

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 3/14/2017 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, Duane Linander, Jerry Morinaka

DWR: Farida Islam, Bryant Giorgi, Kevin Reece, Mike Ford, Tracy Pettit

EPA: Erin Foresman

NMFS: Barb Byrne, Kristin McCleery

Reclamation: Tom Patton, Towns Burgess, Mike Hendrick, Travis Yonts

SWRCB: Chris Kwan, Chris Carr

USFWS: Craig Anderson, Felipe Carillo

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 affecting operations during March:

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 more positive OMR levels have been exceeded.

Agenda Item 3.

Draft 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	3,000*	Jones Pumping Plant	3,750**
Reservoir Releases (cfs)			
Banks Pumping Plant	13,700	American - Nimbus	5,000
		Sacramento - Keswick	10,000***
		Stanislaus - Goodwin	1,000
		Trinity - Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	1,065	San Luis (CVP)	963
Oroville	2,969	Shasta	3,440
New Melones	1,679	Folsom	415
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	62,000
Outflow Index (cfs)	~97,000	San Joaquin River at Vernalis (cfs)	30,300
E:I	6% (3-day avg.) 4% (14-day avg.)	X2	<56 km

*SWP exports will be reduced later today.

**Tracy exports will be reduced to 2,850 cfs tomorrow morning due to decreased demand.

***Keswick releases will be reduced to 8,500 cfs by tomorrow.

Approximate OMR as of 3/14/17:

	Index (cfs)
Daily	+12,000
5-day	+12,500
14-day	+13,400

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

Approximate OMR as of 3/11/17:

	USGS gauges (cfs)	Index (cfs)
Daily	+13,350	+12,600
5-day	+13,600	+13,000
14-day	+15,000	+14,000

Factors controlling Delta exports:

- 3/7 – 3/14: Delta exports limited by real-time demand.

The apron and northern wing wall at Clifton Court Forebay (CCF) are damaged. The wing walls are just inside the radial gates at the southeast corner of CCF, bracketing a concrete apron on the bottom of CCF, and serve to buffer turbulence and scouring of the gate structure. Plans are continuing to be developed and revised for the repair work to the intake structure to Clifton Court. However, a start date and scope or duration of work have not been finalized. Potential restrictions to operation of Clifton Court have not been determined at this time.

The weather forecast predicts dry and warm conditions this week with a chance of light precipitation mid-week.

Agenda Item 5.

Hatchery Releases

A Feather River Fish Hatchery release of spring-run Chinook salmon is tentatively scheduled for Friday, March 17.

Agenda Item 6.

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

Livingston Stone National Fish Hatchery released approximately 141,388 hatchery winter-run Chinook at Caldwell Park in Redding on 2/2/17. 569 were acoustic-tagged with JSATS tags and NOAA's Southwest Fisheries Science Center (SWFSC) is tracking movement of these acoustic-tagged fish past several "real-time" receiver locations near Colusa and Sacramento. From 3/6/17 through 3/12/17, 84 acoustic-tagged hatchery winter-run Chinook salmon were detected at the receivers at Colusa, for a seasonal total of 108 fish (19%) past Colusa. Over the same period, a total of 17 detections were reported at the I80/Hwy50 Bridge receivers, for a seasonal total of 19 (3%). The Tower Bridge receiver stopped operating on 2/27/17.

Sacramento River flows have come down considerably since early March.

Agenda Item 7.

Fish Monitoring: Salvage³

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.

CDFW reported that the outages at the Tracy Fish Collection Facility (highlighted in pale orange) are due to mechanical problems with the secondary screens.

DOSS Weekly Salvage Update

Reporting Period: March 6-March 12, 2017
 Prepared by Bob Fujimura on March 13, 2017 15:40
 Preliminary Results -Subject to Revision

Criteria	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0
Wild steelhead	0	0	0	0	0	0	0	→	0
Exports									
SWP daily export	2,920	2,938	3,507	2,912	3,101	2,928	2,806	↘	3,016
CVP daily export	7,437	7,432	7,428	7,430	7,431	7,435	7,122	→	7,388
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 fish salvage facility outage occurred
 Tan highlighted dates indicate major outages (> 1 h) of a fish salvage facility; TFCF: 3/9 = 2 hrs; 3/11 = 6 hrs

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	→	20	58
Spring Run	8	32	↘	20	82
Late Fall Run	0	0	→	20	73
Fall Run	8	32	↘	8,465	19,299
Unclassified	0	0	→	84	NC
Total	16	64		8,609	19,512
Hatchery					
Winter Run	0	0	→	317	948
Spring Run	0	0	→	0	0
Late Fall Run	0	0	→	639	1,387
Fall Run	0	0	→	116	192
Unclassified	0	0	→	6	NC
Total	0	0		1,078	2,527

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 March 13, 2017

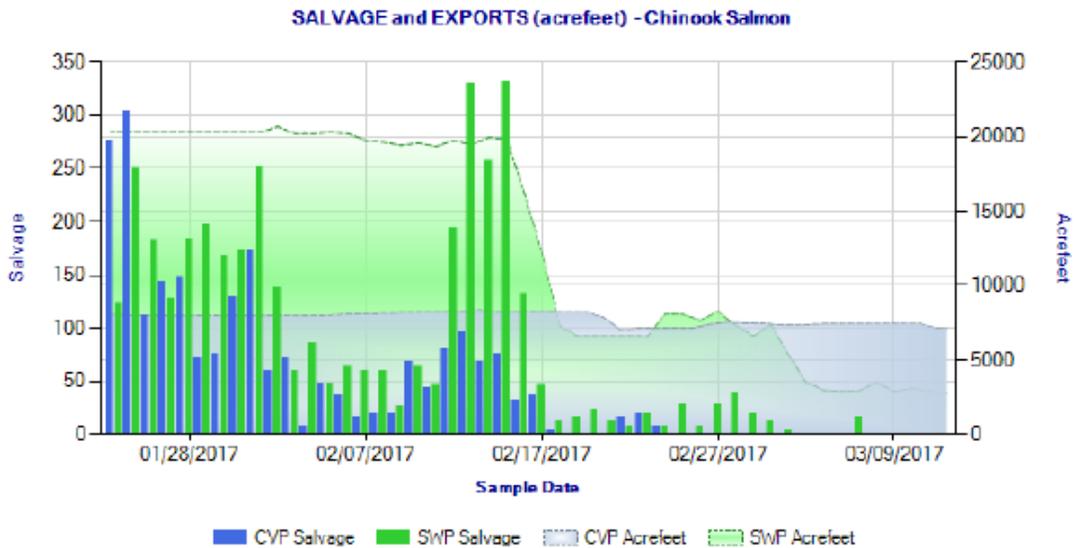


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during Jan 24 through March 12, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

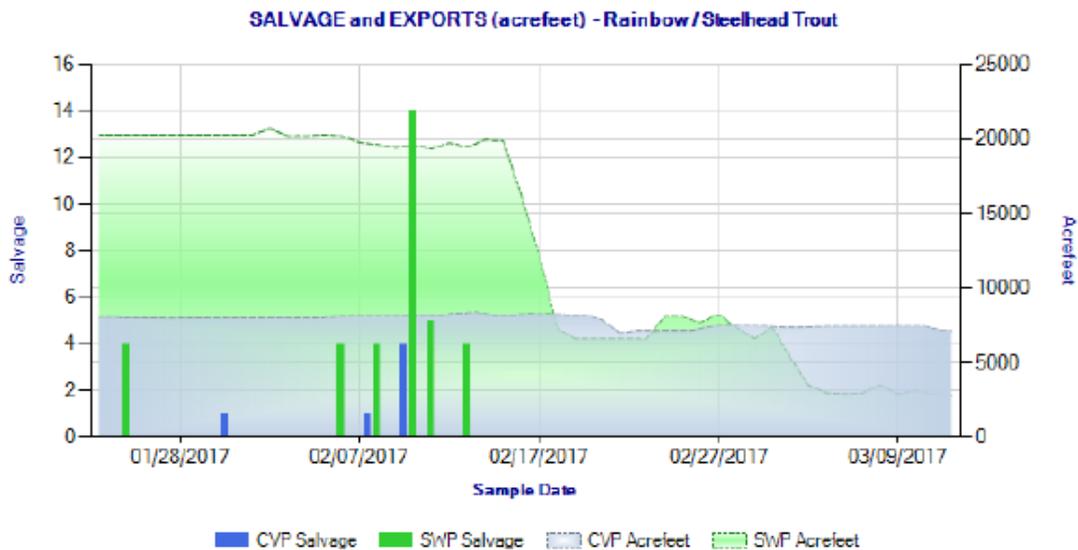


Figure 2. Daily salvage of Steelhead and water exports from the state and federal fish salvage facilities during Jan 24 through March 12, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES through 3/13/17

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	1492.21	861,966	n/a	0.173	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	0.273	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	0.014	n/a	n/a	12/27/2016	1/14/2017

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	141.38				
CVP	2.6				
TOTAL	143.98				

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. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class.

Location	Chippis Is. Midwater Trawl ^{A, E}	Sacramento Trawl ^A	Beach Seines ^A	Knights Landing RST ^B	Tisdale RST ^C	GCID RST ^D	Mossdale Kodiak Trawl ^A
Sample Date	3/5-3/9, 3/11	3/5-3/11	3/6-3/9	3/5-3/12	3/5-3/12	-	-
FR Chinook	1	91	92	37	10		
SR Chinook	1	14	3	12			
WR Chinook	7	2		1			
LFR Chinook							
Ad-Clipped Chinook	1	1		2 WR			
Steelhead (ad-clip)							
Steelhead (wild)	14	6		13			
Green Sturgeon							
Flows (avg. cfs)				25,500	33,133		
W. Temp. (avg. °F)				50	49.5		
Turbidity (avg. NTU)				71.8	66.3		

^AData reported in the 3/5 to 3/11 DJFMP sampling summary. No sampling at Mossdale reported.

^BKnights Landing RST sampling period was from 3/5 at 9:00 am to 3/12 at 9:15 am.

^CTisdale RST sampling period was from 3/5 at 10:00 am to 3/12 at 10:30 am.

^DThe GCID RST cone was pulled on 1/3 at 9:00 pm due to predicted high flows and heavy debris.

Red Bluff Diversion Dam (RBDD)

USFWS biweekly report (2/26/17-3/11/17) 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)	6,293	531,370 (382,689-680,051)
Spring-run Chinook (BY2016)	6,477	81,832 (-27,631-191,295)

Enhanced Delta Smelt Monitoring (EDSM) Catch

EDSM data posted on DJFMP website:

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

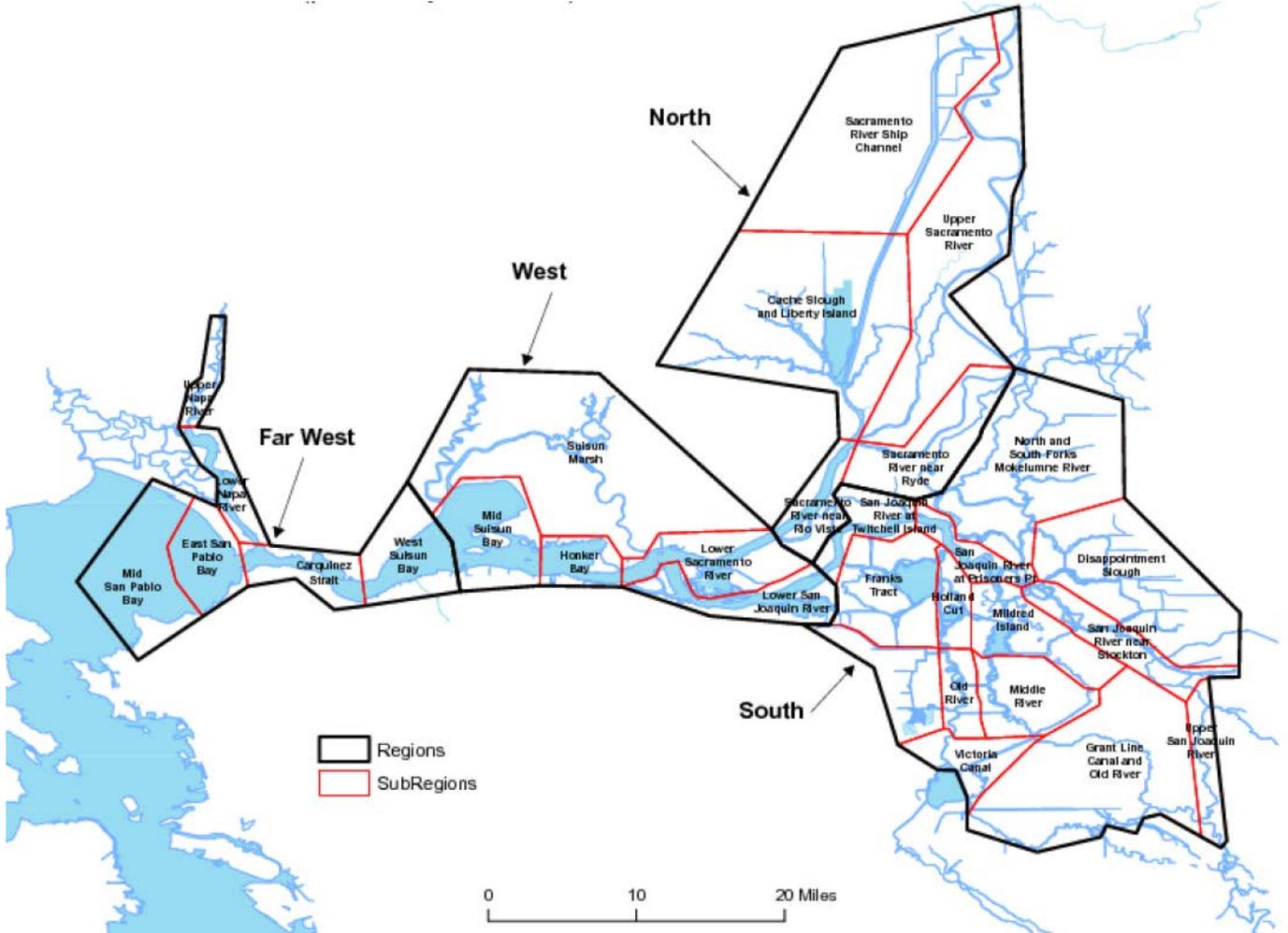
Chinook run assignments for unclipped fish are based on length-at-date criteria. DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class.

For the sampling period 3/6/17-3/9/17, a total of 27 fall-run-sized Chinook, 4 spring-run Chinook, 4 winter-run, and 9 adipose clipped steelhead were caught across all sampling sites. Salmonid catch in the EDSM sampling is summarized in the table below by subregion, and in the bubble plots by individual sampling location.

Subregion	Raw catch						Total Tow Minutes	Catch per 10-minute tow*						Region
	Winter-run Chinook	Spring-run Chinook	Fall-run Chinook	Late-fall-run Chinook	Tagged Chinook	Tagged Steelhead		Winter-run Chinook	Spring-run Chinook	Fall-run Chinook	Late-fall-run Chinook	Tagged Chinook	Tagged Steelhead	
Upper Sacramento River	1	1	8	0	0	1	160	0.06	0.06	0.50	0.00	0.00	0.06	North
Mildred Island	0	0	3	0	0	0	320	0.00	0.00	0.09	0.00	0.00	0.00	South
San Joaquin River at Prisoner's Pt	0	1	1	0	0	2	180	0.00	0.06	0.06	0.00	0.00	0.11	
San Joaquin River near Twitchell Island	0	0	7	0	0	1	180	0.00	0.00	0.39	0.00	0.00	0.06	
Honker Bay	1	0	0	0	0	0	25	0.40	0.00	0.00	0.00	0.00	0.00	West
Lower Sacramento River	0	0	1	0	0	1	25	0.00	0.00	0.40	0.00	0.00	0.40	
Lower San Joaquin	0	0	5	0	0	0	30	0.00	0.00	1.67	0.00	0.00	0.00	
Carquinez Straight	0	0	0	0	0	2	80	0.00	0.00	0.00	0.00	0.00	0.25	Far West
East San Pablo Bay	1	0	0	0	0	0	160	0.06	0.00	0.00	0.00	0.00	0.00	
West Suisun Bay	1	2	2	0	0	2	320	0.03	0.06	0.06	0.00	0.00	0.06	
Total	4	4	27	0	0	9	1480							

*Raw catch/Total tow minutes*10

Map of EDSM sampling regions and subregions:

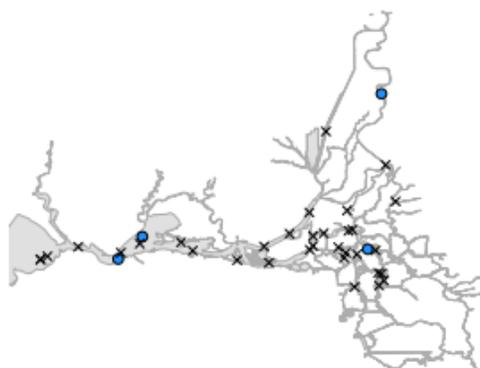


EDSM Sampling 3/6/17 – 3/9/17

Unclipped Winter-run Chinook



Unclipped Spring-run Chinook



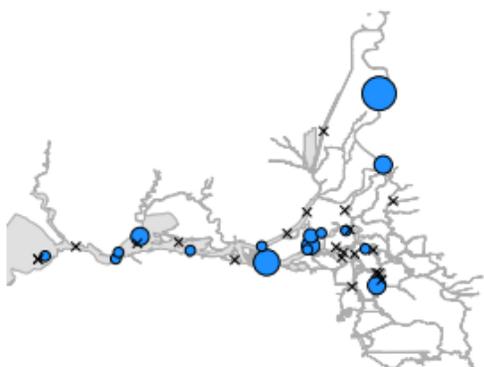
Catch

x 0

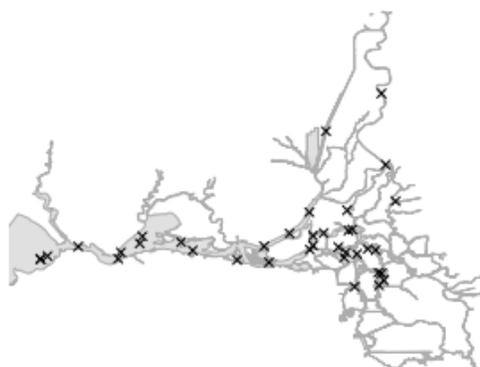
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• 7

All unclipped Chinook



All clipped Chinook

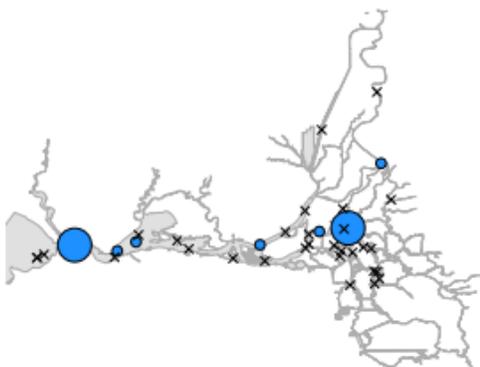


EDSM Sampling 3/6/17 – 3/9/17

All unclipped steelhead



All clipped steelhead



Catch

x 0

• 1

• 2

Spring Kodiak Trawl - Survey 2

2017 Spring Kodiak Trawl preliminary salmonid catch from March 6-9. Data are preliminary and subject to change; Chinook run assignments are based on length-at-date criteria.

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	1									1		
501	1									1		
504	1		1									
519	0											
602	0											
606	1		1									
609	0											
610	1				1							
508	0											Confluence
513	4									4		
520	0											
801	0											
804	0											Sac River System
704	0											
706	0											
707	0											
711	0											
712	0											
713	0											
715	1									1		
716	0											
719	3		3									
724*												
809	0											South & Central Delta
812	0											
815	0											
902	0											
906	0											
910	0											
912	0											
914	0											
915	0											
919	0											
920	1		1									
921	1		1									
922	0											
923	0											
Totals:	15	0	7	0	1	0	0	0	0	7	0	

*No sample

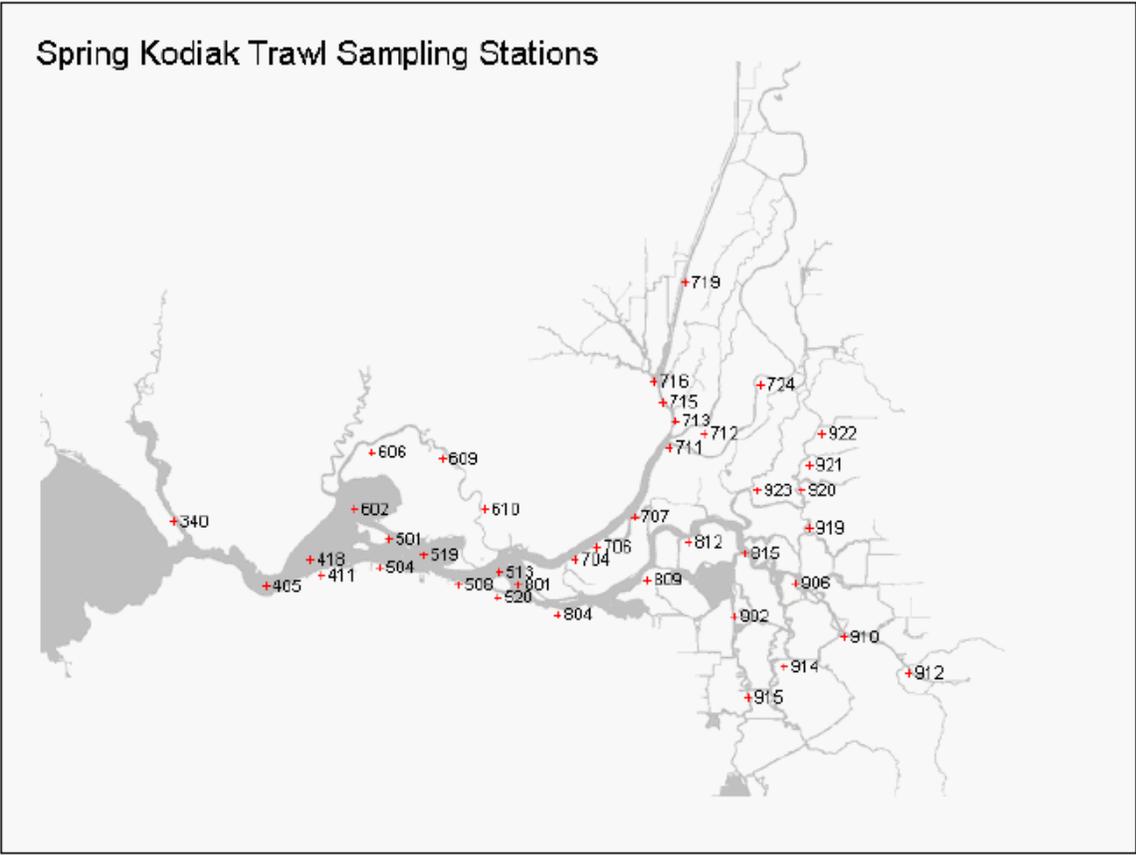


Figure 1. CDFW's Spring Kodiak Trawl Station Locations

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.

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta (including Yolo Bypass)	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year (YOY) winter-run Chinook salmon</i>	0%-2% (Last week: same)	30%-50% (Last week: 40%-60%)	50%-70% (Last week: 40%-60%)
<i>Wild young-of-year (YOY) spring-run Chinook salmon</i>	5%-15% (Last week: same)	40%-60% (Last week: 35%-60%)	35%-50% (Last week: 35%-45%)
<i>Hatchery winter-run Chinook salmon (released 2/2/17)</i>	15%-35% (Last week: 25%-45%)	30%-65% (Last week: same)	15%-45% (Last week: 5%-35%)

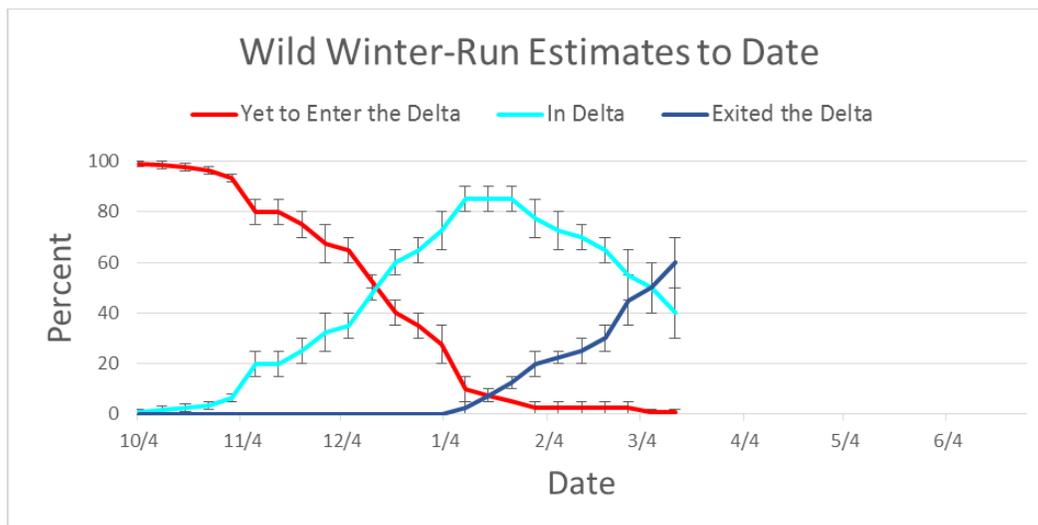
* DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class.

Rationale for changes in distribution

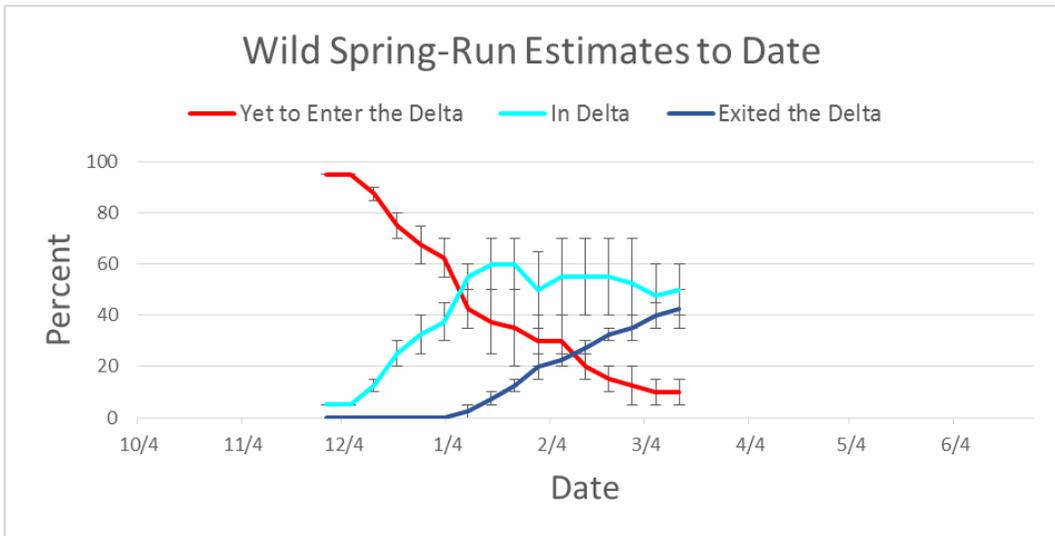
Wild winter-run Chinook: Over the past week 1 juvenile winter-run-sized Chinook salmon was observed at Knights Landing, 2 at Sacramento trawl and beach seines, and 7 at Chipps Island. 4 were also detected at EDSM locations and 1 in the Spring Kodiak Trawl sampling. DOSS considered that the trap efficiency was likely lower at the recent high flows (because the traps are sampling a smaller fraction of the water passing each trapping location) and with some weirs spilling over the past week, some winter-run Chinook likely entered the flood bypasses and did not pass by some sampling locations. Because fish were observed at Chipps Trawl and due to seasonal timing, DOSS estimated that some winter-run Chinook moved past Chipps Island. In mid-March, some winter-run Chinook may have left the Delta and entered the ocean; others may be potentially rearing westward in Honker, Grizzly, Suisun and San Pablo Bays.

Wild spring-run Chinook: Over the past week, 12 juvenile spring-run-sized Chinook were observed at Knights Landing, 17 at the Sacramento trawl and beach seines, and 1 at Chipps Island. 4 juvenile spring-run-sized Chinook were also observed in the EDSM sampling. When estimating the wild spring-run Chinook distribution, DOSS considered that trap efficiency was likely lower at the recent high flows (because the traps are sampling a smaller fraction of the water passing each trapping location) and that with some weirs spilling over the past week, some spring-run Chinook likely entered the flood bypasses and did not pass by some trapping locations. Because more fish were observed at monitoring sites this week and due to seasonal timing, DOSS estimated that some spring-run Chinook moved into the Delta, and a similar fraction exited past Chipps Island, potentially rearing westward in Honker, Grizzly, Suisun and San Pablo Bays.

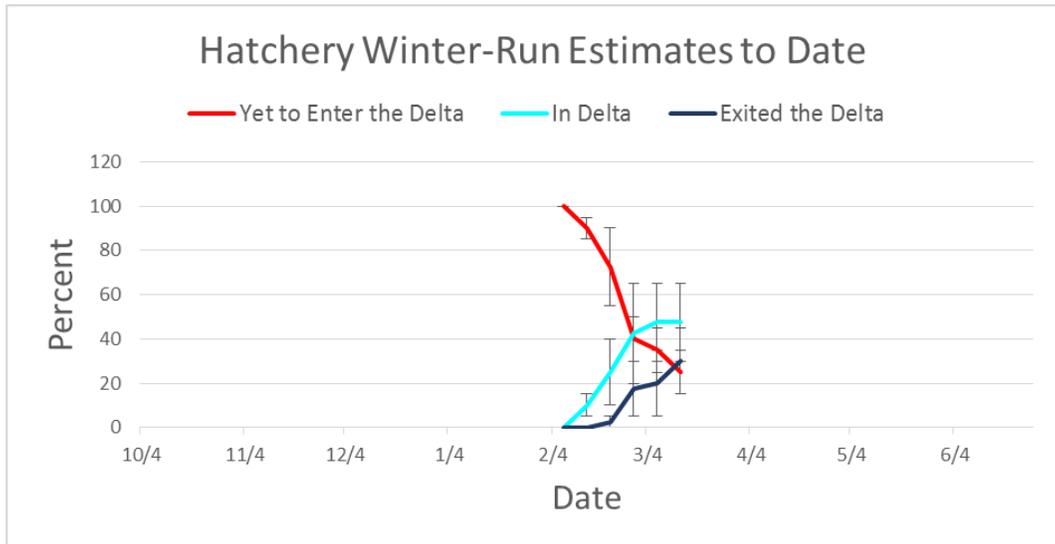
Hatchery winter-run Chinook: Over the past week, 84 winter-run-sized adipose clipped Chinook were observed at receivers at Colusa and 17 at the I80/50 Bridge. This marked increase in tag detections may be due to increased detection range at lower flows, fewer fish spilling into bypasses, increased fish movement, or all three factors. Based on the increase in detections and seasonal timing, DOSS estimates that more hatchery winter-run have moved through the Delta.



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.
 - 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.
 - Moulton, Colusa, Tisdale, and Fremont weirs were all spilling⁶ on 3/5/17. As of 3/14/17, only the Tisdale weir is still spilling, and the spill there is forecasted to end on 3/16.
 - 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**

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 ~12,000 cfs, which are projected to stay >9,000 through the weekend.

- **Exposure Risk: MEDIUM**
 - OMR is positive and salvage has dropped over the past week.
 - Beginning in mid-January, have seen salmonid catch (fall-run-sized Chinook, no steelhead to date) at Mossdale.

⁶ 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

- 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.
- **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-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, and with the expectation that most ESA-listed salmonids will be entering the Delta from the Sacramento basin, 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.

Considering projected hydrologic conditions, the difference between OMR levels of -5,000 and -6,250 represents an incrementally elevated overall entrainment risk to Sacramento Basin salmonid populations. This assessment is likely to change should export levels continue at the current levels and Vernalis flows decrease, at which point risk to Sacramento Basin salmonids will increase.

Agenda Item 10.

DOSS Advice to NMFS and WOMT: None

Agenda Item 11.

Next Meeting: The next DOSS conference call will be on **3/21/17 at 9am.**

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