

**Delta Operations for Salmonids and Sturgeon (DOSS) Group**  
**Conference call: 5/5/2015 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](http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html).

**DWR:** Farida Islam, Rhiannon Mulligan, Aaron Miller, Bryant Giorgi

**Reclamation:** Peggy Manza, Josh Israel

**NMFS:** Barb Byrne, Meiling Roddam

**USFWS:** Craig Anderson, Leigh Bartoo

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

**Agenda Items**

1. Agenda review and introductions
2. RPA Implementation review
3. Current Operations
4. Smelt Working Group
5. Fish Monitoring
6. Special Topic: CWT recoveries in DJFMP & RST monitoring
7. DOSS Advice

**Agenda Item 2.**

***RPA Implementation Review***

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

**Action IV.1.2 (DCC gate operations):**

- Default DCC gate closure.

**Action IV.2.3 (OMR Flow Management)**

- The OMR limit of no more negative than -5,000 cfs is in effect.

**Action IV.2.1 (I:E ratio)**

- Currently, the Critical year 1:1 ratio (of San Joaquin inflow at Vernalis to combined CVP/SWP exports) is in effect. This action restricts combined exports to 100% of Vernalis flow, or 1,500 cfs, whichever is greater.

**Agenda Item 3.**

**Current Operations (5/5/2015)**

SWP		CVP	
<b>Exports (cfs)</b>			
Clifton Court Forebay	300	Jones Pumping Plant	0-800 <sup>A</sup>
<b>Reservoir Releases (cfs)</b>			
Feather - Oroville	2,300 <sup>B</sup>	American - Nimbus	1,000 <sup>C</sup>
		Sacramento - Keswick	7,500
		Stanislaus - Goodwin	150
		Trinity – Lewiston	8,500 <sup>D</sup>
<b>Reservoir Storage (in TAF)</b>			
San Luis (SWP)	882	San Luis (CVP)	371
Oroville	1,755	Shasta	2,631
New Melones	486	Folsom	574
<b>Delta Operations</b>			
DCC	Closed	Sacramento River at Freeport (cfs)	6,222
Outflow Index (cfs)	4,900	San Joaquin River at Vernalis (cfs)	420
E:I	8.1% (3-day avg.)	X2	>81 km

<sup>A</sup> Due to water quality concerns, Reclamation is cycling one unit (which pumps at a rate of ~800 cfs) on/off throughout the week. The unit was cycled off at 0700 Tuesday (5/5/15) and will be cycled on at 0700 Wednesday (5/6/15).

<sup>B</sup> Increased on 5/1/15

<sup>C</sup> Will be increased to 1,250 cfs on 5/6/15

<sup>D</sup> Peak of spring pulse flow; rampdown begins on 5/7/15

Delta outflow (per the 4/6/15 SWRCB Revised Order on the TUCP) and salinity management are currently controlling exports.

OMR values as of 5/2/15:

	USGS gauges (cfs)	Index (cfs)
5-day avg.	-2,100	-1,790
14-day avg.	-1,810	-1,820

#### **Agenda Item 4.**

##### ***Smelt Working Group (SWG)***

Bartoo (FWS) provided the following email update:

The Working Group agreed that given present distribution, current salvage, and Delta conditions, there was no indication that the projected combined exports of approximately 1100 cfs for today and 300 cfs for tomorrow (potentially resulting in daily average OMR flows of approximately -1400 cfs) need to be modified for the protection of Delta Smelt adults and larvae.

The Working Group is following guidance for entrainment protections from both Action 2 (adult Delta Smelt) and Action 3 (juvenile Delta Smelt).

The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt from entrainment in the southern Delta.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Monday, May 11, 2015 at 10 am.

**Agenda Item 5.**

**Fish Monitoring:** The following table presents fish monitoring data. Unless otherwise noted, reported sizes are fork length. See also:

<http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>.

Location	Chippis Is. Midwater Trawl	Sacramento Trawl	Beach Seines	Lower American River RST	Knights Landing RST <sup>A</sup>	Tisdale RST <sup>B</sup>	GCID RST <sup>C</sup>	Mossdale Kodiak Trawl
Sample Date	4/26-5/2	4/26-5/2	4/26-5/2	4/25-5/1	4/27-5/4	4/25-5/3		4/27-5/3
Total Catch	172	17	8	391	11	14		7
FR Chinook	59 (71mm-87mm)	9 (69mm-89mm)	4 (66mm-80mm)	375	6	9		
WR Chinook								
SR Chinook	72 (87mm-108mm)	7 (87mm-100mm)		16	5	2		
LFR Chinook								
Ad-Clipped Chinook	39 (74mm-110mm)	1 (106mm)						
Delta Smelt								
Splittail	2		4					
Longfin Smelt								
Steelhead (ad-clip)						3		5 <sup>D</sup>
Steelhead (wild)				1 (fry)				2
Green Sturgeon								
Flows (avg. cfs)					3,821	4,470		
W. Temp. (avg. °F)					70	67		
Turbidity (avg. NTU)					11	17		

<sup>A</sup> Sampling period was from 4/27 at 10:30am to 5/4 at 11:30am.

<sup>B</sup> Sampling period was from 4/25 at 8:15am to 5/3 at 8:30am.

<sup>C</sup> RST trap resumed fishing on 5/3 at 9:00am.

<sup>D</sup> The 5 ad-clipped steelhead had visible sutures.

### **Red Bluff Diversion Dam (RBDD)**

USFWS biweekly report (April 9-April 22, 2015) for preliminary estimates of passage by brood-year and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

<b>Run and Species</b>	<b>Biweekly Total</b>	<b>Brood Year Total</b>
Winter run Chinook (BY2014)	804	410,592
Spring run Chinook (BY2014)	41,442	92,292
Fall run Chinook (BY2014)	36,101	3,396,319
Late-fall run Chinook (BY2015)	774	830
Rainbow Trout (BY2015)	3,469	3,900

### **Fish Salvage<sup>1</sup>:**

Fujimura (DFW) provided the following summaries of salvage and loss at the SWP and CVP fish collection facilities. The figures were generated from data on CDFW's salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

---

<sup>1</sup>Salvage data reported in this section represent the total estimated and expanded salvage based on the number of fish observed at the fish collection facility. For example, if one steelhead is observed in the typical ½-hour sampling period within a 2-hour operation period, the single steelhead is expanded to a salvage of four.

**DOSS Weekly Salvage Update**  
**Reporting Period: April 27-May 3, 2015**  
 Prepared by Bob Fujimura on May 4, 2015 19:30  
 Preliminary Results -Subject to Revision

Criteria	27-Apr	28-Apr	29-Apr	30-Apr	1-May	2-May	3-May	Trend	
<b>Loss Densities</b>									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0.00
Wild steelhead	0	5.87	0	0	0	0	0	↗	0.84
<b>Exports</b>									
SWP daily export	920	1,356	1,255	1,975	1,074	1,074	2,885	↔	1,506
CVP daily export	1,590	1,593	1,592	1,595	1,597	1,606	477	↔	1,436
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 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
<b>Wild</b>					
Winter Run	0	0	→	53	106
Spring Run	4	3	↘	45	62
Late Fall Run	0	0	→	6	26
Fall Run	0	0	→	16	26
Unclassified	0	0	→	24	NC
<b>Total</b>	<b>4</b>	<b>3</b>		<b>144</b>	<b>220</b>
<b>Hatchery</b>					
Winter Run	0	0	→	62	214
Spring Run	4	3	→	8	6
Late Fall Run	0	0	→	136	340
Fall Run	0	0	→	41	180
Unclassified	0	0	→	12	NC
<b>Total</b>	<b>4</b>	<b>3</b>		<b>259</b>	<b>740</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 = can not be calculated

**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	4	17	↘	39	154
Hatchery	0	0	↘	523	1,841
<b>Total</b>	<b>4</b>	<b>17</b>		<b>562</b>	<b>1,995</b>

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

Figure 1. DOSS weekly salvage update for the reporting period 4/27/15-5/3/15.

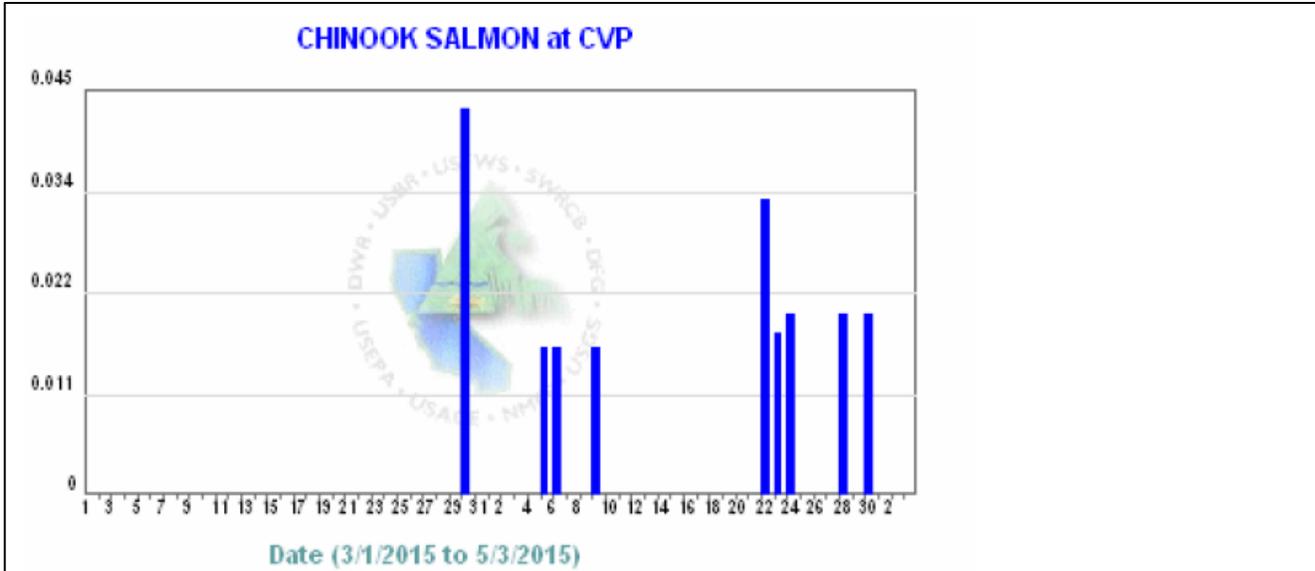


Figure 1. Daily salvage densities (fish per 10,000 m<sup>3</sup>) of Chinook salmon (all races) from the federal fish salvage facility during February 29-May 3, 2015. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

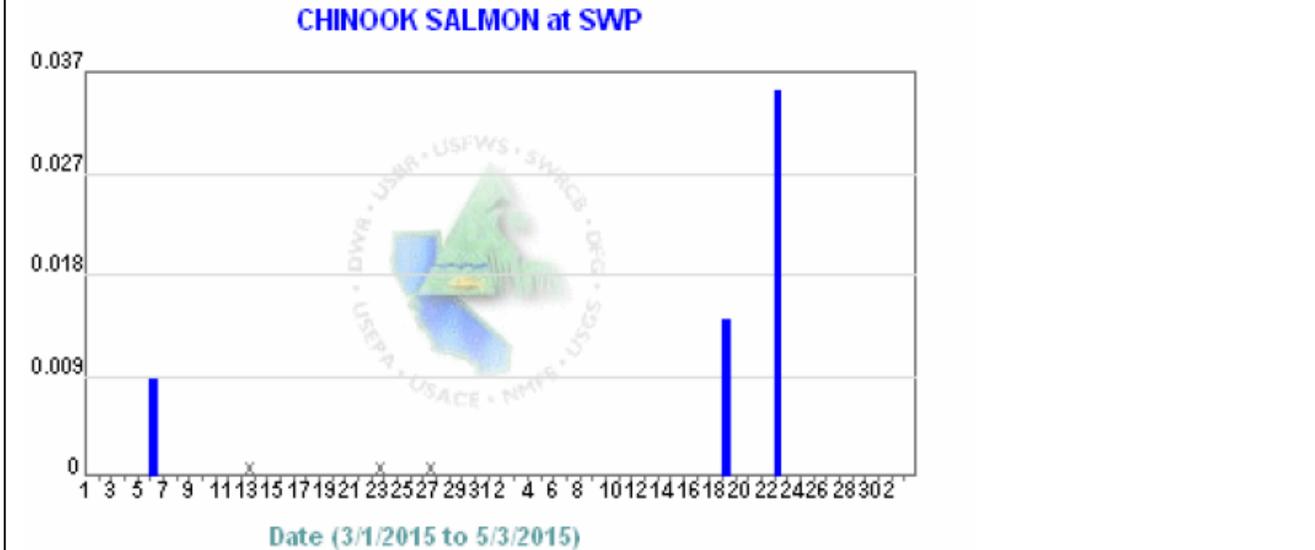


Figure 2. Daily salvage densities (fish per 10,000 m<sup>3</sup>) of Chinook salmon (all races) from the state fish salvage facility during February 29-May 3, 2015. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

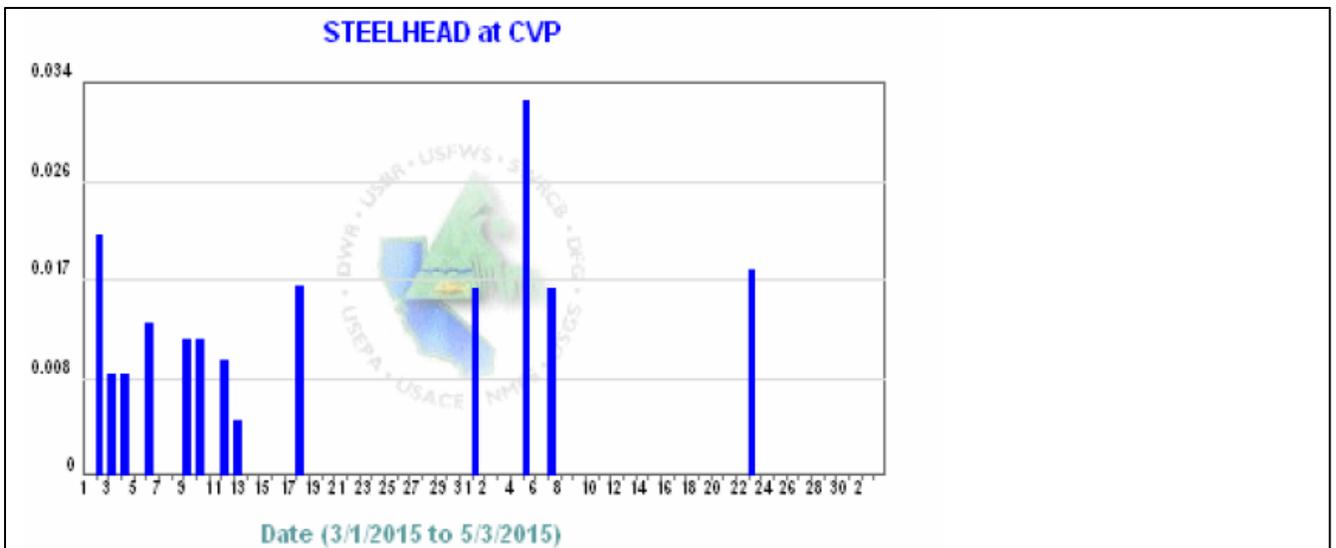


Figure 3. Daily salvage densities (fish per 10,000 m3) of steelhead trout from the federal fish salvage facility during February 29-May 3, 2015. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

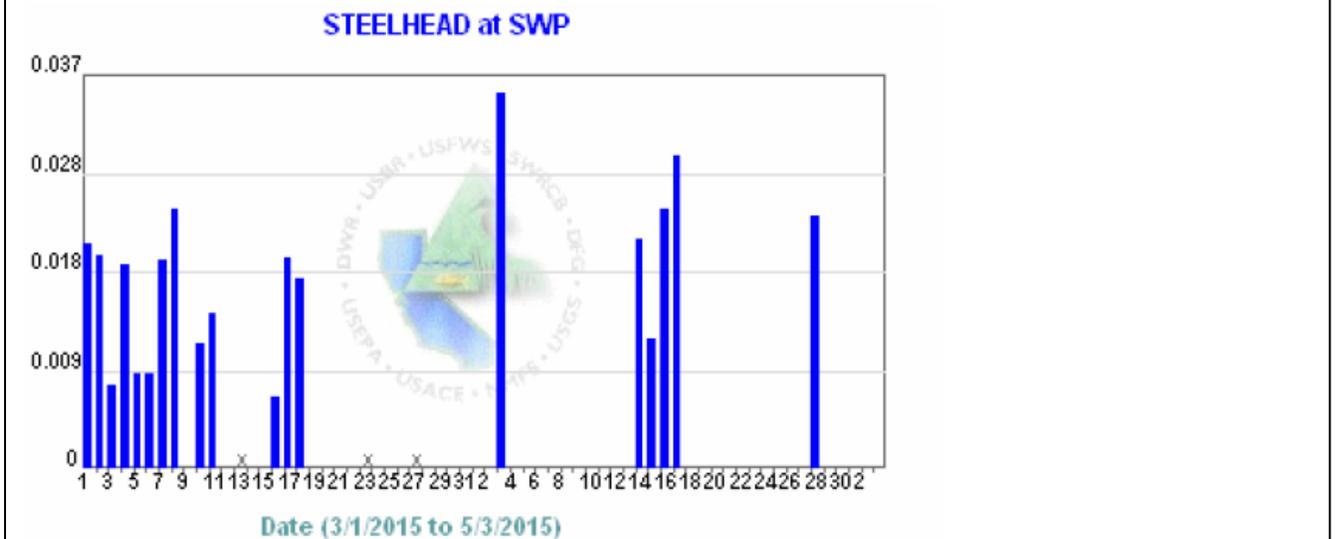


Figure 4. Daily salvage densities (fish per 10,000 m3) of steelhead trout from the state fish salvage facility during February 29-May 3, 2015. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

Islam (DWR) provided the following summary of coded-wire-tag recoveries at the SWP and CVP fish collection facilities.

CONFIRMED HATCHERY (ADIPPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2014/2015

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released <sup>1</sup>	Total Entering Delta	% Loss of Number Released <sup>2</sup>	% Loss of Total Entering Delta <sup>3</sup>	First Concern Level	Second Concern Level	Date of First Loss <sup>4</sup>	Date of Last Loss <sup>4</sup>
12/1/2014	LF	Coleman NFH	Battle Creek	Production	574.59	853,100	n/a	0.067	n/a	n/a	n/a	12/12/2014	1/16/2015
12/4/2014	LF	Coleman NFH	Battle Creek	Spring Surrogate	34.98	77,000	n/a	0.045	n/a	0.5%	1.0%	12/25/2014	12/29/2014
12/18/2014	LF	Coleman NFH	Battle Creek	Spring Surrogate	45.42	78,000	n/a	0.058	n/a	0.5%	1.0%	1/1/2015	1/17/2015
2/5/2015	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	83,100	n/a	0.000	n/a	0.5%	1.0%	*	*
2/4 - 2/6/2015	W	Livingstone NFH	Sacramento River	Production	8.40	612,056	188,500	0.001	0.00004	0.5%	1.0%	2/25/2015	2/25/2015
3/25-3/31/2015	F	Coleman NFH	Rio Vista net pens	Production	3.72	942,800	n/a	n/a	n/a	n/a	n/a	2/23/2015	2/23/2015
4/2-4/3/2015	F	Coleman NFH	Rio Vista net pens	Production	0.00	109,500	n/a	0.000	n/a	0.5%	1.0%	*	*
4/10-4/19/2015	F	Coleman NFH	Rio Vista net pens	Production	0.00	1,517,900	n/a	0.000	n/a	0.5%	1.0%	*	*
4/18-4/19/2015	F	Coleman NFH	Rio Vista net pens	Production	0.00	207,350	n/a	0.000	n/a	0.5%	1.0%	*	*

UNCONFIRMED HATCHERY (ADIPPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2014/2015

Facility	Unknown CWT Loss <sup>5</sup>	Unread CWT Loss <sup>6</sup>	Unknown Hatchery Loss <sup>7</sup>	Acoustic Tag Loss <sup>8</sup>	Number of Unassigned CWTs <sup>9</sup>
SWP	18.01	0.00	0.00	17.00	0
CVP	26.62	0.00	0.00	0.00	0
TOTAL	44.63	0.00	0.00	17.00	0

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2014 through 5/03/2015.

<sup>1</sup>Number released with the adipose-fin clipped and a coded-wire tag (CWT).

<sup>2</sup>% Loss of Number Released = (Confirmed Loss/Number Released)\*100.

<sup>3</sup>% Loss of Total Entering Delta= (Confirmed Loss/Total Entering Delta)\*100.

<sup>4</sup>Date of first and last loss accounts for all CWT loss even those from special studies where salvage and loss=0.

<sup>5</sup>Adipose-fin clipped Chinook was observed during fish count, but tag code could not be determined (e.g., damaged tag, lost tag, no tag, or Chinook released).

<sup>6</sup>CWT has been read, but hatchery release information not yet available.

<sup>7</sup>Adipose-fin clipped Chinook was collected during fish count and has not been processed yet.

<sup>8</sup>Adipose-fin clipped Chinook released due to presence of sutures.

<sup>9</sup>CWT cannot currently be assigned to a salvage record with certainty since the CWT was lost and then found. CWT may be assigned to a salvage record if new information is available.

<sup>10</sup>Chinook outside of the length-at-date criteria (Delta model) are not reported.

\*\* Information not yet available.

DWR-DES Revised 5/04/2015

Preliminary data from DFW, DWR, FWS, and Reclamation; subject to revision.

## 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. The table below reflects current distribution.

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 (naturally produced)</i>	>99% out of Delta; Generally done migrating with the exception of a few stragglers. (Last week: >95% out of Delta)		
<i>YOY winter-run Chinook salmon (hatchery-produced)</i>	>99% out of Delta; Generally done migrating with the exception of a few stragglers. (Last week: >95% out of Delta)		
<i>YOY spring-run Chinook salmon<sup>A</sup></i>	Few stragglers (last week: Few stragglers only to 5%)	20% (last week: 20% - 30%)	80% (last week: 70% - 80%)
<i>Yearling spring-run Chinook salmon<sup>B</sup></i>	>99% out of Delta; Generally done migrating with the exception of a few stragglers. (last week: >95% out of Delta)		
<i>Hatchery steelhead<sup>C</sup></i>	>95% out of Delta; Generally done migrating with the exception of a few stragglers. (Last week: same)		
<i>Sacramento River steelhead (naturally- produced)</i>	Limited catch data		
<i>San Joaquin River steelhead<sup>D</sup></i>	<5% (last week: 5%)	10% (last week: 10% - 15%)	85% - 90% (last week: 80% - 85%)

<sup>A</sup> Chipp Island Trawl data of spring-run is difficult to interpret now that the 75% unmarked fall-run productions are likely masking the wild spring-run Chinook catch.

<sup>B</sup> No yearling spring-run Chinook salmon have been caught in 2014 monitoring. In general, very few yearling spring-run Chinook salmon are observed because of their relatively large size and strong swimming (and associated gear avoidance) abilities.

<sup>C</sup> Difficult to assess now that all hatchery releases are in the system (CNFH, Feather River Fish Hatchery, and Mokelumne Fish Hatchery released as usual; Nimbus Hatchery released their steelhead in the spring of 2014 because of expected unsuitable hatchery water temperatures during the summer of 2014). Percentages are intended to capture distribution of steelhead that migrate out; not those that may residualize.

<sup>D</sup> Have observed a few juvenile steelhead in monitoring data. Distribution estimates are also based on 10 years of historical data from Mossdale Trawls (on the San Joaquin River) and RST data from Caswell Park (on the Stanislaus River), as well as on recent flow and water temperature conditions.

## DOSS Feedback on Entrainment Risk

Entrainment risk of fish from the Sacramento River into the Interior Delta (same as last week except for tidal conditions):

DOSS noted that generally, there is an increased risk of entrainment into the interior Delta during spring tides, compared to during neap tides, at any OMR level. During a spring tide, tidal conditions extend further upstream and may, for example, create conditions at Georgiana Slough

(e.g., reverse flows) that are associated with routing into Georgiana Slough, a route to the interior Delta. Currently, the Delta is in a spring tide.

Entrainment risk of fish in the Interior Delta into the CVP/SWP facilities (same as last week): DOSS assessed the current risk of entrainment for listed salmonids. For listed salmonids in the Delta, the current risk of entrainment for each OMR flow range was characterized as follows:

- -1,200 to -2,000 cfs has a medium risk of entrainment
- -2,000 to -3,500 cfs has a medium to high risk of entrainment
- -3,500 to -5,000 cfs has a high risk of entrainment

### **Agenda Item 6.**

#### **CWT recoveries in Delta Juvenile Fish Monitoring Program (DJFMP) & RST monitoring**

DOSS discussed the value of CWT information from CWT recoveries in DJFMP & RST monitoring, and there was general agreement that the CWT information is very valuable. Some CWT data highlights are provided below:

- CWT data from in-river and in-Delta monitoring provide information on:
  - migration timing of hatchery fish
  - spatial distribution of hatchery fish
- Example uses include:
  - Hatchery winter-run Chinook migration timing based on CWT recoveries at the Sacramento Trawl was considered when scheduling the BY 2014 winter-run hatchery release in coordination with a potential Delta Cross Channel opening
  - CWT recoveries in juvenile monitoring considered in NMFS 5-year status reviews
- It was noted that the information attained from CWT data is used for both retrospective (often multi-year) analyses as well as in-season understanding of fish distributions and migration timing.
- DFW reminded DOSS that the Spring Kodiak Trawl dataset is another rich source of information (including CWT recoveries) for salmonids.

### **Agenda Item 7.**

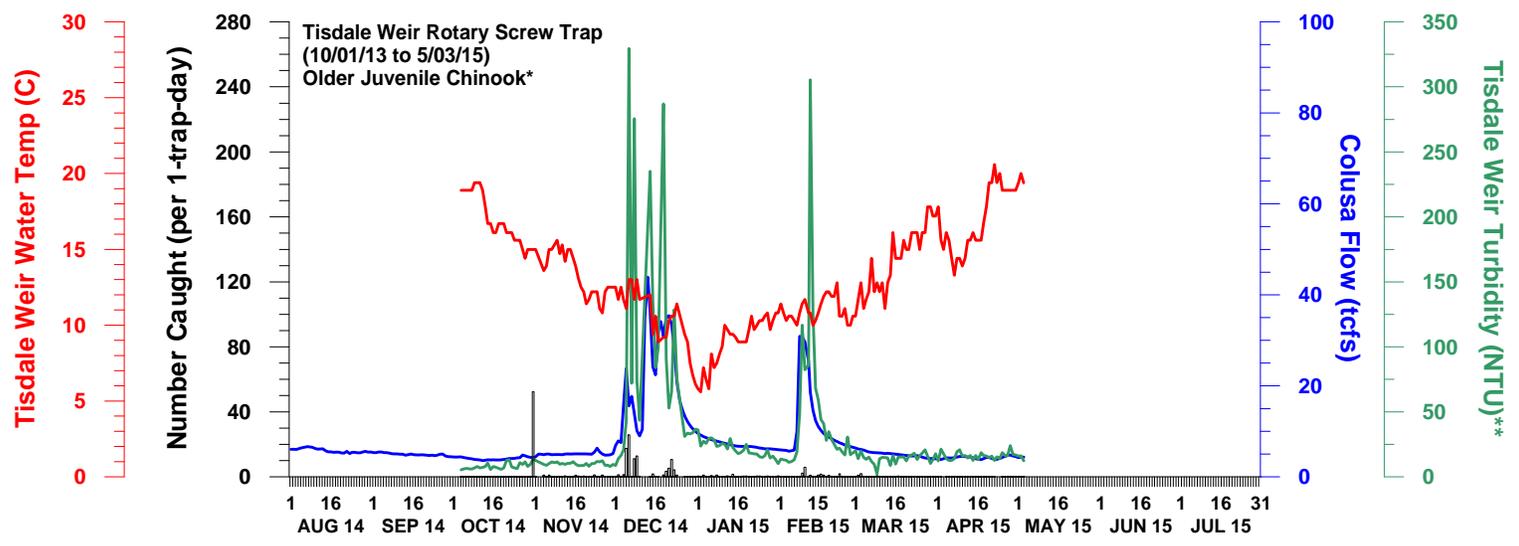
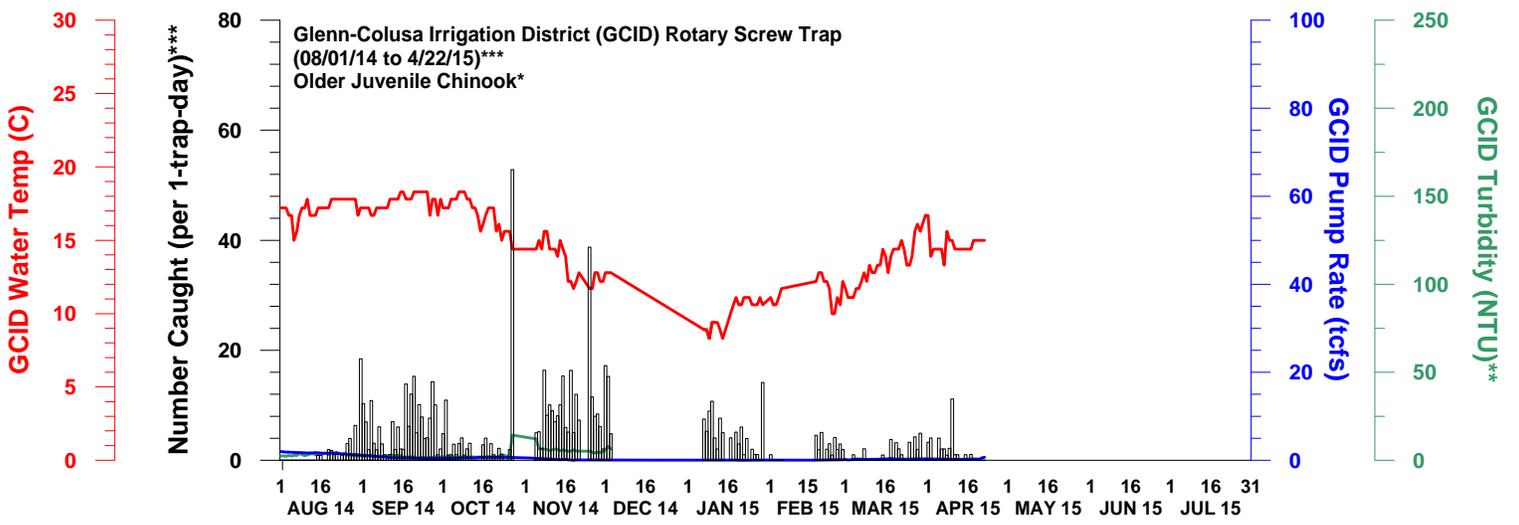
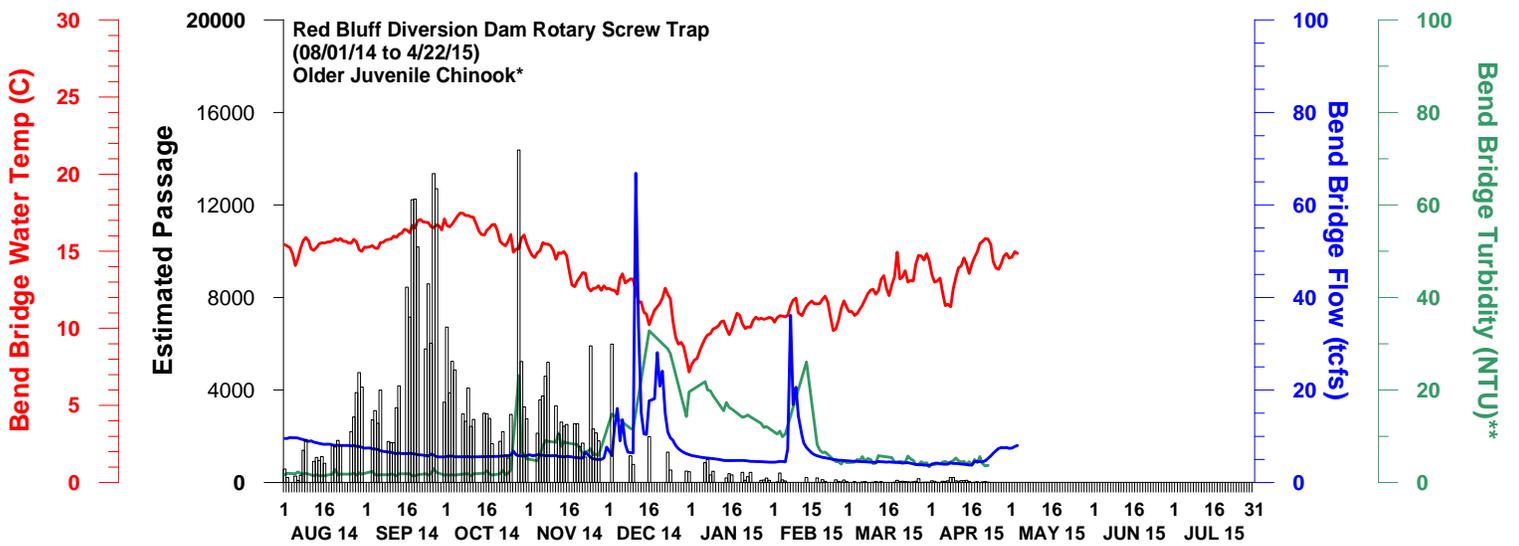
**DOSS Advice to WOMT and NMFS:** None.

**Next Meeting:** The next DOSS conference call will be on 5/12/15 at 9am.

The following graphs were provided by DWR for Chinook salmon and steelhead observed at monitoring locations in the Sacramento and San Joaquin rivers and Delta. For additional graphs, please visit the DWR website at:

<http://www.water.ca.gov/swp/operationscontrol/calFed/calFedMonitoring.cfm>

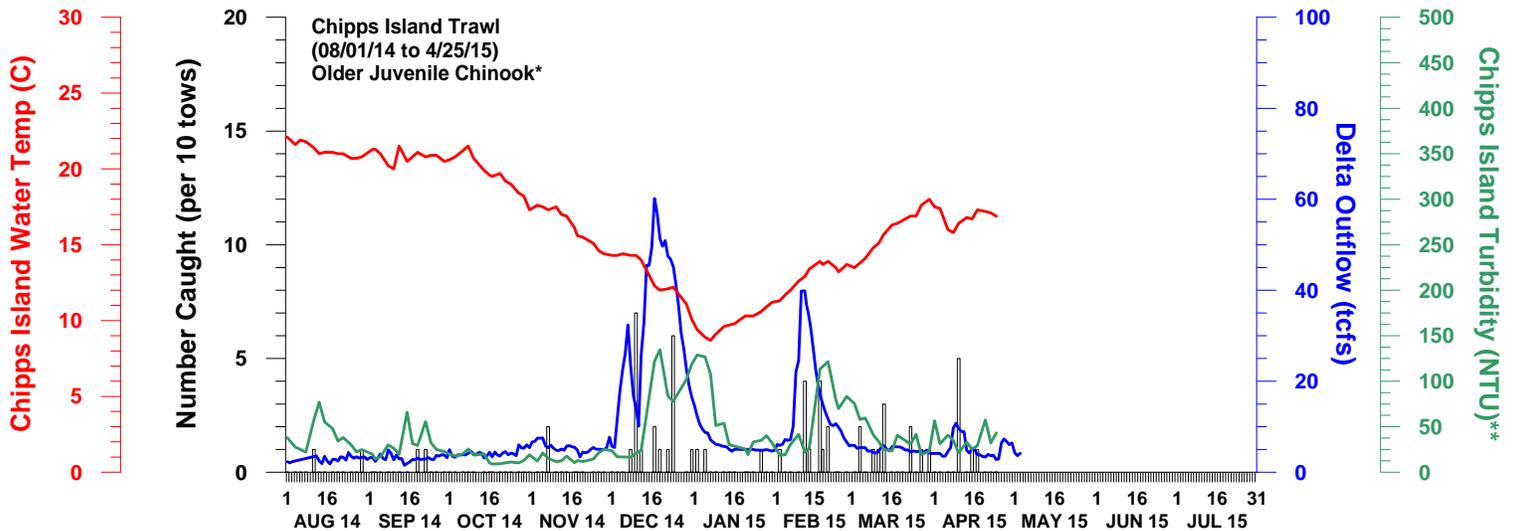
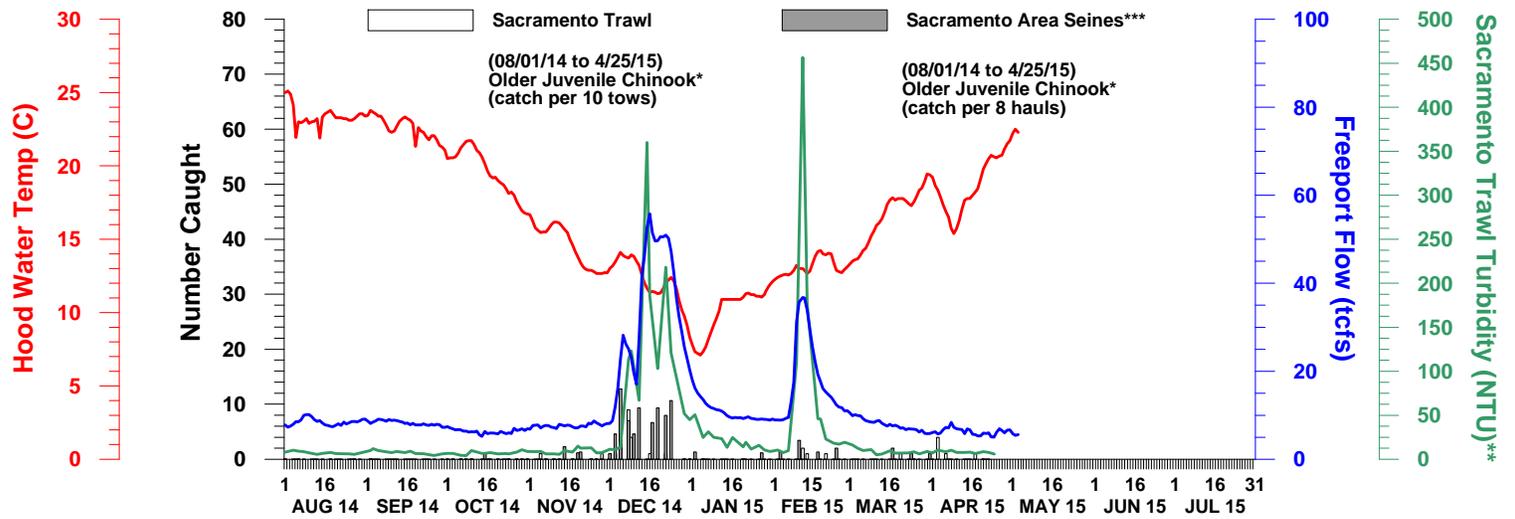
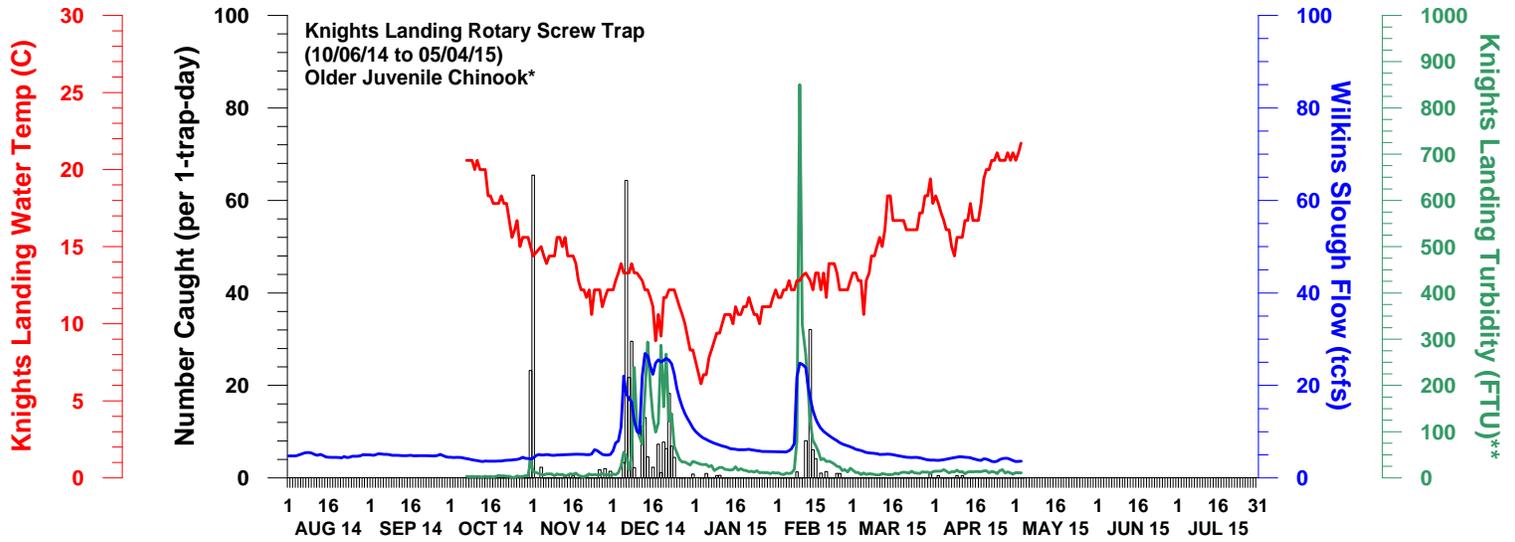
# NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER



DWR-DES 4 MAY 2015  
 Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.

\*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Frank Fisher model) for which a race is assigned on a given sampling date.  
 \*\*Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured unless data are missing for more than five days.  
 \*\*\*Trap was pulled on 10/28/14 due to extremely turbid conditions, heavy debris, and high number of listed winter run Chinook and has resumed since 11/5/14.  
 Trap was not in operation on 10/14/14, 1/14/15, and 2/14/15, 3/14/15 due to forested increases in flow and subsequent elevation change.

# NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE LOWER SACRAMENTO RIVER AND CHIPPS ISLAND



DWR-DES 4 MAY 2015

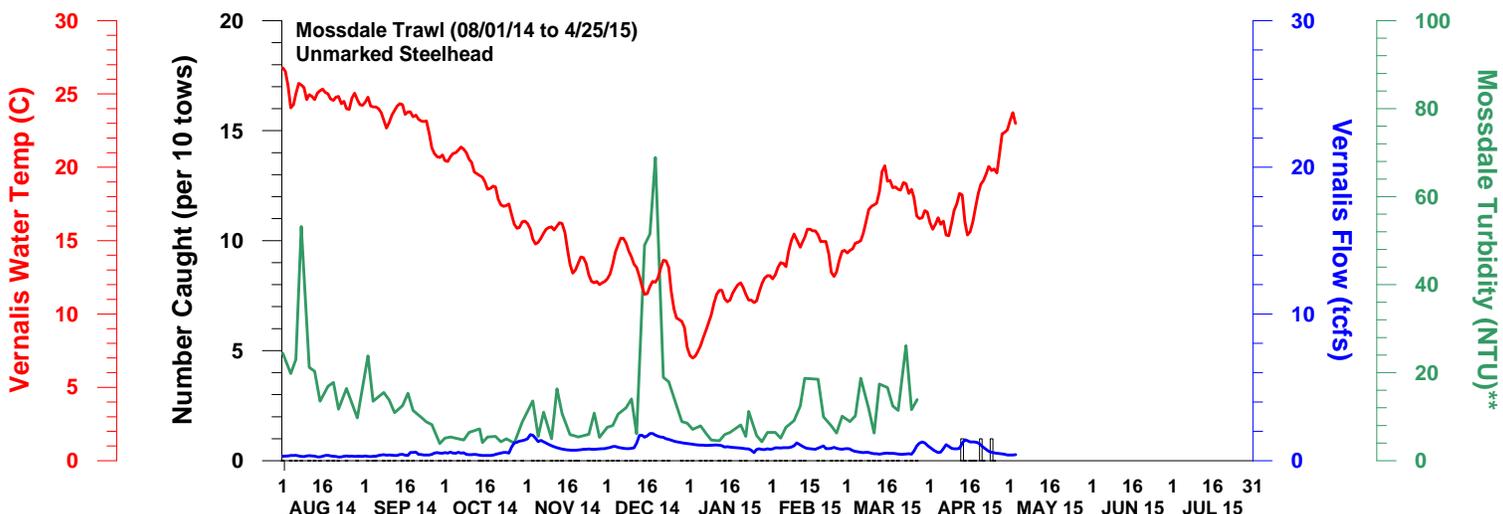
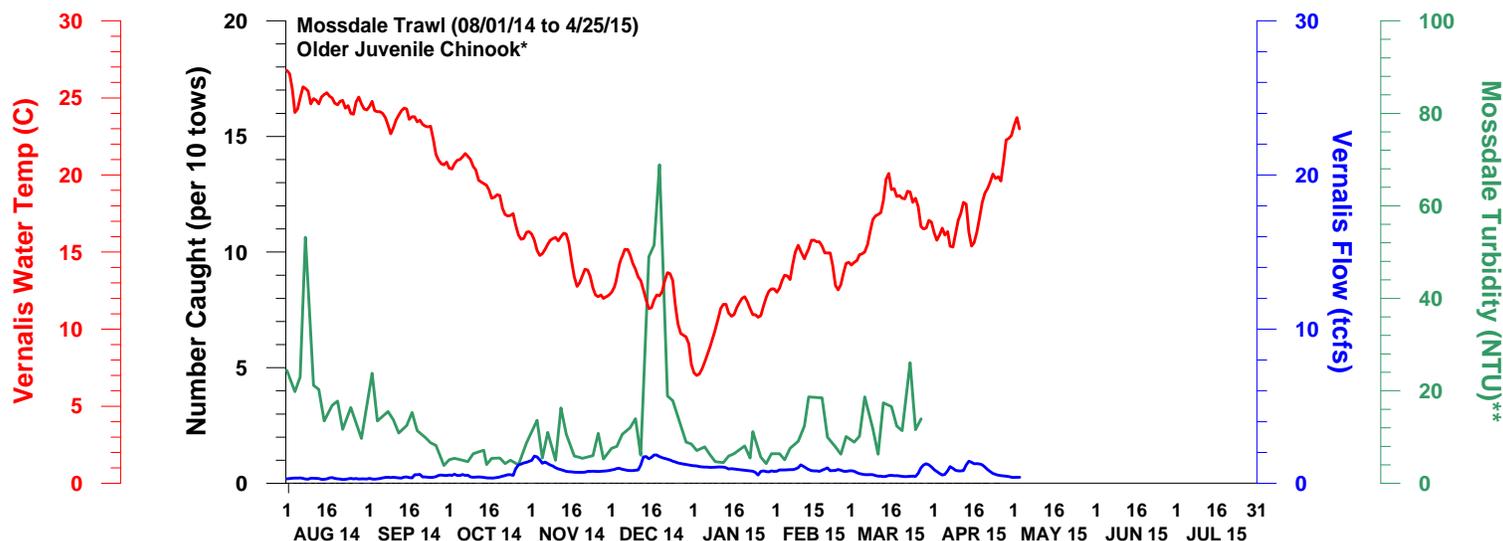
Preliminary data from DFW, FWS, and CDEC; subject to revision.

\*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Frank Fisher Model) for which a race is assigned on a given sampling date.

\*\*Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured unless data are missing for more than five days. Knights Landing turbidity measured in FTU, which should be roughly equivalent to NTU.

\*\*\*Sacramento area seine route consists of the following seine sites: Verona, Elkhorn, Sand Cove, Discovery Park, American River, Miller Park, Sherwood Harbor, and Garcia Bend. Bars are stacked if Chinook caught from the trawl and seines are from the same day.

# NUMBER OF UNMARKED OLDER JUVENILE CHINOOK AND STEELHEAD MEASURED IN THE SAN JOAQUIN RIVER



DWR-DES 4 MAY 2015  
Preliminary data from FWS and CDEC; subject to revision.

\*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Frank Fisher model) for which a race is assigned on a given sampling date.

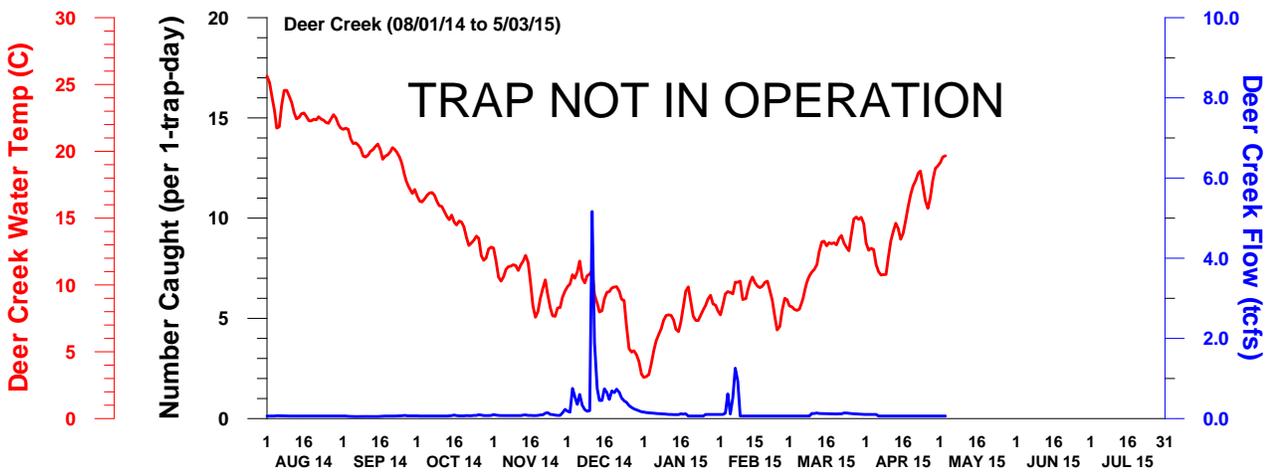
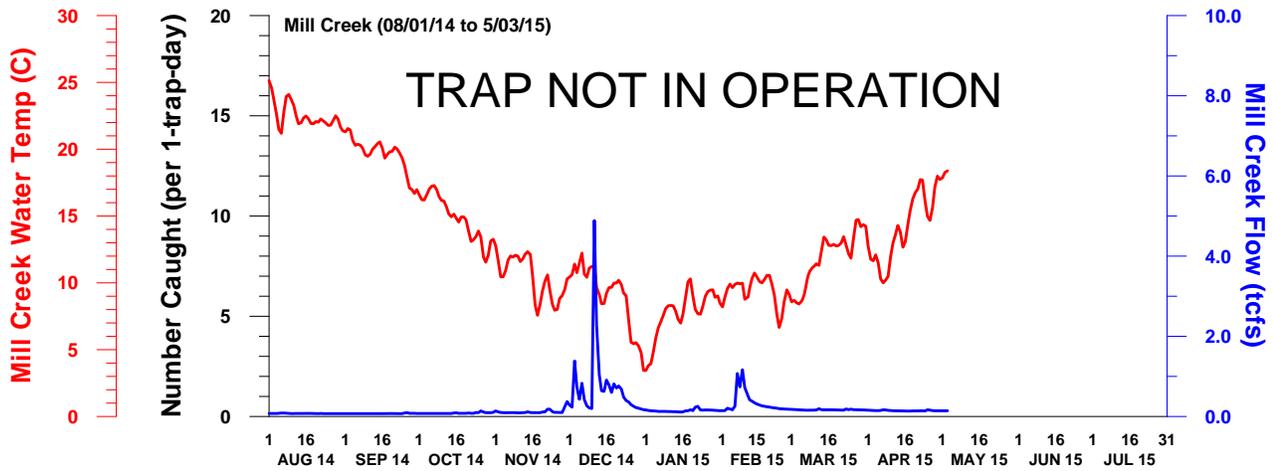
\*\*Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured unless data are missing for more than five days.







# WATER TEMPERATURE AND FLOW MEASURED AT MILL AND DEER CREEK



## **Data Acquisition:**

All data are preliminary and subject to revision.

The estimated passage data for the Red Bluff Diversion Dam were obtained directly from the US Fish and Wildlife Service (FWS), Red Bluff Fish and Wildlife Office ([http://www.fws.gov/redbluff/rbdd\\_biweekly\\_final.html](http://www.fws.gov/redbluff/rbdd_biweekly_final.html)).

The catch data for Glenn-Colusa Irrigation District (GCID) were obtained directly from GCID.

The catch data for Tisdale Weir and Knights Landing were obtained directly from the California Department of Fish and Wildlife (DFW)<sup>1</sup>, North Central Region.

Sacramento River Trawl, Sacramento Area Beach Seine, and Chipps Island Trawl data were obtained directly from FWS, Stockton Fish and Wildlife Office (<http://www.fws.gov/stockton/ifmp/>).

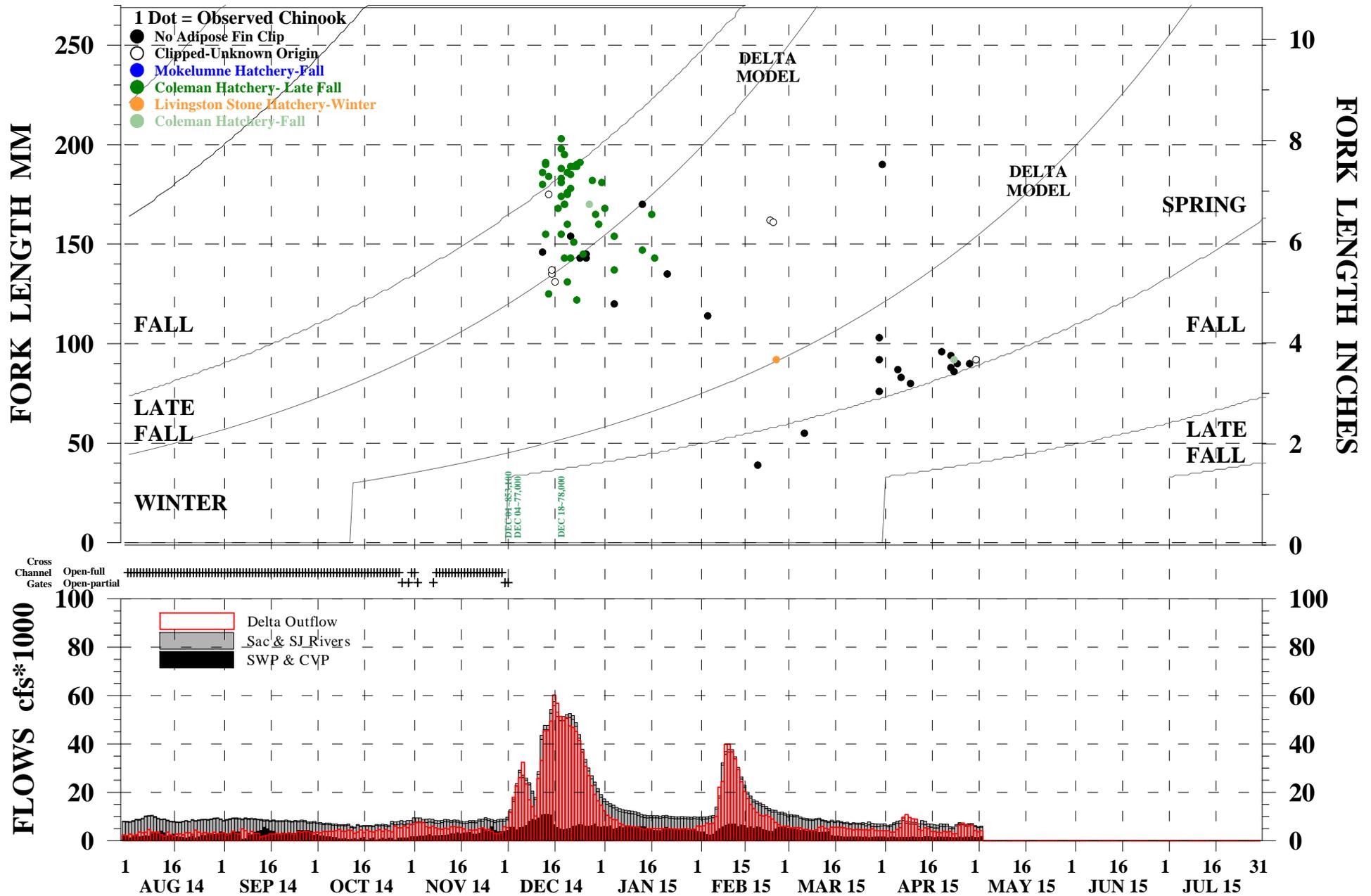
Mossdale Trawl data were either obtained directly from FWS, Stockton Fish and Wildlife Office or from DFW (Region 4).

The hydrology data were either downloaded from the California Data Exchange Center (CDEC) (<http://cdec.water.ca.gov>) or obtained directly from the California Department of Water Resources, Operations Control Office.

---

<sup>1</sup> Formerly known as the California Department of Fish and Game (DFG).

# OBSERVED CHINOOK SALVAGE AT THE SWP & CVP DELTA FISH FACILITIES 08/01/2014 THROUGH 5/3/2015

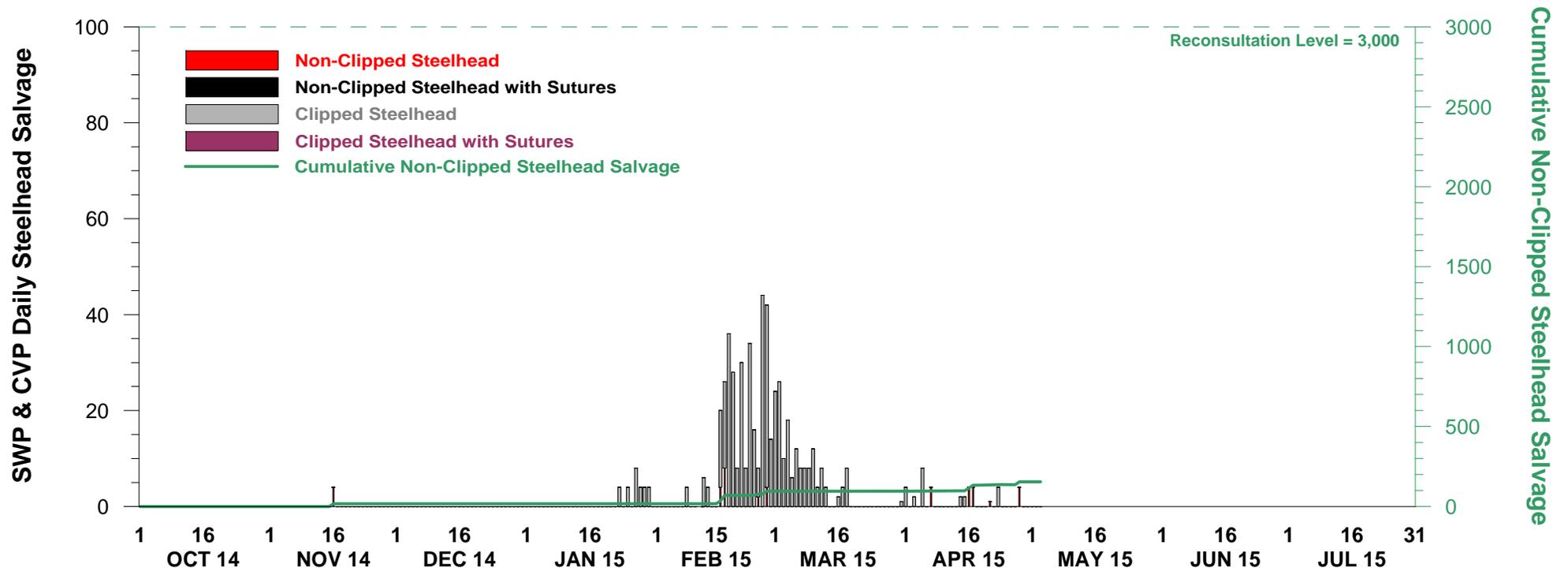


DWR-DES 4 MAY 2015

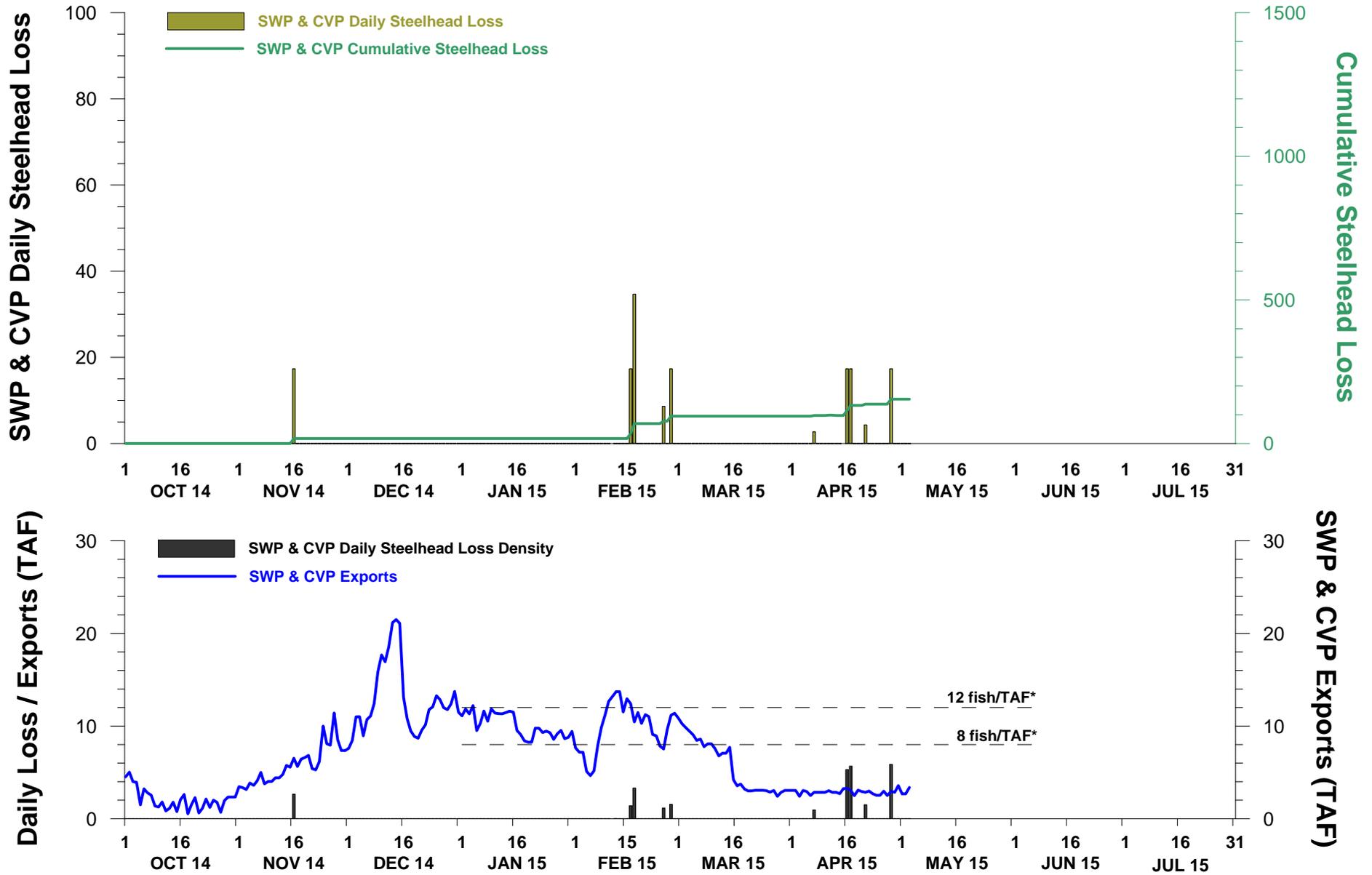
Preliminary data from DFW, DWR, FWS, Reclamation, and CDEC; subject to revision.

\*Chinook not measured for length and Chinook outside of the length-at-date criteria (Delta model) are not reported.

# STEELHEAD SALVAGE AT THE DELTA FISH FACILITIES 01 OCT 2014 THROUGH 3 MAY 2015



# NON-CLIPPED STEELHEAD LOSS AT THE DELTA FISH FACILITIES 01 OCT 2014 THROUGH 3 MAY 2015



DWR-DES 4 MAY 2015

Preliminary data from DFW; subject to revision.

\*Used to roughly estimate whether the daily loss is greater than 8 fish/TAF multiplied by the volume exported in TAF or 12 fish/TAF multiplied by the volume exported in TAF.