



# **Team Arundo del Norte's Arundo Eradication and Coordination Program, a coordinated regional approach**

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A CALFED/California Bay Delta Authority/CDFG funded project

# Presentation Outline

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- Program Overview
- Resource Library
- Experimental Research
- Monitoring Database and Protocol
- Permitting Support
- Mapping and Eradication Prioritization
- Lessons Learned and Next Steps

# Arundo Eradication and Coordination Program

## Phase 1

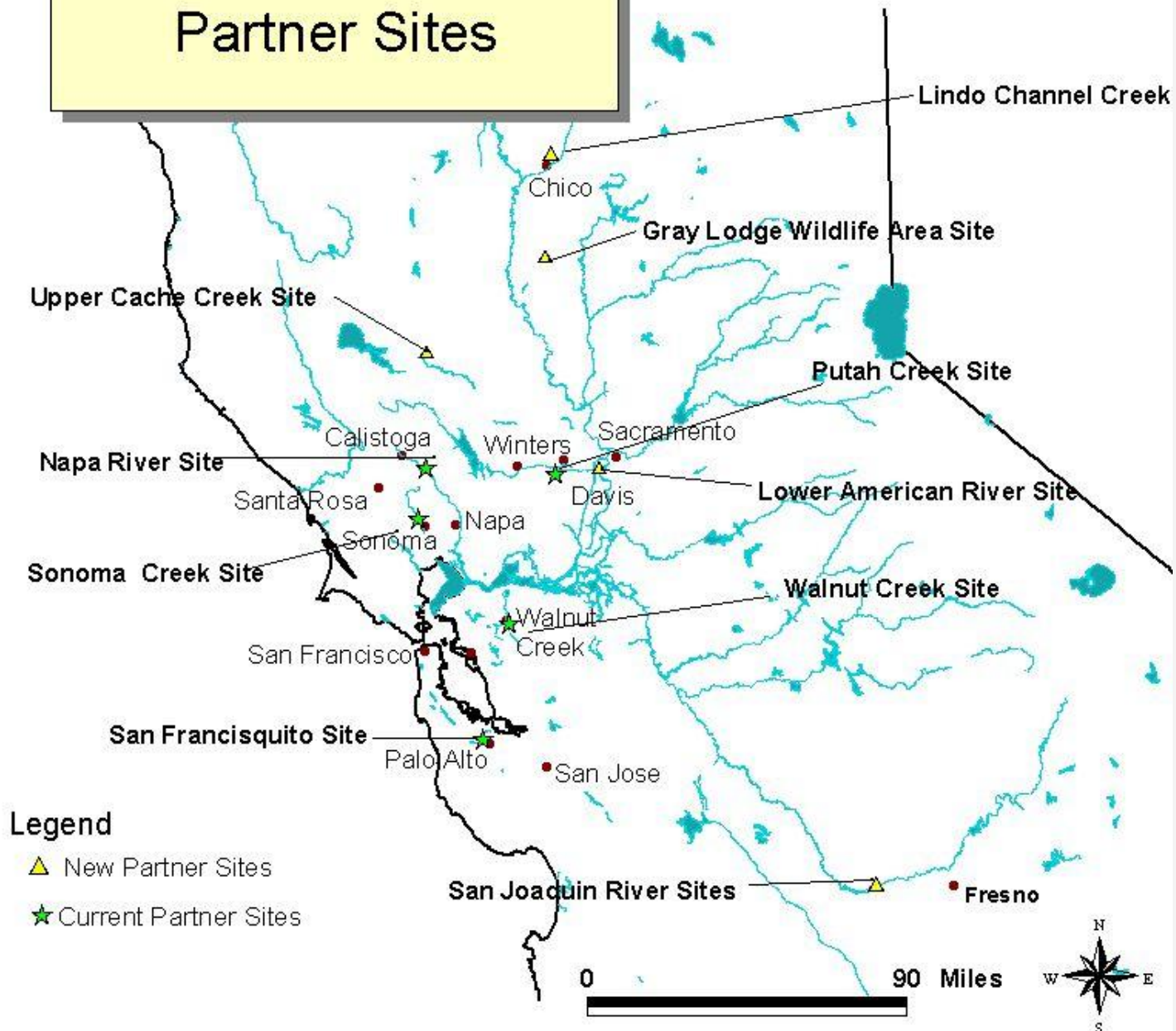
- 2001-2005
- 5 Eradication Partners
- Database and monitoring protocol development

## Phase 2

- 2005-2009
- 9 Eradication Partners
- Added research, distribution mapping, permitting



# Arundo Eradication Partner Sites



# Program Partners

- California State University, Chico Research Foundation
- Solano County Water Agency/ Lower Putah Creek Council
- Napa County Flood Control and Water Conservation District
- Lake County Watershed Protection District
- San Francisquito Creek Watershed Council/Acterra
- Sonoma Ecology Center
- San Joaquin River Parkway and Conservation Trust
- Butte Co. Ag. Commissioner - Gray Lodge Wildlife Area
- Sacramento Weed Warriors, CNPS/Urban Creeks Council
- EDAW - Permitting
- USDA/ARS - Experimental Research
- Information Center for the Environment (ICE)
- The Nature Conservancy
- California Dept. of Fish and Game
- California Bay Delta Authority



# Partners employed a wide array of techniques

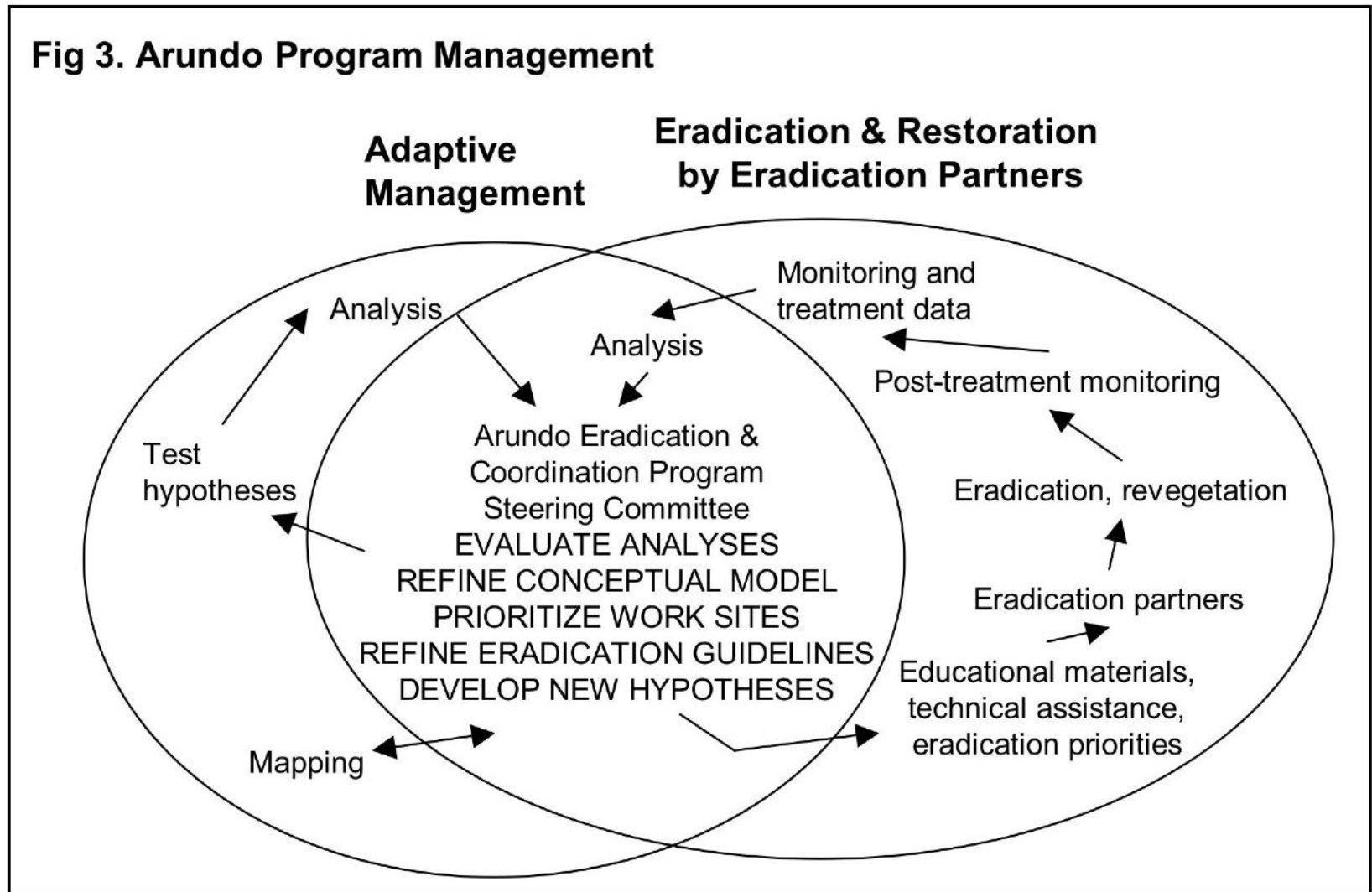
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- Heavy equipment
- Helicopter spraying
- Cutting and digging
- Cutting or bending and spraying
- Different herbicides
- A LOT of volunteers



# Adaptive Management Model

Fig 3. Arundo Program Management



# Resource Library at <http://teamarundo.org>

- Research publications
- Methods
- Outreach materials
- Contacts

## Educational Materials

### Resources from AECF

- Arundo: A Landowner Handbook
- Arundo: Streamside Invader (brochure) **New!**
- Controlling Arundo in Your Watershed: A Guide for Organizations
- Controlling Arundo in Your Watershed (video)

### Other Resources

- Giant Reed (*Arundo donax*) Arundo: Invasive Weed Fact Sheet

## The TAdN Arundo Digital Reference Library

- Bibliographic Resources
- Mapping and Remote Sensing
- Biology of Arundo
- Arundo Ecology and Impact
- Arundo Control and Management
  - Herbicides
  - Permitting
  - Equipment
- Research Programs



# Experimental Research

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- USDA Agricultural Research Service, David Spencer - Experimental Design and Implementation
- Hypotheses and Experiments focused on:
  - Refinements to Arundo control treatment techniques,
  - Riparian vegetation responses to eradication and restoration treatments
  - Geomorphic responses to treatments (HEC-RAS modeling)

# Hypotheses

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- Herbicide formulation and dosage affect Arundo treatment efficacy.
- The timing of Arundo treatment affects treatment efficacy.
- The distance of the treatment site from the stream affects treatment efficacy.
- Active revegetation is required to achieve long-term recovery of native riparian vegetation at weed eradication sites.
- Stream channel capacity increases at Arundo removal sites.

# Monitoring Database and Protocol Development

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- Monitor surrounding vegetation (native and non-native) and track change
- Track management information, such as costs
- Track success of revegetation efforts
- Use this information across partners to discover patterns, test hypotheses

Develop a system for Partners and Researchers to use

# Data Collection and Database Challenges

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- Getting enough data within project period to see changes
- Learning curve, providing technical support to partners
- Collecting consistent data while adjusting protocol and database to partner feedback
- Quality data takes time and effort

# Early Arundo Surveying and Monitoring Protocol

- Survey protocols
- Data collection forms
- Step-by-step instructions
- Partners trained and provided assistance



## *Team Arundo del Norte*

### Arundo Surveying and Monitoring Protocol

#### Arundo Surveying Toolkit:

##### Field Forms

- [Field Workday Metadata Form](#)
- [Site Description Form](#)
- [Arundo Observation Datasheet](#)
- [Treatment Log](#)

##### [Online Database](#)

##### [Instructions](#)

#### Introduction

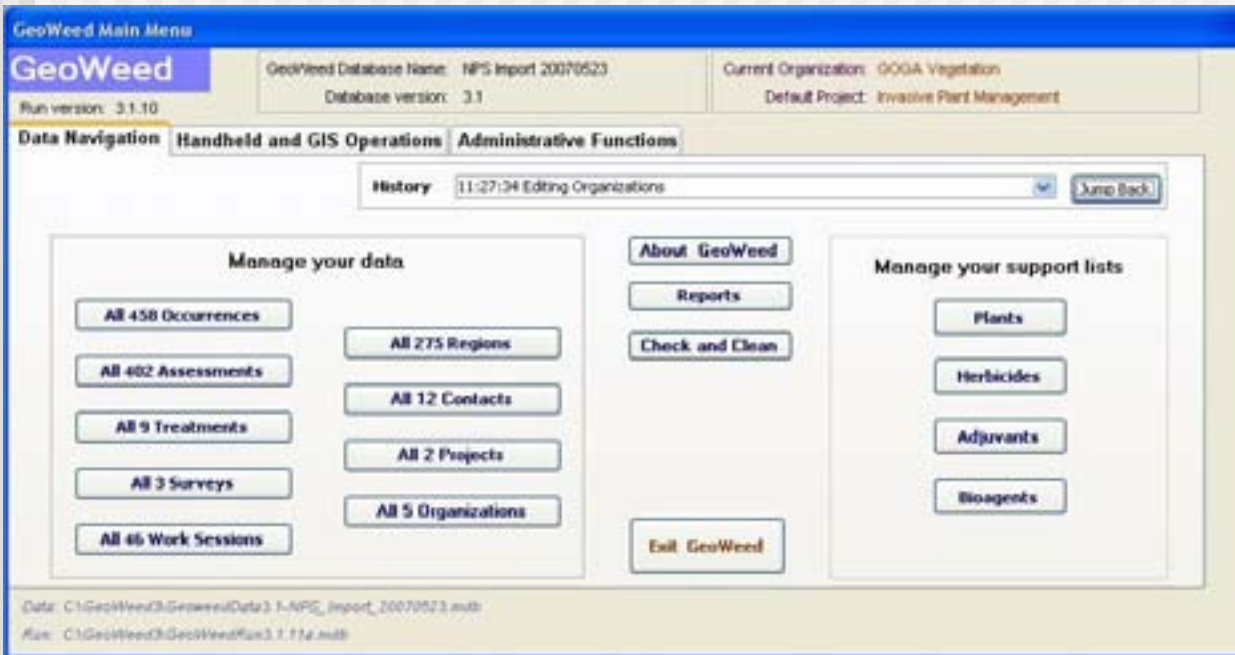
This surveying protocol has been developed for the field forms provide a standard way to describe photos, record descriptions of eradication treatments years. It is based on the North American Weed Inventory was developed for this project, we hope that this for eradication or research purposes, and that we share and combine our data for a regional picture. how we

#### About

There are [Metad](#) informa capture









Supports quality data capture, error detection, and aggregation

<http://geoweed.org>

## GeoWeed Aggregation / Google Maps Test

### Team Arundo Del Norte

 *Arundo donax* L.

 Other species

 [CSU Chico Research Foundation](#)

 [Sonoma Ecology Center](#)

 [San Joaquin River Parkway & Conservation Trust](#)

 [San Francisquito Watershed Council](#)

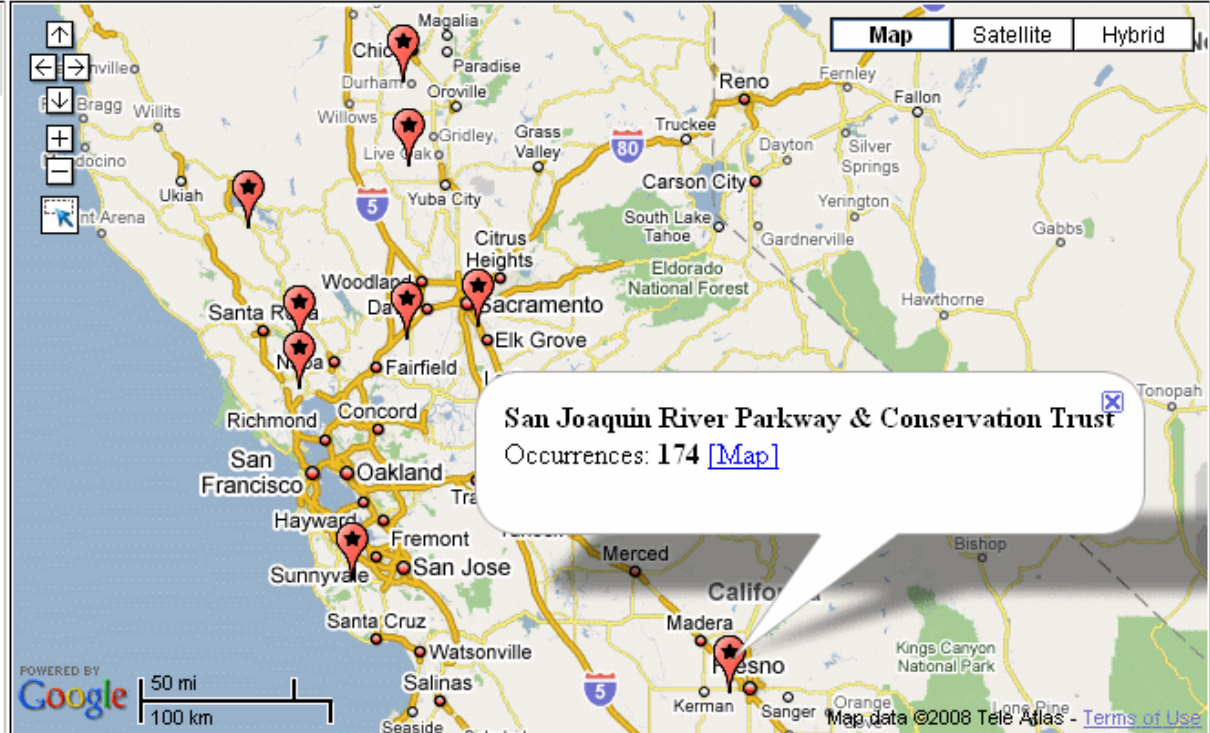
 [Napa County Flood Control District](#)

 [LPCCC/SCWA](#)

 [Sacramento Weed Warriors](#)

 [Upper Cache Creek](#)

 [Gray Lodge Wildlife Area](#)



#### Team Arundo del Norte

[Sandy Gulch \(CSU Chico Research Foundation\)](#)

[Sonoma Creek \(Sonoma Ecology Center\)](#)

[San Joaquin River \(San Joaquin River Parkway & Conservation Trust\)](#)

[San Francisquito Creek \(San Francisquito Watershed Council\)](#)

[Napa River \(Napa County Flood Control District\)](#)

[Putah Creek \(LPCCC/SCWA\)](#)

[Lower American River \(Sacramento Weed Warriors\)](#)

[Upper Cache Creek](#)

[Gray Lodge Wildlife Area](#)

## GeoWeed Aggregation / Google Maps Test

### San Joaquin River Parkway & Conservation Trust

**Species List:**

- [Arundo donax L.](#)
- [Other species](#)
- [020303](#)
- [arundo 020607 no. 02](#)
- [arundo 020607 no. 01](#)
- [arundo 020607 no.02](#)
- [arundo 020607 no.03](#)
- [arundo 020607 no.04](#)
- [arundo 021207 no.01](#)
- [arundo 021207 no.02](#)
- [arundo 021207 no.05](#)
- [arundo 021207 no.06](#)
- [cp\\_eld 022107 n01](#)
- [cp\\_eld 022107 n02](#)

**Popup Details:**

[mbu arundo03 080907](#)  
[ARDO4 Arundo donax](#) giant reed  
Reported 08/09/2007

Visit Date	Size (sqm)	Cover	Action
<a href="#">08/09/2007</a>	1800	51-100%	Assessed

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# Centralized Permitting Support

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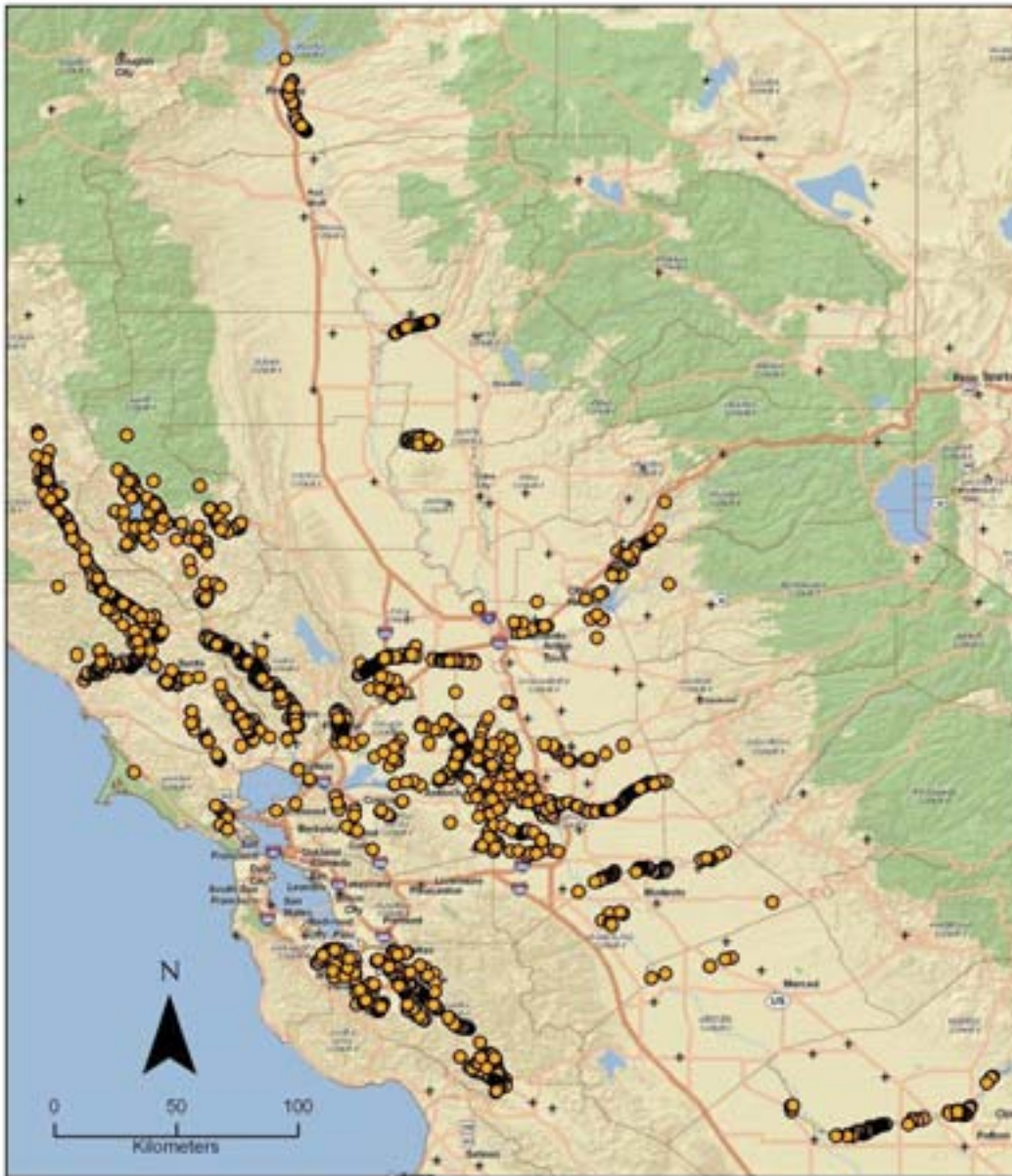
- Partner boundary maps, researched listed species
- Sensitive species biology and avoidance measure methods
- Permit applications
- Helped navigate: DFG CEQA, NMFS, USFWS, State Reclamation Board, and sometimes USACE, Regional Water Board

# Mapping and Prioritization Task

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- Develop a catalog of *Arundo* location data. Identify all organizations doing *Arundo* mapping. Publish metadata on a public server.
- Create an *Arundo* distribution map. Collect GIS data from the above organizations, consolidate into single map, and publish data for use by others on a public server.
- Create an eradication priority map for California's Bay/Delta region and recommend priorities for funding future eradication efforts.





Data Gathering  
Results:

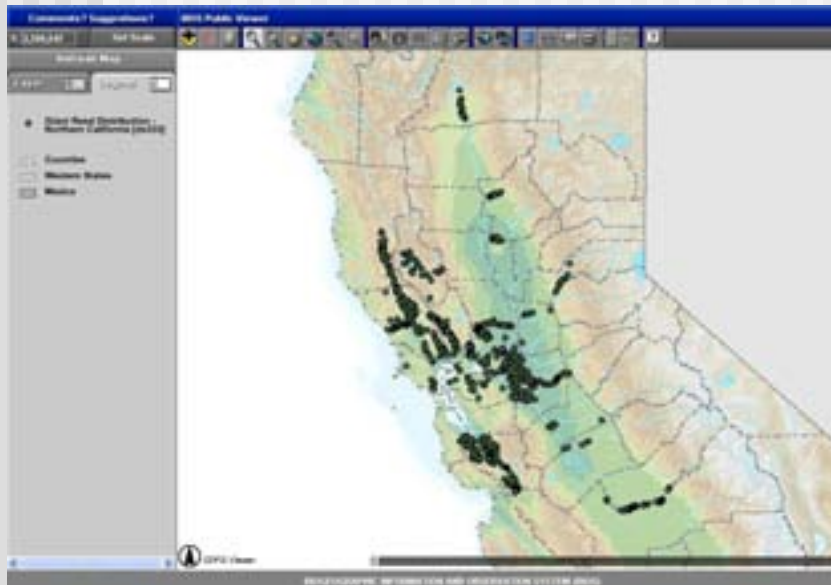
11.7K observations  
22 counties  
21 contributors

Arundo donax Observations  
in North-Central California

# Data Sharing

Consolidated Arundo Distribution file is posted on two public access servers

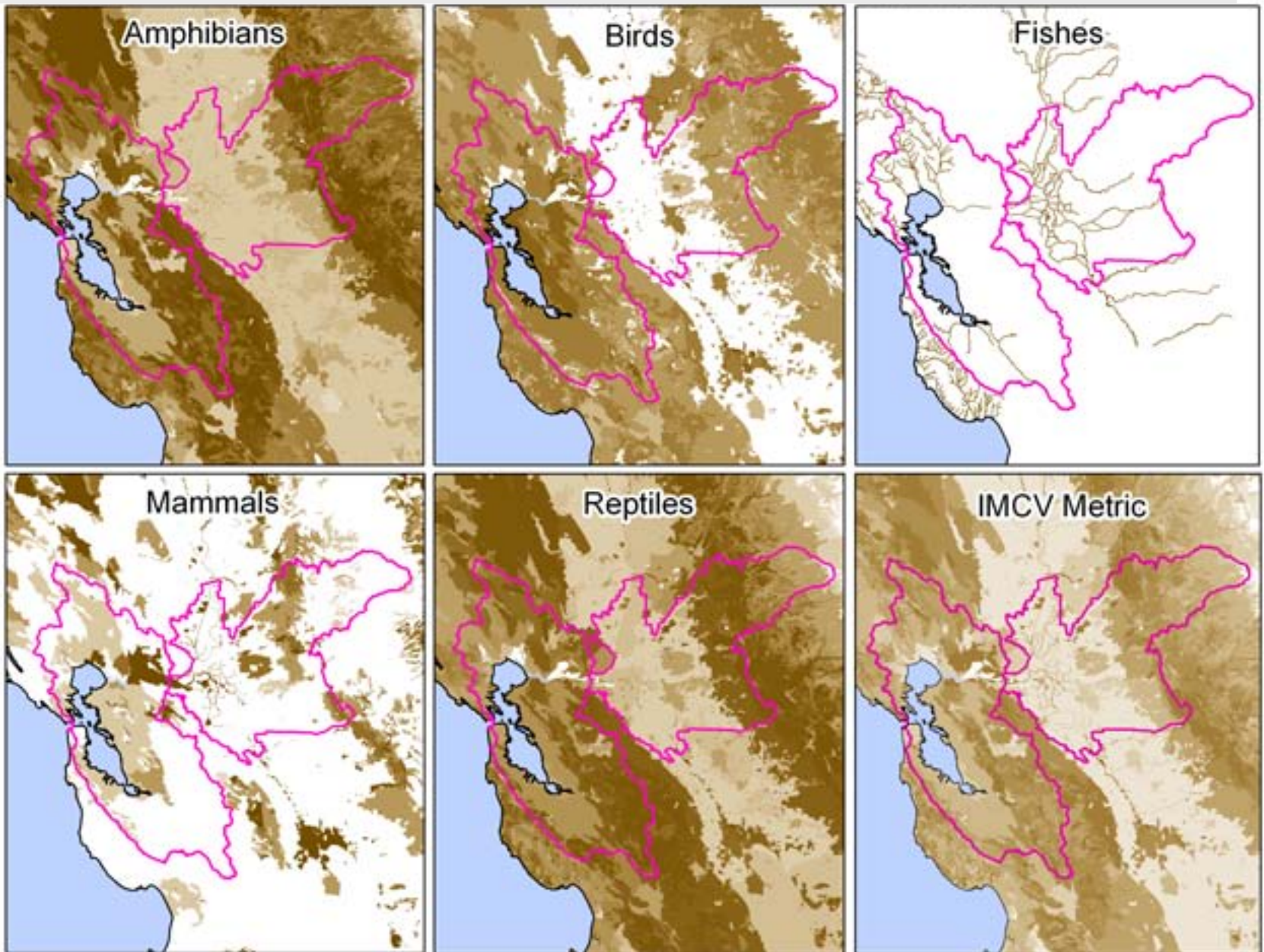
California  
Department of Fish and Game  
BIOS public map server



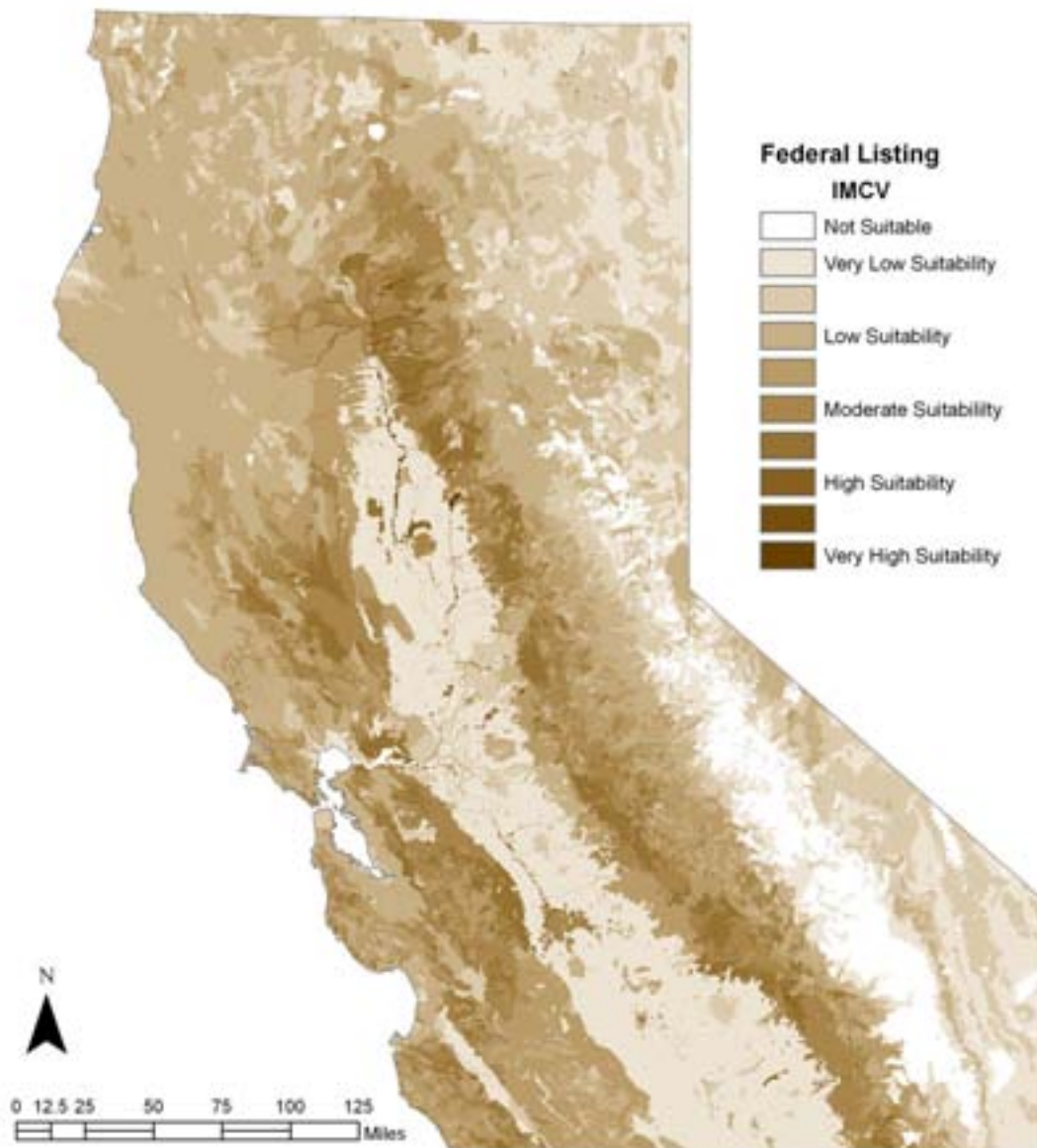
National Biological Information Infrastructure  
California Information Node  
CRISIS Maps



Riparian Habitat Suitability by taxon and IMCV. Darker areas have higher habitat value.

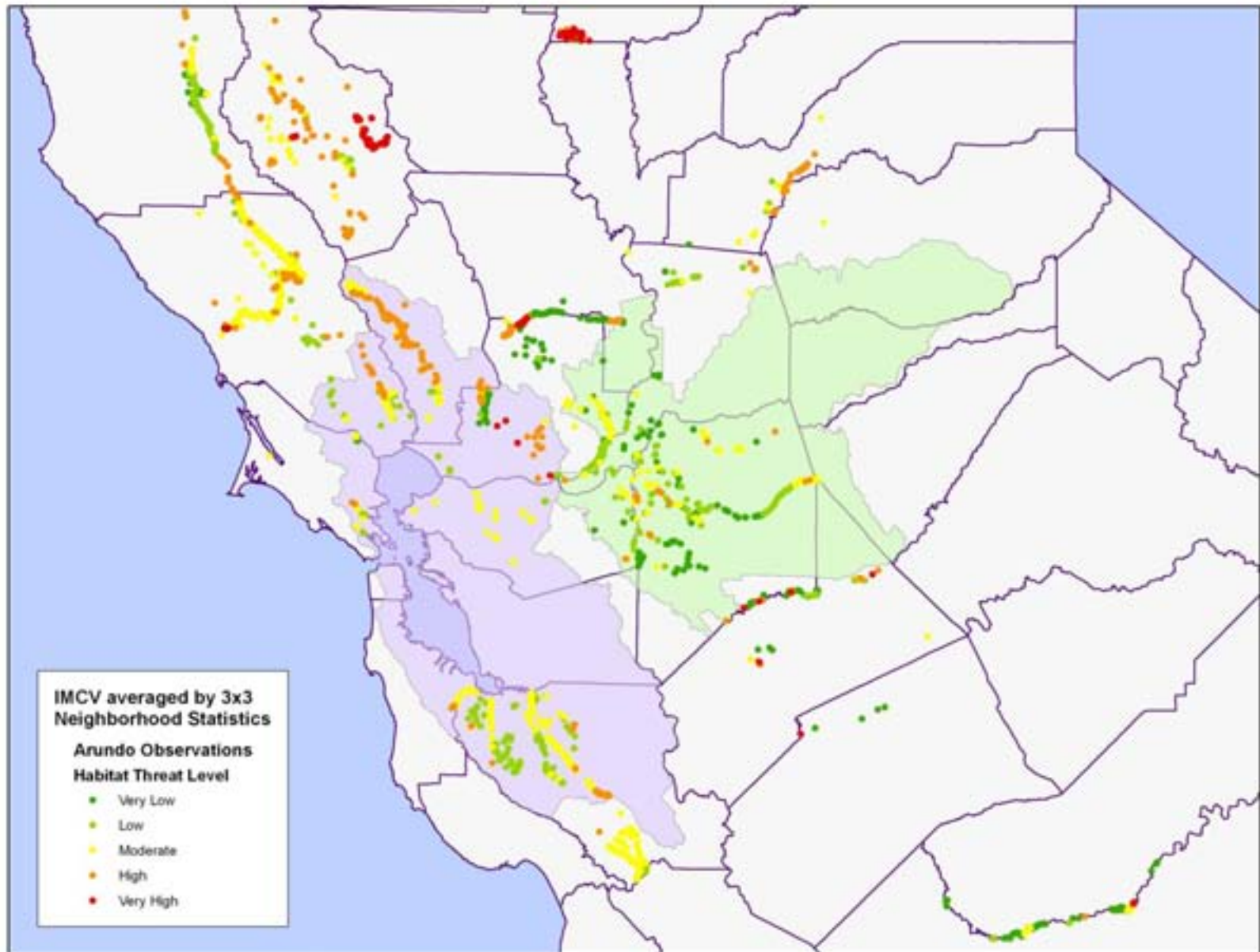


## Index-based Multispecies Conservation Value for Riparian Habitat





# Eradication Priorities Suggested by IMCV





# Lessons Learned

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- A common information source is helpful to get new-comers up to speed
- Support for permitting is helpful but couldn't get blanket permit
- Partners talking to each other was beneficial and contributed to adaptive management
- Good data is hard to get
  - Very difficult to compare across partners
  - Better tools are needed for data aggregation
  - Weed managers need help with their data

# Next Steps:

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## Target Arundo in Priority habitat

- Identify partners in priority areas
- Secure funding for partner support and eradication work

## GeoWeed Development

- Increase data management functionality
- Provide data collection services and support.

# Next Steps:

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## Develop Weed Commons

- Automated data aggregation and exchange
- Technical support and training
- Data management tools
- Continued support of the resource library



*Thank you!*