Sampling Platform: A Tool for Restoration Monitoring

Matthew Ziemer, Whitney Thorpe, Jesse Anderson, and Joe Merz

Cramer Fish Sciences

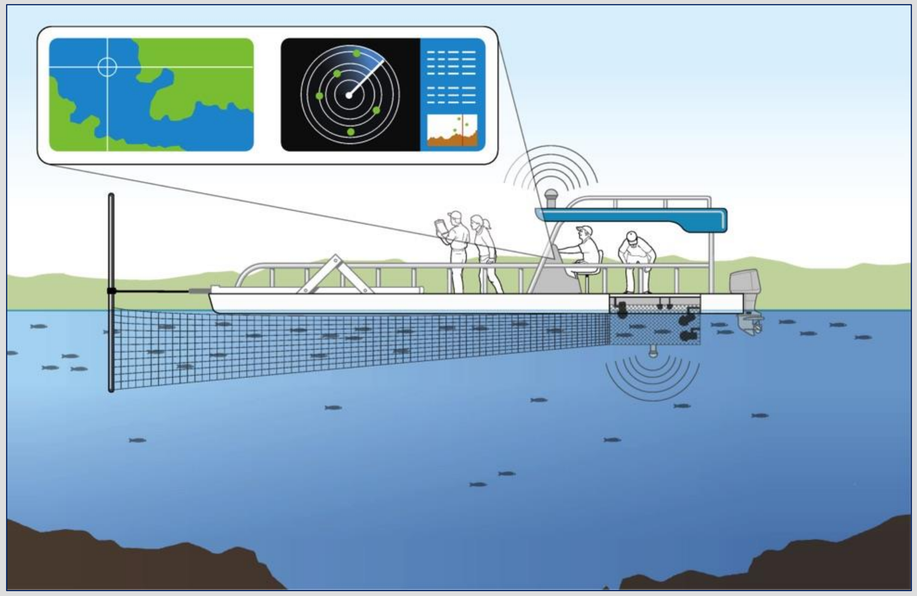
Background

- The Sacramento-San Joaquin River Delta is California's largest freshwater estuary, providing critical habitat for threatened and endangered aquatic species
- The Delta's variable and complex habitats require different sampling methods (trawl, seine, etc.) which are traditionally not directly comparable
- Utilization of multiple methods complicates analysis

Methods

- Utilize a custom pontoon boat with a hydraulically operated pass-through net
- Fish pass through the net into a stereoscopic video chamber and out the stern without being handled
- Simultaneously collect spatial linked water quality and zooplankton data
- Videos are later analyzed to identify and enumerate fish

Passive sampling across complex and variable habitats is standardizable with the Sampling Platform



CRAMER FISH SCIENCES®
An Employee Owned Consulting Company

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

Goal of the Sampling Platform

Associate fish and zooplankton species, sizes and numbers to specific physical, chemical and biological parameters at a given place and time in a non-invasive, automated and rapid process

Dutch Slough Restoration

- Utilized the Platform within the Delta for a BACI study at Dutch Slough Tidal Restoration site
- Successfully collected videos and associated data across multiple habitats though out Dutch slough
- Video analysis will allow comparison of the effects of levee breaching on native vs non-native fish community throughout a tidal system

Next Steps

- Video review is time consuming and requires detailed fish ID training of Delta specific fish
- Turbidity, vegetation, and air bubbles complicate video analysis due to decreased visibility
- Develop automated software to help count, track, and identify fish

Acknowledgements

- Funding from the US Bureau of Reclamation and the California Department of Water Resources
- Kyle Horvath, Ethan Skiles, and Pete Moniz for fabrication

References

- Merz, J.E., Anderson, J.T., Wiesenfeld, J. and Zeug, S.C., 2021. Comparison of three sampling methods for small-bodied fish in lentic nearshore and open water habitats. *Environmental Monitoring and Assessment*, *193*, pp.1-20.
- Merz, J.E., Camp, M.J., Simonis, J.L. and Thorpe, W., 2021. A New Method for Standardizing Inland Fish. Community Surveys: Characterizing Habitat Associated with Small-Bodied Fish Species, Abundance, and Size Distributions in a Highly Modified Estuary. Frontiers in Environmental Science, 9, p.698210.