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Delta Independent Science Board
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Sent via email to kelly.souza@deltacouncil.ca.gov

Subject: Regional San's Comments on the DISB Fishes and Flows in the Sacramento-San Joaquin Delta: Strategic Science Needs, Draft report, 4/28/2015

Dear Members of the Delta Independent Science Board,

Thank you for the opportunity to review and comment on the draft Fishes and Flows in the Sacramento-San Joaquin Delta: Strategic Science Needs report.

The document covers well the major science challenges related to Delta flows and fishes, and provides a good summary of the near- and long-term actions necessary to address these challenges. The report is also highly valuable in that it describes these scientific efforts as part of an adaptive, iterative process by which management scenarios are tested, and the outcomes used to guide future management decisions.

We appreciate the calls in the report for the expansion of integrative science approaches and for a focus on mechanisms. We encourage the DISB to go further with this type of recommendation, and to specifically call on the Delta scientific and management community to seek out opportunities to conduct real-world adaptive management experiments, not just improved models informed by long-term monitoring. As the report notes (p. 7, line 267), "There have been enough retrospective analyses completed to support hypotheses that certain fish populations are affected by flows, but the causal relationships have not been quantified adequately to predict how management decisions on flows affect the quantitative changes in fish populations." We agree with this point, but would add that it will be necessary to conduct real-world tests of potential management actions (at pilot scale, to begin with, if the downside risks are great; see p. 18, line 699) and to monitor the results in order learn what management actions may be most beneficial to fish populations.

The Delta ecosystem is so complex, and there is enough uncertainty in the details of our conceptual and computer models, that modeling alone cannot guide future management. We can learn a lot by building complex, ecologically comprehensive conceptual and computer models, but we could learn more by testing our models against real-world actions to see whether the purported mechanisms hold true. It is when your model breaks down that you learn most about where the key uncertainties lie, and what data or understanding you need to build a better model. Delta models need to be tested against real world management actions, that is, "learning by doing". To some extent, our current, routine management efforts serve as experiments, albeit unplanned ones. With greater investment in the planning of management-scale experiments, we can maximize our learning about the causal relationships most important to the restoration and sustainability of native Delta fish populations.

Similarly, we agree that "understanding how the flow regime affects these drivers is important to making informed management decisions and predicting the consequences of these decisions." (p. 16, line 32), but it would be useful to provide further guidance on the types of experiments that could be used to determine the relationships between flow and other drivers. Should individual experiments attempt to manipulate individual drivers, such as water temperature, salinity, depth, dissolved oxygen concentration, food supply, chemical concentrations, turbidity, and sediment load, and then attempt to synthesize their relative importance to fish vital rates and behaviors? What types of experiments should be considered that are not currently being conducted?

Finally, while we agree that "Upstream diversions for irrigation and cities have reduced inflows." (p. 9, line 348), it is important to stress that the change in inflow seasonality is predominantly due to water management practices, including water storage in reservoirs during the winter and spring snowmelt periods, and then release during summer months to supply downstream irrigation or transport through the Delta and subsequent export from the system.

Overall, we believe that the report is a very valuable document and that it has the potential to serve as a clear guide for well-designed and effective future Delta scientific efforts.

For further information, please contact Timothy Mussen at 916-875-4344 or via email at mussent@sacsewer.com.

Respectfully submitted,

L. Thompson

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Respectfully submitted,

L. Thompson
FOR TIM MUSSEN

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