Interagency Ecological Program 2025 Work Plan Element Evaluation of morphological characteristics used in identification of larval Delta Smelt *Hypomesus transpacificus* in the San Francisco Estuary

Project Manager and Affiliation

Eric Huber, U.S. Fish and Wildlife Service

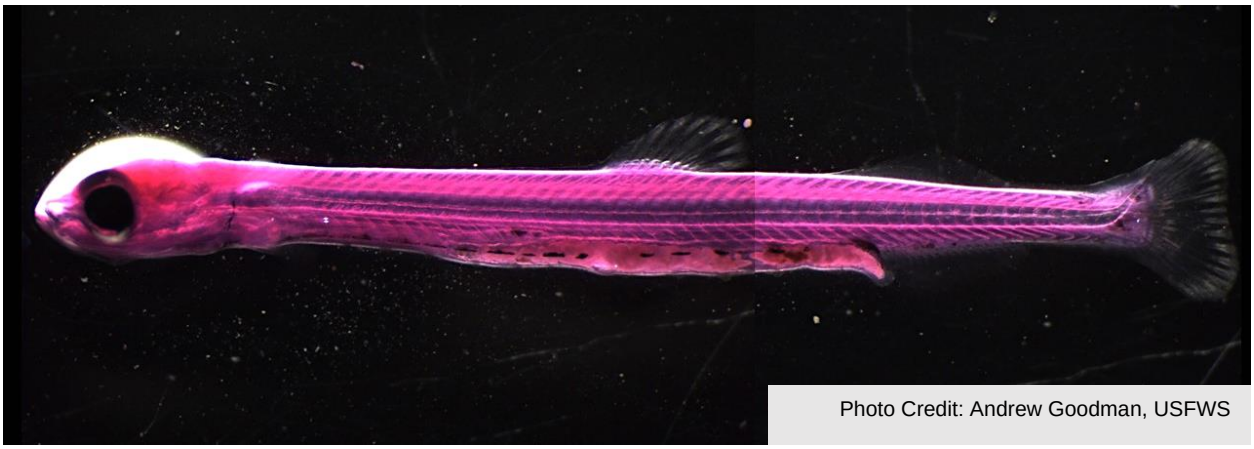
Principal Investigator and Affiliation

Denise Goodman, U.S. Fish and Wildlife Service

Evan Carson, U.S. Fish and Wildlife Service

Annual Cost (thousands) and Funding Sources

$0 (USFWS and CDFW in-kind contribution)



Larval Delta Smelt (14.8mm) produced at the UC Davis Fish Conservation and Culture Laboratory. Photo Credit: Andrew Goodman, USFWS

Description

This collaborative study is an initial step towards improving reliable identification of larval San Francisco Estuary *Osmeridae* (Delta Smelt, Longfin Smelt, and Wakasagi) to species by establishing a baseline of key morphological and phenotypic attributes of cultured larval Delta Smelt. We will evaluate morphological and phenotypic variation in relation to age and size of 600 cultured larval Delta Smelt from the UC Davis Fish Conservation and Culture Laboratory to establish a baseline of key attributes in fish born and reared in a controlled (hatchery) environment. Through coordinated methods development between USFWS and CDFW staff we also hope to improve standardization of larval *Osmeridae* identification methods and account for effects of different preservative-formulations used between the programs.

Project Need

Accurate Delta Smelt catch data are essential for estimating population abundance of Delta Smelt and for water management decisions in the San Francisco Estuary. To improve identification of *Osmeridae* larvae to species, this study will evaluate variation in morphological and phenotypic characters in captive-reared larval Delta Smelt to facilitate improvements to identification of larval Delta Smelt captured in monitoring surveys.

Project Objectives

- Establish a baseline of morphological and phenotypic variation in key attributes in fish born and reared in a controlled (hatchery) environment.
- Facilitate coordinated methods-development for identification of larval Delta Smelt.
- Account for effects of the different preservative-formulations used by USFWS and CDFW.

Schedule of Milestones

2024: USFWS and CDFW developed methods and processed study fish.

Project Reports and Publications

As appropriate, results will be submitted for publication or presented at technical meetings such as the IEP Annual Workshop, AFS CalNeva annual meeting, or Bay Delta Conference. We anticipate that this work will lead to a peer-reviewed publication in approximately 2026. This work will also support ongoing fish identification efforts and could potentially support a future larval fish identification workshop.