Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 10/22/2019 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, Geir Aasen
DWR: Bryant Giorgi, Kevin Reece, Farida Islam
NMFS: Jeff Stuart, Kristin Begun
Reclamation: Elissa Buttermore, Tom Patton, Towns Burgess
SWRCB: Craig Williams, 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: 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 October:

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 (>95 cfs

[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.

flow threshold) or second component (>50% change in mean daily flow) are exceeded. The First Alert was triggered this past week due to flows >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
10/15/2019	127	0%	113	0%
10/16/2019	126	-1%	113	0%
10/17/2019	127	1%	116	3%
10/18/2019	128	1%	118	1%
10/19/2019	128	0%	118	0%
10/20/2019	136	6%	123	4%
10/21/2019	129	-5%	119	-3%

- The Second Alert is triggered only if both Knights Landing temperature is less than 56.3°F and Wilkins Slough flows >7,500 cfs. 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)
10/15/2019	5,702	57.3
10/16/2019	6,470	57.4
10/17/2019	6,906	57.6
10/18/2019	6,506	57.4
10/19/2019	6,029	57.5
10/20/2019	6,767	57.9
10/21/2019	7,177	58.0

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

- The KLCI was exceeded on 10/21. Five winter-run Chinook salmon were observed in 38.08 hours, resulting in a KLCI of 3.14 fish. The action response is DCC gate closure for 3 days. Reclamation will close the DCC gates starting on 10/23/19 at ~9:00 a.m.. The DCC gates will reopen on 10/26/19 if no additional triggers are exceeded.

Agenda Item 3.

Current Operations (10/22/19)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	300	Jones Pumping Plant	800
Reservoir Releases (cfs)			
Feather - Oroville	2,450	American - Nimbus	2,700

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

		Sacramento - Keswick	8,500*
		Stanislaus - Goodwin	650**
		Trinity - Lewiston	300***
Reservoir Storage (in TAF)			
San Luis (SWP)	683	San Luis (CVP)	375
Oroville	2,100	Shasta	3,334
New Melones	2,016	Folsom	635
Delta Operations			
DCC	Open	Sacramento River at Freeport (cfs)	12,900
Outflow Index (cfs)	13,100	San Joaquin River at Vernalis (cfs)	2,900
E:I	7% (3-day avg.)	X2	~72 km

*Keswick releases are still pulsing down (to 6,500 cfs) and up (to 8,500 cfs) repeatedly to minimize fall-run Chinook salmon spawning through the first weekend of November.
**Goodwin releases will continue the pulse flow through the end of October.
***Lewiston releases will remain at 300 cfs winter base flow.

Factors controlling Delta exports:

- 10/15-10/22: Fall X2

Approximate OMRs as of 10/19/19:

	USGS gauges (cfs)	Index (cfs)
Daily	-500	-500
5-day	-1,200	-1,000
14-day	N/A*	-1,400

*Issues with USGS MDM gage earlier in October prevent 14-day average calculations.

Approximate OMRs as of 10/21/19:

	Index (cfs)
Daily	-400
5-day	-700
14-day	-1,100

Weather Forecast

The forecast predicts warm and dry weather with above average temperatures in the 80s this week. Breezy conditions increase fire risk in northern California, especially on Wednesday and Thursday.

Agenda Item 4.

Fish Monitoring: The following table presents fish monitoring data summarized over the past week. Unless otherwise noted, reported sizes are fork length.

Location	GCID RST	Tisdale RST[A]	Knights Landing RST[B]	Beach Seines[C]	Sacramento Trawl[C]	Chipps Is. Midwater Trawl[C]	Mossdale Kodiak Trawl[C]
Sample Date	10/14-10/20	10/14-10/21	10/14-10/21	10/15-10/18	10/15-10/16, 10/18	10/15-10/16, 10/18	10/15, 10/17-10/18
FR Chinook	6 smolts						
SR Chinook	3 juvenile		1				
WR Chinook	723 juveniles	2	8				
LFR Chinook	37 juveniles 4 smolts						
Chinook (ad-clip)							
Steelhead (wild)							
Steelhead (ad-clip)							
Green Sturgeon							
Flows (avg. cfs)	1,122	6,676	6,361				
W. Temp. (avg. °F)	56.71	57	57.6				
Turbidity (avg. NTU)	7.30	4.2	5.82				

[A] Tisdale RST sampling period was from 10/14 at 10:45 am to 10/21 at 10:45 am.
[B] Knights Landing RST sampling period was from 10/14 at 11:15 am to 10/21 at 11:30 am. 859 ad-clip/CWT/VIE-pink late fall-run Chinook salmon Chinook salmon were released for efficiency trial on 10/16 at 8:45 am. Two were recaptured on 10/17.
[C] Data reported in the 10/13 to 10/19 DJFMP sampling summary.

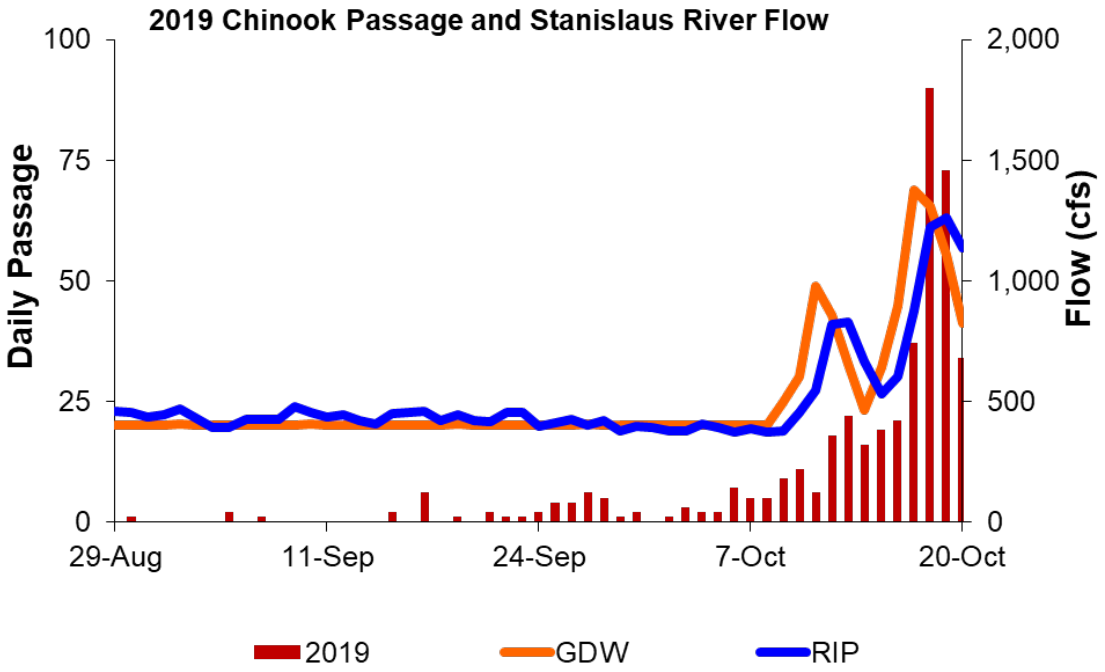
Juvenile Green Sturgeon Monitoring Summary for DOSS; October 22, 2019
2019 Sampling Season Summary

- One juvenile green sturgeon tagged on 10/1/2019 was detected on 10/17/2019 at sampling site north/northwest of Sherman Lake.
- One of 3 juvenile green sturgeon tagged on 10/3/2019 was detected on 10/17/2019 at sampling site north/northwest of Sherman Lake.
- One juvenile white sturgeon tagged 8/6/2019 was detected on 10/17/2019 at sampling site north/northwest of Sherman Lake.
- No detections of juvenile green sturgeon or juvenile white sturgeon tagged in the 2018 sampling season at sampling site north/northwest of Sherman Lake.*

* Please refer to the 10/8/19 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 8/29/19. Over the last week (10/14 – 10/20), 290 adult fall-run Chinook salmon and 2 steelhead were observed passing upstream of the weir. The cumulative net upstream passage through 10/18/19 is 422 Chinook salmon (18% were ad-clipped, indicating a hatchery origin), and 10 steelhead (data provided by FISHBIO in their 10/20/19 Stanislaus Weir Update). One of the steelhead passing the weir last week was greater than 16 inches, indicating that the individual was likely anadromous, i.e. a steelhead, rather than a resident adult rainbow trout. Five of 10 total steelhead were unclipped and 5 were clipped, indicating hatchery origin.



<u>Agenda Item 5.</u>

Fish Monitoring: Salvage

Aasen (CDFW) provided a salvage update informing the group that the first steelhead of the WY 2020 season was salvaged at the CVP facility on 10/17/19. It was an ad-clipped fish and had a fork length of 435 mm (a "half-pounder" steelhead).

Griffiths (CDFW) provided the following salvage summary for the period of 10/14-10/20.

<u>Operations:</u>

The CVP facility had 60 minutes of unscreened diversions for facility maintenance on 10/17 from 10:30 am to 11:30 am.

DOSS Weekly Salvage Update

Reporting Period: October 14-October 20, 2019

Prepared by Kyle Griffiths on October 23, 2019 9:24

Preliminary Results -Subject to Revision

Criteria	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	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	940	697	726	705	1,241	695	782	↘	827
CVP daily export	1,954	1,954	1,958	1,962	1,895	1,841	1,842	↘	1,915
SWP reduced counts	0%	0%	0%	0%	0%	0%	0%		
CVP reduced counts	0%	0%	0%	4%	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	4	3	↗	4	3
Total	**4**	**3**		**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	97% (Last week: 98%)	3% (Last week: 2%)	0% (Last week: 0%)
Young-of-year (YOY) spring-run Chinook salmon	100% (Last week: 100%)	0% (Last week: 0%)	0% (Last week: 0%)

Rationale for changes in distribution

Wild winter-run Chinook salmon:

Over 2.4 million Brood Year 2019 (BY19) winter-run Chinook salmon have passed RBDD this year. Approximately 4,000 BY19 winter-run Chinook salmon have been captured by the GCID RSTs since August 1, 2019. 723 winter-run Chinook salmon were captured at GCID, 8 at Knights Landing RSTs, and at no other monitoring locations this past week. Observation of winter-run Chinook salmon at weekly monitoring locations in the lower Sacramento and upper Delta indicates they are starting to migrate into the Delta.

Wild spring-run Chinook salmon:

A few length-at-date spring-run Chinook salmon were observed at GCID and Knights Landing RST this past week. However, staff from CDFW indicated that they may actually be small winter-run Chinook salmon. No precipitation events have occurred that would trigger young of year spring-run Chinook salmon outmigration at this time. Genetic samples were taken from these fish for genetic verification of their run identity, but the results were not available yet. DOSS assumes that the results would indicate that the fish are genetic winter-run Chinook salmon, and therefore, DOSS assumes that 100% of the spring-run Chinook salmon population is upstream of Knights Landing.

Agenda Item 7.

Risk of Entrainment

Risk of entrainment of listed salmonids into Central and South Delta:

Lower than last week. For the next 3 days (10/23-10/25) risk of entrainment is reduced while the DCC gates are closed, per action response to RPA Action IV.1.2. Overall risk of juvenile winter-run Chinook salmon entrainment into the interior Delta is considered low as a percentage of population. However, some DOSS members expressed concern that with the high population number of juvenile winter-run Chinook salmon this year, the open DCC gate may allow fish 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. Earlier RST monitoring are likely seeing the fish that

were typically present in the system early in the season but not accounted for due to the lack of early monitoring in previous years, and higher population size allows for better detection probability. Delta outflow resulting from implementation of the USFWS' fall X2 RPA action is fairly high for this time of year without any precipitation. Sacramento inflow is about 12,900 cfs. Higher Sacramento River flows help to reduce the influence of tides at the DCC and Georgiana Slough junctions which may reduce the probability of diversion into the interior Delta.

Export Risk:
Low, based on fish distribution (percentage wise) but the absolute number of fish is high compared to previous recent years, and we are seeing fish earlier likely due to early spawning and early RST monitoring, thus will likely see fish in the Delta earlier than in recent years. These "early" fish are important as far as life history diversity for the winter-run Chinook salmon ESU. OMR is becoming more positive with reduced exports as a result of USFWS' fall X2 implementation, and the percentage of flow diverted is low (7%). Also, over the next 3 days (10/23-10/25) the DCC gates will be closed. These conditions should reduce the risk of entrainment at the export facilities over the next week. San Joaquin River flows at Vernalis are approximately 2,900 cfs. Combined exports are approximately 1,100 cfs with a concurrent OMR flow of approximately -400 cfs. The QWEST flows are currently about 7,500 cfs, indicating that a positive outflow from the San Joaquin River past Jersey Point is occurring.

Agenda Item 8.
Other Topics:
Roll out of Reinitiation of Consultation on the Long-Term Operations of the CVP and SWP Biological Opinion this morning.

Discussion from Reclamation for including habitat usage modeling in determining the distribution of juvenile winter-run Chinook salmon within the Sacramento River. This modeling would reflect the role that habitat restoration has in diminishing density dependent factors in fish migration by providing more rearing habitat in the Sacramento River corridor for juvenile salmonids. Consideration for including the modeling results on the SacPas web site was brought up as an additional tool.

Agenda Item 9.
DOSS Advice to WOMT and NMFS:
No advice, but a "heads up" that DCC gates will be closed for 3 days (10/23-10/25) per RPA requirements. Expect to see continuing flux of winter-run Chinook salmon into Delta due to increased population this year, which may lead to additional closures through trigger exceedances.

Agenda Item 10.
Next Meeting: The next DOSS conference call will be on **10/29/19 at 9am**.