

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 11/5/2019 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, Duane Linander, Morgan Kilgour

DWR: Bryant Giorgi, Kevin Reece, Farida Islam, Mike Ford, Brittany Davis, Dan Yamanaka

NMFS: Jeff Stuart

Reclamation: Elissa Buttermore, Towns Burgess

SWRCB: Craig Williams, Chris Carr

USFWS: 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/November:

Action IV.1.1 Alerts that indicate the Delta Cross Channel (DCC) gate operations may be triggered soon¹:

- 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

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.

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

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
10/29/2019	124	2%	114	1%
10/30/2019	123	-1%	113	-1%
10/31/2019	123	0%	114	1%
11/1/2019	124	1%	115	1%
11/2/2019	123	-1%	115	0%
11/3/2019	123	0%	114	0%
11/4/2019	123	0%	115	0%

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

Date	Wilkins Slough (WLK)	Knights Landing (KL)
	Mean Daily Flow (cfs)	Daily water temperature (°F)
10/29/2019	6,546	53.9
10/30/2019	5,752	52.2
10/31/2019	5,027	51.2
11/1/2019	5,538	51.1
11/2/2019	5,208	51.8
11/3/2019	4,490	52.5
11/4/2019	4,146	52.9

Questions were brought up regarding the low flows observed at Wilkins Slough over the past week and whether this would drop below the required flows at this location for navigation and water diversions. Discussions ensued that indicated that the low flows would remain at the approximately 4,000 to 4,500 cfs level to avoid upstream fall-run Chinook salmon redd dewatering and conserve upstream reservoir storage. Fluctuating higher flows might induce adult Chinook salmon to spawn in areas that would subsequently be dewatered on dropping flows. Flows would remain low unless upstream diverters complained that the lower flows were negatively impacting their ability to divert water from the Sacramento River.

Action IV.1.2² (DCC gate operations):

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

Agenda Item 3.

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

Current Operations (11/5/19)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	800 ^A	Jones Pumping Plant	2,700 ^B
Reservoir Releases (cfs)			
Feather - Oroville	2,450	American - Nimbus	2,700
		Sacramento - Keswick	5,250 ^C
		Stanislaus - Goodwin	400 ^D
		Trinity - Lewiston	330 ^E
Reservoir Storage (in TAF)			
San Luis (SWP)	604	San Luis (CVP)	317
Oroville	2,019	Shasta	3,249
New Melones	1,994	Folsom	584
Delta Operations			
DCC	Open	Sacramento River at Freeport (cfs)	~10,300
Outflow Index (cfs)	~8,300	San Joaquin River at Vernalis (cfs)	~2,300
E:I	24 % (3-day avg.)	X2	78 km

^A SWP exports will vary over the next week to meet Delta outflow goals, then a scheduled outage will occur for maintenance at the pumping facility the week of 11/17 for 5 days.

^B CVP exports will decrease to 800 cfs tomorrow. Will vary to meet Delta outflow goals over next week.

^C Keswick releases will decrease to 5,000 cfs on 11/6.

^D Goodwin releases will decrease to minimum flows on 11/7 (300 cfs).

^E Lewiston releases will target 300 cfs winter base flows.

Factors controlling Delta exports:

- 10/28-10/31: Fall X2;
- 11/1 – 11/4 Delta outflow as a function of Delta inflow (outflow equal to 50% of inflow).

Approximate OMRs as of 11/1/19:

	USGS gauges (cfs)*	Index (cfs)
Daily	-3,700	-3,300
5-day	NA	-900
14-day	NA	-500

* Issues with USGS OBI gage.

Approximate OMRs as of 11/3/19:

	Index (cfs)
Daily	-3,100
5-day	-2,200
14-day	-900

Weather Forecast

The weather forecast predicts warm and dry weather with average high temperatures in the 70s during the day and much cooler temperatures at night over the next week. No precipitation anticipated over the next week.

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	Chippys Is. Midwater Trawl ^D	Mossdale Kodiak Trawl ^D
Sample Date	10/29-11/4	10/28-11/4-	10/28-11/4	10/28-11/1	10/28-11/1	10/28-11/1	10/28-11/1
FR Chinook	8 smolts						
SR Chinook	74 juveniles	1					
WR Chinook	694 juveniles	5	9	2			
LFR Chinook	33 juveniles, 16 smolts						
Chinook (ad-clip)							
Steelhead (wild)							
Steelhead (ad-clip)							
Green Sturgeon							
Flows (avg. cfs)	1,208	5,939	5,263				
W. Temp. (avg. °F)	52.6	51.9	52.2				
Turbidity (avg. NTU)	9.163	4.3	4.75				

^A GCID sampling at half cone from 10/29 to 11/4.

^B Tisdale RST sampling period was from 10/28 at 15:00 pm to 11/04 at 10:30 am.

^C Knights Landing RST sampling period was from 10/28 at 11:45 am to 11/04 at 10:45 am.

^D Data reported in the 10/28 to 11/1 DJFMP sampling summary.

Red Bluff Diversion Dam (RBDD) (came in after the DOSS call concluded)

USFWS biweekly report (10/22/19-11/4/19) for preliminary estimates of passage by brood-year and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

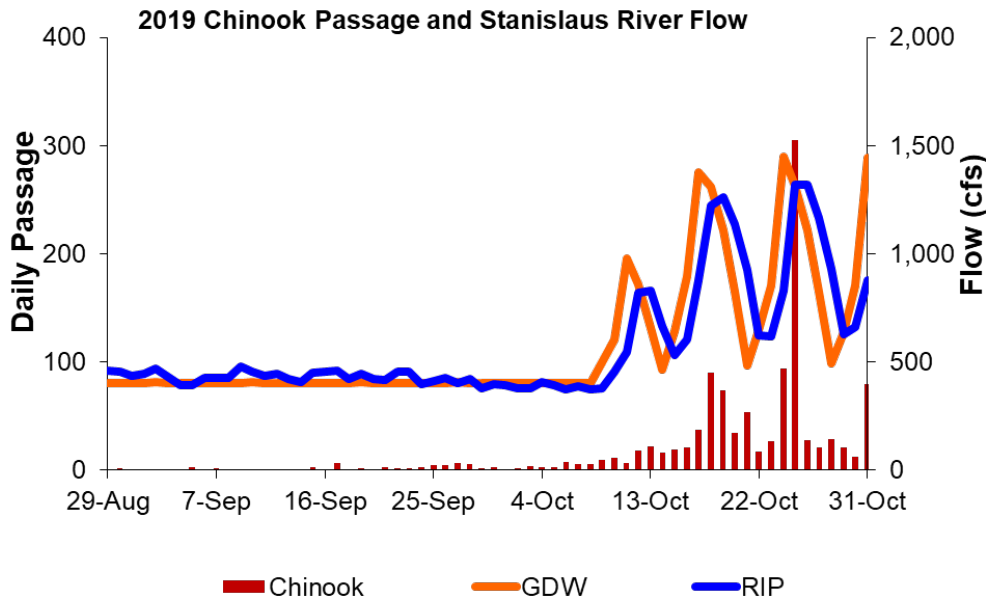
Run and Species	Biweekly Total	Brood Year Total (90% CI)
Winter-run Chinook (BY2019)	389,883	3,606,975 (2,367,934 - 4,846,016)
Spring-run Chinook (BY2019)	175,648	208,308 (129,421 - 287,194)

**Juvenile Green Sturgeon Monitoring Summary for DOSS; November 5, 2019
2019 Sampling Season Summary**

- No changes to the previous week’s update. CDFW was not out in the field attempting to tag juvenile sturgeon last week due to weather concerns on Tuesday (high winds) and other priorities Thursday. Tagging efforts and real-time monitoring will resume on 11/5.
- * 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 (10/28 – 11/3), 364 adult fall-run Chinook salmon and 3 *Oncorhynchus mykiss* were observed passing upstream of the weir. All 3 *O. mykiss* were adipose fin clipped, and 2 were greater than 16 inches. Since all 3 fish were ad-clipped, indicating hatchery origin, these individuals were likely anadromous, i.e., steelhead, rather than resident adult rainbow trout, since no stocking of hatchery fish occurs in the Stanislaus River. The cumulative net upstream passage through 11/3/19 is 1,329 Chinook salmon (21% were ad-clipped, indicating hatchery origin), and 15 steelhead (data provided by FISHBIO in their 11/4/19 Stanislaus Weir Update). 7 of 15 total steelhead this season were unclipped and 8 were ad-clipped, indicating hatchery origin. 8 of the 10 fish >16 inches in length were ad-clipped.



CDFW Lower American River Carcass Survey

(Data received after the DOSS call. Included for continuity.)

Reporting for survey period 10/28-11/1:

- 46 observed carcasses (5 not identifiable to sex)
 - 23 females (one could not determine if there was an adipose clip or not)
 - 4 unclipped

- 18 clipped
- 18 males
 - 1 unclipped
 - 17 clipped
- 23 female carcasses evaluated for spawn condition
 - 9/23 (39%) prespawn mortalities
 - 2/23 (9%) partially spawned
 - 12/23 (52%) spawned
- Temperatures at Hazel during the survey period:
 - Minimum: 58.4°F
 - Mean: 59.0°F
 - Maximum: 59.6°F

Agenda Item 5.

Fish Monitoring: Salvage

Griffiths (CDFW) provided the following salvage summary for the period of 10/28-11/3.

DOSS Weekly Salvage Update

Reporting Period: October 28-November 3, 2019
 Prepared by Kyle Griffiths on November 4, 2019 15:35
 Preliminary Results -Subject to Revision

Criteria	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-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	533	532	533	792	6,220	3,839	232	↗	1,812
CVP daily export	1,605	1,612	1,602	1,601	1,600	1,603	1,660	→	1,613
SWP reduced counts	0	0	0	0	83%	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;

Category	Weekly Total			Season Total	
	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

Category	Weekly Total			Season Total	
	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, 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>Young-of-year (YOY) winter-run Chinook salmon</i>	95% (Last week: 96%)	5% (Last week: 4%)	0% (Last week: 0%)
<i>Young-of-year (YOY) spring-run Chinook salmon</i>	100% (Last week: 100%)	0% (Last week: 0%)	0% (Last week: 0%)

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 5,100 BY19 winter-run Chinook salmon have been captured by the GCID RSTs since 8/1, and 62 BY19 winter-run Chinook salmon have been captured at the Knights Landing RSTs since 9/5. In the last week, 694 winter-run Chinook salmon were captured at GCID, 5 at Tisdale RSTs, and 9 at the Knights Landing RSTs. Two winter-run sized Chinook salmon were captured in the Sacramento Beach seines last week (Discovery Park). No other salmonids have been observed at the remaining monitoring locations in the Delta over this past week. Continued observations of small numbers of winter-run Chinook salmon at weekly monitoring locations in the lower Sacramento and upper Delta over the past several weeks indicate more are starting to migrate into the Delta.

Wild spring-run Chinook salmon:

Seventy four length-at-date spring-run Chinook salmon were observed at GCID this past week and 1 at the Tisdale RSTs. Although some of these fish may actually be small winter-run Chinook salmon from late spawning adults, based on the reported size ranges, others on the lower end of the size range may be true spring-run Chinook salmon fry (i.e., 30 to 31 mm fork lengths). DOSS notes that no precipitation events have occurred this water year that would trigger young-of-year (YOY) spring-run Chinook salmon outmigration at this time. Tissue samples were taken from fish captured at Knights Landing earlier in the season for genetic verification of run identity, but the results are not yet available. DOSS assumes that the results would indicate that these fish are genetic winter-run Chinook salmon, and therefore, DOSS assumes that essentially 100% of the spring-run Chinook salmon population is still upstream of Knights Landing. However, DOSS acknowledges that some of these fish in the 30 mm size range may be spring-run Chinook salmon fry (newly emerged YOY spring-run Chinook salmon-sized fish), but not enough of these fish have been observed to represent more than 1% of population at this time.

Agenda Item 7.

Risk of Entrainment

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

Compared to last week, there is an increasing risk of entrainment to fish that are present in the lower Sacramento River and upper Delta waterways. This is due to the open DCC gates and decreasing Sacramento River inflows to the Delta. The changing hydrodynamics (i.e., lower Sacramento River inflow) leads to increasing tidal effects near the Georgiana Sough and the DCC junctions. Increasing tidal effects redirects flows into these junctions from both the upstream and downstream directions of the Sacramento River on the flood tide. Individual fish in these locations have a higher risk of entrainment into the Delta interior. If Sacramento River inflow continues to decrease, entrainment risk will increase (Keswick releases are scheduled to drop a little more today). Currently, Delta outflow is approximately 8,300 cfs. Sacramento inflow is about 10,000 cfs).

However, the overall risk of juvenile winter-run Chinook salmon entrainment into the interior Delta is considered to be low as a percentage of the population. Some DOSS members, however, expressed concern that with the high population estimate of juvenile winter-run Chinook salmon this year, the open DCC gate may allow more absolute numbers of 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. 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.

Export Risk:

The overall risk is considered low, based on current fish distribution estimates. However, there is an increasing risk of entrainment into the CVP and SWP facilities in the next week. OMR flows are becoming more negative with increased exports, and the percentage of Delta inflow exported is increasing (currently 24% averaged over 3-days). San Joaquin River flows at Vernalis are approximately 2,300 cfs, but are expected to decrease as tributary flows are reduced for winter flows. Combined exports are currently approximately 3,500 cfs with a concurrent OMR flow of about -3,100 cfs. The current QWEST flows are about 3,200 cfs, indicating a positive outflow from the San Joaquin River past Jersey Point, but this is approximately half of last week's QWEST's flow values. Fish in the vicinity of the exports' area of influence have an increased risk of entrainment.

Agenda Item 8.

Other Topics:

Discussion of using the SacPAS entrainment risk models in evaluating our fish distribution estimates and risk assessments was postponed to a future DOSS meeting. Buttermore (Reclamation) provided a write up describing the web-based tools available to the DOSS team.

Agenda Item 9.

DOSS Advice to WOMT and NMFS:

None.

Agenda Item 10.

Next Meeting: The next DOSS conference call will be on **11/12/19 at 9am.**