

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 3/13/2018 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: Bob Fujimura, Jason Julienne Ken Kundargi, and Duane Linander

DWR: Farida Islam, Kevin Reece, Dan Yamanaka, Bryant Giorgi

NMFS: Jeff Stuart, Kristin McCleery

Reclamation: Towns Burgess, Elissa Buttermore, Mike Hendrick

SWRCB: Chris Kwan

USFWS: Craig Anderson, Felipe Carrillo

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: Salvage
7. Hatchery Releases
8. DOSS Estimates of Fish Distribution
9. DOSS Estimates of Fish Entrainment Risk
10. DOSS advice
11. Next DOSS meeting

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions affecting operations during March:

Action IV.1.2¹ (DCC gate operations):

- Gates will remain closed from February 1 to May 20.

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.2.3² (OMR Management):

- Implementation of this action in WY 2018 is from 1/1/18 through 6/15/18, 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 USGS gauges at the 5-day and 14-day running averages.
- The first stage combined older juvenile Chinook salmon loss density trigger was exceeded on 3/6/18 [3.48 fish/ thousand acre-feet (TAF)]. The rapid DNA assay results confirmed that the older juveniles observed in salvage (winter-run by length-at-date) were in fact genetic winter-run Chinook salmon. The first day of the action response of OMR flows at no more negative than -3,500 cfs was on 3/8/18. The 5th day (minimum duration of the action response) of OMR flows at no more negative than -3,500 cfs was on 3/12/18. No additional daily older juvenile Chinook salmon loss density values exceeded the threshold of the first trigger of 2.5 fish/TAF during this period.

Action IV.3³ (Reduce likelihood of entrainment or salvage at the export facilities, including an alert that indicates that export operations may need to be altered):

- Implementation of this action in WY 2018 is from 11/1/17 through 4/30/18.
- The third alert [March 1 through April 30: Knights Landing Catch Index (KLCI) or Sacramento Catch Index (SCI) >15] was not triggered during the past week.

Agenda Item 3.

Current Operations (3/13/18)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	3,000*	Jones Pumping Plant	2,700
Reservoir Releases (cfs)			
Feather - Oroville	1,750	American - Nimbus	1,750
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	200
		Trinity - Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	779	San Luis (CVP)	828
Oroville	1,496	Shasta	3,477
New Melones	1,912	Folsom	535
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	11,600
Outflow Index (cfs)	~8,200	San Joaquin River at Vernalis (cfs)	1,800

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

³ For details, see pages 79-80 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

E:I	28% (14-day avg.)	X2	77 km
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* SWP exports are expected to increase to 3,300 cfs in the next day or two depending on runoff from today's rain event. The projects are targeting an approximate combined export level of 6,000 cfs.

Approximate OMRs as of 3/10/18:

	USGS gauges (cfs)	Index (cfs)
Daily	-3,660	-3,550
5-day	-4,300	-3,800
14-day	-3,200	-3,200

Approximate OMRs as of 3/12/18:

	Index (cfs)
Daily	-3,500
5-day	-3,494
14-day	-3,600

Factors controlling Delta exports:

- 3/6-3/7: E/I ratio
- 3/8-3/12 OMR has been controlling for 5 days due to the fish loss density trigger on 3/6
- 3/13: E/I ratio

Weather Forecast

The weather forecast indicates moderate precipitation moving through the Central Valley this morning with heavier rain in the eastern foothills and mountains through tonight. More precipitation on Thursday and Friday and potential for another storm event next week.

Agenda Item 4.

Smelt Working Group Update

The Smelt Working Group met on Monday, 3/12/18 at 10 am. Anderson (USFWS) provided a Smelt Working Group summary on the DOSS call. Chen (USFWS) distributed the following Smelt Working Group meeting summary via email:

The Smelt Working Group reviewed current Delta conditions, survey data, current water project operations, and forecasted weather. Current weather conditions are partly cloudy and relatively warm, with a storm event forecasted for tomorrow with cooler temperatures for the rest of the week. 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 spawning identified in the Biological Opinion and a trigger for the start of Action 3. One male pre-spawning adult Delta smelt was salvaged at the Central Valley Project (CVP) fish facility on 3/9, which represents the first Delta smelt salvage of the water year. OMR indices are currently at approximately -3,500 cfs and expected to be more negative and held at -4,600 cfs by tomorrow. Based on Delta conditions, water export levels, and the recently salvaged Delta smelt, the Group concluded that Delta smelt

entrainment risk would be high if OMR continues at -4,600 cfs, medium to high at OMR indices from -3,500 to -4,600 cfs, medium at OMR indices from -3,000 to -3,500 cfs, and low at OMR indices of more positive than -3,000 cfs.

Even though field surveys have not shown any evidence of Delta smelt spawning, the Group believes that a recommendation under Action 3 (larval Delta smelt) is necessary to protect adult Delta smelt as protection of adults signifies protection of their potential offspring. The Group will continue to monitor Delta smelt survey and salvage data, Delta conditions, and this week’s forecasted precipitation. If another fish is salvaged, then the Group will meet the following morning. If no additional fish are salvaged, then the Group will meet again next Monday, 3/19 at 10 a.m.

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 Is. Midwater Trawl ^E	Mossdale Kodiak Trawl ^E
Sample Date	3/10*-3/12	3/5-3/12	3/5-3/8	-	-	3/6-3/9	3/4, 3/6-3/8, 3/10	3/4, 3/6-3/8, 3/10	3/5, 3/7, 3/9
FR Chinook	13 juveniles					115	9		
SR Chinook	2 juveniles					17	4		
WR Chinook	1 juvenile 2 smolts	1				1		6	
LFR Chinook									
Chinook (ad-clip)	7 WR smolts	1						4	
Steelhead (wild)								3	
Steelhead (ad-clip)	1	1					5	21	
Green Sturgeon									
Flows (avg. cfs)	806	5,007	5,705						
W. Temp. (avg. °F)	54.3	50.3	49						
Turbidity (avg. NTU)	N/A	14.0	11.8						

* GCID trap pulled on 3/4 due to high volume of hatchery released winter-run Chinook salmon and lowered back in the water at 9:00 am on 3/10.

^A Tisdale RST sampling period was from 3/5 at 9:45 am to 3/12 at 9:30 am.

^B Knights Landing RST sampling period was from 3/5 at 11:15 am to 3/8 at 10:30 am.

^C Butte Creek Fyke trap data have not been updated this week.

^D Butte Creek RST data have not been updated this week.

^E Data reported in the 3/4 to 3/10 DJFMP sampling summary. Data included 7 RBTC (ad-clipped rainbow trout) in EDSM Trawls.

Red Bluff Diversion Dam (RBDD)

The RBDD monitoring report came in after the DOSS call concluded. The data are provided for continuity of information. USFWS biweekly report (2/26/18-3/11/18) 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)	1,483*	460,863 (318,383-603,343)
Spring-run Chinook (BY2017)	5,405**	143,994 (102,771-185,218)

*Biweekly catch increased by 423 fish from previous biweekly total of 1,060.

**Biweekly catch increased by 1,099 fish from previous biweekly total of 4,306.

Spring Kodiak Trawl - Survey 2

2017 Spring Kodiak Trawl preliminary salmonid catch from March 5-8. Data are preliminary and subject to change; Chinook run assignments are based on length-at-date criteria.

**Preliminary Spring Kodiak Trawl Chinook Salmon and Steelhead Catch
Survey 3, 2018**

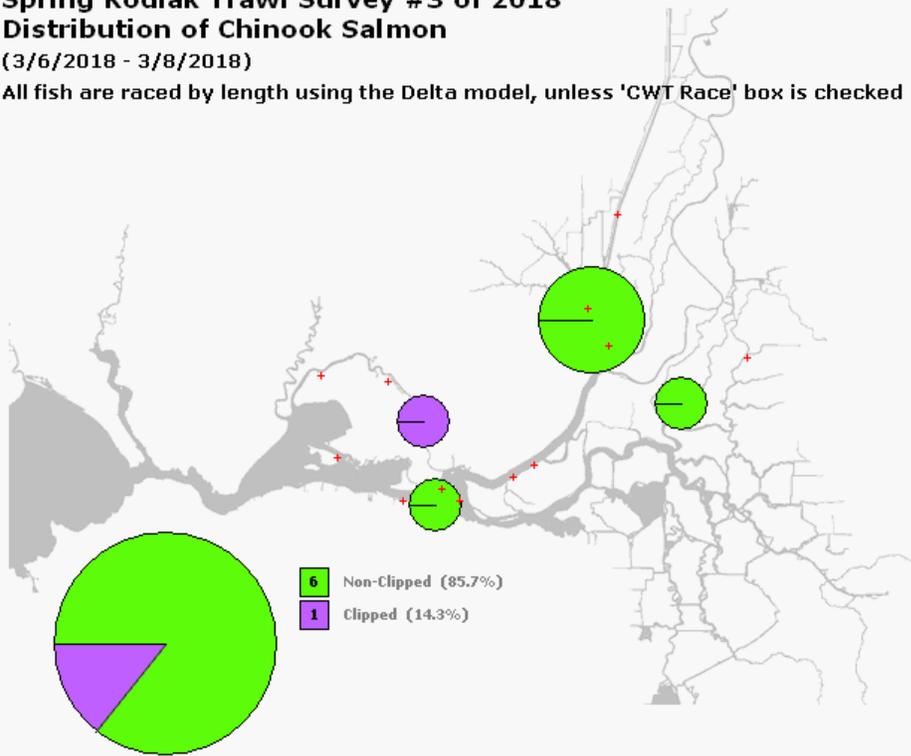
Survey Conducted 3/5/2018 – 3/8/2018

Station	# of Fish	Fall Run Chinook		Spring Run Chinook		Winter Run Chinook		Late Fall Run Chinook		Steelhead		
		Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped	
340	0											Suisun Bay & West
405	0											
411	0											
418	0											
501	2									2		
504	0											
519	0											
602	0											
606	1									1		
609	1									1		
610	1					1						
508	3									3		
513	1									1		
520	1						1					
801	2									2		
804	0											
704	4									4		
706	3									3		
707	0											
711	0											
712	0											
713	5									5		
715	6						4			2		
716	2									2		
719	2									2		
724	0											
809	0											
812	0											
815	0											
902	0											
906	0											
910	0											
912	0											
914	0											
915	0											
919	0											
920	0											
921	0											
922	4									4		
923	5						1			4		
Totals:	43	0	0	0	0	1	6	0	0	36	0	
Range of FL						147	108-124			175-270		

Spring Kodiak Trawl Survey #3 of 2018
Distribution of Chinook Salmon

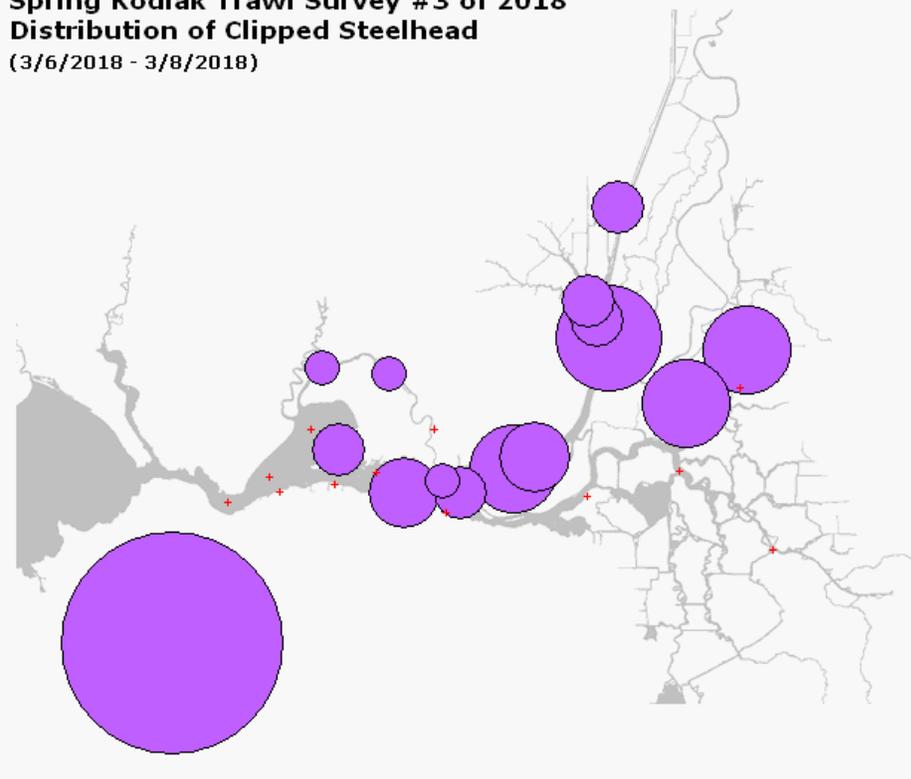
(3/6/2018 - 3/8/2018)

All fish are raced by length using the Delta model, unless 'CWT Race' box is checked



Spring Kodiak Trawl Survey #3 of 2018
Distribution of Clipped Steelhead

(3/6/2018 - 3/8/2018)



Agenda Item 6.

Fish Monitoring: Salvage⁴

Fujimura (CDFW) provided a salvage summary for the period of March 5-11, 2018.

The Skinner Fish Protection Facility and Tracy Fish Collection Facility continued to salvage wild juvenile Chinook salmon last week. Twenty winter-run size, 8 fall-run size, and 4 larger juvenile Chinook salmon were salvaged – these latter salmon were greater than 300 mm in size. On 3/6, the older juvenile Chinook salmon loss density of 3.48 fish/TAF triggered the OMR reduction later that week.

The fish facilities continued to salvage hatchery (ad-clipped) juvenile Chinook salmon last week but at a lower rate than the previous week: 4 winter-run size, 8 spring-run size, and 2 late fall-run sized Chinook salmon were salvaged, based on length at date criteria.

The fish facilities continued to salvage small numbers of wild steelhead and a larger numbers of hatchery steelhead during the past week. Four wild steelhead and 130 hatchery steelhead were salvaged last week. The salvage of wild steelhead on 3/5 & 3/6 resulted in a daily loss density of less than 1.0 fish/TAF, which was below the first stage trigger level of daily loss greater than 8 fish/TAF multiplied by volume exported in RPA IV.2.3.

No white or green sturgeon were salvaged last week.

Preliminary results for yesterday (3/12) indicate the CVP salvaged some wild and hatchery juvenile Chinook salmon and more hatchery steelhead.

⁴ 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: March 5-March 11, 2018

Prepared by Bob Fujimura on March 12, 2018 16:21

Preliminary Results -Subject to Revision

Criteria	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	Trend	
Loss Densities									
Wild older juvenile CS	0	3.48	0	1.66	2.15	0	0	↗	1.04
Wild steelhead	0.79	0.85	0	0	0	0	0	↘	0.23
Exports									
SWP daily export	7,258	6,550	6,633	5,149	4,325	3,713	3,927	↘	5,365
CVP daily export	3,653	3,651	5,371	5,389	5,411	5,417	5,194	↗	4,869
SWP reduced counts	0%	0%	0%	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 salvage facility interruption occurred

Tan highlighted value indicate exceedence of loss density trigger of 2.5 fish/TAF

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	20	74	↗	42	145
Spring Run	0	0	→	0	0
Late Fall Run	0	0	→	1	4
Fall Run	8	6	↘	28	21
Unclassified	4	NC	↘	4	NC
Total	32	79		75	170
Hatchery					
Winter Run	4	18	↘	24	93
Spring Run	8	6	↘	20	18
Late Fall Run	2	9	↘	59	213
Fall Run	0	0	→	0	0
Unclassified	0	0	→	1	NC
Total	14	32		104	324

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	4	17	↘	28	92
Hatchery	130	447	↘	295	1,037
Total	134	464		323	1,129

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

Generated by Bob Fujimura on March 12, 2018

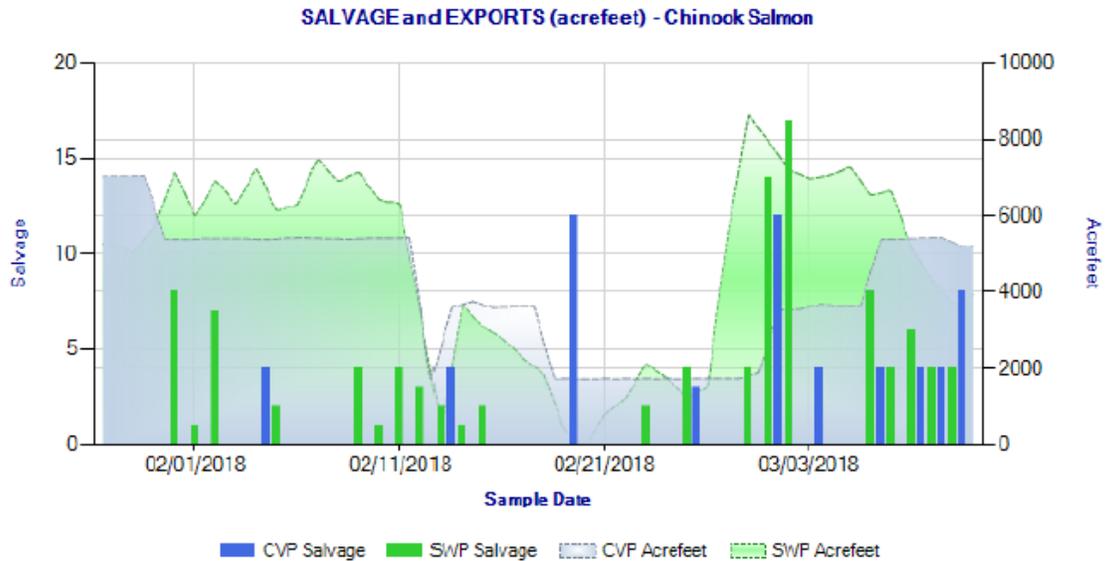


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during January 28 through March 11, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

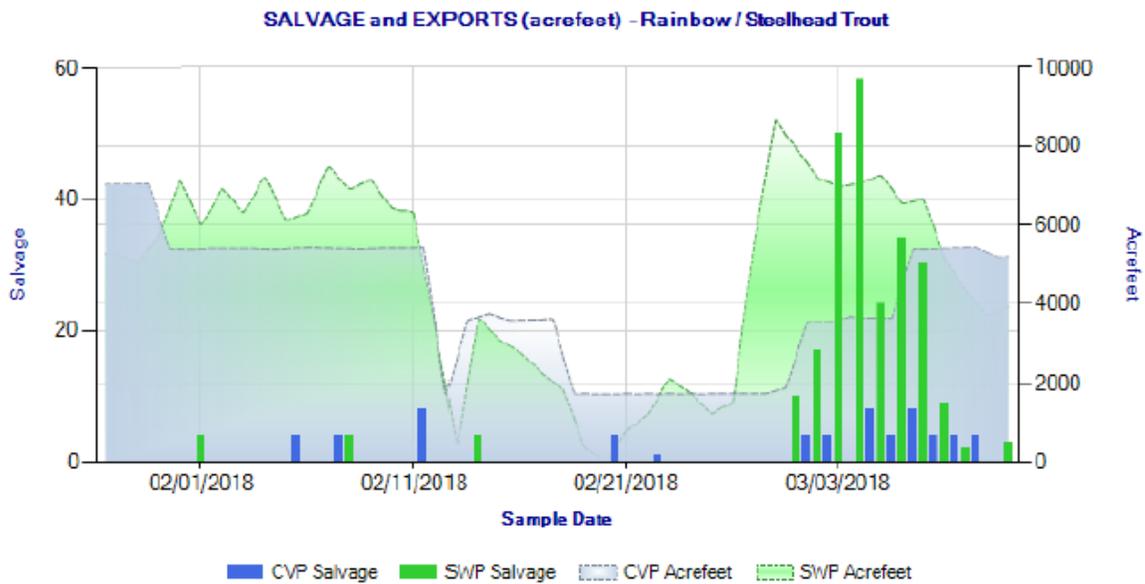


Figure 2. Daily salvage of Rainbow/Steelhead and water exports from the state and federal fish salvage facilities during January 28 through March 11, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 3/8/18

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released ¹	Total Entering	% Loss of Number	% Loss of Total	First Stage	Date of First Loss ⁴	Date of Last Loss ⁴
12/21/2017	LF	Coleman NFH	Battle Creek	Production	20.31	297,370	n/a	0.007	n/a	n/a	1/23/2018	2/23/2018
1/5/2018	LF	Coleman NFH	Battle Creek	Production	131.39	519,791	n/a	0.025	n/a	n/a	1/31/2018	3/2/2018
1/8/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	8.66	78,786	n/a	0.011	n/a	0.5%	1/31/2018	2/1/2018
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	16.87	84,922	n/a	0.020	n/a	0.5%	*	3/8/2018
12/21/2017	S	SJRRP	San Joaquin River	Experimental	9.97	1450	n/a	0.688	n/a	n/a	1/11/2018	3/2/2018
1/19/2018	S	SJRRP	San Joaquin River	Experimental	0	210	n/a	0.000	n/a	n/a	*	*

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	Number of Unassigne
SWP	99.29				
CVP					
TOTAL	99.29				

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2017 through 3/8/2018.

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.

¹⁰ Chinook outside of the length-at-date criteria (Delta model) are not reported.

** Information not yet available.

DWR-DES Revised 3/9/2018

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

Agenda Item 7.

Hatchery Releases

The USFWS distributed a notification for the release of 102,347 hatchery produced winter-run Chinook salmon from the Livingston Stone National Fish Hatchery into the Sacramento River on 3/13. This is the remaining half of the production of Livingston Stone National Fish Hatchery brood year 2017. All fish are 100% ad-clipped and coded wire tagged (CWT). Some fish will be acoustically tagged.

Stuart (NMFS) informed the group that 16 fish from the first winter-run Chinook salmon hatchery release on 3/1/18 have been detected at the acoustic receivers located in Sacramento (Tower Bridge and I-80 bridge).

The USFWS distributed a notification for the release of 92,456 juvenile winter-run Chinook salmon from the Livingston Stone National Fish Hatchery captive broodstock progeny into Battle Creek at Wildcat Road Bridge on 3/14. This is the second planned release of more than 200,000 total juvenile winter-run Chinook salmon into Battle Creek this month. All fish are 100% coded wire tagged (CWT) and marked with both ad-clip and a left pelvic-fin clip.

On 3/14 and 3/15, CDFW will release approximately 100,000 brood year 2017 steelhead from the Mokelumne River Hatchery into the Mokelumne River at the Feist Ranch/New Hope landing. Actual release sites are weather dependent and based on river access for transport trucks. All fish are 100% ad-clipped.

Agenda Item 8.

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.

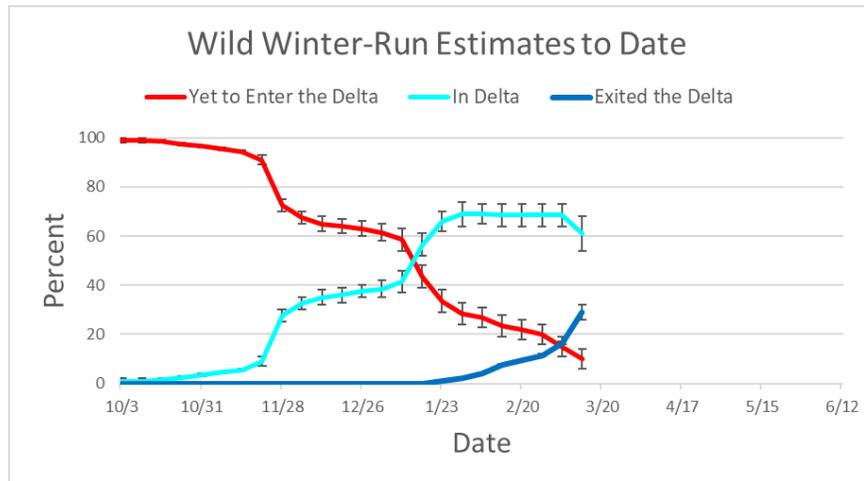
Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year winter-run Chinook salmon</i>	6-14% (Last week: 11-19%)	54-68% (Last week: 64-73%)	26-32% (Last week: 16-17%)
<i>Wild young-of-year spring-run Chinook salmon</i>	18-36% (Last week: 28-46%)	64-82% (Last week: 54-72%)	0% (Last week: 0%)

Rationale for changes in distribution

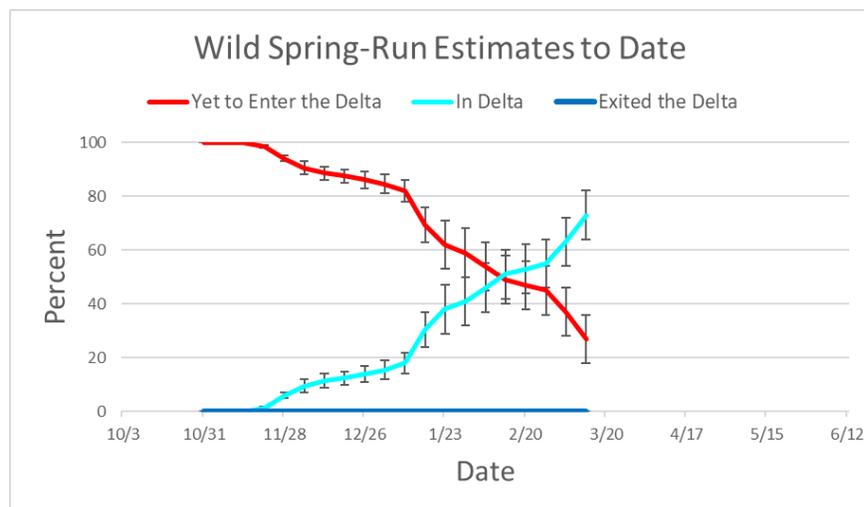
Wild winter-run Chinook: 3 winter-run sized fish were observed at GCID, 1 at the beach seines, and 6 at Chipps Island this past week. Since more fish were observed at monitoring locations, including 6 at Chipps Island, DOSS estimated that an additional 5% of the winter-run population has moved into the Delta, and 10-15% have exited past Chipps Island.

Wild spring-run Chinook: 2 spring-run sized fish were observed at GCID, 17 in the beach seines, and 4 at Sacramento Trawl this past week. Since more fish were observed at locations upstream and within the Delta and none were observed exiting at Chipps Island, DOSS estimated that an

additional 10% of the spring-run population has moved into the Delta. There is also the potential that some of the fish classified as spring-run by the length-at-date criteria may actually be late emerging and slow growing winter-run Chinook salmon. Cooler river water temperatures this year may have delayed spawning and slowed the emergence and growth of winter-run fry in the upper Sacramento River, and thus these fish would fall into the size criteria for spring-run at this time of year. Likewise, some spring-run may fall into the fall-run length-at-date size criteria due to slow growth in cooler waters.



WY 2018 wild winter-run distribution estimates to date.



WY 2018 wild spring-run distribution estimates to date.

Agenda Item 9.

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: HIGH**
 - Over 80% of the winter-run Chinook salmon population has moved downstream into the Delta or have exited past Chipps Island.
 - Hatchery production winter-run releases have occurred and acoustically-tagged fish are beginning to be detected by Sacramento area receivers.
 - Winter-run Chinook salmon have been observed at the salvage facilities (DNA verified).
 - Spring Kodiak Trawl data also indicate winter-run are in the central and western Delta.
 - Increased flows and turbidities from recent storms are expected to stimulate fish movement.
 - Winter-run continue to be present in the Delta and are likely to continue rearing there for the next several weeks, elevating their exposure risk.
 - Approximately 54-68% of winter-run Chinook salmon population is in the Delta at this time. A few winter-run have been seen in the lower Sacramento River section between Sacramento and DCC and several winter-run have been observed in the catch at Chipps Island over the past few weeks, indicating that most of the population is in the Delta and not upstream.
 - Approximately 64-82% of spring run population is in Delta.
 - Surrogate spring-run Chinook salmon hatchery releases of late-fall run Chinook salmon are in the system. The last release occurred on 1/25/18. CWTs from captured ad-clipped Chinook salmon are being read from fish collected during monitoring.

- Wild and hatchery Chinook salmon and steelhead have been observed in the Chipps Island trawls.
- Wild and hatchery Chinook salmon have been observed in beach seines from the North Delta and Liberty Island regions.
- Wild and hatchery Chinook salmon as well as hatchery steelhead have been observed in the EDSM efforts.
- Wild and hatchery salmonids have been observed in salvage.
- **Routing Risk: MEDIUM**
 - River flows are not high enough to mute tidal influence at Georgiana Slough and Three Mile Slough, allowing redirection of fish into these routes on flood tides.
 - Delta Cross Channel is closed.
- **Overall Entrainment Risk: MEDIUM-HIGH** (higher than last week's risk estimate)
 - Increased movement of winter-run Chinook salmon, spring-run Chinook salmon, and steelhead into the Delta and remaining within the Delta increase overall risk of entrainment into the interior Delta.

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

- **Exposure Risk: HIGH**
 - Hatchery and wild steelhead have been observed in salvage.
 - Hatchery and wild Chinook salmon have been observed 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).
 - Greater proportions of winter-run and spring-run Chinook salmon populations are estimated to have moved into the Delta than remain upstream.
- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW-MEDIUM
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: MEDIUM-HIGH
 - OMR -6,250 cfs⁵: HIGH
 - OMR -7,500 cfs⁵: HIGH (incrementally higher risk if Vernalis flows decrease)
 - OMR -9,000 cfs⁵: HIGH (Full export capacity, footprint of export effects extend into western Delta and lower San Joaquin River).
- **Overall Entrainment Risk:**
 - OMR -2,500 cfs: MEDIUM-HIGH
 - OMR -3,500 cfs: MEDIUM-HIGH

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

- OMR -5,000 cfs: MEDIUM-HIGH (incrementally higher than last week due to fish presence)
- OMR -6,250 cfs⁵: HIGH
- OMR -7,500 cfs⁵: HIGH
- OMR -9,000 cfs⁵: HIGH

These assessments are based on current hydrology and fish distributions.

Agenda Item 10.

DOSS Advice to WOMT and NMFS: DOSS advises that OMR flows more negative than -5,000 cfs will have high overall entrainment risks at the CVP and SWP fish salvage facilities given current winter-run Chinook salmon distributions. OMR flows more negative than -5,000 cfs will create conditions that are not protective of listed salmonids in the southern Delta.

Agenda Item 11.

Next Meeting: The next DOSS conference call will be on **3/20/2018 at 9 am.**