

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 6/6/2017 at 9:00 a.m.

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, Jerry Morinaka

DWR: Bryant Giorgi, Farida Islam, Kevin Reece, Mike Ford, Siqing Liu

NMFS: Barb Byrne, Kristin McCleery

Reclamation: Tom Patton, Towns Burgess, Elissa Buttermore, Don Portz, Dave van Rijn

SWRCB: Chris Kwan, Chris Carr

USFWS: 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. Smelt Working Group Update
4. Current Operations
5. Hatchery Releases
6. Fish Monitoring: Tracking of acoustic-tagged Chinook salmon
7. SJRRP Adult Spring-run Chinook Release
8. Fish Monitoring: Salvage
9. Fish Monitoring: RSTs/trawls/seines
10. DOSS Estimates of Fish Distribution and Assessments of Entrainment Risk
11. DOSS Advice
12. Next DOSS Meeting

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions in effect during June:

Action IV.1.2¹ (DCC gate operations):

- From May 21 to June 15, the gates will be closed for up to 14 days.

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 2017 began 1/1/17, and requires that Old and Middle River (OMR) flow be no more negative than -5,000 cfs.
- Since the action went into effect on 1/1/17, no salvage-based triggers that would require OMR to be more positive than -5,000 cfs have been exceeded.
- Action IV.2.3 is in effect until 6/15/17, unless the water temperature offramp is satisfied.
- **Water temperature offramp:** Seven consecutive days, in June, of Mossdale³ daily average temperature >72°F.

San Joaquin River at Mossdale Bridge Temperatures

Date	Temp (F)
06/1/2017	61.2
06/2/2017	62.0
06/3/2017	62.8
06/4/2017	63.2

Action IV.2.1⁴ (I:E ratio)

- Implementation of this action in WY 2017 began on 4/1/17, and required a specific Vernalis flow-to-combined export ratio based on the San Joaquin Basin yeartype.
- The I:E ratio associated with the current “Wet” San Joaquin Basin yeartype was 4:1. Once the flood condition offramp⁵ was no longer satisfied, project operations transitioned into I:E ratio implementation (beginning 5/15).
- The last day of implementation in WY 2017 was on 5/31/17.

Agenda Item 3.

Smelt Working Group update

The Smelt Working Group (SWG) met on Monday, 6/5/17 at 10 am. Bartoo (FWS) provided the following draft SWG meeting summary via e-mail:

The Working Group reviewed current Delta conditions, survey data, expected exports, and forecasted weather. The SWG indicated that the anticipated negative OMR flows later this week are sufficiently protective of Delta Smelt.

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 See "MSD" CDEC station: <http://cdec.water.ca.gov/cgi-progs/queryDaily?s=msd&d=today>

⁴ For details, see pages 68-70 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

⁵ Exports are not restricted by the I:E ratio requirements of Action IV.2.1 when mean daily stage at Vernalis flow is equal to or greater than the flood monitor stage of 24.5 feet. 5/1/17 clarification of San Joaquin I:E ratio flood condition offramp available under "Biological Opinion Actions" heading at:

http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/⁶ 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.

The Working Group is following guidance for entrainment protections from Action 3 (larval/juvenile Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, June 12, 2017 at 10 am.

SWG meeting notes are available at: <https://www.fws.gov/sfbaydelta/CVP-SWP/SmeltWorkingGroup.htm>

Agenda Item 4.

Current Operations

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	6,680	Jones Pumping Plant	4,400
Reservoir Releases (cfs)			
Feather - Oroville	12,100 ^A	American - Nimbus	12,000
		Sacramento - Keswick	11,000
		Stanislaus - Goodwin	4,250 ^B
		Trinity – Lewiston	3,700 ^C
Reservoir Storage (in TAF)			
San Luis (SWP)	1,001	San Luis (CVP)	918
Oroville		Shasta	4,336
New Melones	2,097	Folsom	944
Delta Operations (cfs)			
DCC	Closed ^D	Sacramento River at Freeport (cfs)	41,000
Outflow Index (cfs)	~44,000	San Joaquin River at Vernalis (cfs)	13,700
E:I	19% (3-day avg.) 19% (14-day avg.)	X2	<61 km

^A Releases from Oroville are scheduled to decrease over the next 3 days down to 9,000 cfs.

^B Goodwin releases are scheduled to decrease to 4,000 cfs on 6/7 and to 3,750 cfs later in the week.

^C Lewiston releases are scheduled to decrease this month by approximately 100 cfs per day.

^D*Non-BiOp-related DCC operational considerations:* While Sacramento River flows near the DCC remain greater than ~20,000 cfs, the DCC may remain closed to avoid scouring around the gate structure.

OMR flows as of 6/5/17:

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

Approximate OMR flows as of 6/2/17:

	USGS gauges (cfs)	Index (cfs)
Daily	-3,500	-4,300
5-day	900	0
14-day	2,800	2,500

Factors controlling Delta exports:

- 5/30 – 5/31 Delta exports limited by Action IV.2.1 (I:E ratio).
- 6/1 – 6/6 Delta exports limited by real-time demand or available plant capacity.

The weather forecast indicates possible light precipitation on Thursday and then warming into the weekend.

Agenda Item 5.

Hatchery Releases

See tables summarizing hatchery releases at:

http://www.cbr.washington.edu/sacramento/data/delta_cwt_tables.html. Note that releases are listed in different tables based on whether or not confirmed loss at the SWP and CVP Delta Fish Facilities has been reported; check all tables to review recent releases.

Agenda Item 6.

Fish Monitoring: Tracking of acoustic-tagged Chinook salmon

CDFW released 146 acoustic tagged brood year 2016 fall-run Chinook salmon from Nimbus Hatchery at the Sunrise Boat Ramp on the American River on 5/31/17. 93 fish were detected at the Sacramento I-80/50 Bridge over the reporting period of 5/30-6/5. The cumulative detections since release is 93 (64% of released fish).

RSTs installed in Mill Creek and Deer Creek are being used to collect outmigrating Chinook salmon (expected to be a mix of spring-run and fall-run Chinook salmon). Since 5/15/17, 37 Chinook have been acoustic-tagged and released. Three fish were detected at the Sacramento I-80/50 Bridge over the reporting period of 5/28-6/4. The cumulative detections since the earliest release is 5 (14% of released fish).

Agenda Item 7.

San Joaquin River Restoration Program (SJRRP) Adult Spring-run Chinook Release

Summary provided by Reclamation:

On May 25, 2017 SJRRP released 60 adult spring-run Chinook salmon to the San Joaquin River approximately 7 miles below Friant Dam. These spring-run are ancillary broodstock from SJRRP's Salmon Conservation and Research Facility. Of the 60 fish, 30 are male and 30 are female. These fish ranged from 1.8-5.9 kg (avg. 2.7 kg) and 456-672 mm FL (559 mm FL avg.). All 60 fish are adipose clipped and tagged with coded wire tags, Petersen disc tags, PIT tags, and Vemco V13 acoustic transmitters. Program biologists will track and assess spring-run Chinook salmon summer holding areas and spawning habitat sites using telemetry, snorkel surveys, and redd/carcass surveys. An addition adult spring-run Chinook salmon release is

planned to occur August 8, 2017. This is the second year that SJRRP has released spring-run to the river, as 25 fish were released June 30, 2016.

Agenda Item 8.

Fish Monitoring: Salvage⁶

CDFW reported that a catastrophic screen failure occurred inside the secondary channel at the Tracy Fish Collection Facility on 6/4/17. The failure does not prevent salvage from occurring, but does mean that the secondary channel will need to be periodically drained (likely once or twice daily) to clean debris from the remaining screens. No salvage will occur during the manual cleaning process, expected to take approximately 30 minutes per event.

⁶ 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 29-June 4, 2017

Prepared by Bob Fujimura on June 5, 2017 17:12

Preliminary Results -Subject to Revision

Criteria	29-May	30-May	31-May	1-Jun	2-Jun	3-Jun	4-Jun	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0
Wild steelhead	0	0	0	0	0	0	0.13	↘	0.02
Exports									
SWP daily export	3,918	2,509	3,931	13,142	13,180	12,835	12,606	↗	8,874
CVP daily export	3,686	3,696	3,697	8,280	8,448	8,699	8,706	↗	6,459
SWP reduced counts	0%	0%	92%	92%	33%	67%	8%	↗	42%
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 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	
	Salvage	Loss	Trend	Salvage	Loss
Wild					
Winter Run	0	0	→	46	111
Spring Run	1,192	3,352	↗	25,879	69,115
Late Fall Run	0	0	→	20	73
Fall Run	2,709	7,175	↗	14,072	31,815
Unclassified	0	0	→	97	NC
Total	3,901	10,528		40,114	101,113
Hatchery					
Winter Run	0	0	→	368	1,009
Spring Run	6	11	↘	958	1,764
Late Fall Run	0	0	→	639	1,387
Fall Run	101	84	↘	439	528
Unclassified	0	0	→	6	NC
Total	107	96		2,410	4,689

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

NC = can not be calculated

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	3	↘	57	174
Hatchery	4	3	↗	43	164
Total	8	5		100	338

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

Generated by Bob Fujimura on June 5, 2017

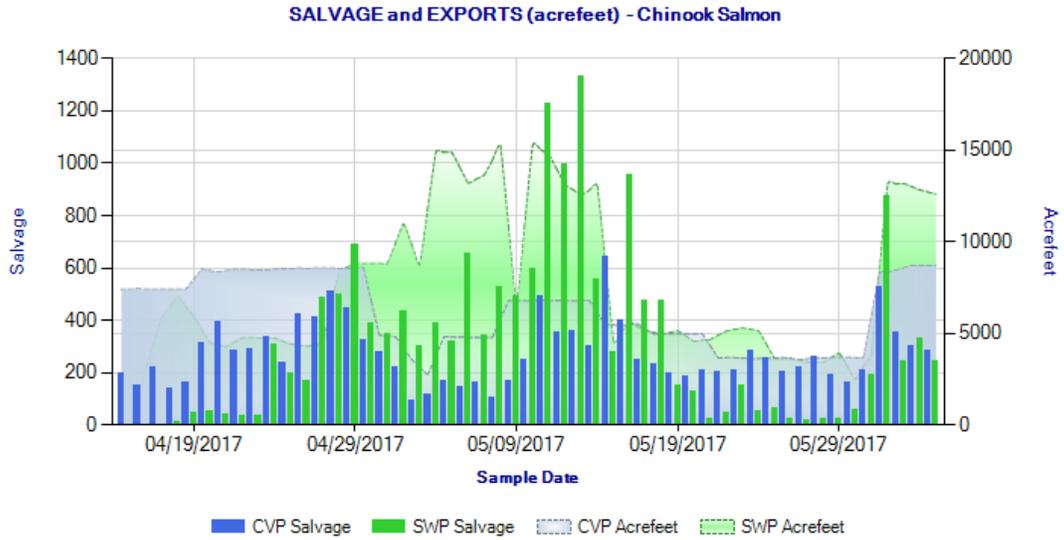


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during April 15 through June 4, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

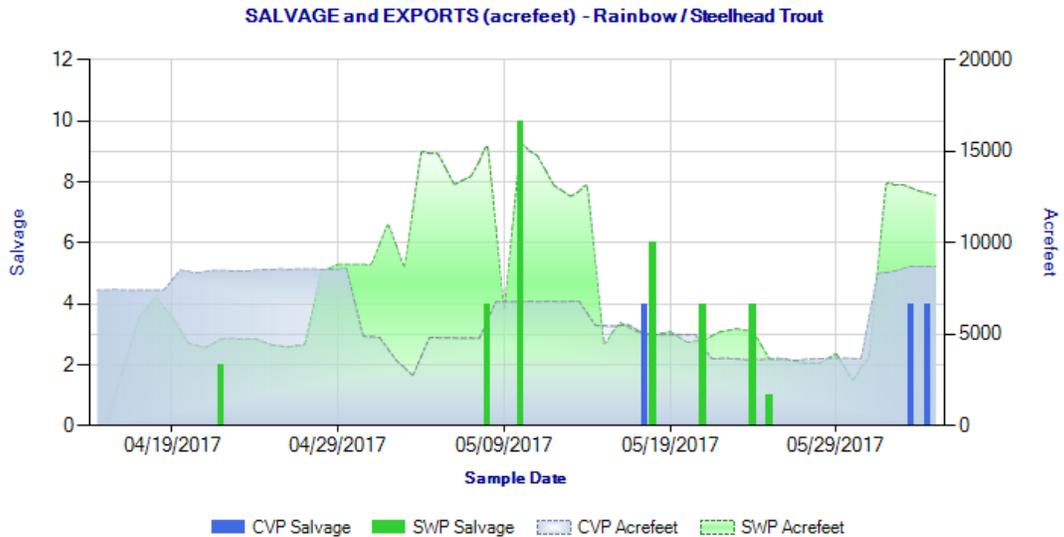


Figure 2. Daily salvage of Steelhead and water exports from the state and federal fish salvage facilities during April 15 through June 4, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

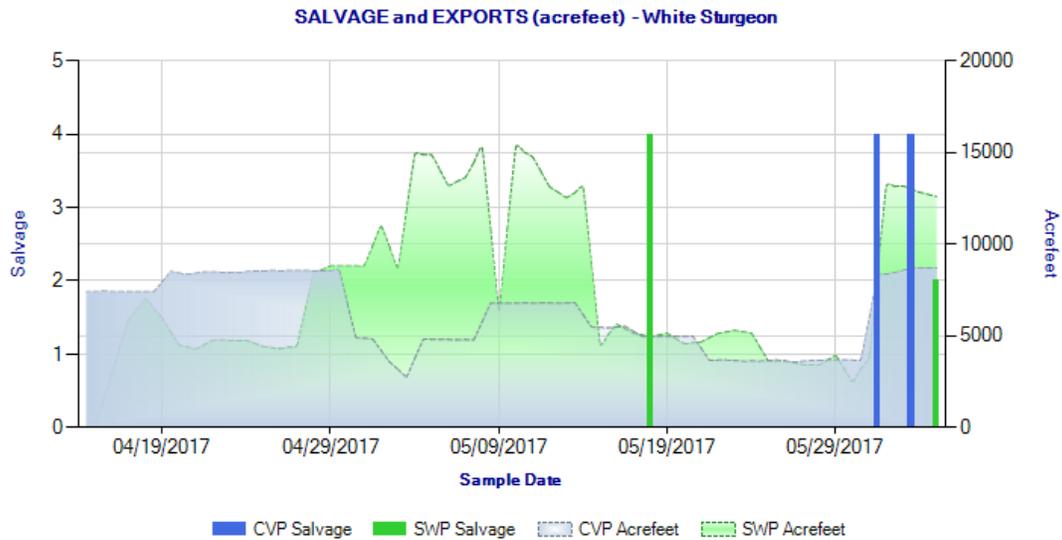


Figure 3. Daily salvage of White Sturgeon and water exports from the state and federal fish salvage facilities during April 15 through June 4, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES through 6/7/17

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released ¹	Total Entering Delta	% Loss of Number Released ²	% Loss of Total Entering Delta ³	First Stage Trigger	Date of First Loss ⁴	Date of Last Loss ⁴
12/9/2016	LF	Coleman NFH	Battle Creek	Production	1642.62	861,966	n/a	0.191	n/a	n/a	12/18/2016	1/23/2017
12/12/2016	LF	Coleman NFH	Battle Creek	Spring Surrogate	181.82	75,000	n/a	0.242	n/a	0.5%	12/22/2016	1/19/2017
12/21/2016	LF	Coleman NFH	Battle Creek	Spring Surrogate	346.73	81,279	n/a	0.427	n/a	0.5%	12/30/2016	1/29/2017
1/9/2017	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	75,000	n/a	0.000	n/a	0.5%	*	*
2/2/2017	W	Livingstone NFH	Sacramento River	WR	0.00	141,388	n/a	0.000	n/a	0.5%	*	*
11/29/2016	S	SJRRP	San Joaquin River	Experimental	175.35	1200	n/a	14.613	n/a	n/a	12/23/2017	1/25/2017
11/29/2016	F	SJRRP	San Joaquin River	Experimental	6.05	544	n/a	1.112	n/a	n/a	12/27/2016	1/14/2017
3/6/2017	S	SCARF	San Joaquin River	Experimental	762.54	60,108	n/a	1.269	n/a	n/a	3/29/2017	5/15/2017
3/6/2017	S	SIRF	San Joaquin River	Experimental	448.77	38,106	n/a	1.178	n/a	n/a	4/2/2017	5/17/2017
4/24/2017	F	MRH	Merced River	Experimental	176.44	70,591	n/a	0.250	n/a	n/a	5/2/2017	6/1/2017

UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2016/2017

Facility	Unknown CWT Loss ⁵	Unread CWT Loss ⁶	Unknown Hatchery Loss ⁷	Acoustic Tag Loss ⁸	Number of Unassigned CWTs ⁹
SWP	266.47				
CVP	32.88				
TOTAL	279.60				

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2016 through 6/7/2017.

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

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

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

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

⁵Adipose-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).

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

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

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

⁹CWT 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.

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

** Information not yet available.

DWR-DES Revised 6/8/2017

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

Agenda Item 9.

Fish Monitoring: The following table presents fish monitoring data summarized over the identified sampling dates. Unless otherwise noted, any reported sizes are fork length. Chinook run assignments are based on length-at-date criteria. DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. Additionally, once hatchery fall-run releases (75% of which are unmarked) occur upstream of a monitoring location (the first of which occurred on 3/22/17 for the current outmigration season), DOSS assumes that many of the unclipped spring-run-sized Chinook (and perhaps some of the winter-run-sized Chinook) observed in monitoring may be unmarked hatchery fall-run Chinook that fall into the spring-run or winter-run size ranges.

Location	Chippis Is. Midwater Trawl ^A	Sacramento Trawl ^A	Beach Seines ^A	Knights Landing RST ^B	Tisdale RST ^C	GCID RST ^D	Mossdale Kodiak Trawl ^E
Sample Date	5/28, 5/30-6/3	5/28, 5/30-6/3	5/30-6/2	5/23-6/4	5/22-6/2	5/30-6/5	5/30-6/3
Chinook							140
FR Chinook	1451	2696	1	5	1	101 juveniles 20 smolts	
SR Chinook	28	2				3 smolts	
WR Chinook							
LFR Chinook							
Ad-Clipped Chinook	358	826	1	1 FR		9 FR (4 juveniles 5 smolts)	6
Steelhead (ad-clip)							
Steelhead (wild)		1				2	
Green Sturgeon							
Flows (avg. cfs)				10,463	11,567	1,709	
W. Temp. (avg. °F)				66.9	64	61.4	
Turbidity (avg. NTU)				21.4	21.6	15.1	

^A Data reported in the 5/28-6/3 DJFMP sampling summary and includes 1 acoustic tagged CHNT at the Sacramento Trawl.

^B Knights Landing RST sampling period was from 5/23 at 11:15 am to 6/4 at 12:15 pm.

^C Tisdale RST sampling period was from 5/22 at 9:30 am to 6/2 at 9:45 am. Both traps were modified to 50% cone sampling during the sampling period. On 6/1 both traps began fishing at full cone.

^D GCID RST sampling period was from 5/30 to 6/5.

^E Mossdale trawl sampling period was from 5/30 to 6/3.

Red Bluff Diversion Dam (RBDD)

USFWS biweekly report (5/21/17-6/3/17) for preliminary daily estimates of passage for all runs of unmarked juvenile Chinook salmon and steelhead captured by rotary screw traps at RBDD included:

Run and Species	Biweekly Total	Brood Year Total (90% CI)
Winter-run Chinook (BY2016)	0	537,519 (385,409-689,630)
Spring-run Chinook (BY2016)	1,689	990,635 (-258,087-2,239,359)

Agenda Item 10.

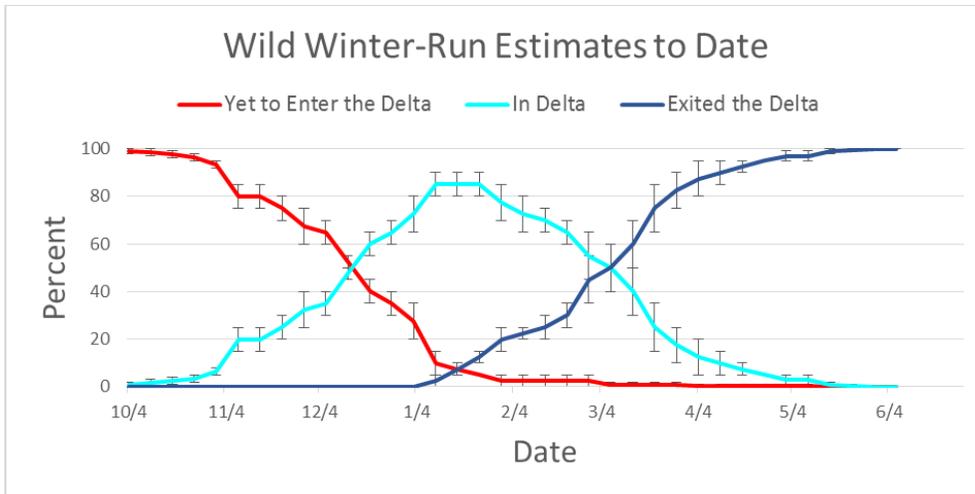
DOSS Estimates of Fish Distribution and Assessment of Entrainment Risk

DOSS estimates of the current distribution of listed Chinook, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns. DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. Additionally, once hatchery fall-run releases (75% of which are unmarked) occur upstream of a monitoring location (the first of which occurred on 3/22/17 for the current outmigration season), DOSS assumes that many of the unclipped spring-run-sized Chinook (and perhaps some of the winter-run-sized Chinook) observed in monitoring may be unmarked hatchery fall-run Chinook that fall into the spring-run or winter-run size ranges.

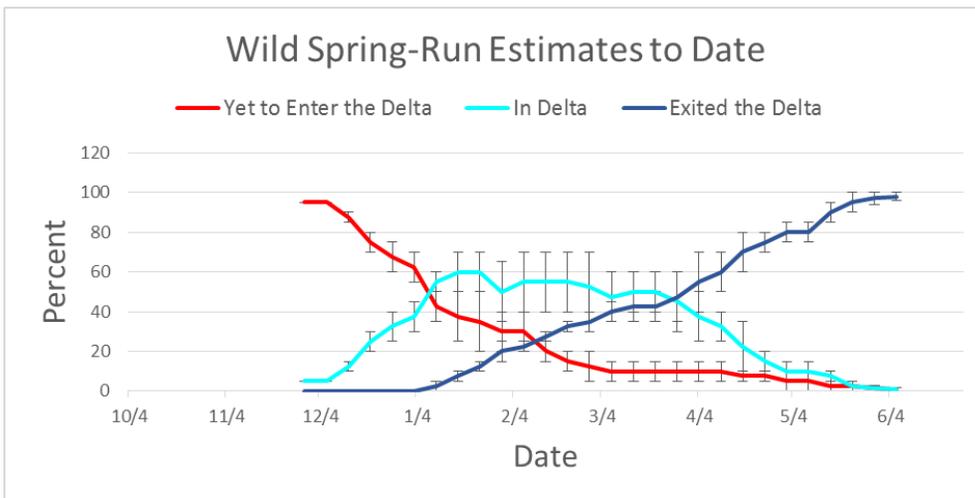
Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year (YOY) winter-run Chinook salmon</i>	0% (Last week: same)	0% (Last week: same)	100% (Last week: same)
<i>Wild young-of-year (YOY) spring-run Chinook salmon</i>	0%-2% (Last week: 0%-3%)	0%-2% (Last week: 0%-3%)	96%-100% (Last week: 94%-100%)
<i>Hatchery winter-run Chinook salmon (released 2/2/17)</i>	0% (Last week: same)	0% (Last week: same)	100% (Last week: same)

Rationale for changes in distribution

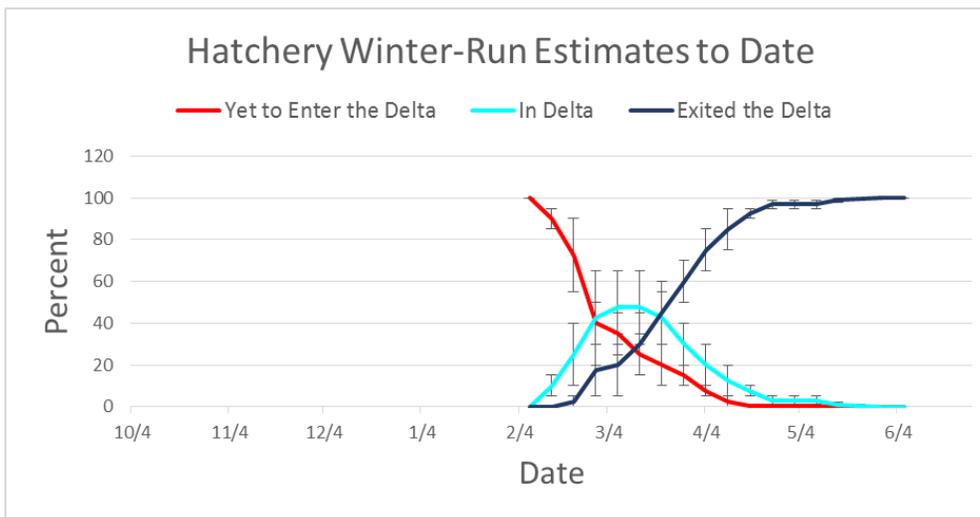
Wild spring-run Chinook: Over the past week, 3 smolt spring-run-sized Chinook were observed at GCID, 2 were observed at the Sacramento trawl, and 28 at Chipps Island. DOSS estimated that 2 percent more have moved past Chipps Island.



WY 2017 wild winter-run distribution estimates to date.



WY 2017 wild spring-run distribution estimates to date.



WY 2017 hatchery winter-run distribution estimates to date.

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. Risks are unchanged from the previous week unless noted otherwise.

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

- **Exposure Risk: LOW**
 - All winter-run and most spring-run Chinook salmon are estimated to have migrated out of the Delta past Chipps Island.
- **Routing Risk: LOW**
 - Intermediate river flows are expected to mute the tidal effects at Georgiana Slough (reducing the risk of routing into Georgiana Slough).
 - Delta Cross Channel is closed and likely to remain closed if river flow remains above ~20,000 cfs.
- **Overall Entrainment Risk: LOW**

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

- **Exposure Risk: LOW**
 - Recent data from Mossdale reported catch of unclipped and clipped Chinook salmon (likely a mix of fall-run Chinook and hatchery spring-run Chinook).

- All recent salvage of hatchery Chinook is from releases in the San Joaquin Basin suggesting that most of the unclipped Chinook observed in recent salvage are also of San Joaquin basin origin.
- For the salvage reporting period of 5/29/17-6/4/17, 4 wild and 4 hatchery steelhead were salvaged at the export facilities.
- DOSS estimates that all Sacramento basin winter-run and most Sacramento basin spring-run Chinook salmon have exited the Delta past Chipps Island.
- Historically, most steelhead outmigration from the San Joaquin River is during April and May.
- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: HIGH
 - OMR -6,250 cfs⁷: incrementally HIGHER (given projected hydrology and high Vernalis flow)

Some members expect the relative risk of entrainment of an OMR limit of -6,250 compared to -5,000 cfs to further increase when Vernalis flows decrease.

- **Overall Entrainment Risk:**
 - OMR -2,500 cfs: LOW
 - OMR -3,500 cfs: LOW
 - OMR -5,000 cfs: MEDIUM
 - OMR -6,250 cfs⁶: incrementally higher within MEDIUM

Considering the continued high Vernalis flows forecasted through the weekend, most members agreed that overall entrainment risk into the export facilities is lower at most OMR levels than it would be under lower flow conditions. The overall entrainment risk was driven in large part by the LOW exposure risk and less so (given projected hydrology) by the OMR/Export Risk.

Agenda Item 11.

DOSS Advice to NMFS and WOMT: None

Agenda Item 12.

Next Meeting: The next DOSS conference call will be on **6/13/17 at 9am.**

⁷By request of management, DOSS also assessed risks at an OMR flow more negative than -5,000 cfs.