

Delta Operations for Salmonids and Sturgeon (DOSS) Group

4/22/14

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.

Attendees

DWR: Mike Ford, Farida Islam, Aaron Miller, Kevin Reece, Dan Yamanaka

FWS: Leigh Bartoo, Craig Anderson

NMFS: Barbara Rocco, Barb Byrne

Reclamation: Josh Israel, Russ Yaworsky

DFW: Bob Fujimura, Krystal Acierto, Chris McKibbin

EPA: Erin Foresman

SWRCB: Scott Ligare

USGS: not present

Agenda

1. Agenda review and introductions
2. Fish Monitoring
3. Current Ops
4. SWG
5. DOSS Advice?

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

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

Location	Chippis Is. Midwater Trawl	Sacramento Trawls ¹	Mossdale Kodiak Trawl ²	GCID	Knights Landing RST ³	Tisdale RST	Beach Seines	Jersey Point
Sample Date	4/16, 18	4/16, 18	4/16–19	4/15–21	4/15–20	4/15–21	4/15–17	n/a
Total Catch	436	261		1,988	162	149	118	
FR	147	136	326 (not identified to race)	1,567	186	108	104	
WR				1				
SR	169	35		420	66	28		
LFR								
Ad-Clipped Chinook	118	89		297 (FR)	10	13	7	
DS							1 (70 mm)	
Splittail	1 (252 mm)						6 (20–27 mm)	

Longfin								
SH (ad-clip)		1						
SH (wild)	1 (208 mm)		2 (167 & 245 mm)					
W. Temp. (avg. °F)	63.0	69.3		67.7	69.1	67.2	68.0	
Flows (avg. cfs)					4766	4992		
Turbidity (avg. NTU)	45.0	9.2		4.63	10.5	13.4	18.3	
WR/LFR Avg. CPUE				13.8				
FR/SR Avg. CPUE					0.607	0.45		

CPUE = catch per unit of effort reported as the average fish/hour over reported sampling dates; AC=ad-clipped; ACT = acoustic tag; GCID = Glenn-Colusa Irrigation District; RST = rotary screw trap

¹Sacramento Trawls changed gear type from a Kodiak trawl arrangement to a midwater trawl arrangement on 4/3.

²Mossdale Trawls to be conducted by CDFW between 4/1 and 6/30.

³Night sampling effort on 4/17.

Knights Landing and Tisdale: Water temperatures at the Tisdale (~67°F) and Knights Landing (~69°F) rotary screw trap locations are approaching the thresholds at which handling stops (72°F) and sampling stops (74°F). Usually, water temperatures do not reach these levels until June. Because these temperature-concern thresholds often occur late in the migration season when few fish might be caught in the rotary screw traps, sometimes the crew staffing the traps can count the fish in the live box of the trap and estimate the length-at-date race classification without actually handling them. Water temperatures will be monitored during both morning and evening sampling to ensure that fish will not be handled if temperatures are too high.

Fish Salvage¹: DFW provided an update on fish salvage at CVP’s Tracy Fish Collection Facility (TFCF) and SWP’s Skinner Fish Collection Facility (SFCF) from 4/14 through 4/20. All salmonids were salvaged at TFCF; none were salvaged at SFCF. At 375 cfs inflow into Clifton Court Forebay, very few fish are being salvaged at SFCF. No wild steelhead were salvaged last week; the number of salvaged hatchery steelhead this week (8) decreased compared to the previous week (26). The season total loss of salvaged wild steelhead is still 254.

Salvage of non-clipped juvenile Chinook salmon in the spring-run and fall-run sizes markedly increased last week at TFCF. Four winter-run-sized non-clipped CS were salvaged on 4/14. The estimated daily combined loss density on 4/14 was 0.4 older juvenile fish/TAF and did not exceed the first stage loss criterion (8 fish/TAF).

Ninety-five non-clipped spring-run-sized and 60 fall-run-sized Chinook were salvaged. Four spring-run-sized ad-clipped Chinook were salvaged last week. No sturgeon have been observed this season.

On 4/18 at TFCF, there was 1 ad-clipped-run-sized Chinook (~87 mm) salvaged but the coded wire tag has not yet been read so the origin is currently unknown.

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

TFCF predator removal: After the previously reported predatory fish removal in the secondary channel using carbon dioxide on the morning of 4/11, TFCF staff initially coded the fish as collected during normal salvage operations. Late last week, DFW determined that the fish collected were taken experimentally and DFW has corrected the salvage and loss estimates for that event. DFW Stockton will be evaluating salvage records for similar scoring errors in the recent past.

DOSS Weekly Salvage Update
Reporting Period: April 14-20, 2014
 Prepared by Bob Fujimura on April 21, 2014 2200
 Preliminary Results -Subject to Revision

Criteria	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	Trend	
Loss Densities									
Wild older juvenile CS	0.40	0	0	0	0	0	0	↘	0.06
Wild steelhead	0	0	0	0	0	0	0	↘	0.00
Exports									
SWP daily export	744	753	744	744	744	744	744	↘	745
CVP daily export	6,546	2,934	4,937	1,958	3,377	3,960	3,954	↘	3,952

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)
 *Value includes the latest interpretation of a NMFS/USBR interim procedure to estimate loss due to secondary channel construction outage.

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	4	3	↘	192	338*
Spring Run	95	69	↘	374	267
Late Fall Run	0	0	↘	0	0
Fall Run	60	45	↘	92	66
Unclassified	0	0	↘	0	0
Total	159	117		658	671*
Hatchery					
Winter Run	0	0	↘	6	12
Spring Run	4	3	↘	12	8
Late Fall Run	0	0	↘	0	0
Fall Run	0	0	↘	0	0
Unclassified	0	0	↘	0	0
Total	4	3		18	20

Trend = weekly loss per race; Salvage = estimated number of fish collected by the CVP and SWP fish protective facilities per unit of time
 *Value includes the latest interpretation of a NMFS/USBR interim procedure to estimate loss due to secondary channel construction outage.

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	↘	174	254
Hatchery	8	5	↘	222	304
Total	8	5		396	558

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

Generated by Bob Fujimura on April 21, 2014



Figure 1. Daily salvage of Chinook salmon (all races) and water exports from the state and federal fish salvage facilities during March 9 through April 20, 2014. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>.

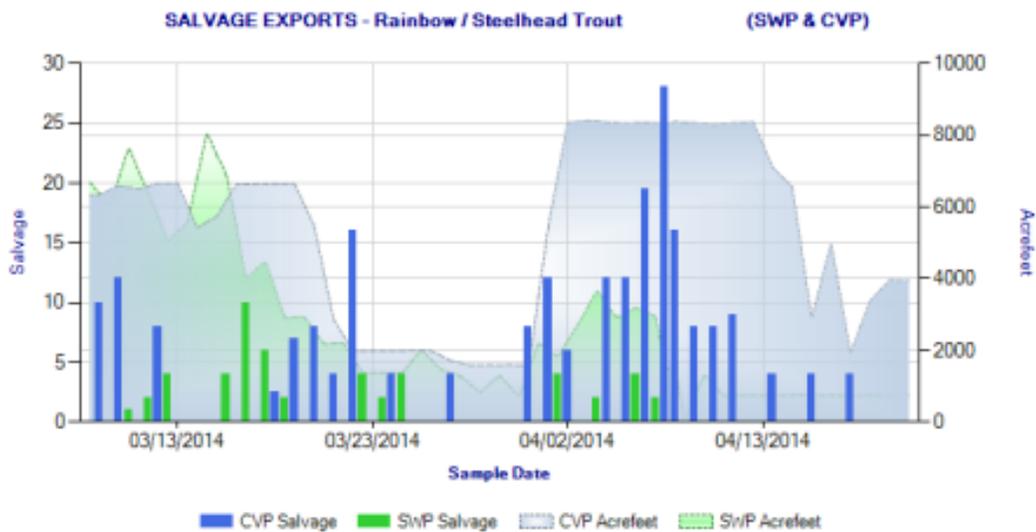


Figure 2. Daily salvage of steelhead and water exports from the state and federal fish salvage facilities during March 9 through April 20, 2014. Graph obtained from the DFG salvage monitoring web-page: <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

Chinook Salmon Releases: From 4/22 through 4/26, FWS will release 3.9 million fall Chinook salmon from the Coleman National Fish Hatchery into San Pablo Bay at Mare Island. The release will comprise 25% marked (ad-clipped and coded wire tagged) and 75% unmarked with an average size of 90 mm.

The table below provides information on the losses at the fish facilities of released and tagged hatchery Chinook.

CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2013/2014

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
11/1/2013	F	Mokelumne River Hatchery	Mokelumne River Hatchery	Production	8.90	99,553	n/a	0.009	n/a	n/a	n/a	3/20/2014	4/11/2014
12/10/2013	LF	Coleman NFH	Battle Creek	Production	0.00	267,301	n/a	0.000	n/a	n/a	n/a	*	*
1/7/2014	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	68,516	n/a	0.000	n/a	0.5%	1.0%	*	*
1/13/2014	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	81,962	n/a	0.000	n/a	0.5%	1.0%	*	*
1/13 to 1/14/2014	LF	Coleman NFH	Battle Creek	Production	2.88	464,300	n/a	0.001	n/a	n/a	n/a	3/7/2014	3/7/2014
1/23/2014	LF	Coleman NFH	Battle Creek	Spring Surrogate	0.00	73,600	n/a	0.000	n/a	0.5%	1.0%	*	*
2/10/2014	W	Livingston Stone NFH	Caldwell Park	Production	0.00	193,224	30,880	0.000	0.000	0.5%	1.0%	*	*
3/24 to 3/28/2014	F	Coleman NFH	Rio Vista net pens	Production	2.33	629,400	n/a	0.0004	n/a	n/a	n/a	4/4/2014	4/4/2014

UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2013/2014

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	0.00	3.01	2.33	0.00	0
TOTAL	0.00	3.01	2.33	0.00	0

SWP and CVP adipose-fin clipped Chinook lost from 10/1/2013 through 4/20/2014.

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 accidentally 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.

** Information not yet available.

DWR-DES Revised 4/21/2014

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

Update on Genetic Analysis of Salvaged Winter-Run-Sized Chinook: For the 47 samples collected through 4/3, genetic analysis confirmed a combined total of 12 winter-run Chinook observed (unexpanded salvage; *i.e.*, number of fish handled) at the fish collection facilities, which represent an expanded salvage of 46 winter run and a combined loss of 48.5.

Facility	Unexpanded salvage of winter-run-sized Chinook (number of winter-run-sized fish handled and run through genetic analysis)	Confirmed unexpanded salvage of genetic winter-run Chinook (number of handled winter-run-sized fish that have a winter-run genotype)
SFCF (SWP)	18	1*
TFCF (CVP)	29	11**

*109 mm, observed on 3/11.

**Samples for genetic analysis were collected from 29 fish at TFCF, but four samples need to be rerun. All of these samples were collected from winter-run-sized fish >200 mm. Because all other winter-run-sized fish >200 mm had fall-run genetics, it is predicted that these four samples are likely to be genetic fall-run as well.

Fish Distribution: Based on the information provided in the monitoring reports, DOSS agreed that the yearling and young-of-year (YOY) spring-run estimates have not changed over the last week, but updated the estimated distribution of YOY winter run.

	Yet to Enter Delta	In the Delta	Exited the Delta Past Chipps Island
<i>Young-of-year (YOY) winter-run Chinook salmon</i>	<5% (same as last week)	<25% (last week: ~20–50%)	>75% (last week: ~50–75%)
<i>Yearling spring-run Chinook salmon</i>	Most yearling spring run have most likely exited the Delta.		
<i>YOY spring-run Chinook salmon</i>	~15–30% (same as last week)	~40–75% (same as last week)	~5–25%* (same as last week)

*DOSS believes that many of spring-run-sized Chinook in the monitoring data are from the millions of fall-run hatchery fish in the system—hatchery releases of fall run (25% ad-clipped and with coded wire tags, 75% unmarked) have occurred at Rio Vista and in Battle Creek. Estimates of the YOY spring-run Chinook distribution take this “spillover” into consideration. For example, the range estimated for the fraction of the YOY spring-run population having passed Chipps Island is lower than it would have been had DOSS believed that all spring-run-sized fish reported at Chipps were actually genetic spring run; however, because DOSS cannot “correct” for the hatchery fish spillover effect exactly, the ranges for the YOY spring-run distribution are rather wide.

Operations (4/22/14)

SWP		CVP	
Exports (cfs)			
Clifton Court Forebay	500 (possibly reduced on 4/23 depending on Vernalis flows)	Jones Pumping Plant	2,400
Reservoir Releases (cfs)			
Feather - Oroville	800	American - Nimbus	1,500 (will remain through 4/24 and then be decreased to 800 cfs by the morning of 4/25)
		Sacramento - Keswick	4,250
		Stanislaus - Goodwin	2,500
Reservoir Storage (in TAF, % of capacity)			
San Luis (SWP)	394	San Luis (CVP)	557
Oroville	1,859	Shasta	2,405
New Melones		Folsom	532
Delta Operations			
DCC	Closed (expected to remain closed through end of April)	Sacramento River at Freeport (cfs)	6,346
Outflow Index (cfs)	~4,800	San Joaquin River (cfs) at Vernalis	2,896
Total Delta Inflow (cfs)	~9,867	OMR (daily) (cfs)	
Water Temperature (°F)		OMR 5-day avg (cfs index method)	-2,700
X2 (km)	>81.0	OMR 14-day avg (cfs, index method)	-3,700
E/I (%)	25.2 (14-d avg)		

OMR Index vs Gage Measurements: NMFS again asked for a comparison of OMR gage data with the OMR index values for the same period, as expected as part of the OMR index demonstration project². Reclamation agreed to look at this and report to DOSS next week.

Controlling Operations: The 1:1 I/E ratio is controlling exports. The revised TUCP order³ issued on 4/18 permitted exports “up to 100 percent of the 3-day running average of San Joaquin River flows at Vernalis or 1,500 cfs, whichever is greater” even if Collinsville is not being met. I/E is controlling because of the revised TUCP order.

Drought Barriers: Last week, DWR announced that precipitation from the recent storms eliminates the current need for rock barriers to be constructed in the Delta to prevent saltwater intrusion. DWR will closely monitor key water quality and storage capacity data to determine whether barriers are needed later in the year.

6-Year Steelhead Study: Israel (Reclamation) reported last week on the scheduled tagging and release of Mokelumne River Hatchery steelhead at Durham Ferry on 4/24. He invited DOSS members to observe the activities. There will be another opportunity to observe the tagging and release that is scheduled for the third week in May.

Spring-Run Releases: Next week, Erin Strange from the NMFS San Joaquin River Branch will provide a short update on the spring-run Chinook releases on the San Joaquin.

RPA Actions:

- IV.1.2 (DCC gate operations): DCC gates are closed. The gates are expected to remain closed at least through April.
- IV.2.1 (I:E ratio): Being implemented per Drought Operations Plan (see A.1 on p. 18): <http://www.ca.gov/Drought/2014-Operations-Plan.pdf>. Because we are currently in the SJR pulse period, the 1:1 I:E ratio is being implemented.
- IV.2.3 (OMR flow management): Unless a loss density trigger is exceeded (which would require a less negative OMR flow limit), OMR flow shall be no more negative than - 5,000 cfs, as measured on a 14-day average using the index method. OMR data are available on the Reclamation CVO website: <https://www.usbr.gov/mp/cvo/index.html>.

Smelt Working Group (SWG): SWG met on 4/21. Bartoo (FWS) reported that based on current operations and OMR levels, SWG concluded that there was no need to change the planned operations for the protection of delta smelt or longfin smelt. Previous SWG meeting notes are available at: http://www.fws.gov/sfbaydelta/cvp-swp/smelt_working_group.cfm.

DOSS Advice to WOMT and NMFS: None.

Next Meeting: The next scheduled conference call will be on 4/29 at 9:00 a.m.

²http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/nmfs_response_to_reclamation_s_omr_index_demonstration_project_-_february_27__2014.pdf

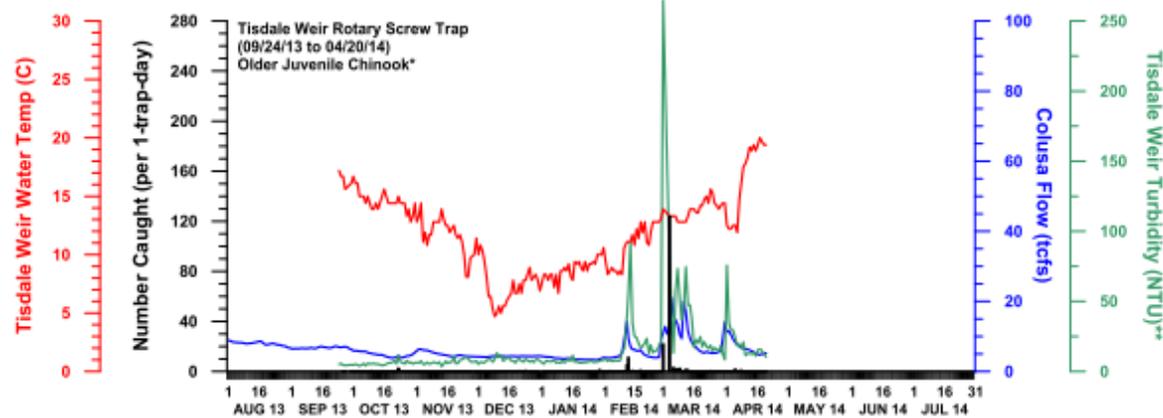
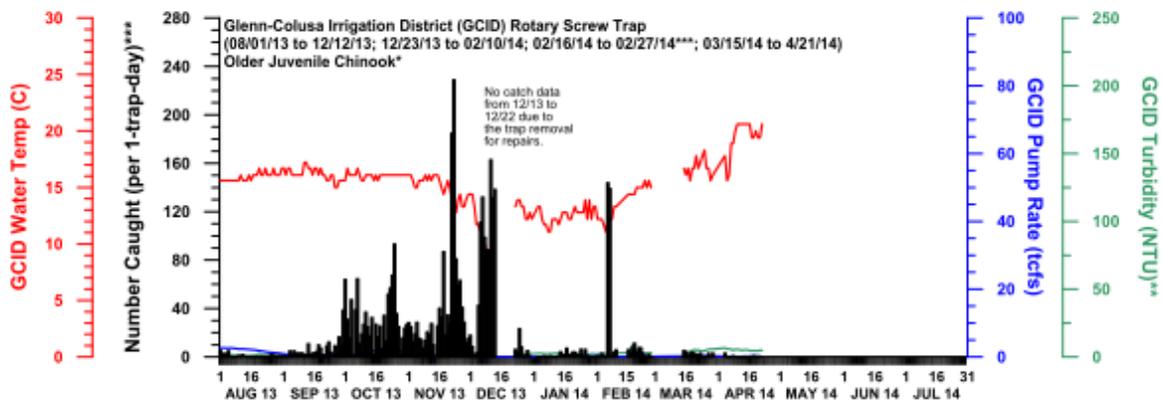
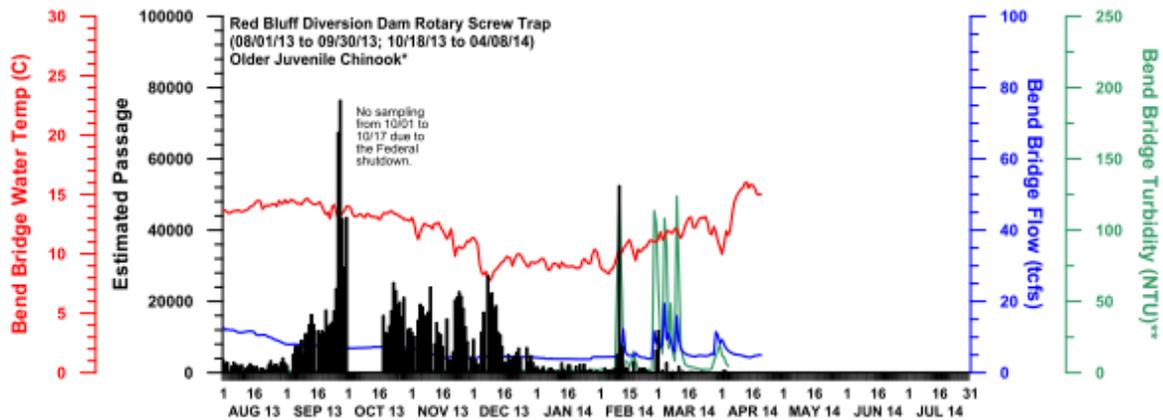
³http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/docs/tucp/20140418_revised_tucp_order.pdf



Happy Earth
Day!

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

NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER



DWR-DES 21 APRIL 2014

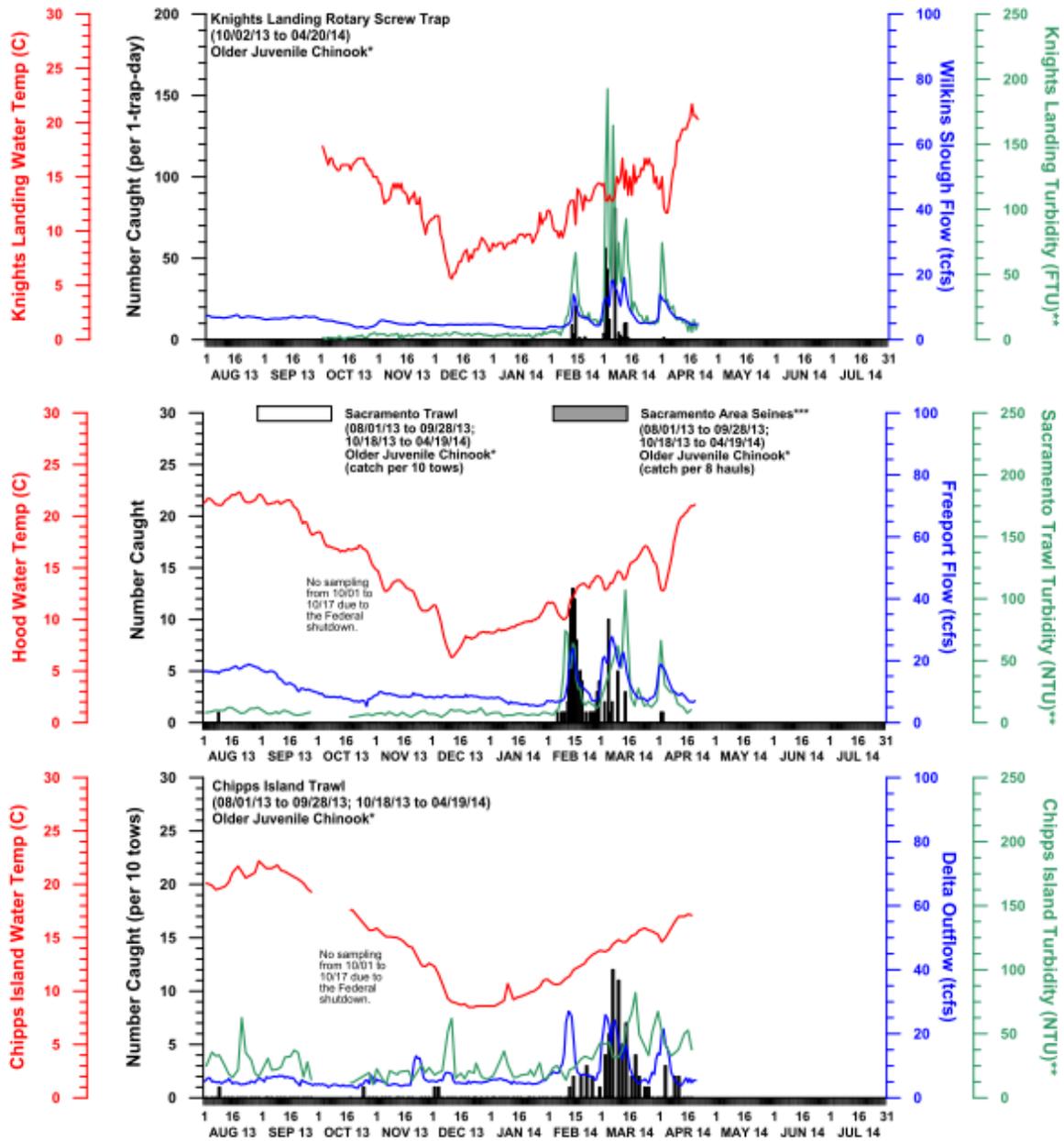
Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.

*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.

***No catch data at GCID from 2/28 to 3/14 since trap cone was raised due to high flow and debris.

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



DWR-DES 21 APRIL 2014

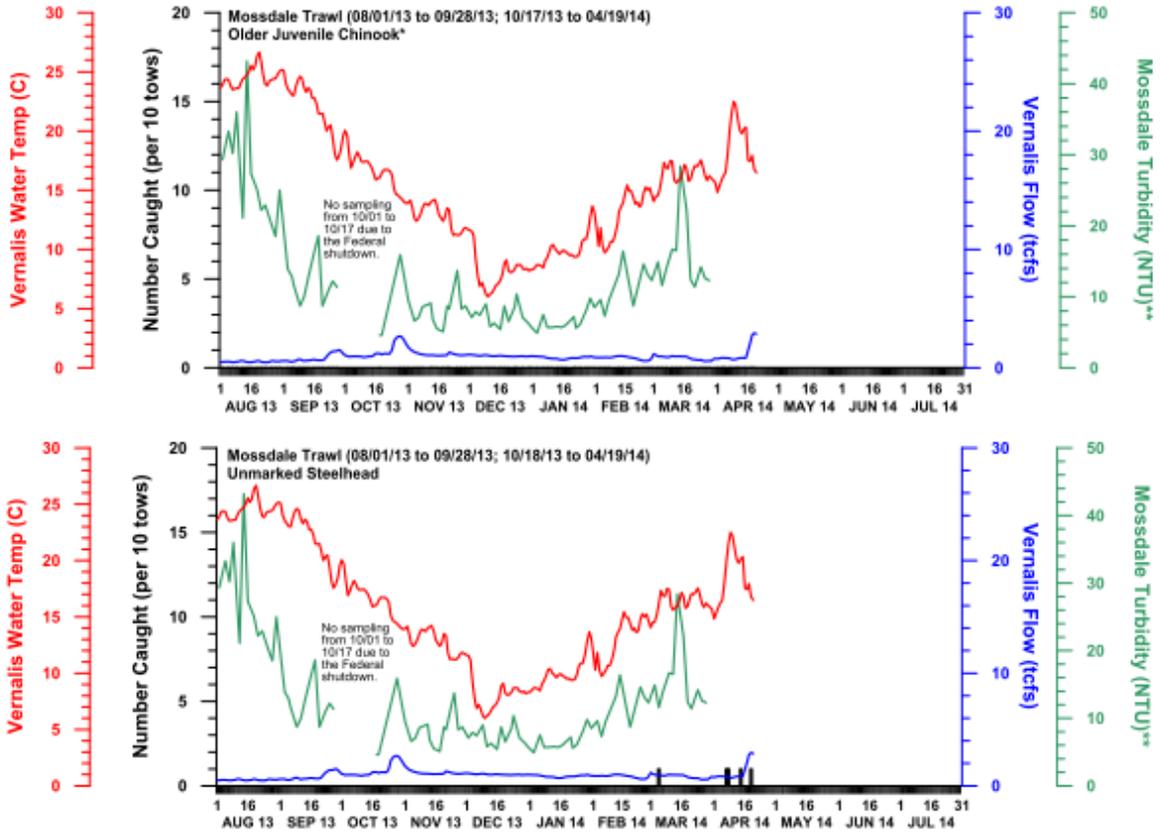
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*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



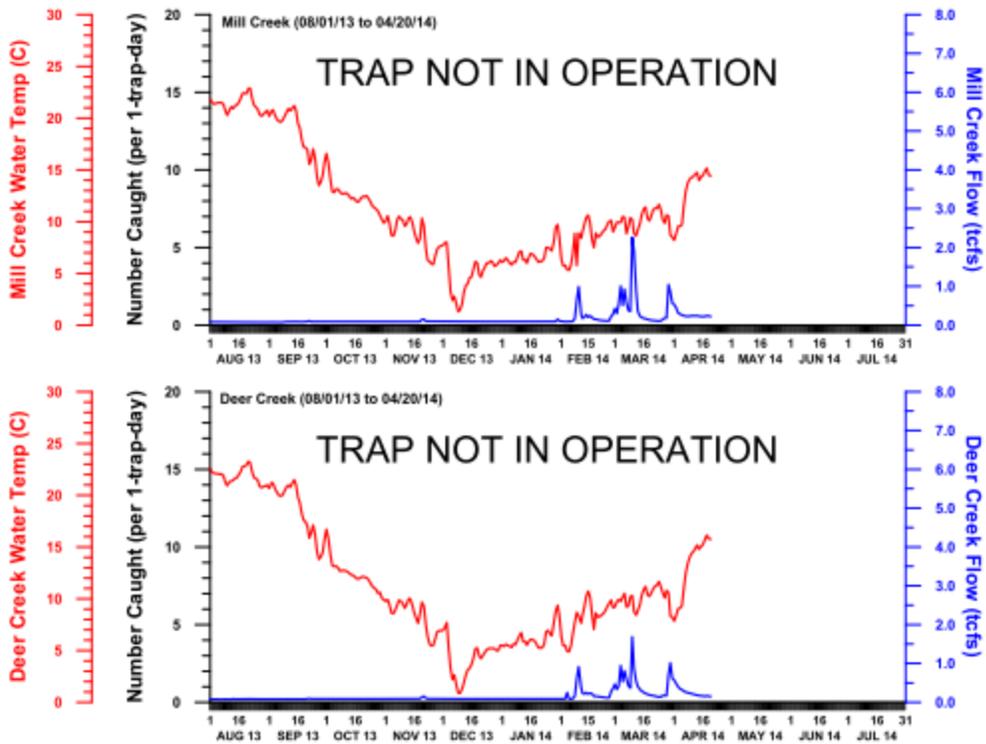
DWR-DES 21 APRIL 2014

Preliminary data from FWS and CDEC; subject to revision.

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

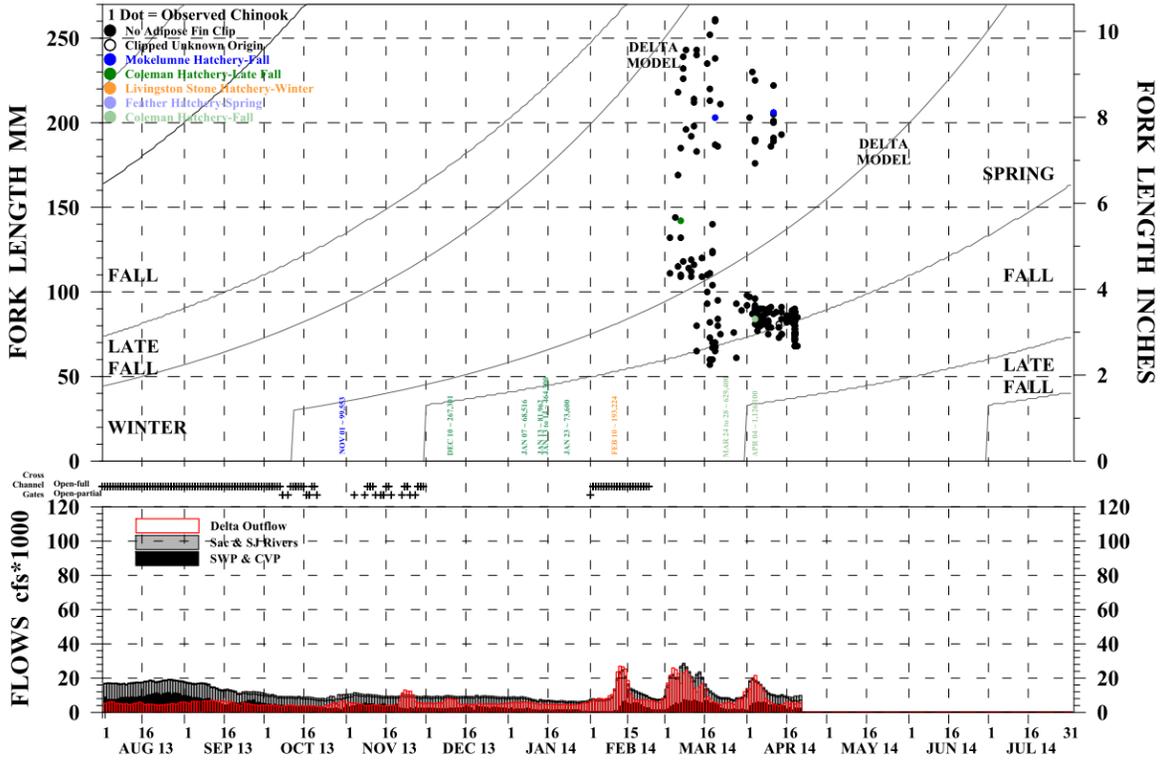
**Turbidity is a discrete measurement and is not measured continuously. Therefore, data are interpolated on days when turbidity was not measured unless data are missing for more than five days.

WATER TEMPERATURE AND FLOW MEASURED AT MILL AND DEER CREEK



DWR-DES 21 APRIL 2014
Preliminary data from CDEC; subject to revision.

OBSERVED CHINOOK SALVAGE AT THE SWP & CVP DELTA FISH FACILITIES 08/01/2013 THROUGH 04/20/2014



DWR-DES 21 APRIL 2014
 Preliminary data from DFW, DWR, FWS, Reclamation, and CDEC; subject to revision.
 *Chinook outside of the length-at-date criteria (Delta model) are not reported.