

Integrating Social and Ecological Research to Control Invasive Species: Fostering Collective Action Among Private and Public Stakeholders

Study Period
2021-2025

Funded by



**Delta
Science
Program**

DELTA STEWARDSHIP COUNCIL

About this Project

The common reed *Phragmites australis* is found in the Suisun Marsh, located in the Sacramento-San Joaquin Delta (Delta), and is a non-native and aggressively invasive plant. *Phragmites* create dense stands that reduce habitat diversity, limit site access and views, reduce wildlife movement, and create fire hazards. *Phragmites* also crowd out native fish and waterbirds, limiting food resources for other wildlife and subsistence fishers and hunters. Several methods, including herbicide application, have been applied to control *Phragmites* on public and private lands, but none have been successful due to a lack of coordination. Collective action and regional collaborative efforts between private and public landowners, combined with effective monitoring, can lead to successful control of *Phragmites*.

This project created a spatial prioritization of *Phragmites* control areas by integrating natural and social science data. By prioritizing areas based on ecological conditions and community engagement, *Phragmites* control can be directed to sites where it is most likely to succeed. In addition, this project created a framework for regional coordination based on landowners' perceptions of the risk to their properties and their perspectives on the value of control efforts. Building on this information, the project developed strategic communication tools to motivate public and private landowners to practice collective action.

Lead Investigators

- John Takekawa, Suisun Resource Conservation District
- Karen Kettenring, Utah State University
- Zhao Ma, Purdue University
- Richelle Tanner, Chapman University
- Virginia Matzek, Santa Clara University

Project Objectives

- Establish an integrated pest management (IPM) approach for *Phragmites* control efforts in Suisun Marsh
- Assess landowner perceptions of *Phragmites* and *Phragmites* control and identify strategies for increasing their likelihood to engage in collective action
- Synthesize results to produce a spatial prioritization model that predicts the likelihood of *Phragmites* control success and inform a regional coordination plan

Why this Research Matters

In addition to improving control of *Phragmites* in Suisun Marsh, this project can inform efforts to control other invasive species by identifying how differences among stakeholders may lead to developing programs that lead to effective collective action.

Management Application

The outcomes of this project will help control invasive *Phragmites* and other invasive species in the Delta. Additionally, this project can serve as a model framework for addressing other management problems in the Delta that are socioecological in nature. For example, results from stakeholder interviews and surveys can promote positive engagement of those stakeholder groups and develop criteria used in prioritizing resource allocation for other invasive species in the Delta.



Next Steps

Datasets and findings from the project will be used to create the spatial prioritization model and a regional coordination plan to control *Phragmites*. A copy of final datasets and other products will be stored on the Suisun Resource Conservation District website (<https://www.suisunrcd.org/>).

Connections to the 2017-2021 Science Action Agenda

- 1: Invest in Assessing the Human Dimensions of Natural Resource Management
- 3: Develop Tools and Methods to Support and Evaluate Habitat Restoration
- 4: Improve Understandings of Interactions Between Stressors, Managed Species and Communities