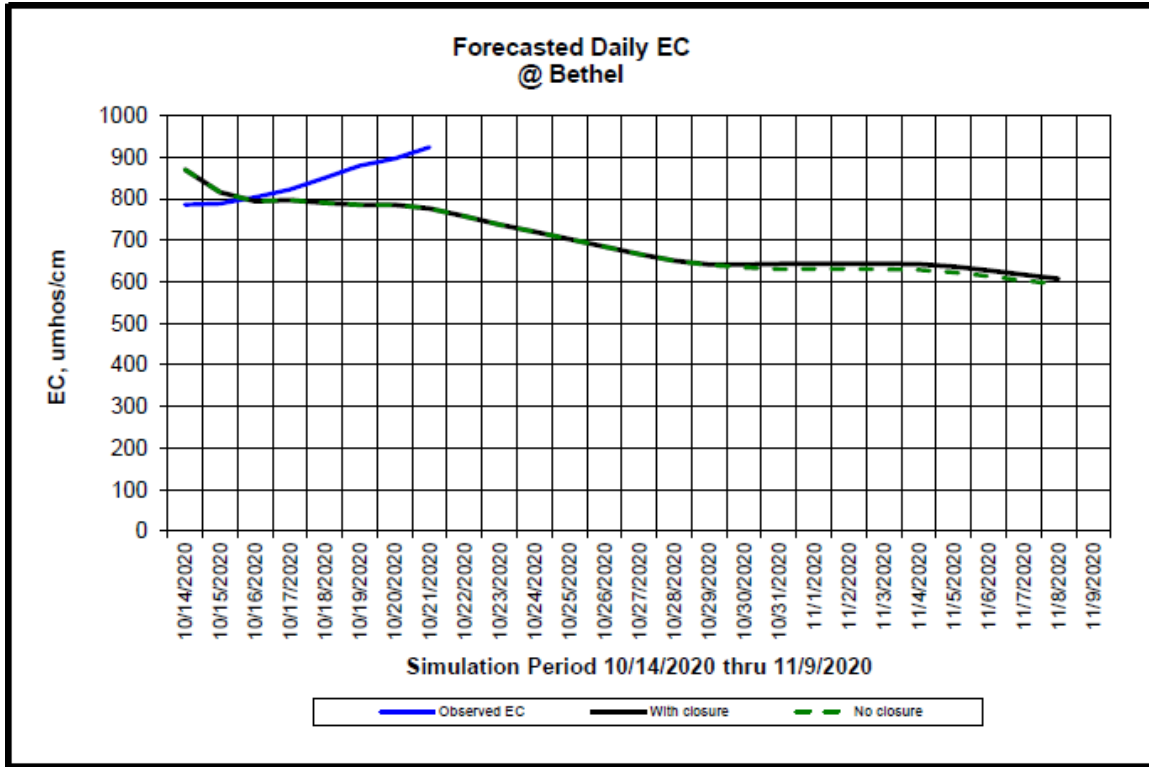
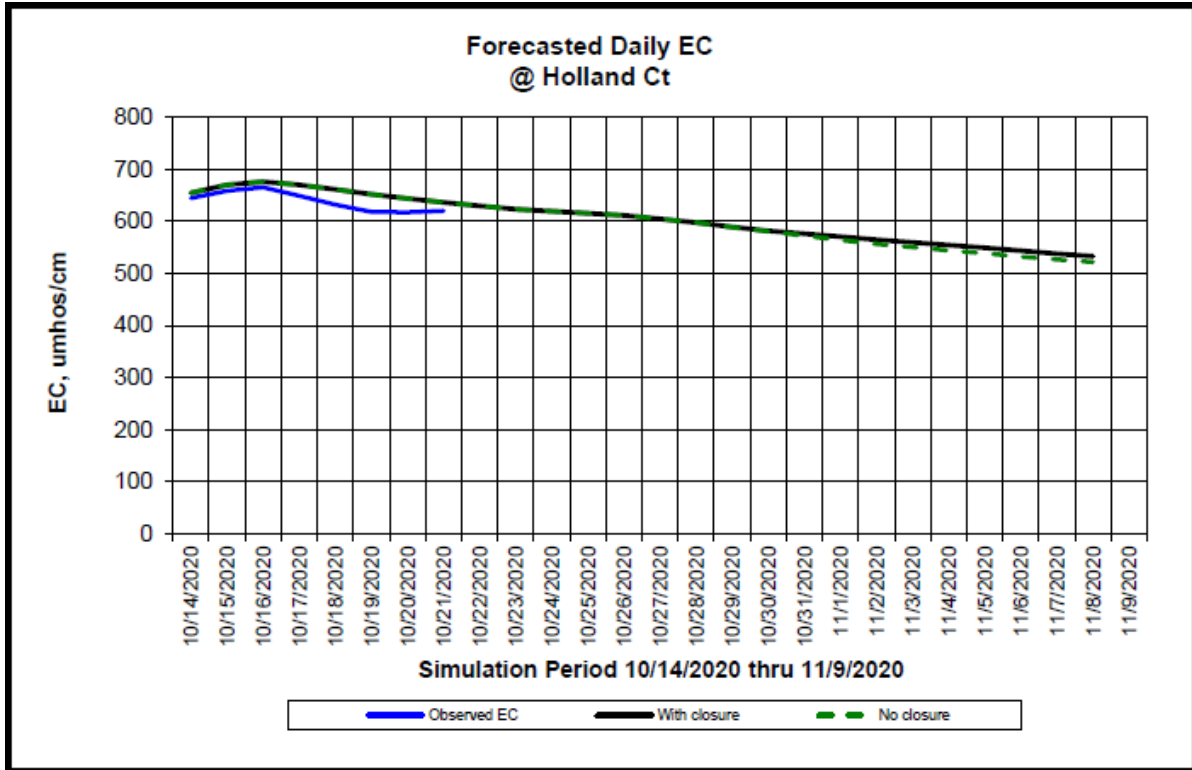
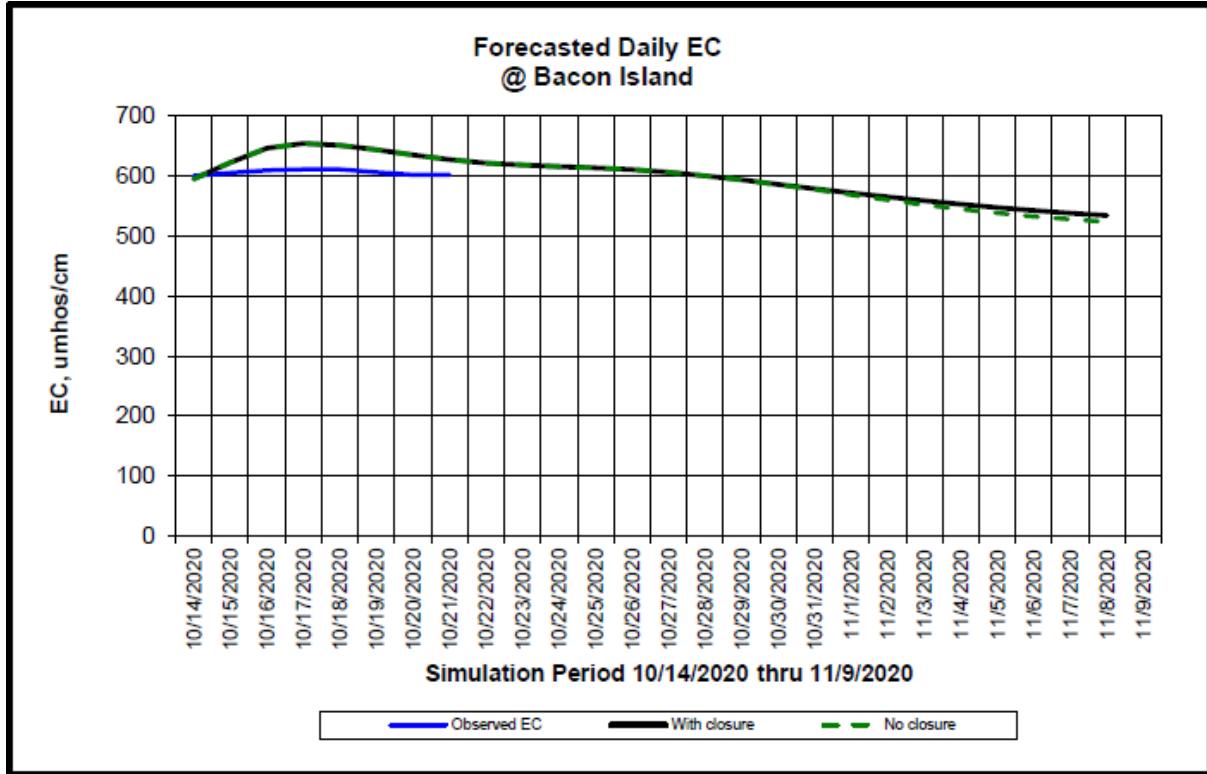


Figure B3. Water quality modeling at Holland Cut conducted on 10/20/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 800 umhos/cm.



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Figure B4. Water quality modeling at Bacon Island conducted on 10/20/20. Neither modelled alternatives (DCC gates open versus closed) indicate an exceedance of the electrical conductivity standard of 700 umhos/cm.



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

Monitoring Survey	Status (as of 10/20/20)
Delta	
SWP regular counts, CWT reading, and larval sampling	Ongoing
CVP regular counts, CWT reading, and larval sampling	Ongoing
Smelt Larval Survey	
20mm Survey	
Bay Study	
DJFMP- Chipps and Sacramento Trawls	Ongoing
DJFMP- Seines	Ongoing
EDSM	Ongoing
EMP	
Mossdale	Ongoing
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