

Salmon Monitoring Team (SaMT) Weekly Meeting
Conference call: 5/5/20 at 9:00 a.m.

Executive Summary:

- OMR flows anticipated to range from -1,000 to -3,000 cfs during the period 5/5/20 – 5/11/20.
- No Delta performance measures have been exceeded.
 - The Delta Performance threshold with the highest potential for exceedance is the 50% of single year natural steelhead loss threshold for the period of April 1 through June 15.
 - Preliminary estimate indicates that current (5/3/20) steelhead loss (253 fish) is approximately 33% of the threshold (776 fish) set between April 1 and June 15. During the SaMT call, the group was aware that additional loss of 2 steelhead occurred on 5/4/20 at the CVP.
 - It is unlikely, but possible, that the winter-run hatchery Chinook salmon threshold could be exceeded during the remainder of the Old and Middle River (OMR) management season.
 - There are no losses of hatchery winter-run Chinook salmon to date for this season. Most of the hatchery winter-run should have left the Delta by now. SaMT estimates that 70-75% of the hatchery winter-run have migrated past Chipps Island.
- SaMT did not have any recommendations for Water Operations Management Team (WOMT) or any advice to change Delta Operations.
- SaMT wanted to ensure that WOMT is aware that temporary agricultural barriers are being installed in the South Delta because this affects hydrodynamics in the Delta. Temporary agricultural barriers installation will be completed on the Old River at Tracy and Middle River sites on 5/22/20 and Grant Line barrier construction will begin on 5/11/20. In addition, San Joaquin River Basin Water Year type will be updated on 5/8/20 and potentially can change from Critical to Dry.

Objective: Provide information to the WOMT, the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) on measures to reduce adverse effects from Delta operations of the CVP and the SWP on salmonids and green sturgeon. SaMT notes will be posted to Reclamation's web page

<https://www.usbr.gov/mp/bdo/salmon-monitoring-team.html>.

- **California Department of Fish and Wildlife (CDFW):** Geir Aasen, Adam Chorazyczewski, Kristal Davis-Fadtke, Kim Holley, Brian Jones, Jason Julienne, Duane Linander, Paige Uttley, Jonathan Williams
- **DWR:** Brittany Davis, Mike Ford, Bryant Giorgi, Farida Islam, Tracy Pettit, Kevin Reece
- **Kearns & West:** Matt Marvin
- **National Marine Fisheries Service (NMFS):** Kristin Begun, Jeff Stuart, Garwin Yip
- **Reclamation:** Towns Burgess, Elissa Buttermore, Suzanne Manugian, Ben Nelson, Tom Patton
- **State Water Resources Control Board (SWRCB):** Erin Foresman, Stanley Mubako

- **US Fish and Wildlife Service (USFWS):** Geoff Steinhart, Katherine Sun

Agenda Items:

1. Introductions
Purpose: Provide an accurate record of who is attending these calls
2. Relevant Actions and Triggers
Purpose: Review of relevant actions and triggers status and discuss any changes
3. Outlook, Current Operations, and Weather Forecast
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
Purpose: Review environmental data to consider context for evaluating Assessment questions about Delta operations effects
5. Fish Abundance and Distribution
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
Purpose: Assist in assessing entrainment risk of Delta operations on salmonids and sturgeon. Complete Evaluation section questions of the Assessment. Review draft assessment.
 - a. Historical Patterns (Comparison of abundance, timing, and loss to prior years)
 - b. Current Conditions (DSM2, Entrainment Models)
 - c. Sensitivity to Operational Actions - review assessment document
7. Other Topics
Purpose: Identify additional topics that are not in the regular agenda
8. Additional Considerations for WOMT
Purpose: Highlight information that SaMT would like WOMT to consider related to changes to Delta water operations
9. Next SaMT Meeting

Agenda Item 2.

Relevant Actions and Triggers Review

Delta Cross Channel (DCC) Gate Operations

- DCC gates are currently closed per operations described in the SWRCB's D-1641, and Reclamation's Proposed Action 4.10.5.3 and are expected to remain closed until 5/20/20.

OMR Flow Management

- Implementation of this action in water year (WY) 2020 began on 1/1/20 under the 2009 NMFS Long Term Operations (LTO) biological opinion and was superseded by Reclamation's Proposed Action 4.10.5.10 (OMR Management) on 2/18/20 following the signing of the Record of Decision, and requires that OMR flow be no more negative than -5,000 cfs. OMR flows are reported weekly with the OMR index and the tidally filtered U.S. Geological Survey (USGS) gauges at the daily, 5-day and 14-day running averages.
- On 3/27/20, NMFS provided a revised winter-run Chinook salmon juvenile production estimate (JPE) letter ([Revised JPE letter](#)) to Reclamation reflecting updated hatchery information. The revised JPE letter provides the Reclamation with the revised JPE and incidental take limit (ITL) for hatchery origin juvenile Sacramento River winter-run Chinook salmon for WY 2020 based on the estimated number of hatchery fish released.
 - The revised incidental take for juveniles released from Livingston Stone National Fish Hatchery into the Sacramento River is **923 hatchery-produced (adipose fin clipped)** winter-run Chinook salmon.
 - The 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 the weekly operations and fish outlook for more triggers relevant to the CDFW Incidental Take Permit (ITP) and the 2019 ROC Proposed Action (see Agenda Item 3).
- DWR's ITP was signed on 3/31/20 and can be found online here: [Incidental Take Permit for Long Term Operations of the State Water Project](#)

Agenda Item 3.

Weekly Fish and Water Operations Outlook 5/5/20 – 5/11/20

Dry and warm (above normal) this week with increased warming forecasted to peak on Friday, with record high temperatures in the Northern Sacramento Valley. A slight cooling trend begins this weekend. Delta Outflow is being maintained to meet D-1641 X2 requirements and Emmatton EC for agriculture. The D-1641 San Joaquin River “pulse flow” period lasts through May 10, with the combined exports of both projects at 100% of the Vernalis flow (3-day average) or 1,500 cfs, whichever is greater. After May 10, SWP exports are limited through the rest of May as described in Section 8.17 of DFW’s Long Term ITP for the SWP. After May 10, CVP exports are limited by CVP’s “respective share” of the D-1641 E/I ratio (0.35).

Tributary/Division	Projected Weekly Operational Range	Related Environmental and Fish Conditions
Clear Creek	Whiskeytown Release: 200 cfs	<ul style="list-style-type: none"> • Adult spring-run Chinook salmon immigration March – June. • Late-fall run Chinook salmon emergence from redds through May. • Steelhead emergence from redds through May
Sacramento River	Shasta Storage: 3.67 MAF Current Release: 9,750 cfs Anticipated Weekly Range of Releases to Sacramento: 9,500 cfs to 10,000 cfs (As needed to support observed legal diversion demands on the Sacramento River in addition to Delta demands)	<ul style="list-style-type: none"> • End of winter-run Chinook salmon juvenile migration, adults migrating and holding. • Spring-run Chinook salmon juveniles rearing and emigrating. • Fall-run Chinook salmon fry in gravel with continued emergence, juveniles rearing and emigrating. • End of late-fall Chinook salmon spawning, eggs and fry in gravel. • Steelhead juvenile emigration occurring. • Green sturgeon adults present.
Feather River	Oroville Storage: 2.48 MAF Current Release: 1,550 cfs Anticipated Weekly Range of Releases to Feather: 1,550 cfs to 2,000 cfs (As needed to support Delta water quality obligations)	<ul style="list-style-type: none"> • Spring-run and fall-run Chinook salmon juveniles are rearing and emigrating. • Steelhead are emerging and rearing. • Late-fall-run Chinook salmon eggs in gravel, hatching, and emergence is continuing.
American River	Folsom Storage: 0.72 MAF Current Release: 1,250 cfs Anticipated Weekly Range of Releases to American: 1,000 to 1,500 cfs (Could have another “mini-pulse” flow, but concerns over stranding expressed)	<ul style="list-style-type: none"> • Peak emergence of fall-run Chinook salmon estimated to have occurred mid-March. Fall-run Chinook salmon that have emerged are currently rearing and emigrating out of the lower American River. • Steelhead spawning has concluded. Preliminary steelhead spawning survey data indicate majority of juvenile steelhead are estimated to have emerged. Steelhead are currently rearing and emigrating out of the lower American River. • Length-at-date spring-run Chinook salmon juveniles present (non-natal rearing).

Tributary/Division	Projected Weekly Operational Range	Related Environmental and Fish Conditions
Stanislaus River	New Melones Storage: 1.90 MAF Total Current Release to Stanislaus: 400 cfs Anticipated Weekly Range of Releases to Stanislaus: 400 cfs to 1,000 cfs (As needed to meet D-1641 flow requirements at Vernalis)	<ul style="list-style-type: none"> • Majority of Chinook salmon fry rearing and emigrating. • Historical timing indicates the majority of steelhead spawning has concluded. Eggs are currently in the gravel and emergence may continue through May. Historical data indicates steelhead are emerging and rearing now.
Delta	Freeport: 7,500 to 10,000 cfs Vernalis: 1,200 to 2,400 cfs Delta Outflow index: 7,100 to 8,500 cfs Combined Exports: 1,500 to 3,000 cfs JPP: 800 to 2,500cfs CC: 200 to 1,500 cfs Expected OMR Index Values: -1,000 to -3,000 cfs (Max allowable: -5,000 cfs) X2 position: 74 to 81 km QWEST: -500 cfs to +1,700 cfs DCC: Closed	<ul style="list-style-type: none"> • 4-5% winter-run Chinook salmon juveniles present in Delta and 94-96% past Chipps Island. • 43-53% spring-run Chinook salmon juveniles present in Delta and 42-47% past Chipps Island. • Fall-run Chinook salmon juveniles rearing. • Steelhead juvenile migration occurring. • Green sturgeon adult and juveniles present. • Delta smelt spawning presently, larval Delta smelt salvaged. • Longfin smelt finishing spawning, larval longfin smelt salvaged

Table 2. Relevant Water Year 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 salmon loss	50% Single-year loss threshold = 5,001 . 50% of 1.17% of JPE = 5,001 WY2020 JPE: 854,941	Loss (LAD) = 197 (3.9% of 50% single-year loss threshold)	Decreasing	5/3/20
Hatchery winter-run Chinook salmon loss	Single-year loss threshold = 110.8 50% of 0.12% of Sac. R releases JPE= 55.4 JPE of Sac. R releases: 92,291 152,000 (~60% of production) released on 3-10-2020 97,505 (~40% of production) released on 3-23-2020	Loss = 0	Potentially increasing	5/3/20
Natural steelhead loss	1) December 1 – March 31 (not active): 50% loss threshold = 707 50% of 1,414 from December 1 – March 31 = 707 2) April 1 – June 15 (active): 50% loss threshold = 776 50% of 1,552 from April 1 – June 15 = 776	1) Loss = 402 (not active) (56.9% of 50% December 1 – March 31 loss threshold) 2) Loss = 253 (33% of 50% April 1 – June 15 loss threshold)	Decreasing	5/3/20
Hatchery spring-run Chinook salmon 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	5/3/20
Green sturgeon	Cumulative salvage = 74	Salvage = 0	No change expected	5/3/20
Delta Smelt	1) Daily Avg. < 12 NTU at OBI 2) March-June: OMR ≥ -5000 cfs 3) 3 days exceeding Clifton Court Daily Avg Temp ≥ 77°F	1) OBI Daily Avg Turbidity = 3.4 FNU (5/3/20) 2) QWEST: Positive 3) ≥ 77 °F Days = 0	Expected to remain stable	5/4/20

Table 3: Relevant Water Year 2020 Fish Criteria and Status for Listed Fish under the SWP Long-Term Incidental Take Permit. *This table is draft and under revision by DWR.*

<u>Species</u>	<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
Chinook salmon	OMR Mgmt. triggered (8.3.2)	Jan. 1 - Jun. 30 (when $\geq 5\%$ of SR or WR in Delta)	In effect	- 5% of the WR or SR population in Delta	4-5% WR estimated in-Delta, 43-53% SR estimated in-Delta	Ongoing	5/5/2020	94-96% of WR estimated to have exited the Delta, 42-47% of SR estimated to have exited.
	Winter-run yearly loss (8.6.1)	Nov. 1 - Jun. 30	In effect	- 1.17% loss of unclipped (natural) WR JPE = 10,002 fish - 0.12% loss of clipped (hatchery) WR = 110 fish	current yearly loss = 196.71 (1.97%) natural, 0 hatchery	salvage likely to continue	5/4/2020	Based on 5/3/20 Salvage data
	Winter-run discrete daily loss (8.6.2)	Nov. 1 - Dec. 31	N.A.	11/1-11/30: loss of 6/day unclipped older juv. WR 12/1-12/31: loss of 26/day clipped older juv. WR	N.A.		N.A.	
	WR relative daily loss (8.6.3)	Jan. 1 - May 31	In effect	1/1 - 1/31: 0.00635% loss of WR JPE = 54.29 fish 2/1 - 2/28: 0.00991% = 84.72 3/1 - 3/31: 0.0146% = 124.82 4/1 - 4/30: 0.00507% = 43.35 5/1 - 5/31: 0.0077% = 65.83	max single daily loss from prev. week = 8.66 fish (WR last observed on 4/30/20)	No change – salvage below “trigger” levels	5/4/2020	Based on 5/3/20 Salvage data. (WR sized last observed on 4/30/20)
	Spring-run surrogate protection (8.6.4)	Feb. 1 - Jun. 30	In effect	- Feather CWT SR surrogates cum. loss $>0.25\%$ for any release group <u>OR</u> - Coleman or Nimbus Fall Run $>0.25\%$ for any release group	max. loss for any group = 0%	none expected	5/4/2020	*CDFW not implementing 8.6.4 in this WY
Delta smelt	Integrated Early Winter Pulse Protection ('First Flush') (8.3.1)	Dec. 1 - Jan. 31	N.A.	- Three-day Freeport daily flow running avg $\geq 25,000$ <u>AND</u> - [Three-day Freeport turbidity running avg ≥ 50 NTU OR Smelt Monitoring Team recommendation]	avg flow = -- cfs avg turbidity = - - NTU	N.A.	N.A.	
	Turbidity Bridge Avoidance (8.5.1)	Dec. 15 - Apr. 1	N.A.	- avg. OBI turbidity > 12 NTU	OBI = 3.4 NTU	none expected	5/4/2020	

<u>Species</u>	<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
	Larval and/Juvenile Delta Smelt Protection (8.5.2)	ongoing	In effect	- 5-day cum. salvage of juv. DS >= [average 3-yr FMWT index + 1] = 1.67	current 5-day salvage = 0 fish	none expected	5/4/2020	One 12mm DSM detected at CVP 4/13/20
Longfin smelt	Early Adult Protection (8.3.3)	Dec. 1 - Feb. 28	N.A.	- Cum. salvage > [most recent FMWT/10] = 1.2 fish <u>OR</u> - Smelt Monitoring Team determines high likelihood of LFS movement into high-risk areas	Cum. Salvage = 0 adults	none expected	N.A.	
	OMR Mgt. for Adults (8.4.1)	Dec. 1 - Feb. 28	N.A.	- Smelt Monitoring Team recommendation		none expected	N.A.	
	Larval and Juvenile Longfin Smelt Entrainment Protection (8.4.2)	Jan. 1 - Jun. 30	In effect	- LFS larvae or juveniles in >=4 SLS or 20 mm stations in central and south Delta, <u>OR</u> - LFS catch/tow >5 larvae or juveniles in >=2 stations	LFS at 1 (20mm#4) stations LFS catch/tow >5 at 0 (20mm#4) stations	Not triggered - no OMR recommendation expected	5/4/2020	1036 (SWP) and 1299 (CVP) LFS salvaged through 4/30/20
	High Flow OMR Off-Ramp for Longfin smelt (8.4.3)	ongoing	In effect	- Sac. R. at Rio Vista >55,000 <u>OR</u> - SJR at Vernalis >8,000	Rio Vista = 6,000 - 7,000 cfs SJ = 1,200 - 2,400 cfs	No change	5/4/2020	Forecasted Values

Operations

Operations Category	Location	Operations on 4/28/20	Operations on 5/5/20
Clifton Court Inflow	Clifton Court Forebay	1,000 cfs currently, reductions to 500 cfs to 800 cfs over the coming days as CVP increases exports. Combined exports will not exceed 1:1 inflow to export ratio criterion.	1,300 cfs, mini pulse in San Joaquin River. Decreasing in coming days to 500 cfs. Will hold between 500 cfs-600 cfs through 5/31/20.
SWP Reservoir Releases	Feather – Oroville	1,550 cfs	1,550 cfs and holding. Can increase if needed for outflows and water quality.
SWP Reservoir Storage	San Luis (SWP)	959 TAF	948 TAF
SWP Reservoir Storage	Oroville	2,480 TAF	2,479 TAF
Environmental Parameters	Sacramento River at Freeport	8,800 cfs	8,070 cfs
Environmental Parameters	San Joaquin River at Vernalis	2,060 cfs	2,400 cfs
Environmental Parameters	Delta Outflow Index	8,160 cfs	7,850 cfs
Environmental Parameters	E:I (14-day)	12% (14-day avg.)	13% (14-day avg.)
Environmental Parameters	X2	74 km, moving upstream	74 km
CVP Exports	Jones Pumping Plant	1,000 cfs, increasing to 1,600 cfs on 4/29/20. Combined exports will not exceed 1:1 inflow to export ratio criterion.	1,000 cfs and holding

Operations Category	Location	Operations on 4/28/20	Operations on 5/5/20
CVP Reservoir Releases	American – Nimbus	1,200 cfs, currently in mini pulse, holding for ~5 days. Will increase to 1,250 cfs on 5/3/20.	1,250 cfs and holding
CVP Reservoir Releases	Sacramento – Keswick	9,750 cfs and holding	9,750 cfs and holding
CVP Reservoir Releases	Stanislaus - Goodwin	900 cfs, scheduled increase to 1,300 cfs before decreasing, continuing spring pulse flows	400 cfs, scheduled to increase to 800 cfs on 5/6/20 in order to meet Vernalis flows starting on 5/11/20.
CVP Reservoir Releases	Trinity - Lewiston	1,500 cfs, continuing pulse flows into July	1,400 cfs, continuing pulse flows
CVP Reservoir Storage	San Luis (CVP)	570 TAF	547 TAF and decreasing storage
CVP Reservoir Storage	Shasta	3,708 TAF	3,660 TAF and decreasing storage
CVP Reservoir Storage	Folsom	679 TAF. Continued snowmelt could potentially increase storage. Inflow is currently close to 5,000 cfs.	714 TAF and increasing storage
CVP Reservoir Storage	New Melones	1,904 TAF. Lack of snowpack has resulted in minimal changes to storage.	1,900 TAF and decreasing storage
CVP	DCC Gates	Closed	Closed

cfs = cubic feet per second

MAF = million acre feet

TAF = thousand acre feet

km = kilometer

Location of X2 measured from the Golden Gate

Factors controlling Delta exports: Controlling factor for 4/28/20 – 5/5/20 was the 1:1 Vernalis inflow to export ratio per D-1641.

- SaMT members noted that the 30-day pulse flow will end on 5/10/20. At that time, SWP exports will remain controlled by the CDFW ITP constraints through May and its proportion of allowed exports. The CVP does not anticipate significant changes after 5/10/20 but will monitor outflow and water quality. Additional future controlling factors include Delta outflow and electrical conductivity at Emmaton per D-1641 requirements.

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 gauge data as of 5/2/20

	USGS gauges (cfs)	Index (cfs)
Daily	-1,000 cfs	-1,100 cfs
5-day	-1,000 cfs	-1,300 cfs
14-day	-1,100 cfs	-1,300 cfs

Approximate OMRs as of 5/4/20:

	Index (cfs)
Daily	-1,300 cfs
5-day	-1,200 cfs
14-day	-1,300 cfs

Agenda Item 5.

Fish Abundance and Distribution

Hatchery Releases

On 4/30/20, CDFW released approximately 485,000 brood year 2019 fall-run Chinook salmon from the Mokelumne River Hatchery into the San Francisco Bay at Fort Baker. This release included 25% Coded Wire Tagged (CWT) fish.

On 5/2 and 5/3/20, CDFW released approximately 1,055,321 brood year 2019 fall-run Chinook salmon from the Feather River Hatchery into San Francisco Bay at Mare Island. This release included 25% adipose fin clip and CWT fish.

On 5/4/20, CDFW released approximately 450,000 brood year 2019 fall-run Chinook salmon from the Mokelumne River Hatchery into the San Joaquin River at the Sherman Island Net Pen site. This release includes 25% adipose fin clip and CWT fish.

On 5/5/20, CDFW will release approximately 597,965 brood year 2019 fall-run Chinook Salmon from Nimbus Fish Hatchery into the San Pablo Bay at the Mare Island net pen site. This release includes 25% adipose fin clip and CWT fish.

On 5/6/20, CDFW will release approximately 1,600,000 brood year 2019 fall-run Chinook salmon from the Nimbus Fish Hatchery into the Lower American River at the Sunrise Boat Ramp. This release includes 25% adipose fin clip and CWT fish.

On 5/6/20, CDFW will release approximately 242,000 brood year 2019 fall-run Chinook salmon from the Merced River Hatchery into the San Joaquin River at the Sherman Island Net Pen site. This release group would normally include 25% marked (adipose fin clip) and CWT fish. Due to concerns with COVID-19, staff was unable to complete the 25% mark and CWT for release Group 3.

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.

Migration Timing: [SacPAS Migration Timing Website](#)

Average percent of annual emigrating population for each species of interest (based on LAD) captured at the following locations by 5/3 for the years 2005 to 2018.

Brood Years	Species	Red Bluff Diversion Dam	Tisdale RST	Knights Landing RST	Sac Trawl (Sherwood)	Chippis Island Trawl	Average Percent Salvaged at SWP and CVP Delta Facilities
2019	Winter-run Chinook salmon	100%	100%	100%	92.9%	99.7%	99.9%
2020	Spring-run Chinook salmon	96.8%	99.2%	99.7%	97.5%	85.1%	73.0%
2019	Steelhead	11.7%	87.5%	84.1%	97.3%	94.0%	84.2%

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	LAR RST ^G	Sacramento Trawls ^F	Chippis Island Midwater Trawl ^F	Caswell RST ^H
Sample Dates	4/27/20 – 5/3/20	4/27/20 – 8/3/20	4/28/20 – 5/4/20 (environmental) 5/3/20-5/4/20 (biological)	4/27/20 – 5/3/20	4/27/20 – 5/3/20	4/28/20 – 5/1/20	4/26/20-4/28/20, 4/30/20-5/1/20	4/26/20-4/28/20, 4/30/20-5/1/20	4/28/20 – 4/30/20
Chinook						13 VIE	2 non-marked not raced		2 juv.
FR Chinook	8,133	945	644 juvenile	61	16	647	91	95	
SR Chinook	12	4	28 juvenile 2 smolt	18		6	10	286	
WR Chinook									
LFR Chinook	58	12							
Chinook (ad-clip)				12 FR 2 SR	7 FR		12	96	
Steelhead (natural)	4	1	2 juvenile		1	2 fry			
Steelhead (ad-clip)					1	1		2	
Green Sturgeon									
Flows (avg. cfs)	650	1,550	1,002	6,349	5,200				
W. Temp. (avg. °F)	56.2	64.2	60.3	66.0	67.4				
Turbidity (avg. NTU)	1.5	2.2	5.1	6.6	8.7				

^A Feather River RST data from Eye Side Channel sampling period was from 4/27/20 at 10:40 to 5/3/20 at 11:12.

^B Feather River RST data at Herringer sampling period was from 4/27/20 at 14:40 to 5/3/20 at 10:15.

^C GCID RST cone was raised 4/23/20 due to recent hatchery release. GCID RST cone was lowered 5/2/20 and trapping will continue until further notice. Biological data sampling period was 5/3/20 to 5/4/20. Environmental data sampling period was from 4/28/20 to 5/4/20.

^D Tisdale RST sampling period was from 4/27/20 at 9:30 to 5/3/20 at 12:00. RST operating at full cone.

^E Knights Landing RST sampling period was from 4/27/20 at 10:15 to 5/3/20 at 10:30. RST operating at half cone.

^F DatCall sampling data period was from 4/26/20 to 5/2/20.

^G Lower American River RST sampling period was from 4/28/20 to 5/1/20.

^H Caswell RST sampling period was from 4/28/20 to 4/30/20.

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

Monitoring Survey	Status (5/5/2020)
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	Suspended temporarily. Completed data analysis ongoing.
20mm Survey	Starting 4/13, Modified (prioritizing South/Central Delta)
Bay Study	Suspended temporarily
DJFMP - Chipps and Sacrament Trawls	Occurring
DJFMP- Seines	Suspended since 3/17/20
EDSM	Occurring
EMP Continuous	Occurring
EMP Discrete	Suspended temporarily
Mossdale	Suspended since 3/16/20
USGS Flow monitoring	Occurring
Sacramento River	
Acoustic tagging - Battle Creek "Jumpstart" hatchery winter run Chinook	Tagged ~ 250 fish
Acoustic tagging - Offsite Release study of fall run Chinook	Postponed until 2021
Acoustic tagging - Spring run Chinook	Cancelled
Acoustic tagging - Pulse Flow experiment	One group will be tagged the week of 5/11, with future groups possible if pulse flow occurs, or there is interest in late May survival with no Sacramento River pulse
Red Bluff Diversion Dam screw trap	Suspended (March 26) until further notice
Knights Landing screw trap	Ongoing through modified staffing
Tisdale screw trap	Ongoing through modified staffing
Redd dewatering and stranding surveys	Suspended March and April of 2020. Resumed May 2020
Sacramento Carcass and Redd Surveys	Carcass surveys continuing. Redd surveys suspended March and April but resumed in May 2020
San Joaquin River	
SJRRP CDFW and USFWS Field Monitoring	On hold until further notice
SJRRP USBR Field Monitoring	Ongoing with modified staffing
San Joaquin River Steelhead (Mokelumne Hatchery) acoustic tagging	Cancelled

*Updated after the call.

Green Sturgeon

Three juvenile green sturgeon were detected on the Sacramento River, north of Sherman Lake on 4/28/20.

DOSS Weekly Salvage Update

Reporting Period: April 27-May 3, 2020

Prepared by Kyle Griffiths on May 4, 2020 14:51

Preliminary Results -Subject to Revision

Criteria	27-Apr	28-Apr	29-Apr	30-Apr	1-May	2-May	3-May	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	2.04	0	0	0	↘	0.29
Wild steelhead	2.71	0	0	0.64	0	0.99	0.99	↘	0.76
Exports									
SWP daily export	1,238	1,690	1,901	816	1,625	805	788	↘	1,266
CVP daily export	1,953	1,955	3,429	3,433	1,952	1,951	1,951	→	2,375
SWP reduced counts	20%	0	0	25%	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 only	
	Salvage	Loss	Trend	Salvage	Loss	Salvage	Loss
Wild							
Winter Run	2	9	↘	47	88	107	197
Spring Run	258	501	↘	749	2,199	2172	3908
Late Fall Run	0	0	↘	12	8	12	8
Fall Run	379	528	↘	2,114	2,737	631	920
Unclassified	0	0	↘	0	0	0	0
Total	639	1,038		2,922	5,033	2,922	5,033
Hatchery							
Winter Run	0	0	→	17	12	79	90
Spring Run	18	49	↘	1,175	1,587	1046	1464
Late Fall Run	0	0	↘	195	153	186	144
Fall Run	16	12	↘	49	35	125	88
Unclassified	0	0	↘	0	0	0	0
Total	34	61		1,436	1,786	1,436	1,786

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		Season Totals >= 4/1	
	Salvage	Loss	Trend	Salvage	Loss	Salvage	Loss
Wild	14	17	↘	260	655	109	253
Hatchery	10	29	↘	427	655	252	361
Total	24	46		687	1,310	361	614

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

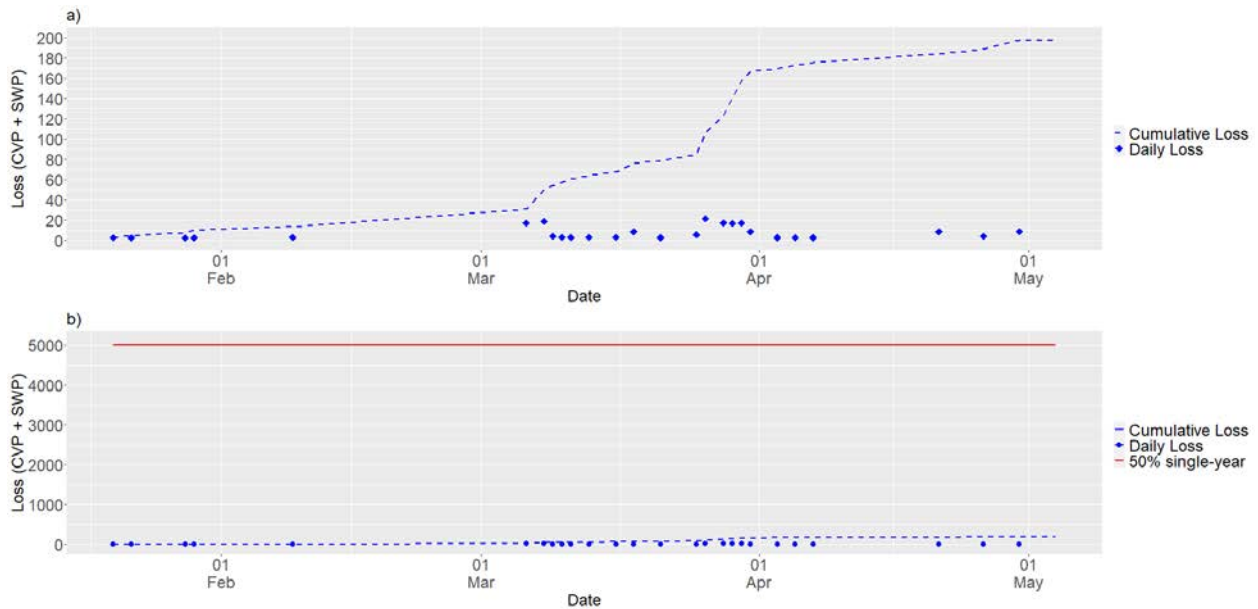


Figure 1. WY2020 loss values through salvage season for winter-run sized Chinook salmon. Values depicted are not genetically corrected. Last loss occurred 4/30/20. Figure created 5/4/20 with most recent available data (5/3/20).

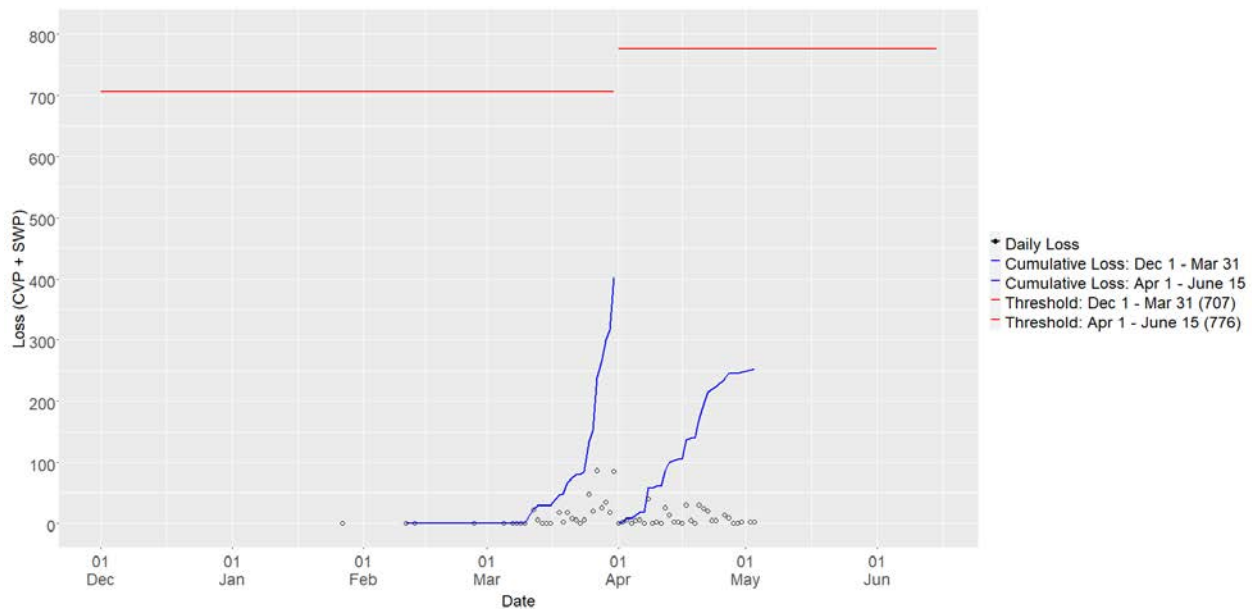


Figure 2. Cumulative WY2020 loss of natural-origin steelhead with 50% single year loss thresholds depicted by red lines. Figure created on 5/4/20 with most recent available data (5/3/20).

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>	0-1% Last week: 0-1%	4-5% Last week: 9-10%	94-96% Last week: 90%
<i>YOY spring-run Chinook salmon</i>	5-10% Last week: 10-15%	43-53% Last week: 48-58%	42-47% Last week: 32-37%
<i>YOY hatchery winter-run Chinook salmon</i>	0-2% Last week: 0-5%	23-30% Last week: 40%	70-75% Last week: 55-60%
<i>Natural origin steelhead</i>	10-20% Last week: 15-30%	35-55% Last week: 35-55%	35-45% Last week: 30-35%

Rationale for changes in distribution

Natural winter-run Chinook salmon:

In the last week, no winter-run Chinook salmon were captured at any monitoring locations. Based on seasonal timing, SaMT estimates that the percentage of winter-run Chinook salmon population within the Delta changed from 9-10% to 4-5%. SaMT also estimates an additional 4-6% exited past Chipps Island equating to an estimated total of 94-96% exiting the Delta. Based on the time of year, the majority of winter-run Chinook salmon juveniles have migrated out of the Delta.

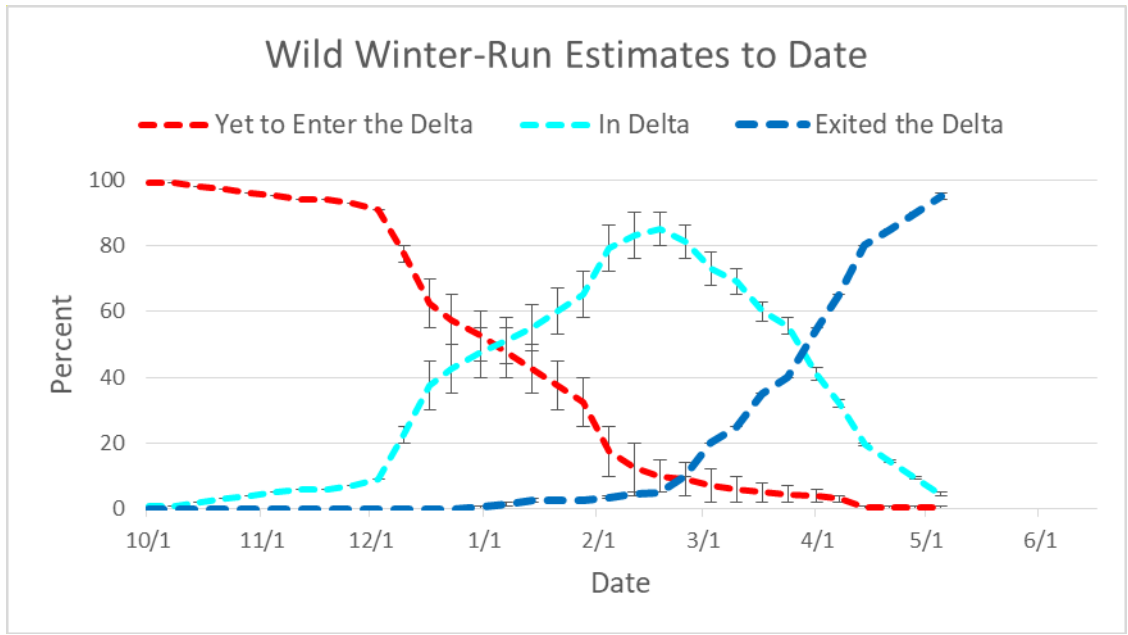


Figure 3. WY 2020 natural winter-run Chinook salmon distribution

Hatchery winter-run Chinook salmon: Hatchery winter-run Chinook salmon were released into Sacramento River and Battle Creek (3/10/20 and 3/23/20). Since these acoustically-tagged fish were released, they have been detected at most receiver locations including: Butte City, Wilkins Slough, I-80/I-50, Tower Bridge, Georgiana Slough, and Benicia Bridge (western Suisun Bay), indicating that many of these fish have moved into the Delta and out past Benicia. In the past week, no hatchery winter-run Chinook salmon were detected by any receivers. The last detection was on 4/24/20 in Sacramento at the Tower Bridge/ I-50:I80 Bridge receivers.

Although acoustically-tagged fish were not detected in the Delta over the past week, SaMT noted that some transmitter batteries have likely expired, and therefore not all fish remaining in the system are detectable. SaMT estimates that an additional 15% of hatchery winter-run Chinook salmon have moved through the system and out past Chipps Island over the past week.

[CalFish Acoustic Tag Tracking website - winter-run Chinook salmon](#)

Natural spring-run Chinook salmon:

In the last week, no juvenile spring-run Chinook salmon were observed at Knights Landing, 10 at Sacramento Trawl, and 286 at Chipps Island. Beach seine sites were not sampled. Historical timing based on passage at Knights Landing indicate that 99.9% 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. Historical timing indicates that young-of-year spring-run Chinook salmon from Mill, Deer, and Butte creeks are currently entering the mainstem Sacramento River and emigrating through the Delta. SaMT estimates 5-10% of the spring-run Chinook salmon population are upstream of the Delta, 43-53% are in the Delta, and 42-47% have exited past Chipps Island.

It is important to note that this week's large numbers of spring-run Chinook salmon were observed at downstream monitoring sites following the fall-run Chinook salmon production releases from hatcheries which include 75% unmarked fish. Natural spring-run Chinook salmon are indistinguishable from larger, unmarked hatchery origin fall-run Chinook salmon and the average FL of this year's releases suggest a large portion of the fall-run Chinook salmon would be counted as spring-run Chinook salmon where monitoring sites assign run using LAD criteria.

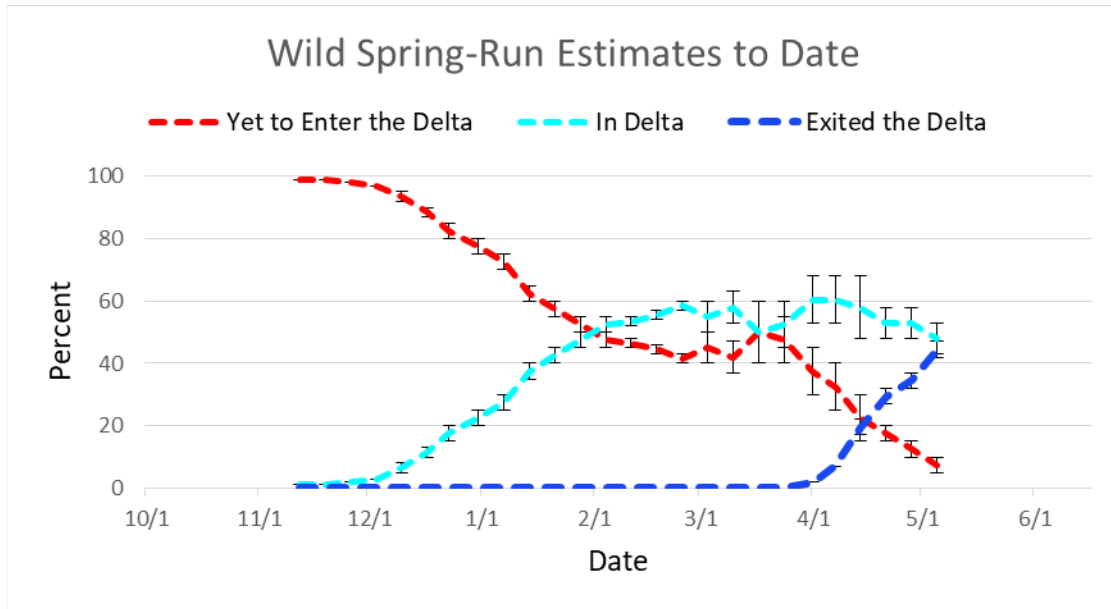


Figure 4. WY 2020 natural spring-run Chinook salmon distribution estimates to date

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, SaMT discussed historical catch and emigration timing data. Natural-origin steelhead were observed in salvage (weekly loss = 17) but not at Chipps Island Trawl during this past week. Historically, 84.2% of steelhead are salvaged by this time of the year. SaMT estimates that 35-55% of steelhead are in the Delta this week and that 35-45% have exited the Delta past Chipps Island. These estimates are based on historical timing rather than upper river monitoring data.

Agenda Item 6.
Fish Exposure and Behavioral Cues:

Historical Patterns

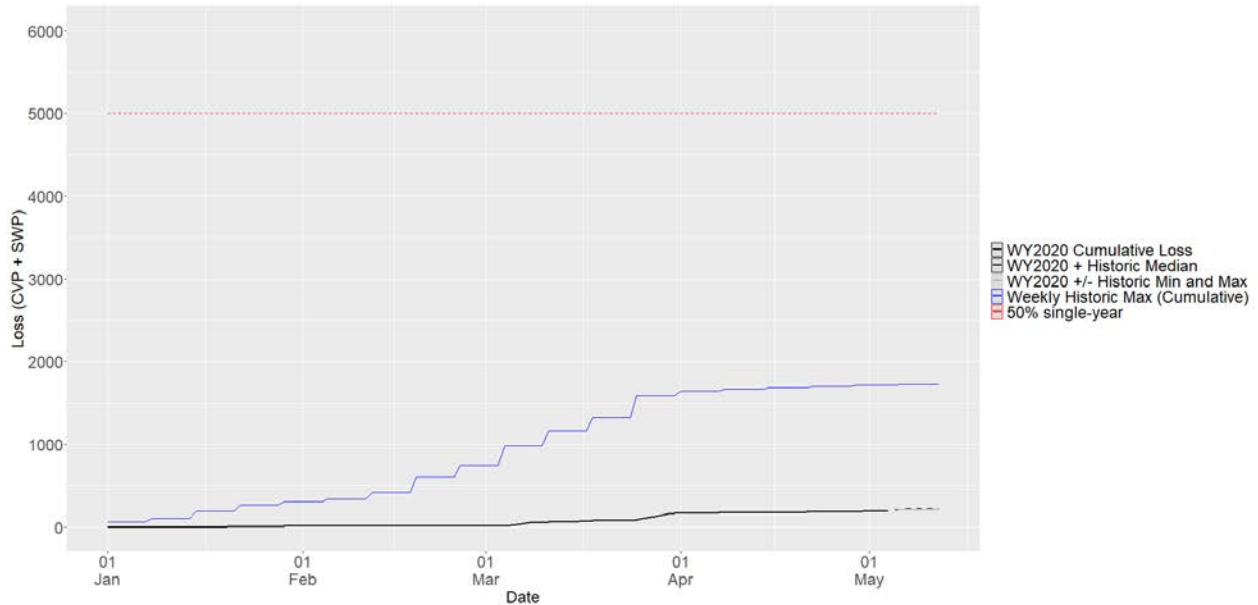


Figure 5. Daily winter-run Chinook salmon loss accumulates towards single-year loss thresholds. Based on historical weekly maximum and minimum loss values from 2009-2018 (*note historic data are calendar-based not WY-based*), WY2020 observed weekly loss (and potential future loss) is not trending towards exceeding LTO Proposed Action loss thresholds.

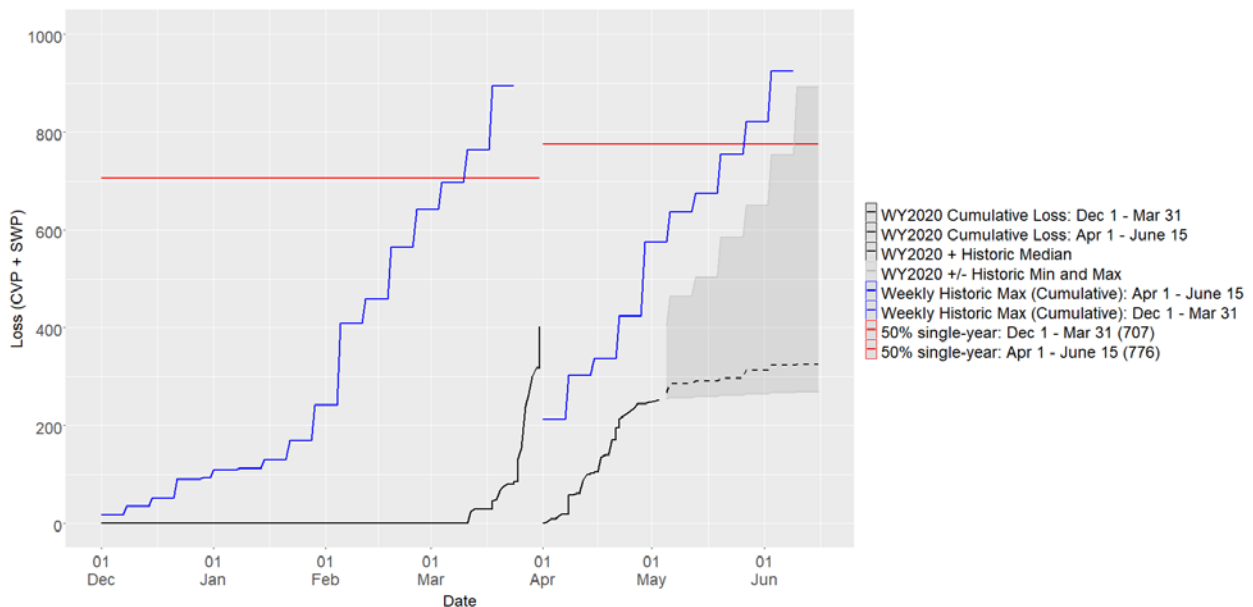


Figure 6. Daily steelhead loss accumulates towards single-year loss thresholds: December 1 – March 31, April 1 – June 15. Based on historical weekly maximum and minimum loss values from 2009-2018 (*note historic data are calendar-based not WY-based*), WY2020 observed weekly loss (and potential future loss) could exceed the 50% loss threshold at this time

depending on the magnitude of loss observed in April and May 2020. See Table A4 in the Assessment document for years included in calculations of weekly summary statistics.

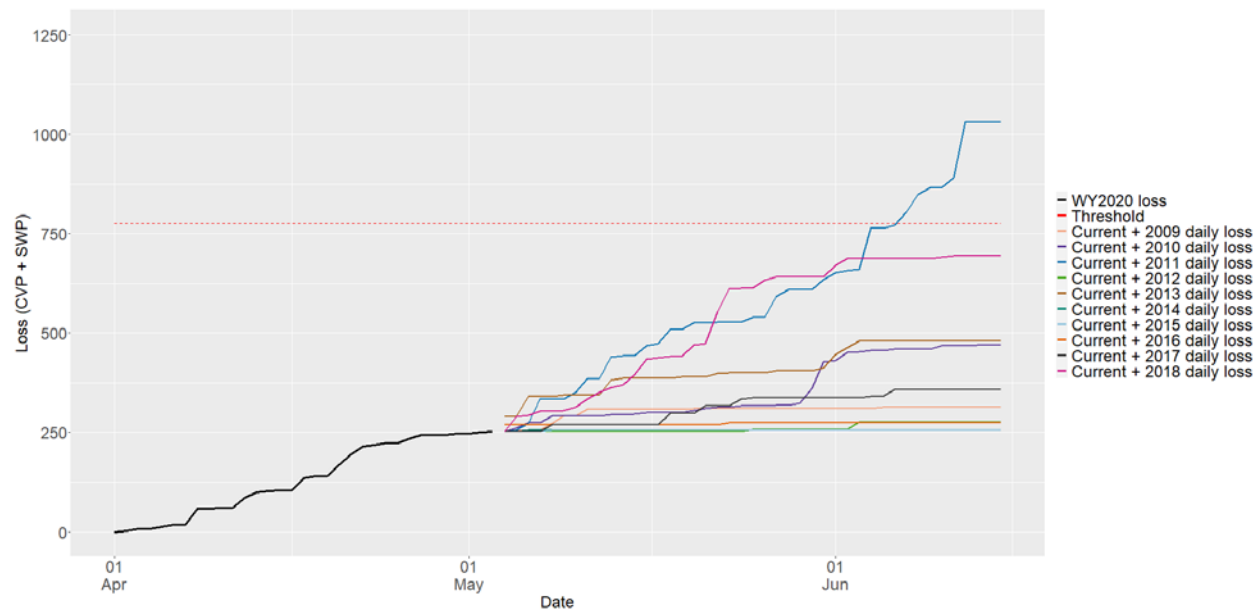


Figure 7. Daily steelhead loss accumulates towards single-year loss thresholds: April 1 – June 15. Based on historical cumulative loss values from 2009 – 2018 (*note historic data are calendar-based not WY-based*), WY2020 observed loss (and potential future loss) could exceed the 50% loss threshold at this time depending on the magnitude of loss observed in April and May 2020.

Current Conditions

Entrainment into the Interior Delta:

The Delta STARS Model ([Delta STARS web site](#)) is an individual-based simulation model that estimates survival, travel time, and routing of juvenile salmon migrating through the Delta. Routing probabilities at Three-Mile Slough and Broad Slough (junction of the Sacramento and San Joaquin rivers) are not estimated by the STARS model.

Juvenile winter-run and spring-run Chinook salmon are present currently in these regions. DCC gates are closed and flows at Freeport have decreased compared to last week. It is not likely juveniles will experience changes in rearing, foraging, sheltering or migration behavior in the western Delta and Sacramento River. The [STARS](#) model projects route-specific proportion of entrainment, survival, and travel times (data accessed through the website on 5/4/20; most recent data for 4/30/20). This model does not estimate entrainment into other lower Sacramento River sloughs (i.e. Three-Mile Slough). The probability of entrainment into the Central Delta is not related to Delta exports at levels described in the Scenarios; it is related to Sacramento River flows and tidal influences. Decreasing outflow this week is likely to result in a return to levels of entrainment into Georgiana Slough previously observed this spring, which is higher than last

week. Travel time is approximately 61-62% longer through Georgiana Slough to Chipps Island as compared to the Sacramento River and Sutter/Steamboat Slough routes.

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

	DCC	Georgiana Slough	Sacramento River	Sutter and Steamboat Slough
Proportion of Entrainment	0%	30%	46%	25%
Survival		16%	49%	37%
Travel time		18.8 days	11.4 days	11.7 days

DSM2

DSM2 – Results are provided in the Assessment documents weekly on Mondays and Fridays. SaMT reviewed the latest DSM2 results in the Assessment.

Sensitivity to Operational Actions - SaMT Feedback on Entrainment Risk

SaMT was provided a draft assessment on the previous Friday. Input that was received on Monday was incorporated into the draft assessment document that SaMT reviewed during the call on Tuesday morning.

Agenda Item 7.

Other Topics

8.1.5.1.C. Assessment of risk of entrainment into the central Delta and CVP/SWP facilities for winter-run Chinook salmon and spring-run Chinook salmon in the Sacramento River:

8.1.5.1.C.ii. Exposure Risk:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Medium
8.1.5.1.C.iii. Routing risk:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Low
8.1.5.1.C.iv. Overall Risk:	Winter-run Chinook salmon: Low-medium Spring-run Chinook salmon: Medium

8.1.5.1.D. CVP/SWP facilities entrainment risk for winter-run Chinook salmon and spring-run Chinook in the central Delta over the next week:

8.1.5.1.D.iii. Exposure risk assessments:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Medium
8.1.5.1.D.iv. Reporting OMR/export risk:	
OMR -1,000 cfs:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Low
OMR -1,300 cfs:	Winter-run Chinook salmon: Low

	Spring-run Chinook salmon: Low
OMR -3,000 cfs:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Low
8.1.5.1.D.v. Overall entrainment risk:	Winter-run Chinook salmon: Low Spring-run Chinook salmon: Low-Medium

Several categories for entrainment risk were amended after the SaMT draft notes were distributed to more accurately reflect the discussion that occurred during the meeting:

- **8.1.5.1.C.iii. Routing risk:** Routing risk based on STARS is not differentiated between winter-run and spring-run Chinook salmon, therefore routing risk was changed to be the same between the two runs as both are currently emigrating from the upper river experiencing the same hydrodynamics.
- **8.1.5.1.C.iv. Overall Risk:** The overall entrainment risk for spring-run CH, which originally read Medium, was changed to Low-Medium to reflect that change.
- **8.1.5.1.D.v. Overall entrainment risk:** For spring-run CH the original category was Low, changed to Low-Medium to match the risk assessment based on the combination of exposure and OMR risk.

Agenda Item 8.

Additional Considerations for WOMT

- No recommendations to change Delta Operations.
- In the near future: The effects of the temporary agricultural barriers on the routing, transit times, and survival of salmonids in the South Delta will increase as barriers near completion of installation. Agricultural barriers installation on Old River at Tracy and Middle River is anticipated to be completed on 5/22/20. Construction of the Grant Line temporary agricultural barrier is anticipated to begin on 5/11/20.
- San Joaquin River Basin Water Year type will be updated on 5/8/20 and may potentially change from a Critical to Dry water year type.

Agenda Item 9.

Next SaMT Meeting is scheduled for Tuesday, 5/12/20 at 9:00 a.m.