

**Delta Operations for Salmonids and Sturgeon (DOSS) Group**  
**Conference call: 1/16/2018 at 9:00 am.**

**Objective:** Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon. DOSS will work with other technical teams. DOSS notes and advice can be found at: [http://www.westcoast.fisheries.noaa.gov/central\\_valley/water\\_operations/doss.html](http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html).

**CDFW:** Jason Julienne, Bob Fujimura, Duane Linander, Ken Kundargi

**DWR:** Norman Lee, Farida Islam, Marianne Kirkland, Dan Yamanaka, Jessie Cheng, Mike Ford

**NMFS:** Jeff Stuart, Kristin McCleery

**Reclamation:** Tom Patton, Towns Burgess, Elissa Buttermore, Mike Hendrick, Don Portz

**SWRCB:** Chris Kwan

**USFWS:** 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](http://www.baydeltalive.com/djfmfp))
3. Current Operations
4. Smelt working group update
5. Fish Monitoring: RSTs/trawls/seines
6. Fish Monitoring: Salvage
7. Hatchery Releases
8. DOSS Estimates of Fish Distribution
9. DOSS Estimates of Fish Entrainment Risk
10. DOSS advice
11. Next DOSS meeting

**Agenda Item 2.**

**RPA Implementation Review**

**Delta RPA Actions affecting operations during January:**

**Action IV.1.1 [Alerts that indicate the Delta Cross Channel (DCC) gate operations may be triggered soon] <sup>1</sup>:**

- The First Alert is triggered if either the first component (river flows >95 cfs or the second component (>50% change in mean daily river flow) is met. The first alert was triggered every day this past week based on Mill Creek and Deer Creek flows. See table below for details.

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<sup>1</sup> For details, see pages 60-61 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](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf). Note that in October 2014, NMFS approved a modification of the first component of the first alert to a 95 cfs mean daily flow threshold in either Mill Creek or Deer Creek in lieu of operating the Mill and Deer Creek rotary screw traps.

Date	Mill Creek (MLM)		Deer Creek (DCV)	
	mean daily flow (cfs)	change in mean daily flow	mean daily flow (cfs)	change in mean daily flow
1/2/2018	885	340%	681	276%
1/3/2018	626	-29%	528	-23%
1/4/2018	437	-30%	407	-23%
1/5/2018	324	-26%	320	-21%
1/6/2018	270	-17%	274	-14%
1/7/2018	240	-11%	245	-11%
1/8/2018	222	-8%	226	-8%

- Second Alert is triggered only if both Knights Landing temperatures are less than 56.3°F and Wilkins Slough flows are greater than 7,500 cfs.
  - The second alert was triggered from 1/10 to 1/15. See table below for details.

Date	Wilkins Slough (WLK)	Knights Landing (KL)
	Mean Daily Flow (cfs)	Daily water temperature (°F)
1/9/2018	6347	52
1/10/2018	9689	52
1/11/2018	11176	54
1/12/2018	9870	54
1/13/2018	8745	53
1/14/2018	8134	52
1/15/2018	7766	51

**Action IV.1.2<sup>2</sup> (DCC gate operations):**

- Gates will remain closed per operations described in RPA Action IV.1.2 starting 12/1/17.

**Action IV.2.3<sup>3</sup> (OMR Management):**

- Implementation of this action in WY 2018 is from 1/1/18 through 6/15/18, and requires that Old and Middle River (OMR) flow be no more negative than -5,000 cfs. OMR flows are reported weekly with the OMR index and the tidally filtered USGS gauges at the 5-day and 14-day running averages.
- Until the official JPE letter is issued, the threshold for the minimum fish density threshold trigger described in Action IV.2.3 will be 2.5 fish /TAF (first trigger) and 5 fish/TAF (second trigger).

<sup>2</sup> 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](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations.%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

<sup>3</sup> 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](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations.%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

**Action IV.3<sup>4</sup> (Reduce likelihood of entrainment or salvage at the export facilities, including alert that indicates that export operations may need to be altered):**

- The third alert [November 1-February 28 Knights Landing Catch Index (KLCI) or Sacramento Catch Index (SCI) >10] was not triggered this past week.
- Since the action went into effect on 11/1/17, no salvage of listed salmonids has occurred and thus no salvage-based triggers that would require export reduction have been exceeded.

**Agenda Item 3.**

**Current Operations (1/16/18)**

SWP		CVP	
<b>Exports (cfs)</b>			
Clifton Court Forebay	3,000	Jones Pumping Plant	3,500 (4 units)
<b>Reservoir Releases (cfs)</b>			
Feather - Oroville	1,750	American - Nimbus	3,000
		Sacramento - Keswick	4,000
		Stanislaus - Goodwin	800*
		Trinity - Lewiston	300
<b>Reservoir Storage (in TAF)</b>			
San Luis (SWP)	734	San Luis (CVP)	960
Oroville	1,299	Shasta	3,261
New Melones	1,987	Folsom	577
<b>Delta Operations</b>			
DCC	Closed	Sacramento River at Freeport (cfs)	19,131
Outflow Index (cfs)	~14,700	San Joaquin River at Vernalis (cfs)	2,629
E:I	30.3% (14-day avg.)	X2	75 km

\* Releases at Goodwin will increase to 1,500 cfs tomorrow (1/17) and will decrease to 600 cfs on Thursday (1/18).

Approximate OMR as of 1/13/18:

	USGS gauges (cfs)	Index (cfs)
Daily	-4,620	-4,987
5-day	-4,448	-5,023
14-day	-4,827	-5,060

Approximate OMR as of 1/16/18:

	Index (cfs)
Daily	-4,952

<sup>4</sup> For details, see pages 79-80 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: [http://www.westcoast.fisheries.noaa.gov/publications/Central\\_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711\\_ocap\\_opinion\\_2011\\_amendments.pdf](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

5-day	-4,993
14-day	-4,970

Factors controlling Delta exports:

- 1/2-1/9: -5,000 cfs OMR limit per NMFS BiOp RPA Action IV.2.3

Weather Forecast

A storm system will move through the Sacramento Valley on Thursday with a chance of precipitation. A second system will move into the Sacramento Valley from Sunday through Tuesday of next week with a chance of rain showers. Snow levels are expected to drop to 4,000 feet.

**Agenda Item 4.**

**Smelt Working Group Update**

Due to the Monday holiday, the Smelt Working Group will meet after the DOSS call today, 1/16/18 at 10 am.

**Agenda Item 5.**

Fish Monitoring: The following table presents fish monitoring data summarized over the past week. Empty cells indicate zero catches at those locations with sample dates shown.

Location	GCID RST <sup>A</sup>	Tisdale RST <sup>B</sup>	Knights Landing RST <sup>C</sup>	Butte Creek Fyke trap <sup>D</sup>	Butte Creek RST <sup>E</sup>	Beach Seines <sup>F</sup>	Sacramento Trawl <sup>F</sup>	Chippis Is. Midwater Trawl <sup>F</sup>	Mossdale Kodiak Trawl <sup>F</sup>
Sample Date	1/9-1/15	1/8-1/15	1/8-1/15	1/6-1/12	1/6-1/12	1/7-1/15	1/7-1/15	1/7-1/11	1/8, 1/10
Chinook									
FR Chinook	9 juveniles	10	12			282	125		
SR Chinook	2 juveniles		1	1869	1874	3			
WR Chinook	50 juveniles 1 smolt	13	8			11	1		
LFR Chinook	8 smolts	2	4				1		
Chinook (ad-clip)	246 LFR smolts	17 LFR	12 LFR				8	6	
Steelhead (wild)	3		1						
Steelhead (ad-clip)	122	7	7			1	5	2	
Green Sturgeon									
Flows (avg. cfs)	1041	8071	8831	470	470				
W. Temp. (avg. °F)	53.7	53.3	52.6	45.2	44.6				

<b>Turbidity (avg. NTU)</b>	13.2	24.2	30.2	11.4	11.4				
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<sup>A</sup> On 1/9-1/11, trap operation hours varied during high volume hatchery releases. On 1/13, the GCID RST cone was stopped by a large tree.

<sup>B</sup> Tisdale RST sampling period was from 1/8 at 10:30 am to 1/15 at 10:00 am.

<sup>C</sup> Knights Landing RST sampling period was from 1/8 at 10:00 am to 1/15 at 11:00 am.

<sup>D</sup> Butte Creek fyke trap sampling period was from 1/6 at 10:00 am to 1/12 at 9:30 am.

<sup>E</sup> Butte Creek RST sampling period was from 1/6 at 9:30 am to 1/12 at 9:00 am.

<sup>F</sup> Data for 1/7-1/11/18 queried from [www.baydeltalive.com](http://www.baydeltalive.com), Sac Trawl and Beach Seines data for 1/12-1/15 received as personal communication from DJFMP staff

**Agenda Item 6.**

**Fish Monitoring: Salvage**

B. Fujimura (CDFW) provided a salvage summary.

The first juvenile Chinook salmon were observed in salvage at the CVP facility on Thursday (1/11). Two adipose fin clipped Chinook salmon were observed in salvage (expanded to 8 juveniles in salvage). The coded wire tags (CWT) were collected and determined that the 2 hatchery fish were both spring run released on December 21 from the San Joaquin River Restoration Program. No steelhead or sturgeon were observed in salvage.

## DOSS Weekly Salvage Update

Reporting Period: January 8-January 21, 2018

Prepared by Bob Fujimura on January 15, 2018 20:00

Preliminary Results -Subject to Revision

Criteria	8-Jan	9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	Trend	
<b>Loss Densities</b>									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0
Wild steelhead	0	0	0	0	0	0	0	→	0
<b>Exports</b>									
SWP daily export	5,220	5,224	5,158	5,234	5,230	5,775	5,705	↘	5,364
CVP daily export	7,014	7,023	3,557	7,042	7,033	7,031	7,031	↗	6,533
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 interruption 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
<b>Wild</b>					
Winter Run	0	0	→	0	0
Spring Run	0	0	→	0	0
Late Fall Run	0	0	→	0	0
Fall Run	0	0	→	0	0
Unclassified	0	0	→	0	0
<b>Total</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>
<b>Hatchery</b>					
Winter Run	0	0	→	0	0
Spring Run	8	6	→	8	6
Late Fall Run	0	0	→	0	0
Fall Run	0	0	→	0	0
Unclassified	0	0	→	1	NC
<b>Total</b>	<b>8</b>	<b>6</b>		<b>9</b>	<b>6</b>

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

NC = cannot be calculated; hatchery salmon salvage and loss estimates have been corrected using CWT readings when available

Tan highlighted numbers indicated race determined by CWT tags

## 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	→	0	0
Hatchery	0	0	→	0	0
<b>Total</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>

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

Generated by Bob Fujimura on January 12, 2018

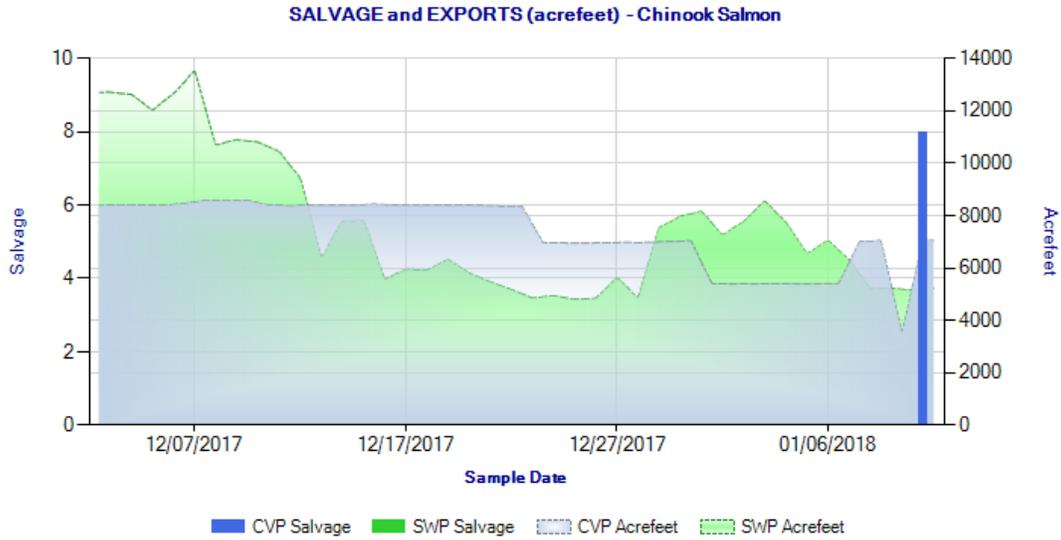


Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during December 3 through January 11, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

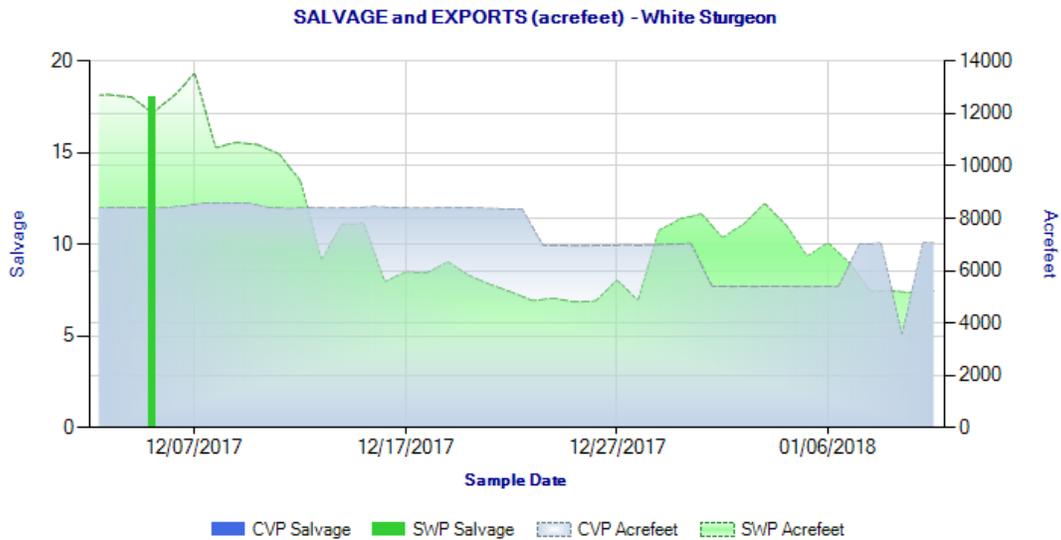


Figure 2. Daily salvage of White Sturgeon and water exports from the state and federal fish salvage facilities during December 3 through January 11, 2018. Graph obtained from the DFG salvage monitoring web page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

**Agenda Item 7.**

**Hatchery Releases**

No releases were posted this week.

**Agenda Item 8.**

**DOSS Estimates of Fish Distribution**

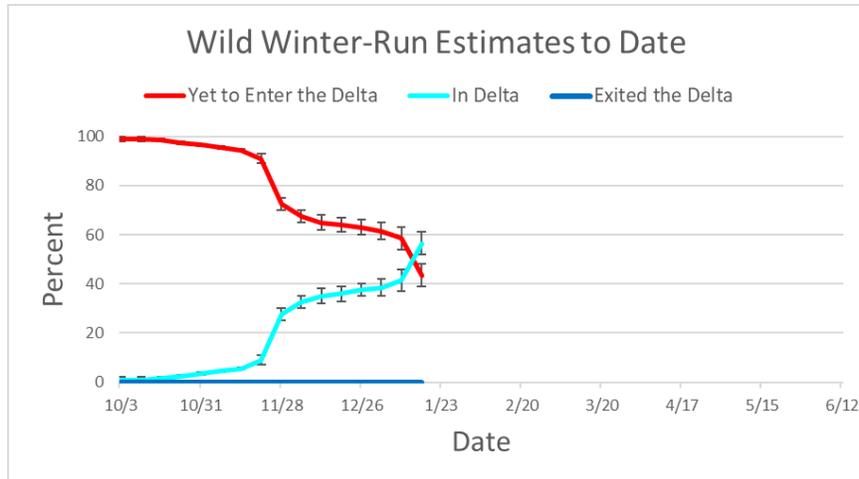
DOSS estimates of the current distribution of listed Chinook and steelhead, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns.

<b>Location</b>	<b>Yet to Enter Delta (Upstream of Knights Landing)</b>	<b>In the Delta</b>	<b>Exited the Delta (Past Chipps Island)</b>
<i>Wild young-of-year winter-run Chinook salmon</i>	39-48% (Last week: 54-63%)	52-61% (Last week: 37-46%)	0% (Last week: 0%)
<i>Wild young-of-year spring-run Chinook salmon</i>	63-76% (Last week: 78-86%)	24-37% (Last week: 14-22%)	0% (Last week: 0%)

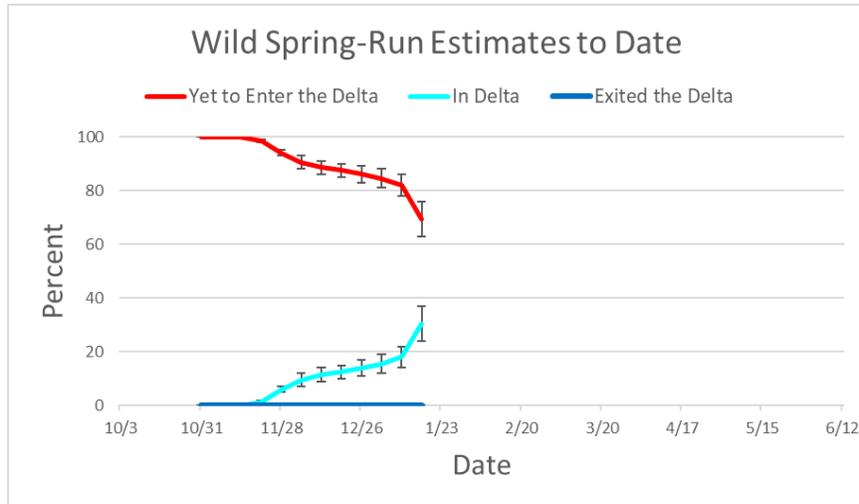
**Rationale for changes in distribution**

Wild winter-run Chinook: 8 juvenile winter-run-sized fish were observed at Knights Landing, 1 Sac Trawl, 11 at the beach seines, 13 at Tisdale, and 51 at GCID this past week. Since last week’s rain increased river flows, and more fish were observed at monitoring locations, DOSS estimated that an additional 15% of the winter-run population has moved into the Delta during the past week.

Wild spring-run Chinook: 1 spring-run-sized fish was observed at Knights Landing, 3 at the beach seines, and 2 at GCID this past week. Since last week’s rain increased river flows, and fish were observed at monitoring locations, DOSS estimated that an additional 10-15% of the spring-run population has moved into the Delta. The majority of spring-run are still considered to be rearing upriver. There is also the potential that some of the fish classified as spring-run by the length-at-date criteria may actually be late emerging and slow growing winter-run Chinook salmon. Cooler river water temperatures this year may have delayed spawning and slowed the emergence and growth of winter-run fry in the upper Sacramento River, and thus these fish would fall into the size criteria for spring-run at this time of year.



**WY 2018 wild winter-run distribution estimates to date.**



**WY 2018 wild spring-run distribution estimates to date.**

**Agenda Item 9.**

**DOSS Feedback on Entrainment Risk**

DOSS provides weekly entrainment risk outlooks by considering (a) two different categories of entrainment risk based on listed fish distribution and (b) factors that influence their potential for entrainment. The two entrainment risk categories considered include:

- **Interior Delta Entrainment Risk**- fish in the Sacramento River that have the potential to be entrained into the Interior Delta through the Delta Cross Channel (when open) and/or Georgiana Slough; and
- **CVP/SWP Facilities Entrainment Risk**- fish in the Interior Delta that have the potential to be entrained into the CVP/SWP facilities.

Influencing factors considered include:

- **Exposure Risk** (both categories)- estimated scale (low, medium, high) of fish anticipated to be in vicinity of an entrainment risk,

- **Routing Risk** (Interior Delta Entrainment Risk)- estimated scale (low, medium, high) that flow split conditions could result in fish migrating into the interior delta instead of remaining in main channel, and
- **OMR/Export Risk** (CVP/SWP Facilities Entrainment Risk)- for fish in the Interior Delta, estimated scale (low, medium, high) that OMR and/or Export levels could result in entrainment into the CVP/SWP facilities.

To provide an overall assessment of entrainment risk, the estimated current status of these influencing factors are described below for each of the entrainment risk categories.

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

- **Exposure Risk: MEDIUM**
  - Increased flows and turbidities from recent storms have stimulated fish movement.
  - Approximately 50-60% of the winter-run population is downstream of Knights Landing at this time, a few winter-run have been seen in the lower Sacramento River section between Sacramento and DCC.
  - 25-40% of spring-run population is in the Delta.
  - Surrogate spring-run Chinook salmon hatchery releases of late-fall run Chinook salmon are in the system. CWTs from captured clipped Chinook salmon are being read from fish collected during monitoring.
  - Clipped Chinook salmon and steelhead have been observed in the Chipps Island trawl.
  - Clipped steelhead have been captured in the Sacramento River near Ryde in Delta smelt monitoring efforts.
  - A Chinook salmon (a 144mm FL clipped fish) was captured near the Sacramento-San Joaquin River confluence (probably a hatchery LFR from CNFH) during Delta smelt monitoring.
- **Routing Risk: MEDIUM**
  - River flows not high enough to mute tidal influence at Georgiana Slough and Three Mile Slough allowing redirection of fish into these route on flood tides.
  - 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:**

- **Exposure Risk: LOW-MEDIUM**
  - San Joaquin River Restoration Program experimental Chinook salmon have been observed in the CVP salvage this past week, indicating that environmental

conditions are likely conducive to listed steelhead moving out of the San Joaquin River basin at this time.

- Beginning to see Chinook salmon and steelhead in the lower Sacramento and western Delta monitoring (at Chipps Island and Sacramento-San Joaquin River confluence).
  
- **OMR/Export Risk:**
  - OMR -2,500 cfs: LOW
  - OMR -3,500 cfs: LOW
  - OMR -5,000 cfs: LOW-MEDIUM
  - OMR -6,250 cfs<sup>5</sup>: LOW-MEDIUM (but higher than -5,000 cfs OMR)
  - OMR -7,500 cfs<sup>5</sup>: MEDIUM (incrementally higher risk if Vernalis flows decrease)
  - OMR -9,000 cfs<sup>5</sup>: MEDIUM-HIGH (Full export capacity, footprint of export effects extend into western Delta and lower San Joaquin River). Different DOSS members ranked the risk as either a medium or a high risk.)
  
- **Overall Entrainment Risk:**
  - OMR -2,500 cfs: LOW-MEDIUM
  - OMR -3,500 cfs: LOW-MEDIUM
  - OMR -5,000 cfs: LOW-MEDIUM
  - OMR -6,250 cfs<sup>5</sup>: LOW-MEDIUM
  - OMR -7,500 cfs<sup>5</sup>: MEDIUM
  - OMR -9,000 cfs<sup>5</sup>: MEDIUM

These assessments are based on current hydrology and fish distributions. Should fish monitoring detect fish moving down into the Delta from the Sacramento or San Joaquin basins, the risk of entrainment into the interior Delta or at the SWP/CVP facilities will increase.

**Agenda Item 10.**

**DOSS Advice to WOMT and NMFS:** None.

**Agenda Item 11.**

**Next Meeting:** The next DOSS conference call will be on **1/23/2018 at 9 am.**

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