



## INFORMATION ITEM

### Lead Scientist Report

#### Summary

To avoid jeopardizing Delta Smelt, compliance with the Endangered Species Act for operation of the south Delta pumps requires augmentation to Delta outflow in the fall of wet and above-normal years. Augmentation is supplied through reservoir releases and reduced exports. Its effectiveness for supporting Delta Smelt populations has, however, been controversial. This study evaluated how fall flow augmentation has impacted the food supply for Delta Smelt. Based on comparisons between two years with flow augmentation and two years without augmentation, the research team found that years with augmentation featured higher zooplankton abundance and more favorable species of zooplankton for Delta smelt. However, given extremely low catch rates for Delta smelt in field surveys, it was not possible to document whether this improved prey abundance boosted Delta smelt populations.

#### Flow Augmentations Modify an Estuarine Prey Field

*Lee, C. Y; Smith, A. G; Hassrick, J. L; Kalmbach, A. J; Sabal, M. C; Cox, D. M, Grimaldo, L. F; and Schultz, A. (2023). Flow Augmentations Modify an Estuarine Prey Field. San Francisco Estuary and Watershed Science, 21(2). <http://dx.doi.org/10.15447/sfews.2023v21iss2art1> R*

The U.S. Fish and Wildlife Service 2008 Biological Opinion for the endangered Delta smelt includes a fall X2 action (i.e., augmentation of Delta outflow through reservoir releases and/or decreased exports) as a “reasonable and prudent alternative” to status-quo operation of the south Delta pumps in order to avoid jeopardy of the species. Flow augmentation is required only for wet and above-normal years, and the amount of required augmentation was reduced in the 2019 update to the Biological Opinion. The flow augmentation regulation is based on the understanding that Delta Smelt migrate to a low-salinity zone in the fall, and when that low-salinity zone gets pushed upstream of Suisun Marsh due to low outflow, there is little food available to smelt. However, both the updated regulation and the general concept of protecting Delta Smelt by regulating Delta outflow

have been controversial, with few studies demonstrating a strong correlation between X2 and Delta Smelt population measures.

In this study, a research team from ICF consulting, the California Department of Fish and Wildlife, California Department of Water Resources, and U.S. Fish and Wildlife Service addressed the question of how flow augmentation might improve habitat for Delta Smelt. Namely, they compared monitoring surveys from two years with the X2 flow augmentation (2017, 2019) and without augmentation (2018, 2020) to determine whether increased freshwater flow enhanced the food supply for Delta Smelt. The study is particularly relevant to a current peer review that the Delta Science Program is conducting by a request from the U.S. Bureau of Reclamation. The review assesses the Fish and Aquatic Effects Analysis for proposed changes to the long-term operations of the Central Valley Project. This Aquatic Effects Analysis will inform a Biological Assessment, which the U.S. Fish and Wildlife Service and National Marine Fisheries Service will evaluate to determine whether the modifications to the long-term operations will jeopardize listed species like the Delta smelt and are acceptable under federal law.

From their comparisons of augmented and reference flow years, the research team found that increased freshwater flow was associated with higher abundance of the low-salinity-preferring *Pseudodiaptomus forbesi*, a copepod that is a preferred prey species of Delta Smelt, whereas species that are associated with high salinities were of lower abundance. However, it is challenging to differentiate whether this outcome was caused by the flow augmentation action or by wetter conditions in general, as the reference years used in the comparison were years too dry for a regulated flow action. Further work must also be done to understand the response of Delta Smelt to improved habitat quality and food supply during the augmented-flow years.

## Delta Science Program Activities

### Delta Independent Science Board Recruitment

The Delta Independent Science Board (Delta ISB) is a board of 10 prominent scientists that provides oversight of the science supporting adaptive management for the Sacramento-San Joaquin Delta. Dr. Stephen Brandt will conclude his second term on the Delta ISB in January 2024. To fill this upcoming vacancy, the Delta Stewardship Council is seeking a prominent scientist with expertise in fish ecology to serve on the Delta ISB.

The announcement (available here: <https://deltacouncil.ca.gov/pdf/isb/flyer/2023-07-20-isb-member-recruitment-flyer.pdf>) was released on July 24, 2023, and applications are due on August 18, 2023. The applications will be reviewed by a recruitment committee

consisting of Delta Science Program staff and U.S. Geological Survey scientists. Later in the year, the Delta lead scientist will provide a recommendation to the Council on who it should appoint to the Delta ISB, pursuant to Water Code section 85280(a)(1).

### Salinity Management Focused Working Group

As a part of the Salinity Management Workshop series, the Delta Science Program is hosting two virtual focused working group meetings to explore human dimensions of salinity management in the Delta. The two working group meetings are convening this week, on August 23rd from 6-7 pm and August 25th from 10-11 am. Both working group sessions will offer the same content and present an opportunity to delve into salinity management topics. These working groups are specifically meant to inform the direction of social science research to better understand the broad range of people impacted by salinity management and their perspectives, values, and priorities. At these meetings, participants will be split into small groups to discuss their perspectives on the drivers and impacts of salinity in the Delta, provide input on possible salinity management actions, and identify groups of people whom the research team should reach out to for interviews and focus groups. The working groups will provide initial baseline data on stakeholder perspectives, allowing the research team to document how engagement in a collaborative scenario development and analysis process may change perspectives and values.

### Update on Independent Peer Review of the State Water Project-Delivery Capability Report – Part 1

Facilitating independent peer reviews is one of the ways that the Delta Science Program advances its mission to provide the best possible scientific information to inform water and environmental decision-making. The DSP is currently at the midpoint of facilitating an independent peer review of the State Water Project Delivery Capability Report (DCR).

The DCR is a biennial report that provides essential information about the current and projected future water supply capability of the State Water Project (SWP) (more information available here: <https://water.ca.gov/Programs/State-Water-Project>), a system that delivers water across California for residential, agricultural, municipal, and industrial uses. The SWP is managed by the Department of Water Resources (DWR), which issues a DCR every two years; the next DCR is due in December 2023. The DCR is used extensively by SWP contractors and others to plan their water uses.

DWR requested this independent peer review of the data and methods used in the DCR to model conditions that have changed and will continue to change as a result of climate change. The review is occurring in two parts. The first part of this peer review focused on whether the historical hydrologic data used in the model should be adjusted to account for

non-stationarity due to a changing climate. The second part of this peer review focuses on risk-informed climate change scenarios to model future performance of the SWP system.

A group of three subject matter experts completed the first part of the review in July, and the same group of experts will begin the second part in late August, with final reports expected in October. There are no public meetings for this review, and all materials are posted on our webpage as soon as they are available here:

<https://deltacouncil.ca.gov/delta-science-program/delivery-capacity-report-independent-scientific-review>.

The general conclusion from the reviewers for the first part of the review is that the new method, which accounts for non-stationarity, is an improvement over the previous method. Reviewers suggested that the analyses could be presented more clearly to make a stronger case for changing the methods, and they offered several specific suggestions for further improvements to make in future issues of the DCR. For example, the reviewers suggested that DWR consider taking into account the influence of the Interdecadal Pacific Oscillation on temperature, precipitation, and runoff.

## By the Numbers

Science Program staff will summarize current numbers related to Delta water and environmental management. The summary (Attachment 1) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management issues.

## List of Attachments

*Attachment 1: By the Numbers*

*Attachment 2: Visual Summary of Flow Augmentations Modify an Estuarine Prey Field Contact*

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