

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 1/24/2017 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, Jason Julienne, Jerry Morinaka, Ken Kundargi
DWR: Kevin Reece, Farida Islam, Dan Yamanaka, James Edwards, Bryant Giorgi, Mike Ford
NMFS: Barb Byrne, Kristin McCleery
Reclamation: Tom Patton, Towns Burgess, Mike Hendrick
SWRCB: Chris Kwan, Chris Carr
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/djfmfp)
3. Smelt Working Group update
4. Current Operations
5. Hatchery Releases
6. Fish Monitoring: Salvage
7. Fish Monitoring: RSTs/trawls/seines
SacPAS (<http://www.cbr.washington.edu/sacramento/>) has some summaries of juvenile sampling)
8. Check-in on EDSM report content & format
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 January:

Action IV.1.2¹ (DCC gate operations):

- From December 1 to January 31, the gates will remain closed, with limited exceptions.

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.

Smelt Working Group update

The Smelt Working Group did not meet this week.

Agenda Item 4.

Current Operations

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	10,300	Jones Pumping Plant	4,200
Reservoir Releases (cfs)			
Feather - Oroville	12,500	American - Nimbus	11,000*
		Sacramento - Keswick	30,000
		Stanislaus - Goodwin	600
		Trinity - Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	971	San Luis (CVP)	615
Oroville	2,877	Shasta	3,714
New Melones	950	Folsom	395
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	~74,000
Outflow Index (cfs)	~178,000	San Joaquin River at Vernalis (cfs)	~18,500
E:I	8% (3-day) 7% (14-day avg.)	X2	<56 km

*Nimbus releases are expected to ramp down to 5,000 cfs by 2/2/17.

OMR index as of 1/23/16:

- Daily: ~ -4,700 cfs
- 14-day: ~ -4,900 cfs

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

Factors controlling Delta exports:

- 1/17 - 1/18: -5,000 cfs OMR limit per Action IV.2.3 of the NMFS BiOp
- 1/19 - 1/20: Both CVP and SWP at maximum operational capacity
- 1/21 - 1/22: -5,000 cfs OMR limit per Action IV.2.3 of the NMFS BiOp
- 1/23 - 1/24: Both CVP and SWP at maximum operational capacity

The weather forecast predicts dry conditions for the next week.

Agenda Item 6.
Fish Monitoring: Salvage³

DOSS Weekly Salvage Update

Reporting Period: January 16-January 22, 2017
Prepared by Bob Fujimura on January 23, 2017 21:15
Preliminary Results -Subject to Revision

Criteria	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0.32	0	0	0	0	↘	0.05
Wild steelhead	0	0.66	0	0	0	0	0	↗	0.09
Exports									
SWP daily export	17,752	18,465	18,719	19,939	19,891	19,621	19,550	↗	19,134
CVP daily export	7,983	7,968	7,947	8,013	8,027	8,039	8,027	→	8,001
SWP reduced counts	0%	0%	17%	75%	58%	8%	42%	↗	29%
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 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	→	12	23
Spring Run	0	0	↘	0	0
Late Fall Run	2	8	↘	12	39
Fall Run	1,210	1,475	↘	2,329	2,165
Unclassified	0	0	↘	78	NC
Total	1,212	1,483		2,431	2,226
Hatchery					
Winter Run	64	276	↘	316	944
Spring Run	0	0	↘	0	0
Late Fall Run	26	98	↘	610	1,277
Fall Run	0	0	↘	116	192
Unclassified	0	0	↘	6	NC
Total	90	374		1,048	2,413

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	17	↗	16	40
Hatchery	0	0	→	0	0
Total	4	17		16	40

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

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.

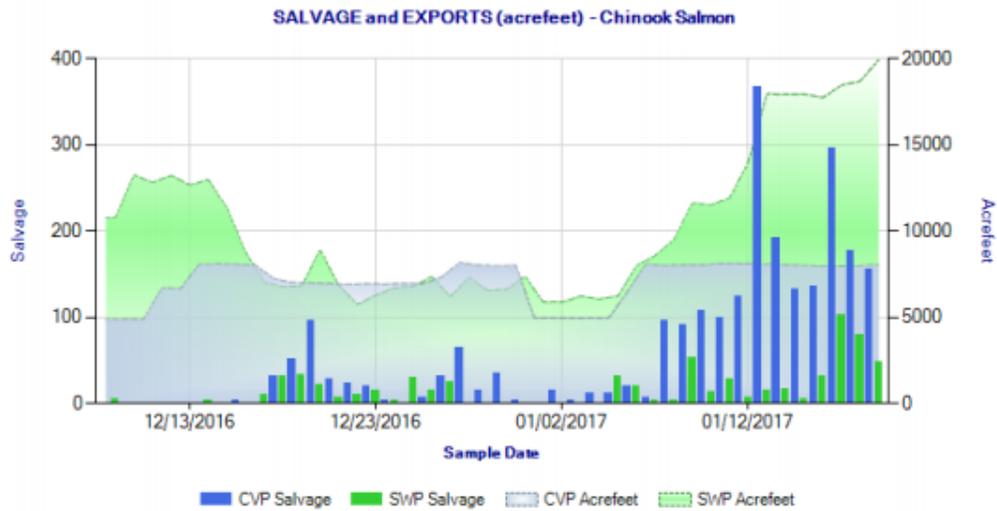


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during Dec 9, 2016 through Jan 19, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

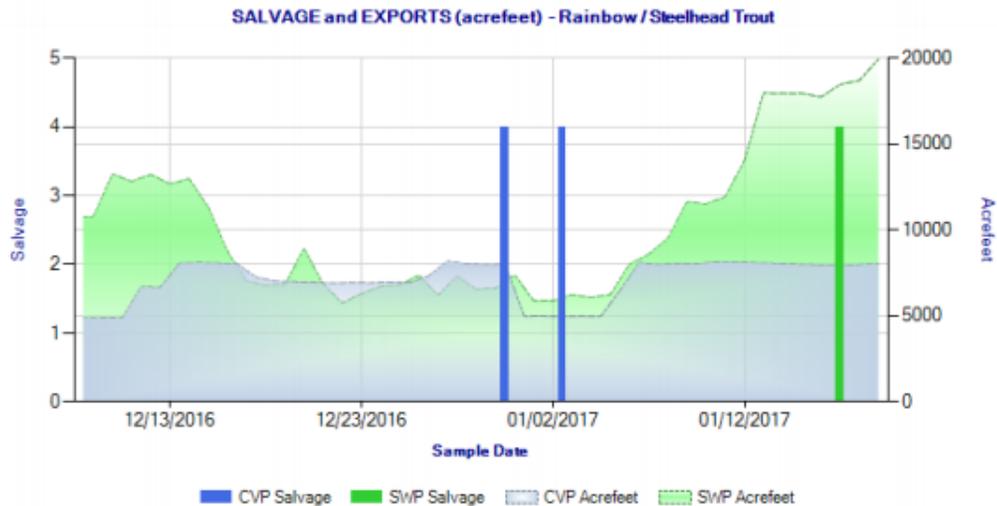


Figure 2. Daily salvage of Steelhead and water exports from the state and federal fish salvage facilities during Dec 9, 2016 through Jan 19, 2017. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 1/23/17

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 Concern Level	Second Concern Level	Date of First Loss ⁴	Date of Last Loss ⁴
12/9/2016	LF	Coleman NFH	Battle Creek	Production	1348.01	861,966	n/a	0.156	n/a	n/a	n/a	12/18/2016	1/23/2017
12/12/2016	LF	Coleman NFH	Battle Creek	Spring Surrogate	179.22	75,000	n/a	0.239	n/a	0.50%	1.00%	12/22/2016	1/19/2017
12/21/2016	LF	Coleman NFH	Battle Creek	Spring Surrogate	236.21	81,279	n/a	0.291	n/a	0.50%	1.00%	1/5/2017	1/16/2017
1/9/2017	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	75,000	n/a	0	n/a	0.50%	1.00%	*	*

Facility	Unknown CWT Loss ⁵	Unread CWT Loss ⁶	Unknown Hatchery Loss ⁷	Acoustic Tag Loss ⁸	Number of Unassigned CWTs ⁹
SWP	102.58				
CVP	2.60				
TOTAL	105.18				

*This table is an update to the CWT table originally shared with DOSS, which did not include all CWTs recovered within the reporting period.

Agenda Item 7.

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.

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	1/17, 1/19	1/17, 1/19, 1/20	1/18-1/19	1/16-1/22	1/13-1/19		1/17-1/18
FR Chinook		56	60	788	213		3
SR Chinook		1	5	5	3		
WR Chinook				5	1		
LFR Chinook				1			
Ad-Clipped Chinook				2 WR	3		
Steelhead (ad-clip)				2	1		
Steelhead (wild)							
Green Sturgeon							
Flows (avg. cfs)				27,200	42,600		
W. Temp. (avg. °F)				47.7	44.7		
Turbidity (avg. NTU)				135.1	180.5		

^AData reported in the 1/15 to 1/21 DJFMP sampling summary.

^BKnights Landing RST sampling period was from 1/16 at 10:15 am to 1/22 at 9:45 am.

^CTisdale RST sampling period was from 1/13 at 10:00 am to 1/19 at 10:00 am. On 1/10 at 9:00 am cones were raised/not fishing due to high winds and safety concern for personnel.

^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 (1/1/17-1/14/17) 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)	1,138	521,945 (388,568-655,322)
Spring-run Chinook (BY2016)	777	50,427 (29,859-70,994)

Enhanced Delta Smelt Monitoring (EDSM) Catch

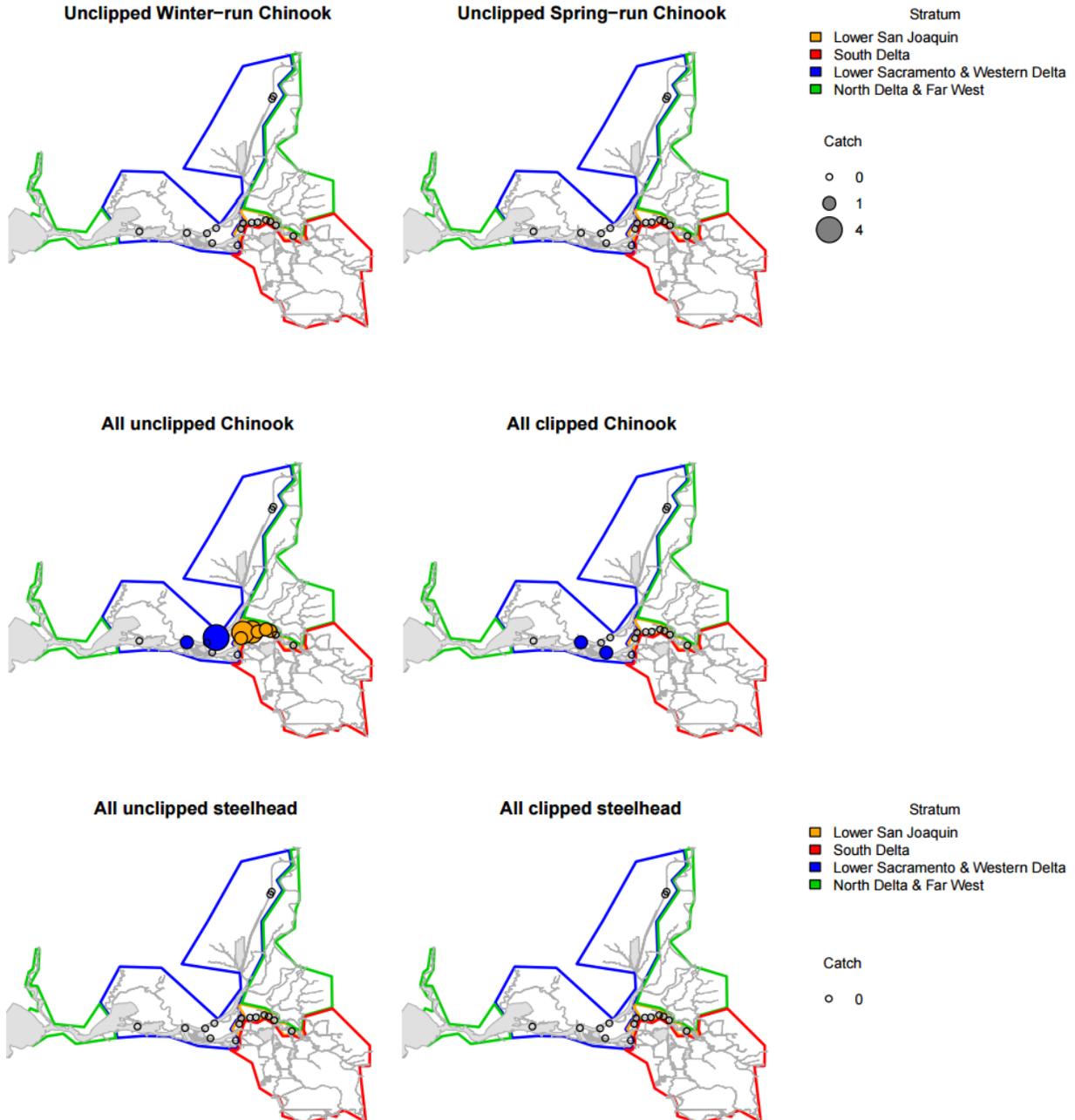
EDSM data posted on DJFMP website:

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

Over the last week of sampling, a total of 2 adipose fin clipped Chinook and 15 fall-run-sized Chinook were caught across all sampling sites.

Dates: 1/17/17-1/19/17		
Number of Sites: 9		
Race	Catch	
FR Chinook	10	Lower San Joaquin
SR Chinook		
WR Chinook		
LFR Chinook		
Ad-Clipped Chinook		
FR Chinook		South Delta
SR Chinook		
WR Chinook		
LFR Chinook		
Ad-Clipped Chinook		
FR Chinook	5	Lower Sac & Western Delta
SR Chinook		
WR Chinook		
LFR Chinook		
Ad-Clipped Chinook	2	
FR Chinook	Not Sampled Last Week	North Delta & Far West
SR Chinook		
WR Chinook		
LFR Chinook		
Ad-Clipped Chinook		

EDSM Sampling 1/17/17 – 1/19/17



Agenda Item 8.

Check-in on EDSM report content & format

DOSS members reviewed and discussed the updated reporting format for salmonid catch in the EDSM sampling and agreed on some additional adjustments to implement in future weeks.

- Summarize catch by new DOSS-defined regions: McCleery or Byrne, for NMFS, will summarize catch by the new regions each week for the tabular reporting.

- Report effort-adjusted catch: NMFS will work with FWS on a metric for effort-adjusted catch for both the tabular reporting and map-based bubble plots.

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.

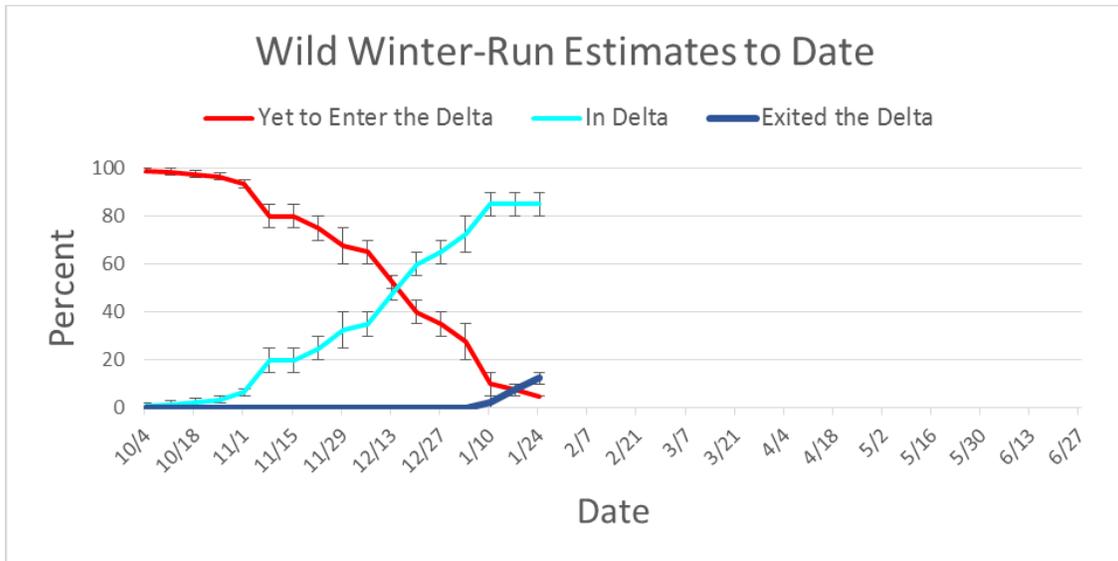
Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Wild young-of-year (YOY) winter-run Chinook salmon</i>	5% (Last week: 5% - 10%)	80%-90% (Last week: same)	10%-15% (Last week: 5 - 10%)
<i>Wild young-of-year (YOY) spring-run Chinook salmon*</i>	20%-50% (Last week: 25% - 50%)	50%-70% (Last week: same)	10%-15% (Last week: 5 - 10%)

* 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.

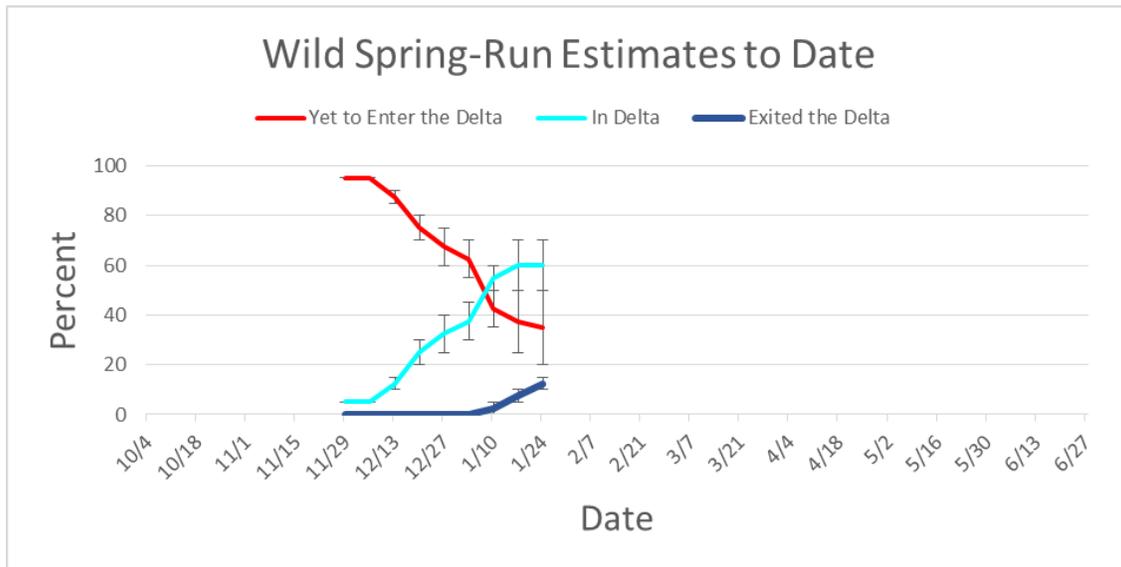
Rationale for changes in distribution

Wild winter-run Chinook: While relatively few juvenile winter-run-sized Chinook salmon were observed at monitoring locations upstream of the Delta, 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). Also, DOSS noted that with all weirs spilling, some winter-run Chinook will enter the flood bypasses and will not pass by some trapping locations. Because of the high flows and due to seasonal timing, DOSS estimated that some winter-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.

Wild spring-run Chinook: Over the past week, 3 juvenile spring-run-sized Chinook salmon were observed at Tisdale, 5 at Knights Landing and 6 in the beach seines and Sac trawl. 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 all weirs spilling, some spring-run Chinook will enter the flood bypasses and will not pass by some trapping locations. Because of the high flows 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.



WY 2017 wild winter-run distribution estimates to date.



WY 2017 wild spring-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 from recent rains, which are cues for salmonid movement, have been high since the weekend and are expected to remain high through the coming weekend.
 - 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.
 - 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.
 - However, we are seeing Sacramento-basin-origin fish in salvage
- **Overall Entrainment Risk: MEDIUM**

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

- **Exposure Risk: MEDIUM-HIGH**
 - Have seen consistent salvage of CNFH hatchery Chinook released into Battle Creek (which enter the Sacramento River upstream of the Red Bluff Diversion Dam) which shows that Sacramento basin fish are present in the south Delta and being entrained into the export facilities; also have seen salvage of unclipped Chinook, likely from the Sacramento basin.
 - Beginning in mid-January, have seen salmonid catch (fall-run-sized Chinook, no steelhead to date) at Mossdale.

- **OMR/Export Risk:**
 - OMR -2,500 cfs: LOW
 - OMR -3,500 cfs: MEDIUM
 - OMR -5,000 cfs: HIGH
 - OMR -6,250 cfs⁵: incrementally HIGHER (given projected hydrology and high Vernalis flow)

- **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)

Agenda Item 10.

DOSS Advice to NMFS and WOMT: None

Agenda Item 11.

Next Meeting: The next DOSS conference call will be on **1/31/17 at 9am.**

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