

Results of Joint Stipulation Agreement on South Delta Operations for 2012
June 4, 2012

BACKGROUND: In January 2012, Public Water Agencies (PWA), State of California and Federal agencies filed a joint stipulation regarding project operations during April and May 2012 in the litigation relating to the Biological Opinion (BiOp) on long-term operations of the State Water Project and Central Valley Project (the Projects) issued by NOAA's National Marine Fisheries Service (NMFS). The parties stipulated that, if a rock barrier were installed at the head of Old River, the SWP and CVP would operate within an adaptive range of Old and Middle River (OMR) flows in lieu of operating to the inflow:export ratio specified in the Reasonable and Prudent Alternative (RPA) of the NMFS BiOp.

The objectives of the joint stipulation were (1) to provide minimum protections for out-migrating juvenile steelhead by managing flow conditions in the Delta in a manner expected to allow salmonids to successfully exit the Delta; (2) attempting to increase water exports consistent with (1), above; and (3) generating real-time tracking information to better understand how pumping rates, flows in Old and Middle River and juvenile migrations relate to one another. In addition to installing a rock barrier, the stipulation called for OMR flows to be managed at an adaptive range between -1,250 and -3,500 cubic feet per second (cfs) during April, and between -1,250 and -5,000 cfs during May. Export levels would be adjusted to ensure adequate protection was afforded to out-migrating steelhead.

THE PROCESS: A planning committee, comprised of representatives from the Federal and State agencies, as well as technical experts from non-governmental organizations and the PWA, was involved in two workshops (an acoustic tag workshop on February 3, 2012, and a technical workshop on OMR management on February 7, 2012), and subsequent discussions regarding the design of the acoustic tag experimental study and potential triggers for OMR management during spring 2012. This resulted in two approaches for managing OMR flows for the protection of San Joaquin basin steelhead: one based a method using the particle tracking model (PTM) for the period April 1-15, and another based on in-season monitoring of acoustically-tagged steelhead for the period April 16-May 31.

The acoustically-tagged sentinel steelhead experiment was the first of its kind to study the fine scale movements of acoustically-tagged steelhead within and throughout the Delta, and to utilize some of the data to inform in-season management and water operations. Receivers to monitor the sentinel steelhead migration were established at a location specifically selected as an indication that the steelhead were migrating toward the pumps. This spot in the southern Delta is known as Railroad Cut. The reason why PTM was used for April 1-15, 2012, was that the experiment with tagged fish was delayed two weeks due to an unanticipated equipment requisition problem.

Real-time operations were then carried out by weekly and/or daily decision-making for April and May, 2012. On Monday afternoon of each week, the Delta Conditions Team (DCT), was convened by California's Department of Water Resources (DWR), to provide any information to assist the Delta Operations for Salmonids and Sturgeon (DOSS) technical group in evaluating the potential effects of planned water operations. On Tuesday morning of each week, the DOSS group, consisting of technical staff from all relevant Federal and State agencies, met to advise the Water Operations Management Team (WOMT) and NMFS. The WOMT then met Tuesday afternoon of each week, and consisted of management representatives from all relevant Federal and State agencies. NMFS then made the final determinations on OMR flows shortly thereafter and explained them in writing and posted them on the NMFS' website.

RESULTS: The overall results included a modest increase in water exports of approximately 57,000 acre feet over what would have occurred under the NMFS BiOp, significantly improved real-time tracking of migration patterns of the juveniles over the course of differing flow and pumping regimes, and higher than expected straying of juvenile steelhead into the south Delta.

The original determination for the acoustic study period was to manage OMR flows in real-time through constant monitoring of sentinel acoustically-tagged steelhead under experimental flows of -3500 cubic feet per second (cfs) from April 16-30, -1250 cfs from May 1-15 and -5000 cfs from May 16-31. The first set of 166 tagged fish was released into the San Joaquin River on April 15-16. Four days later, 13 tags had been detected by the receivers which surpassed the trigger of 9 set by NMFS. Therefore, OMR flows were required to be reduced to -1250 cfs from April 22-30, 2012. All total for the two-week period, over 30% of the tags (49) were detected as heading toward the southern Delta, not downstream toward the San Francisco Bay.

In response, DWR and the PWA proposed raising the trigger number and switching the experimental periods for May, so that May 1-15 would operate OMR at -5000 cfs and May 16-31 would be -1250 cfs. DOSS and NMFS agreed to the following operations: the switch in experimental OMR flows; a new trigger set at 24 fish, based on data from the first experimental period and adjustments to the mortality rate in the calculation of the trigger number; operating at the experimental OMR flow for at least 5 days, even if the trigger was met; and limiting the action response of OMR at -1,250 cfs to 5 days before OMR can resume to the initial experimental flow. The second set of 167 acoustically-tagged steelhead were released on May 1-2. By May 4, the newly raised trigger was met and OMR flows were again reduced to -1250 cfs from May 8-12, 2012. For this period, over 30% of the tags (51) in total were detected as heading toward the southern Delta, not downstream toward the San Francisco Bay.

Due to the high number of tags detected and other regulatory constraints (i.e., State Water Board), the Projects were not able to implement the higher (more negative) OMR flows within the allowable range set out in the study design. Therefore, in consideration of information provided by members of the DCT, and DOSS advice, the Federal and State agencies came up with a proposal that created the greatest experimental value for the acoustic study while still maintaining minimum protections for steelhead. The result was increasing the trigger number again to 31 (based on further adjustments to the mortality rate in the calculation of the trigger number), operating to an OMR of -5,000 cfs from May 16-20, even if the new trigger was surpassed, and if the trigger was exceeded, reducing flows to -1250 cfs for five consecutive days beginning as soon as possible after May 20. The third and final set of 167 acoustically-tagged steelhead was then released on May 15-16. By May 21, the new trigger was met. OMR flows were then reduced to -1250 cfs from May 23-28. Overall, over 25% of the tags (42) were detected as heading toward the southern Delta, not downstream toward the San Francisco Bay.

LESSONS LEARNED: The joint stipulation originated as a direct and substantial response to the OCAP litigation and desire for a new approach to OMR operations and management. All parties believed this was a substantial good faith effort to find a better way to achieve operations that provided for salmonid survival, improve water supply and generate more precise information relating pumping operations and juvenile migration patterns. The process allowed for real-time adaptive management and was transparent, inclusive and scientifically supportable. The result was the development of an enhanced system to track and monitor juvenile fish migrating through and out of the Delta to improve an understanding of the rate steelhead are moving through South Delta channels and the responses of the fish to various levels of flows and pumping.

A sizable portion of the tagged fish, more than expected, turned into the southern Delta under all conditions. While the results were not what were predicted, this process and information it generates should allow the parties to refine operating parameters over time to meet both juvenile survival and water supply objectives more efficiently.

While the full analysis and conclusions of the acoustic study is still ongoing, there are a few facts and observations that are worth noting:

- All total, water exports were higher under the stipulation by greater than 57,000 acre feet compared to operations under the San Joaquin flow to export ratio in the BiOp;
- For the experimental period of April 15-May 31, NMFS determinations and real-time management allowed for 21 days of OMR flows at -5000cfs, 19 days at -1250cfs and 6 days at -3500cfs;
- In actuality, however, water exports were actually controlled by restrictions imposed by the State Water Board almost half of that time and operations did not occur at the above levels;
- Work will continue this summer, per the stipulation, on efforts to learn more about the fine-scale movement of steelhead throughout the wider delta; and
- The NMFS BiOp RPA has been in effect for over 3 years now and, while it's too early to make conclusions, the early salmon counts for 2012 show an increase in adult escapement and more fish returning to the system.
- The export levels were adjusted to ensure adequate protection was afforded to out-migrating steelhead.

NEXT STEPS: The parties continue to analyze and discuss the results of the spring acoustic study and are working on the remaining parts of the stipulation, including summer studies and habitat restoration. NMFS expects that the data from the acoustic study, in combination with results from other experimental studies, can be used to evaluate some of the many assumptions that were used this year and inform management approaches for operations in 2013.