



## Interagency Ecological Program 2023 Work Plan Element Aquatic Habitat Sampling Platform: Platform Utility and Delta Implementation Studies

### **Project Manager and Affiliation**

Randy Mager, Ph.D.

Division of Multibenefit Initiatives, DWR

### **Principal Investigator and Affiliation**

Joseph Merz, Ph.D.

Cramer Fish Sciences/ UC Santa Cruz

### **Costs (thousands) and Funding Sources**

\$ 627 DWR



Figure: Aquatic Habitat Sampling Platform (Cramer Fish Sciences)

### **Description**

The Aquatic Habitat Sampling Platform (AHSP) is an integrated aquatic species and habitat sampling system that can effectively monitor aquatic organisms and reveal habitat associations while having minimal or no “take” of sensitive species. Utilizing forward mounted net opening, flow-through open-ended net, high-definition video

imaging box coupled with constant water quality measurements, recorded geo-location, and collection of water during transects for the detection of environmental DNA (eDNA), the AHSP gives an unprecedented view of fish use of various habitats. Continued development and deployment of the AHSP will expand data collection to shallow and off-channel habitat, while offering the capability to transition to deeper and open water habitats, providing reliable sampling efficiency estimates (e.g., probability fish detection) and “catch” per unit effort (i.e., number of individual species per volume of water sampled) and improving our knowledge about populations, habitat associations and major stressors of key organisms within the San Francisco Estuary (Estuary).

## **Need**

Within the Estuary, numerous monitoring techniques are used. However, monitoring weaknesses for determining fish status and trends include: 1) restricted locations available for some techniques; 2) limited ability to simultaneously assess zooplankton and fish larvae; and 3) difficulty in estimating fish population size due to lack of gear efficiency information (Honey et al. 2004). Furthermore, past attempts at integrated abundance indices from more than one sampling method have had limited success. Although there continues to be considerable collaborative monitoring and research devoted to understanding Central Valley fish species, coordination among activities has been difficult. Other issues include permitting take of listed species and time-consuming monitoring with extended periods of down time due to sample post-processing of fish and invertebrate species. Identification of key microhabitats for each life stage and attributes and linking associated physical parameters such as habitat features (e.g., depth, structure, channel type) and water quality is needed.

## **Objectives**

- Test AHSP operation within the Estuary while providing information highly relevant to pressing Delta management issues (IEP 2016);
- Quantify aquatic biological community responses to large-scale tidal restoration.
- Test how large-scale ecosystem change influences the aquatic community by recruitment of both native and non-native aquatic species.
- Test whether there are spatially and temporally explicit changes in aquatic communities during the Dutch Slough tidal restoration project.
- Test whether specific levee waterside habitat design features have measurable effects on San Francisco Estuary fish species including native/non-native and target species.

## **Schedule of Milestones**

May 2022: IEP coordination and permits

March 2023: Equipment repairs, upgrades, and preparation

April-June 2023: Levee field surveys

April-January 2023: Dutch Slough surveys

May 2023: Begin data entry and analysis

December 2023: Draft report to IEP