

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 5/22/2018 at 9:00 am.

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon. DOSS will work with other technical teams. DOSS notes and advice can be found at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html.

CDFW: Duane Linander, Jason Julienne
DWR: Bryant Giorgi, Ming-Yen Tu, Farida Islam
NMFS: Jeff Stuart, Kristin McCleery
Reclamation: Tom Patton, Mike Hendrick
SWRCB: Chris Kwan, Chris Carr
USFWS: Craig Anderson

Agenda Items

1. Agenda review and introductions
2. RPA Implementation review (For the DOSS Dashboard, click on the "Triggers & Indices" tab at: www.baydeltalive.com/djfmj)
3. Current Operations
4. Smelt working group update
5. Fish Monitoring: RSTs/trawls/seines
6. Fish Monitoring: Tracking of acoustic-tagged Chinook salmon
7. Fish Monitoring: Salvage
8. Hatchery Releases
9. DOSS Estimates of Fish Distribution
10. DOSS Estimates of Fish Entrainment Risk
11. DOSS advice
12. Next DOSS meeting

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions affecting operations during May:

Action IV.1.2¹ (DCC gate operations):

- From 5/21 – 6/15, DCC Gates closed for 14 days during this period, per 2006 WQCP, if NMFS determines it is necessary.
- Gates will be open for the Memorial Day weekend from Friday morning (5/25) to Tuesday morning (5/29).
- Gates will be opened on weekends and closed on weekdays through mid-June.

¹ For details, see pages 62-66 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

Action IV.2.1 San Joaquin River to Export Ratio:

- For the period of 4/1 through 5/31, the level of combined SWP and CVP exports is determined by the San Joaquin River inflow as measured at Vernalis. For the current water year type (determined on 4/9 to be below normal in the San Joaquin River basin), the ratio of San Joaquin River inflow to combined CVP and SWP exports is 3:1, based on a 14-day running average.
- An exception procedure provides for minimum health and safety needs, identified as 1,500 cfs combined exports in the 2009 RPA with 2011 amendments.

Action IV.2.3² (OMR Management):

- Implementation of this action in WY 2018 is from 1/1 through 6/15, and requires that OMR flow be no more negative than -5,000 cfs.
- Responses to exceedances of RPA action triggers require that OMR flows become more positive to meet the mandatory OMR flow limits required by the action.
- OMR flows are reported weekly with the OMR index and the tidally filtered USGS gauges at the 5-day and 14-day running averages.
- Wild steelhead loss number exceeded the first stage daily loss trigger on 5/16. The loss was 38.97 fish (first stage trigger = 34.08 fish/day) and the combined CVP and SWP exports were 4,260 TAF. OMR flows were more positive than -3500 cfs, therefore, no operational changes were required in response to the first stage trigger exceedance.

Agenda Item 3.

Current Operations (5/22/18)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	1,200	Jones Pumping Plant	1,850 (2 units)
Reservoir Releases (cfs)			
Feather - Oroville	2,050	American - Nimbus	2,500
		Sacramento - Keswick	9,500
		Stanislaus - Goodwin	3,000 ^A
		Trinity - Lewiston	1,700 ^B
Reservoir Storage (in TAF)			
San Luis (SWP)	871	San Luis (CVP)	736
Oroville	2,447	Shasta	4,041
New Melones	1,996	Folsom	950
Delta Operations			
DCC	Closed (opened on weekends)	Sacramento River at Freeport (cfs)	8,500
Outflow Index (cfs)	~9,300	San Joaquin River at Vernalis (cfs)	5,300
E:I	22% (14-day avg.)	X2	73 km

² For details, see pages 74-79 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

^A Goodwin releases will start decreasing on 5/29 or 5/30, down to approximately 1,800 cfs on 6/1, and will continue for a couple of weeks per the flow schedule in Appendix 2-E under NMFS' RPA Action III.1.3.

^B Lewiston releases will continue ROD pulse flow schedule.

Approximate OMRs as of 5/19/18:

	USGS gauges (cfs)	Index (cfs)
Daily	-1,700	-1,700
5-day	-1,200	-700
14-day	-900	-300

Approximate OMRs as of 5/21/18:

	Index (cfs)
Daily	-1,700
5-day	-1,100
14-day	-600

Factors controlling Delta exports:

5/15-5/22: San Joaquin inflow-to-export ratio of 3:1 per NMFS BiOp RPA Action IV.2.1. However, there is the potential for water quality criteria to become a co-controlling factor for Project operations as Delta outflow declines.

Weather Forecast

Chance of showers on Friday with more precipitation in the mountains than in the Sacramento Valley. Slightly cooler than normal temperatures continue this week, warming to above normal temperatures early next week.

Agenda Item 4.

Smelt Working Group Update

The Smelt Working Group met on Monday, 5/21/18 at 10 am. Anderson (USFWS) provided an update during the DOSS call. Sun (USFWS) provided the following Smelt Working Group summary via email.

The Smelt Working Group reviewed current Delta conditions, survey data, current water project operations, and forecasted weather. Current weather is sunny and warm with minor precipitation forecasted for Friday morning. The 3-station average water temperature (Antioch, Rio Vista Bridge, and Mossdale) has remained above 12°C since 3/8, which is the temperature indicative of suitable spawning identified in the Biological Opinion and a trigger for the start of Action 3. OMR flows, which are currently at approximately -1,900 cfs, are expected to be at around -1,000 cfs starting tomorrow and for the rest of the week. Based on Delta conditions, water export levels, and the survey data, the Group concluded that the risk for Delta Smelt entrainment would be low for OMR flows of more positive than -1,250 cfs, low to medium for OMR flows between -1,250 cfs and -3,500 cfs, and medium for OMR flows between -3,500 cfs and -5,000 cfs.

The Service notified Reclamation that conditions had been met to begin implementation of Action 3 (protections for larval and juvenile Delta Smelt) on 3/26 and requires an OMR flow of no more negative than -5,000 cfs. The Smelt Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions. The Group will meet again next Tuesday, 5/29, at 10 am due to the upcoming holiday.

Agenda Item 5.

Fish Monitoring: The following table presents fish monitoring data summarized over the past week. Empty cells indicate zero catches at those locations with sample dates shown.

Location	GCID RST	Tisdale RST ^A	Knights Landing RST ^B	Butte Creek Fyke trap ^C	Butte Creek RST ^D	Beach Seines ^E	Sacramento Trawl ^E	Chippis Island Midwater Trawl ^E	Mossdale Kodiak Trawl ^F
Sample Date	5/15-5/21	5/11-5/21	5/14-5/21	5/14-5/21	5/14-5/21	5/14-5/15, 5/18	5/14, 5/16, 5/18	5/13-5/19	5/14-5/15, 5/17-5/19
Chinook									61
FR Chinook	688 juveniles 3 smolts		2			6	9	237	
SR Chinook	39 smolts			452	172			7	
WR Chinook									
LFR Chinook									
Chinook (ad-clip)	64 FR juveniles 4 FR smolts							70	
Steelhead (wild)	10	1			1		1	1	
Steelhead (ad-clip)								1	
Green Sturgeon									
Flows (avg. cfs)	1,010	6,107	4,205	259	256				
W. Temp. (avg. °F)	62.3	62.4	67.6	52.8	52.6				
Turbidity (avg. NTU)	11.5	13.7	9.9	7.0	7.1				

^ATisdale RST sampling period was from 5/11 at 9:30 am to 5/21 at 10:15 am.

^BKnights Landing RST sampling period was from 5/14 at 10:45 am to 5/21 at 12:00 pm.

^CButte Creek Fyke trap sampling period was from 5/14 at 9:00 am to 5/21 at 9:30 am.

^DButte Creek RST sampling period was from 5/14 at 8:30 am to 5/21 at 9:00 am.

^EData reported in the 5/6 to 5/12 DJFMP sampling summary.

^FMossdale Trawl sampling is being conducted by CDFW (Region 4) from 4/1 to 6/30.

Red Bluff Diversion Dam (RBDD)

USFWS biweekly report (5/7/18-5/20/18) for preliminary estimates of passage by brood-year and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

Run and Species	Biweekly Total	Brood Year Total (90% CI)
Winter-run Chinook (BY2017)	0*	601,722 (415,861-787,582)
Spring-run Chinook (BY2017)	29,966**	310,497 (163,346-457,649)

*Biweekly catch decreased by 550 fish from previous biweekly total of 550.

**Biweekly catch decreased by 19,897 fish from previous biweekly total of 49,863. The spring-run bi-weekly total was likely impacted by hatchery fall-run releases (mostly 25% marked), causing misclassification of fall-run as spring-run.

Agenda Item 6.

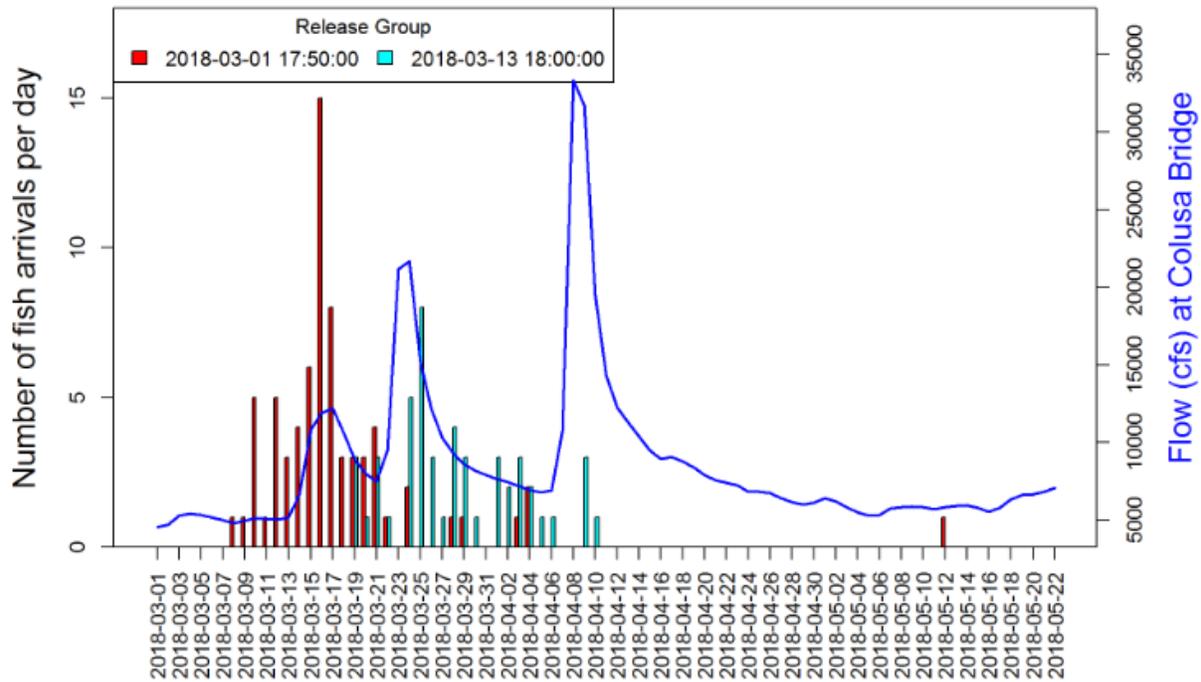
Fish Monitoring: Tracking of acoustic-tagged hatchery winter-run Chinook salmon

The Livingston Stone National Fish Hatchery released acoustic-tagged (JSATS) winter-run Chinook salmon from brood year 2017. The following table provides the detection frequency at Tower Bridge and Sacramento I-80/50 Bridge from 3/8 to 5/22.

	First Release Group	Second Release Group
Date of release	3/1/2018	3/13/2018
# acoustically tagged (JSATS)	361	239
Detections at Tower Bridge	71 (19.7%)	49 (20.5%)
Detections at the Sacramento I-80/50 Bridge	63 (17.5%)	41 (17.2%)
Detections at Georgiana Slough	1 (0.3%)	0
Minimum Survival to Tower Bridge	21.0%	26.9%
95% Confidence Interval	17.0% to 25.6%	21.4% to 33.2%

<https://calfishtrack.github.io/real-time/pageLSWR.html>

Detections at Tower Bridge (downtown Sacramento) versus Sacramento River flows at Colusa Bridge



Agenda Item 7.

Fish Monitoring: Salvage³

Fujimura (CDFW) provided a salvage summary for the period of 5/14/18-5/20/18.

The number of unclipped juvenile Chinook salmon salvaged last week decreased compared to the previous week. The reported salvage of salmon from the CVP and SWP for this reporting week was: 1,153 fall-run size, 210 spring-run size, and 1 winter-run size unclipped juvenile Chinook salmon. No clipped salmon were salvaged.

The number of steelhead salvaged last week decreased compared to the previous week. The reported salvage of steelhead from the CVP and SWP for this reporting week was 45 wild steelhead and no hatchery steelhead.

Wild steelhead were salvaged six days last week and resulted in daily loss densities ranging from 0 to 9.15 fish/TAF.

One white sturgeon was salvaged on 5/15.

³ Salvage data reported in this section represent the total estimated and expanded salvage based on the number of fish observed at the fish collection facility. For example, if one steelhead is observed in the typical ½-hour sampling period within a 2-hour operation period, the single steelhead is expanded to a salvage of four.

DOSS Weekly Salvage Update

Reporting Period: May 7-May 13, 2018

Prepared by Bob Fujimura on May 14, 2018 15:57

Preliminary Results -Subject to Revision

Criteria	7-May	8-May	9-May	10-May	11-May	12-May	13-May	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0.62	0	↗	0.09
Wild steelhead	2.54	0	0.76	2.27	4.56	2.56	1.42	↘	2.01
Exports									
SWP daily export	175	0	0	0	799	1,822	2,464	↘	751
CVP daily export	3,668	3,697	3,599	3,594	3,599	5,181	5,221	↗	4,080
SWP reduced counts	0%				0%	0%	0%	→	0%
CVP reduced counts	0%	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 brief fish facility salvage interruption 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	
	Salvage	Loss	Trend	Salvage	Loss
Wild					
Winter Run	1	4	↗	113	296
Spring Run	357	535	↘	9,257	17,669
Late Fall Run	0	0	→	5	7
Fall Run	2,263	2,465	↘	6,923	10,216
Unclassified	0	0	→	4	NC
Total	2,621	3,004		16,302	28,188
Hatchery					
Winter Run	0	0	→	48	183
Spring Run	0	0	→	1,006	1,724
Late Fall Run	0	0	→	71	236
Fall Run	0	0	→	0	0
Unclassified	0	0	→	1	NC
Total	0	0		1,126	2,144

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	70	70	↘	992	2,521
Hatchery	0	0	↘	728	2,446
Total	70	70		1,720	4,966

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

Generated by Bob Fujimura on May 21, 2018

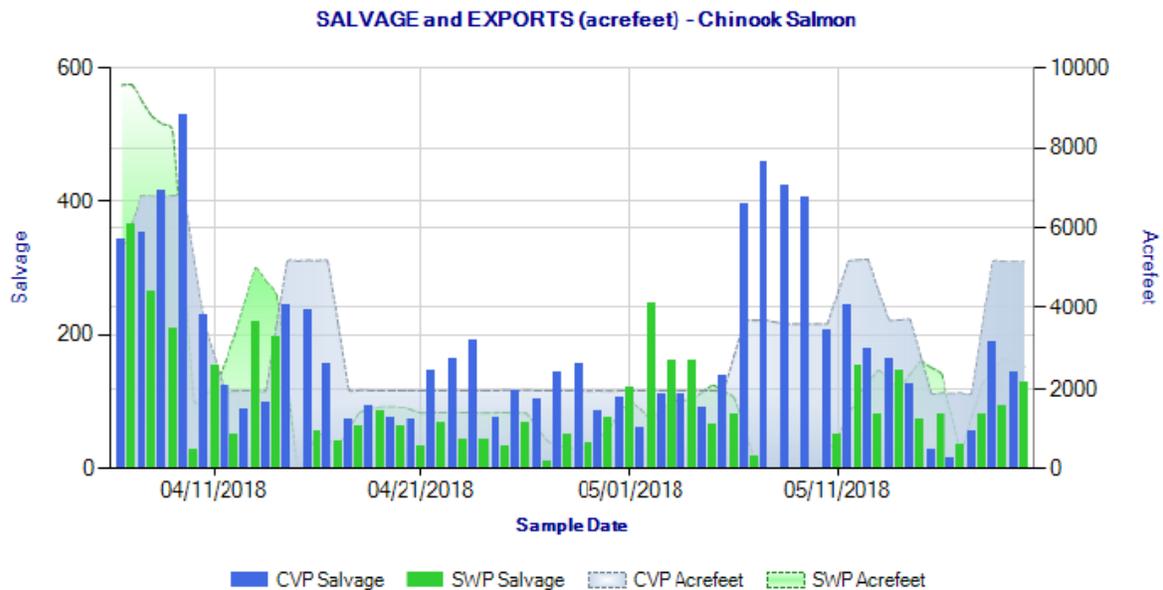


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during April 7 through May 20, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

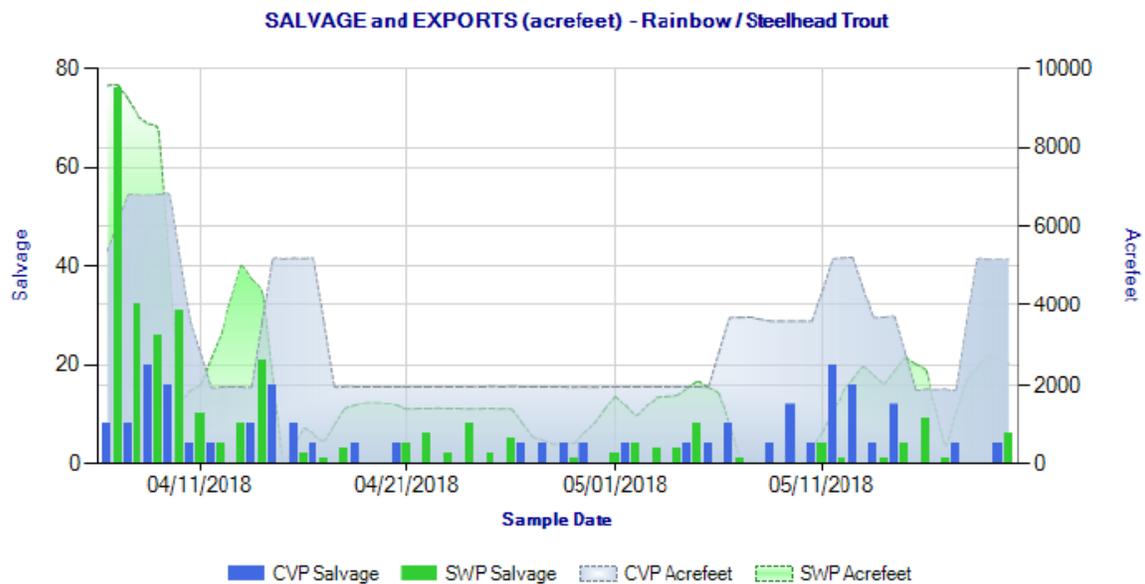


Figure 2. Daily salvage of Rainbow/Steelhead and water exports from the state and federal fish salvage facilities during April 7 through May 20, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

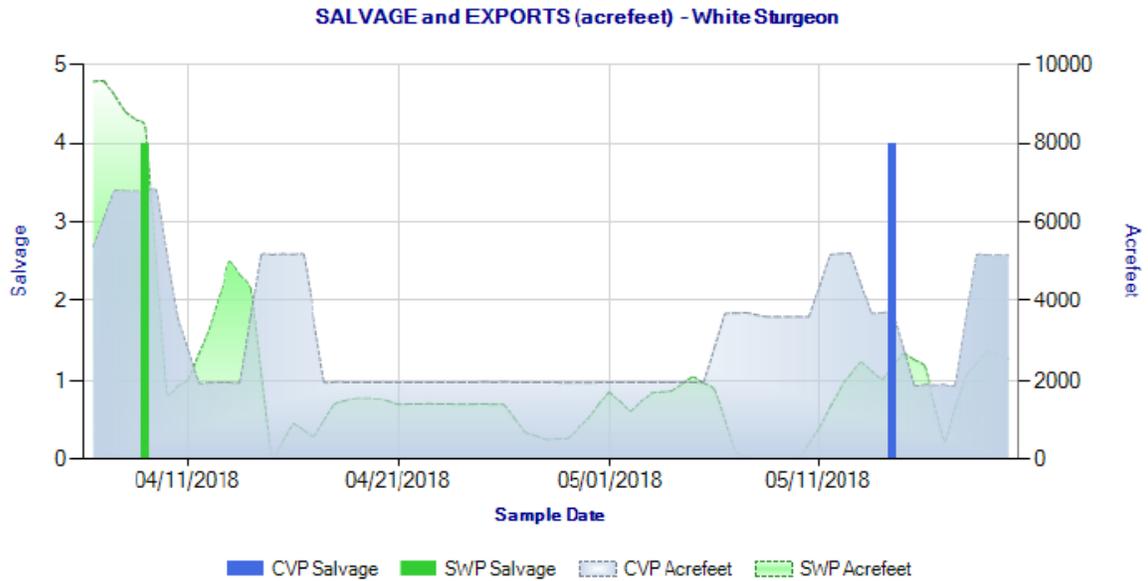


Figure 3. Daily salvage of White Sturgeon and water exports from the state and federal fish salvage facilities during April 7 through May 20, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 4/19/18

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
12/21/2017	LF	Coleman NFH	Battle Creek	Production	35.68	297,370	n/a	0.012	n/a	n/a	1/23/2018	4/14/2018
1/5/2018	LF	Coleman NFH	Battle Creek	Production	130.62	519,791	n/a	0.025	n/a	n/a	1/31/2018	3/28/2018
1/8/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	12.99	78,786	n/a	0.016	n/a	0.5%	1/31/2018	3/26/2018
1/19/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	0	71,645	n/a	0.000	n/a	0.5%	*	*
1/25/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	25.68	84,922	n/a	0.030	n/a	0.5%	*	3/8/2018
3/1/2018, 3/13/2018	W	Livingstone NFH	Sacramento River	Production	55.4	216,746	n/a	0.026	n/a	0.5%	3/22/2018	4/9/2018
12/21/2017	S	SJRRP	San Joaquin River	Experimental	13.16	1450	n/a	0.908	n/a	n/a	1/11/2018	3/13/2018
1/19/2018	S	SJRRP	San Joaquin River	Experimental	167.35	31184	n/a	0.537	n/a	n/a	3/14/2018	4/13/2018
1/26/2018	S	SJRRP	San Joaquin River	Experimental	253.16	49549	n/a	0.511	n/a	n/a	3/11/2018	4/13/2018
3/2/2018	S	SJRRP	San Joaquin River	Experimental	762	87115	n/a	0.875	n/a	n/a	3/30/2018	4/11/2018

UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2017/2018

Facility	Unknown CWT Loss ⁵	Unread CWT Loss ⁶	Unknown Hatchery Loss ⁷	Acoustic Tag Loss ⁸	Number of Unassigned CWTs ⁹
SWP	296.14				
CVP	16.02				
TOTAL	312.16				

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2017 through 4/19/2018.

¹ Number 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.

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

⁵ Adipose-fin clipped Chinook was observed during fish count, but tag code could not be determined (e.g., damaged tag, lost tag, no tag, or Chinook released).

⁶ Adipose-fin clipped Chinook was collected during fish count and has not been processed yet.

⁷ CWT has been read, but hatchery release information not yet available.

⁸ Adipose-fin clipped Chinook released due to presence of sutures.

⁹ CWT cannot currently be assigned to a salvage record with certainty since the CWT was lost and then found. CWT may be assigned to a salvage record if new information is available.

* Information not yet available.

DWR-DES Revised 4/20/2018

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

Agenda Item 8.

Hatchery Releases

On 5/9/18, CDFW released approximately 240,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the Coastside Fishing Club net pens in Pillar Point Harbor. The release was the second of three weekly releases totaling 720,000 and included 100% marked (adipose fin clip and CWT) fish.

On 5/16/18, CDFW released approximately 240,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the Coastside Fishing Club net pens in Pillar Point Harbor. The release was the final of three weekly releases totaling 720,000 and included 100% marked (adipose fin clip and CWT) fish.

On 5/11/18 and 5/12/18, CDFW released a total of approximately 900,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the San Joaquin River at the Sherman Island net pen site. The release included 25% marked (adipose fin clip and CWT) fish.

On 5/15/18 and 5/16/18, CDFW released a total of approximately 949,900 brood year 2017 fall-run Chinook salmon from the Feather River Fish Hatchery into the Mare Island net pen site. The release included 25% marked (adipose fin clip and CWT) fish.

On 5/17/18, CDFW released approximately 450,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the San Joaquin River at the Sherman Island net pen site. The release included 25% marked (adipose fin clip and CWT) fish.

On 5/18/18, CDFW released a total of approximately 400,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the Mokelumne River (200,000 below Woodbridge Dam and 200,000 at Mokelumne River Hatchery). The release was part of a special study to determine survival and fate of fish released from the Mokelumne River and included two groups of 100% marked (adipose fin clip and CWT) fish.

On 5/19/18, CDFW released approximately 450,000 brood year 2017 fall-run Chinook salmon from the Mokelumne River Fish Hatchery into the San Joaquin River at the Sherman Island net pen site. The release included 25% marked (adipose fin clip and CWT) fish.

On 5/19/18 and 5/20/18, CDFW released a total of approximately 1,001,081 (660,713 on 5/19 and 330,357 on 5/20) brood year 2017 fall-run Chinook salmon from the Feather River Fish Hatchery into the San Francisco Bay at Fort Baker. The release included 25% marked (adipose fin clip and CWT) fish.

On 5/21/18 and 5/22/18, CDFW released a total of approximately 1,340,000 (650,666 on 5/21 and 654,650 on 5/22) brood year 2017 fall-run Chinook salmon from the Nimbus Fish Hatchery into the Conoco and Mare Island net pen sites. The release included 25% marked (adipose fin clip and CWT) fish.

Agenda Item 9.

DOSS Estimates of Fish Distribution

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

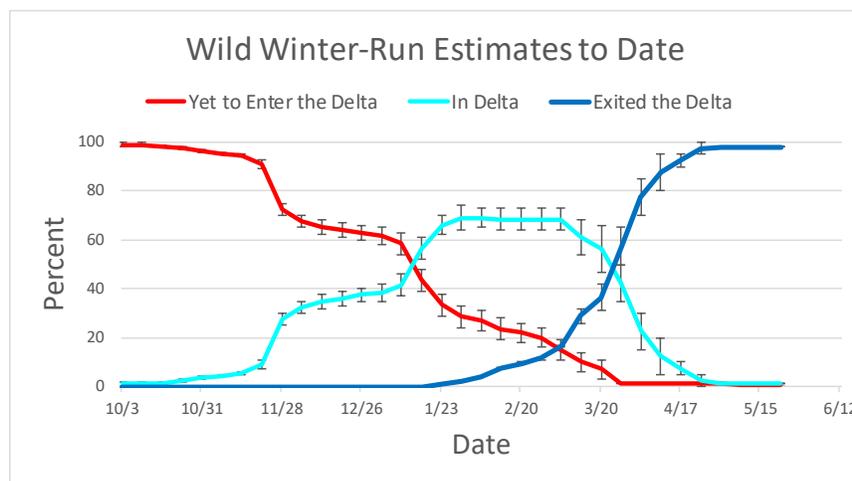
Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year winter-run Chinook salmon</i>	0-1% (Last week: same)	<1% (Last week: same)	>98% (Last week: same)
<i>Wild young-of-year spring-run Chinook salmon</i>	<1% (Last week: same)	1-3% (Last week: 2-5%)	96-99% (Last week: 94-98%)
<i>Hatchery winter-run Chinook salmon</i>	0-1% (Last week: same)	0-1% (Last week: same)	99% (Last week: >98%)

Rationale for changes in distribution

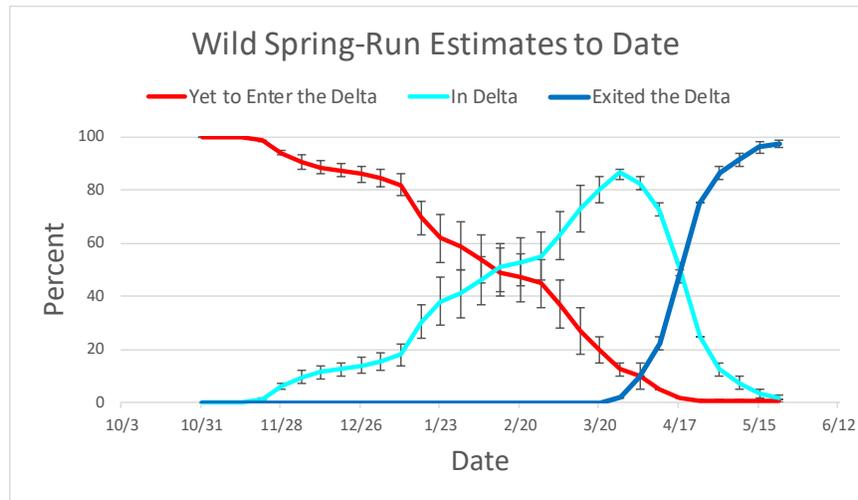
Wild winter-run Chinook: No winter-run sized fish were observed at monitoring locations this past week. DOSS estimated that at least 98% of the winter-run population have exited past Chipps Island and that 0-1% remain upstream or in the Delta.

Wild spring-run Chinook: 39 spring-run sized fish were observed at GCID, 624 at Butte Creek, and 7 in the Chipps Island Trawl this past week. Since some fish were still being observed at locations upstream of the Delta and at Chipps Island trawl, thus indicating a continuing although substantially reduced presence of fish, DOSS estimated that less than 1% of the spring-run population remain upstream of the Delta and 96-99% of the population have exited the Delta past Chipps Island.

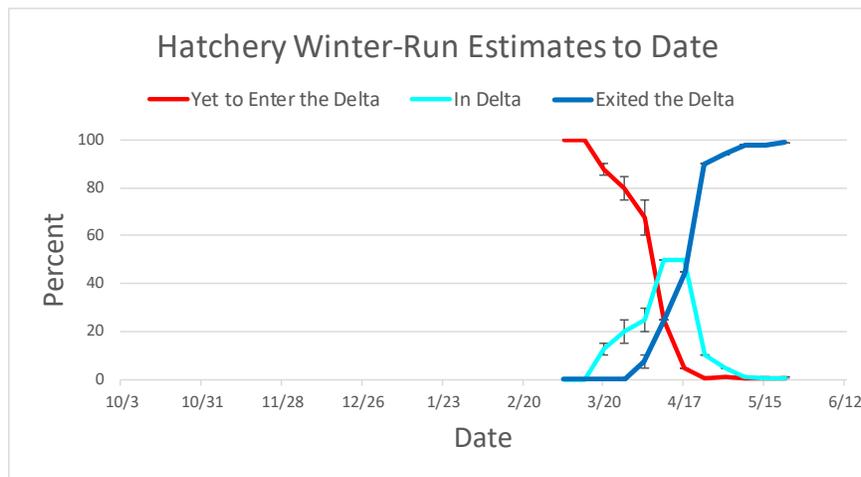
Hatchery winter-run Chinook: Approximately 20% of the hatchery-released fish from the two releases on the Sacramento River in Redding have been detected by the acoustic receiver arrays located on the Tower and I-80/ US-50 bridges in Sacramento. Minimum survival is estimated at approximately 23%. DOSS estimated that most hatchery winter-run Chinook salmon have moved out of the upper river and through the Delta, with 99% moving past Chipps Island.



WY 2018 wild winter-run distribution estimates to date.



WY 2018 wild spring-run distribution estimates to date.



WY 2018 hatchery winter-run distribution estimates to date.

Agenda Item 10.

DOSS Feedback on Entrainment Risk

DOSS provides weekly entrainment risk outlooks by considering (a) two different categories of entrainment risk based on listed fish distribution and (b) factors that influence their potential for entrainment. The two entrainment risk categories considered include:

- **Interior Delta Entrainment Risk**- fish in the Sacramento River that have the potential to be entrained into the Interior Delta through the Delta Cross Channel (when open) and/or Georgiana Slough; and
- **CVP/SWP Facilities Entrainment Risk**- fish in the Interior Delta that have the potential to be entrained into the CVP/SWP facilities.

Influencing factors considered include:

- **Exposure Risk** (both categories)- estimated scale (low, medium, high) of fish anticipated to be in vicinity of an entrainment risk,
- **Routing Risk** (Interior Delta Entrainment Risk)- estimated scale (low, medium, high) that flow split conditions could result in fish migrating into the interior delta instead of remaining in main channel, and
- **OMR/Export Risk** (CVP/SWP Facilities Entrainment Risk)- for fish in the Interior Delta, estimated scale (low, medium, high) that OMR and/or Export levels could result in entrainment into the CVP/SWP facilities.

To provide an overall assessment of entrainment risk, the estimated current status of these influencing factors are described below for each of the entrainment risk categories.

Interior Delta Entrainment Risk for listed salmonids in the Sacramento River over the next week:

- **Exposure Risk: LOW-MEDIUM**
 - Most of the wild winter-run Chinook salmon population for BY17 has moved through the Delta at this time.
 - Most of the BY17 wild spring-run Chinook salmon population has moved through the Delta at this time (96-99%).
 - Most of the hatchery winter-run Chinook salmon population has moved through the Delta at this time (99%).
 - Reduced numbers of wild steelhead are still being observed in the Delta and at Chipps Island.
 - Wild steelhead are still being observed in the Mossdale Trawls.
- **Routing Risk: MEDIUM**
 - Sacramento River inflows are currently ~8,500 cfs and are within the range of being affected by tidal flows at Georgiana Slough and Three Mile Slough.
 - Delta Cross Channel Gates will be opened for Memorial Day weekend.
- **Overall Entrainment Risk: LOW-MEDIUM**
 - Fish are present in the Delta but high river inflows and predicted positive/neutral OMR and Qwest reduce the risk of entrainment into the central and southern Delta.

CVP/SWP Facilities Entrainment Risk for listed salmonids in the Interior Delta over the next week:

- **Exposure Risk: MEDIUM-HIGH**
 - Clipped steelhead and wild steelhead have been observed in salvage.
 - Clipped and wild Chinook salmon have been seen in salvage.
 - Continuing to see Chinook salmon and steelhead in lower Sacramento River and western Delta monitoring efforts (Chipps Island and in the river confluence region)
 - SKT trawl has captured clipped and unclipped Chinook salmon in the San Joaquin River and southern Delta.

- Greater proportions of the winter-run and spring-run Chinook salmon populations are estimated to have moved into the Delta or out of the Delta than remain upstream
- Increased exports due to the WIIN Act and higher Stanislaus (3,000 cfs through May) and Tuolumne flows may present issues for steelhead migrating out of the San Joaquin River basin.
- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: MEDIUM-HIGH
 - OMR -6,250 cfs⁴: HIGH
 - OMR -7,500 cfs⁴: HIGH (incrementally higher risk if Vernalis flows decrease)
 - OMR -9,000 cfs⁴: HIGH (full export capacity, footprint of export effects extend into the western Delta and lower San Joaquin River).
- **Overall Entrainment Risk:**
 - OMR -2,500 cfs: LOW-MEDIUM
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: MEDIUM-HIGH
 - OMR -6,250 cfs⁴: MEDIUM-HIGH
 - OMR -7,500 cfs⁴: MEDIUM-HIGH
 - OMR -9,000 cfs⁴: MEDIUM-HIGH

These assessments are based on current hydrology and fish distributions.

Agenda Item 11.

DOSS Advice to WOMT and NMFS: None.

Agenda Item 12.

Next Meeting: The next DOSS conference call will be on **5/29/2018 at 9 am.**

⁴By request of management, DOSS also assessed risks at an OMR flow more negative than -5,000 cfs.