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

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Presentation Outline

- 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
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

- 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

Adaptive Management

- Analysis
- Test hypotheses
- Mapping
- Arundo Eradication & Coordination Program Steering Committee
  - Evaluate analyses
  - Refine conceptual model
  - Prioritize work sites
  - Refine eradication guidelines
  - Develop new hypotheses

Eradication & Restoration by Eradication Partners

- Monitoring and treatment data
- Post-treatment monitoring
- Eradication, revegetation
- Eradication partners
- Educational materials, technical assistance, eradication priorities
Resource Library at http://teamarundo.org

- Research publications
- Methods
- Outreach materials
- Contacts

**Educational Materials**

Resources from AECP

- 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

- 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

- 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

- 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

- 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 its field forms provide a standard way to describe photos, record descriptions of eradication treatment years. It is based on the North American Weed N was developed for this project, we hope that this for eradication or research purposes, and that the share and combine our data for a regional picture how we.

**About**

There are also Metadata forms and links to information on how to capture.
Supports quality data capture, error detection, and aggregation

http://geoweed.org
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

San Joaquin River Parkway & Conservation Trust
Occurrences: 174 [Map]
Centralized Permitting Support

- 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

- 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
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

Federal Listing IMCV
- Not Suitable
- Very Low Suitability
- Low Suitability
- Moderate Suitability
- High Suitability
- Very High Suitability

Scale: 0 12.5 25 50 75 100 125 Miles

North
Eradication Priorities Suggested by IMCV
Lessons Learned

- 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:

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:

Develop Weed Commons
- Automated data aggregation and exchange
- Technical support and training
- Data management tools
- Continued support of the resource library
Thank you!