

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 02/17/2015 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, Dan Yamanaka, Bryant Giorgi, Mike Ford, Tracy Pettit

Reclamation: Michelle Palmer, Josh Israel, Peggy Manza

NMFS: Barb Byrne, Jeff Stuart, Meiling Roddam

USFWS: Craig Anderson

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

Agenda Item 2.

RPA Implementation Review

Delta RPA Actions affecting operations during December/January/February:

Action IV.1.2 (DCC gate operations):

- Default DCC gate closure started Monday, December 1.

Action IV.2.3 (OMR Management)

- Last week, the Projects requested flexibility in OMR implementation. See details in the 2/9/15 letter to NMFS from Reclamation, and the 2/10/15 NMFS determination; both available under “Biological Opinion Actions” at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/.
- 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 (02/17/2014)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	4,900*	Jones Pumping Plant	800**
Reservoir Releases (cfs)			
Feather - Oroville	950	American - Nimbus	900***
		Sacramento - Keswick	3,250
		Stanislaus - Goodwin	400****
		Trinity – Lewiston	300
Reservoir Storage (in TAF)			
San Luis (SWP)	856	San Luis (CVP)	367
Oroville	1,680	Shasta	2,506
New Melones	602	Folsom	546
Delta Operations			
DCC	Closed	Sacramento River at Freeport (cfs)	22,169
Outflow Index (cfs)	17,400	San Joaquin River at Vernalis (cfs)	~800
E:I	24.5% (14-day Avg.)	X2	72 km

*Will decrease to 4,700 cfs on 2/19.

**There may be an increase in pumping to 1800 cfs starting on 2/19 due to completion of work at O’Neill Forebay.

***There is a request to discuss reducing to 800 cfs at Folsom

****For salinity management at Vernalis

OMR flow management (for both salmonid and smelt concerns) has been controlling exports since Saturday, 2/7. Prior to that, delta outflow (per D-1641) was controlling exports. Weather outlook is dry for the next 7-10 days.

The daily OMR index for 2/17 is -5,000 cfs. The OMR index from 2/14-2/16 was -5,500. The 5-day OMR index to 2/16 was -4,680, and the 14-day OMR index to 2/16 was approximately -4,000.

Agenda Item 4.

Smelt Working Group (SWG)

SWG will meet at 10am on 2/17/15.

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 ^A	Prisoners Pt/ Jersey Pt. ^A	Sacramento Trawl ^A	Mossdale Kodiak Trawl ^A	GCID RST ^B	Knights Landing RST ^C	Tisdale RST ^D	Beach Seines ^A
Sample Date						2/9-2/16	2/9-2/15	
Total Catch						5,181 (28mm-125mm)	3,279 (28mm-110mm)	
FR Chinook						4,654	3,279	
WR Chinook						25	2	
SR Chinook						73	29	
LFR Chinook								
Ad-Clipped Chinook						355 ^E	149	
Delta Smelt								
Splittail								
Longfin Smelt								
Steelhead (ad-clip)						69	12	
Steelhead (wild)						5		
Green Sturgeon								
W. Temp. (avg. °F)						55	51	
Flows (avg. cfs)						18,557	18,617	
Turbidity (avg. NTU)						180	118	

^A Data were provided to DOSS after the call; the holiday on Monday delayed the usual reporting schedule.

^B Trap pulled on 2/5 and will be re-set on 2/17.

^C Sampling period was from 2/9 at 5:30 pm to 2/16 at 9:30am. Both RSTs modified to sample at 50% efficiency: during night hours on 2/9 at 5:30pm to 2/10 at 10:00am; during daylight hours from 2/10 at 10:00am to 2/11 at 4:45pm; and during both night and daylight hours from 2/12 at 6:45am to 2/16 at 9:30am.

^D Sampling period was from 2/9 at 4:00 pm to 2/15 at 3:45 pm. Traps fishing at 100% from 2/10 at 9:00am to 2/10 at 5:00pm. RST cones modified to 50% efficiency for all other sample times.

^E Of these 355 fish, 350 were winter-run sized and 3 were late fall-run sized based on length at capture date criteria.

Due to the storm during the weekend of 2/6-2/8, there was an overall increase in the catches of juvenile Chinook salmon at all sampling locations. DOSS noted that “high numbers” in the catch data might be interpreted differently for the different runs of Chinook salmon (*e.g.* a catch of 10 Chinook at the Knights Landing RST might be considered “high” for winter-run Chinook but “low” for fall-run Chinook) and at different times of year (*e.g.*, a catch of 100 fall-run

Chinook at the Knights Landing RST might be considered “high” in February but “low” or “medium” in April). The trend in the catch data is important, in that an increase in catch, for any salmonid species or run, may indicate a pulse in migration, whatever the absolute catch.

Preliminary Sacramento Beach Seine and Prisoner’s Point/Jersey Pt. Data

2/10: Sacramento Beach Seines—108 fall-run, 9 spring-run, 4 ad-clipped Chinook (68mm-80mm)

2/8, 2/10, 2/11, 2/14, 2/16: Jersey Point—40 Delta Smelt, 220 fall-run, 1 winter-run, 1 spring-run, 2 ad-clipped Chinook (71mm-97mm)

2/9, 2/12, 2/13, 2/15: Prisoner’s Point—6 wild steelhead, 1 ad-clipped steelhead (170mm), 5 Delta Smelt, 114 fall-run, 1 spring-run, 1 winter-run, 7 ad-clipped Chinook (76mm-102mm)

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).
- Proportion of tag codes¹ observed passing I80/I50 bridge receiver as of 6:00am on Monday, 2/16/15 (see table below):

	Release 1	Release 2	All releases
Number released:	251	321	571
Number of fish with only 1 detection:	23	35	58
Number of fish with 2 or more detections:	43	61	104
Total detects of valid IDs:	66	96	162
Percent detected all detections:	26.3	29.9	28.4
Percent detected with 2 or more detects:	17.1	19.0	18.2
Detections over time: 2+ detects (single detects listed in parentheses)			
Number of fish 2/09/2015	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	0 (0)	3 (3)	

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.

- There are now two more real-time receivers working and transferring data to the web: Data collection began at the receiver at Tisdale on 2/14/2015 at 6:00pm and at the receiver in Middle River on 2/16/2015 6:00pm.

Fish Salvage²:

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>.

DOSS Weekly Salvage Update
Reporting Period: February 9-15, 2015
Prepared by Bob Fujimura on February 16, 2015 20:09
Preliminary Results -Subject to Revision

Criteria	9-Feb	10-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	Trend	
Loss Densities									
Wild older juvenile CS	0	0	0	0	0	0	0	↘	0.00
Wild steelhead	0	0	0	0	0	0	0	→	0.00
Exports									
SWP daily export	9,228	10,886	11,923	12,102	12,093	9,889	11,304	↘	11,061
CVP daily export	1,975	1,776	1,617	1,615	1,624	1,626	1,641	↘	1,696
SWP reduced counts	42%	0%	0%	0%	0%	0%	0%	↘	6%
CVP reduced counts	25%	17%	17%	33%	33%	0%	0%	↘	18%

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;

Category	Weekly Total			Season Total	
	Salvage	Loss	Trend	Salvage	Loss
Wild					
Winter Run	0	0	↘	48	83
Spring Run	0	0	→	0	0
Late Fall Run	0	0	→	6	26
Fall Run	0	0	→	0	0
Unclassified	0	0	→	24	NC
Total	0	0		78	110
Hatchery					
Winter Run	0	0	→	52	170
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	0	0		241	691

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	0	0	→	4	17
Hatchery	10	43	↘	42	182
Total	10	43		46	199

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 02/09/15-02/15/15.

²Salvage 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.

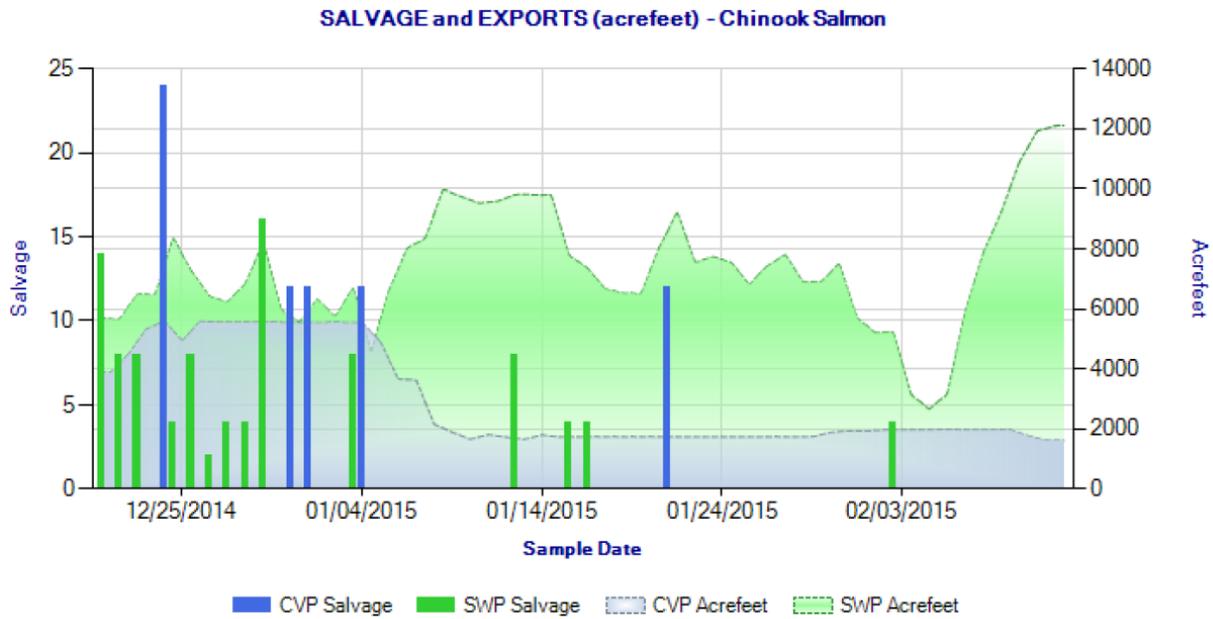


Figure 2. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during 12/21/14 through 02/12/15.

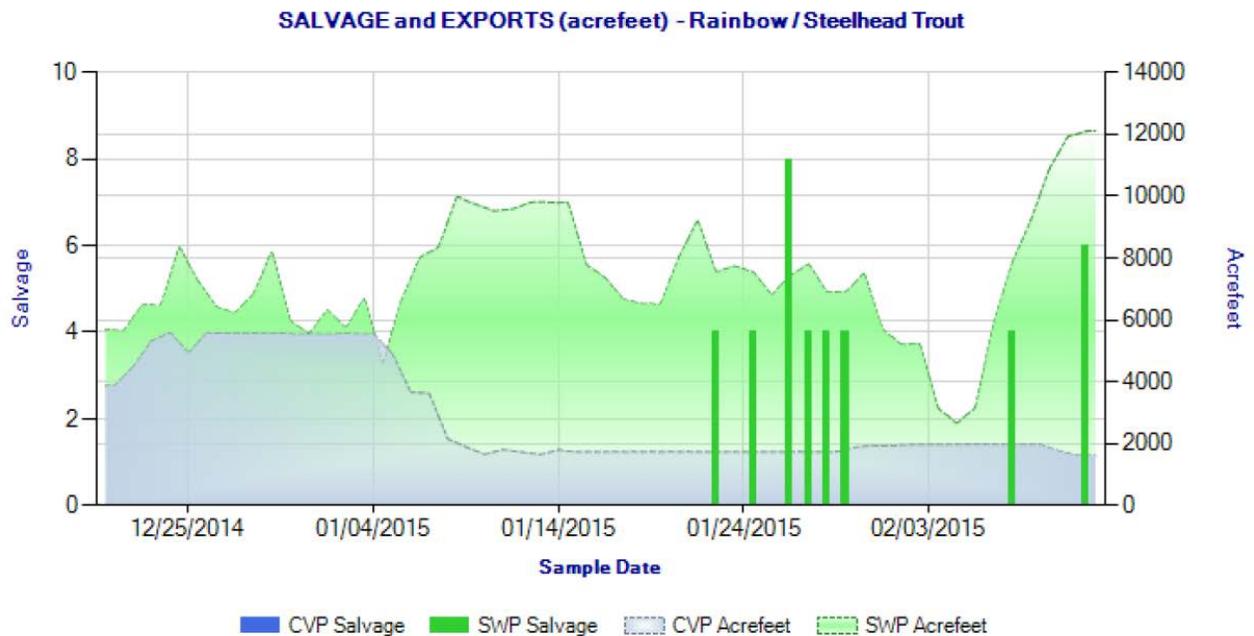


Figure 3. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during 12/21/14 through 02/12/15.

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 ²	% 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 ⁵
12/11/2014	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
12/24/2014	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	0.00	612,056	188500	0.000	0	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	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 2/16/2015.

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 2/17/2015

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

DOSS noted that there has been no green sturgeon salvaged to date for water year 2015, however, a green sturgeon with forklength 670mm was found dead in one of the holding tanks that was not sampled for salvage. The carcass was saved, and tissue samples taken, for potential necropsy and genetic analysis.

DOSS Estimates of Fish Distribution and Risk Assessment

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 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. Mossdale and Chippis Island Trawl data were not available during the call.

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chippis Island)
<i>Young-of-year (YOY) winter-run Chinook salmon (naturally produced)</i>	Few stragglers only (last week: Same)	> 95% (last week: same)	< 5% (last week: same)
<i>YOY winter-run Chinook salmon (hatchery-produced)</i>	~75% (last week: 95%)	~25% (last week: 5%)	0% (last week: 0%)
<i>YOY spring-run Chinook salmon</i>	5% - 20% (last week: < 25%)	80% - 95% (last week: >75%)	< 5% (last week: < 5%)
<i>Yearling spring-run Chinook salmon*</i>	Few stragglers only (last week: same)	75% - 85% (last week: same)	15% - 25% (last week: same)
<i>Hatchery Steelhead**</i>	10% - 20% (Includes all hatchery fish) (last week: 10% - 20% of CNFH steelhead)	80% - 90% (Includes all hatchery fish) (last week: 80% - 90% of CNFH steelhead)	Few to <5% (Includes all hatchery fish) (last week: ~5% of CNFH steelhead)
<i>Sacramento River steelhead (naturally-produced)</i>	Limited catch data; will review historical data for next week		
<i>San Joaquin River steelhead***</i>	~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 three hatchery releases are in the system (CNFH, Feather River Fish Hatchery, and Mokelumne Fish Hatchery).

***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 assessed the current risk of entrainment for YOY winter-run Chinook salmon. For both naturally-produced and hatchery-produced YOY winter-run currently in the Delta, DOSS estimated that an OMR index of -5,000 cfs has a medium risk of entrainment, and an OMR index of -6,250 cfs (which might occur during implementation of an OMR flex drought action) has a

high risk of entrainment. DOSS noted that the overall risk to listed salmonids depends on both OMR conditions and the fraction of the population vulnerable to OMR flows. For example, even if OMR flows remain constant, overall risk to winter-run Chinook will increase as more fish enter the Delta in the upcoming weeks (because a greater fraction of the population may be vulnerable to OMR flow conditions).

DOSS also noted that the temperature at Chipps Island between now and mid-March may influence migration behavior, but it is difficult to assess the extent to which temperature may affect migration behavior due to confounding factors (*i.e.*, flow, turbidity). DOSS thinks that migrating fish (more likely to be captured in trawls than seines) are more vulnerable to entrainment from more negative OMR flows than are rearing fish (more likely to be captured in seines than trawls; rearing fish may be assumed present based on recent high catches in all sampling and low exit rates past Chipps Island). Based on historical delta exit timing (could occur a bit earlier this year due to warming water temps), winter-run Chinook (hatchery and natural-origin) will likely be exiting the Delta over the next 2-4 weeks.

Agenda Item 6.

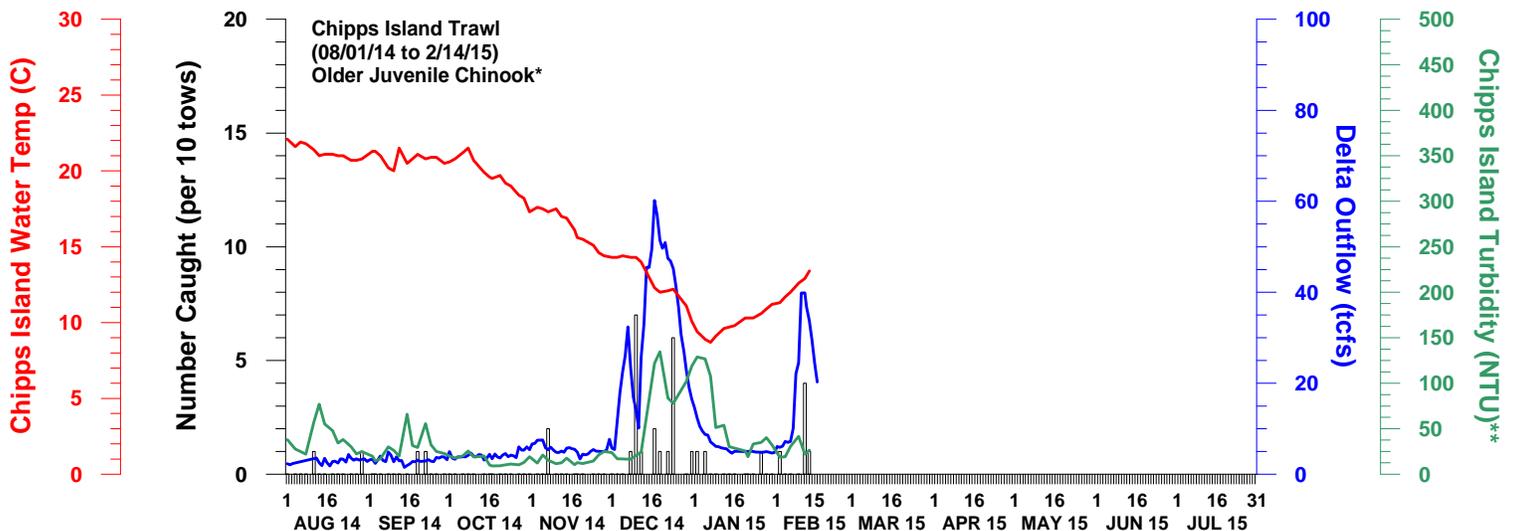
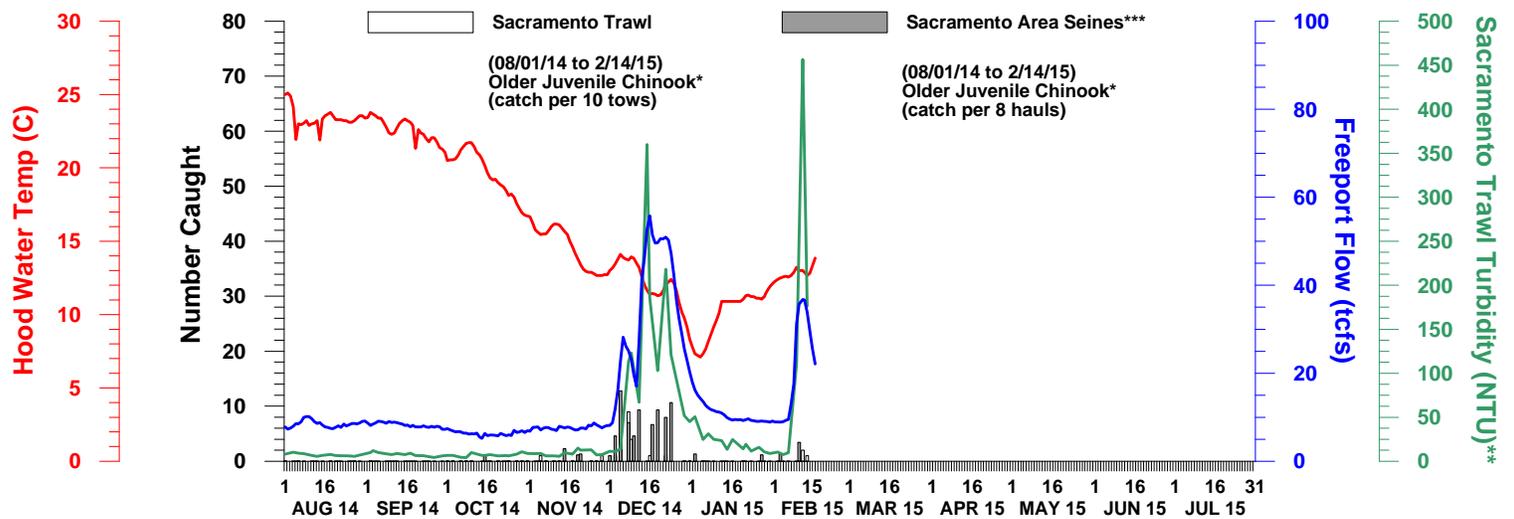
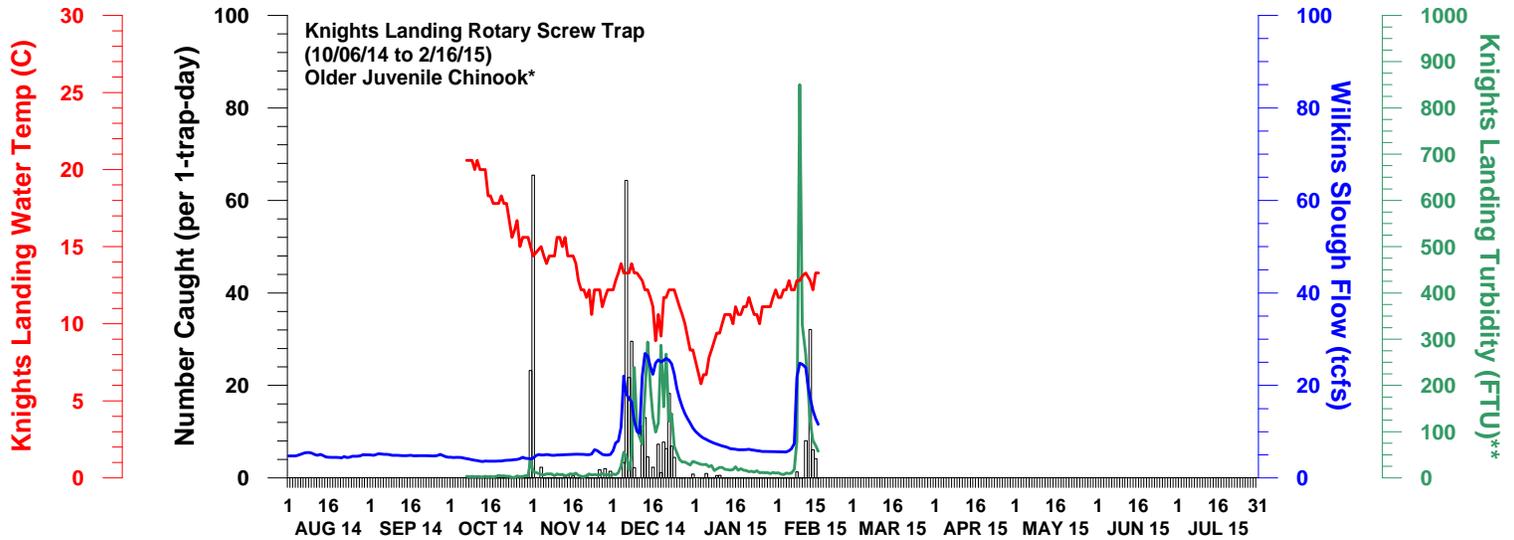
DOSS Advice to WOMT and NMFS: None.

Next Meeting: The next DOSS conference call will be on 02/24/15 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 LOWER SACRAMENTO RIVER AND CHIPPS ISLAND



DWR-DES 17 FEBRUARY 2015

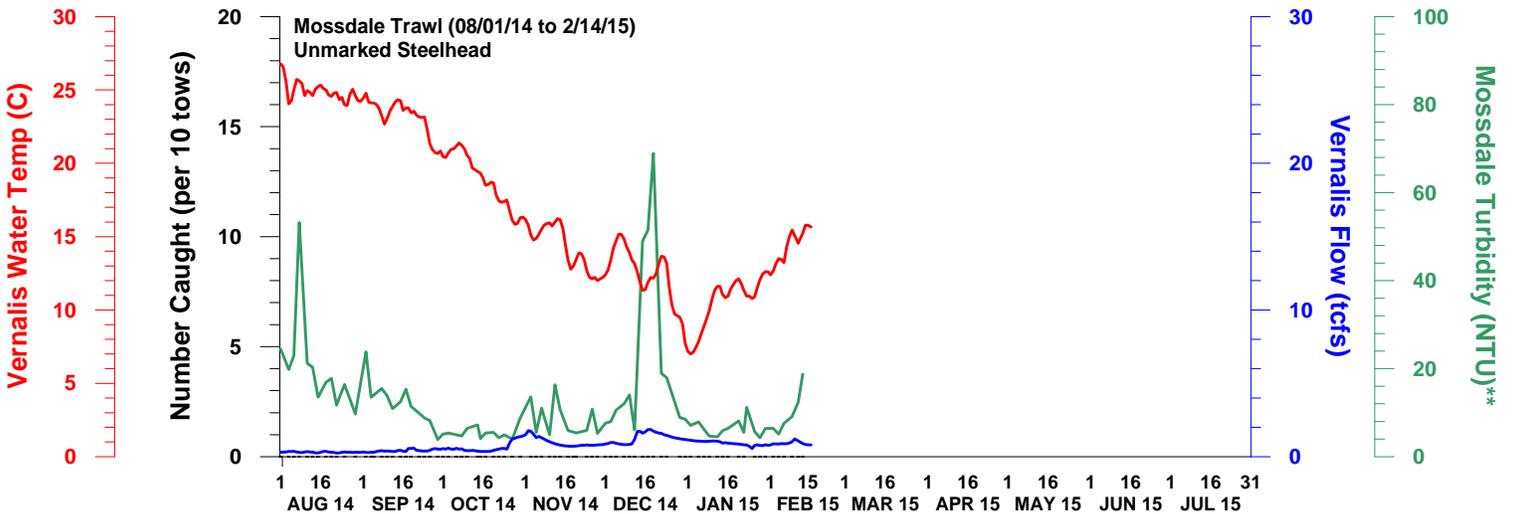
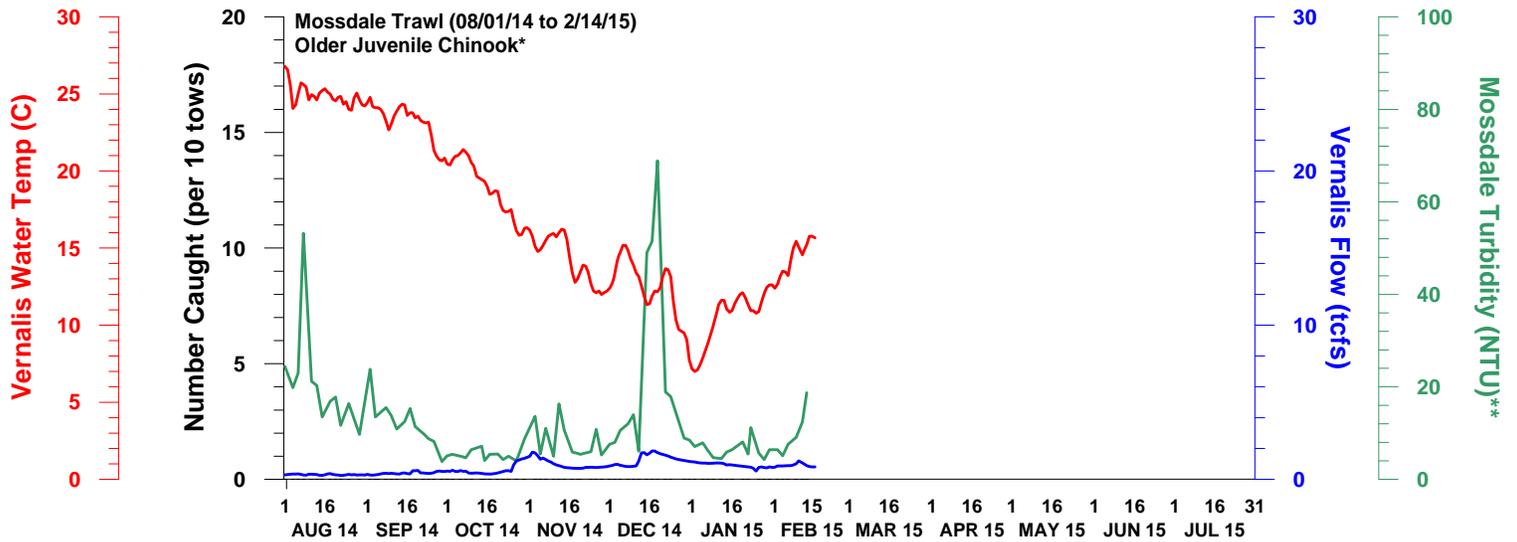
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*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

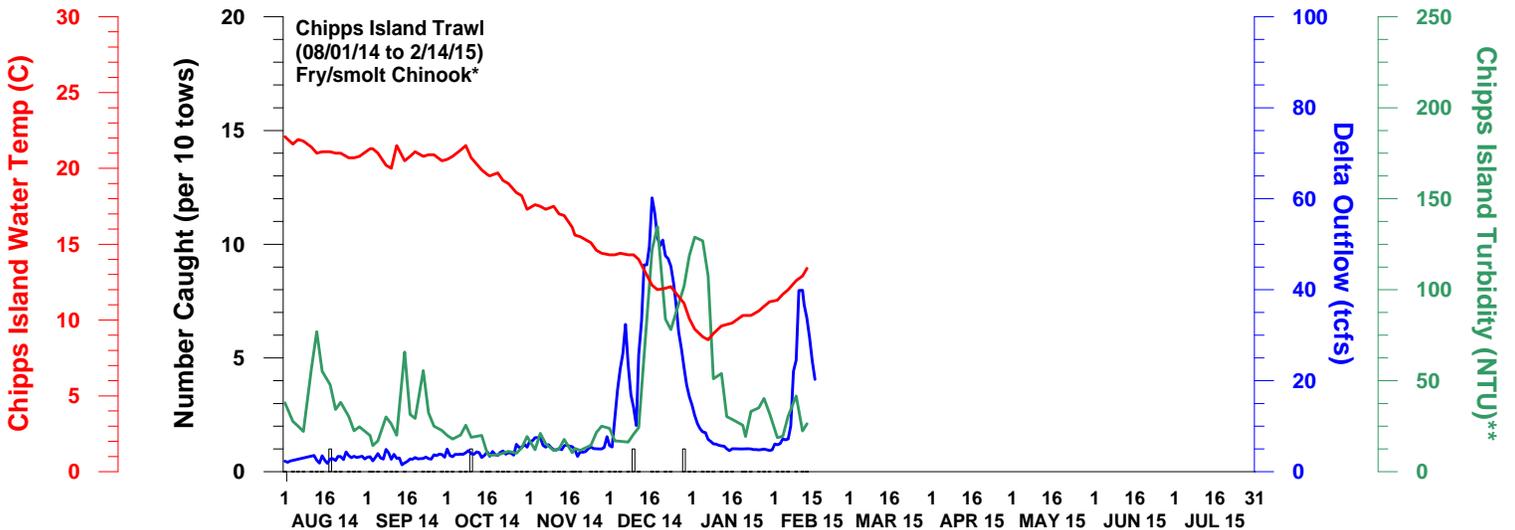
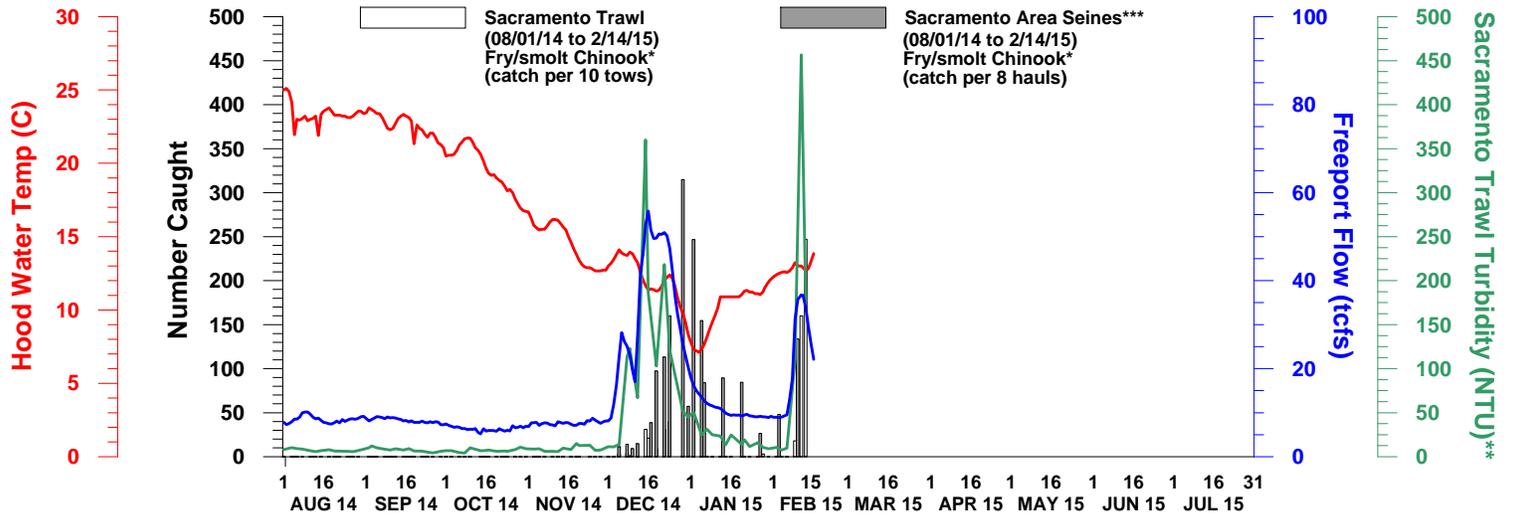
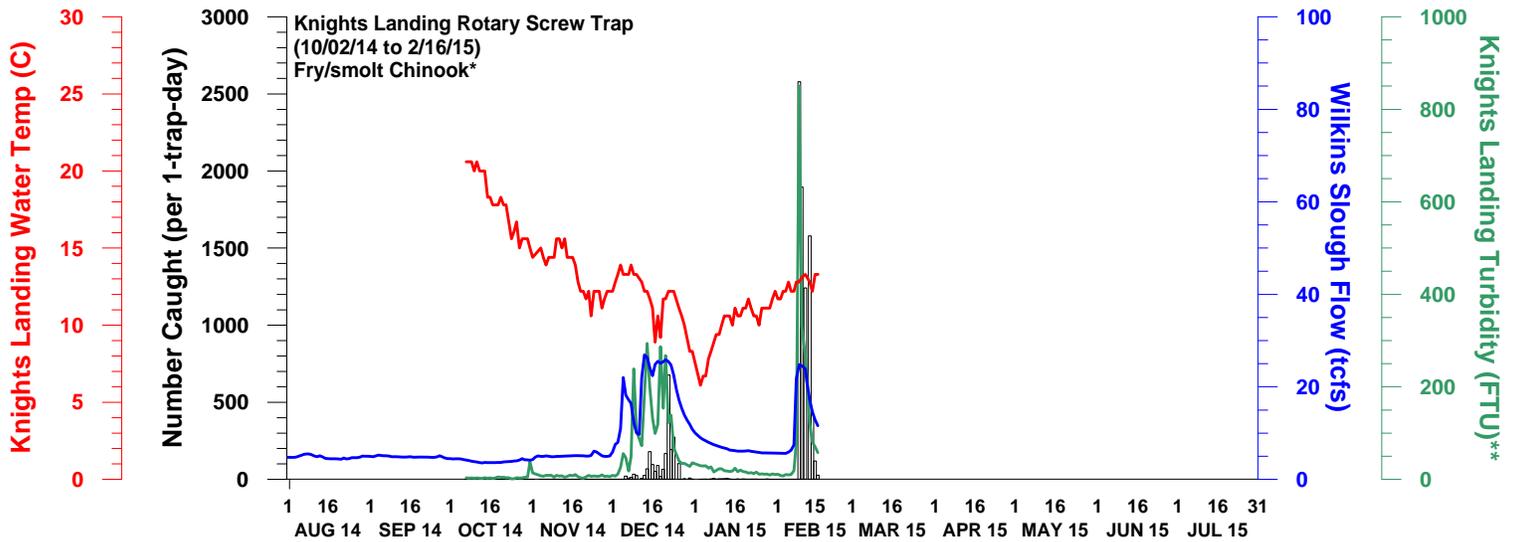


DWR-DES 17 FEBRUARY 2015
Preliminary data from FWS and CDEC; subject to revision.

*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 LOWER SACRAMENTO RIVER AND CHIPPS ISLAND



DWR-DES 17 FEBRUARY 2015

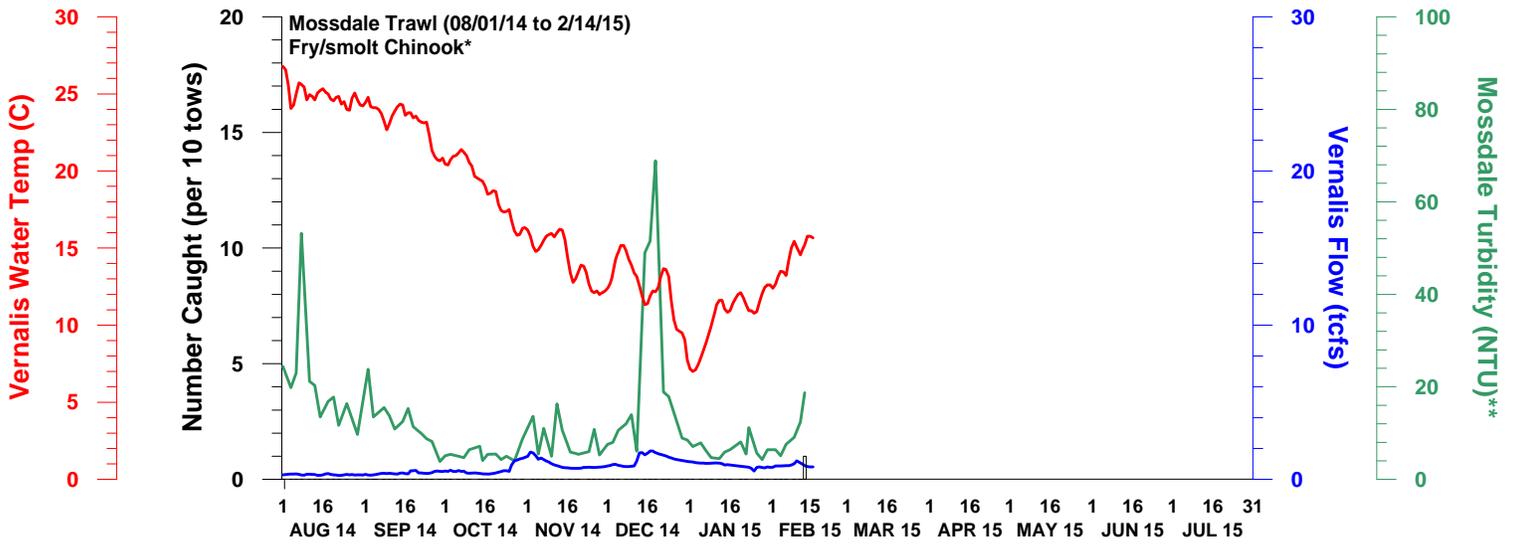
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*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 17 FEBRUARY 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.

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.

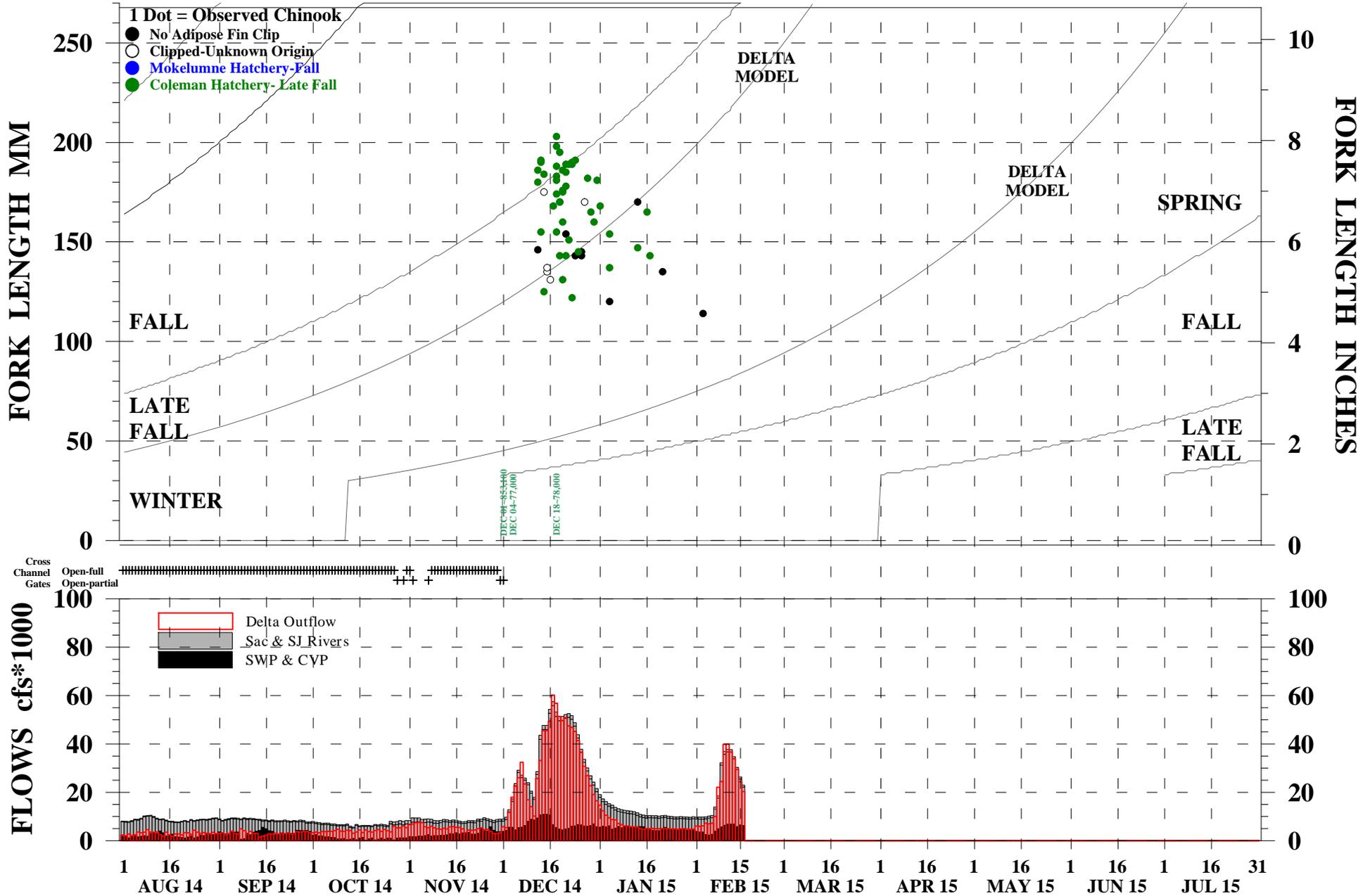
Sacramento River Trawl, Sacramento Area Beach Seine, and Chipps Island Trawl data were obtained directly from FWS, Stockton Fish and Wildlife Office (<http://www.fws.gov/stockton/ifmp/>).

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 2/16/2015



DWR-DES 17 FEB 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 16 FEBRUARY 2015

