

KEY MESSAGES

- Both the I:E ratio and OMR management RPA actions affect hydrodynamic conditions in the south Delta through management of export rates. The objective of those actions is to limit the extent to which the natural hydrograph is disrupted during the core migration periods of ESA-listed salmonids. The actions already have been limited in duration in consideration of water supply and do not offer protection to the tails of the migration periods. Further constriction of the protected period is a concern.
- Reclamation's proposed modifications in the draft EA are likely to result in increased exports during some months in most yeartypes and therefore will result in a relatively larger export footprint compared to implementation of the 2009 NMFS BiOp and thus may not provide equal protection to listed species compared to implementation of the 2009 BiOp.
- NMFS considers several types of water project-related effects on salmonids in the south Delta – local effects such as entrainment into and loss at the facilities, and far-field effects such as hydrodynamic changes in the south Delta that may influence the outmigration success of salmonids rearing in or passing through the Delta. Effects outside the facilities likely diminish with distance.
- Loss of older juveniles at the CVP and SWP fish collection facilities increases sharply at Old and Middle River flows of approximately -5,000 cfs. For any given increase in OMR flows more negative than -5,000 cfs, there is a significant increase in the amount of fish that are 'lost'.
- Impacts to fish seen at the pumps are just the 'tip of the iceberg'; more negative OMR flows or less restrictive I:E ratios also change hydrodynamics within the Delta. Those hydrodynamic effects may increase residence time in the Delta, even for fish not entrained into the export facilities, increasing the exposure to predation and other stressors within the central and south Delta.
- For an overview of recent science relevant to Delta management, NMFS recommends the comprehensive January 2017 report, "Effects of Water Project Operations on Juvenile Salmonid Migration and Survival in the South Delta" (2017 SST Report)¹. Written by the Salmonid Scoping Team (SST) convened by the Collaborative Adaptive Management Team (which included technical staff from multiple agencies and stakeholder groups), the report provides an overview of the findings and uncertainties related to salmonids and water operations in the South Delta.
- Key takeaway from the 2017 SST Report is that there is uncertainty in linking specific management actions (which have variable effect at different locations in the Delta) to through-Delta survival.
- Specifically, the 2017 SST Report identifies a gap in linking hydrodynamics to fish behavior -- smaller scale, mechanism-oriented, studies may be necessary (as a complement to measures of through-Delta survival) to better understand how fish react to local conditions.
- For details on our rationale for the I:E ratio, we recommend your technical staff read the technical memo in Appendix 5 of the 2009 BiOp.
- NMFS technical staff has also provided extensive comments to the draft EA and has provided a large set of documents and reports to Reclamation's Bay Delta Office.

¹ This report was shared with Mr. Watts earlier, and is available at:

http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/OCAReports.html