

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 4/11/2017 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: Duane Linander, Ken Kundargi, Jerry Morinaka, Bob Fujimura, Jason DuBois, Trishelle Tempel

DWR: Bryant Giorgi, Farida Islam, Mike Ford, Dan Yamanaka

NMFS: Kristin McCleery

Reclamation: Tom Patton, Towns Burgess, Mike Hendrick, Don Portz

SWRCB: Chris Kwan

USFWS: Felipe Carrillo, 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/djfmfp)
3. Smelt Working Group update
4. Current Operations
5. Hatchery Releases
6. Fish Monitoring: Tracking of acoustic-tagged hatchery winter-run Chinook salmon
7. Fish Monitoring: Salvage
8. Fish Monitoring: RSTs/trawls/seines
9. DOSS Estimates of Fish Distribution and Assessments of Entrainment Risk
10. DOSS advice
11. Next DOSS meeting

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions in effect during April:

Action IV.1.2¹ (DCC gate operations):

- From February 1 to May 20, the gates will remain closed.

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.2.1³ (I:E ratio)

- Implementation of this action in WY 2017 began 4/1/17, and requires 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 is 4:1, but because the offramp condition is satisfied, no I:E ratio is currently required.
- **Offramp:** Exports are not restricted by the I:E ratio requirements of Action IV.2.1 when Vernalis flow is equal to or greater than 21,750 cfs.

Agenda Item 3.

Smelt Working Group update

The Smelt Working Group (SWG) did not meet this week.

Agenda Item 4.

Current Operations

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	0 ^A	Jones Pumping Plant	3,750
Reservoir Releases (cfs)			
Feather - Oroville	13,750	American - Nimbus	10,000
		Sacramento - Keswick	10,000 ^B
		Stanislaus - Goodwin	1800 ^C
		Trinity – Lewiston	1,500
Reservoir Storage (in TAF)			
San Luis (SWP)	1,024	San Luis (CVP)	967
Oroville	2,922	Shasta	4,273
New Melones	1,877	Folsom	668
Delta Operations (cfs)			
DCC	Closed	Sacramento River at Freeport (cfs)	68,000
Outflow Index (cfs)	~104,000	San Joaquin River at Vernalis (cfs)	22,300
E:I	3.7% (3-day avg.) 3.7% (14-day avg.)	X2	<56 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

³ 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

^A Clifton Court Forebay is shut down for repairs to the intake structure, and may start up early next week at a limited flow rate.

^B Keswick releases will be increased to 20,000 cfs tomorrow, 4/12/17.

^C Goodwin releases will be increased to 2,200 cfs tomorrow, 4/12/17.

OMR flows as of 4/10/17:

	Index (cfs)
Daily	+8,200
5-day	+8,600
14-day	+10,400

Approximate OMR flows as of 4/4/17:

	USGS gauges (cfs)	Index (cfs)
Daily	+9,900	+10,100
5-day	+11,800	+11,100
14-day	+12,600	+12,000

Factors controlling Delta exports:

- 4/4 – 4/11: Delta exports limited by real-time demand or available plant capacity.

The weather forecast indicates rain on Thursday and another chance of rain on Sunday and Monday. Unsettled weather may occur after that.

Agenda Item 5.

Hatchery Releases

On April 5, 2017 USFWS released approximately 6,948,690 brood year 2016 fall-run Chinook salmon from Coleman National Fish Hatchery into Battle Creek. The release is 25% marked (adipose fin clip and CWT) and 75% unmarked fish. A subset (290) are acoustic tagged.

On April 17, 2017 the Department of Fish and Wildlife will release approximately 450,000 brood year 2016 Mokelumne River Hatchery fall-run Chinook salmon into the Sherman Island Net Pens on the San Joaquin River. This release will include 25% marked (adipose fin clip and CWT) fish.

Agenda Item 6.

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

Coleman National Fish Hatchery released approximately 6,948,690 fall-run Chinook salmon into Battle Creek on April 5, 2017. A subset of 290 fish were acoustic tagged with JSATS tags. Two real-time receivers are located at Colusa and the I80/50 Bridge. The fastest fish to Colusa arrived in 1.8 days at a speed of 69 miles/day and the fastest fish to the I80/50 Bridge arrived in 3.7 days at a speed of 59 miles/day. As of 4/8, 22% of the fish were detected at Colusa and as of 4/9, 7% were detected at the I80/50 Bridge.

Agenda Item 7.

DOSS Weekly Salvage Update

Reporting Period: April 3-April 9, 2017

Prepared by Bob Fujimura on April 10, 2017 16:58

Preliminary Results -Subject to Revision

Criteria	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0.39	0	0	0	0	↘	0.06
Wild steelhead	0	0	0	0	0	0	0	→	0
Exports									
SWP daily export	0	0	0	0	0	0	0	↘	0
CVP daily export	7,432	7,427	7,428	7,431	7,453	7,448	7,420	→	7,434
SWP reduced counts									
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

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	4	3	↘	36	70
Spring Run	668	450	↗	1,229	892
Late Fall Run	0	0	→	20	73
Fall Run	4	3	→	8,489	19,314
Unclassified	0	0	→	84	NC
Total	676	456		9,858	20,349
Hatchery					
Winter Run	12	9	↗	337	962
Spring Run	180	130	↗	200	144
Late Fall Run	0	0	→	639	1,387
Fall Run	0	0	→	116	192
Unclassified	0	0	→	6	NC
Total	192	138		1,298	2,685

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	0	0	→	28	77
Hatchery	0	0	→	29	118
Total	0	0		57	196

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

Generated by Bob Fujimura on April 10, 2017

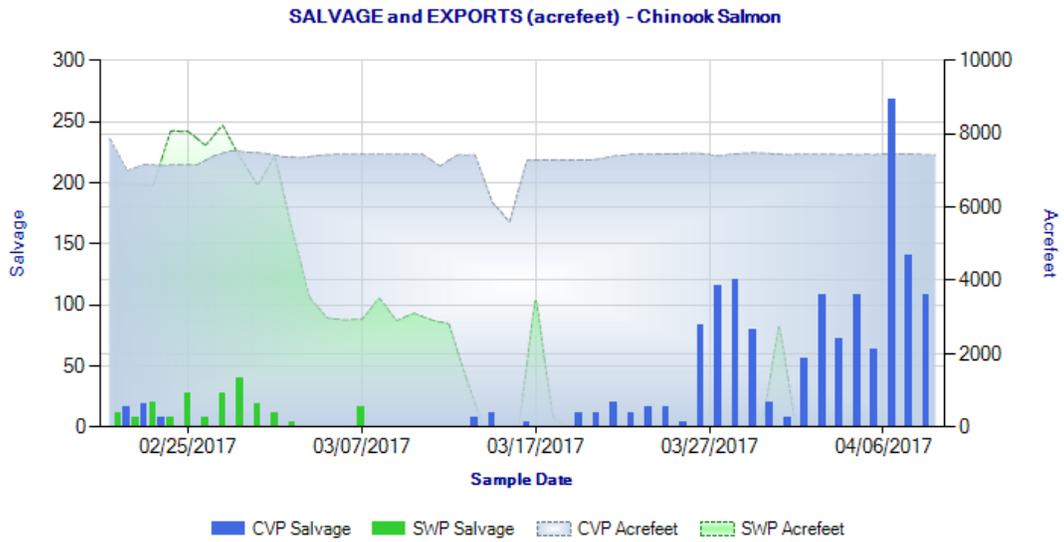


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during Feb 21 through April 9, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

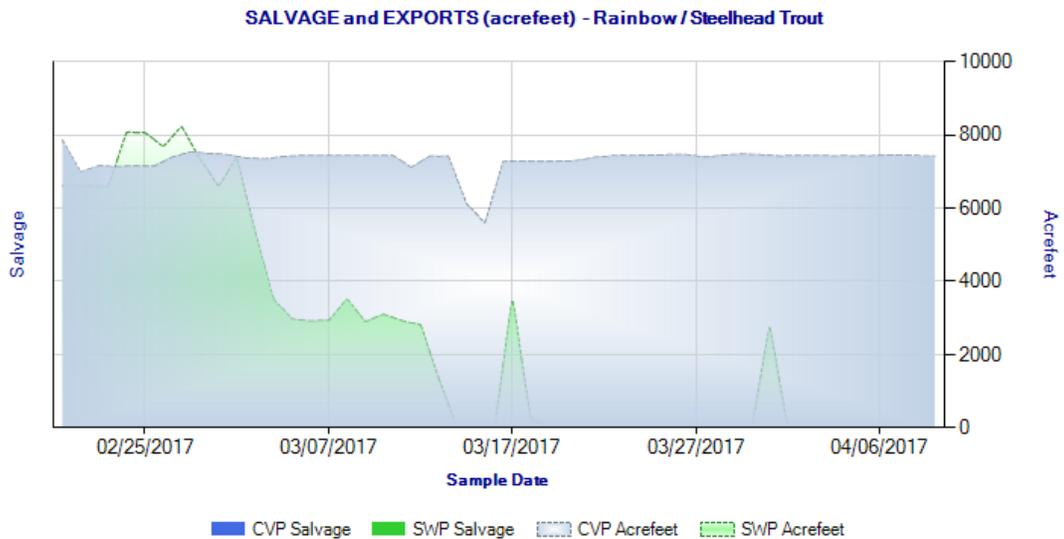


Figure 2. Daily salvage of Steelhead and water exports from the state and federal fish salvage facilities during Feb 21 through April 9, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES through 4/6/17

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	1,642.62	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	0.50%	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	0.50%	12/30/2016	1/29/2017
1/9/2017	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	75,000	n/a	0	n/a	0.50%	*	*
2/2/2017	W	Livinstone NFH	Sacramento River	WR	0.00	141,388	n/a	0	n/a	0.50%	*	*
11/29/2016	S	SJRRP	San Joaquin River	Experimental	116.82	544	n/a	21.474	n/a	n/a	1/8/2017	1/17/2017
11/29/2016	F	SJRRP	San Joaquin River	Experimental	6.05	1,200	n/a	0.504	n/a	n/a	12/27/2016	1/14/2017
3/6/2017	S	SCARF	San Joaquin River	Experimental	37.44	60,108	n/a	.062	n/a	n/a	4/2/17	4/6/17
3/6/2017	S	SIRF	San Joaquin River	Experimental	31.68	38,106	n/a	.083	n/a	n/a	3/29/17	4/6/17

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	141.38				
CVP	13.84				
TOTAL	155.22				

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.

Agenda Item 8.

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 (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	4/2-4/6, 4/8	4/2-4/8	4/2-4/7	4/2-4/9	3/29-4/9	-	4/3-4/8
Chinook							63
FR Chinook	46	155	113	118	337		
SR Chinook	553	451	30	156	722		
WR Chinook	96	27					
LFR Chinook							
Ad-Clipped Chinook	276	424	4	25 FR 38 SR	228		7
Steelhead (ad-clip)				1			
Steelhead (wild)	3	2			2		
Green Sturgeon							
Flows (avg. cfs)				21,757	21,510		
W. Temp. (avg. °F)				55.6	55.6		
Turbidity (avg. NTU)				42.6	38.9		

^A Data reported in the 4/2 to 4/8 DJFMP sampling summary.

^B Knights Landing RST sampling period was from 4/2 at 10:15 am to 4/9 at 10:00 am. On 4/9 cones were modified to 50% sampling in anticipation of increased catch of marked and unmarked CNFH fall-run.

^C Tisdale RST sampling period was from 3/29 at 10:00 am to 4/9 at 10:00 am.

^D No GCID RST sampling has been reported since 3/20/17.

^E Mossdale trawl sampling period was from 4/3 to 4/8. CDFW will continue sampling through June.

Enhanced Delta Smelt Monitoring (EDSM) Catch

EDSM data posted on DJFMP website:

https://www.fws.gov/lodi/juvenile_fish_monitoring_program/jfmp_index.htm

DOSS does not expect to get salmonid data from the EDSM sampling program for the rest of the current salmonid outmigration season, due to the transition to 20mm gear aimed to collect larval delta smelt.

Spring Kodiak Trawl - Survey 4

2017 Spring Kodiak Trawl preliminary salmonid catch from April 3-6. Data are preliminary and subject to change; Chinook run assignments are based on length-at-date criteria. Unless otherwise noted, each station is sampled with a single 10-minute tow. 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 (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.

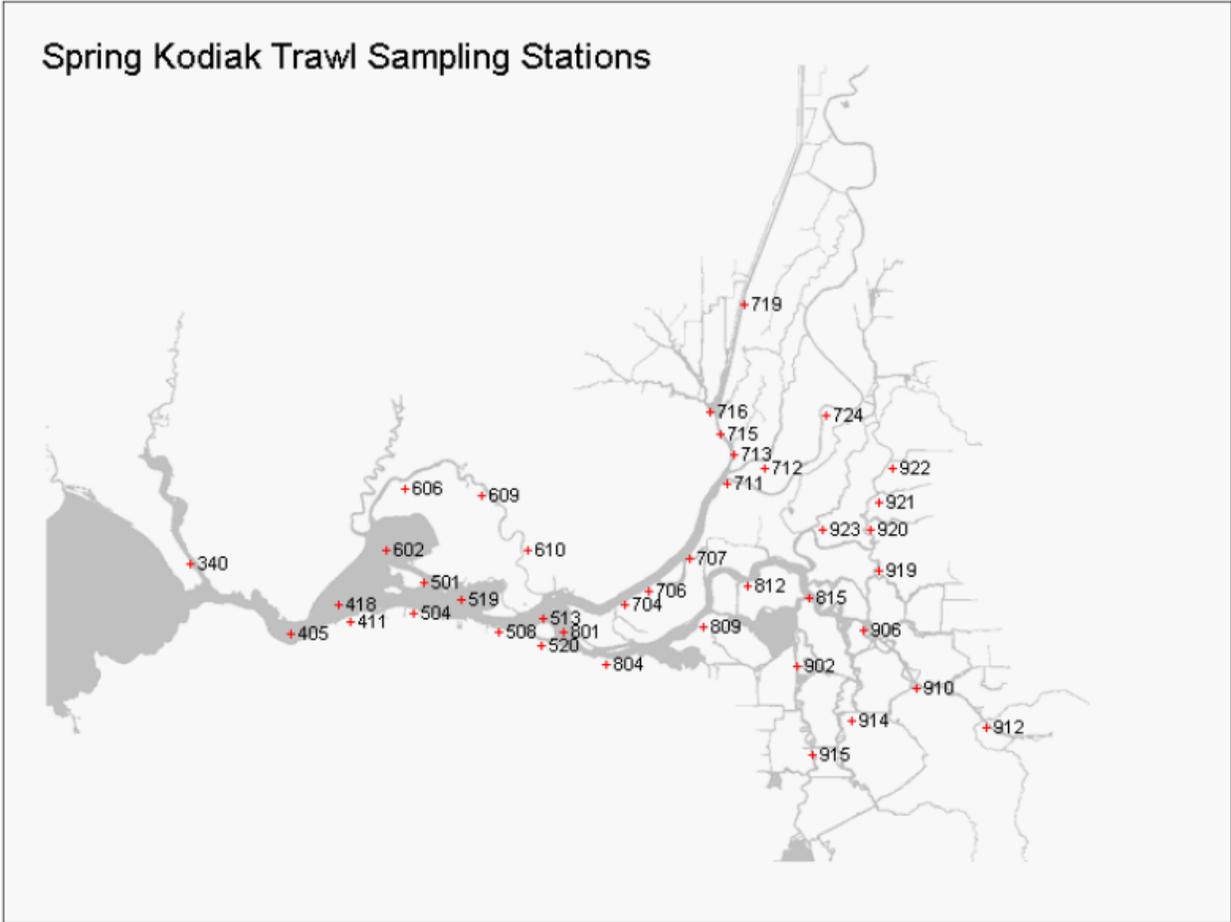
Station	# of Fish	Fall Run Chinook		Spring Run Chinook		Winter Run Chinook		Late Fall Run Chinook		Steelhead	
		Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped	Clipped	Not Clipped
340	2			1	1						
405	7			1	6						
411	0										
418	6			2	4						
501	8			2	6						
504	10			3	6					1	
519	1				1						
602	1				1						
606	1		1								
609	5	1	1		3						
610	0										
508	9			1	8						
513	4			1	3						
520	3				3						
801	3	1			2						
804	1				1						
704	24			6	17	1					
706	22		7	1	13					1	
707	39		5	8	26						
711	8			1	7						
712	2				2						
713	5				5						
715	12	1		3	5					3	
716	1		1								
719	7	1	2		4						
724	7		3	2						2	
809	4			1	3						
812	1			1							
815	4			1	3						
902	0										
906	0										
910	2				2						
912	0										
914	0										
915	0										
919	0										
920	1				1						
921	1										1
922	0										
923	0										
Totals:	201	4	20	35	133	1	0	0	0	7	1

Suisun Bay & West

Confluence

Sac River System

South & Central Delta



Agenda Item 9.

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 (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%-1% (Last week: same)	5%-15% (Last week: 5%-20%)	85%-95% (Last week: 80%-95%)

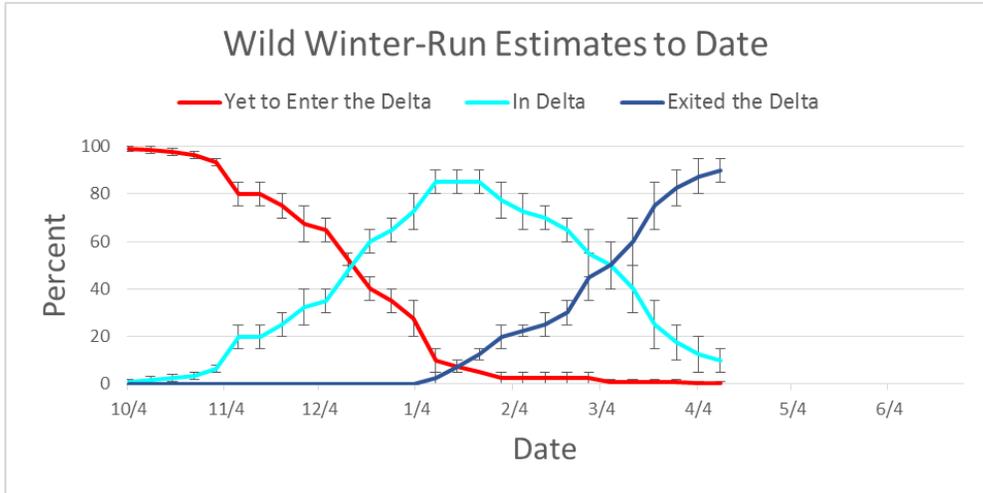
<i>Wild young-of-year (YOY) spring-run Chinook salmon</i>	5%-15% (Last week: same)	25%-40% (Last week: 25%-50%)	50%-70% (Last week: 40%-70%)
<i>Hatchery winter-run Chinook salmon (released 2/2/17)</i>	0%-5% (Last week: 5%-10%)	5%-20% (Last week: 10%-30%)	75%-95% (Last week: 65%-85%)

Rationale for changes in distribution

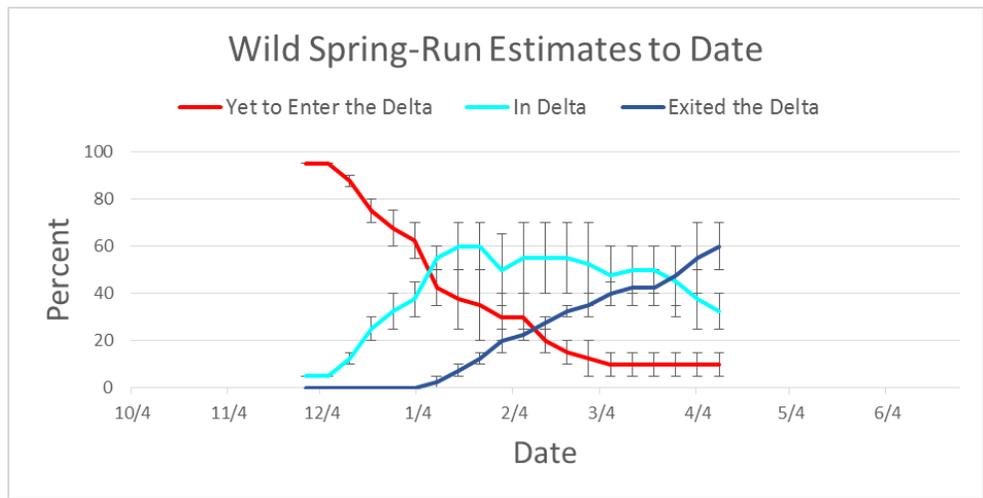
Wild winter-run Chinook: Over the past week 27 juvenile winter-run-sized Chinook salmon were observed at the Sacramento trawl and 96 at Chipps Island. None were observed at upstream monitoring locations. Several Sacramento River weirs were spilling over the past week, continuing the opportunity for winter-run Chinook to enter the flood bypasses and not pass by some sampling locations. Because more fish were observed at Chipps Trawl and none at upstream locations, and due to seasonal timing, DOSS estimated that more winter-run Chinook moved past Chipps Island and fewer remain upstream. At the current time of year, it's expected that most of the winter-run Chinook observed at Chipps Island will soon enter the ocean rather than rear westward in Honker, Grizzly, Suisun and San Pablo Bays.

Wild spring-run Chinook: Over the past week, 156 juvenile spring-run-sized Chinook were observed at Knights Landing, 722 at Tisdale, 451 at the Sacramento trawl, 30 in the beach seines, and 553 at Chipps Island. Several Sacramento River weirs were spilling over the past week, continuing the opportunity for spring-run Chinook to enter the flood bypasses and not pass by some sampling locations. Although high numbers of spring-run-sized fish were observed at multiple monitoring sites this week, many of these are expected to be genetic fall-run. DOSS estimated that up to 10% of spring-run Chinook have moved out of the Delta past Chipps Island compared to last week. DOSS acknowledges that peak smolt emigration from Mill and Deer Creeks usually occurs in April and May, therefore, the upstream estimate remained the same as last week. At the current time of year, some of the spring-run Chinook that have exited past Chipps Island may be ready to enter the ocean; others may potentially be rearing westward in Honker, Grizzly, Suisun and San Pablo Bays.

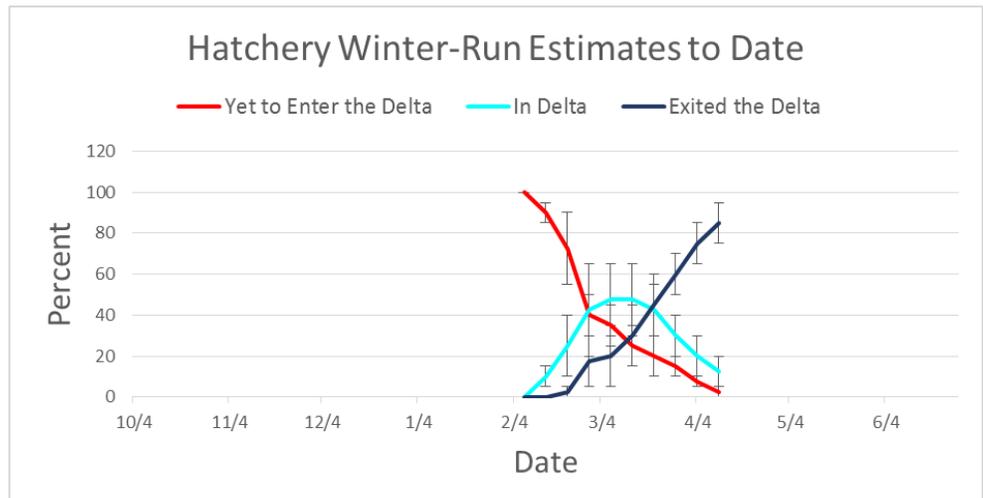
Hatchery winter-run Chinook: Over the past week, 1 winter-run hatchery Chinook was observed in the Spring Kodiak Trawl survey. Migration information on the acoustic-tagged hatchery winter-run Chinook is no longer available since the JSATS tags have reached their 60-day battery life. At this time of year, fewer hatchery winter-run Chinook are expected to remain upstream of the Delta. Based on only observed 1 hatchery winter-run Chinook and seasonal timing, DOSS estimates that more hatchery winter-run have moved through the Delta. With high Sacramento River flows at the time of the winter-run hatchery release (early February), many hatchery winter-run may have reared upstream on inundated floodplains.



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.

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

- **Exposure Risk: HIGH**
 - Flow and turbidities, which are cues for salmonid movement, remain high (flow) or intermediate (turbidity).
 - Some fish are going into bypasses. Fish entering the Yolo Bypass will exit the bypass downstream of the Georgiana Slough junction, reducing entrainment risk into the interior Delta.
 - For the period 4/4/17 to 4/10/17, the Tisdale weir spilled⁷ for three days, and the Fremont and Colusa weirs spilled for two days. The Moulton weir did not spill during this period.
 - Overall, despite bypass overflow, the group assessed the exposure risk as high.
- **Routing Risk: LOW**
 - Continued high 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.
- **Overall Entrainment Risk: MEDIUM**

⁷ A summary of river stage relative to crest height of the weirs on the Sacramento River is available at: http://www.cbr.washington.edu/sacramento/data/alert_weirs.html

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

DOSS notes that these risk assessments at negative OMR levels are not relevant to current OMR levels of ~8,000 cfs, which are projected to stay >8,000 through the weekend.

- **Exposure Risk: MEDIUM**
 - OMR is positive.
 - Beginning in mid-January, saw salmonid catch (fall-run-sized Chinook, no steelhead to date) at Mossdale. Mossdale sampling did not occur from 2/10/17 to 4/2/17 due to high flows; data from last week reported catch of unclipped and clipped Chinook salmon (likely a mix of fall-run Chinook and hatchery spring-run Chinook).
 - Of the fish predicted to be “In the Delta”, DOSS expects that many are in the Yolo Bypass and not at risk of entrainment into the export facilities.
 - All recent catches of hatchery Chinook are 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.

- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: HIGH
 - OMR -6,250 cfs⁸: 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-MEDIUM (given projected hydrology and high Vernalis flow)
 - OMR -5,000 cfs: MEDIUM-HIGH (given projected hydrology and high Vernalis flow)
 - OMR -6,250 cfs⁶: incrementally higher within MEDIUM-HIGH (given projected hydrology and high Vernalis flow)

Considering the high Sacramento River and 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 MEDIUM exposure risk and less so (given projected hydrology) by the OMR/Export Risk.

⁸By request of management, DOSS also assessed risks at an OMR flow more negative than -5,000 cfs.

Agenda Item 10.

DOSS Advice to NMFS and WOMT: None

Agenda Item 11.

Next Meeting: The next DOSS conference call will be on **4/18/17 at 9am.**