Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 11/19/2019 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 here: CCV Water Operations DOSS page.

CDFW: Jason Julienne, Ken Kundargi, Duane Linander, Kyle Griffiths, Jonathan Williams, Geir Aasen
DWR: Bryant Giorgi, Farida Islam, Mike Ford
NMFS: Jeff Stuart, Kristin Begun
Reclamation: Tom Patton, Suzanne Manugian, Towns Burgess
SWRCB: Craig Williams, Michael Macon, Chris Carr, Brittany Davis
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: Bay Delta Live)
3. Current Operations
4. Fish Monitoring: RSTs/trawls/seines
5. Fish Monitoring: Salvage
6. DOSS Estimates of Fish Distribution
7. Risk of Entrainment
8. Other Topics
9. DOSS Advice
10. Next DOSS Meeting

Agenda Item 2.
RPA Implementation Review

Delta RPA Actions affecting operations during November:

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

The First Alert has two components. Capture of yearling-sized spring-run Chinook salmon at the mouths of natal tributaries between October and April indicates that emigration from the tributaries has started or is occurring. As an environmental surrogate to the capture of the yearling-sized spring-run Chinook salmon, which are difficult to capture in the rotary screw traps, tributary flow increases are used to signal conditions conducive to emigration. The First Alert is triggered if either the first component (greater than 95 cfs flow threshold) or

[1] For details, see pages 60-61 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document. 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.

second component (greater than 50% change in mean daily flow) are exceeded. The First Alert was triggered (yellow highlights) this past week due to flows greater than 95 cfs.

	Mill Creek (MLM)		Deer Creek (DCV)	
Date	mean daily flow (cfs)	change in mean daily flow	mean daily flow (cfs)	change in mean daily flow
11/12/2019	121	0%	112	-1%
11/13/2019	121	0%	112	0%
11/14/2019	121	0%	113	1%
11/15/2019	121	0%	113	0%
11/16/2019	121	0%	113	0%
11/17/2019	120	-1%	112	-1%
11/18/2019	120	0%	111	0%

The Second Alert is triggered only if **both** Wilkins Slough flows are greater than 7,500 cfs and Knights Landing temperature is less than 56.3°F. The second alert is in effect beginning 10/1, and has not been triggered.

	Wilkins Slough (WLK)	Knights Landing (KL)
Date	Mean Daily Flow (cfs)	Daily water temperature (°F)
11/12/2019	4,054	56.2
11/13/2019	4,061	56.1
11/14/2019	4,111	56.4
11/15/2019	4,157	56.2
11/16/2019	4,204	56.2
11/17/2019	4,211	56.5
11/18/2019	4,385	56.3

Action IV.1.2[2] (DCC gate operations):

- None of the criteria requiring DCC gate closure were met this past week.

Agenda Item 3.
Current Operations (11/19/2019)

[2] For details, see pages 62-66 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document.

SWP		CVP	
Exports (cfs)			
Banks Pumping Plant	0*	Jones Pumping Plant	800 (1 unit)**
Reservoir Releases (cfs)			
Feather - Oroville	2,450	American - Nimbus	2,700
		Sacramento - Keswick	5,000
		Stanislaus - Goodwin	500***
		Trinity - Lewiston	300
Reservoir Storage (TAF)			
San Luis (SWP)	599	San Luis (CVP)	268
Oroville	1,949	Shasta	3,214
New Melones	1,993	Folsom	532
Delta Operations			
DCC	Open	Sacramento River at Freeport (cfs)	10,400
Outflow Index (cfs)	~8,000	San Joaquin River at Vernalis (cfs)	1,540
E:I	41% (3-day avg.)	X2	>81 km

*SWP exports are currently at 0 cfs for a maintenance outage through tomorrow (11/20). Exports will increase to approximately 3,000 cfs on Friday (11/22) and to 4,000-5,000 cfs over the weekend.
**CVP exports are currently around 800 cfs today (11/19) and tomorrow (11/20) for louvre replacement work and for bathymetric surveys in the main channel. Exports will increase on Thursday/Friday to around 4 units targeting 3,600 cfs, and will drop back down to 1 unit on Saturday (11/23).
***Releases from Goodwin Dam are slightly above base flows (300 cfs) to reduce water volume in New Melones Reservoir prior to this winter.

Factors controlling Delta exports:

- 11/12/2019 – 11/19/2019 Delta outflow as a function of Delta inflow (outflow equal to 50% of inflow) under the USFWS' Delta Smelt biological opinion RPA November Fall X2 action obligations.

Approximate OMRs as of 11/16/2019:

	USGS gauges (cfs)	Index (cfs)
Daily	-4,000	-5,500
5-day	-4,100	-4,400
14-day	-3,100	-3,100

Approximate OMRs as of 11/18/2019:

	Index (cfs)
Daily	-2,100
5-day	-4,900
14-day	-3,300

Weather Forecast
Cooler temperatures and possible showers this afternoon over mainly the Sierra Nevada south of I-80. Breezy to windy conditions tomorrow. Mild temperatures this week across the Sacramento Valley area.

Agenda Item 4.
Fish Monitoring: The following table presents fish monitoring data summarized over the past week.

Location	GCID RST[A]	Tisdale RST[B]	Knights Landing RST[C]	Beach Seines[D]	Sacramento Trawl[D]	Chipps Is. Midwater Trawl[D]	Mossdale Kodiak Trawl[D]
Sample Date	11/12-11/18	11/11-11/18	11/11-11/18	11/12-11/15	11/12-11/13, 11/15	11/12-11/13, 11/15	11/12-11/13, 11/15
FR Chinook							
SR Chinook	6 juveniles						
WR Chinook	42 juveniles			1			
LFR Chinook	2 juveniles 6 smolts						
Chinook (ad-clip)							
Steelhead (wild)							
Steelhead (ad-clip)							
Green Sturgeon							
Flows (avg. cfs)	511	4,466	4,153				
W. Temp. (avg. °F)	55.8	55.7	56.3				
Turbidity (avg. NTU)	6.6	3.9	5.84				

[A] GCID was sampling at half cone this past week.
[B] Tisdale RST sampling period was from 11/11 at 10:30 am to 11/18 at 11:00 am.
[C] Knights Landing RST sampling period was from 11/11 at 11:15 am to 11/18 at 10:00 am.
[D] Data reported in the 11/10 to 11/16 DJFMP sampling summary.

Red Bluff Diversion Dam (RBDD)
USFWS biweekly report (11/5/2019-11/18/2019) for preliminary estimates of passage by brood-year and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

Run and Species	Biweekly Total	Brood Year Total (90% CI)
Winter-run Chinook (BY2019)	77,882	3,684,857 (2,431,390-4,938,324)
Spring-run Chinook (BY2019)	15,948	224,256 (142,027-306,484)

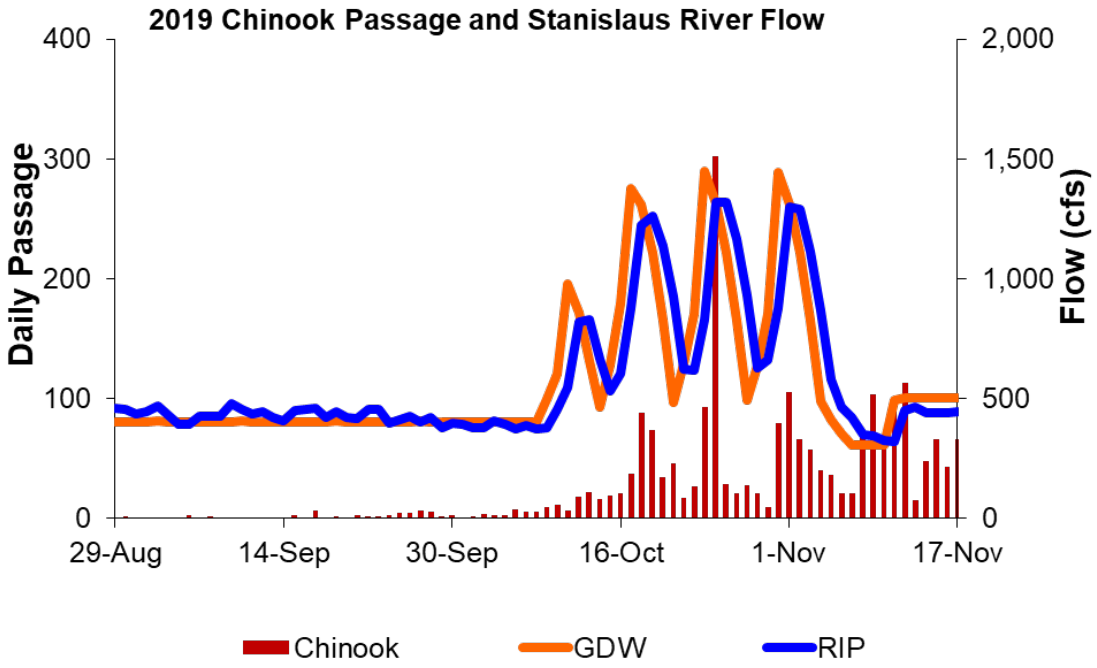
Juvenile Green Sturgeon Monitoring Summary for DOSS; 11/19/2019
Sampling Season Summary

- **No juveniles were tagged on 11/13/2019 or 11/14/2019 at sampling site northwest of Sherman Lake.**
- One juvenile green sturgeon tagged on 12/27/2018 was detected 11/13/2019 at sampling site northwest of Sherman Lake (A69-1602-12231).
- One juvenile green sturgeon tagged on 10/3/2019 was detected on 11/13/2019 at sampling site northwest of Sherman Lake (A69-1602-12237).
- One juvenile white sturgeon tagged on 8/6/2019 was detected on 11/13/2019 and 11/14/2019 at sampling site northwest of Sherman Lake (A69-1602-12229).
- Four adult white sturgeon tagged by USFWS Lodi staff in the San Joaquin River were detected at sampling site northwest of Sherman Lake on 11/13/2019: 1 tagged on 3/11/2014 (A69-9001-27541); 1 tagged on 4/3/2014 (A69-9001-27462); 2 tagged on 3/31/2016 (A69-9001-19545 and A69-9001-19646).
- Two adult white sturgeon tagged by USFWS Lodi staff in the San Joaquin River were detected at sampling site northwest of Sherman Lake on 11/14/2019: 1 tagged on 4/3/2014 (A69-9001-27462); 1 tagged on 3/31/2016 (A69-9001-19545).
- One adult white sturgeon tagged by UCD Biotelemetry Lab in September 2010 (location unknown) was detected at sampling site northwest of Sherman Lake on 11/13/2019 (A69-1303-62783).

* Please refer to the 10/8/2019 DOSS notes for a summary of the 2018 sampling season summary.

Stanislaus River Weir

Monitoring at the weir near Riverbank (for upstream passage of adult salmonids) began on 8/29/2019. Over the last week (11/11/2019-11/17/2019), 444 adult fall-run Chinook salmon and 4 *O. mykiss* (*O. mykiss* data through 11/14/2019) were observed passing upstream of the weir. No *O. mykiss* were adipose fin clipped and 2 were greater than 16 inches (indicating that they are steelhead). The cumulative net upstream passage through 11/17/2019 is 2,117 Chinook salmon (21% were adipose fin clipped, indicating a hatchery origin), and 30 steelhead (through 11/14/2019) (data provided by FISHBIO in their 11/18/2019 Stanislaus Weir Update). 17 of 30 total *O. mykiss* this season were unclipped and 13 were clipped, indicating hatchery origin. 10 of the 15 fish >16 inches in length were adipose fin clipped.



CDFW Lower American River Carcass Survey

Chinook salmon carcass surveys began the week of 10/15/2019. The survey area includes Nimbus Dam to Watt Avenue. Reporting for survey period 11/12/2019-11/15/2019:

- 251 observed carcasses
    - 96 female
        - 51 unclipped
        - 45 clipped
    - 103 males
        - 36 unclipped
        - 67 clipped
    - 52 carcasses too deteriorated to determine sex
    - 95 female carcasses evaluated for spawn condition
        - 36/95 (38%) prespawn mortalities
        - 19/95 (20%) partially spawned
        - 38/95 (40%) spawned
- Temperatures at Hazel during the survey period:
    - Minimum: 57.0°F
    - Mean: 57.2°F
    - Maximum: 57.4°F

Agenda Item 5.

Fish Monitoring: Salvage

Griffiths (CDFW) provided the following salvage summary for the period of 11/11/2019-11/17/2019.

DOSS Weekly Salvage Update

Reporting Period: November 11-November 17, 2019

Prepared by Kyle Griffiths on November 19, 2019 8:22

Preliminary Results -Subject to Revision

Criteria	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0.00
Wild steelhead	0	0	0	0	0	0	0	→	0.00
Exports									
SWP daily export	3,820	4,235	5,168	11,147	10,156	10,733	7,048		7,472
CVP daily export	1,738	1,738	1,739	1,740	1,737	1,737	1,733		1,737
SWP reduced counts	100%	100%	100%	100%	100%	100%	100%		
CVP reduced counts	0	0	0	0	0	0	0		

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present
Loss = estimated number of fish lost at the CVP and SWP Delta export facilities based on estimated salvage (see below)
Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operations
Yellow highlighted dates indicate TFCF salvage outage occurred

Chinook Salmon Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

Race determined by size at date of capture; hatchery = adipose fin missing;

		Weekly Total			Season Total	
Category		**Salvage**	**Loss**	**Trend**	**Salvage**	**Loss**
Wild						
	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
	Total	**0**	**0**		**0**	**0**
Hatchery						
	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
	Total	**0**	**0**		**0**	**0**

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

Steelhead Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

	Weekly Total			Season Total	
Category	**Salvage**	**Loss**	**Trend**	**Salvage**	**Loss**
Wild	0	0	→	0	0
Hatchery	0	0	→	4	3
Total	**0**	**0**		**4**	**3**

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

Agenda Item 6.
DOSS Estimates of Fish Distribution
DOSS estimates of the current distribution of listed Chinook salmon and steelhead, 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)
Young-of-year (YOY) winter-run Chinook salmon	94% (Same as last week)	6% (Same as last week)	0% (same as last week)
Young-of-year (YOY) spring-run Chinook salmon	99% (Same as last week)	1% (Same as last week)	0% (same as last week)

Rationale for changes in distribution
Wild winter-run Chinook salmon:
Over 3.6 million Brood Year 2019 (BY19) winter-run Chinook salmon have passed RBDD this year. Approximately 5,200 BY19 winter-run Chinook salmon have been captured by the GCID RSTs since 8/1/2019, and 62 at the Knights Landing RSTs since 9/5/2019. In the last week, 42 winter-run Chinook salmon were captured at GCID and 1 at the beach seines. No winter-run Chinook salmon were observed at the other monitoring locations in the Delta over this past week. Since a small number of winter-run Chinook salmon were observed at monitoring locations in the lower Sacramento and upper Delta over the past week, DOSS estimates that 94% are still present upstream of the Delta.

Wild spring-run Chinook salmon:
Six length-at-date spring-run Chinook salmon were observed at the GCID RSTs this past week and at no other monitoring locations. DOSS notes that no precipitation events have occurred this water year that would trigger young-of-year spring-run Chinook salmon outmigration at this time. Since only 6 spring-run Chinook salmon were observed this past week, flows are low, and due to seasonal timing, DOSS estimates that 99% of the spring-run Chinook salmon population remains upstream of the Delta.

Agenda Item 7.
Risk of Entrainment
Risk of entrainment of listed salmonids into Central and South Delta:
The risk of entrainment to fish that are present in the lower Sacramento River and upper Delta waterways is low. DCC gates are open and Sacramento River inflows to the Delta are similar to last week (~8,000 cfs). Lower Sacramento River flows allow greater tidal influence at the junctions of Georgiana Slough and the DCC with the Sacramento River. These hydrodynamic conditions increase the risk of reverse flows into these junctions. Entrainment risk to fish present in these locations is elevated. Overall risk of juvenile winter-run Chinook salmon entrainment into the interior Delta is considered low as a percentile of population but absolute numbers may increase due to a larger population of young-of-year winter-run Chinook salmon this year.

Some DOSS members, however, expressed concern that with high population numbers of winter-run juveniles, anytime the DCC gate are open, fish may move into the interior Delta as juveniles have already been detected in the upper Delta (Knights Landing and Sacramento Beach seines). These early fish may represent the progeny of earlier spawning adults, and a different life history strategy.

Export Risk:
The overall export risk is slightly higher than last week but still considered low, based on export levels increasing this week at SWP from 0 cfs to approximately 3,000-5,000 cfs on Thursday, and at CVP increasing from 800 cfs to approximately 3,600 cfs on Friday, then decreasing on Saturday. OMR flows will be more negative while exports are increased, and the percentage of Delta inflow exported will be increasing (currently 41% averaged over 3 days). San Joaquin River flows at Vernalis are approximately 1,500 cfs, but are expected to decrease as tributary flows are reduced. Combined exports are currently approximately 800 cfs with a concurrent OMR flow of about -2,100 cfs. The current QWEST flows are about 3,225 cfs, indicating a positive outflow from the San Joaquin River past Jersey Point, but QWEST flow values were negative the past few days. Fish in the vicinity of the exports' area of influence have an increased risk of entrainment due to increased exports this week.

Agenda Item 8.
Other Topics
Stuart (NMFS) reminded the group about the LOBO update meeting tomorrow (11/20/2019) from 1-4 pm. Tom and Elissa from Reclamation will be providing a DOSS summary. Stuart will send out the link for the Webex and audio call-in number.

Begun (NMFS) informed the group that the WY 2019 DOSS Annual Report is now available on the NMFS website at: California Central Valley Water Operations: Delta Operations for Salmonids and Sturgeon

Agenda Item 9.
DOSS Advice to WOMT and NMFS:
None.

Agenda Item 10.
Next Meeting: The next DOSS conference call will be on **11/26/2019 at 9am**.