

**Delta Operations for Salmonids and Sturgeon (DOSS) Group**  
**Conference call: 2/9/16 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:** Aaron Miller, Kevin Reece

**Reclamation:** Josh Israel, Peggy Manza

**NMFS:** Barb Byrne

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

**SWRCB:** Matt Holland

**FWS:** Craig Anderson, Leigh Bartoo

**Agenda Items**

1. Agenda review and introductions
2. RPA Implementation review
3. Update on genetic race assignment on salvaged Chinook
4. Current Operations
5. Smelt Working Group
6. Fish Monitoring
7. DOSS Advice
8. Next DOSS meeting

**Agenda Item 2.**

**RPA Implementation Review**

**Delta RPA Actions that may affect operations during February:**

**Action IV.1.2<sup>1</sup> (DCC gate operations):**

- DCC gates have been closed since 12/15/15.

**Action IV.2.3<sup>2</sup> (OMR Management based on salvage triggers)**

- No triggers exceeded over past week.
- OMR limit of -5,000 cfs is in effect (but not controlling Delta exports)

**Agenda Item 3.**

**Update on genetic race assignment of salvaged Chinook**

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<sup>1</sup> 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](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

<sup>2</sup> For details, see pages 74-79 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](http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

Genetic analysis has been completed for all unclipped Chinook salvaged at the CVP and SWP export facilities from 10/1/15 through 1/16/16. No genetic winter-run Chinook have been salvaged through 1/16/16.

Summary of results (see complete results at end of meeting notes)

Of the 7 young-of-year WR-sized Chinook tested:

- 6 were genetic fall-run
- 1 was a genetic spring run

Of the 17 yearling-LFR sized Chinook tested:

- 6 were genetic fall-run
- 2 were genetic late-fall-run
- 1 was a genetic spring-run

Of the 1 yearling-FR sized Chinook tested:

- 1 was a genetic late-fall-run

No yearling spring-run-sized, young-of-year (YOY) spring-run-sized, YOY fall-run-sized, or YOY late-fall-run-sized Chinook had been salvaged as of 1/16/16.

Reece (DWR) reported than another batch of tissue samples (from unclipped Chinook observed in salvage since 1/16/16, and through 2/7/16) was picked up from the facilities yesterday (2/8/16) and will be submitted for analysis. May have results by the end of the week. He also mentioned that the IEP Salmon Genetics Project Work Team<sup>3</sup> will be discussing ways to improve genetic race assignment at its meeting next Tuesday (2/16/16).

**Agenda Item 4.**

**Current Operations (2/9/16)**

SWP		CVP	
<b>Exports (cfs)</b>			
Clifton Court Forebay	1,800	Jones Pumping Plant	2,450
<b>Reservoir Releases (cfs)</b>			
Feather - Oroville	950	American - Folsom	1,750, increasing to 3,500* at 9pm on 2/9
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	200
		Trinity - Lewiston	300
<b>Reservoir Storage (in TAF)</b>			
San Luis (SWP)	520	San Luis (CVP)	218
Oroville	1,650	Shasta	2,497
New Melones	413	Folsom	600
<b>Delta Operations</b>			
DCC	Closed	Sacramento River at Freeport (cfs)	19,884

<sup>3</sup> [http://www.water.ca.gov/iep/about/salmon\\_genetic.cfm](http://www.water.ca.gov/iep/about/salmon_genetic.cfm)

Outflow Index (cfs)	~16,700	San Joaquin River at Vernalis (cfs)	1,175
E:I	9.9% (14-day avg.)	X2	70 km

\*On 2/9/16, after the DOSS call, a new change order was issued for an increase to 3,000 cfs rather than 3,500 cfs.

Review of factors controlling Delta exports over past week:

OMR limits related to turbidity management for the protection of Delta smelt have been controlling exports over the past week, and are expected to continue controlling exports over the coming week.

- *Tuesday (2/2/16)-Friday (2/5/16):* -2,500 cfs OMR limit (per Reclamation & DWR voluntary flow proposal, described in 2/2/16 FWS Memo<sup>4</sup>; FWS OMR limit of -3,500 in effect per 1/29/16 determination<sup>5</sup>)
- *Saturday (2/6/16):* -2,500 cfs to -3,000 cfs OMR range (per Reclamation & DWR voluntary turbidity management; FWS OMR limit of -3,500 in effect per 1/29/16 determination<sup>5</sup>)
- *Sunday (2/7/16)- Monday (2/8/16):* -2,500 cfs to -3,000 cfs OMR range (per Reclamation & DWR voluntary turbidity management; FWS OMR limit of -4,000 in effect per 2/5/16 determination<sup>6</sup> )
- *Tuesday (2/9/16):* -3,500 OMR limit (per Reclamation & DWR voluntary turbidity management; FWS OMR limit of -4,000 in effect per 2/5/16 determination<sup>6</sup>)

OMR as of 2/6/16:

	USGS gauges (cfs)	Index* (cfs)
5-day	-2,350	-2,450
14-day	-2,430	-2,860

\*The OMR Index values reported to DOSS on 2/9/16 include Contra Costa Water District’s Rock Slough diversion in the export term of the OMR Index equation, but the Projects intend to drop the Rock Slough diversion from the OMR Index equation (as was the original intent). Reclamation plans to recalculate the indices retroactive to 2/1/16, so that the February 2016 OMR report on the CVO reports website will be based on the OMR Index equation without the Rock Slough diversion.

**Agenda Item 5.**

**Smelt Working Group**

The SWG met on Monday, 2/8/16 at 10am. Bartoo (FWS) provided the following SWG meeting summary:

The Working Group reviewed current Delta Smelt distribution, salvage data, and Delta conditions. The Working Group described the risk of entrainment under the Service-

<sup>4</sup> [http://www.fws.gov/sfbaydelta/documents/smelt\\_working\\_group/Memo\\_to\\_BOR\\_Voluntary\\_Actions\\_2-2-2016.pdf](http://www.fws.gov/sfbaydelta/documents/smelt_working_group/Memo_to_BOR_Voluntary_Actions_2-2-2016.pdf)

<sup>5</sup> [http://www.fws.gov/sfbaydelta/documents/smelt\\_working\\_group/Determination\\_2016\\_01\\_29.pdf](http://www.fws.gov/sfbaydelta/documents/smelt_working_group/Determination_2016_01_29.pdf)

<sup>6</sup>

[http://www.fws.gov/sfbaydelta/documents/smelt\\_working\\_group/signed\\_determination\\_memo\\_to\\_bor\\_and\\_letter\\_2\\_5\\_2016.pdf](http://www.fws.gov/sfbaydelta/documents/smelt_working_group/signed_determination_memo_to_bor_and_letter_2_5_2016.pdf)

provided advice framework. Under this framework the relative risk of entrainment for OMR flow ranges is discussed and assessed. For the current week, the risk of entrainment of delta smelt for each of the flow ranges is characterized as follows:

- -1250 to -2000 cfs has a medium risk of entrainment,
- -2000 to -3500 cfs has a high risk of entrainment,
- -3500 to -5000 cfs has a high risk of entrainment.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Tuesday, February 16, 2016 at 10 am.

SWG meeting notes are available at: [http://www.fws.gov/sfbaydelta/cvp-swp/smelt\\_working\\_group.cfm](http://www.fws.gov/sfbaydelta/cvp-swp/smelt_working_group.cfm).

**Agenda Item 6.**

**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	Station 902/ Prisoners Pt. Trawls	Sacramento Trawl	Beach Seines	Knights Landing RST <sup>A</sup>	Tisdale RST <sup>B</sup>	GCID RST <sup>C</sup>	Mossdale Kodiak Trawl
Sample Date	2/1, 2/3, 2/5	902: 1/31, 2/2, 2/4 Pris. Pt: 2/1, 2/3, 2/5	2/1 (limited?), 2/3, 2/5	2/2 (limited?), 2/4	2/1-2/8	1/31-2/7	2/1-2/8	2/1, 2/3, 2/5
Total Catch	23	27	69	278	385	474		0
FR Chinook		24	64	278	381	472	66	
WR Chinook							11	
SR Chinook		1				2	1	
LFR Chinook							2	
Ad-Clipped Chinook	1				1			
Chinook Adult								
Steelhead (wild)								
Steelhead (ad-clip)	10		5		3		19	
Green Sturgeon								
Delta Smelt		2						
Splittail	7							

<b>Longfin Smelt</b>	5							
<b>Flows (avg. cfs)</b>					15,071	15,253	1,400	
<b>W. Temp. (avg. °F)</b>					48.1	48	50.3	
<b>Turbidity (avg. NTU)</b>					54.1	66	29.3 (based on 2/2-2/4 readings)	

<sup>A</sup> Sampling period was from 2/1 at 2:45 pm to 2/8 at 9:15 am. Traps were modified to 50% catch.

<sup>B</sup> Sampling period was from 1/31 at 3:00 pm to 2/8 at 9:00 am. Traps were modified to 50% catch through 2/7 at 1:45 pm, at which point traps were returned to fishing at 100%.

<sup>C</sup> Sampling period was from 2/1 at 10:00 am to 2/8 at 9:00 am. On both 2/4 and 2/5, a log was jammed in the RST cone upon arrival of field crew for the morning trap check.

### Monitoring Summary for DCC and Early Warning surveys:

Location	Prisoners Pt. Trawls	Sacramento Trawl	Jersey Point <sup>A</sup> Trawls
<b>Sample Date</b>	2/8	2/8	2/8
<b>Total Catch</b>	<b>3</b>	<b>4</b>	<b>1</b>
<b>FR Chinook</b>	2	4	1
<b>WR Chinook</b>	0	0	0
<b>SR Chinook</b>	0	0	0
<b>Ad-Clipped Chinook</b>	0	0	0
<b>Delta Smelt</b>	1	0	0

<sup>A</sup> One tow was sampled at Jersey Point due to scheduling error. The field crew moved over to Prisoners Point and completed 15 tows.

### Upcoming Hatchery Releases

- The group was reminded that Nimbus Fish Hatchery would be releasing a total of ~300,000 steelhead over February 10-11, 2016.

### Fish Salvage<sup>7</sup>:

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

<sup>7</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: February 1-February 7, 2016  
 Prepared by Bob Fujimura on February 8, 2016 15:00  
 Preliminary Results -Subject to Revision

Criteria	1-Feb	2-Feb	3-Feb	4-Feb	5-Feb	6-Feb	7-Feb	Trend	
<b>Loss Densities</b>									
Wild older juvenile CS	0	1.41	0	0	0	0.53	0	↗	0.28
Wild steelhead	2.81	0.42	0	0.89	0	0	0	↗	0.59
<b>Exports</b>									
SWP daily export	4,396	2,737	2,175	2,898	3,491	2,898	3,157	↘	3,107
CVP daily export	4,855	3,693	3,183	3,202	3,180	3,703	3,895	↘	3,673
SWP reduced counts	12%	0%	0%	0%	0%	0%	0%	↗	2%
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	6	13	↗	24	48
Spring Run	0	0	→	0	0
Late Fall Run	0	0	→	44	166
Fall Run	4	3	↘	32	38
Unclassified	0	0	→	10	NC
<b>Total</b>	<b>10</b>	<b>16</b>		<b>110</b>	<b>251</b>
<b>Hatchery</b>					
Winter Run	10	45	↘	168	515
Spring Run	0	0	→	0	0
Late Fall Run	0	0	↘	93	298
Fall Run	0	0	→	1	4
Unclassified	0	0	→	0	0
<b>Total</b>	<b>10</b>	<b>45</b>		<b>262</b>	<b>817</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	18	34	↗	22	37
Hatchery	34	89	↘	162	497
<b>Total</b>	<b>52</b>	<b>123</b>		<b>184</b>	<b>534</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 2/1/16-2/7/16.

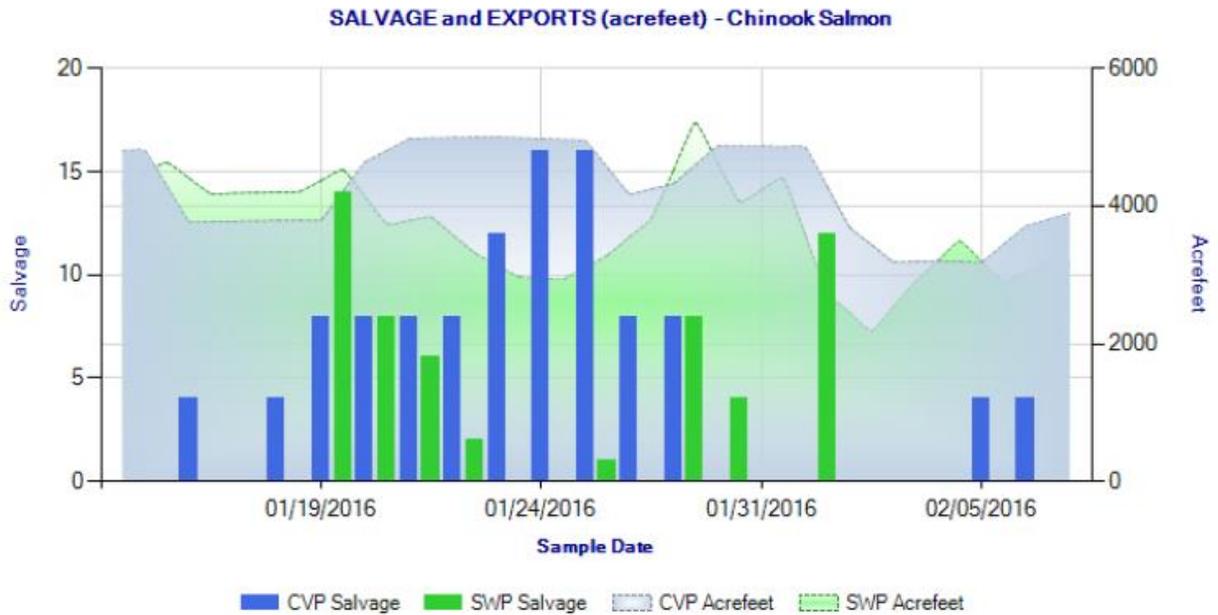


Figure 2. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during February 1, 2016 through February 7, 2016.

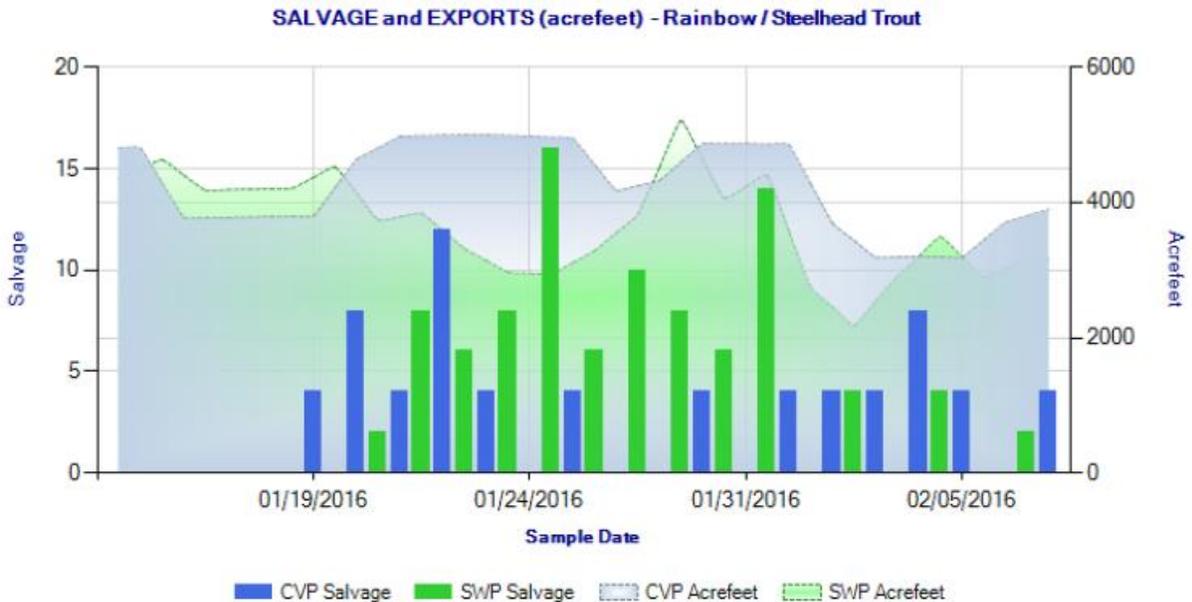


Figure 3. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during February 1, 2016 through February 7, 2016.

Mulligan (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 LOSSES AT THE SWP & CVP DELTA FISH FACILITIES, 2015/2016

Release Date	CWT Race	Hatchery	Release Site	Release Type	Confirmed Loss	Number Released	Total Entering Delta	% Loss of Number Released	% Loss of Total Entering Delta	First Concern Level	Second Concern Level	Date of First Loss	Date of Last Loss
5/11/2015 to 6/12/2015	LP	Coleman NFH	Bass Fern Boat Ramp, Sacramento River	Production	0.00	234,227	0.00	0.000	0.00	n/a	n/a	-	-
12/17/2015	LP	Coleman NFH	Saline Creek	Production	256.00	281,213	0.09	0.13	0.03	n/a	n/a	12/22/2015	12/22/2015
12/17/2015	LP	Coleman NFH	Saline Creek	Spring Surgegate	183.85	171,600	0.11	0.15	0.03	0.5%	1.0%	12/25/2015	12/25/2015
12/22/2015	LP	Coleman NFH	Saline Creek	Spring Surgegate	170.59	68,000	0.25	0.251	n/a	0.5%	1.0%	1/6/2016	2/22/2016
1/12/2016	LP	Coleman NFH	Saline Creek	Spring Surgegate	204.04	67,700	0.30	0.301	n/a	0.5%	1.0%	1/20/2016	2/22/2016

UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSSES AT THE SWP & CVP DELTA FISH FACILITIES, 2015/2016

Category	Unassigned CHTs	Unread CHTs	Accounting Tag Loss	Number of Unassigned CHTs
SWP	18.16	0.00	0.00	0
CVP	0.00	0.00	0.00	0
TOTAL	18.16	0.00	0.00	0

SWP and CVP adipose-fin clipped Chinook lost from 12/25/2015

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

-% Loss of Number Released = (Confirmed Loss/Number Released)\*100.

-% Loss of Total Entering Delta = (Confirmed Loss/Total Entering Delta)\*100.

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

-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 accidentally released).

-adipose-fin clipped Chinook was collected during fish count, but tag code could not be determined (e.g., damaged tag, lost tag, no tag, or Chinook accidentally released).

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

-adipose-fin clipped Chinook released due to presence of a tag.

-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.

\*\* Information not yet available.

DWR-CES Revised 02/08/2016

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, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns. As monitoring information is received, listed species distribution will be updated and included in the following table.

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Young-of-year (YOY) winter-run Chinook salmon</i>	5-10% (Last week: same)	90-95% (Last week: same)	0% - 5% (Last week: same)
<i>Young-of-year (YOY) spring-run Chinook salmon*</i>	35% - 45% (Last week: same)	55% - 65% (Last week: same)	0% - 5% (Last week: same)

\*When reviewing monitoring data, DOSS assumes that some of the juvenile Chinook categorized as fall-run (based on the length at date criteria) are actually genetic spring-run Chinook.

**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 associated with 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: MEDIUM**
  - DOSS estimated a reduction in exposure risk (“MEDIUM” this week compared to “HIGH” last week) based on decreasing flows and turbidities which are expected to be associated with decreasing salmonid movement.

- **Routing Risk: MEDIUM**
  - DOSS estimated an increase in routing risk (“MEDIUM” this week compared to “LOW to MEDIUM” last week) based on decreasing flows; decreased river flows are associated with greater tidal effects at Georgiana Slough (increasing the risk of routing into Georgiana Slough).
- **Overall Entrainment Risk: MEDIUM**

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

- **Exposure Risk: MEDIUM**
  - Listed runs are expected to have previously migrated into and be rearing within the Interior Delta.
- **OMR/Export Risk:**
  - OMR -2,500 cfs to -3,500 cfs: LOW
  - OMR -3,500 cfs to -5,000 cfs: MEDIUM to HIGH
- **Overall Entrainment Risk:**
  - OMR -2,500 cfs to -3,500 cfs: LOW to MEDIUM
  - OMR -3,500 cfs to -5,000 cfs: MEDIUM

**Agenda Item 7.**

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

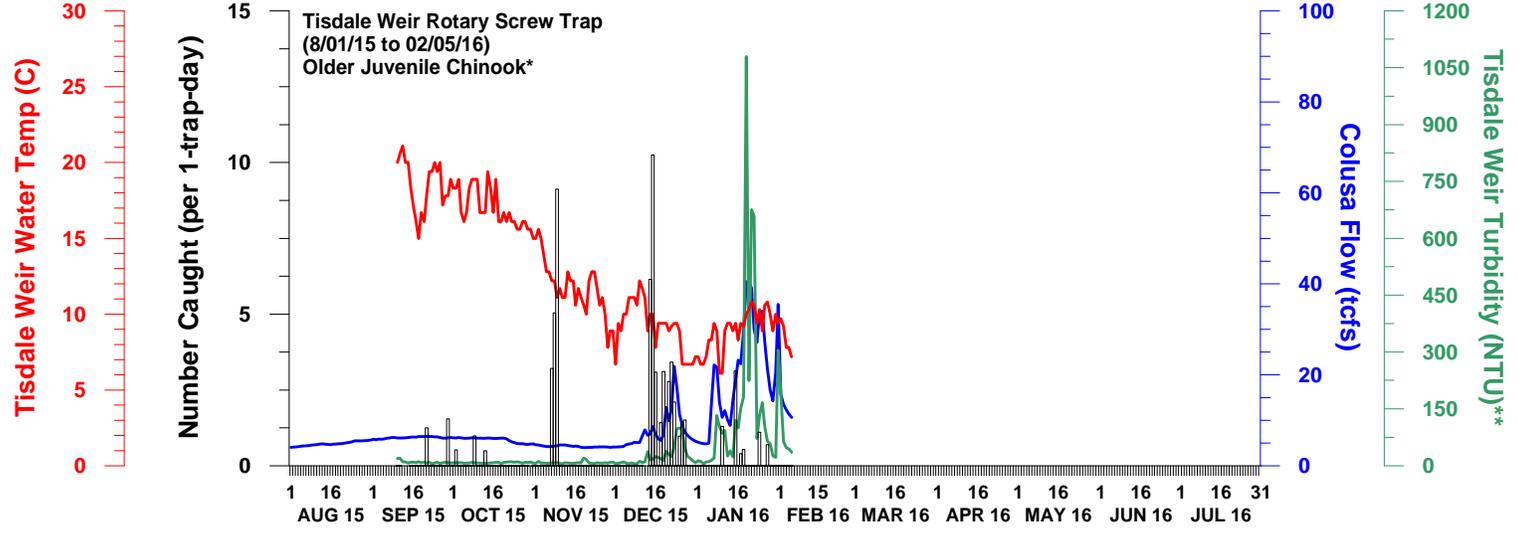
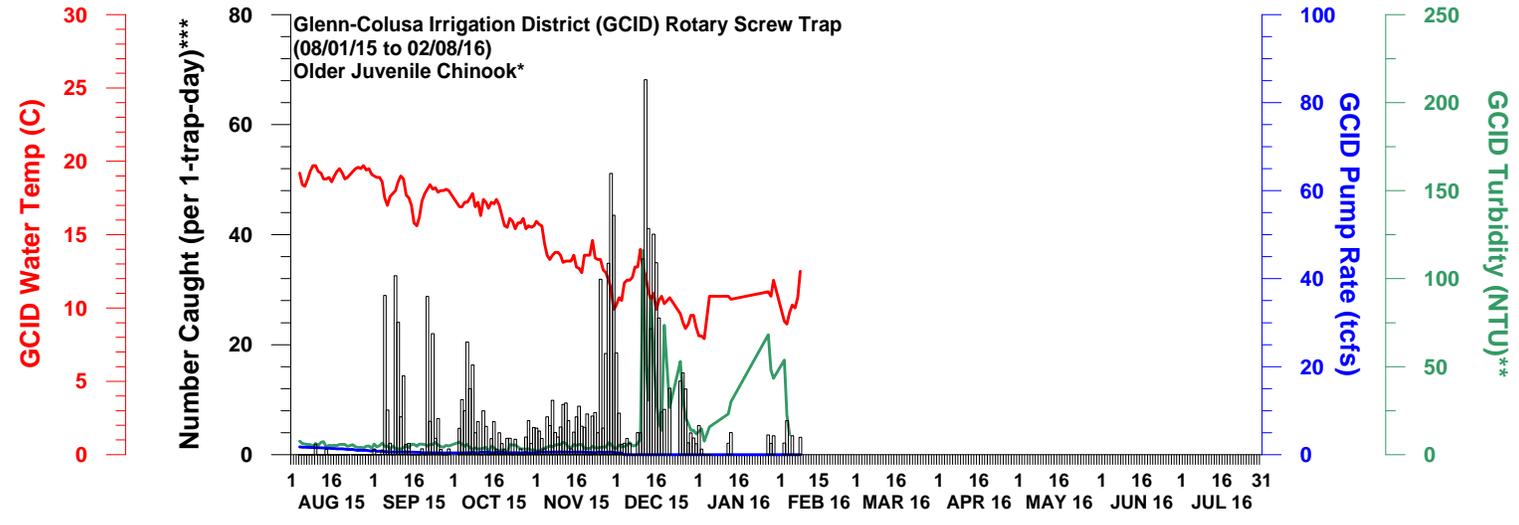
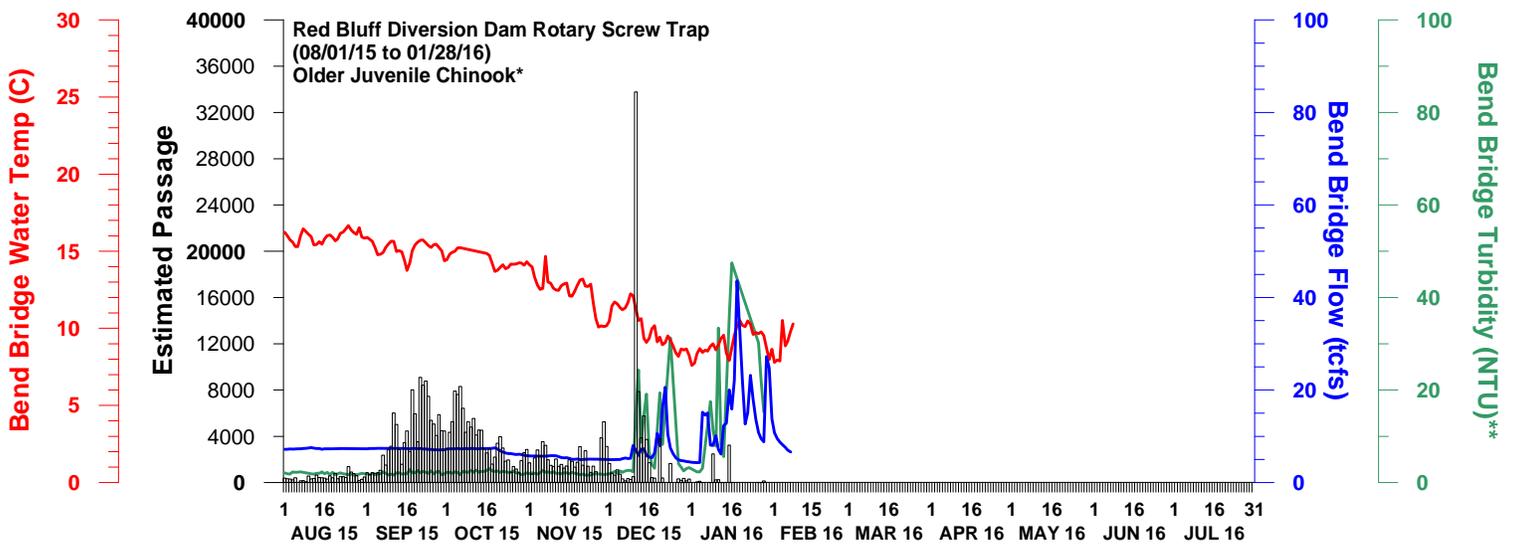
**Agenda Item 8.**

**Next Meeting:** The next DOSS conference call will be on 2/16/16 at 9am. Because of the Presidents’ Day holiday on Monday, 2/15/16, some monitoring data will not be available to DOSS by 9am on Tuesday.

FACILITY	SampleDate	TIME	ForkLength	Delta LD Model Race ID	Genetic Assignment	PosProb1	Genetic Race ID	PosProb2	Best		CATCH	SALVAGE	LOSS
2	12/22/2015	10:00	160	LateFall	Non-winter	1.000	Spring	0.565	DeerCrsp		1	4.0	3.52
1	12/23/2015	14:00	146	LateFall	Non-winter	1.000	Fall	0.924	ButteCrfa		1	2.0	9.16
1	12/24/2015	13:00	169	LateFall	Non-winter	1.000	Fall	0.416	USacramentoRlfa		1	4.0	17.15
1	12/24/2015	13:00	180	LateFall	Non-winter	1.000	Fall	0.910	ButteCrfa		1	4.0	17.15
1	12/24/2015	13:00	176	LateFall	Non-winter	1.000	Late Fall	0.556	USacramentoRlfa		1	4.0	17.15
1	12/24/2015	16:00	162	LateFall	Non-Winter	1.000	Late Fall	0.752	USacramentoRlfa		1	2.0	9.16
1	12/25/2015	02:00	160	LateFall	Non-winter	1.000	Fall	0.540	USacramentoRlfa		1	2.0	8.57
2	12/25/2015	08:00	170	LateFall	Non-winter	1.000	Fall	0.871	ButteCrfa		1	4.0	3.19
1	12/26/2015	09:00	150	LateFall	Non-winter	1.000	Fall	0.998	MokelumneRfa		1	4.0	17.95
1	12/26/2015	09:00	198	Fall	Non-Winter	1.000	Late Fall	0.566	USacramentoRlfa		1	4.0	17.95
1	12/28/2015	07:30	192	LateFall	Non-winter	1.000	Fall	0.642	ButteCrfa		1	1.0	4.33
1	12/28/2015	07:30	140	Winter	Non-winter	1.000	Fall	0.904	ButteCrfa		1	1.0	4.33
1	12/28/2015	07:30	147	Winter	Non-winter	1.000	Fall	0.860	ButteCrfa		1	1.0	4.33
1	12/28/2015	07:30	155	LateFall	Non-winter	1.000	Fall	0.991	ButteCrfa		1	1.0	4.33
1	12/28/2015	07:30	165	LateFall	Non-winter	1.000	Fall	0.856	ButteCrfa		1	1.0	4.33
1	12/28/2015	07:30	153	LateFall	Non-winter	1.000	Fall	0.988	MokelumneRfa		1	1.0	4.33
1	12/28/2015	07:30	183	LateFall	Non-Winter	1.000	Late Fall	0.761	USacramentoRlfa		1	1.0	4.33
1	12/28/2015	07:30	151	LateFall	Non-winter	1.000	Fall	0.966	ButteCrfa		1	1.0	4.33
1	1/1/2016	05:00	158	LateFall	Non-winter	1.000	Fall	0.996	MokelumneRfa		1	4.0	18.30
1	1/2/2016	05:00	193	LateFall	Non-winter	1.000	Fall	1.000	MokelumneRfa		1	4.0	18.32
1	1/5/2016	08:00	151	Winter	Non-winter	1.000	Fall	0.819	MokelumneRfa		1	1.0	4.33
1	1/5/2016	08:00	152	Winter	Non-Winter	1.000	Late Fall	0.893	USacramentoRlfa		1	1.0	4.33
2	1/12/2016	10:00	146	Winter	Non-Winter	1.000	Late Fall	0.602	USacramentoRlfa		1	4.0	2.88
2	1/14/2016	23:59	162	Winter	Non-winter	1.000	Fall	0.781	MokelumneRfa		1	4.0	2.88
2	1/16/2016	04:00	175	Winter	Non-winter	1.000	Fall	0.518	FeatherRHsp		1	4.0	3.52
1	1/6/2016		520		Non-winter	1.000	Fall	0.906	ButteCrfa				
1	1/6/2016		548		Non-winter	1.000	Spring	0.962	FeatherRHsp				
1	1/7/2016		555		Non-winter	1.000	Fall	0.690	ButteCrfa				

The following graphs were provided (after the DOSS call) by DWR for Chinook salmon and steelhead observed at monitoring locations in the Sacramento and San Joaquin rivers and Delta. Also available at: <http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>

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

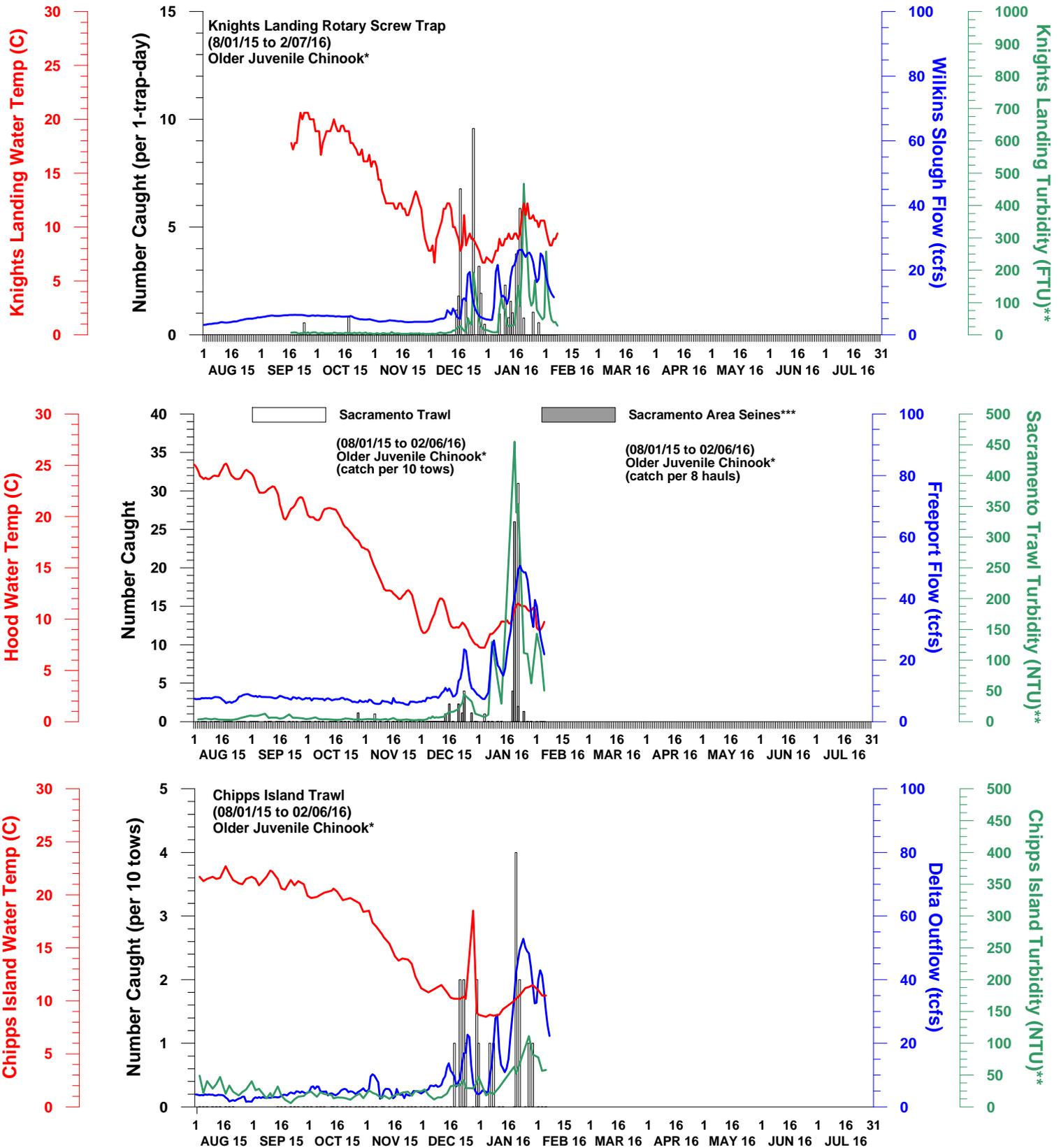


DWR-DES 09 FEB 2016  
 Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.

\*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.

-Tisdale: 12/12/2015-12/13/2015 there was a river right revolution malfunction.

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



DWR-DES 9 FEB 2016

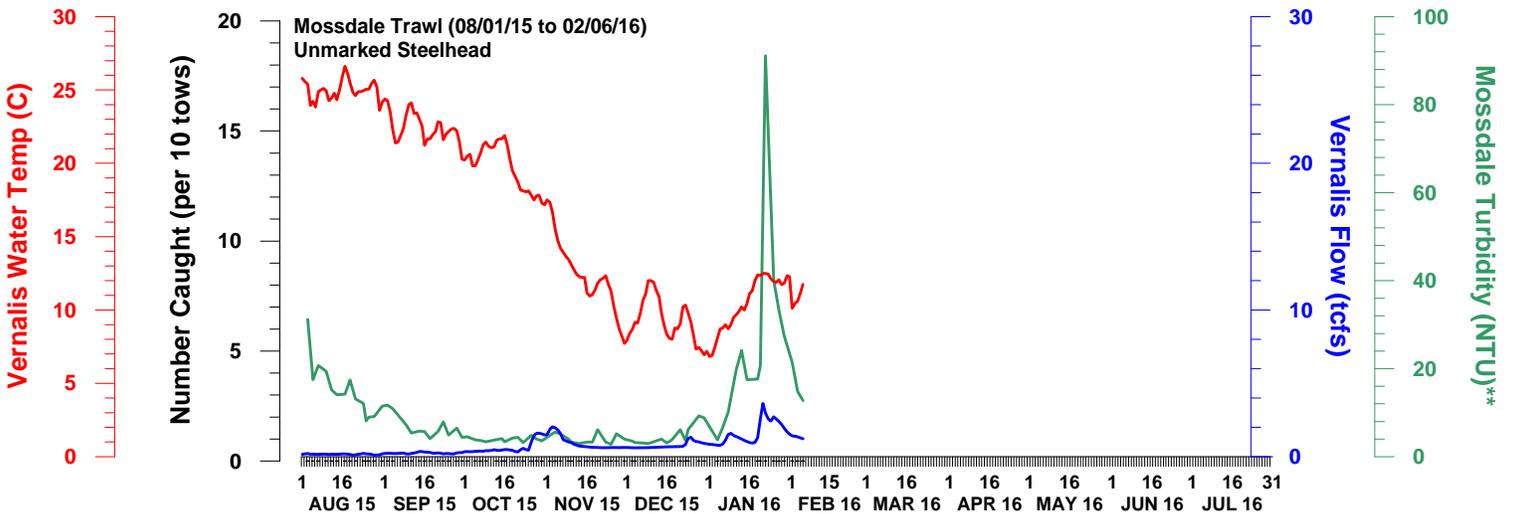
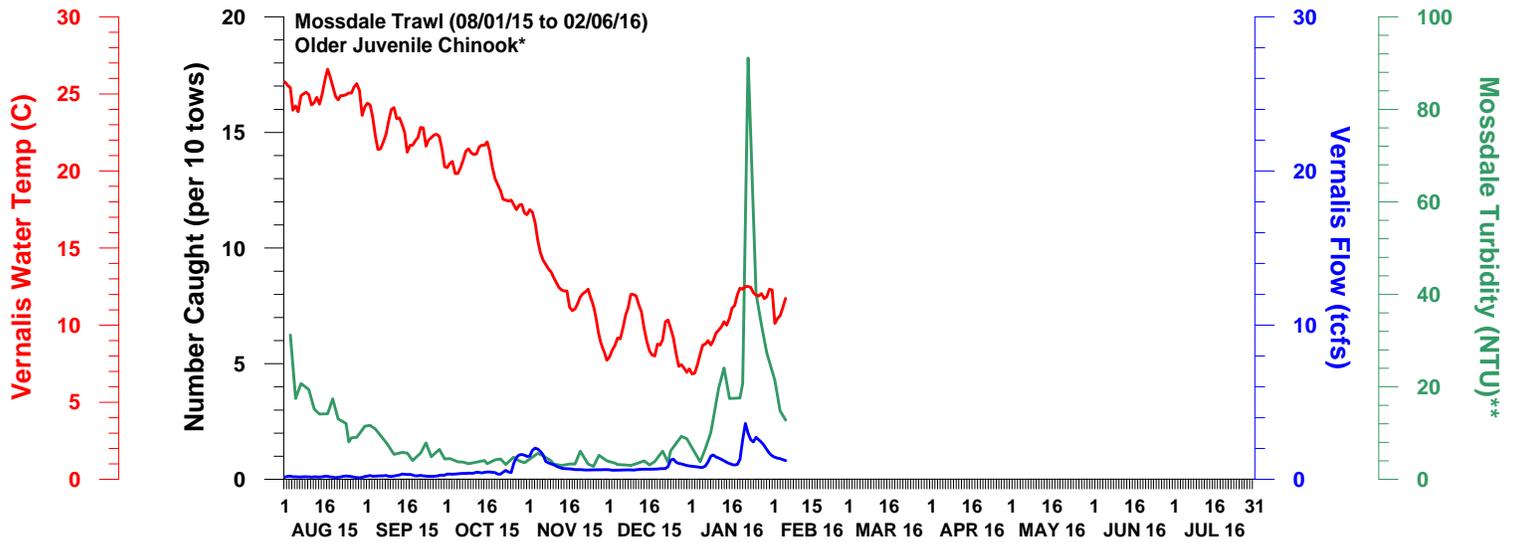
Preliminary data from DFW, FWS, and CDEC; subject to revision.

\*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

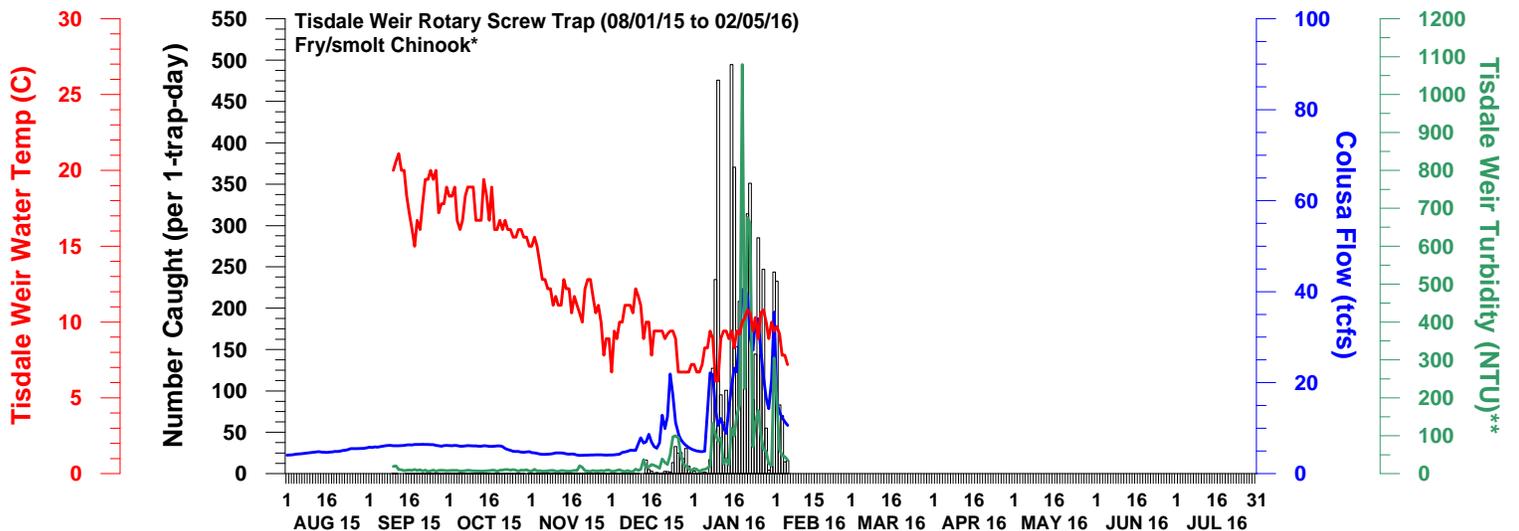
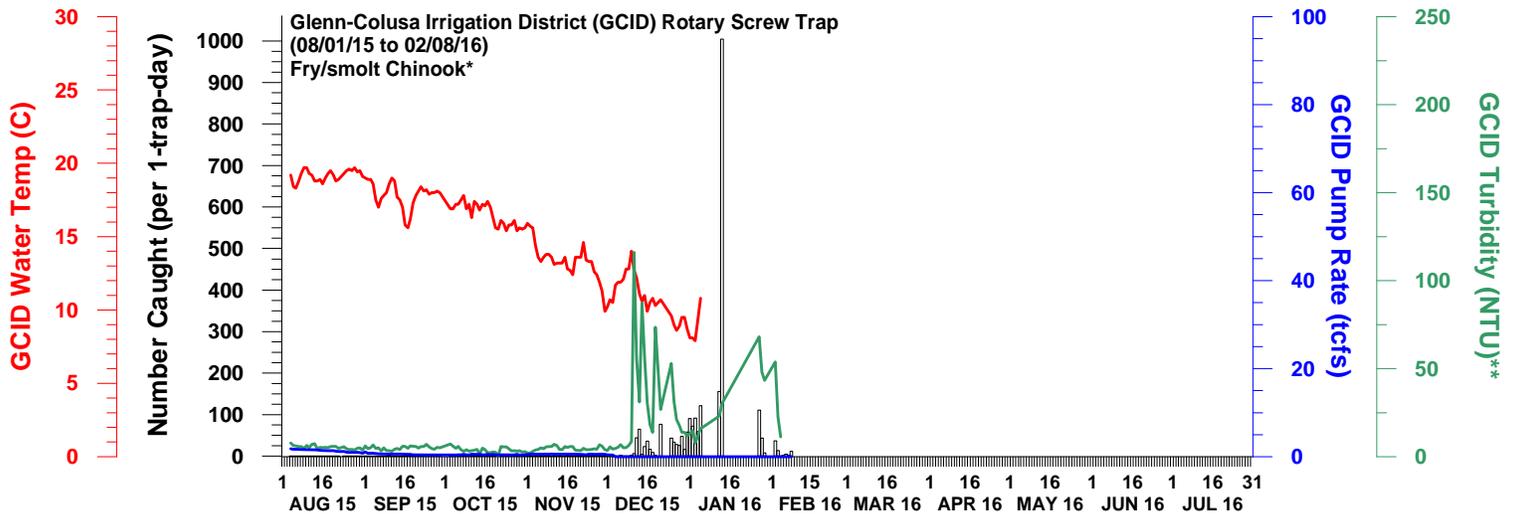
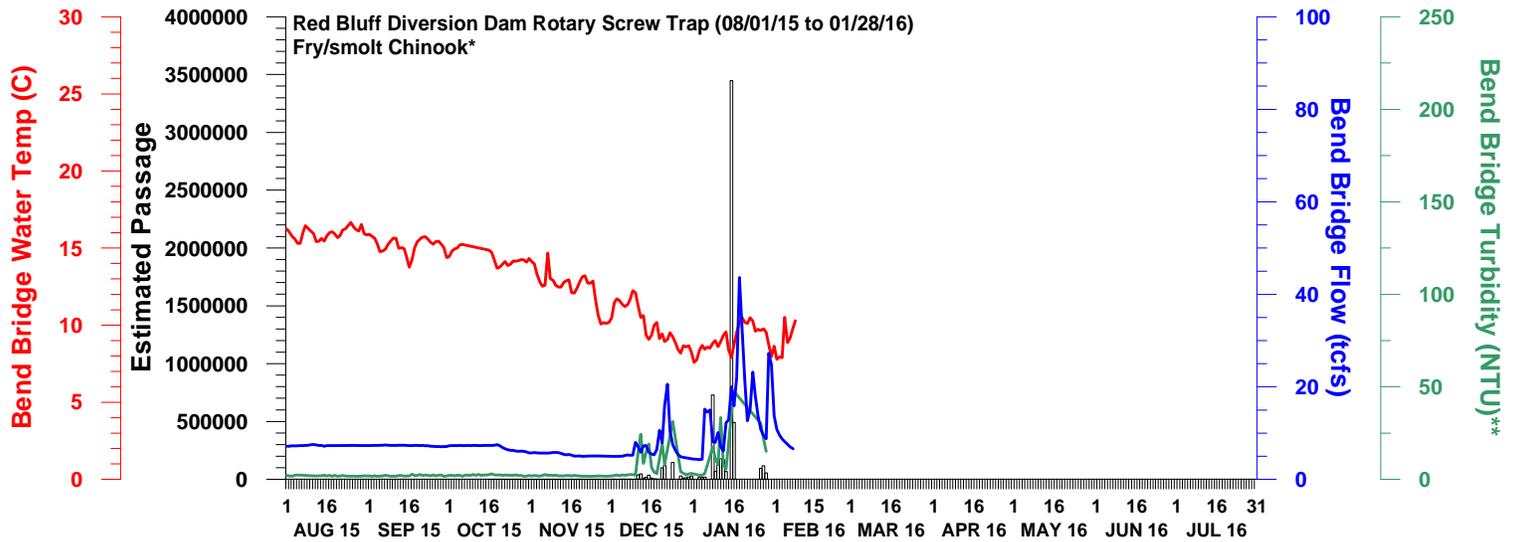


DWR-DES 9 FEB 2016  
Preliminary data from FWS and CDEC; subject to revision.

\*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



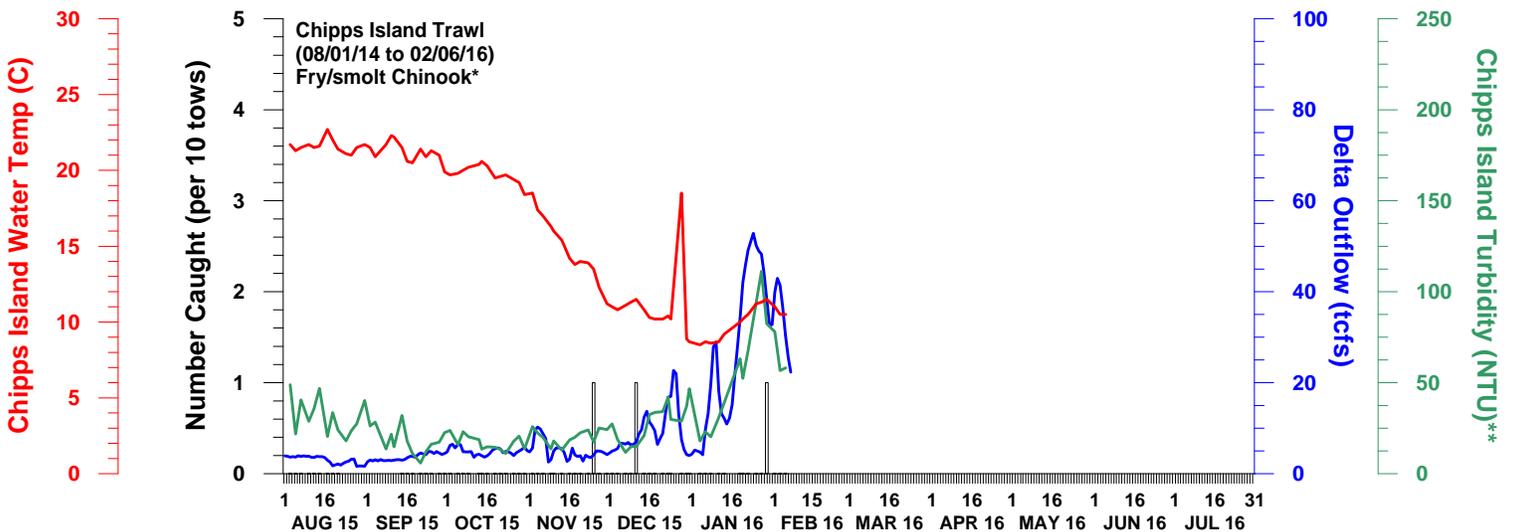
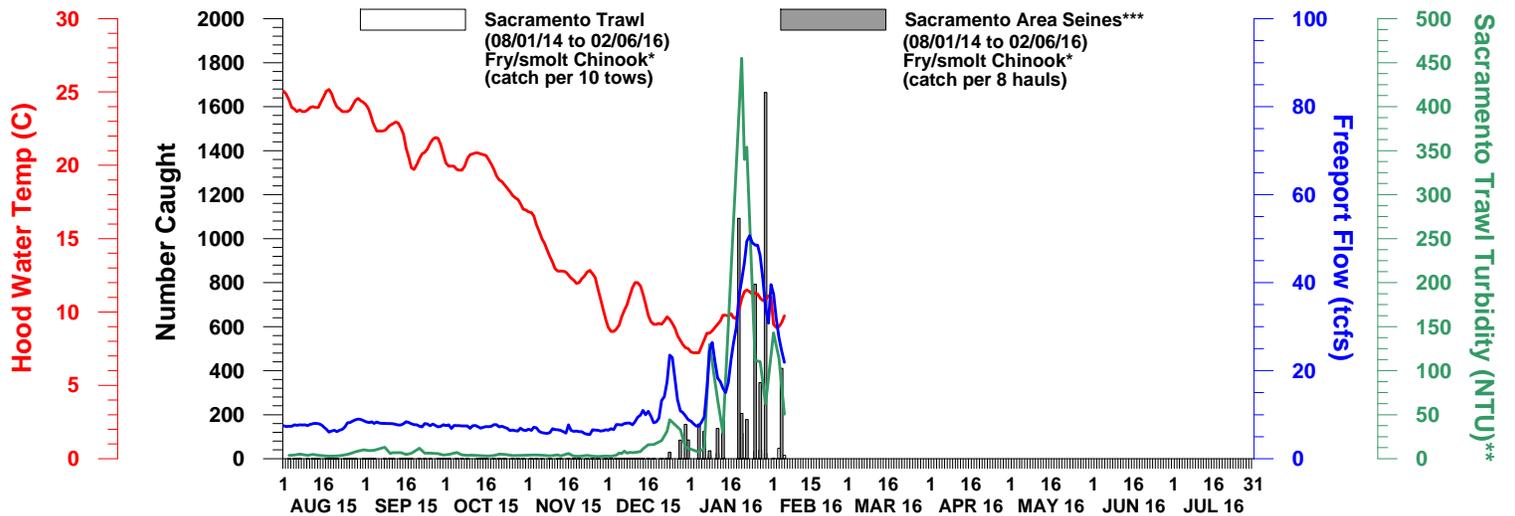
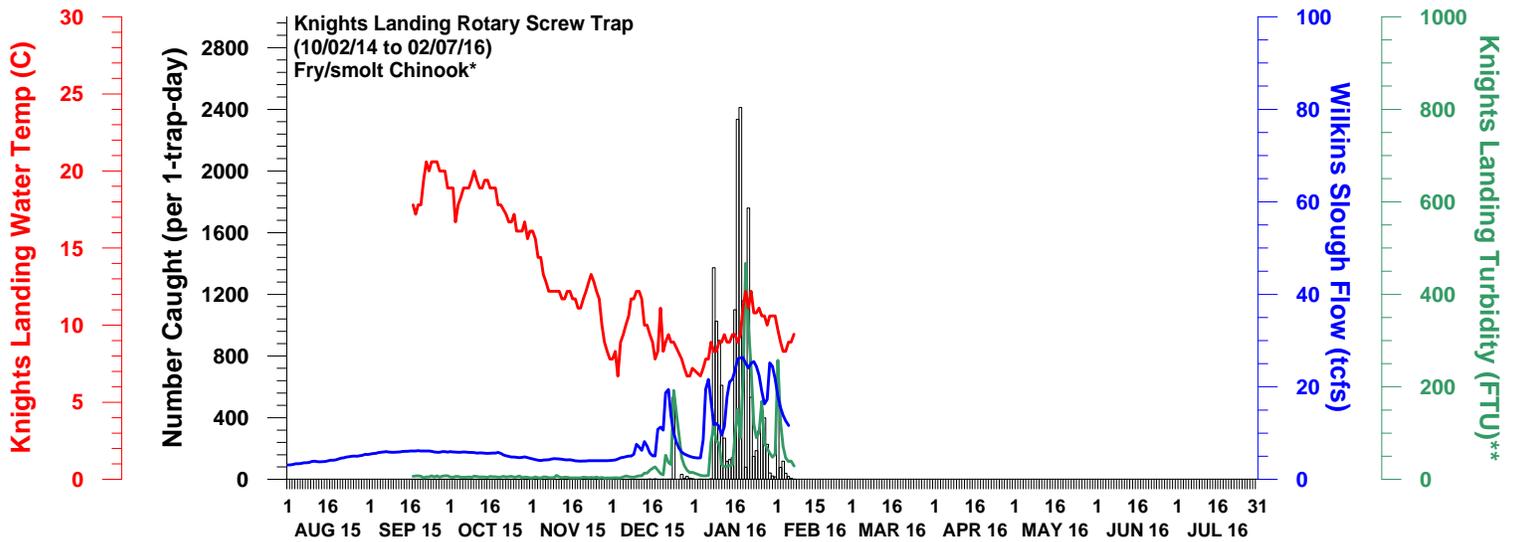
DWR-DES 9 FEB 2016

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.

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



DWR-DES 9 FEB 2016

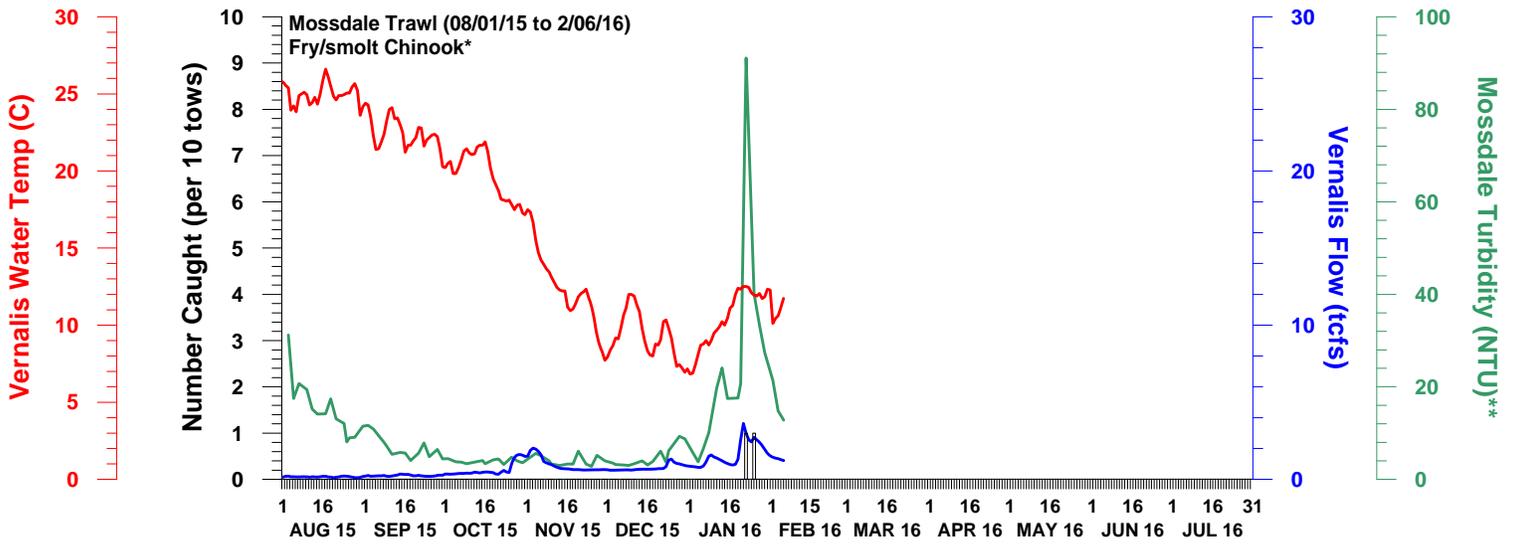
Preliminary data from DFW, FWS, and CDEC; subject to revision.

\*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 9 FEB 2016

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.

## **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).

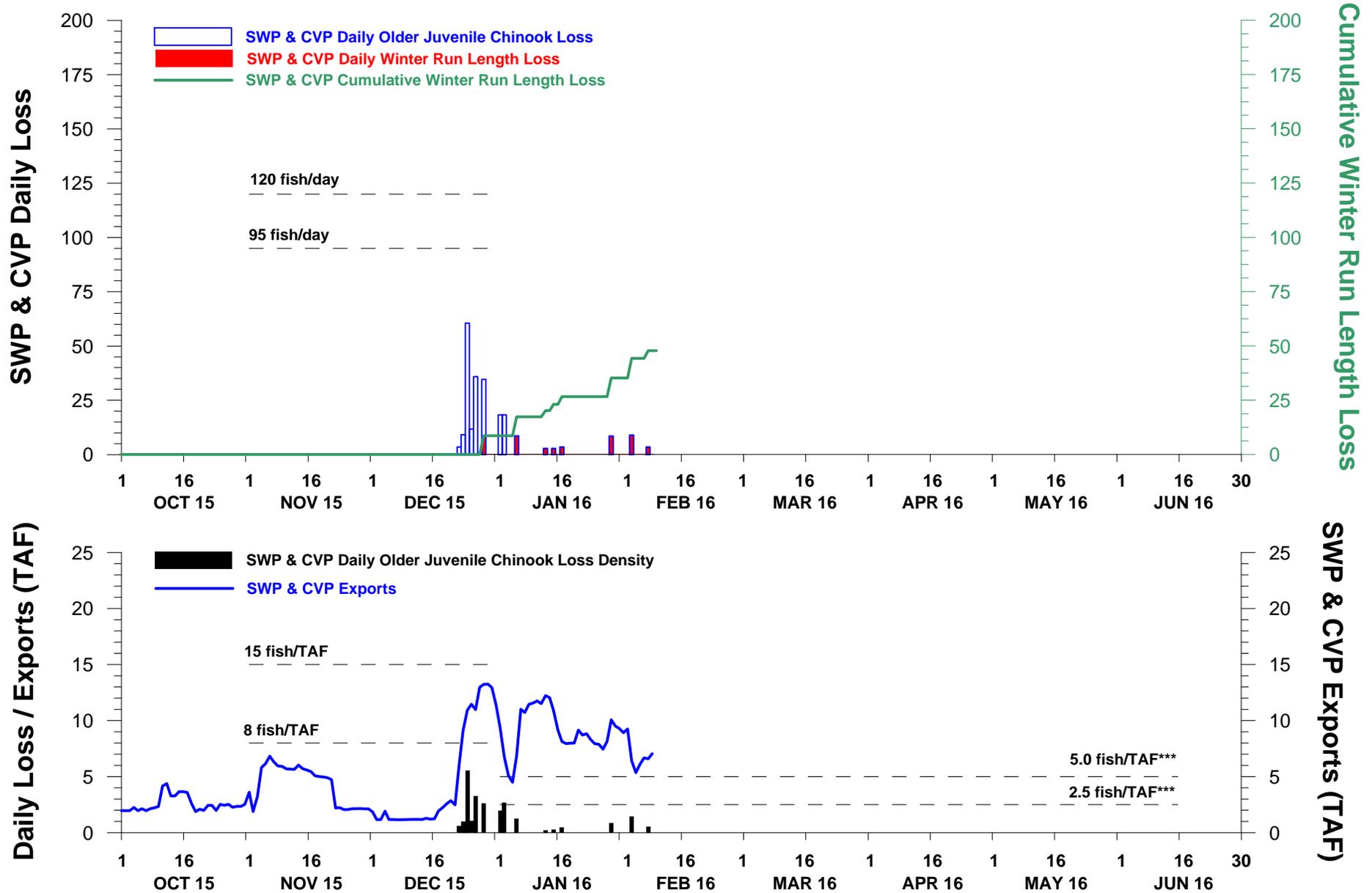
The hydrology data were either downloaded from the California Data Exchange Center (CDEC) (<http://cdec.water.ca.gov>) or obtained directly from the California Department of Water Resources, Operations Control Office.

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



# NON-CLIPPED WINTER RUN & OLDER JUVENILE CHINOOK LOSS AT THE DELTA FISH FACILITIES 01 OCT 2015 THROUGH 26 JAN 2016



DWR-DES 09 FEB 2016

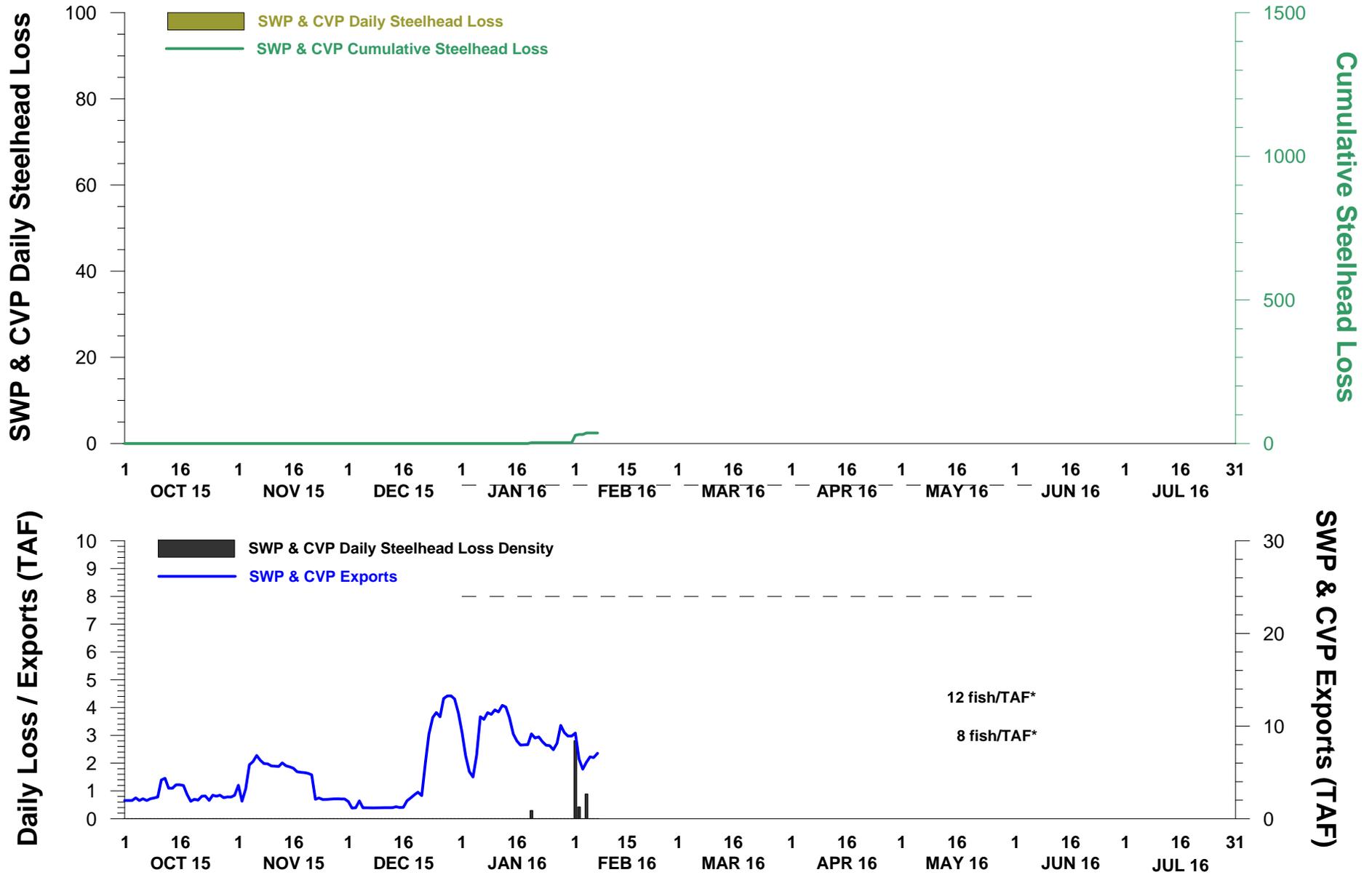
Preliminary data from DFW; subject to revision.

\*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 (Delta model) for which a race is assigned on a given sampling date.

\*\*ITL (Incidental Take Limit) is based on the JPE, which is not yet available.

\*\*\*minimum value determined by NMFS

# NON-CLIPPED STEELHEAD LOSS AT THE DELTA FISH FACILITIES 01 OCT 2015 THROUGH 9 FEB 2016

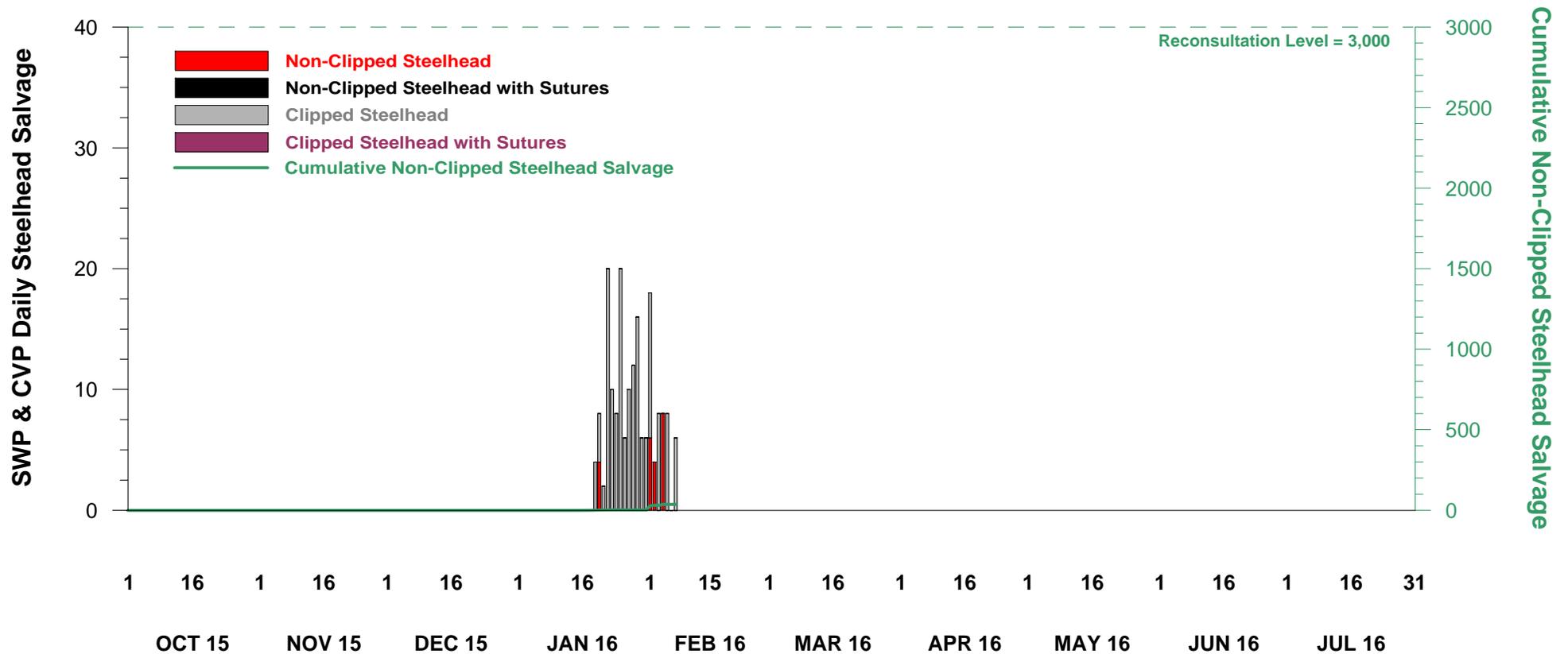


DWR-DES 9 FEB 2016

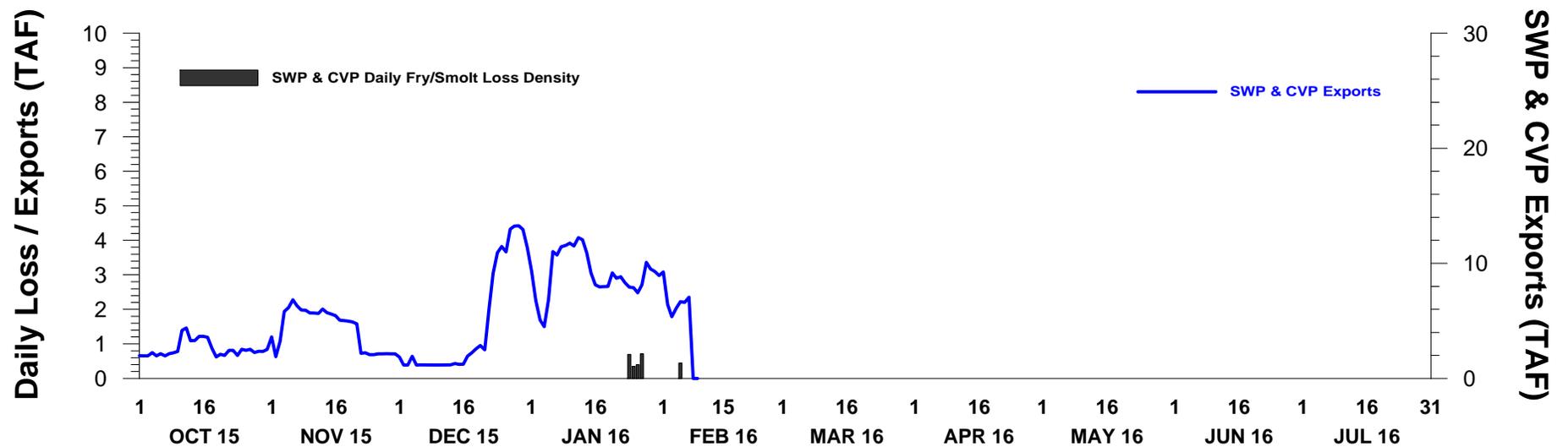
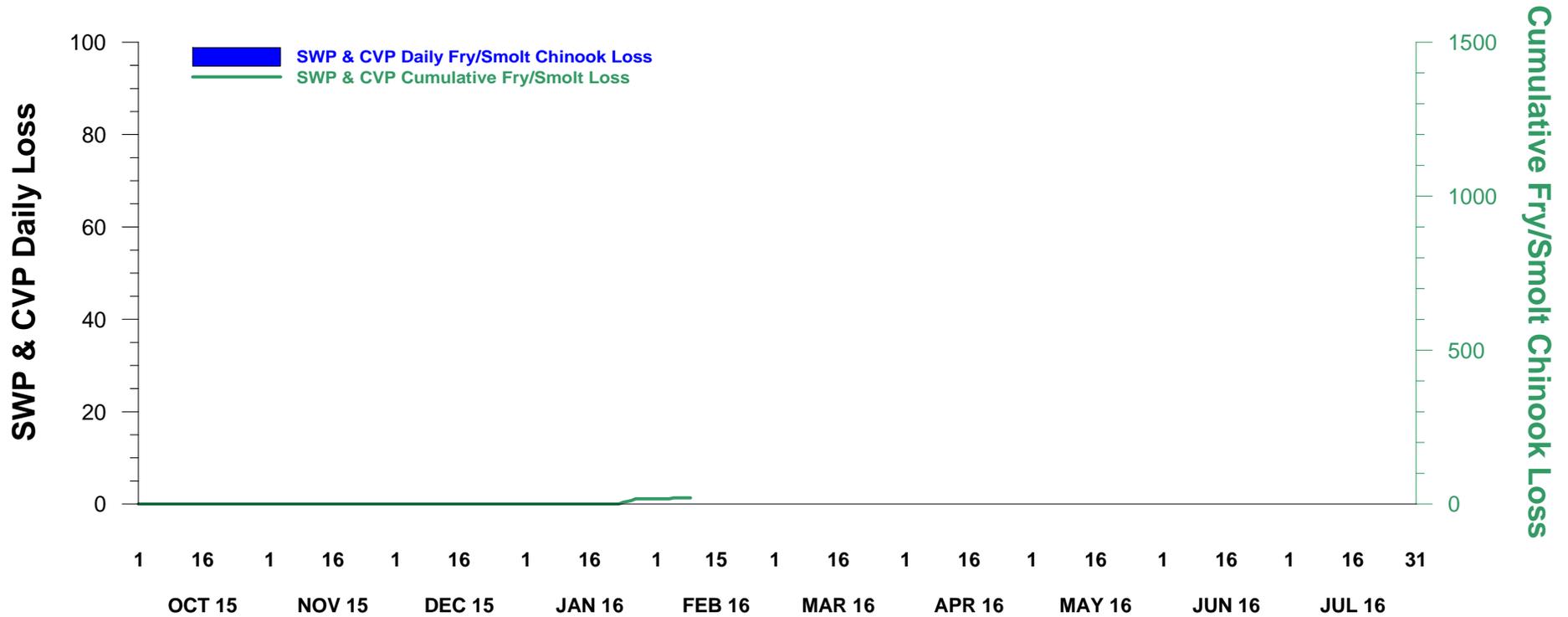
Preliminary data from DFW; subject to revision.

\*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.

# STEELHEAD SALVAGE AT THE DELTA FISH FACILITIES 01 OCT 2015 THROUGH 09 FEB 2016



# NON-CLIPPED FRY/SMOLT CHINOOK LOSS AT THE DELTA FISH FACILITIES 01 OCT 2014 THROUGH 9 FEB 2016



DWR-DES 9 FEB 2016  
 Preliminary data from DFW; subject to revision.  
 \*Fry/smolt Chinook defined as all Chinook less than the minimum winter run length-at-date criteria (Delta model).