Delta Operations for Salmonids and Sturgeon (DOSS) Group

03/11/10 Thurs conf. call 2:00 pm

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, Sheila Greene, John Leahigh, Andy Chu, Tracy Pettit (DWR); Roger Guinee, Craig Anderson, Nick Hindman (FWS); Bruce Herbold (EPA), Barbara Byrne, Garwin Yip, Jeff Stuart, Bruce Oppenheim (NMFS); Paul Fujitani, Thuy Washburn (USBR); Greg Wilson (SWRCB); Dan Kratville (CDFG)

Agenda: Discuss NMFS' reasonable and prudent alternative (RPA) Action IV.2.3, and determine whether an Old and Middle River (OMR) flow trigger was met on Monday, March 8.

Because not all call participants had attended the DOSS meeting on Tuesday morning, March 9th, or the WOMT meeting on Tuesday afternoon, March 9th, NMFS provided a brief review of the discussions at those meetings.

DOSS meeting summary from March 9th:

The DOSS group discussed the second trigger in the table describing implementation of Action IV.2.3 (NMFS Opinion page 649) and noted that, as written, it advised operations not intended by the RPA. NMFS noted that a more meaningful implementation of the second trigger could be achieved using a modified trigger that would trigger a shift to OMR flows no more negative than -3500 cfs when combined loss density [fish/thousand acre feet (TAF)] exceeded 8 fish/TAF, and a shift to OMR flows no more negative than -2500 cfs when combined loss density exceeded 12 fish/TAF. DOSS supported this proposed trigger.

DOSS then reviewed monitoring data through Sunday (all that was available at the time of the DOSS call) and, using the modified second trigger, concluded that (because no triggers were met) the advice to WOMT was to continue operating so that OMR flows are no more negative than -5000 cfs. Because salvage numbers were observed to be getting higher (combined loss densities greater than 5 fish/TAF were observed on two days), and because March is typically the peak month of winter-run Chinook salmon salvage, DOSS also advised that the daily salvage be monitored closely on a daily basis so that action could be taken in a timely manner, if necessary. In this discussion, it was also noted that the higher salvage numbers were likely linked to the recent storm flows, and that since the flows were going down, it was possible that salvage might also taper off.

WOMT meeting summary:

NMFS reported on the morning's DOSS meeting, providing the advice and noting the points summarized above. WOMT agreed to the following notification procedure if daily combined loss density exceeded a trigger that would advise a change in operations:

1. NMFS sends a formal notification of the trigger being met (and the recommended action) to both the DOSS and WOMT e-mail distribution lists.
2. Project operators, per the transition procedures in the NMFS RPA (page 649), begin operating to the less negative OMR flows within two full days of the formal NMFS notification.
3. DOSS and WOMT, at their discretion, may call a meeting to discuss the triggering data or transition procedure.

New discussion

The group then moved on to a discussion of the second trigger. The second trigger, as written in the RPA (first and second stage triggers are met when loss>measured fish density/12 TAF and when loss>measured fish density/8 TAF, respectively), was modeled after a trigger used in the 2007 Chinook Salmon Decision Tree (same formula, applied to a overlapping, but different time of the year). The Chinook Decision Tree included in the OCAP BA (Appendix B) uses a similar trigger using a slightly different formula (first and second stage triggers are met when loss>measured fish density*12 TAF loss>measured fish density*8 TAF). These triggers will be referred to hereafter as the "division-based second trigger" and the "multiplication-based second trigger".

The group then briefly reviewed the behavior of the triggers and their responsiveness to loss densities at the facilities:

- Divison-based second trigger – This trigger is always exceeded, at both first and second stages, with *any* take at the pumps, which does not provide the sort of tiered protection (increased protection at higher loss densities) intended by this RPA action.
- Multiplication-based second trigger – This trigger is exceeded any time actual total exports (in TAF) exceeds 12 TAF (for the first stage trigger) or 8 TAF (for the second stage trigger), *independent* of loss. This trigger, like the division-based trigger, does not provide the tiered protection intended by this RPA action.

In contrast, a trigger that is met when combined loss density exceeds some "warning level" loss density is able to provide increased protection with increasing loss density and meet the intent of this RPA action. The "modified trigger" discussed would have triggered the first stage action if combined loss density exceeded 8 fish/TAF and the second stage action if combined loss density exceeded 12 fish/TAF.

Because the second trigger, as written in the NMFS RPA, has its basis in the Chinook Decision Tree, much of the call discussed the development of that trigger in the Chinook Decision Tree. It was noted that earlier (pre-2007) Chinook Decision trees did not include any form of the second trigger, and that just two Chinook triggers were used from mid-February onward:

(1) a trigger for winter-run that triggered an action if loss exceeded a criterion based on the current year's winter-run juvenile production estimate (JPE), and
(2) a trigger for spring-run that triggered an action if the percent loss of any spring-run surrogate release exceeded 0.5%.

The Chinook Decision Tree (both in 2007 and earlier) did use triggers very similar to the modified second trigger (*i.e.*, action was triggered if combined loss density exceeded some fixed "warning" loss density), with two differences. First, the Chinook Decision Tree used those types

of triggers during the October 1-February 15 period, and then switched to the triggers described immediately above. Second, the "warning" densities were set at 8 fish/TAF and 15 fish/TAF (compared to the 8 fish/TAF and 12 fish/TAF of the modified trigger).

While the group was able to review the triggers used in past Chinook Decision Trees, we did not have sufficient information to fully reconstruct the development of those triggers. The intent of the OMR actions in the RPA (similar to the export reduction actions in the Chinook Decision Tree) was to provide tiered protection based on the real-time monitoring of salvage at the fish facilities. Further review of materials used in the development of the Chinook Decision Tree (or a new review of relevant materials) would help to ensure that the second trigger is modified in a way that provides the intended protection to listed species, and that it would have associated biological rationale.

After a review and discussion of the various triggers, the group identified three options to move forward and identified the pros and cons of each (provided in the background section of the DOSS advice, below). After discussion of the three options, there was group consensus on the following DOSS advice.

DOSS advice to NMFS and WOMT from the March 11, 2010, DOSS call

Background:
Given the questions regarding the second salmon trigger within NMFS RPA Action IV.2.3 (*i.e.*, daily loss is greater than daily measured fish density divided by 12 taf), DOSS identified 3 options to move forward, along with pros and cons of each:

(1) implement the second trigger as written.
- Pro: Implementing the RPA as written.
- Con: The second trigger, as written, does not meet the intent of the action, which is to be responsive to increasing densities of fish at or near the pumps. As written, any take at either salvage facility would trigger an OMR action.

(2) implement a modified second trigger as discussed during the March 9, 2010, DOSS and WOMT meetings, that is, the first and second stage triggers would be met if combined loss density of older juveniles exceeds 8 fish/thousand acre feet (TAF) and 12 fish/TAF, respectively.
- Pros: A. This modified trigger, as intended, would increase protection as fish density increases at or near the export facilities.
  B. This modified trigger provides greater protection than the first trigger based on the winter-run juvenile production estimate for 2009-10 (*i.e.*, first and second stage triggers of 11 and 22 fish/TAF, respectively[1]).
- Con: The biological rationale for the modified trigger has not been fully discussed. While the modified trigger is similar to loss density criteria used in the Chinook salmon decision, the exact triggering densities and time of year during which

[1] [1] Based on the official JPE, the first and second stage triggers are 12 and 24 fish/TAF. The trigger levels of 11 and 22 fish/TAF mentioned on the call were based on the preliminary JPE and are no longer current.

those triggers apply differ between the Chinook salmon decision process and the modified trigger.

(3) implement only the first and third triggers while DOSS evaluates the second trigger.

Pros: A. The first and third triggers are well documented and understood, while the second trigger, as written, would require operations not intended by the action.

B. The biological rationale for the modified trigger has not been fully discussed.

Con: Not implementing the second trigger would provide less protection.

Recent loss densities are provided below.

Date	Combined loss (# fish)	Combined exports[2] (TAF)	Combined loss density (fish/TAF)
March 8, 2010	145	16,568	8.75
March 9, 2010	13	16,350	0.80
March 10, 2010	19.72	15,420	1.28
March 11, 2010[3]	17.32	14,951	1.16

DOSS discussed the potential benefits of the JPE-based versus absolute loss density triggers. All acknowledged the value of the first trigger, which is scaled to the current JPE.

- Some felt that this was adequate to protect the juvenile population. The first take concern level this year is 11,796, and the reconsultation level is 23,592. The current combined loss at the facilities is ~1,200. Because the combined loss is low, DWR concluded that protection beyond trigger #1 (*i.e.*, fish density trigger based on winter-run JPE) is not necessary at this time.
- Others felt that an additional fish density trigger not tied to the JPE would provide important protection against sporadic episodes of high salvage events.

DOSS advice:

After discussing the three options, above, and their associated pros and cons, DOSS advises WOMT and NMFS to implement option 3. Because neither the first or third triggers have been met, the DOSS advice to WOMT and NMFS is for the CVP and SWP to operate such that OMR is no more negative than -5,000 cfs.

[2] http://www.usbr.gov/mp/cvo/vungvari/deltaop.pdf

[3] Data for March 11, 2010, were reported after the DOSS call, but DOSS suggested including the data, if available, to inform WOMT