

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 5/12/2015 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.

DWR: Farida Islam, Rhiannon Mulligan, Aaron Miller, Bryant Giorgi, Dan Yamanaka
Reclamation: Peggy Manza, Michele Palmer, Josh Israel
NMFS: Barb Byrne, Jeff Stuart, Meiling Roddam
USFWS: Craig Anderson, Leigh Bartoo
CDFW: Ken Kundargi, Bob Fujimura

Agenda Items

1. Agenda review and introductions
2. RPA Implementation review
3. Current Operations
4. Smelt Working Group
5. Fish Monitoring
6. DOSS Advice
7. Ideas on data summaries for WY 2016
8. Next DOSS meeting

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 (5/12/2015)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	400	Jones Pumping Plant	0-800 ^A
Reservoir Releases (cfs)			
Feather - Oroville	3,750 ^B	American - Nimbus	1,250
		Sacramento - Keswick	7,500
		Stanislaus - Goodwin	150
		Trinity – Lewiston	2,800 ^C
Reservoir Storage (in TAF)			
San Luis (SWP)	851	San Luis (CVP)	355
Oroville	1,691	Shasta	2,572
New Melones	475	Folsom	565
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	6,544
Outflow Index (cfs)	4,700	San Joaquin River at Vernalis (cfs)	449
E:I	9% (3-day avg.)	X2	>81 km

^A Due to water quality concerns, Reclamation is cycling one unit (which pumps at a rate of ~800 cfs) on/off daily throughout the week.

^B Increased from 3,000 cfs on 5/9/15 for salinity management in the Delta

^C Will be decreased to 450 cfs by the end of June.

Salinity management is currently controlling exports.

Current OMR index (5/12): = ~ 1,100 cfs

OMR values as of 5/9/15:

	USGS gauges (cfs)	Index (cfs)
5-day avg.	-1,170	-1,080
14-day avg.	-1,520	-1,450

Agenda Item 4.

Smelt Working Group (SWG)

Bartoo (FWS) provided the following email update:

The Service requested that the Working Group provide an assessment of risk for Delta Smelt for the -1,250 to -2,000 cfs OMR flow range. The Working Group reviewed the recent survey data, current salvage, and Delta conditions, and indicated that the OMR flow range of -1,250 to -2,000 cfs had a low to medium risk of entrainment.

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 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 18, 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	Knights Landing RST ^A	Tisdale RST ^B	GCID RST ^C	Mossdale Kodiak Trawl
Sample Date	5/3-5/9	5/3-5/9	5/3-5/9	5/4-5/11	5/3-5/11	5/5-5/11	5/4-5/10
Total Catch	35	0	39	5	6	304	3
FR Chinook	22 (68mm-91mm)			4	5	275	
WR Chinook						1	
SR Chinook	4 (91mm-107mm)			1	1	27	
LFR Chinook						1	
Ad-Clipped Chinook	8 (72mm-109mm)		1 (76mm)				
Delta Smelt			28				
Splittail			9				
Longfin Smelt			1				
Steelhead (ad-clip)	1 (287mm)						1 ^D
Steelhead (wild)							2 (214mm, 235mm)
Green Sturgeon							
Flows (avg. cfs)				3,754	4,643	878	
W. Temp. (avg. °F)				68	65	60	
Turbidity (avg. NTU)				11	15	6.32	

^A Sampling period was from 5/4 at 11:30am to 5/11 at 10:00am. For sampling period from 5/10 at 10:00am to 5/11 at 10:00am, only one RST was sampling due to mechanical issues with the other trap.

^B Sampling period was from 5/3 at 8:30am to 5/11 at 7:45am.

^C RST trap resumed fishing on 5/3 at 9:00am. For 5/4 sample period, a log was jammed in the cone which resulted in no catch.

^D The 1 ad-clipped steelhead was acoustic-tagged, and the same ad-clipped fish was captured in 2 of the 10 tows on 5/7.

Acoustic-tagged Spring-run Chinook and *O. mykiss* from the Mill Creek RST

(Data provided by Jeremy Notch—SWFSC)

- Dates of tagging: 4/22 – 5/2
- Total number of SR Chinook tagged as of 5/2: 140
- Total number of *O. mykiss* tagged as of 5/2: 16
- Summary of detections as of 5/8 at 4:30pm in table below:

Species	Avg. FL	Tisdale	Sacramento	Hood
SR Chinook	86mm	7 (5% of total)	0	0
<i>O. mykiss</i>	204mm	1 (6.25% of total)	0	0

Coleman National Fish Hatchery fall-run Chinook production release

Table 1 — Planned release summary of Coleman National Fish Hatchery brood year 2014 fall Chinook salmon.

Release		CWT	Fork Length (mm) <i>estimated average</i>	Count	
Date	Location	Code or Mark		With CWT and Mark ¹	Total
May 13-14, 2015	Mare Island	05 58 10	75	104,775	419,100
	net pens	05 58 11	75	101,025	404,100
Grand Total				205,800	823,200

¹ Total number of fish with a coded-wire tag (CWT) and an adipose fin clip (Mark) for groups receiving a CWT or total number of fish with a Mark for groups only receiving an adipose fin clip. For this planned release notice, retention was assumed to be 100% for any applied CWT or Mark.

Fish Salvage¹:

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>.

¹Salvage 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: May 4-10, 2015
 Prepared by Bob Fujimura on May 11, 2015 19:43
 Preliminary Results -Subject to Revision

Criteria	4-May	5-May	6-May	7-May	8-May	9-May	10-May	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	↔	0.00
Wild steelhead	0	0	0	0	2.11	0	0	↘	0.30
Exports									
SWP daily export	0	0	0	0	0	346	364	↘	101
CVP daily export	1,132	476	1,225	362	1,288	298	1,125	↘	844
SWP reduced counts	NS	NS	NS	NS	NS	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
 NS = not sampled

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	↔	53	106
Spring Run	1	4	↘	46	66
Late Fall Run	0	0	↔	6	26
Fall Run	0	0	↔	16	26
Unclassified	0	0	↔	24	NC
Total	1	4		145	225
Hatchery					
Winter Run	0	0	↔	62	214
Spring Run	0	0	↘	8	7
Late Fall Run	0	0	↔	136	340
Fall Run	0	0	↔	41	180
Unclassified	0	0	↔	12	NC
Total	0	0		259	741

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	3	↘	43	157
Hatchery	0	0	↔	523	1,841
Total	4	3		566	1,998

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 5/4/15-5/11/15.

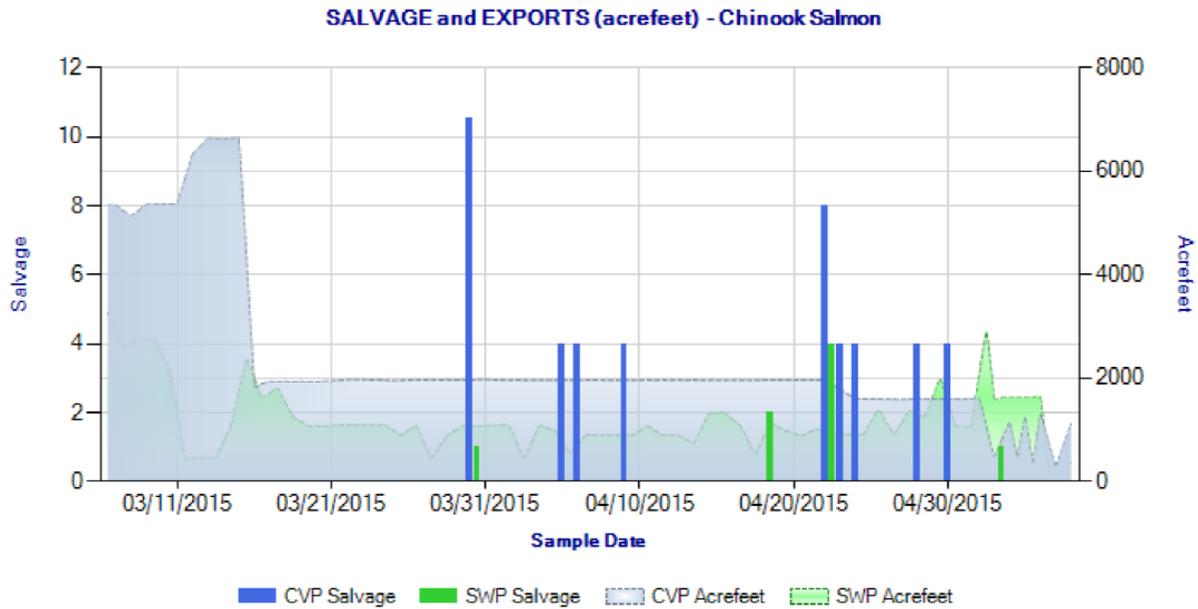


Figure 2. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during 3/7/15 through 5/10/15.

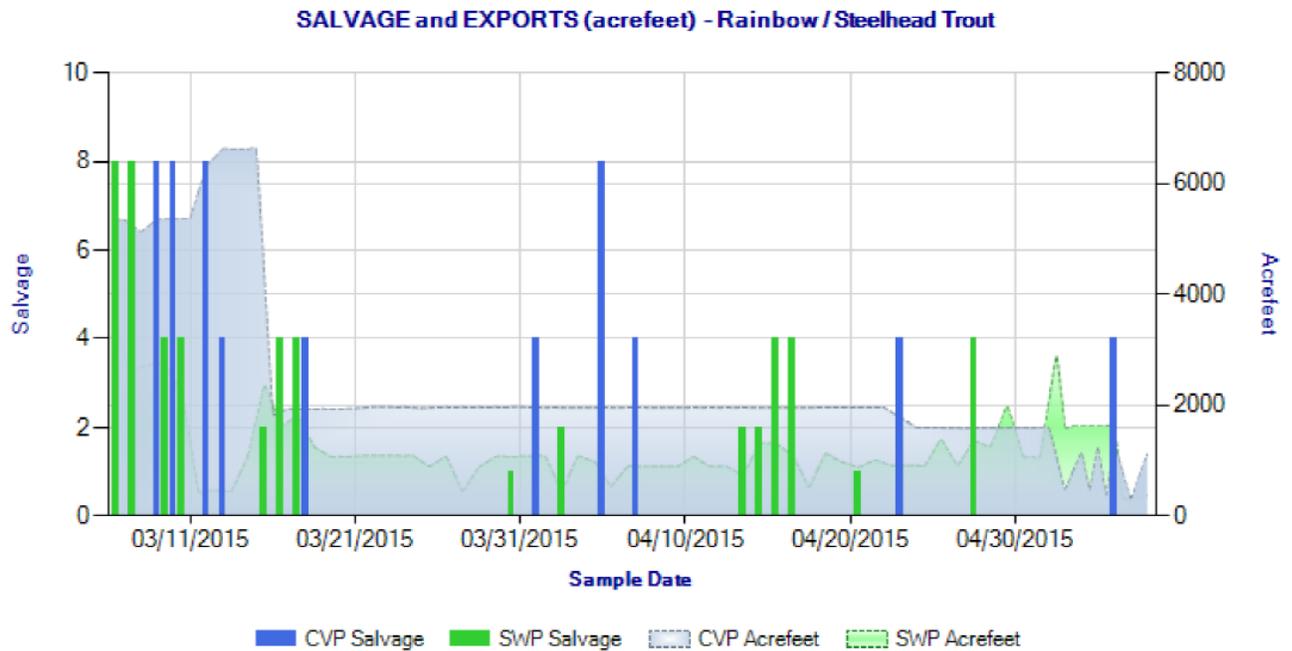


Figure 3. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during 3/7/15 through 5/10/15.

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

CONFIRMED HATCHERY (ADIPOSE-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 ¹	Total Entering Delta	% Loss of Number Released ²	% Loss of Total Entering Delta ³	First Concern Level	Second Concern Level	Date of First Loss ⁴	Date of Last Loss ⁴
12/12/2014	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
2/6/2015	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	188500	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 (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2014/2015

Facility	Unknown CWT Loss ⁵	Unread CWT Loss ⁶	Unknown Hatchery Loss ⁷	Acoustic Tag Loss ⁸	Number of Unassigned CWTs ⁹
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 5/10/2015.

¹Number 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.

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

⁵Adipose-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).

⁶Adipose-fin clipped Chinook was collected during fish count and has not been processed yet.

⁷CWT has been read, but hatchery release information not yet available.

⁸Adipose-fin clipped Chinook released due to presence of sutures.

⁹CWT 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.

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

** Information not yet available.

DWR-DES Revised 5/11/2015

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: same)		
<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: same)		
<i>YOY spring-run Chinook salmon^A</i>	Few stragglers (last week: Few stragglers only to 5%)	15% (last week: 20%)	85% (last week: 80%)
<i>Yearling spring-run Chinook salmon^B</i>	>99% out of Delta; Generally done migrating with the exception of a few stragglers. (last week: same)		
<i>Hatchery steelhead^C</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^D</i>	<5% (last week: same)	10% (last week: same)	90% (last week: 85% - 90%)

^A 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.

^B 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.

^C 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.

^D 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 experiencing a neap tide.

DOSS notes that a DCC opening (planned for 5/14/15) may increase the risk of entrainment into the interior Delta for fish in the vicinity of the DCC. The DCC matrix triggers are in place to reduce the risk.

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.

DOSS Advice to WOMT and NMFS: None.

Agenda Item 7.

Ideas on data summaries for WY 2016: Reclamation and NMFS asked DOSS members for any suggestions for alternate data formats or summaries for use in WY 2016, based on the WY 2015 experience with acoustic-tag tracking data. Some initial suggestions were:

- provide figure showing cumulative acoustic-tag passage by different receivers
- provide bulleted summary (rather than full worksheet) for managers
- consider alternate distribution/online posting mechanisms for data sharing

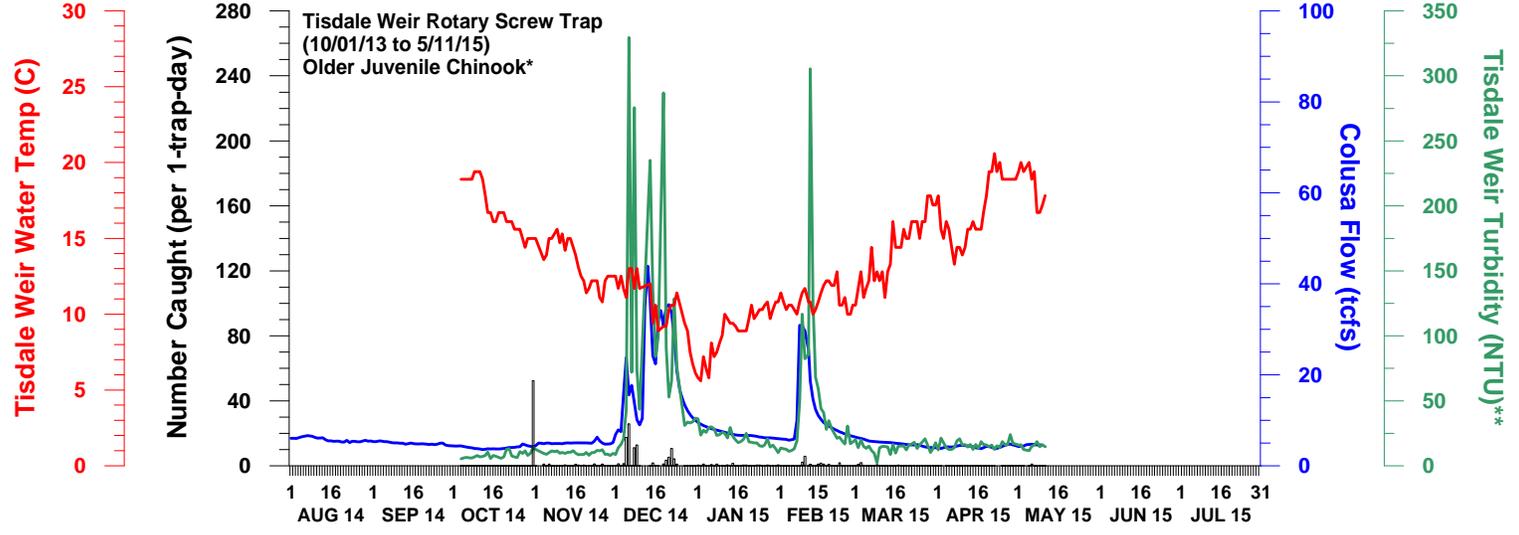
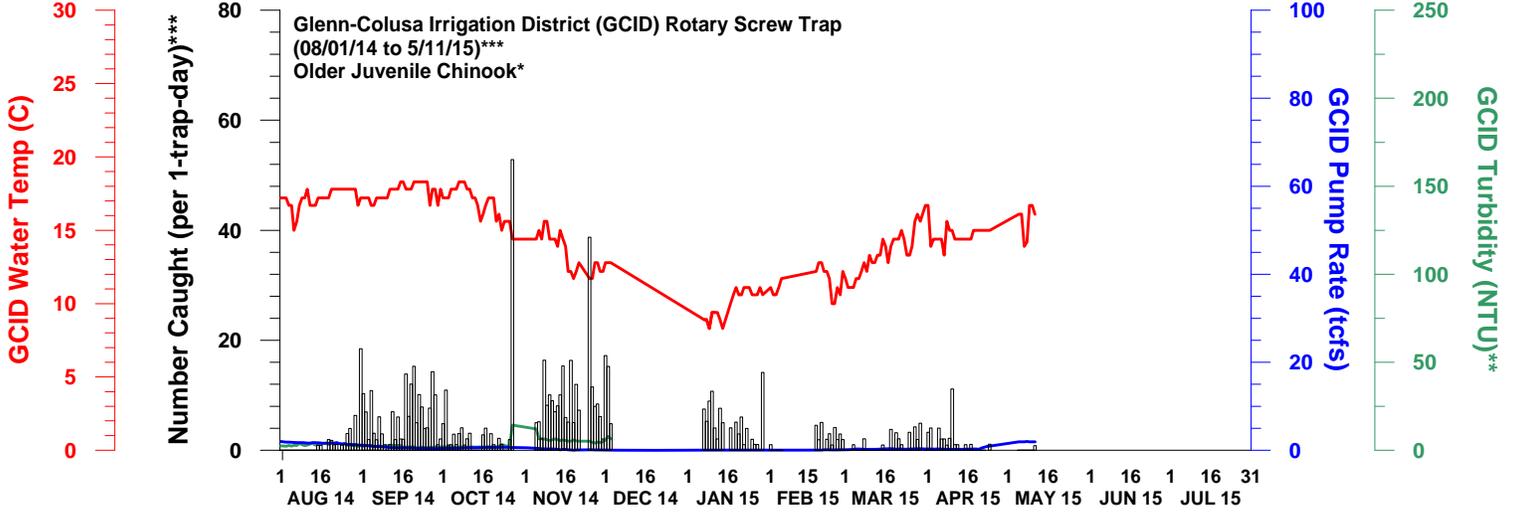
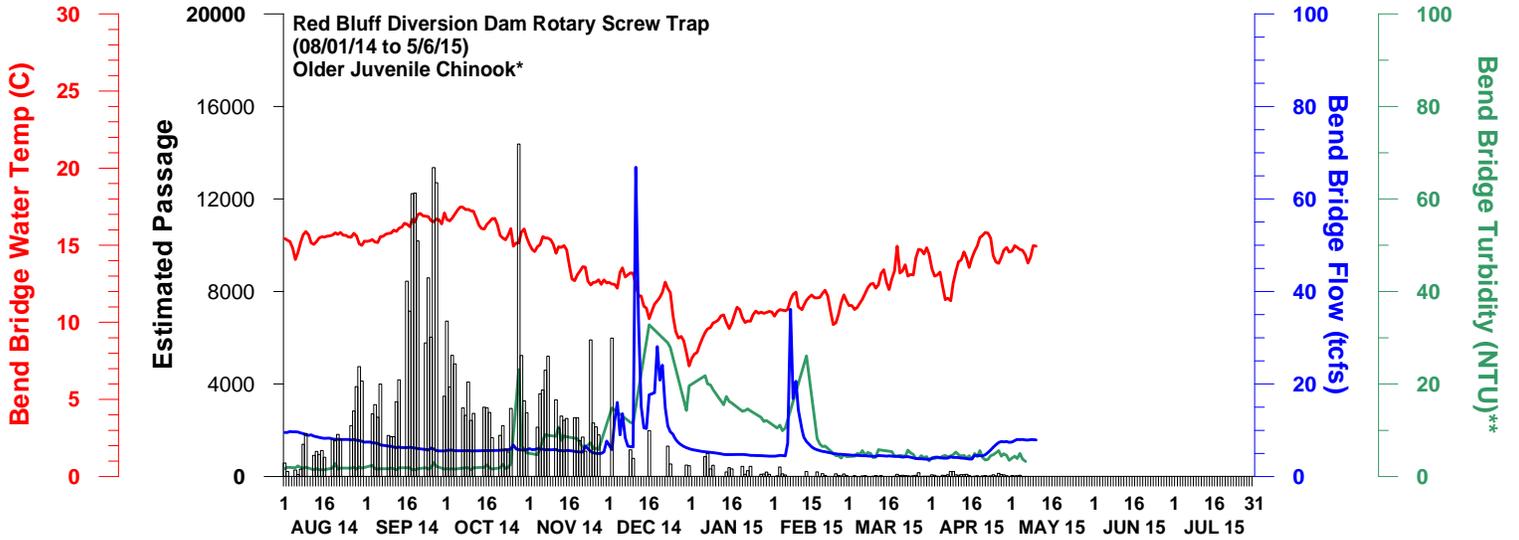
Agenda Item 8.

Next Meeting: The next DOSS conference call will be on 5/19/15 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>

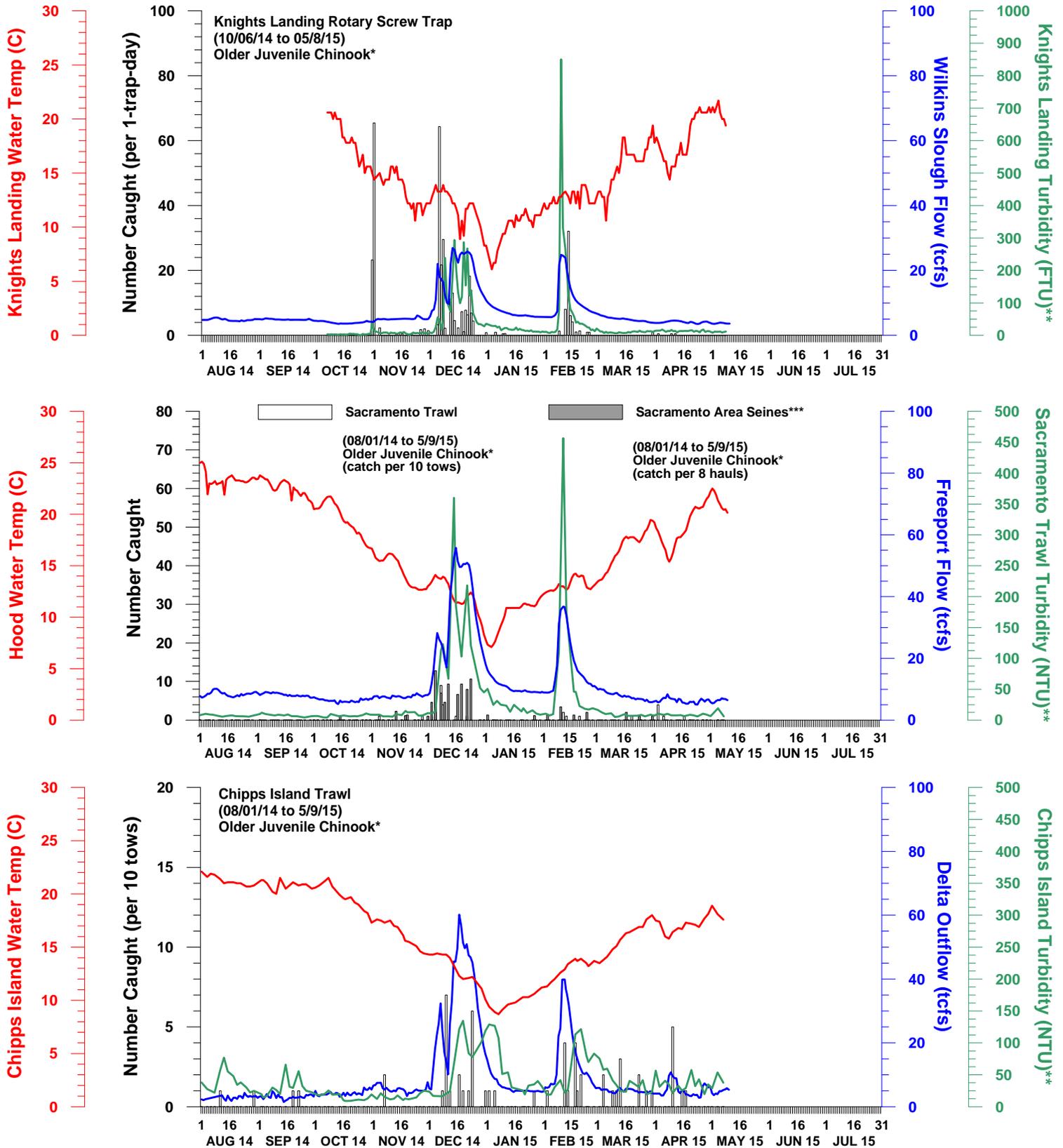
NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER



DWR-DES 11 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 12/3/14-1/6/15, 2/5/15-2/16/15, and 4/25/15-5/4/15 due to various reasons.

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



DWR-DES 11 MAY 2015

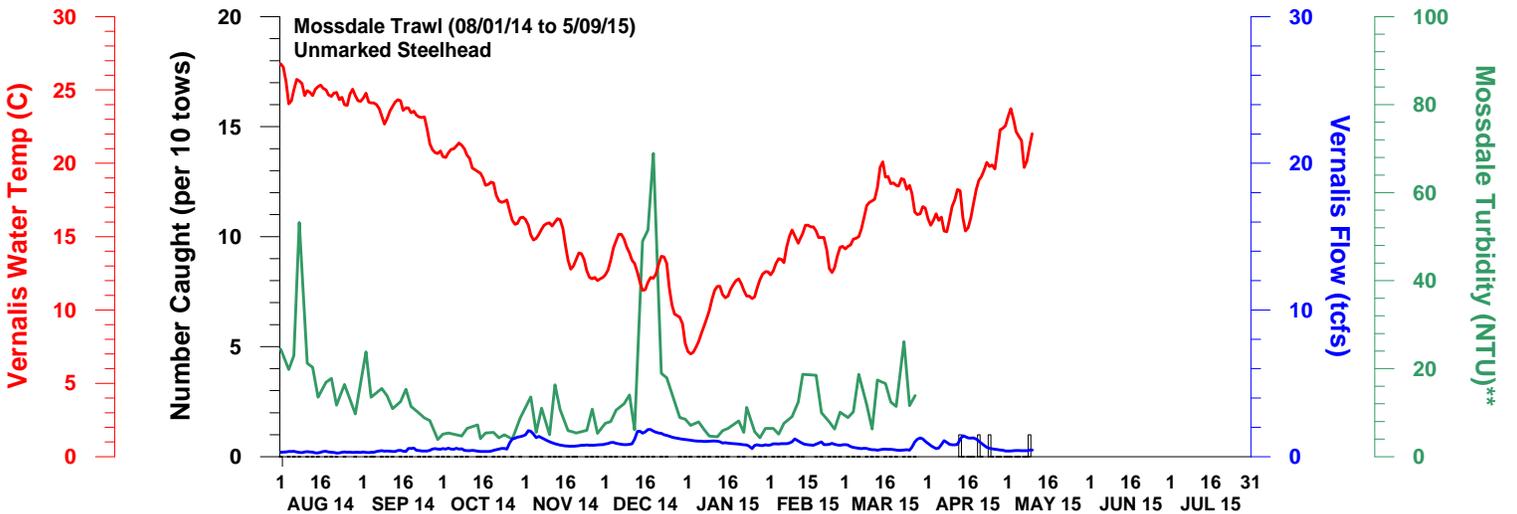
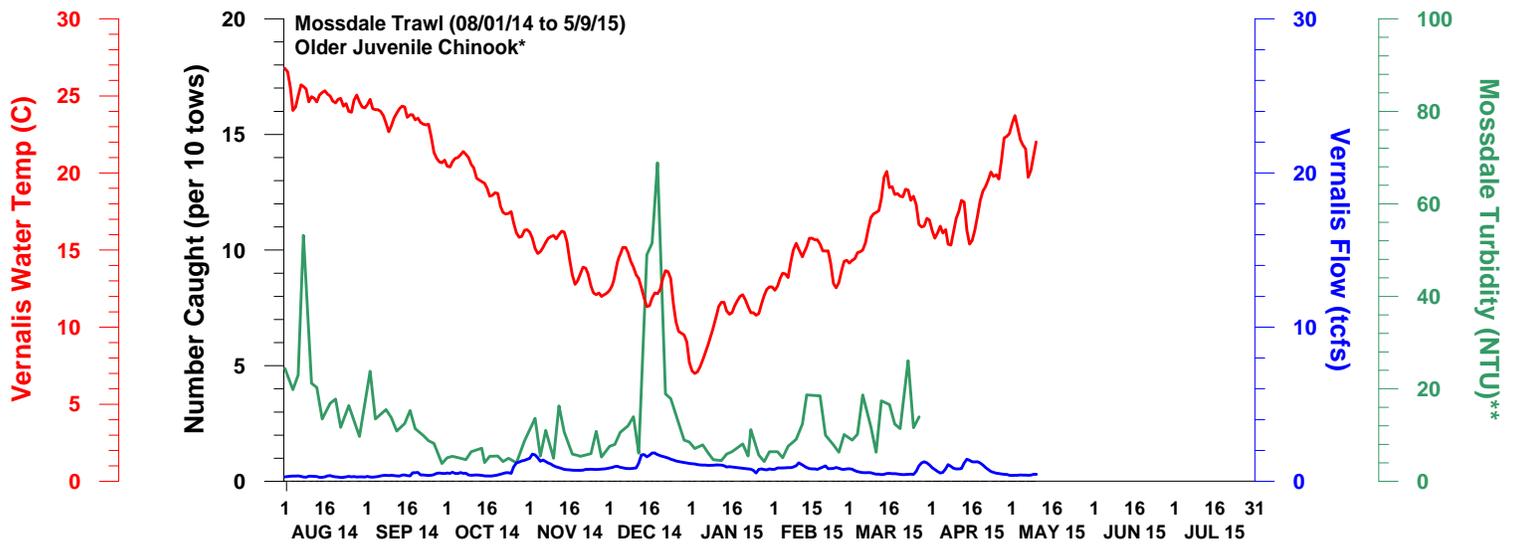
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*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

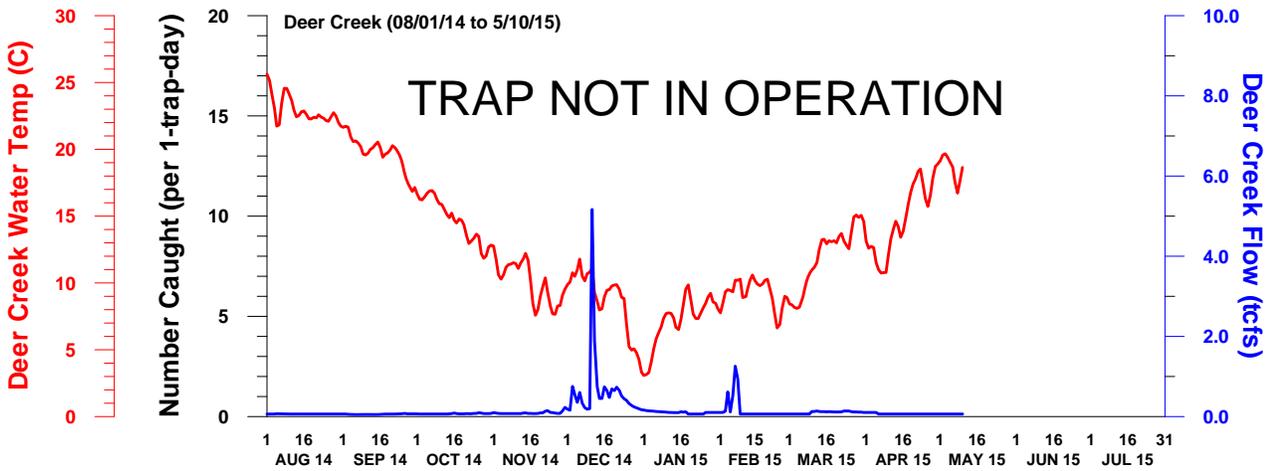
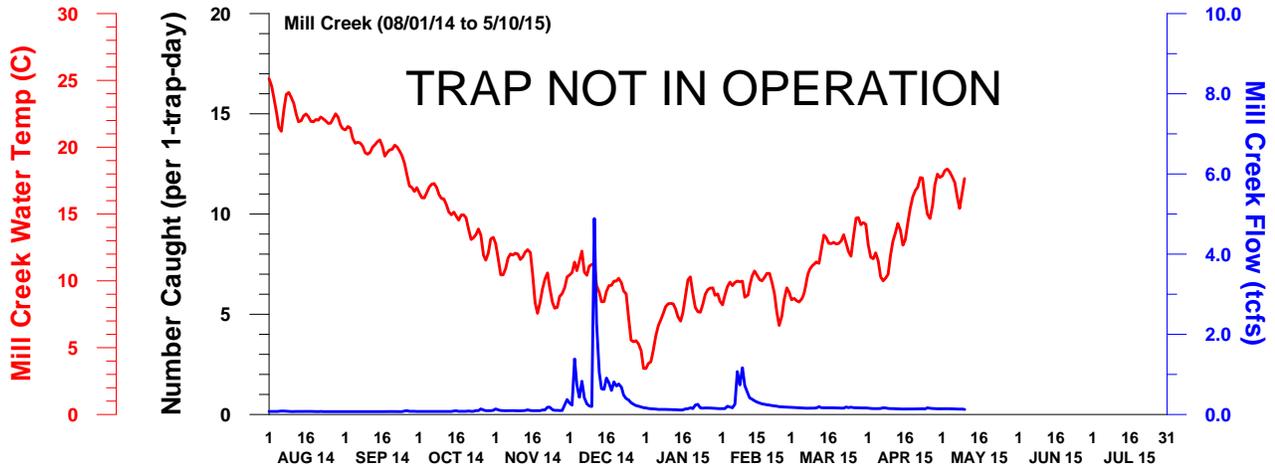


DWR-DES 11 MAY 2015
Preliminary data from FWS and CDEC; subject to revision.

*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).

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)¹, North Central Region.

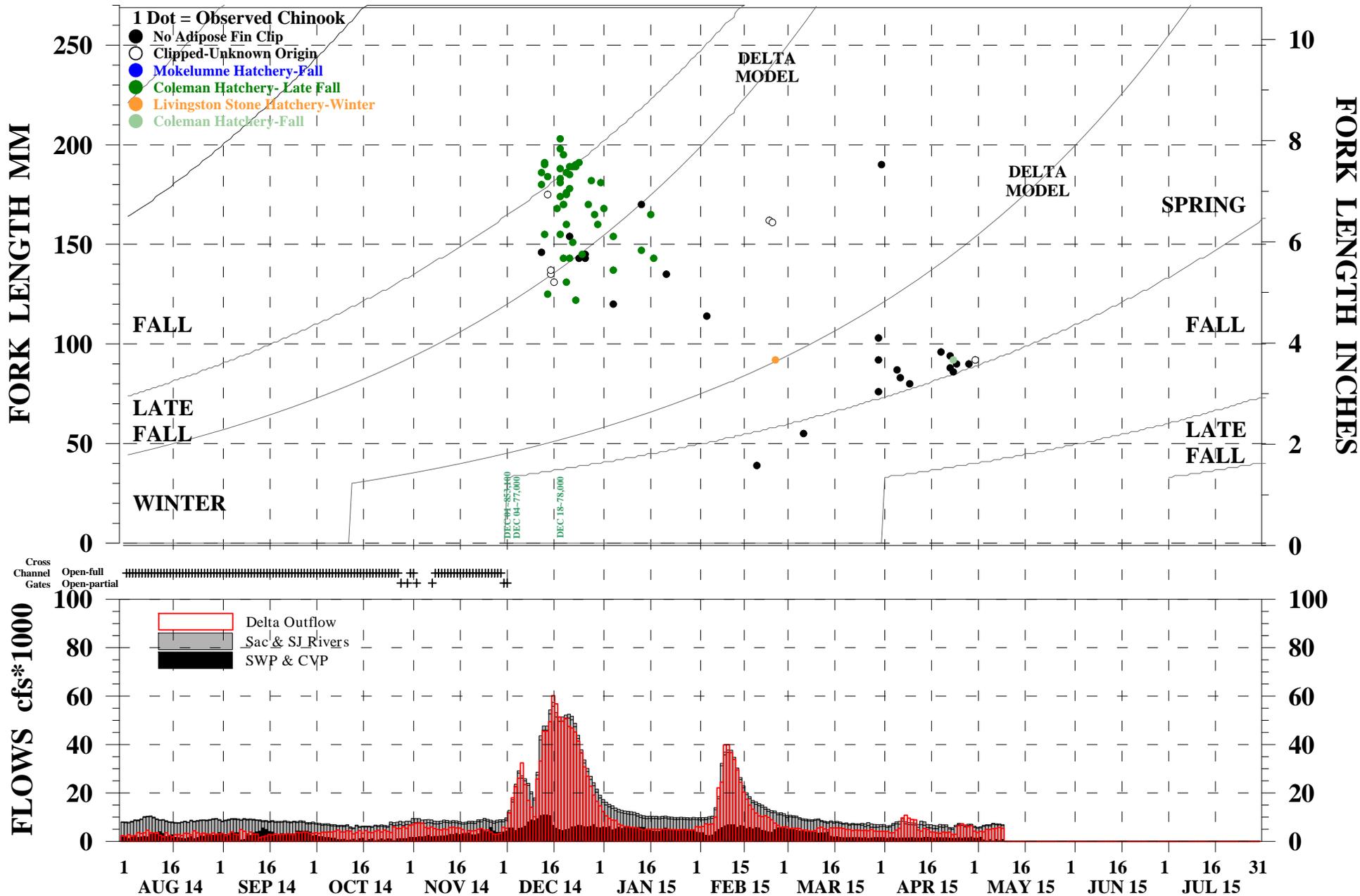
Sacramento River Trawl, Sacramento Area Beach Seine, and Chipps Island Trawl data were obtained directly from FWS, Stockton Fish and Wildlife Office (<http://www.fws.gov/stockton/ifmp/>).

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.

¹ 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 5/10/2015

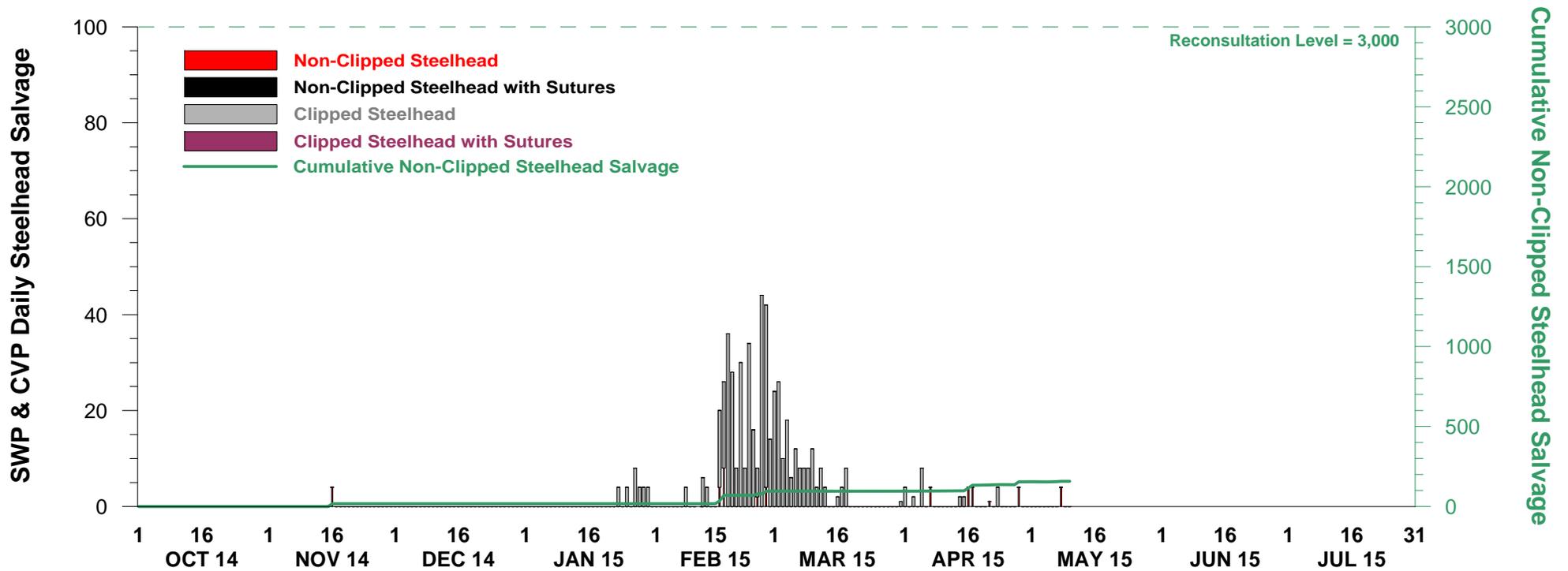


DWR-DES 11 MAY 2015

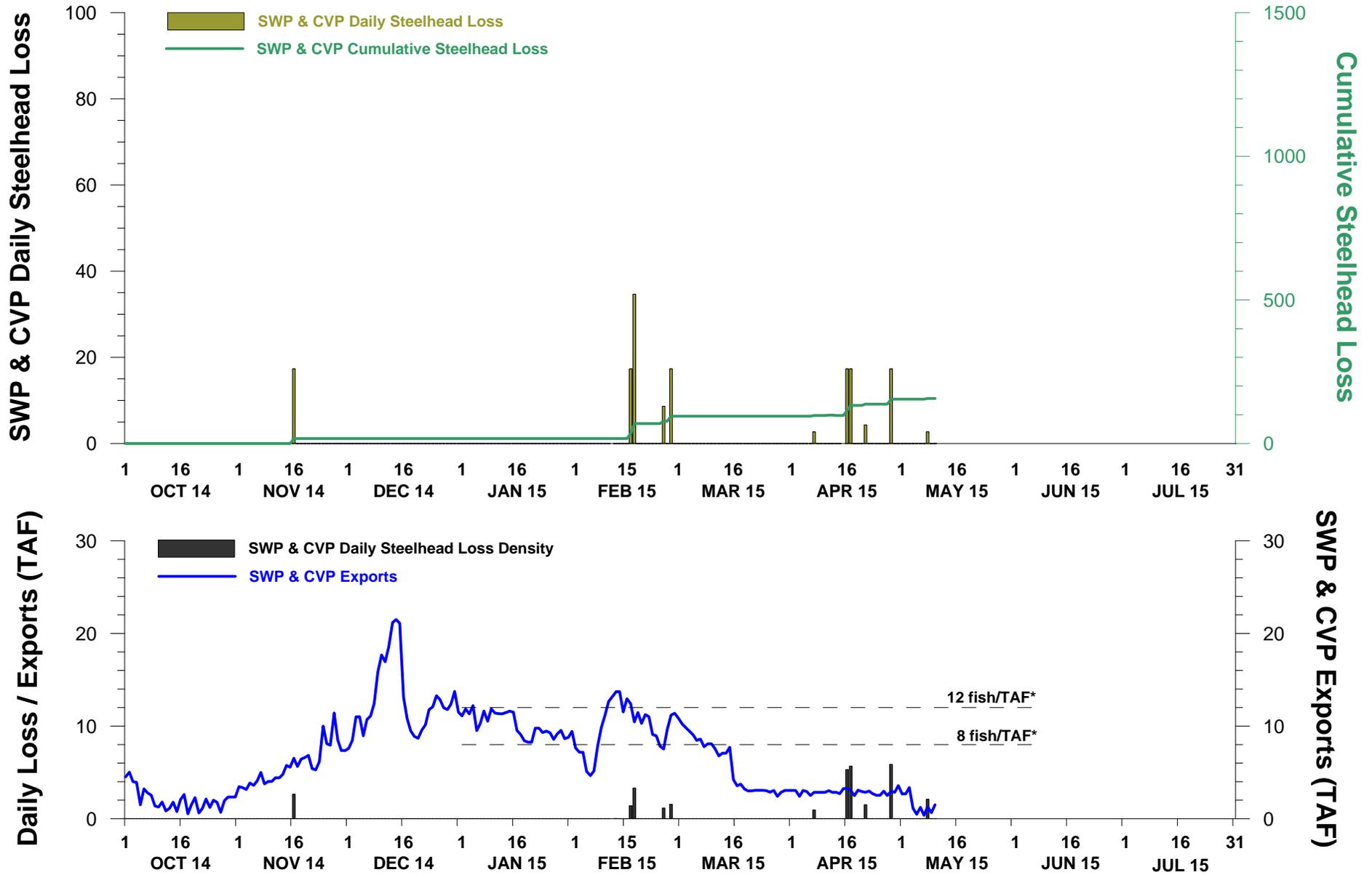
Preliminary data from DFW, DWR, FWS, Reclamation, and CDEC; subject to revision.

*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 10 MAY 2015



NON-CLIPPED STEELHEAD LOSS AT THE DELTA FISH FACILITIES 01 OCT 2014 THROUGH 10 MAY 2015



DWR-DES 11 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.