

# Interagency Ecological Program 2024 Work Plan Element Upper Estuary Zooplankton Study

## Project Manager and Affiliation

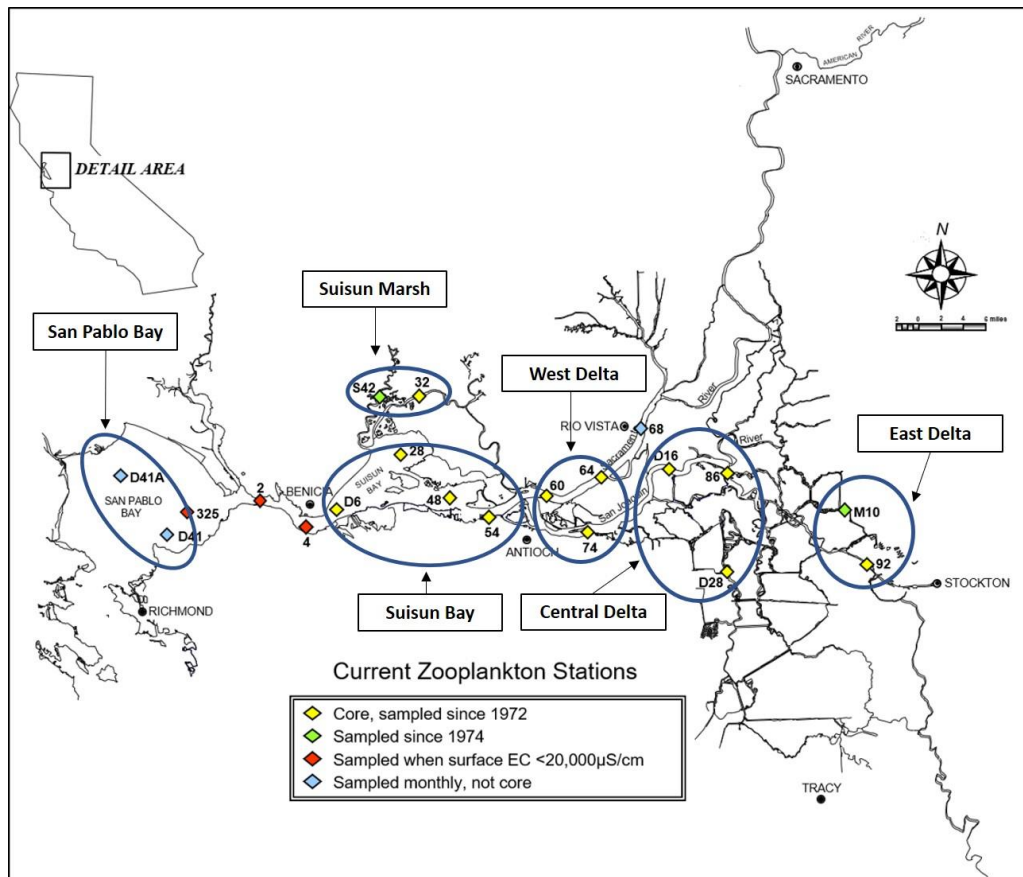
Kathy Hieb, CDFW

## Principal Investigator and Affiliation

Caroline (Tracy) Shaw, CDFW

## Costs (thousands) and Funding Sources

DWR: \$264k; USBR: \$264k



*Map of Upper Estuary Zooplankton Study sampling stations.*

## Description

The Zooplankton Study has sampled macro, meso, and micro zooplankton in the upper San Francisco Estuary since 1972. Currently, sampling occurs monthly at 20 fixed stations and 2 to 4 floating entrapment zone stations located from upper San Pablo Bay to the eastern Delta with 3 types of gear – the mysid net for macro zooplankton, the CB

net for meso-zooplankton, such as adult copepods and cladocera, and a pump sampler for micro zooplankton, such as copepod nauplii and rotifers. The Zooplankton Study provides abundance estimates and distributional data for fish food resources in the upper San Francisco Estuary, as zooplankton are an important trophic link between primary producers and fish. This information is used by aquatic ecologists to understand the physical and biological drivers of the lower food web and the relationships between the food web and upper estuary fishes that feed upon zooplankton, such as the listed Delta Smelt.

### **Project Need**

The Zooplankton Study is part of the State Water Resources Control Board's mandate to monitor water quality and related parameters. It is conducted in compliance with Decision 1485 (Term 10a) and Decision 1641 (Term 11a). In addition, this study may inform the 2020 CDFW Incidental Take Permit for Long-term Operation of the State Water Project (IEP Core Long-Term Monitoring Elements, Table 3.13.1,) and the multi-agency Delta Smelt Summer-Fall Habitat Action.

### **Project Objectives**

- What is the abundance and distribution of macro, meso, and micro-zooplankton in Suisun Bay and the Delta?
- What are the relationships between species abundance and temperature, salinity, turbidity, and chlorophyll?
- What are the long-term abundance trends for the various species of zooplankton and do these trends show significant declines or increases?
- Are introduced species of zooplankton becoming established in the estuary?

### **Schedule of Milestones**

- January 2024 to December 2024 – Zooplankton samples collected monthly.
- January 2024 to April 2024 - Complete processing of the 2023 zooplankton samples.
- January 2024 to April 2025 – 2024 zooplankton samples processed.
- June 2024 – 2023 sample and data QAQCs completed, data edited.
- July 2024 – 1974-2023 CPUE matrices (macro, meso, and micro zooplankton) released and posted to FTP folder.
- August 2024 – 2023 zooplankton data released (FTP folder and EDI).
- September 2024 – 2023 Zooplankton Status and Trends Report published on the DWR EMP website ([Zooplankton Study Annual Report](#)).

### **Project Reports and Publications**

Drought Synthesis Team. 2023. Ecological Impacts of Drought on the Sacramento-San Joaquin Delta. Interagency Ecological Program for the San Francisco Estuary. *IEP Technical Report 100, Sacramento, CA, 46 pp. Published March 28, 2023*

Bashevkin, S. M, Burdi, C. E, Hartman, R., & Barros, A. 2023. Long-Term Trends in Seasonality and Abundance of Three Key Zooplankters in the Upper San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 21(3).

<http://dx.doi.org/10.15447/sfews.2023v21iss3art1>

Barros, A., R. Hartman, S. M. Bashevkin, and C. E. Burdi. 2024. Years of Drought and Salt: Decreasing Flows Determine the Distribution of Zooplankton Resources in the San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 22(1).

<http://dx.doi.org/10.15447/sfews.2024v22iss1art3>.

2022 Zooplankton Status and Trends Report published online August 2024  
([Zooplankton Study Annual Report](#)).

2023 Zooplankton Status and Trends Report in progress.