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8/8/2024

Dr. Lisamarie Windham-Myers, Delta Lead Scientist
Delta Science Program
Delta Stewardship Council
715 P Street, 15-300
Sacramento, CA 95814

DWR Response Letter to the Independent Peer Review of the Delta Smelt Summer-Fall Habitat Action Monitoring and Science Plans and Decision-Making Approach

Dear Dr. Windham-Meyers:

On behalf of the California Department of Water Resources (DWR), we extend our sincere gratitude to the Delta Stewardship Council's Delta Science Program for convening an independent peer review of the Delta Smelt Summer-Fall Habitat Action monitoring and science plans and the structured decision-making approach in January 2024. This review was instrumental in meeting one element of obligations for independent peer review under the 2020 Incidental Take Permit for the Long-term Operation of the State Water Project in the Sacramento-San Joaquin Delta, issued by the California Department of Fish and Wildlife and improving management of the system.

The Delta Science Program's engagement in forming a planning committee including Federal and State agency partners and water contractors, facilitated the development of a collaborative, transparent, and effective review charge. This effort provided insights for DWR and the interagency Delta Coordination Group (DCG) which adaptively manages the Summer-Fall actions. We commend and appreciate the Delta Science Program for ensuring the independence and unbiased nature of this review, which was thorough in addressing the charge questions and scope, and for delivering comprehensive findings and recommendations in the final report, consisting of four individual letters in June 2024. The Delta Science Program's dedication to transparency, as demonstrated through the Peer Review webpage (including the charge, review materials, and findings) contributes significantly to foster trust in the independent scientific peer review process and legitimacy of expert advice to agencies.

We would also like to recognize and thank the four esteemed panelists selected by the Delta Science Program for their broad expertise in aquatic food webs, fisheries management, and decision-making processes. These panelists dedicated their time and expertise to review over 600 pages of materials and write formal letters of findings.

- Dr. Lars Rudstam, Cornell University, Laurentian Great Lakes Monitoring Program; Rudstam Consultants LLC
- Isa Woo, US Geologic Survey, Western Ecological Research Center
- Dr. Robin Gregory, Decision Science Center, Oregon Research Institute; University of British Columbia, Institute for Resources, Environment and Sustainability
- Dr. Kelly Robinson, US Geologic Survey, Georgia Cooperative Fish and Wildlife Research Unit; University of Georgia, Warnell School of Forestry and Natural Resources

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The review letters addressed technical evaluations of the monitoring and science plans for Summer-Fall actions, as well as evaluation of the DCG's decision framework and past iterations of the structured decision model (SDM). The insights provided by the panelists are of significant value to the State Water Project, and our collaborators within the DCG, guiding the planning and implementation of Summer-Fall actions aimed to improve habitat conditions for the endangered Delta Smelt, and the associated monitoring to evaluate the effectiveness of actions.

The technical evaluations commended the comprehensive nature of the science and monitoring plans, while also highlighting limitations and identifying areas for improvement. The opportunities for improvement included incorporating new techniques such as use of eDNA for Delta Smelt detection, machine learning approaches for zooplankton enumeration, integration of databases, zooplankton aquaculture, and use of enclosures to test specific hypotheses. Some of these recommendations are already being implemented or are planned (e.g., interagency zooplankton database, available here: https://deltascience.shinyapps.io/ZoopSynth/, field enclosures of Delta Smelt, eDNA). Additionally, the panelists highlighted the importance of understanding ecological interactions within the food web, including predation of fish and zooplankton, competition and effects of clams, and microcystins. In response to these recommendations, which are consistent with other related review efforts, including the Delta Independent Science Board's draft review of the food web science and monitoring in the Delta, DWR is actively developing a food web synthesis proposal in collaboration with interagency partners to deepen our understanding of these complex interactions in our system. Panelists' recommendations also included the integration of temperature and climate change assessments and alternative ways to use the bioenergetics model, both of which are being considered for inclusion in our 2025 science and decision activities.

The evaluations of the SDM highlighted the overall effectiveness of the work, but the letters describe multiple areas for enhancement, such as the formal evaluation of uncertainties and incorporation of confidence metrics. The recommendations for refining decision scope (including problem framing and objectives), inclusion of factors that may influence objectives in the model and influence diagram, and integrating value of information analysis, and addressing cognitive biases (e.g., divergence of DCG opinions from varied risk tolerance and values or differential understanding of the information) are being considered for future iterations of the SDM. The mixed approach of passive and active adaptive management of the Summer-Fall action was also noted by reviewers, with suggestions for incorporating clear feedback loops and potential laboratory studies to improve model certainty.

DWR has shared these peer-review letters with our agency partners and is working closely with the DCG to discuss the peer-review findings and recommendations for potential implementation in the 2025 planning cycle and beyond. We particularly anticipate discussion and consideration for incorporating the following recommendations:

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- Utilizing power analysis and updated species threshold information to enhance modeling.
- Integrating climate change predictions into long-term management discussions.
- Improving structured decision-making processes by formally incorporating uncertainty, biases, and value of information.
- Continuing research on managed wetlands as potential food subsidies.
- Applying the Resist, Accept, Direct model for adaptive management.
- Conducting additional studies on the food web and use of stable isotopes to trace food sources, with a food web synthesis proposal under development and a current stable isotope project underway in the northern Delta.
- Increasing the number of temperature loggers to enhance spatial coverage.

We truly appreciate the Delta Science Program and panelists' efforts in completing this peer review. Should you have any questions or require further information regarding the use of the review letters, please contact Brittany Davis at Brittany.E.Davis@water.ca.gov.

Thank you once again for your invaluable assistance.

Sincerely,

John Yarbrough

John Yarbrough
State Water Project Deputy Director
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