


FACT SHEET

Study of Delta Smelt Effective Population Size	
Deliverables: Annual Delta Smelt population size metrics (2012-2014) derived from genetic-based measures, peer-reviewed publication of work.	
Status: Initiated September 2014	
Primary Investigator: Scott Blankenship Ph.D.	Recipient Organization: Genidaqs – A business of Cramer Fish Sciences 
Project Cost: \$247,000	SFCWA Funding: \$247,000
Partners: University of California, Davis	

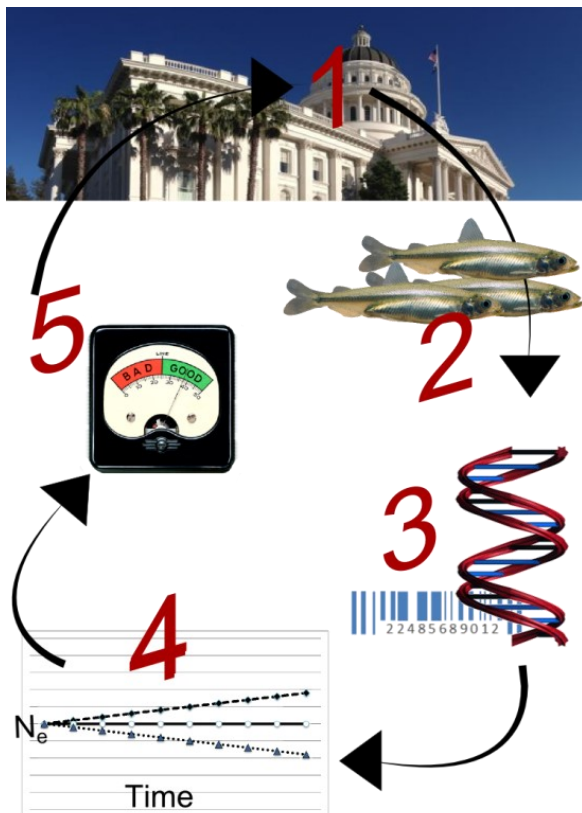


Figure 1. Project will produce genetic measurements to aid stakeholders in making decisions.

Introduction

Present monitoring programs were not designed to derive population estimates of Delta smelt. Thus, estimating Delta smelt annual population size (N) has proven challenging due to difficulties in estimating gear efficiencies and sampling in all potentially occupied habitats. Additionally, reliance on an abundance index has hindered the ability to evaluate the role that water exports may play in Delta smelt population dynamics. There is an alternative to using an abundance index for assessing Delta Smelt population status. (1) The ongoing activities of regulators and stakeholders provide (2) information and biological material on which (3) genetic measures can be made. From a conservation and population recovery stand point, the effective population size (N_e) is a critical metric to know over time (4), as there are agreed upon thresholds where genetic impact (long term viability) would be minimized (5) – the so called 50/500 rule. Further, the N_e is measurable, which would provide credible and useful information for assessing impacts of water operations to Delta smelt (1).

Information regarding Delta smelt N_e is limited, which was stated as a critical information gap in review of Delta smelt Long-term Operations Opinions Reasonable and Prudent Alternatives. The information that does exist regarding total Delta smelt N_e shows N_e has recently approached the threshold where long-term population persistence could be impacted ($N_e \sim 1000$).

Objective

The number of Delta smelt individuals, in the form of an index, is estimated annually. Yet, there is debate surrounding the accuracy of sampling methods in characterizing the true population size and how an abundance index should be used to inform water operations. An additional metric, the effective population size (N_e), can be quantified from existing monitoring activities, has established scientifically defensible thresholds, and directly relates to recovery planning and population viability. This project will calculate the N_e of Delta smelt from existing tissue collections from 2012-14.

Results

To be determined

Conclusions

To be determined

Relevance

Calculating this alternative population size measure will increase the information content produced from current monitoring activities, adding value without increasing “take”. Additionally, scientifically defensible population size measures could directly inform deliberations about water operation impacts on Delta smelt and population recovery performance measures.

Next Steps

To be determined