

Delta Operations for Salmonids and Sturgeon (DOSS) Group

04/27/10 Conference call 9:00 am

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 to salmonids and green sturgeon. DOSS will coordinate the work of other technical teams. DOSS notes and advice can be found at: <http://swr.nmfs.noaa.gov/ocap/actions.htm>

Attendees: Mike Ford, Carol Stroble, & Andy Chu (DWR); Nick Hindman & Craig Anderson (FWS); Bruce Oppenheim, Jeff Stuart, & Barbara Byrne (NMFS); Thuy Washburn & Josh Israel (USBR); Greg Wilson & Kari Kyler (SWRCB)

Agenda: fish monitoring, Delta water operations, SWP outage, & DCC Gate Study

Fish Monitoring:

Mill and Deer Creek (4/20-1/26)

The Mill Creek trap fished 6 days during this reporting period. The trap catch included; 13 spring-run YOY Chinook (40-68 mm fl), 11 yearling spring-run Chinook (102-124 mm fl), and 8 steelhead (26-237 mm fl). Flows ranged from 442 to 829 cfs.

The Deer Creek trap fished 6 days also. The trap catch included; 12 spring-run YOY Chinook (45-73 mm fl), one yearling spring-run Chinook (116 mm fl), and 2 steelhead (208 and 231 mm fl). Flows ranged from 581 to 950 cfs.

Knights Landing (4/19 -4/26): The catch for the week declined from a peak of 3,806 Chinook last week to 36 fish on Monday. Total for the week was 859 Chinook: 795 fall-run, 61 spring-run, and 3 late-fall, of which 178 were ad-clipped, plus 1 ad-clipped steelhead, and 1 non-clipped steelhead. The weekly CPUE was 52.7 for fall/spring-run, 0.16 for winter-run/late fall, and 0.04 for non-clipped steelhead.

FWS Sampling Data (4/18- 4/24):

Beach Seines: 71 fall-run Chinook, 7 spring-run Chinook, 19 late-fall Chinook, and 20 ad-clipped Chinook, 58 splittail, and 2 delta smelt (Koket)

Sacramento MWTR: 250 fall-run Chinook, 43 spring-run Chinook, and 242 ad-clipped Chinook, & 1 ad-clipped steelhead

Chippis Island MWTR: 744 fall-run Chinook, 431 spring-run Chinook, 6 winter-run Chinook, and 306 ad-clipped Chinook, 1 ad-clipped steelhead, & 1 delta smelt

Mossdale Kodiak trawl (4/18-4/25) Steve Tsao, DFG: The catch for the week increased on the San Joaquin River from 28 non-clipped Chinook last week to 53 this week. 41 of 53 fish were caught on Sunday 4/25. 2 non-clipped steelhead were also caught (1 on 4/22 and 1 on 4/25).

CVP and SWP Fish Salvage Facilities (4/19 Monday – 4/25 Sunday): The weekly loss of non-clipped winter-run declined to 4 at the CVP. No winter-run were caught at the SWP. The cumulative non-clipped total YTD is 1,657. Salvage of non-clipped steelhead increased to 10

since last week (4 at the CVP and 6 at the SWP). The cumulative salvage of non-clipped steelhead YTD is 831.

Sturgeon and Smelt: Green sturgeon have not been observed this season (since October 1st). No delta smelt were salvaged at either facility. Cumulative loss for delta smelt YTD is still 92 adults. 3 longfin smelt were salvaged on 4/19.

Daily loss densities for Chinook salmon (4/19-4/25): The loss density of older juveniles (*i.e.*, winter-run, spring-run, and late-fall Chinook) was zero last week except for one day 4/20, which was 1.31 fish /taf.

CWT data: No change this week in the spring-run surrogate or hatchery winter-run loss rates. Hatchery winter-run loss is 0.123% and the first concern level is 0.5%. The predicted loss rate for hatchery winter-run is 0.169% if some of the unread tags are winter-run, and there are still 8 unread tags. For a graphical representation of the YTD loss of the 3 releases monitored (see attached graphs from Carol Stroble's for today's call).

The data indicate that a large number of fall-run Chinook have entered the Delta from last week's summary at Knights Landing and are moving quickly through the Delta, as seen at Chipps Island. Yearling spring-run and steelhead smolts are still emigrating from tributaries on the Sacramento River and entering the Delta. On the San Joaquin River, the number of juvenile Chinook has increased and the first 2 steelhead were observed at Mossdale. Salvage and loss at the fish facilities is very low due to the low export rates and positive OMR flows. Current loss rates and loss densities are below the triggers identified in the NMFS Opinion.

DOSS subgroup update: Sheila Greene, DWR, is working on testing the 2nd trigger in the NMFS Opinion with the historical data and will write up the notes.

Smelt Working Group (SWG): Did not meet this week, but is reviewing real-time data. The SWG had no comments about opening the DCC gates in May for the proposed Cramer Fish Science study.

For fish data at other monitoring sites see:

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

1) Other Compliance Standards: Old and Middle River (OMR) flow update from USGS CDEC data reported 4/27 from DWR delta operations. Daily OMR turned negative yesterday (-822 cfs) for the first time since implementing the NMFS San Joaquin River inflow to export ratio. Merced River increased releases to 1,000 cfs on Sunday April 25 for the VAMP flow requirements. The VAMP target of 4,450 cfs is currently being exceeded at Vernalis due to flood control releases and restoration flows from reservoirs. Water quality in the Delta has improved due to the increased flows from the San Joaquin River. The Port Chicago standard is being met by more days than required under D-1641. The SWRCB response was that carryover days in April could be applied to the Port Chicago standard in May. The South Delta standard is also being met.

	Current	NMFS Limit	FWS/DFG limit
14-Day running average	= + 1,070 cfs	-5000 cfs	-5000 cfs
5-Day running average	= + 835 cfs	-6250 cfs	

2) Water operations (4/27):

Clifton Court Inflow (SWP) =	700 cfs
Jones Pumping Plant (CVP) =	800 cfs
Total Delta Inflow ~	28,025 cfs
Sacramento River =	20,422 cfs
San Joaquin River =	5,635 cfs
% Inflow Diverted =	4.8% (14-day average)

Weather outlook: Storms on Tuesday and Wednesday will bring light precipitation in the Central Valley and some reservoirs are approaching COE permitted fill levels.

Reservoir releases: Keswick increased releases from 5,500 cfs to 6,500 cfs, due to pre-flood control management and temperature control. Sacramento River temperature exceeded 56 F at Jellys Ferry over the weekend. The Sacramento River Temperature Task Group met last Thursday and set the initial compliance point a Jellys Ferry per the NMFS Opinion. Nimbus increased releases from 1,750 cfs to 2,500 cfs due to fill management, Goodwin is 1,000 cfs, and Oroville is 800 cfs.

3) SWP Export shut down: This issue was discussed at the B2 Interagency Team meeting on April 22 and operators agreed to the change in operation described in last week's DOSS call. Project operators agreed to reduce combined exports to 1400 cfs for 10 day before the SWP outage, and then increase to 1600 cfs at the CVP during the outage.

Andy asked; 1) how the actual Vernalis flows at 5,600 cfs this week impact the VAMP experimental design? (Would VAMP export target change to 2,250 cfs criteria in D-1641, Table 2 page 19), and 2) In case Vernalis flows exceed 6,000 cfs would the NMFS 4:1 ratio allow some flexibility to increase export increase above the 1500 cfs requirement in the OCAP BiOp?

Response: 1) The VAMP experimental design has already been set at 4,450 cfs based on April 1st forecasts and since the study started April 25 it is unlikely to change because of uncertainty in whether a higher flow target (5,700 cfs) could be maintained for the entire 30 day period. Mike Ford stated the SWP did not sign on to the VAMP one year extension this year, therefore is not subject to the export reduction required for the experiment. However, SWP did agree to continue with the VAMP-like study described in the OCAP project description. Mike asked what DWR was responsible for, since they're not part of VAMP? There was some discussion of the baseline. Since this is the 11th year of VAMP, the default (absent the NMFS Opinion) would be to operate to the VAMP export rates in D-1641, which allows the projects to pump the greater of a maximum of 1,500 cfs exports, or 100% of a 3 day running average of the San Joaquin River at Vernalis. That would have allowed the exports to be at approximately 5,500 cfs combined during the VAMP. DWR intended to use the 48 TAF of Yuba River water transfers to offset the export reduction during VAMP. There was some discussion of water costs during the VAMP period and whether the projects could maintain 5,500 cfs exports for 30 days right now.

Regardless of the biological rationale, the projects must follow the SWRCB criteria, if the NMFS Opinion was not in place, the baseline reverts back to D-1641.

Response: 2) DOSS group agreed that if the Vernalis flows are greater than 6,000 cfs during the April 1 through May 31 period the 4:1 ratio in the NMFS BiOp (Action IV.2.1 page 642) would apply and some export pumping above the 1500 cfs criteria would be allowed (*i.e.*, 25% of the flows above 6,000 cfs).

Biological rationale for change in export pumping rate: This operational change was proposed to prevent wear and tear on the CVP pumps while allowing the projects to obtain the expected level of exports under the Vernalis action in the NMFS Opinion. DOSS considered how this change might impact the species covered under the NMFS Opinion, recognizing the capacity of the CVP to export is only 1 unit at 800 cfs or 2 units at 1600 cfs.

- a. The water year type on the San Joaquin River is not a critical year. Vernalis flows are higher than required under VAMP and reservoirs are spilling water to maintain storage for flood control. High San Joaquin River flows in the spring have been shown to result in higher survival of outmigrating Chinook salmon smolts and greater adult returns 2.5 years later (Kjelson, *et al* 1981, Kjelson and Brandes 1989, USFWS 1995), as cited in the NMFS Opinion. Steelhead on the San Joaquin River would likewise benefit under higher spring flows in much the same way as fall-run Chinook, since they emigrate at the same time. The NMFS Opinion established minimum levels of protection to avoid jeopardy. The current hydrologic conditions are better than the minimum protection required in the NMFS Opinion. The 2010 VAMP experiment will be in place from 4/25-5/25, during which the I:E ratio would not fall below 4450:1500, or 2.97:1. If the projects export 1600 cfs during the SWP shutdown, the minimum I:E ratio expected would be 4450:1600, or 2.78:1. Therefore, a change in export pumping from 1,500 cfs to 1,600 cfs (100 cfs more) for 10 days is not expected to measurably reduce this level of protection.
- b. The non-physical barrier currently installed at the Head of Old Rive is expected to keep 85% or more of the downstream migrants in the mainstem San Joaquin River and away from being entrained at the export pumps. This barrier will be in place and operational during the entire SWP outage.
- c. OMR flows are averaging positive due to the low pumping rate and high San Joaquin River inflow, and are expected to provide benefits to spring-run Chinook and steelhead that are still emigrating from the Sacramento River. The more positive the OMR flows are, the less likely fish from the Sacramento River will find their way across the Central delta to the export facilities. Increasing the speed of migration through the Delta, or shortening the length of the migratory route is expected to decrease the extent of predation or loss (Anderson *et al* 2005).
- d. The number of listed fish salvaged or lost at the export facilities is low (*i.e.*, 4 winter-run lost, and 10 steelhead salvaged this week) and so variable, that the impact on fish salvage of a 100 cfs change in pumping is probably not measurable, in terms of fish loss.

Overall entrainment risk: The DOSS group advises that an increase in exports of 100 cfs during the 10 day SWP shutdown is not expected to measurably reduce the level of protection afforded in the NMFS BiOp for the following reasons; 1) short 10 day time frame, 2) the higher than expected spring flows on the San Joaquin River are providing more than required protections (increased survival rates), 3) placement of a non-physical barrier at the head of Old River, 4) positive OMR flows providing additional protection for Sacramento River origin fish.

4) DCC gate operations in relationship to fish studies: Cramer Fish Science has requested DOSS consider opening the DCC gates in mid-May for a salmon survival study on the Mokelumne River. As of yet, no agency has proposed early gate openings. The last VAMP fish release is scheduled for May 20 at Stockton. DOSS discussed whether more than 6 days would be necessary for these tagged fish to move through the Delta. DOSS concluded 10 days would allow sufficient time for VAMP fish to move out of the influence of the DCC gates. The operations of the DCC gates are usually reactive to flows and hard to predict ahead of time. There may be unforeseen flow conditions in May or reservoir releases for flood control that would keep the gates closed. Mokelumne River releases are increasing due to Camanche reservoir filling. Typically, Reclamation meets the needs of recreational boaters by opening the gates on weekends after the end of the D-1641 required seasonal closure on May 20. The recent VAMP review identified minimizing variation in operations during the VAMP release period as important to evaluating the biological outcome (survival measurement at Chipps) of the VAMP action. It was noted that VAMP was delayed this year and will not be finished until May 25, and modifying DCC gates operations during the VAMP experiment would create the variability that the VAMP proponents would like to minimize. There was a suggestion that the DCC be closed 1st weekend (5/22-5/23) to keep conditions the same during the VAMP experiment.
Action item: Jeff Stuart will bring up the need for DCC gate closure May 22 – 23 at the next VAMP meeting on Weds.

The DCC gate openings after May 20 have been variable historically. Reclamation advises that they can't make the call whether or not to open the gates until probably a few days before May 20 due to changing hydrological conditions. Notification to recreational boaters takes 24-48 hours. Reclamation will continue to provide timely information to DOSS to understand factors controlling DCC operations.

DOSS advice for NMFS and WOMET (4/27 – 5/2). The DOSS group advises that the projects be allowed to operate to an export rate of 1600 cfs during the SWP shutdown period of May 11 to May 21 (10 days, with partial SWP operations on the first and last days of the period), and that exports be reduced for five days before (May 6-10) and five days after (May 22-26) the SWP shutdown period such that the average export rate for the May 6-26 period matches the average export rate that would have resulted if the projects were to have managed exports on a daily basis to either 1500 cfs (on days when Vernalis flows are less than 6000 cfs) or ¼ the daily Vernalis flow (on days when Vernalis flows exceed 6000 but are less than 21,750 cfs).

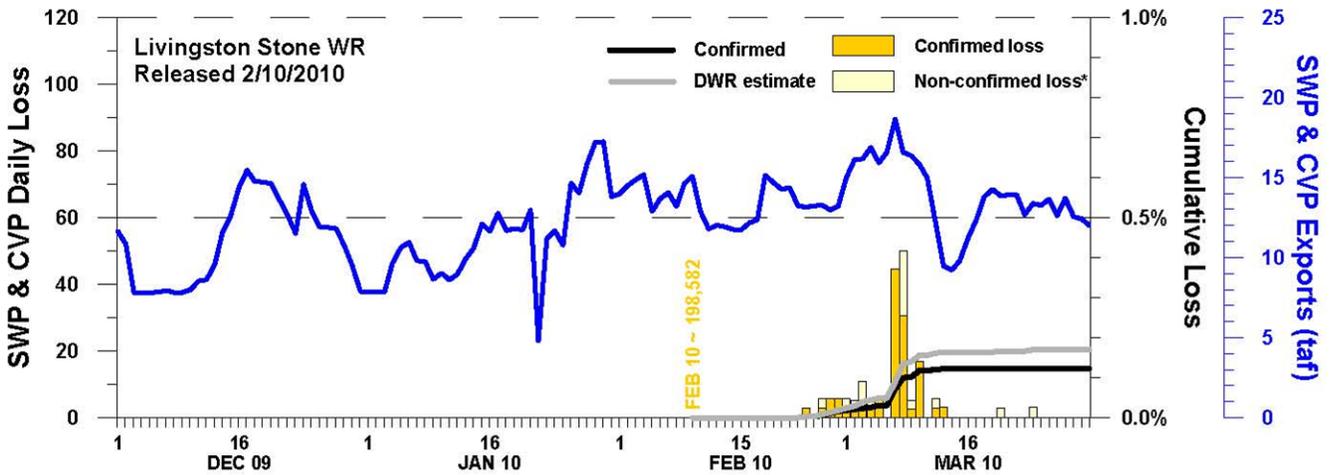
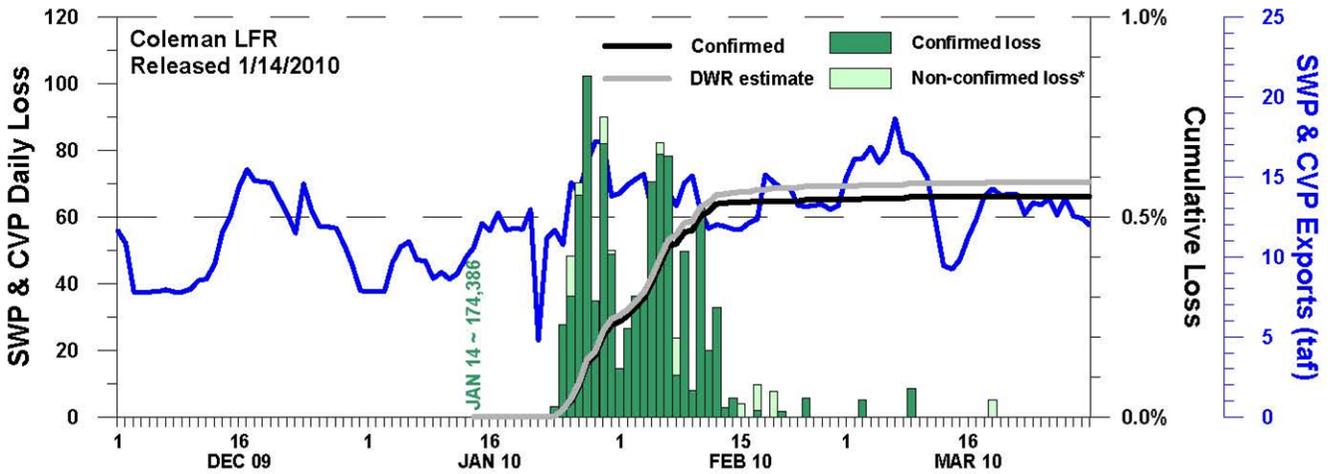
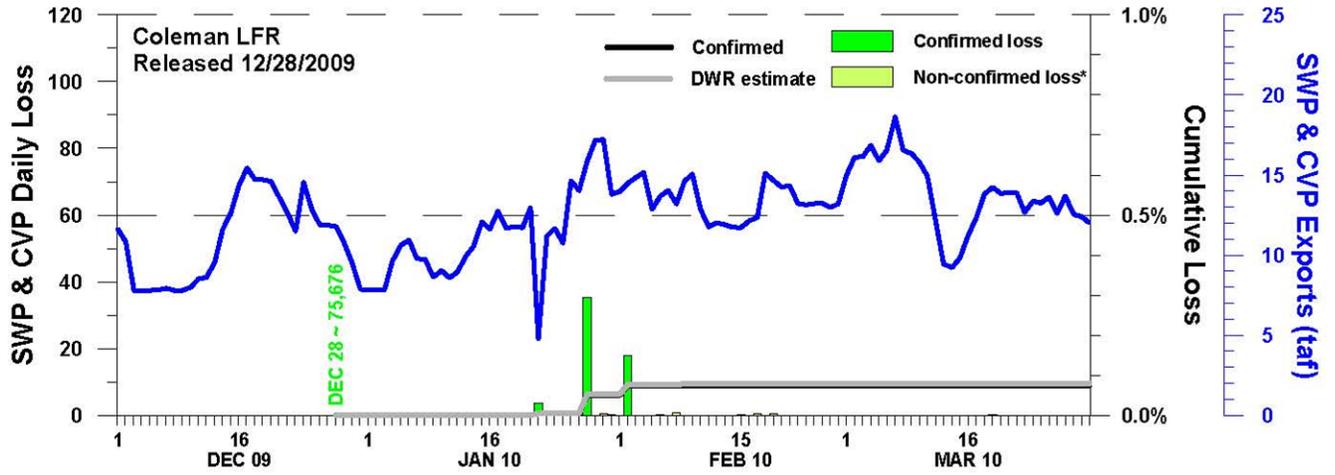
Next Mtg: May 2 at 9:00 am.

References

- Anderson, J.J., E. Gurarie, and R.W. Zabel. 2005. Mean free-path length theory of predator-prey interactions: Application to juvenile salmon migration. *Ecological Modeling* 186: 196-211.
- Kjelson, M.A., P.F. Raquel, and F.W. Fisher. 1981. Influences of freshwater inflow on Chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento-San Joaquin Estuary. In P.D. Cross and D.L. Williams, editors, *Proceedings of the National Symposium on Freshwater Inflow to Estuaries*, pages 88-108. U.S. Fish and Wildlife Service, FWS/OBS-81-04.
- Kjelson, M.A. and P.L. Brandes. 1989. The use of smolt estimates to quantify the effects of habitat changes on salmonid stocks in the Sacramento-San Joaquin Rivers, California. Pages 100-115 in C.D. Levings, L.B. Holtby, and M.A. Henderson (editors), *Proceedings of the National Workshop on Effects of Habitat Alteration on Salmonid Stocks*. Canadian Special Publication of Fisheries and Aquatic Sciences 105.
- U.S. Fish and Wildlife Service. 1995. Working paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volumes 1-3. Prepared by the Anadromous Fish Restoration Program Core Group for the U.S. Fish and Wildlife Service, Stockton, California.

Attachment 1: DWR graph of CWT data on spring-run Chinook and winter-run Chinook hatchery release loss at the Delta Fish Facilities December 1, 2009 to March 31, 2010.

CWT CHINOOK LOSS AT THE DELTA FISH FACILITIES 1 DEC 2009 THROUGH 31 MARCH 2010



* Lost tag, no tag, unread tag or missing fish

DWR-DES 26 APRIL 2010
Preliminary, subject to revision

