

Delta Operations for Salmonids and Sturgeon (DOSS) Group
Conference call: 11/12/2014 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: Aaron Miller, Kevin Reece, Farida Islam, Jim Edwards, Mike Ford, Reza Shahcheraghi
Reclamation: Josh Israel, Michele Palmer
NMFS: Barb Byrne, Meiling Roddam
CDFW: Ken Kundargi, Duane Linander, Bob Fujimura, Colin Purdy
SWRCB: Matt Holland

Agenda Items

1. Agenda review and introductions
2. Fish Monitoring & Estimate of fish distribution
3. Current Operations
4. Sampling Effort at Fish Collection Facilities
5. Brief overview of annual review and initial panel feedback
6. RPA Implementation review and DOSS Advice

Agenda Item 2.

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 | Mossdale Kodiak Trawl | GCID RST* | Knights Landing RST** | Tisdale RST** | Beach Seines |
|---------------------------|----------------------------|-------------------|-----------------------|------------------------|-----------------------|---------------|--------------|
| Sample Date | 11/3- 11/7 | 11/3- 11/7 | 11/3- 11/7 | 11/5-11/11 | 11/4- 11/09 | 11/3- 11/10 | 11/3- 11/7 |
| Total Catch | 2 (123mm-131mm) | 1 (67mm) | 0 | 59 (42mm-156mm) | 0 | 3 | 0 |
| FR Chinook | | | | 3 | | | |
| WR Chinook | | 1 | | 47 | | 2 (54mm-55mm) | |
| SR Chinook | | | | 1 | | | |
| LFR Chinook | 2 | | | 8 | | | |
| Ad-Clipped Chinook | | | | | | | |
| Delta Smelt | | | | | | | |
| Splittail | | | | | | | |

| | | | | | | | |
|-----------------------------|------|------|------|------|-------|-------|--|
| Longfin | | | | | | | |
| Steelhead (ad-clip) | | | | | | 1 | |
| Steelhead (wild) | | | | | | | |
| Green Sturgeon | | | | | | | |
| W. Temp. (avg. °F) | 63.5 | 59.3 | 59.7 | 58.7 | 58 | 58.5 | |
| Flows (avg. cfs) | | | | 859 | 4,960 | 4,932 | |
| Turbidity (avg. NTU) | 16.2 | 7.9 | 10.0 | 7.0 | 7.5 | 10.2 | |

*GCID catch reported on the DOSS call was for 11/11 only.

**

For both KL and Tisdale, sample dates 11/4-11/10, the “half cone” sampling method was used in which one of the two perforated walls of the RST cone was removed and entry into the live well from the back of the cone was partially blocked. Rotation speed was normal.

Red Bluff Diversion Dam (RBDD)

USFWS biweekly report (October 22, 2014- November 4, 2014) for preliminary estimates of passage by brood-year and run for unmarked juvenile Chinook salmon captured by rotary screw traps at RBDD included:

- Winter run Chinook salmon biweekly total: 42, 648
- Winter run Chinook salmon brood year 2014 total: 322,600

Salvage

From 11/3 to 11/9, no listed species have been salvaged at the SWP or CVP fish collection facilities.

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. No spikes in fish catch, flow, or turbidity were observed over the past week, so the estimated distribution of winter-run is the same as that estimated last week (not included in last week’s notes, but captured in this week’s table). Because yearling spring-run Chinook salmon may have migrated from Sacramento tributaries during the turbidity event observed in late October (which was associated with flow increases on Deer Creek and Mill Creek, tributaries to the Sacramento), this life-history was added to the table, though no specific population fraction was estimated.

Of the 75% of winter-run Chinook estimated upstream of the Delta, DOSS further estimated that approximately 1/3 (25% overall) of winter run Chinook salmon are currently distributed above Red Bluff Diversion Dam (RBDD), and approximately 2/3 (50% overall) of winter-run Chinook salmon are between RBDD and Knights Landing. This estimated distribution is based in part on an assumption that the low RBDD passage is indicative of high mortality upstream of RBDD.

| 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> | ~75% (last week: same) | ~25% (last week: same) | 0% (last week: same) |

| | |
|---|---|
| <i>Yearling spring-run Chinook salmon</i> | Some fraction may have moved during the turbidity event in late October.* |
|---|---|

* No yearling spring-run Chinook salmon have been observed in monitoring, but few are usually observed because of their relatively large size and strong swimming (and associated gear avoidance) abilities.

Agenda Item 3.

Current Operations (11/12/2014)

| SWP | | CVP | |
|-----------------------------------|-------|-------------------------------------|---------------------|
| Exports (cfs) | | | |
| Clifton Court Forebay | 1300 | Jones Pumping Plant | 800 |
| Reservoir Releases (cfs) | | | |
| Feather - Oroville | 950 | American - Nimbus | 1050 |
| | | Sacramento - Keswick | 4500 |
| | | Stanislaus - Goodwin | 200 |
| Reservoir Storage (in TAF) | | | |
| San Luis (SWP) | 212 | San Luis (CVP) | 192 |
| Oroville | 915 | Shasta | 1,079 |
| New Melones | 502 | Folsom | 291 |
| Delta Operations | | | |
| DCC | Open | Sacramento River at Freeport (cfs) | ~7,000 |
| Outflow Index (cfs) | 4,600 | San Joaquin River at Vernalis (cfs) | ~940 |
| Total Delta Inflow (cfs) | 8,449 | E:I | 24% (three day Avg) |
| X2 (km) | > 81 | | |

Participants on the call were interested in the status of the 31-day Vernalis fall pulse flow, as modified in the 10/7/14 SWRCB order¹; Byrne (NMFS) will ask R. Yaworsky (Reclamation) to provide an update to DOSS next week.

Water quality management is currently controlling export operations.

Agenda Item 4.

Sampling Effort at Fish Collection Facilities

Assignment given to DOSS by NMFS:

Monitoring Salvage at Tracy Fish Collection Facility (CVP) and Skinner Fish Facility (SWP)

The Delta Operations for Salmon and Sturgeon (DOSS) technical advisory team will convene (a subgroup) to consider and make a recommendation on whether fish salvage counts at the Tracy Fish Collection Facility and Skinner Fish Facility should be increased to a minimum 60 minutes for every 2 hours of operational time during drought years.

¹ Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp.shtml

NMFS' BiOp, RPA Action IV.4.3(1) requires sampling at the fish facilities for fish salvage counts no less than 30 minutes every 2 hours (25 percent of operational time). However, during drought years, juvenile survival throughout their freshwater life history stages is expected to decrease. Likewise, salvage of salmonids at the fish facilities may also decrease, and the 30-minute salvage counts may introduce inadvertent errors in expanded salvage (*e.g.*, fish may be salvaged during operations, but not during the 30-minute counts, therefore, underestimating expanded salvage and loss. Conversely, a single fish salvaged during the 30-minute count when there is no other salvage for the rest of the 2-hour time period may overestimate expanded salvage and loss.). During the discussions and associated recommendations, the DOSS technical advisory team should:

- document potential benefits/pros (*e.g.*, more accurate quantification of expanded salvage and loss) or cons (*e.g.*, potential increase in incidental take and mortality) of increased sample time at the fish facilities;
- consider/propose the timing to initiate, and the duration of, the 60-minute counts, if appropriate; and
- consider the Federal and State fish facilities implementing a test to determine whether the additional 30 minutes of sampling would significantly improve daily salvage or loss estimates.

Initial Advantages and Disadvantages discussed by DOSS:

Several DOSS participants asked for more information about the specific management objectives or performance metrics of this proposal. Byrne (NMFS) reported that her understanding was that the suggested change to salvage sampling was intended to improve confidence in the daily loss densities used for OMR management in January through mid-June, and that unless she reported otherwise, DOSS should consider the proposal in that context.

Advantages:

- Increasing the count time to 50% of the export period will reduce the un-sampled salvage period and the uncertainty of the salvage estimate is presumed to be decreased since the salvage expansion factor is smaller.
- The salvage expansion factor associated with observing listed species in samples will be reduced similarly.

Disadvantages:

- Regulatory triggers or metrics such annual, seasonal, or daily loss densities will remain unchanged and many of the uncertainties associated with loss estimation (*e.g.*, lower efficiencies, pre-screen loss) are not addressed by this action.
- Increased labor required to collect, process (including special length measurement, marked fish, DNA, CWT, larval fish, sexual maturation, etc. sampling), and report samples. During times when operators have limited time between counts (heavy debris, incidental fish loads, and fish transport hauls) the extra labor demands may compromise the accuracy of the counts.
- Direct lethal take of adipose-fin clipped Chinook salmon, delta, and longfin smelt for CWT recovery or mandated fish identification QC or sexual maturation will also increase with increased sampling time. Will increase known loss reporting bias with adipose-fin clipped Chinook salmon

- Acute mortality and injury associated with count collection and handling will increase with all fish species.
- Increased count times can increase extreme debris or incidental fish numbers and likely triggered reduced count times during these conditions.

Other:

- Some of the logistical disadvantages (e.g. labor, some handling stress) might be less significant if the processing (enumeration, length measurement, etc.) of salvaged fish beyond the 25% sampling time is limited to salmonids only.
- There was general consensus that because of the lower pre-screen loss expansion factor, and steadier operations (steady inflow into facility from delta vs. sporadic radial gate operations at the SWP) at the CVP facility, daily loss densities might be less uncertain if most export was shifted to the CVP. Operators noted that the logistics of preferential CVP pumping were a significant challenge.

Agenda Item 5.

Brief overview of annual review and initial panel feedback

Did not have time to discuss this agenda item during the DOSS call. Byrne (NMFS) instead provided the link to the Annual Review presentations to DOSS after the call::

<http://deltacouncil.ca.gov/science-program/2014-long-term-operations-biological-opinions-annual-science-review-review-materials>

Agenda Item 6.

Delta RPA Actions in effect during November:

Action IV.1.1 (Alerts that indicate the Delta Cross Channel (DCC) gate operations may be triggered soon):²

- Recent (11/04/14-11/11/14) conditions for:
 - Wilkins Slough flow: 4,913-5,079 cfs (range of mean daily flow at WLK CDEC station)
 - Knights Landing temperature: 58-60°F (range of temperatures reported at the rotary screw traps during trap checks)

² For details, see pages 60-61 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

- Mill Creek and Deer Creek flows [highlighted cells exceed the first component (95 cfs flow threshold) or second component (>50% flow change) in first alert]:

| Date | Mill Creek (MLM) | | Deer Creek (DCV) | |
|------------|------------------|-------------------------------|------------------|-------------------------------|
| | mean daily flow | % increase in mean daily flow | mean daily flow | % increase in mean daily flow |
| 11/3/2014 | 100 | -- | 80 | -- |
| 11/4/2014 | 97 | -3.0% | 78 | -2.6% |
| 11/5/2014 | 96 | -1.0% | 77 | -1.0% |
| 11/6/2014 | 95 | -1.0% | 76 | -0.7% |
| 11/7/2014 | 95 | 0.0% | 75 | -1.0% |
| 11/8/2014 | 95 | 0.0% | 76 | 0.2% |
| 11/9/2014 | 93 | -2.1% | 75 | -0.3% |
| 11/10/2014 | 93 | 0.0% | 76 | 0.9% |
| 11/11/2014 | 93 | 0.0% | 76 | 0.3% |

- The first alert has been triggered based on Mill Creek flows >95 cfs from 11/4/14-11/5/14.
- The second alert (based on Wilkins Slough flows and Knights Landing temperatures was not triggered over the past week

Action IV.1.2³ (DCC gate operations):

- DCC operations are currently governed by the criteria table for Oct 1 - Nov 15 in Attachment G of the Drought Operations Plan⁴.
- No catch triggers that would require DCC gate closure have been exceeded over the past week.
- DCC gates are open.

Action IV.3⁴ (Reduce likelihood of entrainment or salvage at the export facilities, including alert that indicates that export operations may be need be altered)

- Third alert has not been triggered.
- No salvage-based triggers that would require export reduction have been exceeded over the past week.

DOSS Advice to WOMT and NMFS: None.

³ 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

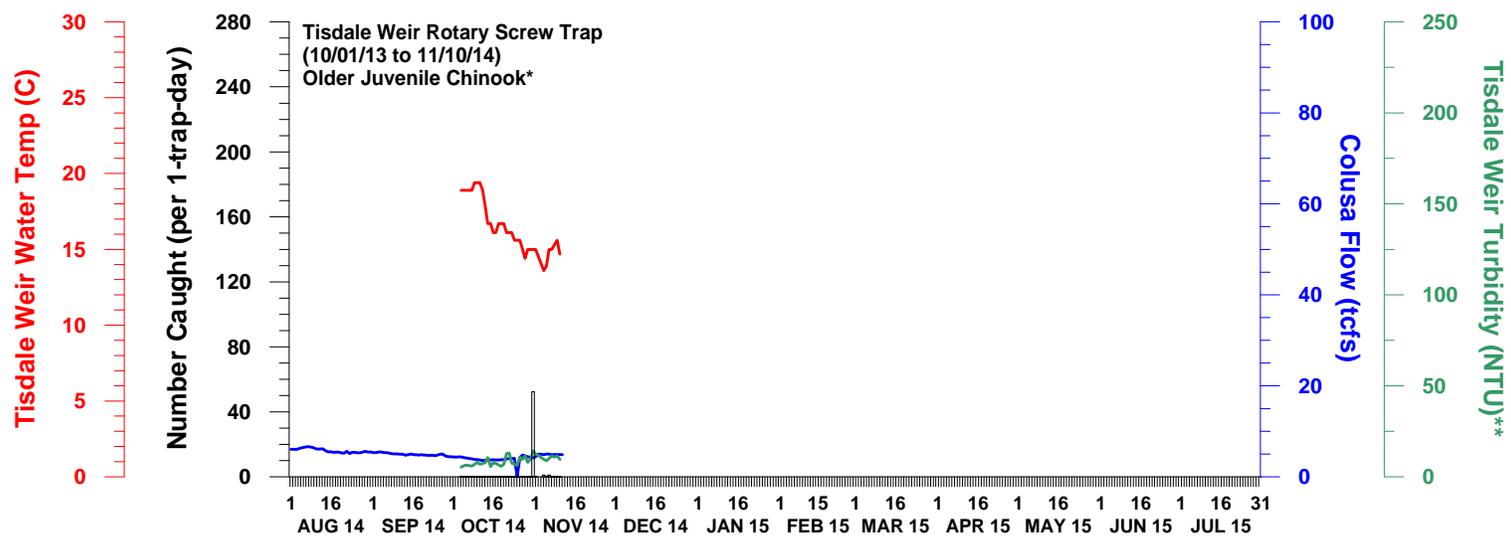
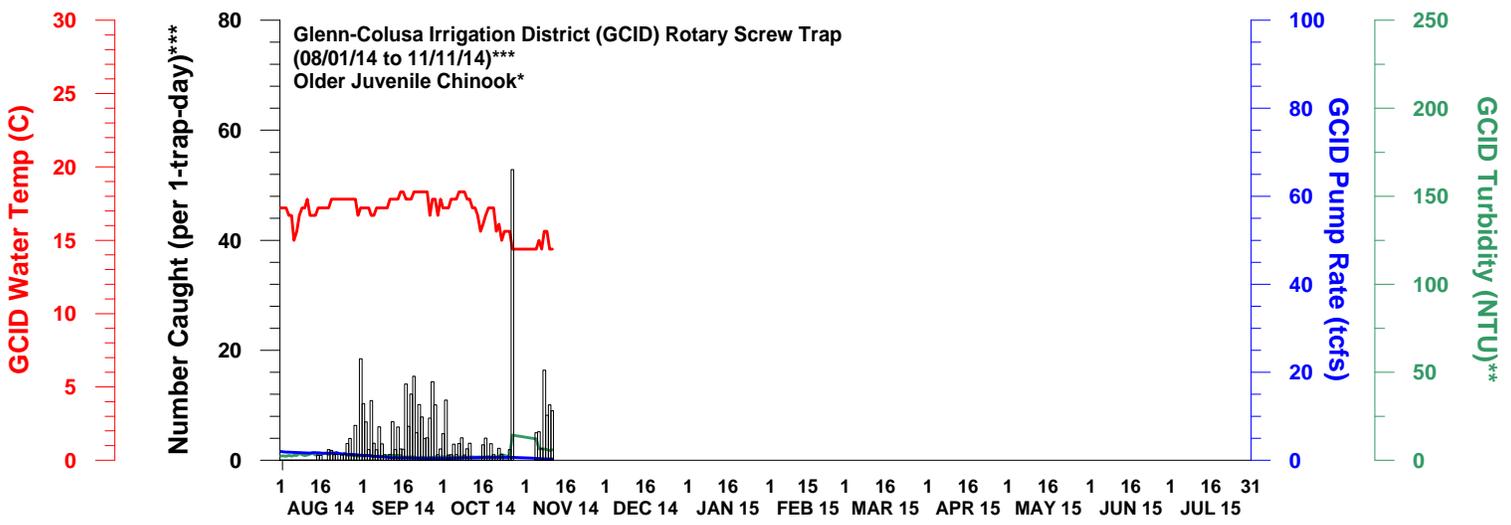
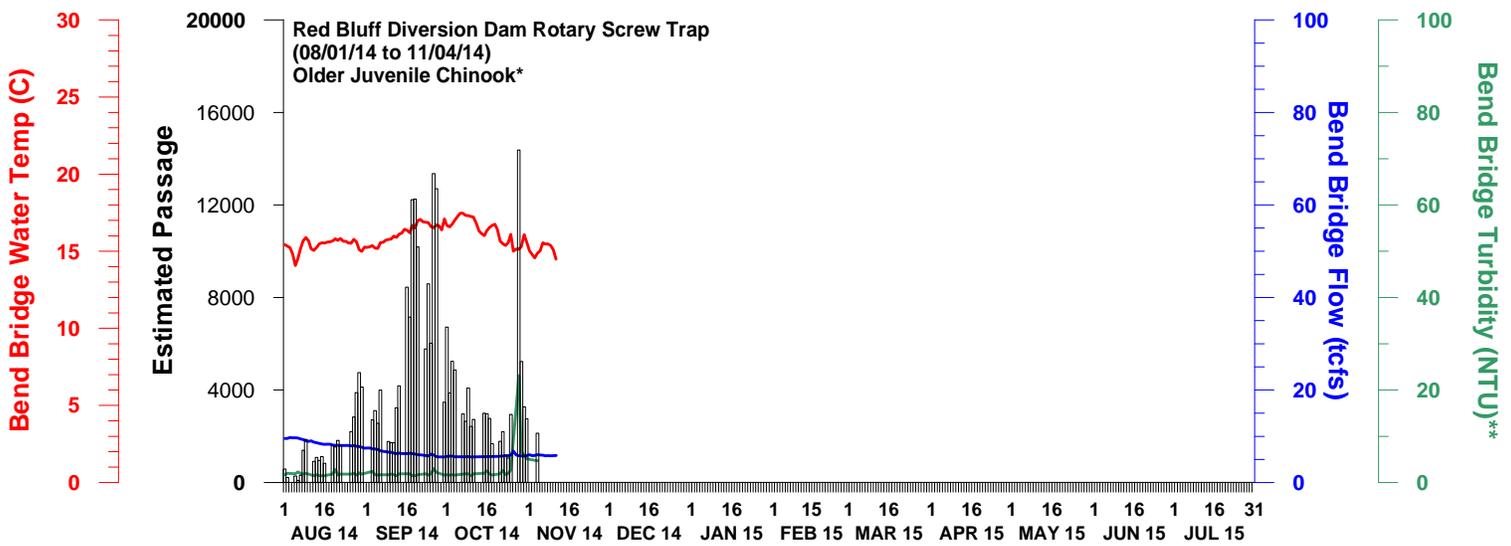
⁴ Attachment G begins on p. 132 of the Drought Operations Plan, available at: <http://ca.gov/drought/pdf/2014-Operations-Plan.pdf>

⁴ For details, see pages 79-80 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

Next Meeting: The next DOSS conference call will be on 11/18/14 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. These graphs were forwarded to DOSS after the DOSS call. For additional graphs, please visit the DWR website at: <http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>.

NUMBER OF UNMARKED OLDER JUVENILE CHINOOK MEASURED IN THE SACRAMENTO RIVER



DWR-DES 12 NOVEMBER 2014

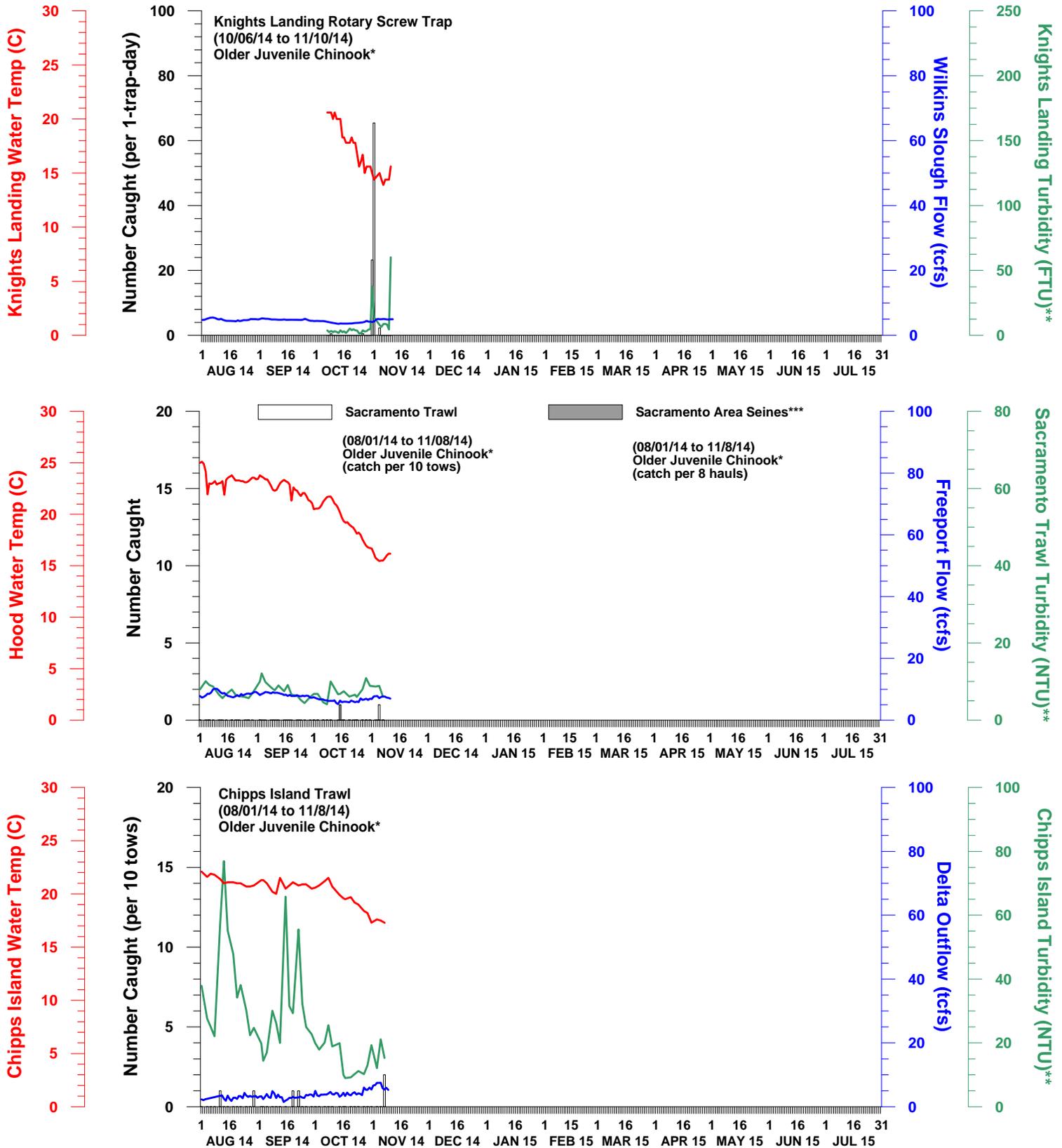
Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.

*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.

***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 OLDER JUVENILE CHINOOK MEASURED IN THE LOWER SACRAMENTO RIVER AND CHIPPS ISLAND



DWR-DES 12 NOVEMBER 2014

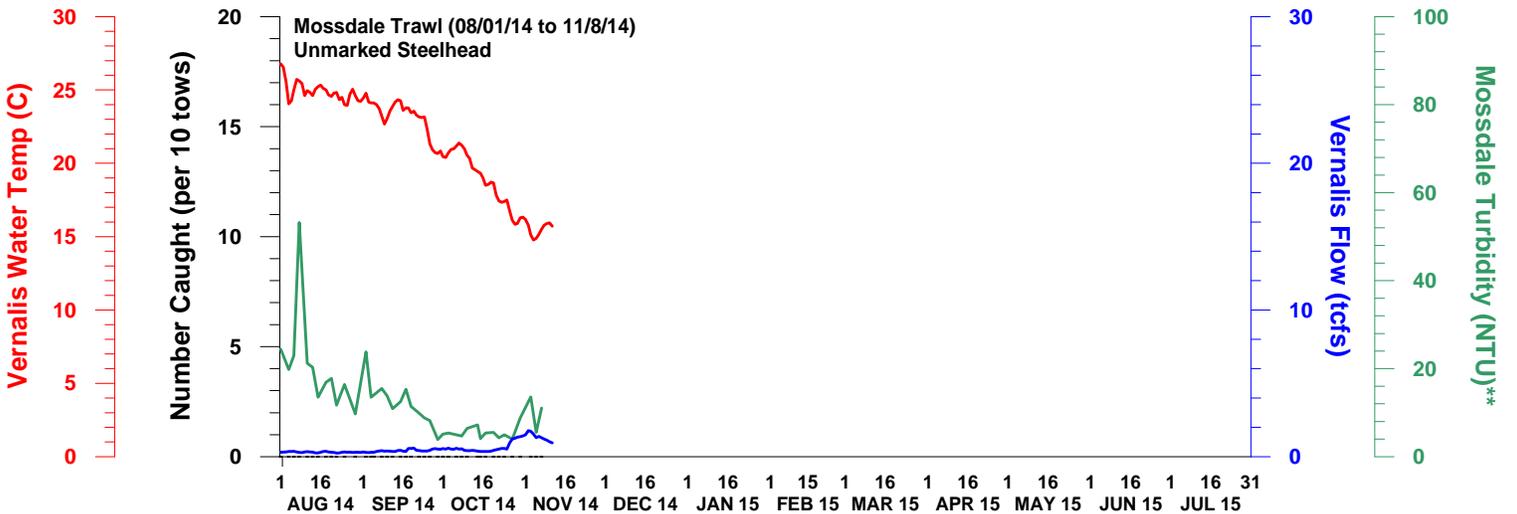
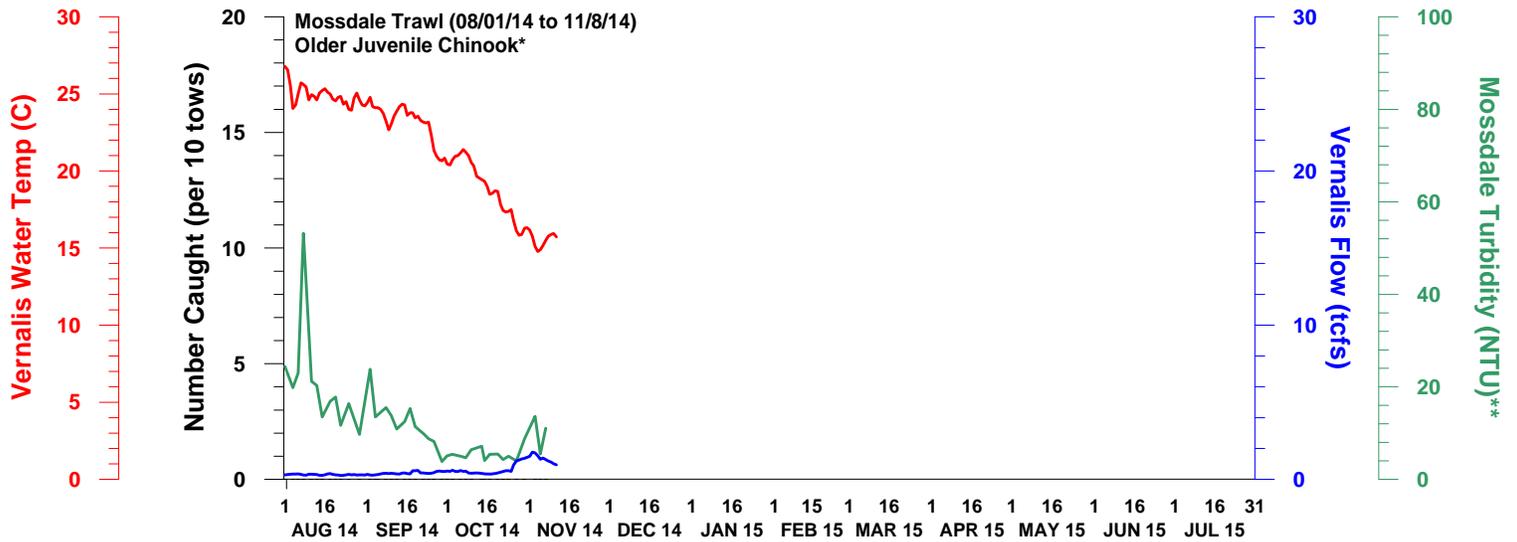
Preliminary data from DFW, FWS, and CDEC; subject to revision.

*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

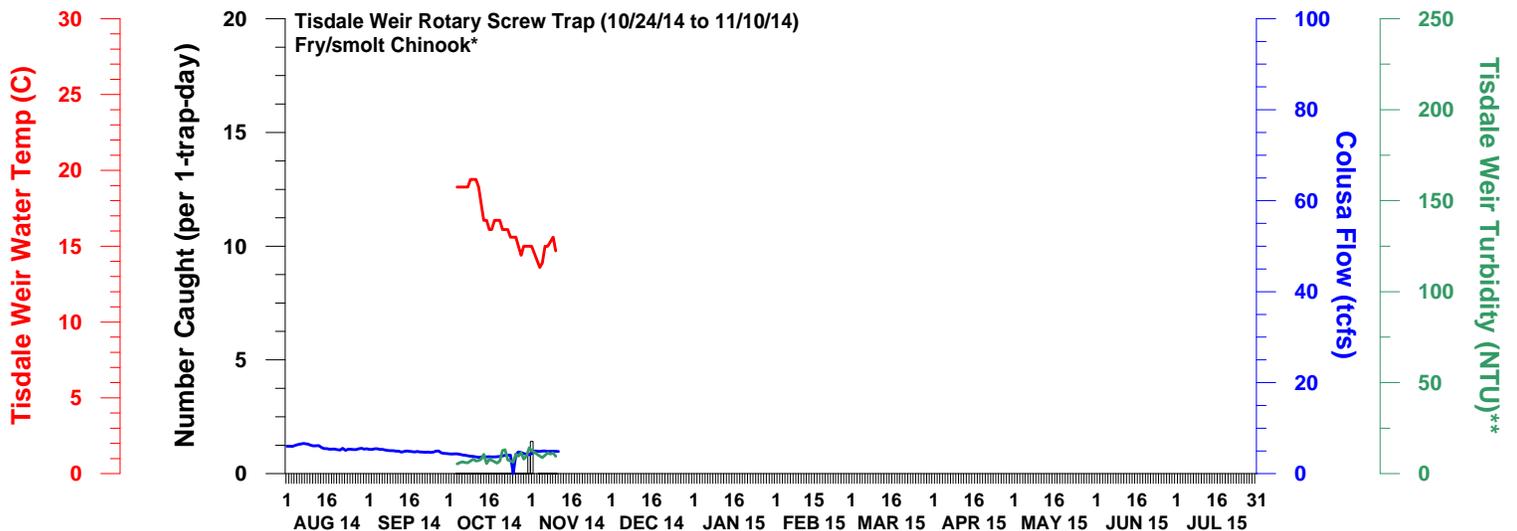
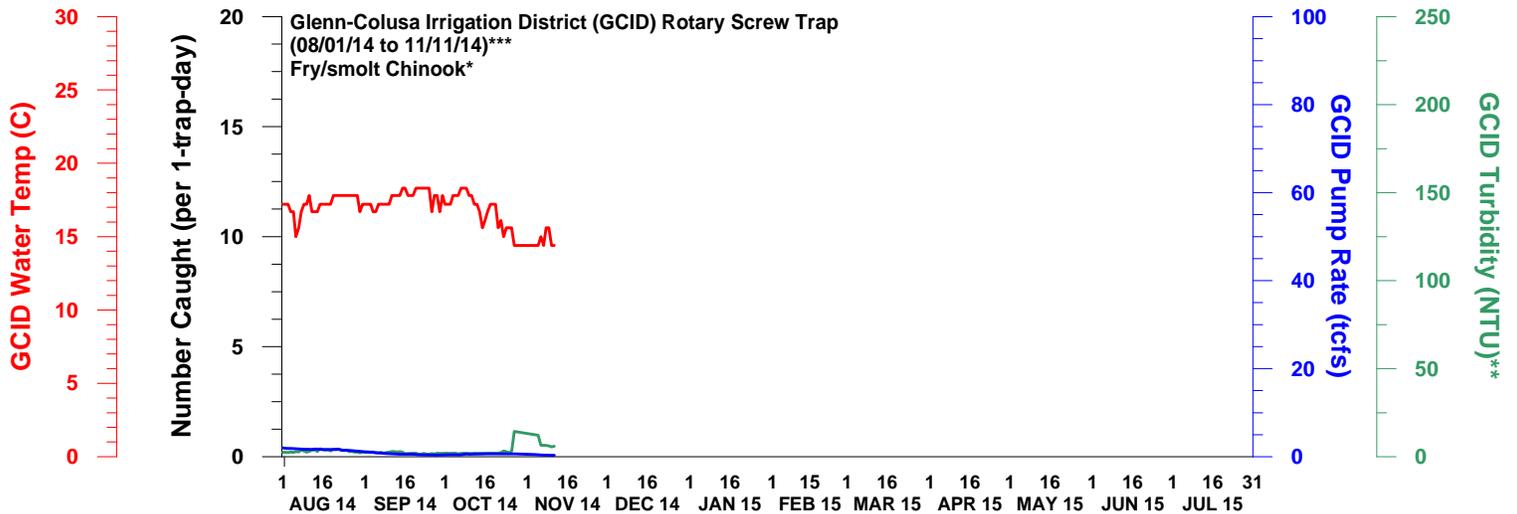
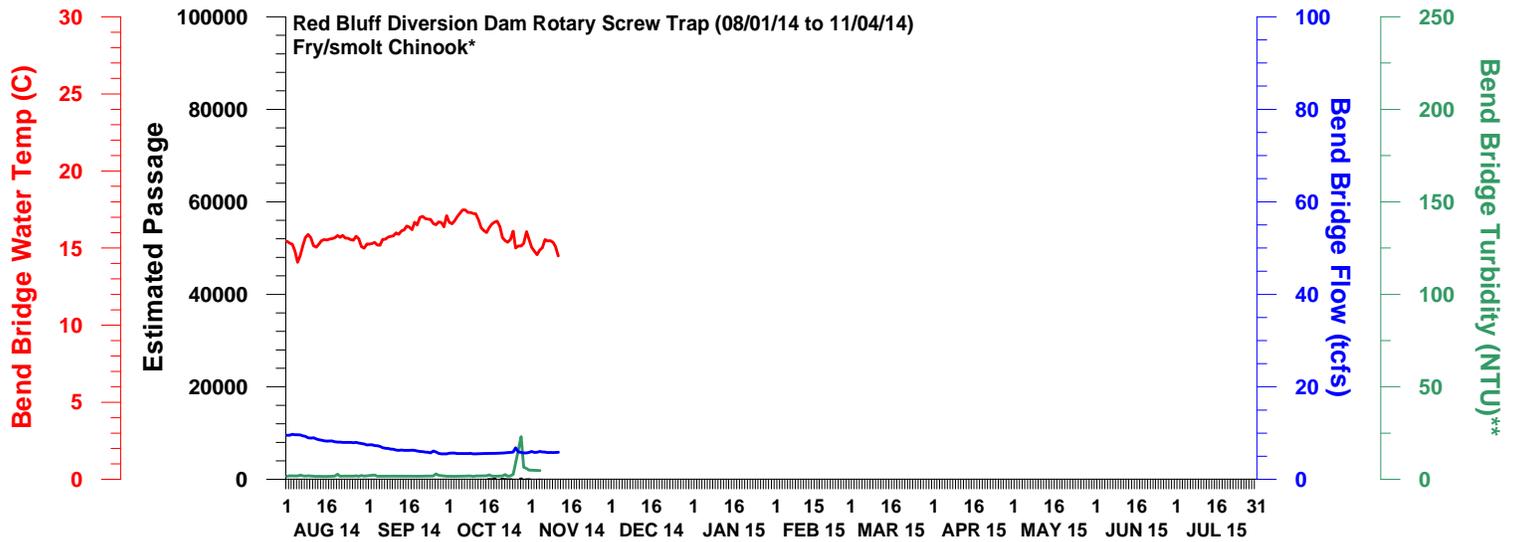


DWR-DES 12 NOVEMBER 2014
Preliminary data from FWS and CDEC; subject to revision.

*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.

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



DWR-DES 12 NOVEMBER 2014

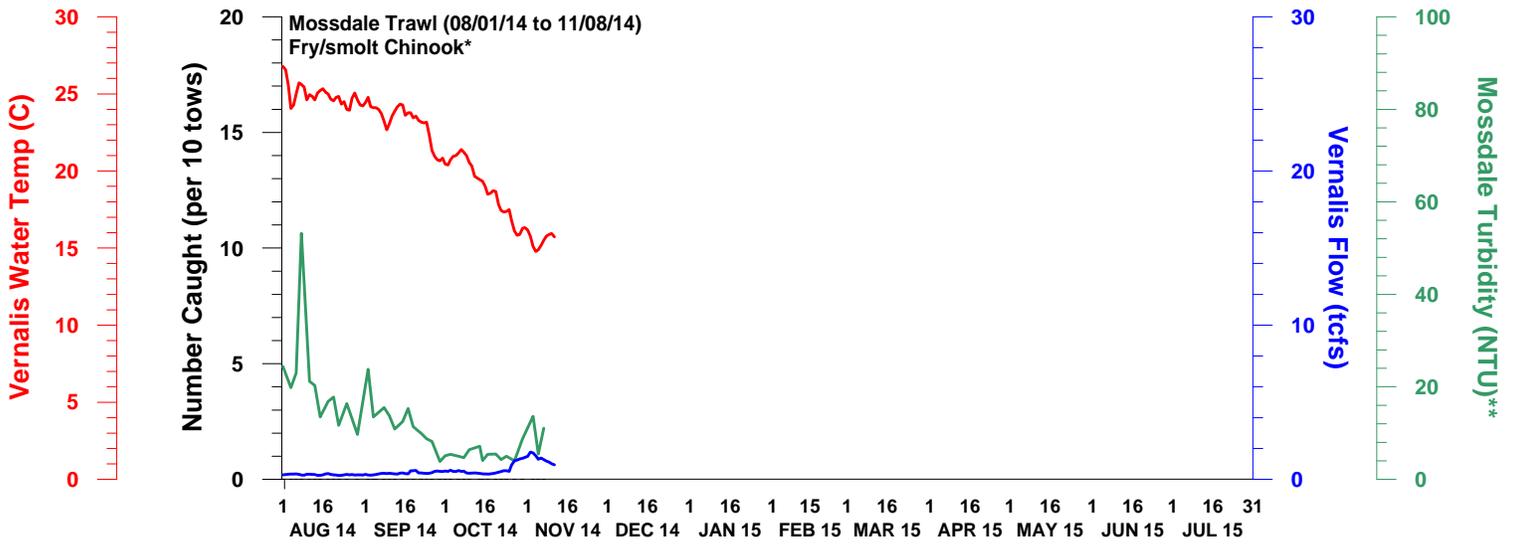
Preliminary data from DFW, FWS, GCID, and CDEC; subject to revision.

*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 SAN JOAQUIN RIVER



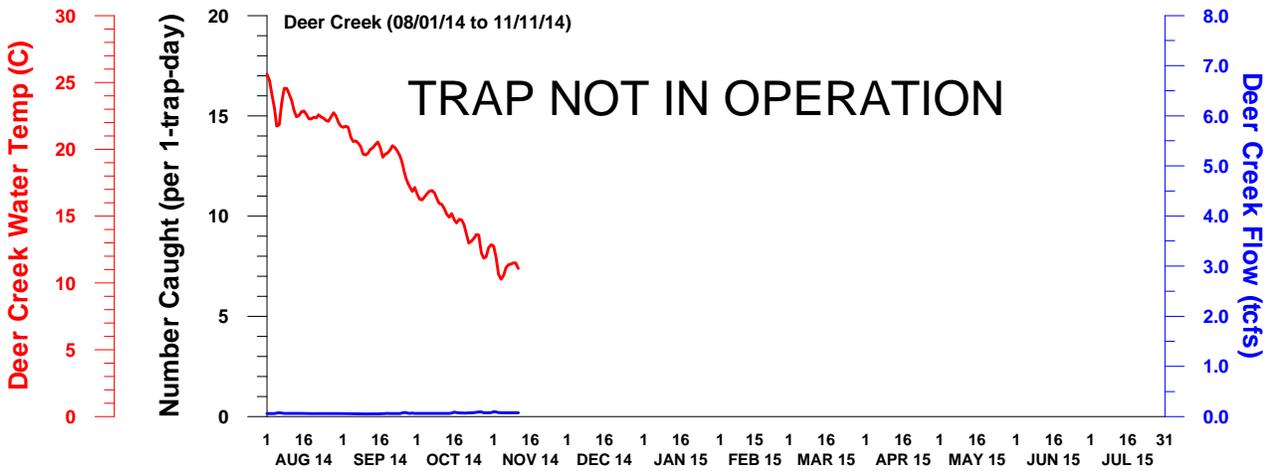
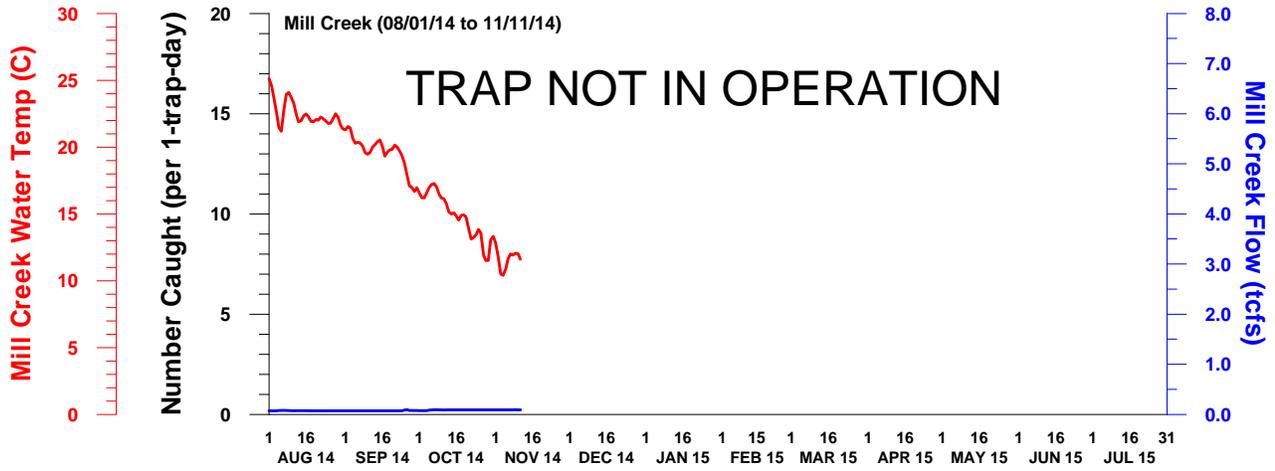
DWR-DES 12 NOVEMBER 2014

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).

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WATER TEMPERATURE AND FLOW MEASURED AT MILL AND DEER CREEK



Data Acquisition:

All data are preliminary and subject to revision.

The estimated passage data for the Red Bluff Diversion Dam were obtained directly from the US Fish and Wildlife Service (FWS), Red Bluff Fish and Wildlife Office (http://www.fws.gov/redbluff/rbdd_biweekly.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).