Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 03/03/2015 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, Kevin Reece, Aaron Miller, Dan Yamanaka, Bryant Giorgi, Tracy Petit, Mike Ford
Reclamation: Peggy Manza, Michelle Palmer, Josh Israel, Jason Hassrick
NMFS: Barb Byrne, Jeff Stuart, Arnold Ammann, Meiling Roddam
USFWS: Leigh Bartoo, Roger Guinee
CDFW: Bob Fujimura, Duane Linander, Ken Kundargi
SWRCB: Matt Holland

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. ePTM results

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions affecting operations during December-March:

Action IV.1.2 (DCC gate operations):

- Default DCC gate closure started Monday, December 1.

Action IV.2.3 (OMR Management)

- The OMR limit of no more negative than -5,000 cfs is in effect, but not controlling delta exports.
- Since 2/11/15, daily OMR targets have been based on daily assessment of conditions and a decision by the Directors.

Agenda Item 3.

Current Operations (03/03/2015)

SWP	CVP

Exports (cfs)			
Clifton Court Forebay	3,200	Jones Pumping Plant	1,800
Reservoir Releases (cfs)			
Feather - Oroville	800*	American - Nimbus	800
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	250**
		Trinity – Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	953	San Luis (CVP)	356
Oroville	1,739	Shasta	2,621
New Melones	606	Folsom	565
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	9,874
Outflow Index (cfs)	~5,300	San Joaquin River at Vernalis (cfs)	~800
E:I	35% (14-Day Avg.)	X2	> 81 km

*Decreased yesterday, and is the minimum for this time of year.
**Will be increased to 350 cfs on the afternoon of 3/3/15 due to salinity concerns at Vernalis.

E:I is currently controlling exports as of 3/2/15.

The daily OMR Index for 3/3 is -4,430 cfs. The 5-day OMR to 2/28 was -4,220 cfs based on the index and was -4,180 cfs based on the USGS gauges. The 14-day OMR to 2/28 was -4,550 cfs based on the index and was -4,340 cfs based on the USGS gauges.

The weather forecast for the remainder of the week is dry.

Agenda Item 4.

Smelt Working Group (SWG)

Bartoo (FWS) provided the following update:

> The Working Group described the risk of entrainment under the Service-provided advice framework. Under this framework the relative risk of entrainment for each of the three OMR flow ranges is discussed and assessed. For the current week the risk of entrainment for each of flow ranges is characterized as follows:
> - -1250 to -2000 cfs has a low risk of entrainment,
> - -2000 to -3500 cfs has a low risk of entrainment, and
> - -3500 to -5000 cfs has a medium risk of entrainment.

DWR produces turbidity maps for the SWG, based on temporary monitoring. DOSS requested those maps. Byrne (NMFS) will forward those to the group. Reece (DWR) noted that those turbidity maps were produced on an as-needed basis, and might not be produced once turbidity management was no longer controlling exports.

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	Chipps Is. Midwater Trawl[A]	Prisoners Pt/ Jersey Pt.[A]	Sacramento Trawl[A]	Mossdale Kodiak Trawl[A]	GCID RST	Knights Landing RST[C]	Tisdale RST[E]	Beach Seines[A]
Sample Date	2/22-2/28	2/22-2/28	2/22-2/28	2/22-2/28	2/24-3/2	2/23-3/1	2/23-3/1	2/22-2/28
Total Catch	**70**	**77**	**4**	**0**	**86**	**5**	**4**	**220**
FR Chinook		47	3		21	1	1	203
WR Chinook					12	2		2
SR Chinook		1			1			10
LFR Chinook	16 (57-92mm)	2 (83-85mm)						
Ad-Clipped Chinook	18	3	1		52[B]	2[D]	3	5
Delta Smelt		23 (55-77mm)						
Splittail	21							
Longfin Smelt								
Steelhead (ad-clip)	15	1						
Steelhead (wild)								
Green Sturgeon								
Flows (avg. cfs)					903	7,083	6,837	
W. Temp. (avg. °F)					51	55	51	
Turbidity (avg. NTU)					2.98	18	19	

[A] DAT data was provided to DOSS after the call.
[B] The 52 ad-clipped Chinook were winter-run sized.
[C] Sampling period was from 2/23 at 10:45 am to 3/1 at 11:15am. Both RSTs modified to sample at 50% efficiency.
[D] The 2 ad-clipped Chinook were winter-run sized.
[E] Sampling period was from 2/23 at 4:00 pm to 3/1 at 9:00 am. Both RSTs modified to sample at 50% efficiency.

Acoustic-tagged Hatchery Winter-Run Chinook Tracking with Real-Time Receivers:

- 251 and 321 acoustic-tagged fish released on 2/4 and 2/6, respectively, in Redding (379 river km upstream of Sacramento)
- Single detections could be false positives. The tag detections are reported based on both "single" and "2 or more" detections, and the associated percentages calculated based on all detections (may overestimate passage if some single detections are false positives) and based on "2 or more" detections (may underestimate passage if some single detections are correctly detecting tags).
- DOSS noted that the proportion of tagged fish detected may represent the minimum estimate of the actual proportion of tagged fish (and, presumably, the non-acoustic-tagged hatchery winter-run production release) passing a receiver because it is assumed that (especially after the first storm pulse) some mortality is occurring before fish pass the real-time receivers.

Proportion of tag codes[1] observed passing **I80/I50 bridge** receiver as of 6:15am on Tuesday, 3/03/15:

	Release 1	Release 2	All releases
number released:	251	321	572
Number of fish with only 1 detection:	26	36	62
Number of fish with 2 or more detections:	54	96	150
Total detects of valid IDs:	80	132	212
Percent detected all detections:	31.9	41.1	37.1
Percent detected with 2 or more detections:	21.5	29.9	26.3
Detections over time: 2+ detects (single detects listed in parentheses)			
Number of fish 2/9/2015	16 (17)	3 (4)	
Number of fish 2/10/2015	7 (13)	22 (30)	
Number of fish 2/11/2015	4 (6)	10 (15)	
Number of fish 2/12/2015	4 (6)	4 (8)	
Number of fish 2/13/2015	3 (7)	7 (14)	
Number of fish 2/14/2015	8 (12)	7 (15)	
Number of fish 2/15/2015	1 (5)	5 (7)	
Number of fish 2/16/2015	5 (7)	6 (6)	
Number of fish 2/17/2015	2 (2)	4 (4)	
Number of fish 2/18/2015	0 (1)	5 (5)	
Number of fish 2/19/2015	1 (1)	1 (1)	
Number of fish 2/20/2015	0 (0)	6 (7)	
Number of fish 2/21/2015	0 (0)	3 (3)	
Number of fish 2/22/2015	0 (0)	8 (8)	
Number of fish 2/23/2015	0 (0)	1 (1)	
Number of fish 2/24/2015	0 (0)	1 (1)	
Number of fish 2/25/2015	0 (0)	2 (2)	
Number of fish 2/26/2015	0 (0)	1 (1)	
Number of fish 2/27/2015	1 (1)	2 (2)	
Number of fish 2/28/2015	1 (1)	0 (0)	
Number of fish 3/01/2015	1 (1)	0 (0)	
Number of fish 3/02/2015	0 (0)	0 (0)	
Number of fish 3/03/2015	0 (0)	0 (0)	

[1] A tag detection indicates that a tag has passed the receiver, but it is possible that the tag could be in a predator that ate a tagged winter-run Chinook. There is limited ability to apply a "predator filter" even with tag detection data from the entire acoustic receiver array (most of which are not real-time receivers); no predator filter is attempted on the reported real-time data.

Proportion of tag codes observed at **Middle River** receiver as of 6:15am on Tuesday, 3/03/15:

	Release 1	Release 2	All releases
number released:	251	321	572
Number of fish with only 1 detection:	0	0	0
Number of fish with 2 or more detections:	1	0	1
Total detects of valid IDs:	1	0	1
Percent detected all detections:	0.4	0.0	0.2
Percent detected with 2 or more detections:	**0.4**	**0.0**	**0.2**
Detections over time: 2+ detects (single detects listed in parentheses)			
Number of fish 2/17/2015	0 (0)	0 (0)	
Number of fish 2/18/2015	0 (0)	0 (0)	
Number of fish 2/19/2015	0 (0)	0 (0)	
Number of fish 2/20/2015	0 (0)	0 (0)	
Number of fish 2/21/2015	0 (0)	0 (0)	
Number of fish 2/22/2015	1 (1)	0 (0)	
Number of fish 2/23/2015	0 (0)	0 (0)	
Number of fish 2/24/2015	0 (0)	0 (0)	
Number of fish 2/25/2015	0 (0)	0 (0)	
Number of fish 2/26/2015	0 (0)	0 (0)	
Number of fish 2/27/2015	0 (0)	0 (0)	
Number of fish 2/28/2015	0 (0)	0 (0)	
Number of fish 3/01/2015	0 (0)	0 (0)	
Number of fish 3/02/2015	0 (0)	0 (0)	
Number of fish 3/03/2015	0 (0)	0 (0)	

Proportion of tag codes observed at **Tisdale** receiver as of 6:15am on Tuesday, 3/03/15:

	Release 1	Release 2	All releases
number released:	251	321	572
Number of fish with only 1 detection:	14	5	19
Number of fish with 2 or more detections:	9	41	50
Total detects of valid IDs:	23	46	69
Percent detected all detections:	9.2	14.3	12.1
Percent detected with 2 or more detections:	3.6	12.8	8.8
Detections over time: 2+ detects (single detects listed in parentheses)			
Number of fish 2/14/2015	1 (1)	3 (3)	
Number of fish 2/15/2015	3 (4)	4 (6)	
Number of fish 2/16/2015	1 (1)	4 (4)	
Number of fish 2/17/2015	0 (1)	0 (1)	
Number of fish 2/18/2015	0 (1)	1 (1)	
Number of fish 2/19/2015	0 (2)	6 (8)	
Number of fish 2/20/2015	0 (1)	7 (7)	
Number of fish 2/21/2015	1 (2)	2 (3)	
Number of fish 2/22/2015	0 (0)	3 (4)	
Number of fish 2/23/2015	0 (1)	3 (3)	
Number of fish 2/24/2015	0 (2)	0 (0)	
Number of fish 2/25/2015	0 (0)	2 (3)	
Number of fish 2/26/2015	0 (0)	1 (1)	
Number of fish 2/27/2015	0 (0)	0 (0)	
Number of fish 2/28/2015	1 (3)	2 (2)	
Number of fish 3/01/2015	2 (2)	2 (2)	
Number of fish 3/02/2015	0 (0)	1 (1)	
Number of fish 3/03/2015	0 (0)	0 (0)	

Proportion of tag codes observed at **Hood** receiver as of 6:15am on Tuesday, 3/03/15:

	Release 1	Release 2	All releases
number released:	251	321	572
Number of fish with only 1 detection:	0	0	0
Number of fish with 2 or more detections:	1	0	1
Total detects of valid IDs:	1	0	1
Percent detected all detections:	0.4	0.0	0.2
Percent detected with 2 or more detections:	0.4	0.0	0.2
Detections over time: 2+ detects (single detects listed in parentheses)			
Number of fish 2/27/2015	0 (0)	0 (0)	
Number of fish 2/28/2015	0 (0)	0 (0)	
Number of fish 3/01/2015	0 (0)	0 (0)	
Number of fish 3/02/2015	1 (1)	0 (0)	
Number of fish 3/03/2015	0 (0)	0 (0)	

- DOSS discussed that the small uptick in fish detected at Tisdale might be from the Fish Rescue implemented by CDFW, but the release site for the rescued fish was below the Tisdale weir so additional fish detected at Tisdale were not likely the released fish.
- For a day or so, some acoustic tags were stationary, indicating that they might have been expelled. The tags have moved since then, but it is not clear at this point if those tags are in smolts or predators.

Fish Salvage[2]:
Fujimura (DFW) provided the following summaries of salvage and loss at the SWP and CVP fish collection facilities. The two salvage figures were generated from data on CDFW's salvage monitoring web-page: http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx.

[2]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: February 23-March 1, 2015
Prepared by Bob Fujimura on March 2, 2015 21:00
Preliminary Results -Subject to Revision

Criteria	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	→	0.00
Wild steelhead	0	0	**1.15**	0	**1.55**	0	0	↘	0.39
Exports									
SWP daily export	7,347	6,144	5,827	7,914	9,473	9,675	9,153	↘	7,933
CVP daily export	1,712	1,702	1,700	1,702	1,706	1,706	1,701	↘	1,704
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

Chinook Salmon Weekly/Season Salvage and Loss
Combined salvage and loss for both CVP and SWP fish facilities
Race determined by size at date of capture; hatchery = adipose fin missing;

		Weekly Total			Season Total	
Category		Salvage	Loss	Trend	Salvage	Loss
Wild						
	Winter Run	0	0	→	52	102
	Spring Run	0	0	→	0	0
	Late Fall Run	0	0	→	6	26
	Fall Run	0	0	↘	12	9
	Unclassified	0	0	→	24	NC
	Total	**0**	**0**		**94**	**137**
Hatchery						
	Winter Run	10	43	↗	62	214
	Spring Run	0	0	→	0	0
	Late Fall Run	0	0	→	136	340
	Fall Run	0	0	→	41	180
	Unclassified	0	0	→	12	NC
	Total	**10**	**43**		**251**	**734**

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

	Weekly Total			Season Total	
Category	Salvage	Loss	Trend	Salvage	Loss
Wild	6	26	↘	22	95
Hatchery	176	747	↗	362	1,407
Total	**182**	**773**		**384**	**1,502**

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 02/23/15-03/01/15.

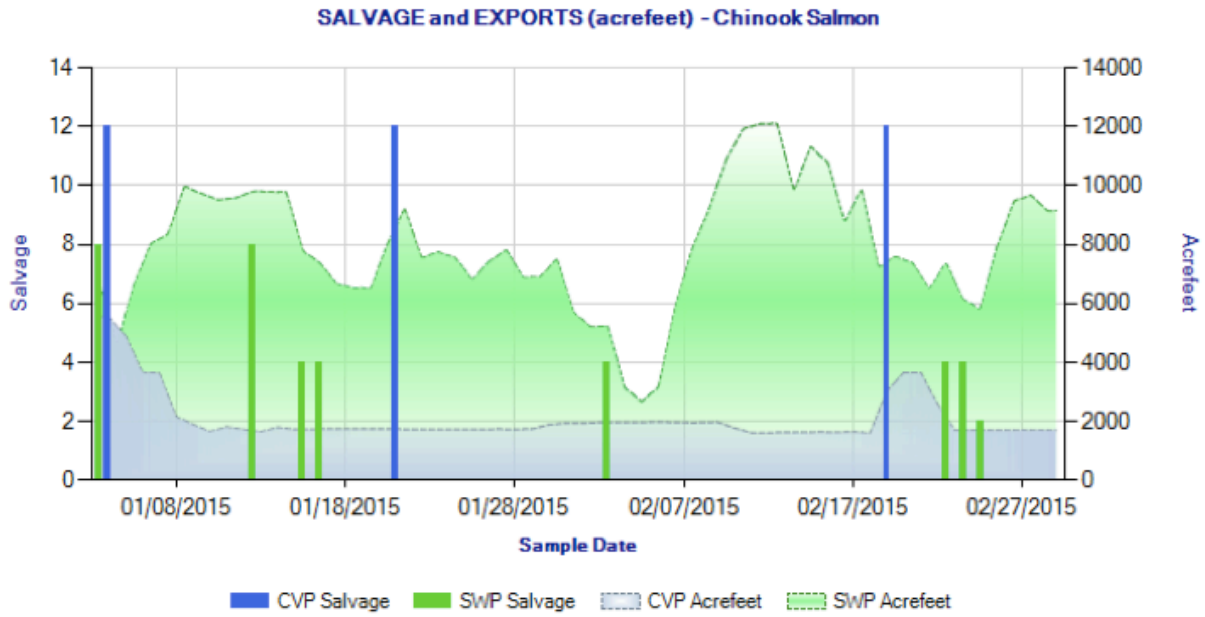


Figure 2. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during 01/04/15 through 03/01/15.

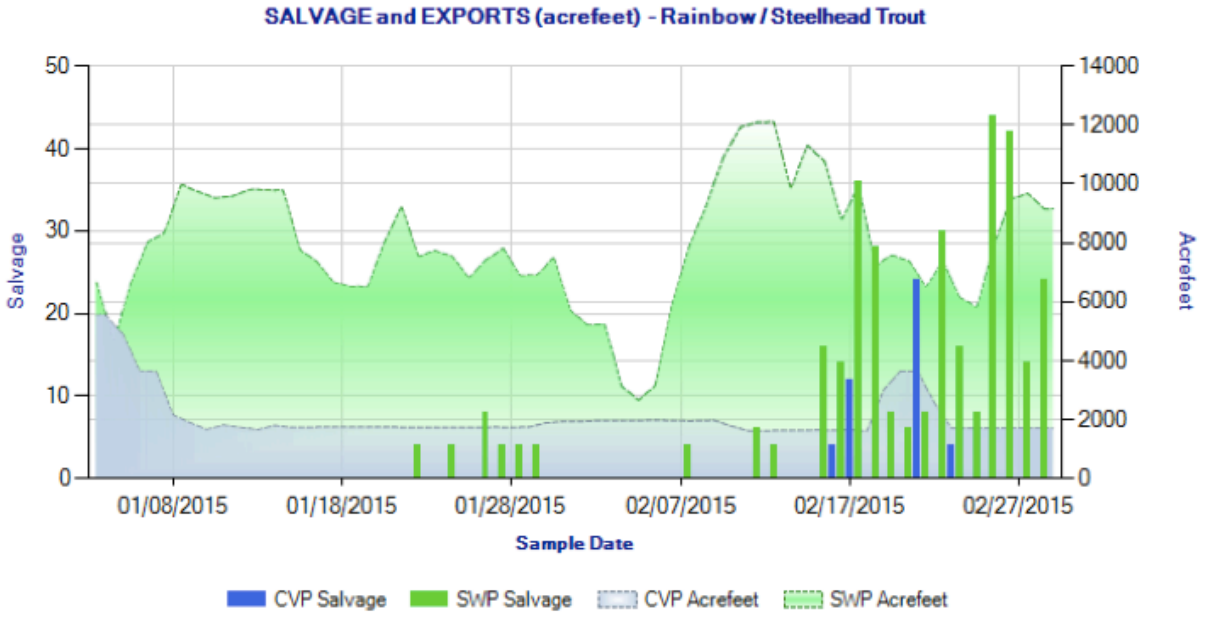


Figure 3. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during 01/04/15 through 03/01/15.

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]
12/1/2014	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	188500	0.001	0	0.5%	1.0%	2/25/2015	2/25/2015

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	0.00	0.00	0.00	0.00	0
CVP	26.62	0.00	0.00	0.00	0
TOTAL	26.62	0.00	0.00	0.00	0

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2014 through 3/01/2015.
[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.
[5]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).
[6]Adipose-fin clipped Chinook was collected during fish count and has not been processed yet.
[7]CWT has been read, but hatchery release information not yet available.
[8]Adipose-fin clipped Chinook released due to presence of sutures.
[9]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.
[10]Chinook outside of the length-at-date criteria (Delta model) are not reported.
** Information not yet available.

DWR-DES Revised 3/2/2015
Preliminary data from DFW, DWR, FWS, and Reclamation; subject to revision.

- Islam (DWR) provided more detailed information on CWT fish caught at the facilities:
  - 2/23: 1 ad-clipped Chinook was accidently released by staff
  - 2/24: 1 ad-clipped Chinook that was acoustically tagged (assumed due to visible scar on belly) was released. Discussions are occurring on how/whether to include those fish in the calculation of loss/salvage and incidental take.
  - 2/26: 1 ad-clipped Chinook with an identified origin of LSNFH winter-run Chinook release.

- The current loss/salvage of clipped steelhead is trending high for this time of year compared to last year.
- Byrne (NMFS) provided the summary comparison below:

	Salvage through 2/28		**Total over WY**
	WY 2014	WY 2015	**WY 2014**
Wild steelhead salvage (take limit=3,000)	28	18	**185**
Clipped steelhead salvage	43.5	**300**	**230**

- DOSS was also provided with a graph and table (from DWR) that provided context for the high (1,178) striped bass counts in the predator flush at the SWP last week:

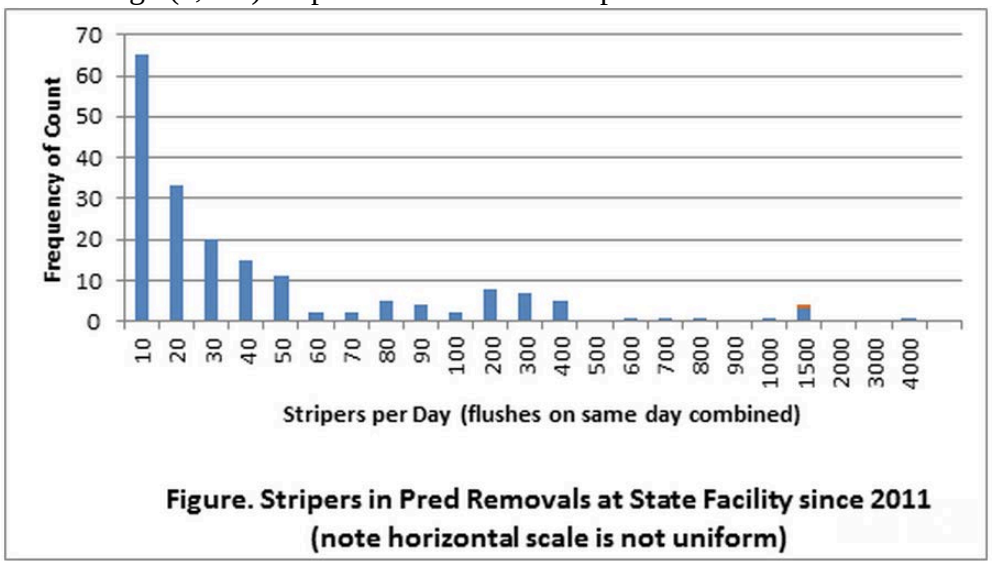


Figure. Stripers in Pred Removals at State Facility since 2011 (note horizontal scale is not uniform)

Table. Counts over 500 since 2012

Date	Count
11/8/2011	3160
7/3/2012	1375
2/24/2015	**1178**
7/12/2011	1009
10/29/2013	938
12/4/2012	702
11/15/2011	674
6/12/2012	574

- The CVP does not remove predators from the secondary channel for staff safety reasons.

DOSS Estimates of Fish Distribution

DOSS estimates of the current distribution of listed Chinook, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns. The table below reflects current distribution. Over the next week, DOSS still expects to see a steady stream of fish moving, but at lower abundances compared to catches observed in sampling during and soon after the storm.

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(naturally produced)	Few stragglers only (last week: Same)	> 95% (last week: same)	< 5% (last week: same)
YOY winter-run Chinook salmon (hatchery-produced)	30% - 50% (last week: 35% - 55%)	45% - 65% (last week: 40% - 60%)	~5% (last week: same)
YOY spring-run Chinook salmon	5% - 20% (last week: same)	80% - 95% (last week: same)	< 5% (last week: same)
*Yearling spring-run Chinook salmon**	Few stragglers only (last week: same)	70% (last week: ~75%)	30% (last week: ~25%)
*Hatchery Steelhead***	~10% (last week: 10% - 20% of all hatchery fish)	75% (last week: ~80% all hatchery fish)	15% (last week: ~10% all hatchery fish)
Sacramento River steelhead (naturally-produced)	Limited catch data		
*San Joaquin River steelhead****	~80% (last week: same)	~20% (last week: same)	0% (last week: same)

* 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.

**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.

***Have not observed juvenile steelhead in monitoring data; Distribution estimates are based on 10 years of historical data from Mossdale Trawls, and RST data from Caswell Park on the Stanislaus River.

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 spring tides (full moon is on Thursday).

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 YOY winter-run Chinook salmon. For both naturally-produced and hatchery-produced YOY winter-run in the Delta, the current risk of entrainment for each OMR flow ranges 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
- more negative than -5,000 cfs has a higher risk of entrainment

DOSS estimated a high risk of entrainment at OMR flows of -3,500 cfs or more negative than -3,500 cfs, since salvage of salmonids (including 4 clipped Chinook -- in the winter-run size range based on the length-at-date criteria -- at the SWP on Monday, 2/23) has been observed over recent days at those OMR levels. The less negative ranges of OMR flow were considered to create medium or medium-high risk of entrainment because 1) currently there are physiological cues for migration (*i.e.* high temperatures) which increases the vulnerability of migrating fish across even the lower ranges of OMR; and 2) the threshold for exceeding a trigger is low, which means that even low salvage is associated with a fairly high risk of exceeding an OMR trigger.

Agenda Item 6.

DOSS Advice to WOMT and NMFS: None.

Next Meeting: The next DOSS conference call will be on 03/10/15 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

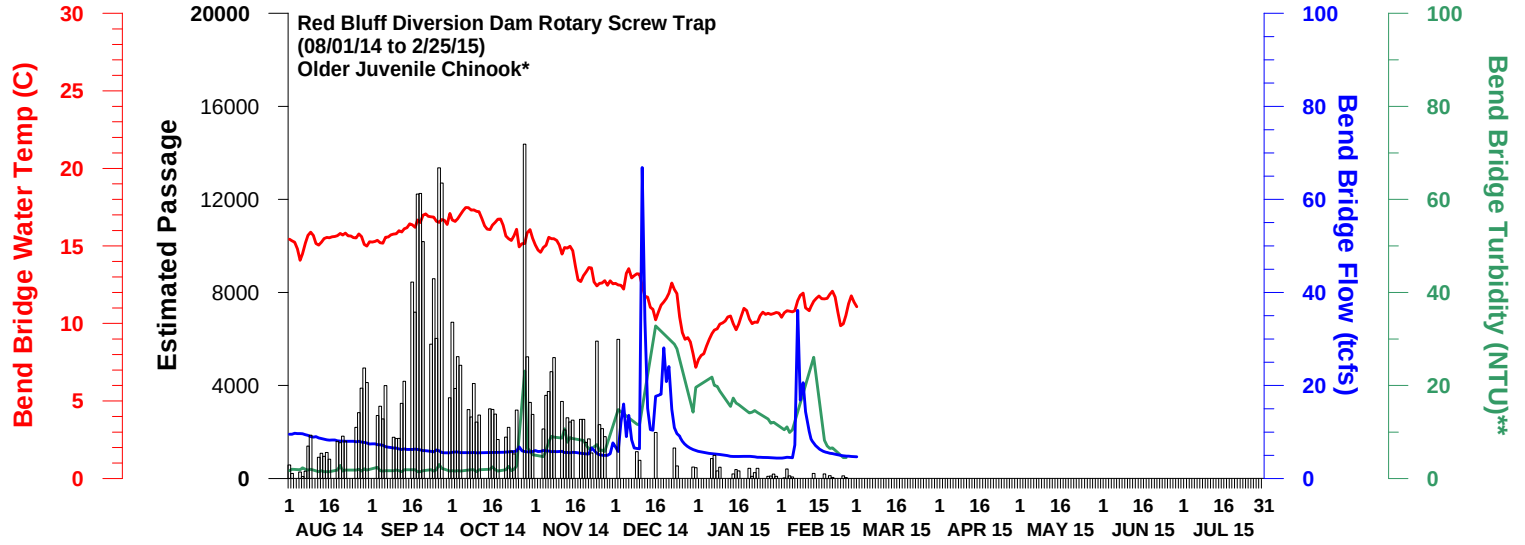
Agenda Item 7.

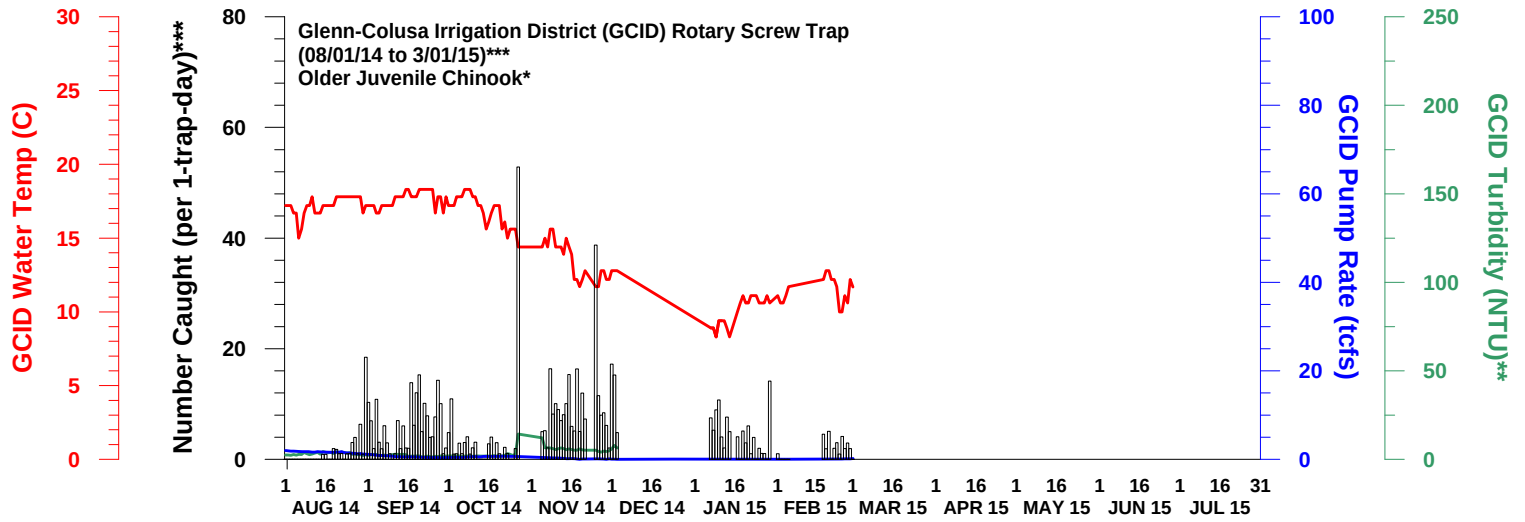
ePTM Results

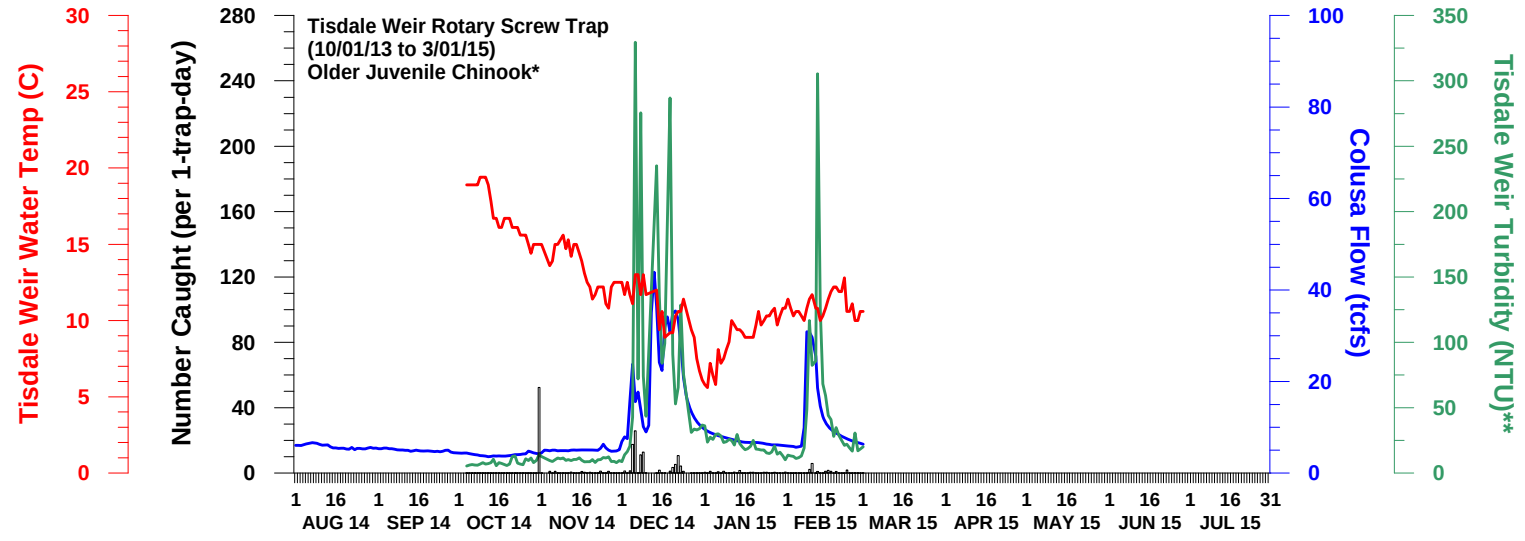
The discussion did not involve the full DOSS group, since a number of DOSS members had a conflict beginning at 10am, when this discussion started.

- DOSS reviewed the data summary prepared by NMFS (appended to the notes after the salmonid monitoring graphs).
- ePTM results were qualitatively as expected, *e.g.* fewest eParticles reached the SWP/CVP from the Sacramento Insertion
- DOSS was surprised by the cumulative percentage graph where "Insertion point= Sacramento River at Sacramento, Fate= Chipps", in which eParticles arrive at Chipps a couple of days sooner under the -6,250 OMR flex scenario than for the -5,000 OMR baseline scenario. *NMFS will review data processing R code.*
- Even with a -6,250 OMR flex for just five days, the ePTM results indicated that 2-3% more eParticles were entrained in the SWP/CVP -for the Central Delta and South Delta insertions -- small in absolute terms, but maybe significant for a relatively short operations change.

NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER







DWR-DES 2 MAR 2015

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

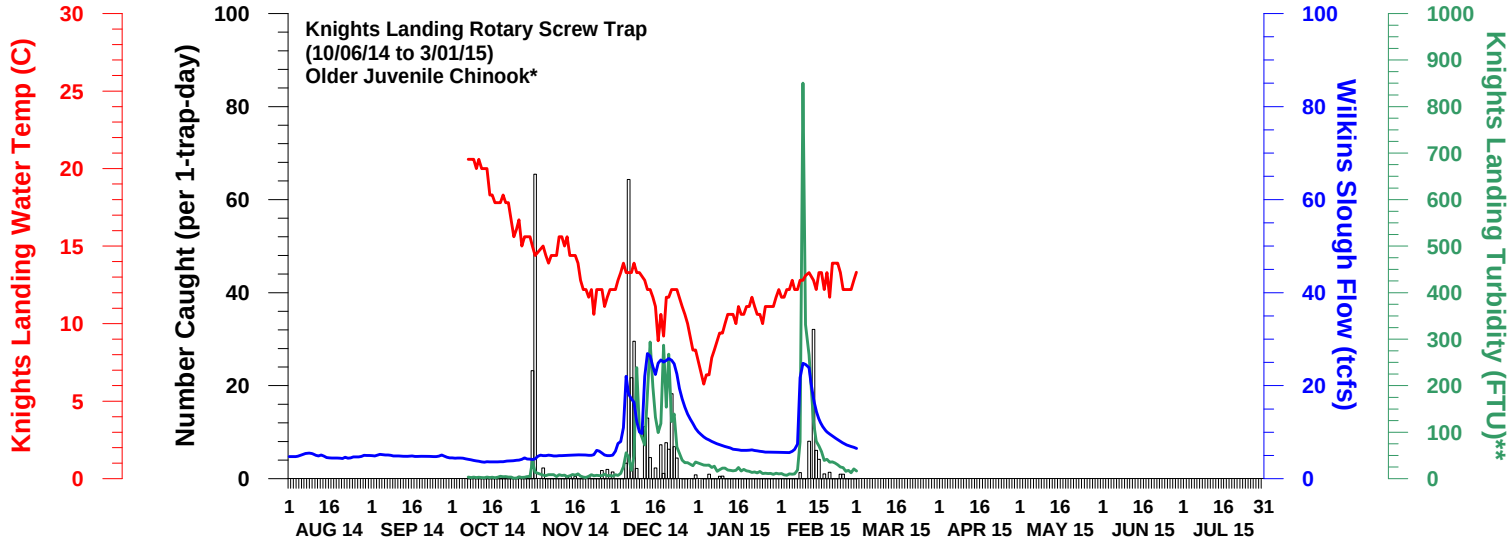
*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Frank Fisher model) for which a race is assigned on a given sampling date.

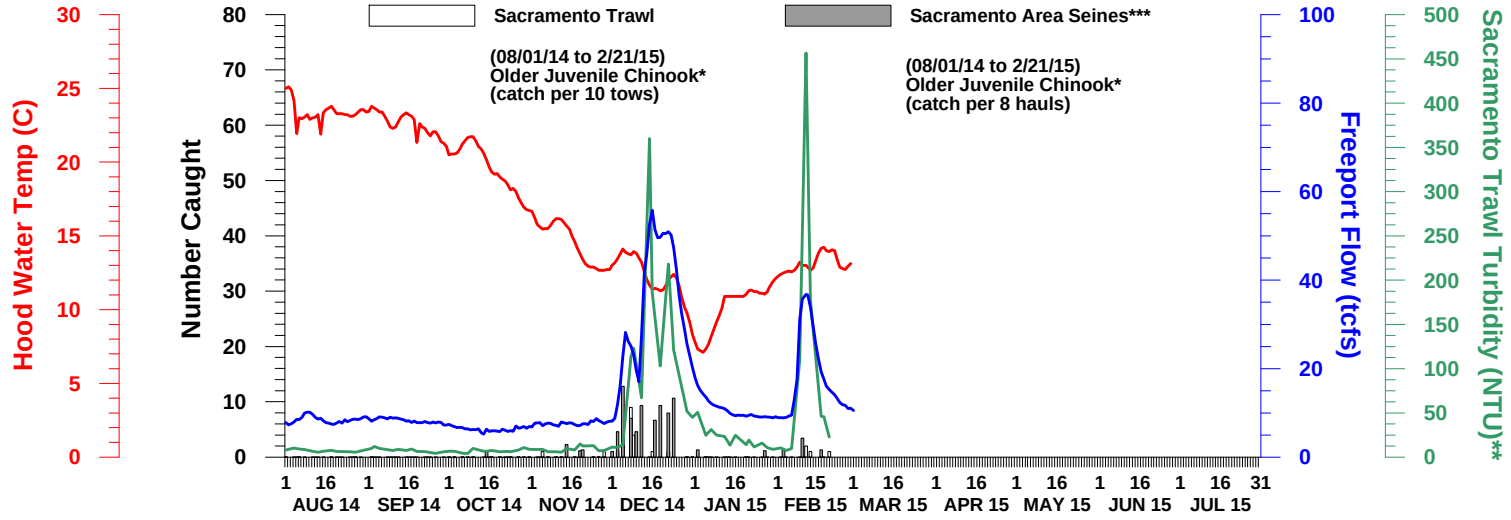
**Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured unless data are missing for more than five days.

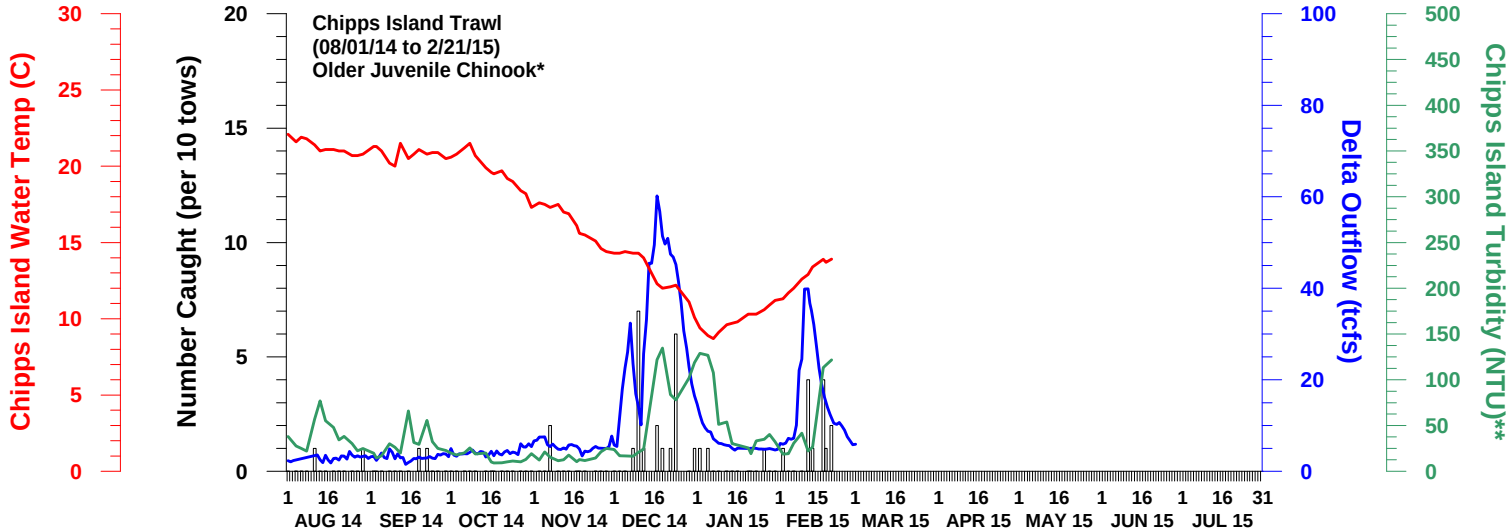
***Trap was pulled on 10/28/14 due to extremely turbid conditions, heavy debris, and high number of listed winter run Chinook and has resumed since 11/5/14.

Trap was not in operation on 12/2/14-1/6/15 and 2/5/15-2/16/15 due to forecasted increase in flow and subsequent elevation change.

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

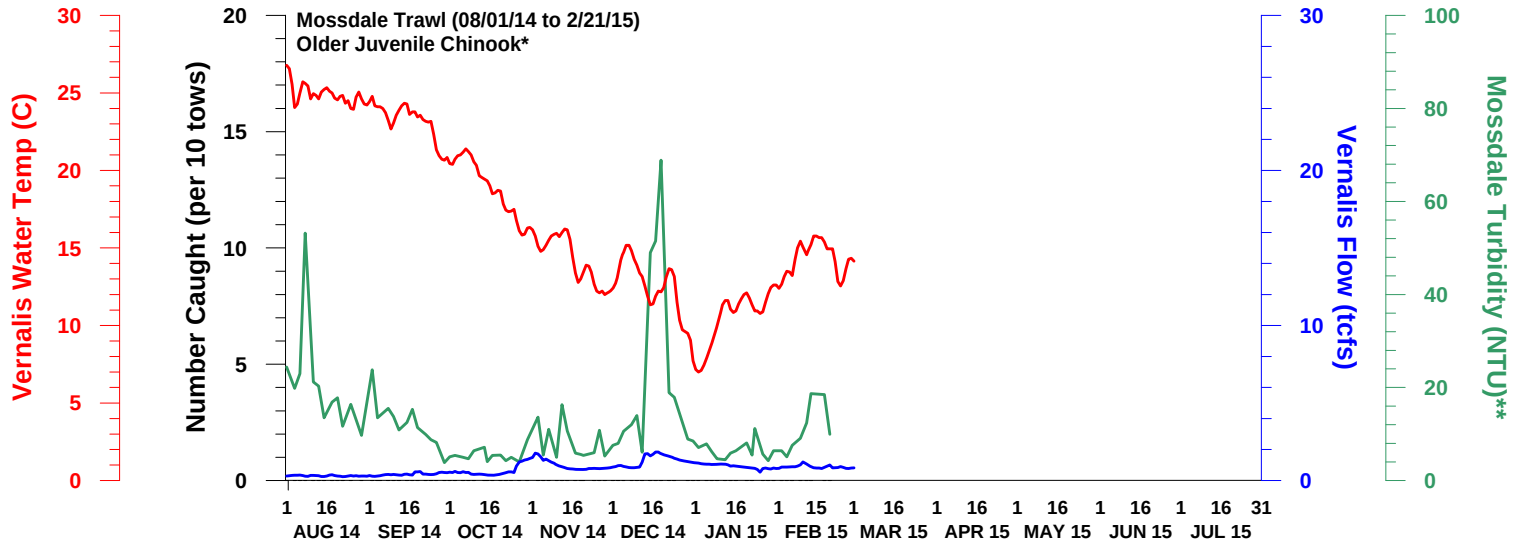


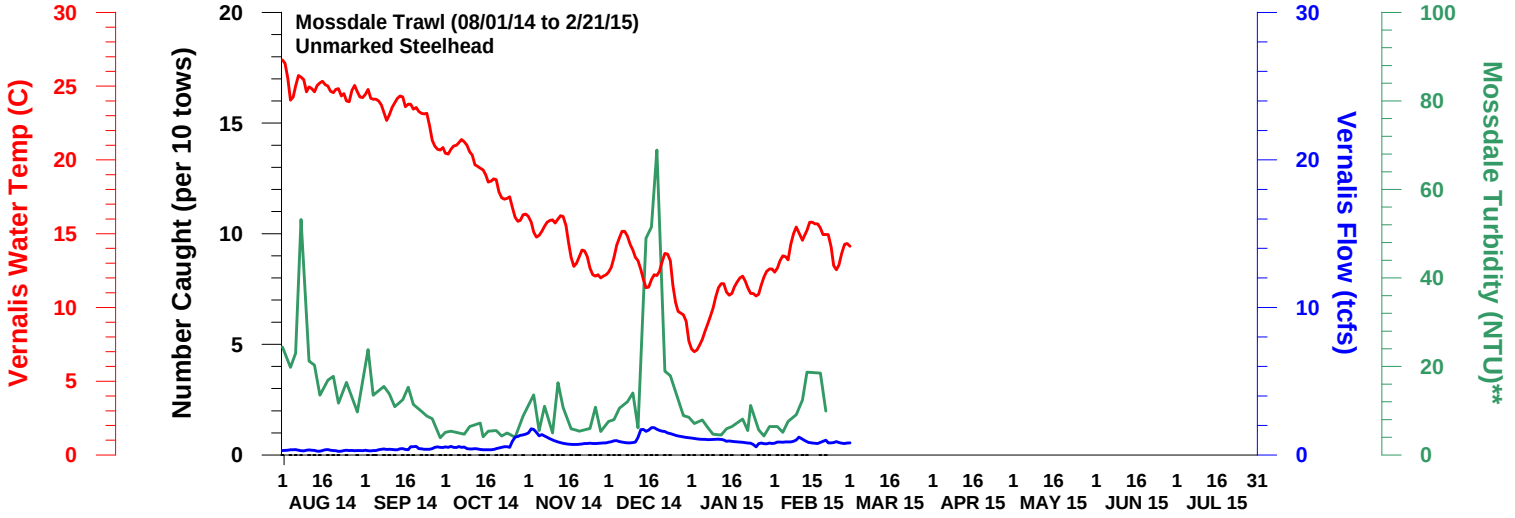




DWR-DES 2 MAR 2015
Preliminary data from DFW, FWS, and CDEC; subject to revision.
*Older juvenile Chinook defined as all Chinook greater than or equal to the minimum winter run length-at-date criteria and less than the maximum size included in the length-at-date criteria (Frank Fisher Model) for which 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

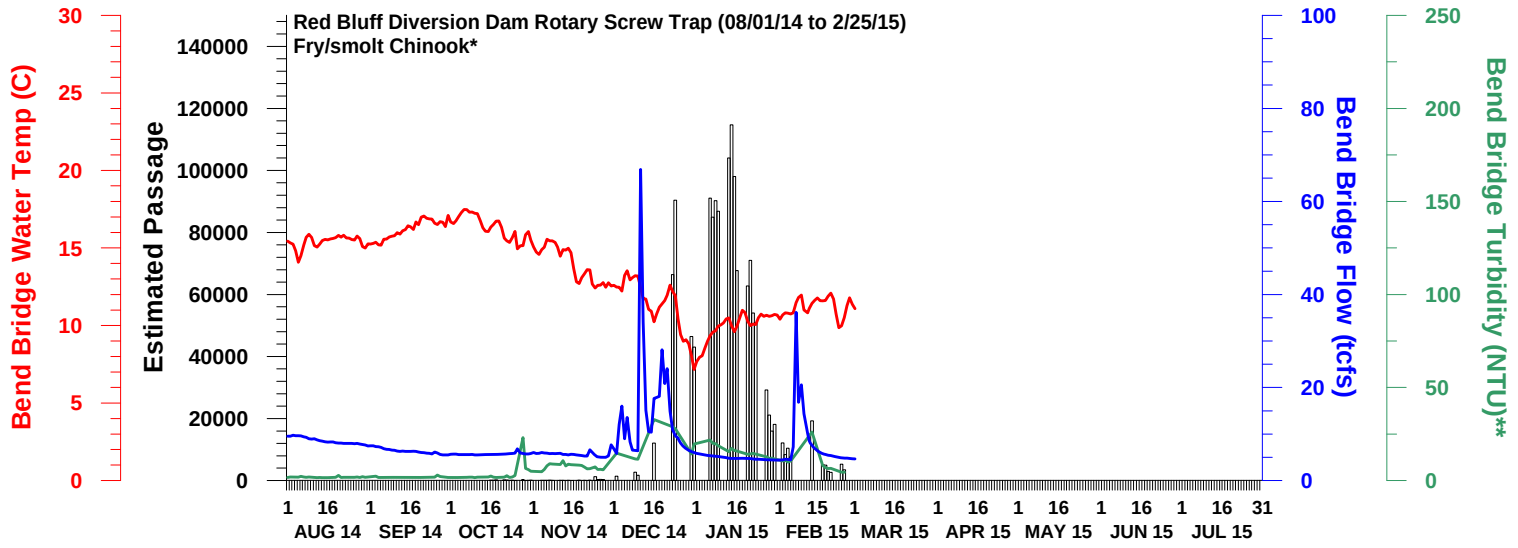


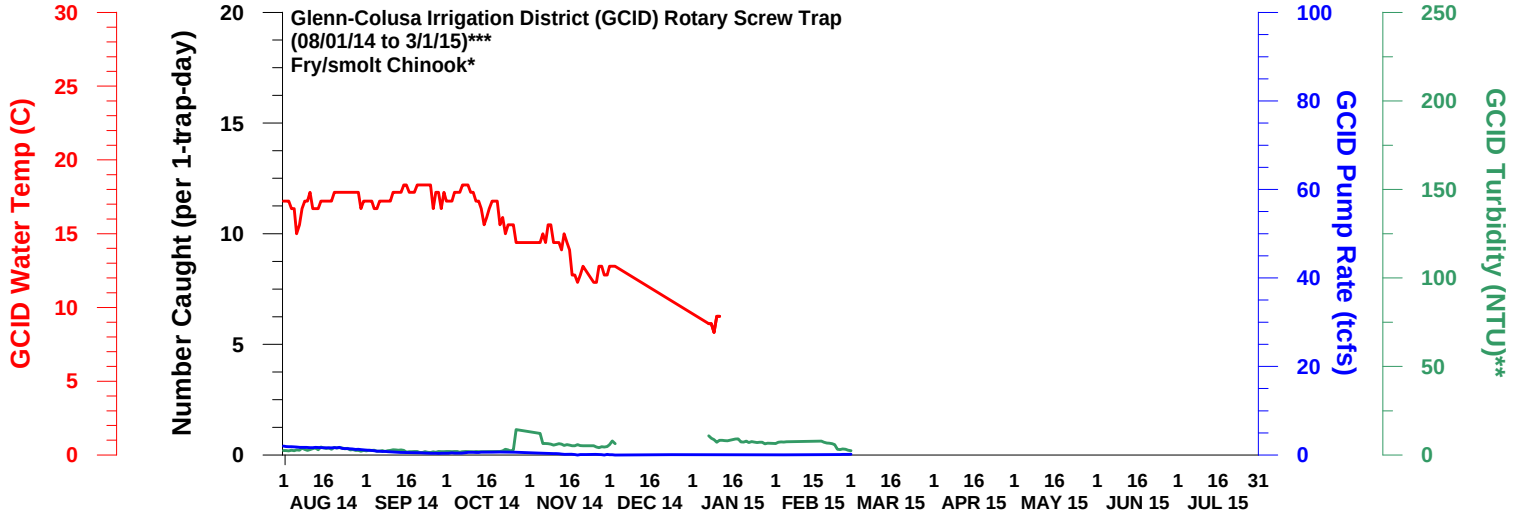


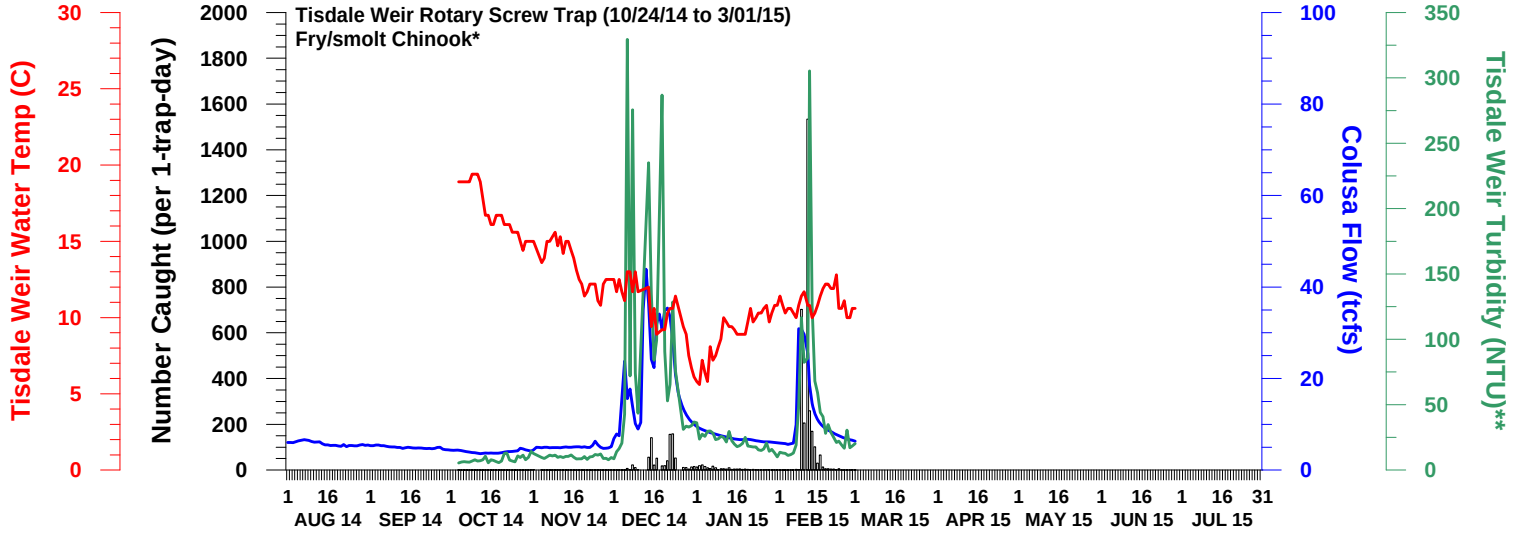
DWR-DES 2 MAR 2015
Preliminary data from FWS and CDEC; subject to revision.

*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.

NUMBER OF UNMARKED FRY/SMOLT CHINOOK MEASURED IN THE SACRAMENTO RIVER

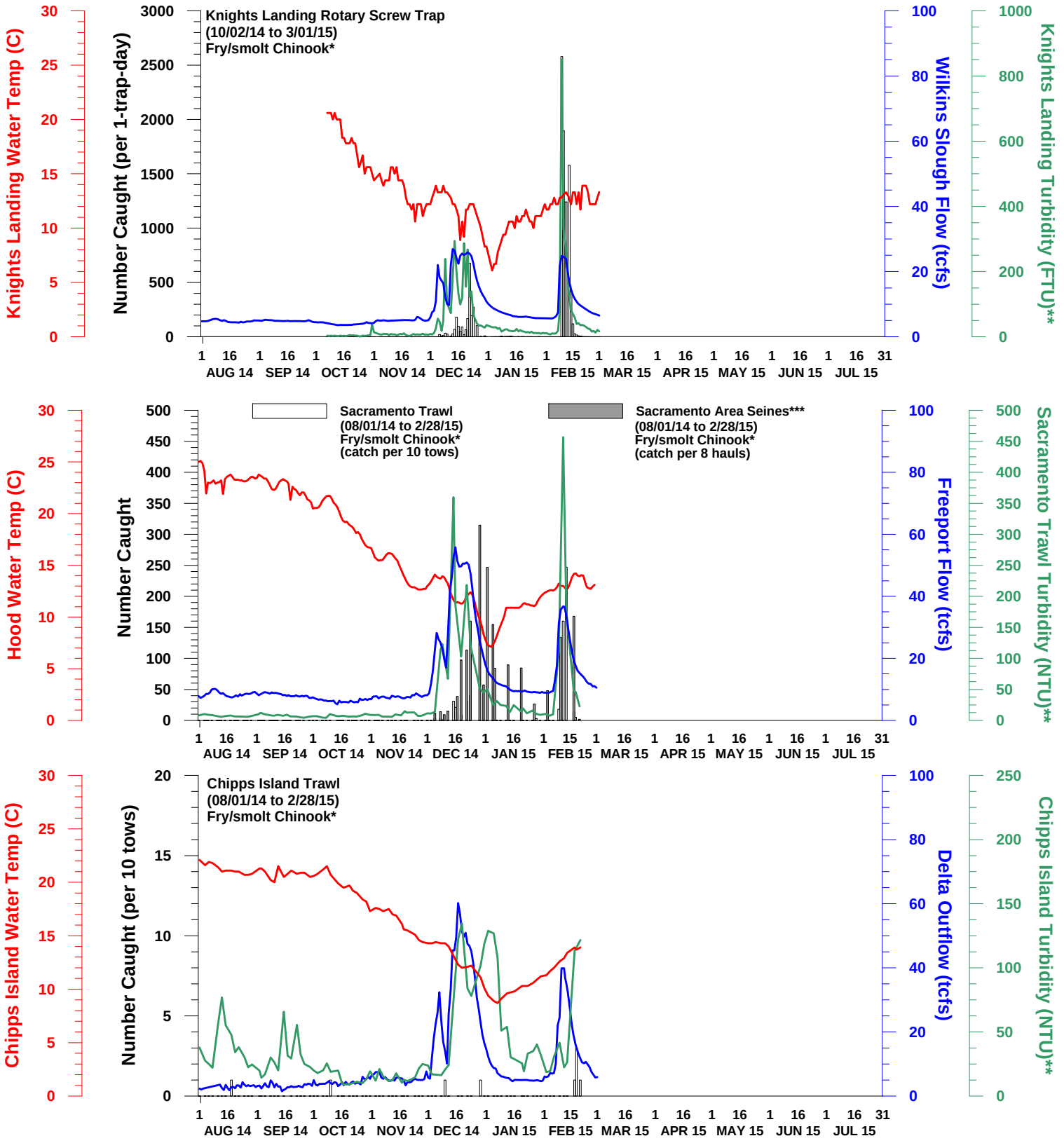






DWR-DES 2 MAR 2015
Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.
*Fry/smolt Chinook defined as all Chinook less than the minimum winter run length-at-date criteria (Frank Fisher model).
**Turbidity is a discrete measurement and is not measured continuously. Therefore, data are 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.

NUMBER OF UNMARKED FRY/SMOLT CHINOOK MEASURED IN THE LOWER SACRAMENTO RIVER AND CHIPPS ISLAND



DWR-DES 2 MAR 2015

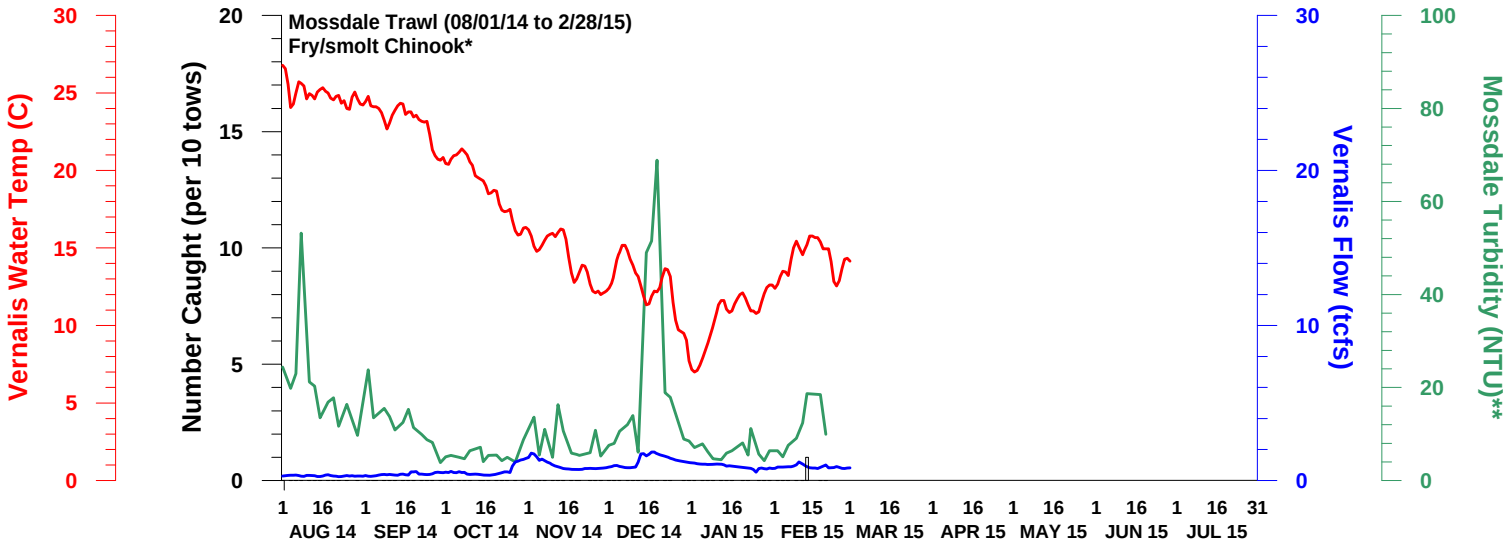
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*Fry/smolt Chinook defined as all Chinook less than the minimum winter run length-at-date criteria (Frank Fisher model).

**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.

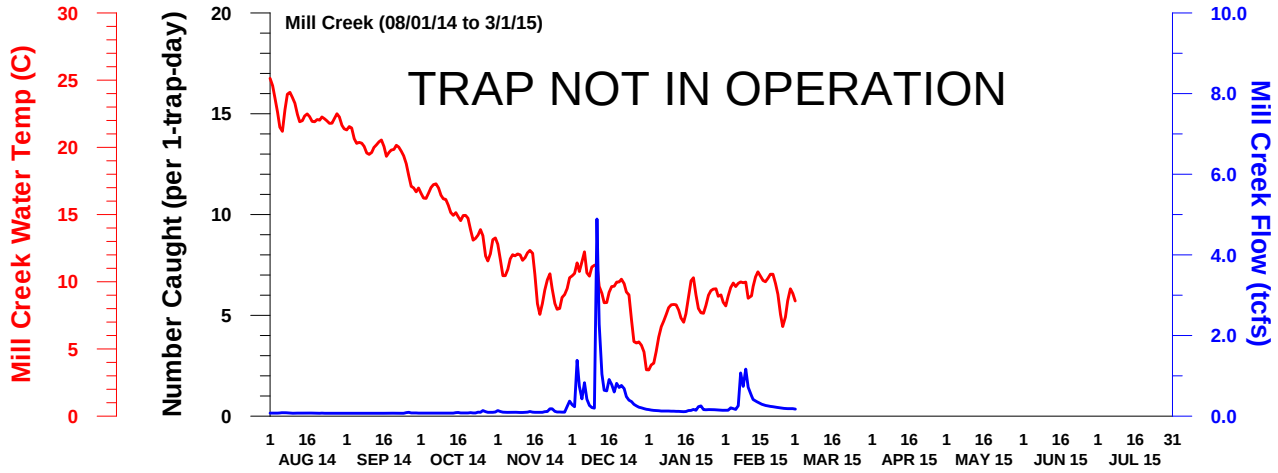
***Sacramento area seine route consists of the following seine sites: Verona, Elkhorn, Sand Cove, Discovery Park, American River, Miller Park, Sherwood Harbor, and Garcia Bend. Bars are stacked if Chinook caught from the trawl and seines are from the same day.

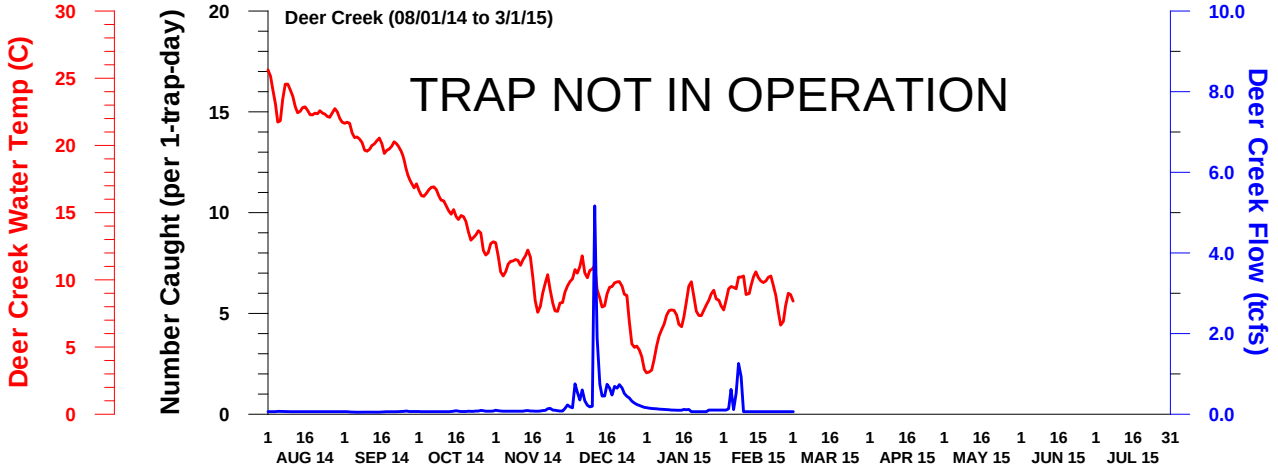
NUMBER OF UNMARKED FRY/SMOLT CHINOOK MEASURED IN THE SAN JOAQUIN RIVER



DWR-DES 2 MAR 2015
Preliminary data from FWS and CDEC; subject to revision.
*Fry/smolt Chinook defined as all Chinook less than the minimum winter run length-at-date criteria (Frank Fisher model).
**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





DWR-DES 2 MAR 2015
Preliminary data from CDEC; subject to revision.

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.aspx).

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.

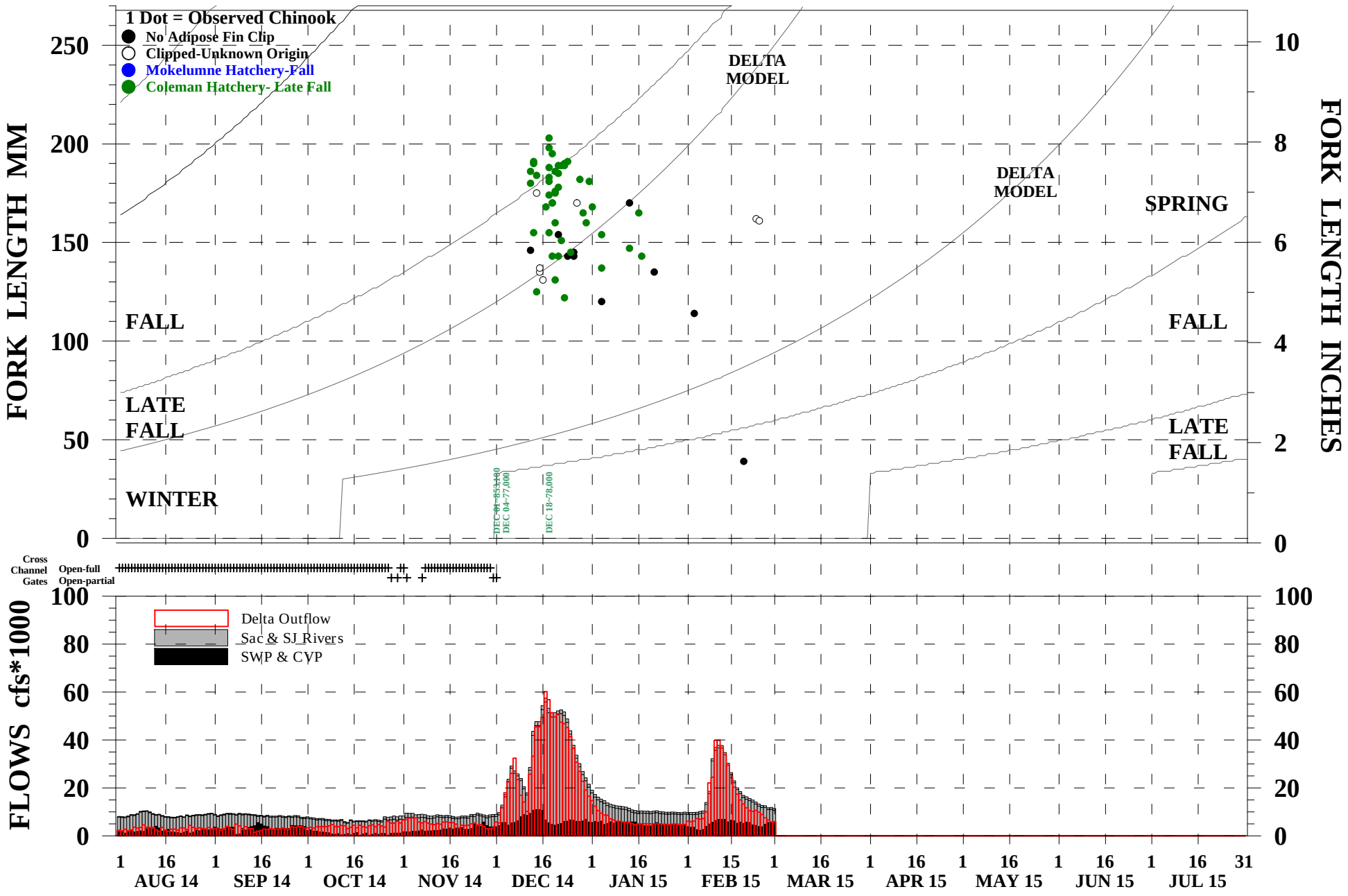
Sacramento River Trawl, Sacramento Area Beach Seine, and Chipps Island Trawl data were obtained directly from FWS, Stockton Fish and Wildlife Office (http://www.fws.gov/stockton/jfmp/).

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.

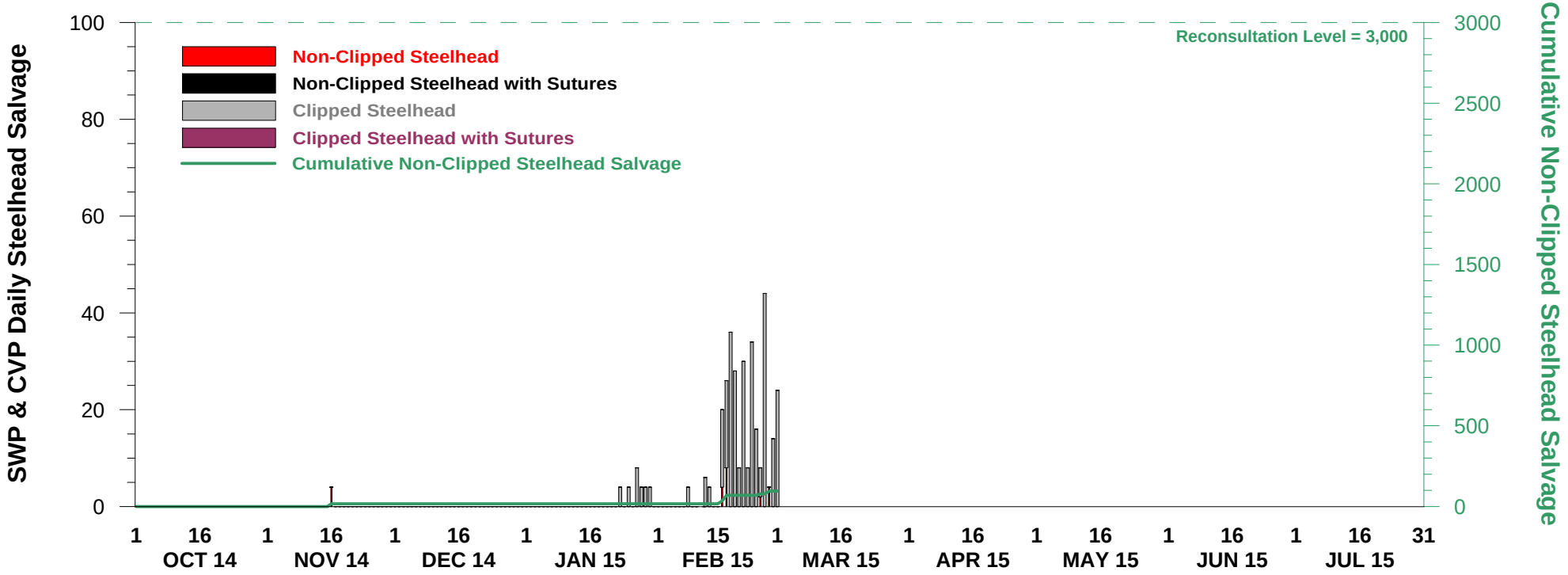
[1] Formerly known as the California Department of Fish and Game (DFG).

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



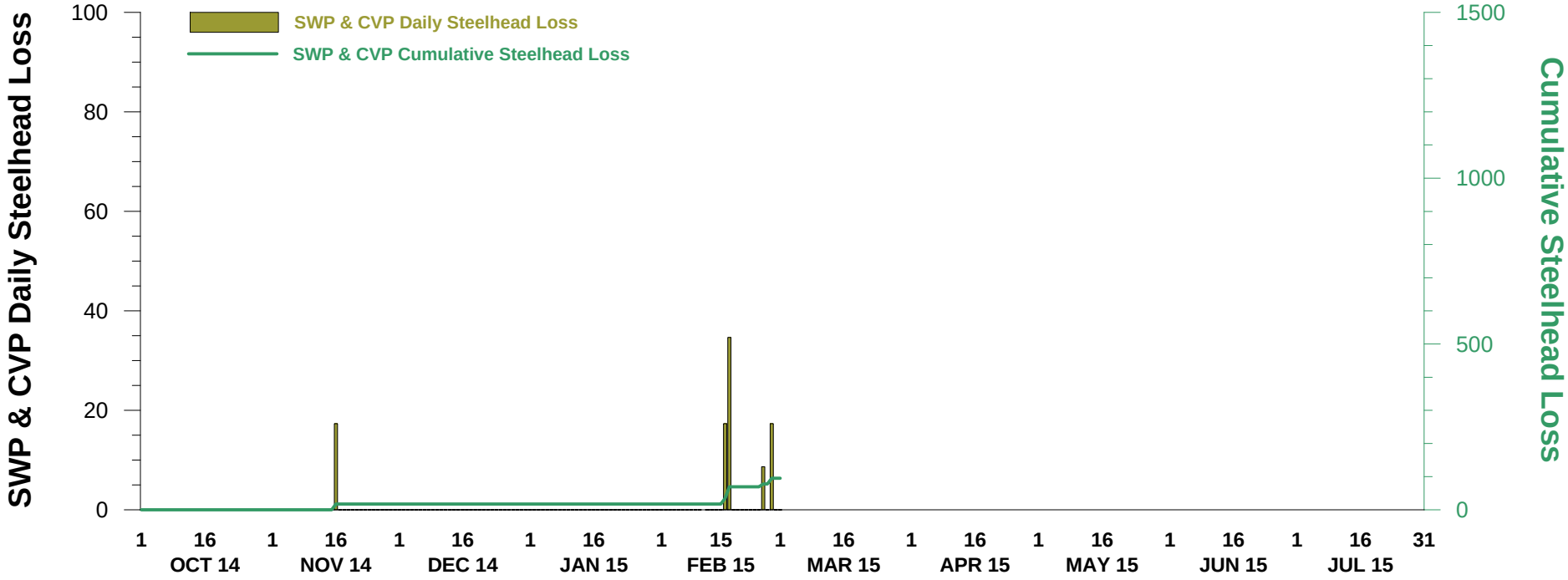
DWR-DES 2 MAR 2015
Preliminary data from DFW, DWR, FWS, Reclamation, and CDEC; subject to revision.
*Chinook not measured for length and Chinook outside of the length-at-date criteria (Delta model) are not reported.

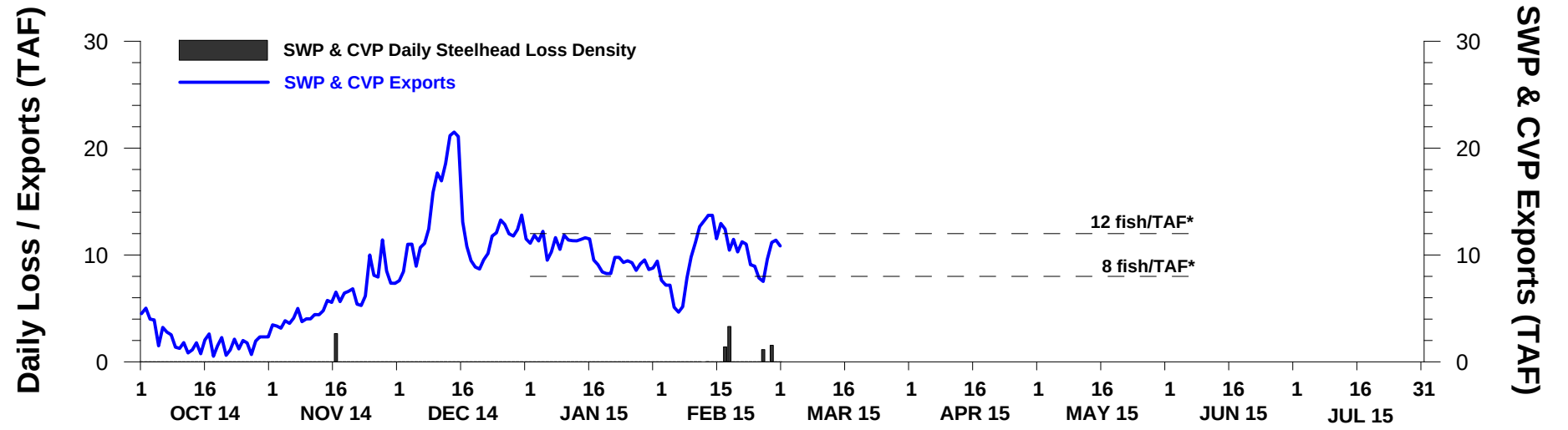
STEELHEAD SALVAGE AT THE DELTA
FISH FACILITIES 01 OCT 2014 THROUGH 1 MARCH 2015



DWR-DES 2 MAR 2015
Preliminary data from DFW; subject to revision.

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





DWR-DES 2 MAR 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.