Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 1/29/2019 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 at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html.

CDFW: Jason Julienne, Duane Linander, Ken Kundargi
DWR: Bryant Giorgi, Farida Islam, Kevin Reece, Mike Ford
NMFS: Jeff Stuart, Barb Byrne, Kristin Begun
Reclamation: Tom Patton, Elissa Buttermore, Towns Burgess
SWRCB: Craig Williams
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/djfmp)
3. Current Operations
4. Smelt Working Group
5. Fish Monitoring: RSTs/trawls/seines
6. Fish Monitoring: Salvage
7. Hatchery Releases
8. Winter-run JPE and fish loss density triggers
9. DOSS Estimates of Fish Distribution
10. DOSS Feedback on Entrainment Risk
11. DOSS advice
12. 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)[1]:

- Starting on 10/1, the First Alert is triggered if either the first component (>95 cfs flow threshold) or second component (>50% change in mean daily flow) has been exceeded at either the Deer Creek gage at Vina (DCV), or the Mill Creek gage at Los Molinos

[1] 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. 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.

(MLM). The First Alert was triggered every day this past week. See table below for details.

	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
1/22/19	788	-49%	973	-37%
1/23/19	538	-32%	696	-28%
1/24/19	422	-22%	550	-21%
1/25/19	352	-17%	454	-17%
1/26/19	307	-13%	387	-15%
1/27/19	279	-9%	343	-11%
1/28/19	260	-7%	315	-8%

- Second Alert (triggered only if both Knights Landing water temperatures are <56.3°F and Wilkins Slough flows are >7,500 cfs). The Second Alert was triggered every day this past week. See table below for details.

	Wilkins Slough (WLK)	Knights Landing (KL)
Date	Mean Daily Flow (cfs)	Daily water temperature (°F)
1/22/19	25,662	50.3
1/23/19	24,396	49.3
1/24/19	22,403	48.3
1/25/19	20,062	48.4
1/26/19	17,549	48.9
1/27/19	15,302	49.3
1/28/19	13,716	*

*Knights Landing temperature was assumed to be below 56.3°F on 1/28.

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

- DCC gates will remain closed per operations described in RPA IV.1.2 starting 12/1/18.

Action IV.2.3[3] (OMR Management):

- Implementation of this action in WY 2019 began on 1/1/19, 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 5.1 fish/TAF (second trigger).

[2] 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.3[3] (Reduce likelihood of entrainment or salvage at the export facilities, including an 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 11/1/18, no salvage-based triggers that would require export reduction have been exceeded.

Agenda Item 3.

Current Operations (1/29/19)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	2,500	Jones Pumping Plant	3,500 (4 units)
Reservoir Releases (cfs)			
Feather - Oroville	1,750	American - Nimbus	1,750
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	200
		Trinity - Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	931	San Luis (CVP)	799
Oroville	1,382	Shasta	2,885
New Melones	1,864	Folsom	511
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	31,300
Outflow Index (cfs)	~30,800	San Joaquin River at Vernalis (cfs)	1,444
E:I	13% (14-day avg.)	X2	62 km

Factors controlling Delta exports:

- 1/22/19-1/29/19: -5,000 cfs OMR limit per NMFS BiOp RPA Action IV.2.3

Approximate OMR as of 1/26/19:

	USGS gauges (cfs)	Index (cfs)
Daily	-4,500	-4,800
5-day	-4,500	-4,900
14-day	-4,600	-5,000

Approximate OMR as of 1/28/19:

	Index (cfs)

[3] 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

Daily	-4,900
5-day	-4,900
14-day	-5,000

Weather Forecast
Light precipitation possible in the Sacramento area Wednesday night to Thursday. Wet weather expected Friday through the weekend, with the potential for significant snow in the mountains.

Agenda Item 4.
Smelt Working Group
The Smelt Working Group met on Monday, 1/28/19, at 10 am.

The Smelt Working Group (SWG) reviewed current Delta conditions, survey data, expected exports, and forecasted weather. Even with the previous week's downstream movement of high turbidity pulses, the 3-day average turbidity at Prisoner's Point, Holland's Cut, and Victoria Channel did not surpass the 12 NTU threshold that would have triggered Action 1 (adult pre-spawning Delta Smelt). The SWG agreed that the "first flush" event signaling the Delta Smelt spawning migration has already occurred, and that the focus should now be on Action 2 (adult pre-spawning Delta Smelt) and Action 3 (larval Delta Smelt). With the lack of Delta Smelt detections in the South and Central Delta and with turbidity levels now lower, the SWG did not have enough information to recommend any specific change in operations at this time. However, as the spawning season is likely underway, the SWG stressed that any detection in the South Delta should be viewed as a high concern as the salvage of even one fish would be a substantial issue.

The SWG does not believe that a recommendation under Action 2 or Action 3 is warranted at this time. The SWG will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and may meet again later this week if any fish are detected in the South Delta in order to discuss any potential protective actions. The SWG plans to meet again on Monday, February 4, 2019 at 10 am.

Agenda Item 5.
Fish Monitoring: The following table presents fish monitoring data summarized over the past week. Unless otherwise noted, reported sizes are fork length. Empty cells indicate zero catches at those locations with sample dates shown.

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	1/24-1/27	1/21-1/28	1/21-1/27	1/22-1/25	1/20, 1/22, 1/24-1/26	1/20, 1/23-1/25	1/22-1/24
FR Chinook	84 juveniles	36	375	187	355		
SR Chinook	6 juveniles		16	7	3		
WR Chinook	24 juveniles		3	2	4		

	14 smolts						
LFR Chinook	2 smolts					3	
Chinook (ad-clip)			1 WR[E]			10	
Steelhead (wild)	1			1	1		
Steelhead (ad-clip)	24		12		9	6	
Green Sturgeon							
Flows (avg. cfs)	1,215	22,056	21,068				
W. Temp. (avg. °F)	51.28	56	49.1				
Turbidity (avg. NTU)	27.80	90.2	78.32				

[A] On 1/15 the GCID RST was removed from the bypass channel due to predicted high flows and heavy debris. On 1/24 the GCID RST was lowered at 1400. Trapping will continue until further notice.

[B] Tisdale RST sampling period was from 1/21 at 9:30 am to 1/28 at 9:30 am. RST trap fishing effort at 50% through the morning of 1/27, and then switched to 100% effort.

[C] Knights Landing RST sampling period was from 1/21 at 10:30 am to 1/27 at 10:15 am. RST trap fishing effort at 50%.

[D] Data reported in the 1/20 to 1/26 DJFMP sampling summary.

[E] Classified as a winter-run Chinook salmon by length-at-date criteria, no winter-run hatchery fish have been released yet in WY 2019.

Enhanced Delta Smelt Monitoring (EDSM):

Sixteen fall-run Chinook salmon, 1 spring-run Chinook salmon, and 2 clipped Chinook salmon were observed in the EDSM this week.

CDFW carcass surveys

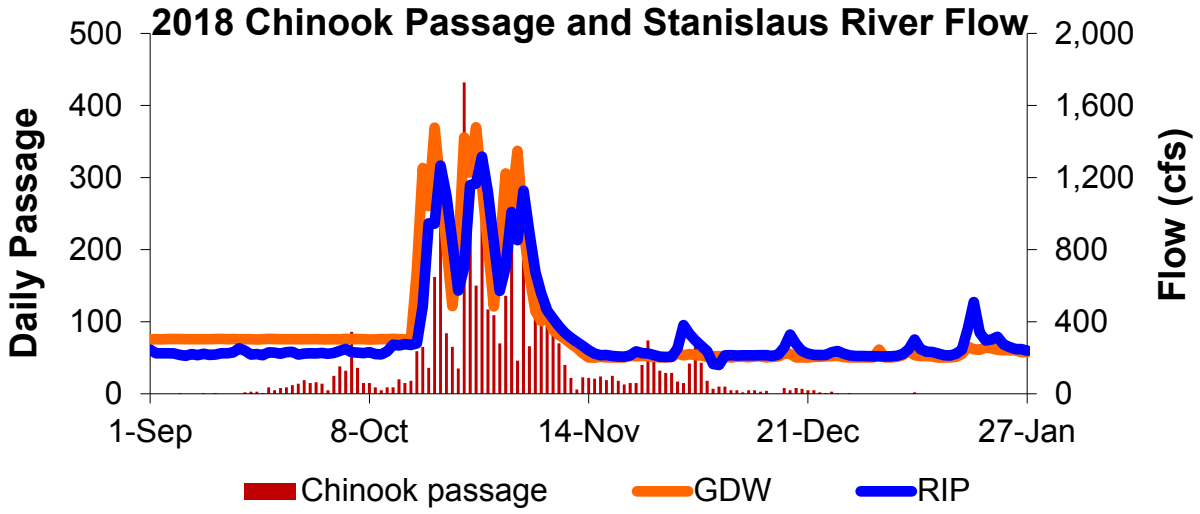
- ***San Joaquin River tributaries:*** Chinook salmon carcass surveys, with incidental redd counts, began the week of 10/1/18 on the Merced River, Tuolumne River, and Stanislaus River. CDFW has completed the ninth week of surveys. No data were collected this week.

- ***American River:*** Chinook salmon carcass surveys began on Monday, 10/15/18. The survey area is from Nimbus Dam to Watt Avenue. The Nimbus Basin was closed to all fishing on 3/1/2018. Chinook salmon spawning is currently monitored in this area. The weir was pulled out during the week of 12/10 and is no longer part of the survey. Carcass surveys for the 2018-2019 season concluded on 1/9/2019 with a total of 12,581 carcasses observed with peak carcass observation occurring during the week of 12/3/2018. It is estimated that peak emergence will be during the beginning of March.

Stanislaus River weir

Monitoring at the weir near Riverbank (for upstream passage of adult salmonids) began on 9/5/18. Last week (1/22/19 – 1/27/19); 0 adult fall-run Chinook salmon

(Oncorhynchus tshawytscha) and 0 steelhead *(O. mykiss)* were observed passing upstream of the weir. The cumulative net upstream passage through 1/27/19 is 4,777 Chinook salmon (26% were ad-clipped, indicating a verifiable hatchery origin; hatcheries ad-clip 25% of their production fall-run Chinook salmon), and 24 steelhead (data provided by FISHBIO in their 1/28/19 Stanislaus Weir Update). Fifteen of the steelhead passing the weir were greater than 16 inches. Of these 15 fish, 6 were ad-clipped indicating a hatchery origin, and 9 were unclipped indicating a natural origin.



Acoustic-tagged green sturgeon

CDFW has acoustic-tagged 40 juvenile sturgeon (35 green sturgeon and 5 white sturgeon) captured between 7/24/18 and 12/27/18 near Sherman Lake on the Sacramento River (western Delta). Fork lengths of these fish range between 39 cm and 94 cm. 31 individuals have been detected (near the Sherman Lake tagging location) between 8/14/18 and 1/3/19.

Other Surveys

The following fish hatchery spawning data are provided to inform DOSS members of potential hatchery influence on catch numbers at monitoring locations. Data from additional hatchery spawning programs and other carcass surveys may be provided in the future as they become available to DOSS.

- **Feather River Fish Hatchery Spawning**
  No updates were provided for this week's DOSS call.

- **Mokelumne River Fish Hatchery**
  On 12/11, the Mokelumne River Fish Hatchery satisfied its egg take goal this season of 6.82 million fall-run Chinook salmon eggs. Steelhead egg take has initiated at the Mokelumne River Fish Hatchery. The seasonal egg take goal is 400,000; this number will be achievable using fish entering the hatchery this season along with broodstock already at the hatchery held over from last season.

- **Nimbus Fish Hatchery**
  Last updated from 12/19, the last fall-run Chinook salmon pair was spawned 12/13 and approximately 8.4 million eggs were collected this season. As of 12/19, 13 steelhead pairs had been spawned.

Agenda Item 6.
Fish Monitoring: Salvage
Griffiths (CDFW) provided a salvage summary for the period of 1/21-1/27.

Unclipped (wild origin) Chinook salmon were observed at the state facility on 1/22 and 1/23, and at the federal facility 1/25. The latter individual was 39 mm fall-run size) and was collected for DNA/otolith analysis. Weekly salvage of wild origin Chinook salmon was 9 individuals. Total WY19 salvage of wild-origin fish is 51.

Clipped (hatchery origin) Chinook were observed at the state facility on 1/21, 1/22, 1/23, 1/24, and 1/26. Clipped Chinook salmon were observed the federal facility 1/21, 1/22, 1/23, and 1/25. A large proportion of the clipped Chinook salmon were identified as late-fall run from Coleman National Fish Hatchery spring-run surrogate release group 3 (released 1/4/2019) based on coded wire tag data. Farida Islam (DWR) has noted this particular release group was very close to the 0.5% trigger of Action IV.2.3. To date, 0.457% of this release group has been lost at the fish collection facilities. Weekly salvage of clipped (hatchery origin) Chinook salmon was 73 individuals, for a WY19 total of 339.

Clipped steelhead were salvaged at the federal facility 1/21, 1/22, 1/23, 1/24, 1/25, and 1/26. Unclipped steelhead were salvaged on 1/22, 1/23, 1/24, and 1/25 at the federal facility.

No sturgeon were salvaged this week.

No outages or unusual operating conditions were noted this week.

DOSS Weekly Salvage Update

Reporting Period: January 21-January 27, 2019

Prepared by Kyle Griffiths on January 28, 2019 14:36

Preliminary Results -Subject to Revision

Criteria	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	Trend	
Loss Densities									
Wild older juvenile CS	0	1.35	0.32	0	0	0	0	↘	0.24
Wild steelhead	0	0.88	0.20	0.46	1.69	0.24	0	↗	0.49
Exports									
SWP daily export	4,607	5,017	5,216	5,038	4,986	4,491	5,290	→	4,949
CVP daily export	8,006	7,925	8,307	6,862	6,895	6,869	6,871	→	7,391
SWP reduced counts	0	0	0	0	0	0	0		
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	4	17	↘	20	43
	Spring Run	0	0	→	0	0
	Late Fall Run	1	4	↗	3	13
	Fall Run	4	3	↗	28	34
	Unclassified	0	0	→	0	0
	Total	**9**	**24**		**51**	**90**
Hatchery						
	Winter Run	0	0	→	0	0
	Spring Run	0	0	→	32	21
	Late Fall Run	73	229	↗	307	599
	Fall Run	0	0	→	0	0
	Unclassified	0	0	→	0	0
	Total	**73**	**229**		**339**	**621**

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	30	42	↗	39	63
Hatchery	89	196	↗	129	281
Total	**119**	**238**		**168**	**344**

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

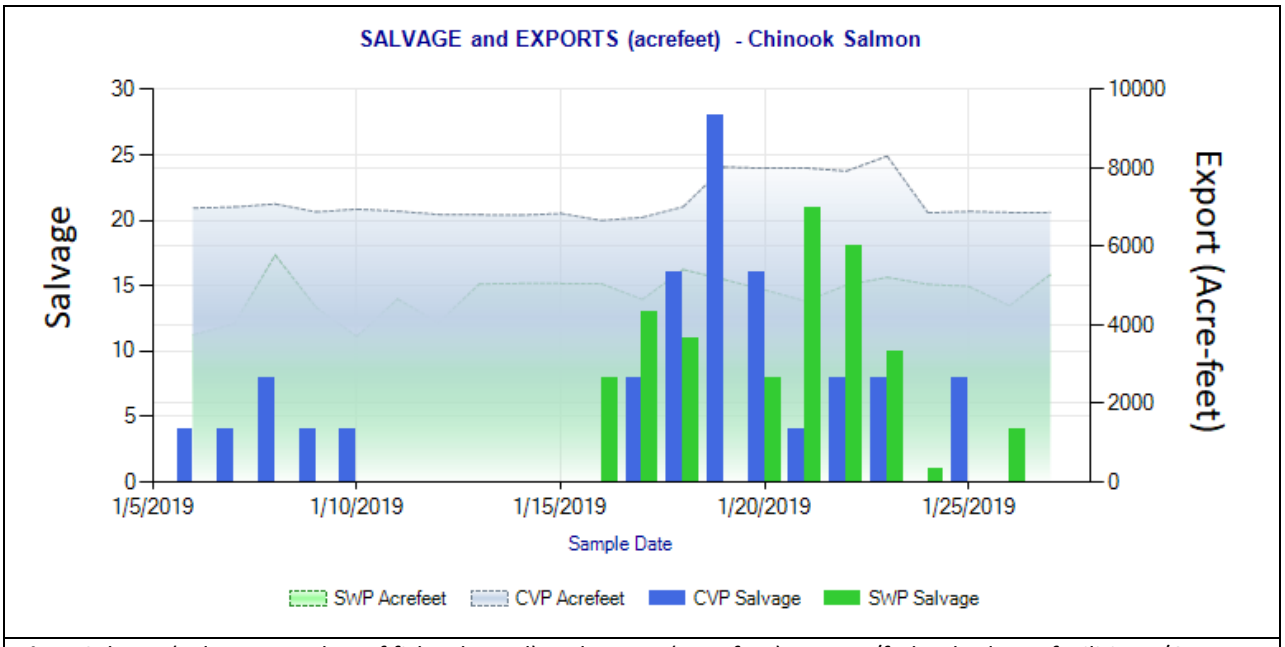


Fig 1. Salvage (values = number of fish salvaged) and export (acre-feet) at state/federal salvage facilities 1/6 – 1/27/2019. All CS races/origins combined.

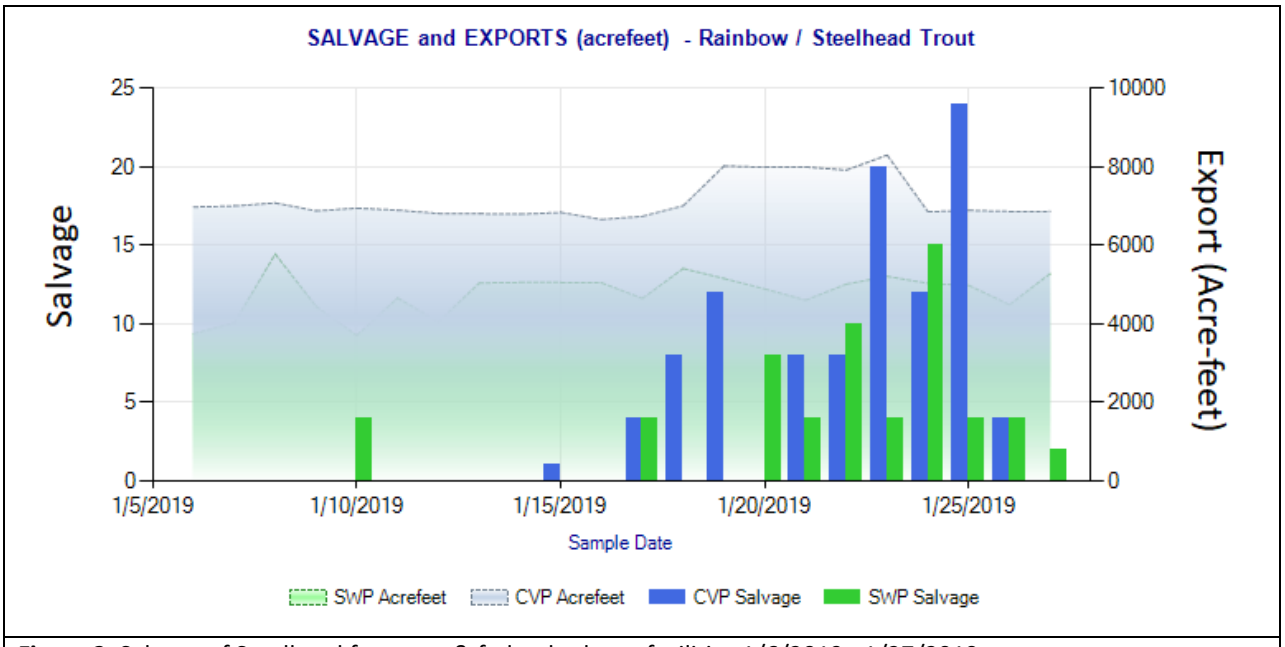


Figure 2. Salvage of Steelhead for state & federal salvage facilities 1/6/2019 - 1/27/2019

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 1/27/19

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 Stage Trigg	Date of First Loss[4]	Date of Last Loss[4]
12/3/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	49.68	61,277	n/a	0.081	n/a	0.5%	12/27/2018	1/21/2019
12/14/2018	LF	Coleman NFH	Battle Creek	Spring Surrogate	15.88	66,266	n/a	0.024	n/a	0.5%	12/27/2018	1/20/2019
1/4/2019	LF	Coleman NFH	Battle Creek	Spring Surrogate	338.17	73,952	n/a	0.457	n/a	0.5%	1/16/2019	1/26/2019

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2018 through 1/27/2019.

[1]Number released with the adipose-fin clipped and a coded-wire tag (CWT).

[2]% Loss of Number Released = (Confirmed Loss/Number Released)*100.

[3]% Loss of Total Entering Delta= (Confirmed Loss/Total Entering Delta)*100.

[4] Date of first and last loss accounts for all CWT loss even those from special studies where salvage and loss=0.

Preliminary Genetic Data for CVP/SWP Salvage – Data subject to revision.
Provided by E. Buttermore (Reclamation)

Preliminary genetic results indicate all winter-run sized Chinook salvaged during this water year that have been tested were fall-run Chinook salmon NMFS ESU. The fall-run Genetic ID category includes both fall-run and late-fall-run Chinook.

Collection Date	Fork Length	Genetic ID	Delta LAD Model	Facility
12/4/18 10:00	132	Fall/Late Fall	Late Fall	CVP
12/23/18 13:00	146	Fall/Late Fall	Late Fall	SWP
12/31/18 14:00	122	Fall/Late Fall	Winter	CVP
1/2/19 13:00	156	Fall/Late Fall	Winter	SWP
1/2/19 14:00	143	Fall/Late Fall	Winter	CVP
1/3/19 16:00	138	Fall/Late Fall	Winter	CVP
1/6/19 16:00	138	Fall/Late Fall	Winter	CVP

Agenda Item 7.

Hatchery Releases

On 2/4-5/2019, the Department of Fish and Wildlife will release approximately 54,000 brood year 2018 steelhead from Mokelumne River Fish Hatchery into the Mokelumne River at New Hope Landing. Forecasted rain events will make the Feist Ranch site inaccessible. This release will include 100% marked (adipose fin clip) fish. The average fork length is 180 mm.

Agenda Item 8.

Winter-run JPE and Fish Loss Density Triggers

B. Byrne (NMFS) asked for feedback from DOSS about updating the interim estimate of the winter-run JPE for Brood Year 2018 for use in implementing WIIN Act section 4003. The group discussed both the rough estimation method used in the December DOSS advice, and a more precise estimation method based on the procedure used in last year's JPE letter. Byrne reported that the winter-run JPE subteam (a subset of the winter-run Project Work Team) is meeting today at noon and that her plan is to ask that group for a preliminary JPE by tomorrow, which would be shared with the DOSS group.

DOSS concluded that the preliminary JPE from the winter-run JPE subteam should be used as the interim JPE for WIIN Act implementation.

DOSS will review the updated interim JPE and discuss at next week's DOSS meeting whether an update to the advice on the interim JPE-based fish density triggers in Action IV.2.3 is warranted.

Agenda Item 9.

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)
Young-of-year (YOY) winter-run Chinook salmon	9-13% (Last week: 10-15%)	87-91% (Last week: 85-90%)	0% (Last week: 0%)
Young-of-year (YOY) spring-run Chinook salmon	40-50% (Last week: 45-60%)	50-60% (Last week: 40-55%)	0% (Last week: 0%)

Rationale for distribution

Wild winter-run Chinook:

38 wild winter-run Chinook salmon were observed at the GCID RST, 3 at Knights Landing, 2 at the beach seines, and 4 at Sacramento trawl. DOSS believes that a portion of the population is still holding upstream of the Delta, and will move down when an environmental stimulus occurs. DOSS estimates that an additional 1-2 percent of wild winter-run Chinook salmon population

has migrated into the Delta this past week. Since no winter-run were observed at Chipps Island trawl, no wild winter-run Chinook salmon are estimated to have exited the Delta.

Wild spring-run Chinook:
6 wild spring-run Chinook salmon were observed GCID, 16 at Knights Landing, 7 at the beach seines, and 3 at Sacramento trawl. Since a small number of fish continue to be detected at monitoring locations, DOSS estimates that an additional 5-10 percent of the population has entered the Delta this past week. Since no spring-run were observed at Chipps Island trawl, no wild spring-run Chinook salmon are estimated to have exited the Delta.

Agenda Item 10.
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
    - Approximately 87-91% of winter run juveniles estimated to be in the Delta.
    - Approximately 50-60% of spring run juveniles estimated to be in the Delta.
    - Central Valley steelhead are in the system.
- **Routing Risk:** LOW-MEDIUM
    - DCC is closed.
    - Flows are decreasing on the Sacramento River, which lessens the muting of tidal effects around Georgiana Slough and Threemile Slough.

- **Overall Entrainment Risk:** MEDIUM

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

- **Exposure Risk:** MEDIUM
    - Listed Chinook salmon have been salvaged and observed in monitoring sites in the Delta.

- **OMR/Export Risk:**
    - OMR -2,500 cfs: LOW
    - OMR -3,500 cfs: LOW
    - OMR -5,000 cfs: MEDIUM
    - OMR -6,250 cfs[4]: MEDIUM-HIGH
    - OMR -7,500 cfs[4]: HIGH
    - OMR -9,000 cfs[4]: HIGH

- **Overall Entrainment Risk:**
    - OMR -2,500 cfs: LOW-MEDIUM
    - OMR -3,500 cfs: LOW-MEDIUM
    - OMR -5,000 cfs: MEDIUM
    - OMR -6,250 cfs[4]: MEDIUM-HIGH
    - OMR -7,500 cfs[4]: HIGH
    - OMR -9,000 cfs[4]: HIGH

These assessments are based on anticipated and current hydrology and fish distributions for the next week.

<u>Agenda Item 11.</u>
DOSS Advice to WOMT and NMFS: None

DOSS wants to provide WOMT and NMFS a heads up that there is a risk of exceeding the spring-run surrogate first stage trigger for release group #3 this next week.

DOSS suggests that we wait for the winter-run JPE subteam to provide their suggested JPE estimation method and numbers, to help inform NMFS how to provide the most accurate JPE. DOSS will use these updated numbers to revise their interim fish density triggers for RPA IV.2.3, which were provided in December 2018.

<u>Agenda Item 12.</u>
Next Meeting: The next DOSS conference call will be on **2/5/19 at 9am**.

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