Understanding and improving the early detection and rapid response process for invasive species in the Sacramento-San Joaquin Delta

Study Period
2023-2024

Funded by

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DELTA STEWARDSHIP COUNCIL

About this Project

Aquatic invasive species and their impacts have been ecological and management challenges in the Sacramento-San Joaquin Delta and Suisun Marsh for decades. Despite these impacts, the Delta still provides critical habitat for numerous native species and important ecosystem services. **To protect the Delta from new invaders, an efficient early detection and rapid response (EDRR) framework is needed.** EDRR is a coordinated set of actions that aims to find and report potential invasive species, then design a management plan to control and hopefully eradicate them before they spread and cause harm. Effective EDRR frameworks require coordination and early action, but frequently the implementation of effective EDRR is limited by lack of information or coordination.

This project evaluated the draft EDRR framework and coordination table developed by the Delta Interagency Invasive Species Coordination (DIISC) Team (DIISCT 2021). The DIISC Team fosters communication and collaboration among California state agencies, federal agencies, research and conservation groups, and other stakeholders that detect, prevent, and manage invasive species and restore invaded habitats in the Delta. The framework defined key EDRR terms and summarized existing EDRR processes within the region. **By interviewing agency staff and stakeholders, this project evaluated each stage of the Delta EDRR process to discover successful strategies, identify barriers to success and policy hurdles, and suggest solutions.** Evaluation of the draft EDRR framework was paired with a study on the ecological characteristics and control options of a relatively new invasive plant (ribbon weed, *Vallisneria australis*).

Lead Investigator

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Project Objectives

- Understand key natural history and ecological relationships of ribbon weed (*Vallisneria australis*) in the Delta to inform rapid response actions.
- Refine the DIISC Team's draft Delta EDRR framework and coordination table.

Draft Delta EDRR Framework

This project built off the Draft Delta EDRR Framework (DIISCT 2021) to develop recommendations for effective EDRR of invasive species.

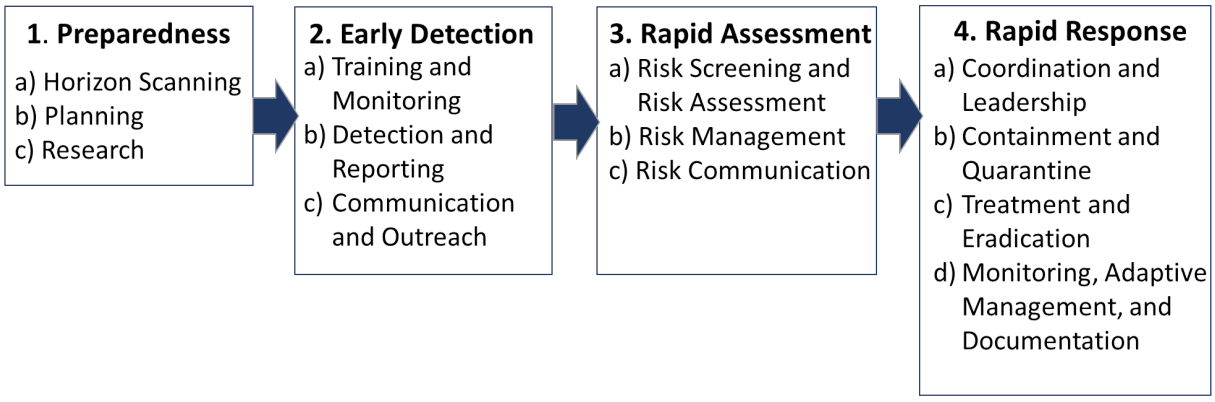

Photo credit: Nicholas Rasmussen, Department of Water Resources

Why this Research Matters

Invasive species threaten the Delta's ecosystem and economy, and new invaders continue to arrive. Many agencies have authority over different invasive species and different parts of a response. While many programs are in place, there are needs to improve detection, coordination, and response to new invasive species (Delta ISB 2021). The policy recommendations from this project aim to make response to invasive species more successful, thereby protecting the Delta and the ecosystem and human services it provides. The ribbon weed research points out the effort and process required to compile information on ecology and control of new invasive species that is critical for an effective response.

Management Application

By identifying and addressing challenges, EDRR programs can help prevent the establishment and spread of invasive species, protect native ecosystems, and mitigate the impacts on biodiversity and human well-being.

Recommendations from this project include:

- Create structures within and across institutions to support invasive species work beyond the passion and expertise of individual staff.
    - Add invasive tasks to existing job descriptions to allow time allocation.
- Fund invasive species-focused staff and monitoring.
- Improve surveillance efficiency through technology to increase detection and potentially lower costs.
- Coordinate reporting and data management.
    - Consistent messaging from partners that state-funded grantees must enter data into a database that is spatially based, has quality control procedures, and can be queried.
- Enhance stakeholder connections.
- Understand and enhance public outreach and communication.
    - Find synergies with existing state mandates to message consistently.
    - Collaborate with agricultural constituencies for messaging that invasive aquatic weeds are an agricultural challenge.

- Use existing structures to coordinate across administrative and regulatory silos.
- Streamline permitting process for invasive species control.
- Fund and authorize pilot testing of control methods.
- Prioritize management actions using risk assessment tools.
- Leverage existing efforts that have political attention at the highest levels.
- Transfer lessons from other states or countries.
- Conduct proactive literature review (as done for ribbon weed in this project) and risk assessment of species that have high potential for invading the Delta to accelerate response.

Next Steps

- Discuss recommendations with the DIISC Team.
- Continue ribbon weed fieldwork to expand description of plant characteristics and environmental tolerances (especially salinity).
- Compare the Delta EDRR Framework to additional EDRR plans.
- Prepare a scientific manuscript summarizing results.
- Share the final report and other products on the Delta Science Tracker at https://sciencetracker.deltacouncil.ca.gov/node/53836.

References

Delta Independent Science Board (Delta ISB). 2021. The Science of Non-native Species in a Dynamic Delta: A Review by the Delta Independent Science Board. 84 pp. deltacouncil.ca.gov/pdf/isb/products/2021-05-21-isb-non-native-species-review.pdf

Delta Interagency Invasive Species Coordination Team (DIISCT). 2021. Draft Delta Invasive Species Early Detection and Rapid Response Framework.

Reaser, J. K., S. W. Burgiel, J. Kirkey, K. A. Brantley, S. D. Veatch .and J. Burgos-Rodrıguez. 2020. The early detection of and rapid response (EDRR) to invasive species: a conceptual framework and federal capacities assessment. Biological Invasions. 22:1–19. https://doi.org/10.1007/s10530-019-02156-w

Connections to the 2022-2026 Science Action Agenda

Management Need 3:

Expand multi-benefit approaches to managing the Delta as a social-ecological system

Management Need 5:

Acquire new knowledge and synthesize existing knowledge of interacting stressors to support species recovery and ecosystem health