

Salmon Monitoring Team Weekly Meeting
Conference call: 4/1/20 at 9:00 a.m.

Executive Summary:

- We are observing an increase in the rate of salmonids salvaged at the Delta Fish Collection Facilities.
 - In the past week, natural-origin winter-run sized Chinook salmon were salvaged at the Delta fish collection facilities (weekly loss = 62).
 - Natural-origin spring-run sized Chinook salmon were salvaged last week at the Delta fish collection facilities (weekly loss = 115)
 - Hatchery-origin spring-run Chinook salmon (weekly loss = 705)
 - Natural-origin steelhead (weekly loss = 220)
 - Hatchery-origin steelhead were observed in salvage (weekly loss = 116).
- New California Department of Fish and Wildlife (CDFW) Incidental Take Permit (ITP) released yesterday (3/31/20) for the long term operations of the State Water Project (SWP).
- Updated Juvenile Production Estimate (JPE) and incidental take limit (ITL) for hatchery-origin winter-run Chinook salmon released on 3/27/20 based on revised hatchery release group information.

Objective: Provide information to the Water Operations Management Team (WOMT), Reclamation and California Department of Water Resources on measures to reduce adverse effects from Delta operations of the Central Valley Project (CVP) and the State Water Project (SWP) on salmonids and green sturgeon. Salmon Monitoring Team (SaMT) notes will be posted to Reclamation's web page <https://www.usbr.gov/mp/bdo/salmon-monitoring-team.html>.

CDFW: Geir Aasen, Adam Chorazyczewski, Kyle Griffiths, Jason Julienne, Ken Kundargi, Duane Linander, John Williams

DWR: Chris Cook, Brittany Davis, Bryant Giorgi, Farida Islam, Tracy Pettit, Kevin Reece, Ian Uecker

Kearns & West: Matt Marvin

NMFS: Kristin Begun, Jeff Stuart

Reclamation: Elissa Buttermore, Suzanne Manugian, Tom Patton

SWRCB: Chris Carr, Michael Macon, Craig Williams

USFWS: Katherine Sun

Agenda Items:

1. Introductions (9:00-9:03)
Purpose: Provide an accurate record of who is attending these calls
2. Relevant Actions and Triggers (9:04-9:08)
Purpose: Review of relevant actions and triggers status and discuss any changes
 - a. NMFS JPE revision
 - b. CDFW ITP update
3. Outlook, Current Operations, and Weather Forecast (9:09 – 9:17)

Purpose: Review operations and weather sections on Weekly Outlook. Discuss Delta operations to consider context for evaluating Assessment questions about Delta operation effects

4. Review of Environmental Data (9:18-9:20).
Purpose: Review environmental data to consider context for evaluating Assessment questions about Delta operations effects
5. Fish Abundance and Distribution (9:21-9:40)
Purpose: Review fish monitoring data to inform fish distribution estimates, fish exposure, and behaviour cues that is part of the next section
 - a. Hatchery Releases
 - b. Historical Fish Monitoring Data
 - c. Fish Monitoring: RSTs/trawls/seines
 - d. Fish Monitoring: Salvage
 - e. Migration Status: Estimates of Fish Distribution
6. Fish Exposure and Behavioural Cues (9:41-9:56)
Purpose: Assist in assessing entrainment risk of Delta operations on salmonids and sturgeon. Complete Evaluation section questions of the Assessment
 - a. Historical Patterns (Comparison of abundance, timing, and loss to prior years)
 - b. Current Conditions (Entrainment Models)
 - c. Sensitivity to Operational Actions
7. Other Topics (9:57-9:58)
Purpose: Identify additional topics that are not in the regular agenda
 - a. Assessment schedule and process.
8. Additional Considerations for WOMT (9:58-10:00)
Purpose: Highlight information that SaMT would like WOMT to consider related to changes to Delta water operations
9. Next SaMT Meeting (10:00)

Agenda Item 2.

Relevant Actions and Triggers Review

DCC Gate Operations

- DCC gates are closed per operations described in NMFS' 2009 Biological Opinion (BiOp) RPA Action IV.1.2 and Reclamation's Proposed Action 4.10.5.3 and are expected to remain closed until 5/20/20.

OMR Management

- Implementation of this action in water year (WY) 2020 began on 1/1/20 and requires that Old and Middle River (OMR) flow be no more negative than -5,000 cfs (NMFS' 2009 BiOp RPA Action IV.2.3 and 2019 ROC Proposed Action). OMR flows are reported

weekly with the OMR index and the tidally filtered USGS gauges at the daily, 5-day and 14-day running averages.

- The official [Juvenile Production Estimate \(JPE\) letter](#) from NMFS was signed and issued to Reclamation on 2/3/20. The JPE for natural-origin brood year (BY) 2019 Sacramento River winter-run Chinook salmon is 854,941 fish surviving to enter the Delta. The ITP issued by CDFW for the operations of the SWP references the 2009 NMFS biological opinion RPA actions for its compliance. NMFS' RPA action IV.2.3 uses the length-at-date (LAD) for run assignment of older juveniles (i.e., larger than the minimum LAD for winter-run Chinook salmon), the first stage trigger will be exceeded if more fish are lost in salvage than calculated by multiplying 8 fish/thousand acre feet (TAF) times the volume of water exported in TAF. The second stage is triggered if the number of older juvenile Chinook salmon lost is greater than the number calculated by multiplying 12 fish/TAF by the volume of water exported in TAF.
 - If a trigger is exceeded, all older juvenile Chinook salmon will have a tissue sample processed through the rapid genetic analysis protocol to determine the genetic run assignment.
 - When applying the rapid genetic analysis protocol, the first stage trigger is exceeded if genetically verified combined daily loss density of older-juvenile-sized winter-run Chinook salmon exceeds 4.27 fish per TAF of water exported, and the second stage trigger is exceeded if the genetically verified daily loss density of older-juvenile-sized winter-run Chinook salmon exceeds 8.55 fish per TAF of water exported.
- [Revised JPE letter](#) sent on 3/27/20. On 3/27/20, NMFS provided a revised JPE letter to Reclamation reflecting updated information. The revised JPE letter provides the U.S. Bureau of Reclamation (Reclamation) with the revised JPE and ITL for hatchery origin juvenile Sacramento River winter-run Chinook salmon for water year (WY) 2020 based on the estimated number of hatchery fish released.
 - The revised incidental take for juveniles released from LSNFH into the Sacramento River is **923 hatchery-produced (adipose fin clipped)** winter-run Chinook salmon
 - Revised incidental take of juveniles released into Battle Creek is **622 hatchery produced (adipose fin clipped and left ventral fin clipped)** winter-run Chinook salmon.
- Refer to weekly operations and fish outlook document for more triggers relevant to the CDFW ITP and the 2019 ROC Proposed Actions (see Agenda Item 3).
- DWR's ITP was signed on 3/31/20 and can be found online here: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/ITP-for-Long-Term-SWP-Operations.pdf>

Agenda Item 3.

Weekly Fish and Water Operations Outlook:

Summary: Forecasted showers persist across far northern California through Tuesday, otherwise dry and milder this week. Chance of precipitation returns this weekend and could increase outflow in the Delta. X2 requirements in effect are at Collinsville (81 km) [can be met through (1) daily X2, (2) 14 day-averaged X2, or (3) 3 day-averaged Delta Outflow \geq 7,100 cfs]. The maximum D-1641 E/I ratio of 0.35, Collinsville X2 compliance, or OMR \geq -5,000 cfs are factors that could potentially control project operations. Beginning on April 1, the SWP will also operate in accordance with CDFW’s Long-Term ITP, finalized this week. The interim ITP (previously in effect) is superseded by the Long-Term ITP.

Tributary/Division	Projected Intended Operations and Ranges for week	Related Environmental and Fish Conditions
Clear Creek	Whiskeytown Release: 200 cfs	<ul style="list-style-type: none"> • Fall-run Chinook salmon emergence underway. • Spring-run Chinook immigration March – June. • Late-fall run chinook are spawning. • Steelhead spawning. <p><i>(updated 3/30/20)</i></p>
Sacramento River	Shasta Storage: 3.59 MAF Shasta Release: 5,000 cfs	<ul style="list-style-type: none"> • End of winter-run Chinook salmon juvenile migration. • Winter-run Chinook salmon adults migrating in and holding. • Spring-run Chinook salmon juveniles rearing and emigrating. • Fall-run Chinook salmon fry in gravel with continued emergence, juveniles rearing and emigrating. • Late-fall Chinook salmon ending spawning, eggs and fry in gravel. • Steelhead spawning commencing. • Green sturgeon adults present. <p><i>(updated 3/30/20)</i></p>
Feather River	Oroville Storage: 2.29 MAF Oroville Release to Feather: 1,750 cfs	<ul style="list-style-type: none"> • Fall-run Chinook salmon eggs still in gravel, hatching, and emergence is ongoing. Peak emergence of fall-run was expected to have occurred in mid-March but is more likely to occur through mid-April. • Steelhead spawning is minimal. Steelhead eggs are in gravel, hatching and emergence is ongoing.

Tributary/Division	Projected Intended Operations and Ranges for week	Related Environmental and Fish Conditions
		<ul style="list-style-type: none"> • Spring-run and fall-run juvenile Chinook salmon continue to emigrate out of the Lower Feather River. <i>(updated 3/30/20)</i>
American River	Folsom Storage: .47 MAF Nimbus Release to American: 1,500 cfs (a decrease to 1,000 cfs is possible)	<ul style="list-style-type: none"> • Fall-run Chinook salmon eggs still in gravel, hatching and emergence is ongoing. Peak emergence of fall-run estimated to have occurred mid-March. Preliminary carcass survey results indicate emergence will occur through mid-April. • Steelhead spawning continues, eggs are in the gravel, hatching and emergence is ongoing. • Spring-run and winter-run Chinook salmon juveniles present (non-natal rearing). • Fall-run Chinook salmon that have emerged are currently rearing and emigrating out of the lower American River. • Fall-run Chinook salmon and steelhead redds at potential risk of dewatering due to reductions in releases. • Fall-run Chinook salmon and steelhead juveniles at risk of stranding due to reductions in releases. • <i>(updated 3/30/20)</i>
Stanislaus River	New Melones Storage: 1.89 MAF Goodwin Release to Stanislaus: 200 cfs	<ul style="list-style-type: none"> • Majority of fall-run Chinook salmon have emerged. Preliminary carcass survey data estimated peak emergence to have occurred mid-February. • Steelhead are spawning based on historical timing and eggs are currently in the gravel. No empirical data on steelhead spawning is available. Historical data indicates steelhead may be emerging now. • <i>(updated 3/30/20)</i>

Tributary/Division	Projected Intended Operations and Ranges for week	Related Environmental and Fish Conditions
Delta	Freeport: 10,000 to 12,500 cfs Vernalis: 1,400 to 1,700 cfs Delta Outflow index: 7,000 to 9,500 cfs Exports JPP: 1,800 to 4,000 cfs CC: 500 to 800 cfs Expected OMR Index Values: -2,000 to -3,500 cfs Maximum Allowable OMR: -5,000 cfs X2 position: 77 to >81 km QWEST: +500 cfs to -1,500 cfs DCC: Closed	<ul style="list-style-type: none"> • 39-43% winter-run Chinook salmon juveniles present and 55% past Chipps Island. • 53-68% spring-run Chinook salmon juveniles present and 2% past Chipps Island. • Fall-run Chinook salmon juveniles rearing. • Steelhead juvenile migration occurring. • Green sturgeon adult and juveniles present. • Adult Delta Smelt likely spawning. • Spawning adult and larval Longfin Smelt present. • <i>(updated 4/1/2020)</i>

Table 2¹. Relevant WY 2020 Fish and Environmental Criteria and Status in 2019 Reclamation LTO Action and NMFS and USFWS Biological Opinions.

Species/run	Threshold	Current Status	Weekly Trend	Updated through
Natural winter-run Chinook Loss	50% Single-year loss threshold = 5,001 . 50% of 1.17% of JPE = 5,001 WY 2020 JPE: 854,941	Loss (LAD) = 141	Increasing	3/29/20
Hatchery winter-run Chinook loss	Single-year loss threshold = 55.4 50% of 0.12% of Sac. R releases JPE= 55.4 JPE of Sac. R releases: 92,291 152,000 (~60%) released on 3/10/20 97,505 (~40%) released on 3/23/20	Loss = 0	No change expected	3/28/20
Steelhead, non-clipped	1) December - March = Loss not to exceed 707. This is 50% of 1,414 from December – March single year loss threshold. 2) April 1- June 15: Loss not to exceed 776 . This	1. 300 2. Loss = N/A	Increasing	3/29/20

¹ The Table 3: Relevant WY 2020 Fish Criteria and Status under the CDFW Interim ITP, that was included in prior Fish and Operations Outlook documents has been removed. This table will be revised and included at a later date when the Long-Term ITP has been issued and reviewed.

Species/run	Threshold	Current Status	Weekly Trend	Updated through
	is 50% of 1,552 from April – June 15 single year loss threshold			
Hatchery spring- run Chinook surrogates	Loss > 0.5% of each release group: 1) 12-9-2019: 84,869 = 424.3 2) 12-18-2019: 77,672 = 388.4 3) 01-13-2020: 77,866 = 389.3	1. 20.2 2. 25.0 3. 0	No change expected	3/30/20
Green sturgeon	Cumulative salvage = 74	0	No change expected	3/30/20
We Delta Smelt	No First Flush identified. Daily Avg. < 12 NTU at OBI Ripe Female Observed March-June: OMR no more negative than -5,000 cfs	Turbidity = 2.21 NTU at OBI Daily Avg	Expected to remain stable	3/30/20
Longfin Smelt	Jan. - July: larvae found in at least 8 of 12 Stations Catch per tow exceeds 15 in at least 4 stations Larvae detected at station 716 Advice Warranted	CSI < 5 Larval Smelt Detections warrant advice on OMR	OMR advice to be given. Barker Slough to be off ramped	3/31/20

Operations

Operations Category	Location	Operations on 3/24/20	Operations on 4/1/20
Clifton Court Inflow	Clifton Court Forebay	1,800 cfs	600 cfs (meeting the proportional flow allotment for the SWP based on the Vernalis I:E requirement of the CDFW ITP)
SWP Reservoir Releases	Feather – Oroville	1,750 cfs	1,750 cfs
SWP Reservoir Storage	San Luis (SWP)	950 TAF	975 TAF
SWP Reservoir Storage	Oroville	2,270 TAF	2,294 TAF
Environmental Parameters	Sacramento River at Freeport	12,166 cfs	11,700 cfs
Environmental Parameters	San Joaquin River at Vernalis	1,894 cfs	1,480 cfs
Environmental Parameters	Delta Outflow Index	8,188 cfs	7,517 cfs
Environmental Parameters	E:I (14-day)	33.6 % (14-day)	34% (14-day)
Environmental Parameters	X2	80.4 Km	79 Km
CVP Exports	Jones Pumping Plant	3,600 cfs	Targeting 2,700 cfs, change order submitted on 3/27/20 for 3,500 cfs on Friday (4/3/20)
CVP Reservoir Releases	American - Nimbus	1,500 cfs	1,500 cfs, incoming storm this weekend may result in reductions to Nimbus releases.

Operations Category	Location	Operations on 3/24/20	Operations on 4/1/20
CVP Reservoir Releases	Sacramento - Keswick	4500 cfs	5,000 cfs (increased on 3/27/20), incoming storm this weekend may result in reductions to Keswick releases.
CVP Reservoir Releases	Stanislaus - Goodwin	200 cfs	200 cfs, releases potentially increasing for spring pulse flow later this week. 31-day pulse period scheduled for the period between 4/10/20 – 5/10/20
CVP Reservoir Releases	Trinity - Lewiston	300 cfs	300 cfs
CVP Reservoir Storage	San Luis (CVP)	505 TAF	536 TAF
CVP Reservoir Storage	Shasta	3,564 TAF	3,600 TAF
CVP Reservoir Storage	Folsom	465 TAF	476 TAF
CVP Reservoir Storage	New Melones	1,892 TAF	1,892 TAF
CVP	DCC Gates	Closed	Closed

cfs = cubic feet per second

TAF = thousand acre feet

Km = kilometer

Location of X2 measured from the Golden Gate

Factors controlling Delta exports: E:I controlling exports during the past week (3/24/20 to 3/31/20). Members noted the convergence of competing controlling regulatory factors for Delta exports under D-1641, such as the Emmaton EC standard, X2 standard (5-days at Chipps Island for April), and the differences in the State's requirements under CDFW's ITP and the CVP requirements under the long-term operations proposed action.

Agenda Item 4.
Review of Environmental Data

OMR Demonstration Project: OMR Index and USGS Tidally Filtered Values are displayed on SacPAS. http://www.cbr.washington.edu/sacramento/data/delta_loss.html

Approximate OMR gage data as of 3/29/20

	USGS gauges (cfs)	Index (cfs)
Daily	-4,700 cfs	-4,300 cfs
5-day	-4,400 cfs	-4,400 cfs
14-day	N/A*	-4,200 cfs

*The OBI gage data had gaps that prevented the calculation of the 14-day average.

Approximate OMRs as of 3/31/20:

	Index (cfs)
Daily	-4,400 cfs
5-day	-4,500 cfs
14-day	-4,300 cfs

Agenda Item 5.
Fish Abundance and Distribution

Hatchery Releases

On 3/30/20 the CDFW released approximately 200,000 brood year 2019 Chinook salmon from Nimbus Fish Hatchery into the Lower American River at Sunrise Boat Ramp. This release included 100% marked (adipose fin clip) and Coded Wire Tagged (CWT) fish.

Release Correction

On 3/24/20 the U.S. Fish and Wildlife Service (USFWS) released approximately 375,540 brood year 2019 fall Chinook salmon from the Coleman National Fish Hatchery into Battle Creek. A CWT code was corrected in the current notification that was incorrect in the initial notification. This release was 100% marked with an adipose fin clip and CWT.

Fish Monitoring:**Historical Fish Monitoring Data**

Because of challenges with limited data and interpretation of real-time steelhead catch data, SaMT reviews historical catch data on SacPAS’s Migration Timing and Conditions page and the Salvage Timing page.

SacPAS main page: <http://www.cbr.washington.edu/sacramento/>

Migration Timing: http://www.cbr.washington.edu/sacramento/data/query_hrt.html

Migration Timing

Average percent of annual emigrating population for each species of interest captured at the following locations by 3/30/20 for the years 2005 to 2018.

Brood Years	Species, species run	Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Beach Seines	Sac Trawl (Sherwood)	Chipps Island Trawl
2005 – 2018	Winter-run Chinook salmon	99.8%	99.4%	99.4%	100%	83.6%	60.5%
2005 – 2018	Spring-run Chinook salmon	56.8%	45.8%	60.9%	87.7%	26.4%	2.6%
2005 – 2018	Steelhead	3.3%	69.7%	60.2%	77.8%	91.1%	84.2%

Salvage timing:

Average percent for each species (based on length at date) of interest salvaged at the SWP and CVP Delta Fish Facilities by 3/30/20 in previous years. Average sampled represents historic data spanning years 2005 – 2018.

Brood Year	Species, species run	Average Percent Salvaged at SWP and CVP Delta Facilities
Average 2005 - 2018	Winter-run Chinook salmon (unclipped)	93 %
Average 2005 – 2018	Spring-run Chinook salmon (unclipped)	12.3%
Average 2005 – 2018	Steelhead (unclipped)	59.9%

Current Fish Monitoring Data

Fish monitoring data summarized over the past week are found on Bay Delta Live. Unless otherwise noted, reported races are based on fork length (LAD).

Location	Feather River RST Eye Channel ^A	Feather River RST Herringer ^B	GCID RST ^C	Tisdale RST ^D	Knights Landing RST ^E	Beach Seines ^F	EDSM	LAR RST ^G	Sacramento Trawl ^F	Chippis Island Midwater Trawl ^F	Mossdale Kodiak Trawl ^F	Caswell RST ^H	Okie Screw Trap ^I	Okie Diversion Trap ^J
Sample Dates	3/23-3/29	3/23-3/29	3/20-3/26	3/23-3/30	3/23-3/30	No sampling	3/23-3/26	3/24 - 3/26	3/22-3/24, 3/26-3/27	3/22-3/24, 3/26-3/27	No sampling	3/25-3/26	3/23 – 3/29	3/23 – 3/29
Chinook												9		
FR Chinook	28,311	1,777	1,331 juv 2,067 smolts		12			2,601	12					
SR Chinook	128	27	229 juv	11	23		1	164	9	1			1,900	850
WR Chinook			6 smolts		1		2	13	1	28				
LFR Chinook														
Chinook (ad-clip)		44 SR	289 FR 477 WR	2 FR 2 SR	6 SR 1 WR				10	2				
Steelhead (natural)	9	3						2 fry		1			4	
Steelhead (ad-clip)					1		4	37		3				
Green Sturgeon														
Flows (avg. cfs)	800	1,750	1,019	6,111	6,396								182	182.6
W. Temp. (avg. °F)	51.6	54.3	54.6	54.9	55.6								7	7
Turbidity (avg. NTU)	1.4	2.2	5.9	5.3	7.1									

^A Feather River RST data from Eye Channel sampling period was from 3/23/2020 at 1630 to 3/29/2020 at 1100 hours.

^B Feather River RST data at Herringer sampling period was from 3/23/2020 at 1100 to 3/29/2020 at 0924 hours.

^C GCID numbers have been adjusted accordingly due to the magnitude of the recent hatchery releases. The GCID RST cone was raised to allow the remainder of hatchery released chinook to move through the system.

^D Tisdale RST sampling period was from 3/23/2020 at 1015 to 3/30/2020 at 1000. RST operating at full cone.

^E Knights Landing RST sampling period was 3/23/2020 at 1115 to 3/30/2020 at 1030 hours. RST operating at full cone. One hatchery salmon keyed to spring-run based on LAD, but recorded as winter-run because of a pectoral fin clip.

^F DatCall sampling data period for 3/22-3/28/2020.

^G Lower American River RST sampling period was from 3/24/2020 to 3/26/2020.

^H No sampling occurred at Caswell RSTs 3/20-3/24/2020.

^I Okie Screw Trap (Butte Creek) sampling period was from 3/23/20 at 9:30 to 3/29/20 at 8:45.

^J Okie Diversion Trap (Butte Creek) sampling period was from 3/23/20 at 8:30 to 3/29/20 at 8:15

Fish Monitoring Gear Efficiency/Disruptions:

Monitoring Survey	Status (as of 3/26/20)
Delta	
SWP regular counts, CWT reading, and larval sampling	Ongoing through modified staffing
CVP regular counts, CWT reading, and larval sampling	Ongoing through modified staffing
Smelt Larval Survey	On hold until further notice (after 4/1/20)
20mm Survey	On hold until further notice (after 4/1/20)
Bay Study	On hold until further notice (after 4/1/20)
DJFMP- Chipps and Sacrament Trawls	USFWS Prioritized with reduced effort
DJFMP- Seines	USFWS Prioritized
EDSM	USFWS Prioritized with reduced effort
EMP	Discrete sampling will not occur in April, Continuous sampling continues
Mossdale	USFWS Prioritized
USGS Flow monitoring	Continuous monitoring continues
Sacramento River	
Acoustic tagging- Battle Creek hatchery	Ended tagging early. Tagged ~250 fish
Acoustic tagging- Fall run Chinook	Will not occur this March and April
Acoustic tagging-Spring run Chinook	Expected to occur beginning the week of 4/6/20
Acoustic tagging-Pulse Flow experiment	Unlikely to occur

Monitoring Survey	Status (as of 3/26/20)
Red Bluff Diversion Dam screw trap	USFWS Prioritized with modified staffing
Knights Landing screw trap	Ongoing through modified staffing
Tisdale screw trap	Ongoing through modified staffing
Sacramento River	
Redd dewatering and stranding surveys	Suspended
Sacramento Carcass and Redd Surveys	Continuing
San Joaquin River	
SJRRP CDFW Field Monitoring	On hold until further notice
SJRRP USFWS and USBR Field Monitoring	Ongoing with modified staffing

Green Sturgeon

No green sturgeon sampling was conducted during the last week.

Red Bluff Diversion Dam Biweekly Report

USFWS biweekly report (3/11/20 – 3/24/20) for preliminary estimates of passage by BY (brood year) and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

Run and Species	Biweekly Total	BY Total (90% CI)
Winter-run Chinook (BY2019)	7,311	3,811,843 (2,476,404 - 5,147,282)
Spring-run Chinook (BY2019)	80,769	141,589 (53,567 - 229,610)

DOSS Weekly Salvage Update

Reporting Period: March 23-March 29, 2020

Prepared by Kyle Griffiths on March 30, 2020 16:8

Preliminary Results -Subject to Revision

Criteria	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0.53	2.06	0	1.57	1.62	↗	0.82
Wild steelhead	0	0.49	4.35	1.89	8.17	2.35	3.28	↗	2.93
Exports									
SWP daily export	2,836	4,056	3,884	3,541	6,880	7,417	6,899	↗	5,073
CVP daily export	7,061	7,053	7,054	7,044	3,663	3,650	3,651	↘	5,597
SWP reduced counts	0	0	0	0	0	0	0		
CVP reduced counts	0	0	0	0	0	0	0		

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present

Loss = estimated number of fish lost at the CVP and SWP Delta export facilities based on estimated salvage (see below)

Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operations

Yellow highlighted dates indicate TFCF salvage outage occurred

Chinook Salmon Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

Race determined by size at date of capture; hatchery = adipose fin missing;

Category	Weekly Total			Season Total		Season Total - LAD	
	Salvage	Loss	Trend	Salvage	Loss	Salvage	Loss
Wild							
Winter Run	21	62	↗	58	108	84	141
Spring Run	44	115	↗	52	120	52	120
Late Fall Run	0	0	→	12	8	12	8
Fall Run	0	0	→	54	52	28	19
Unclassified	0	0	→	0	0	0	0
Total	65	177		176	288	176	288
Hatchery							
Winter Run	0	0	↘	13	9	73	78
Spring Run	278	705	↗	458	829	323	710
Late Fall Run	0	0	→	195	153	186	144
Fall Run	0	0	→	21	14	105	72
Unclassified	0	0	→	0	0	0	0
Total	278	705		687	1,005	687	1005

Trend = weekly loss per race; Salvage = estimated number of fish collected by the CVP and SWP fish protective facilities per unit of time

NC = cannot be calculated; hatchery salmon salvage and loss estimates have been corrected using CWT readings when available

Steelhead Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild	71	220	↗	124	300
Hatchery	47	116	↗	151	219
Total	118	336		275	519

State Water Project loss = salvage x 4.33; Central Valley Project loss = salvage x 0.68

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 3/28/20

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released ¹	Total Entering Delta	% Loss of Number Released ²	% Loss of Total Entering Delta ³	First Stage Trigger	Date of First Loss ⁴	Date of Last Loss ⁴
12/9/19	LF	Coleman NFH	Battle Creek	Spring Surrogate	20.21	84,869	n/a	0.024	n/a	0.5%	12/22/19	1/9/20
12/18/19	LF	Coleman NFH	Battle Creek	Spring Surrogate	25.03	77,672	n/a	0.032	n/a	0.5%	1/1/20	1/4/20
1/13/20	LF	Coleman NFH	Battle Creek	Spring Surrogate		77,866	n/a		n/a	0.5%		

SWP and CVP adipose-fin clipped Chinook lost from 10/1/19 through 3/28/20.

¹Number released with the adipose-fin clipped and a coded-wire tag (CWT).

²% Loss of Number Released = (Confirmed Loss/Number Released)*100.

³% Loss of Total Entering Delta= (Confirmed Loss/Total Entering Delta)*100.

⁴Date of first and last loss accounts for all CWT loss even those from special studies where salvage and loss=0.

DWR-DES Revised 2/7/20

Preliminary data from DFW, DWR, USFWS, and Reclamation; subject to revision.

- Numerous San Joaquin River Restoration Program (SJRRP) Salmon Conservation and Research Facility fish were captured between 3/26/20 and 3/29/20 through late Sunday this past week.
- Members had questions as to whether a CWT tag was damaged. DWR indicated a second reading of this tag will occur on 4/1/20.

SaMT Estimates of Fish Distribution

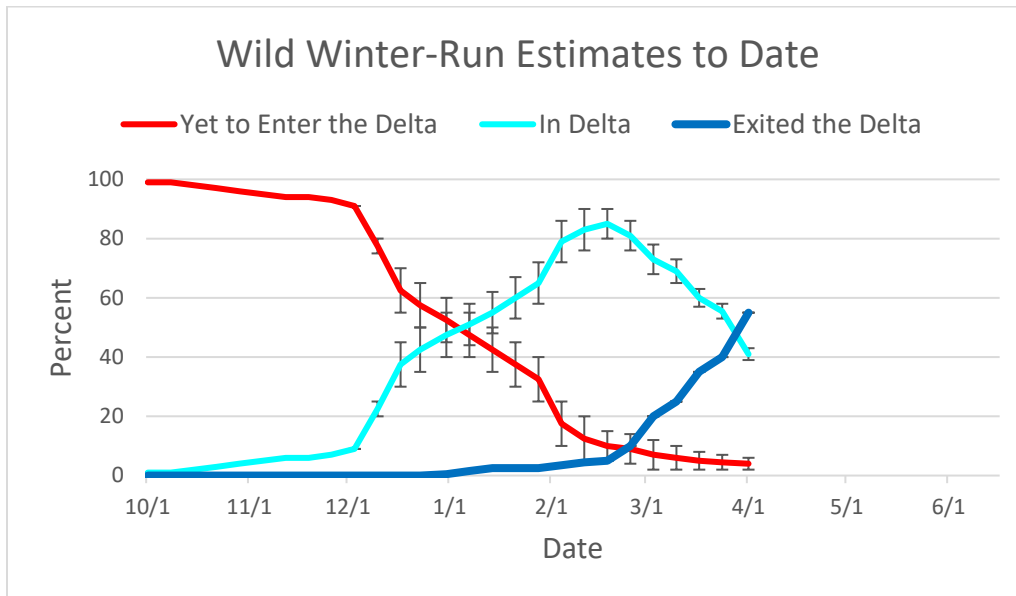
SaMT estimates of the current distribution of listed Chinook salmon, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns.

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Young-of-year (YOY) winter-run Chinook salmon</i>	2-6% Last week: 2-7%	39-43% Last week: 53-58%	55% Last week: 40%
<i>YOY spring-run Chinook salmon</i>	30-45% Last week: 40-55%	53-68% Last week: 45-60%	2% Last week: 0%
<i>YOY hatchery winter-run Chinook salmon</i>	45-55% Last week: 60-65%	35-40% Last week: 30-35%	10-15% Last week: 5%
<i>Steelhead</i>	40-65%	30-50% Last week: 20-40%	5-10%

Rationale for changes in distribution

Natural winter-run Chinook salmon:

Over 3.8 million BY 2019 winter-run Chinook salmon have passed RBDD so far in WY 2020. In the last week, 28 winter-run were captured in Chipps Island Trawl, 1 at Knights Landing, and 1 was captured in the Sacramento Trawl. SaMT estimates that the percentage of winter-run Chinook salmon population within the Delta changed from 53-58% to 39-43%. SaMT also estimates an additional 15% exited past Chipps Island equating to an estimated sum total of 55% exiting the Delta. Based on the time of year, winter-run Chinook salmon juveniles are likely to be migrating out of the Delta.



WY 2020 natural winter-run Chinook salmon distribution

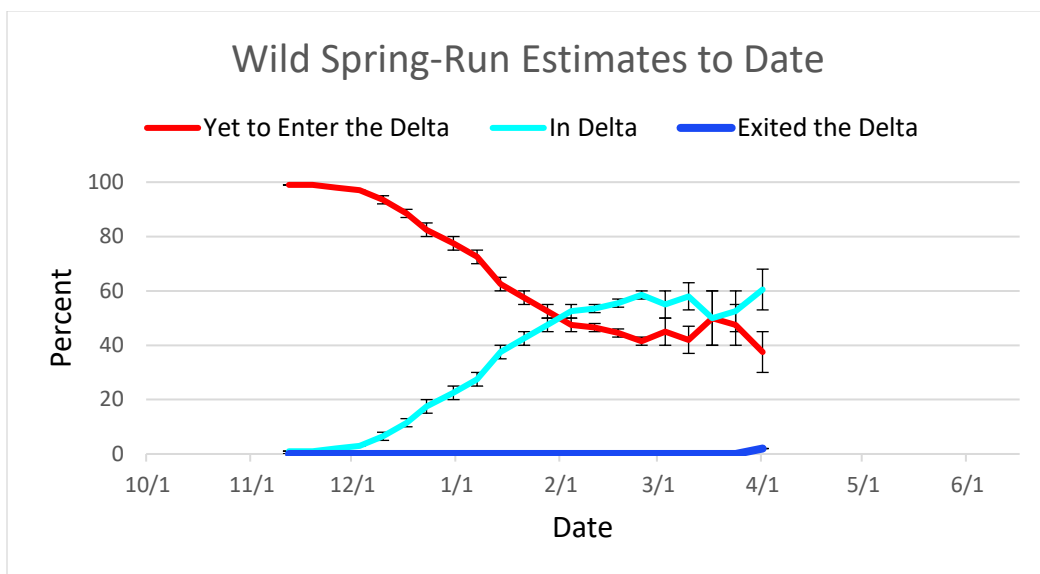
Hatchery winter-run Chinook salmon: Hatchery winter-run Chinook salmon were released recently into Sacramento River and Battle Creek (3/10/20, 3/23/20). Acoustic tagged hatchery winter-run Chinook salmon from these releases were detected at Butte City Bridge every day during the past week. Acoustic tagged fish have been detected at several locations including: Butte City (62 detections; 12% of the release groups), Wilkens Slough, I-80/I-50 (36 detections, 7% of the release groups), Tower Bridge (37 detections, 7% of the release groups), Georgiana Slough (11 detections, 2% of the release groups), and Benicia (8 detection, 2% of the release groups).

https://calfishtrack.github.io/real-time/pageLSWR_2020.html

Natural spring-run Chinook salmon:

In the last week 9 juvenile spring-run Chinook salmon were observed at Sacramento Trawl, 23 at Knights Landing, 11 at Tisdale, and 1 at Chipps Island. Beach seine sites were not sampled. Historical timing based on passage at Knights Landing indicate that 60.9% of the natural young-of-year spring-run Chinook salmon are considered to be in the Delta by this time of year, but excludes Butte Creek and Feather River spring-run Chinook salmon that typically emigrate into the Delta later in the season and are not captured at the Knights Landing monitoring station. In previous years with similar hydrological conditions (i.e., low flows and limited environmental cues), juvenile Chinook salmon have been observed to hold and rear in the upper river later than years with consistent winter storms and elevated flows. SaMT estimates 30-45% of the spring-run Chinook salmon population are upstream of the Delta and 53-68% are in the Delta. SaMT also estimates an additional 2% have exited past Chipps Island.

It is important to note that this week large numbers of spring-run were observed at downstream monitoring sites following the fall-run production releases from Coleman NFH. Natural spring-run are indistinguishable from larger, unmarked hatchery origin fall-run and the average FL of this year’s releases suggest a large portion of the fall-run would be counted as spring-run where monitoring sites assign run using LAD criteria.



WY 2020 natural spring-run Chinook salmon distribution estimates to date.

Natural Steelhead:

Several factors increase uncertainty of measuring downstream movements of steelhead including varying life history and residency times, as well as monitoring gear avoidance. To provide an estimate of steelhead presence in the Delta, the SaMT discussed historical catch and emigration timing data. Natural-origin steelhead were observed in salvage (loss = 220) and AT Chipps Island (n = 3) during this past week. Historically, 59.9% of steelhead are salvaged by this time of the year. SaMT estimates that 30-50% of steelhead are in the Delta this week and that 5-10% have exited past Chipps Island.

Agenda Item 6.

Fish Exposure and Behavioral Cues

Historical Patterns

This section will include plots of historical loss to current loss and loss tool predictions in future meetings.

Current Conditions

Entrainment into the Interior Delta: <https://oceanview.pfeg.noaa.gov/shiny/FED/CalFishTrack/>
The Delta STARS Model is an individual-based simulation model that estimates survival, travel time, and routing of juvenile salmon migrating through the Delta. The model's structure and parameters are based on a recent analysis (Perry et al. in press) that relates individual survival, travel time, and routing of late-fall-run Chinook salmon to daily Sacramento River flows at Freeport and Delta Cross Channel operations. SaMT reviewed the STARS model for route-specific survival and routing probabilities.

Routing probabilities into the interior Delta from the Sacramento River appeared to be similar to last week based on minute changes in Sacramento River flows. The STARS model estimates the following proportion of entrainment: 0% DCC, 27% Georgiana Slough, 46% Sacramento River, and 27% Sutter and Steamboat Slough (Last updated on 3/27/20).

Routing probabilities at Three Mile Slough and Broad Slough (junction of the Sacramento and San Joaquin rivers) are not estimated by the STARS model. However, QWEST remains negative, likely leading to higher likelihood of juvenile salmon being entrained at Three Mile Slough and at Broad Slough (confluence of Sacramento and San Joaquin rivers).

Sensitivity to Operational Actions - SaMT Feedback on Entrainment Risk

The questions from OMR Flow Management Guidance Document (page 20) are provide below.

- 1) After January 1, are more than 5% of the juveniles from one or more salmonid species present in the Delta?
 - o Yes.
 - o Currently 39-43% natural winter-run Chinook salmon, 53-68% spring-run Chinook salmon, 35-40% of hatchery winter-run Chinook salmon, and 30-50% of steelhead are estimated to be in the Delta.

- 2) Does the action (Delta exports, OMR flows, DCC gate operations) impact fish movement and change the potential distribution of fish?
 - Yes.
 - Winter-run Chinook salmon, spring-run Chinook salmon, and steelhead are shifting from a rearing phase (where they are closer to river banks) to migration phase (where they are moving in the river channel). This behavior makes them more vulnerable to exports.
 - Storms events will also cue fish movement. Precipitation events occurred over the past week and are forecasted for the upcoming weekend (4/4 -4/5/20).
 - Considering historical timing of outmigration for winter-run Chinook salmon, spring-run Chinook salmon, and steelhead as well as monitoring data (in salvage and Chipps Island Trawl), we believe that the distribution of Sacramento-origin fish are likely to be affected by Delta exports as they are migrating through the Delta to be observed at these locations.
 - Under conditions similar to those being experienced currently in past years, fish have been routed through Old River. We are not observing many San Joaquin origin fish at Mossdale trawl, but we have observed SJRRP spring-run Chinook salmon in salvage at the Delta Fish Collection Facilities during the past week (total estimated loss > 487).
 - In the upcoming week, we anticipate that there will be a shift in pumping from SWP to CVP because of change in controlling factors (shift of salvage from State to Federal) – the Salmon Monitoring Team expects to see more San Joaquin River origin fish at CVP.
- 3) How much loss has occurred in the past week (3/23/20 - 3/29/20)?
 - Increased losses of salmonids in both clipped and natural fish have been observed at the SWP and CVP facilities (particularly Chinook salmon released pursuant to the SJRRP, and steelhead). Fish salvage is beginning to increase on the State side, however, this may decrease in the upcoming week as the SWP decreases exports.
 - In the past week, natural-origin winter-run sized Chinook salmon were salvaged at the Delta fish collection facilities (weekly loss = 62).
 - Natural-origin spring-run sized Chinook salmon were salvaged last week at the Delta fish collection facilities (weekly loss = 115)
 - Hatchery-origin spring-run Chinook salmon were salvaged at both facilities (weekly loss = 705)
 - Hatchery-origin steelhead were observed in salvage at both facilities (weekly loss = 116).
 - Natural-origin steelhead were observed in salvage at both facilities (weekly loss = 220).
- 4) What is the likelihood of increased loss exceeding the next single year loss threshold based on the population distribution, abundance, and behavior of fish in Delta?
 - Unlikely. Annual cumulative loss is not approaching any of the Delta Performance Thresholds. In addition, the natural steelhead loss threshold resets on April 1. Please refer to operations outlook for details.
- 5) If a single-year loss threshold has been exceeded, do continued OMR restrictions benefit fish movement based on real-time information?
 - Not applicable. No thresholds have been exceeded during this water year.

- 6) If OMR is more negative than -5,000 cfs, are there changes in spawning, rearing, foraging, sheltering, or migration behavior beyond those anticipated to occur under OMR management at -5,000 cfs?
 - o Not applicable. Current OMR flows more positive than -5,000 cfs.

Agenda Item 7.

Other Topics

- General Schedule of Activities:
 - o Monday by 3:00 pm: Distribute data and weekly fish and water outlook to SaMT
 - o Tuesday by 9:00 am: Distribute data that arrives after 3:00 pm on Monday
 - o Tuesday at 9:00 am: SaMT call
 - o Tuesday at 4:00 pm: Distribute final assessment to SaMT and WOMT
 - o Tuesday by 5:00 pm: Distribute draft SaMT notes to SaMT and WOMT
 - o Friday by 2:00 pm: Distribute draft assessment to SaMT for the following week's outlook
 - o Friday by 5:00 pm: Distribute final SaMT notes
- **Less time to review the notes this week because call is occurring on Wednesday and we need to receive comments by 5:00 pm on Thursday.
- Q-west is online on DWR's website, Delta Operations tab [QWEST Delta Hydrologic Conditions](#) DWR can report this out during weekly SaMT calls and will consider adding it to its Daily Delta Operations report.

Agenda Item 8.

Additional Considerations for WOMT

- Significant increase in salvage of salmonids.
- Divergent controlling factor between SWP and CVP exports because of recently signed ITP.
- Not all components of ITP are captured in LTO table. Refer to accompanying text (e.g. off-ramp for temperature management) (page 9 of Synopsis of DWR's Proposed Long-Term Operations of the State Water Project).

Agenda Item 9.

Next SaMT Meeting is scheduled for Tuesday, 4/7/20 at 9:00 a.m.