

Arundo donax Eradication and Coordination Program Arundo Surveying and Monitoring Protocol

CALFED Bay-Delta Authority (CBDA) Project Number ERP-02D-P68

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I. Overview

The Arundo Eradication and Coordination Program Surveying and Monitoring Protocol is a complete data collection and management system approved by Team Arundo del Norte for the standardized collection and reporting of three kinds of information: 1) an initial site survey which includes Area descriptions and Area Surveys, and Weed Occurrences and Weed Assessments, 2) Treatment information, and 3) follow-up monitoring accomplished by collecting subsequent Weed Assessments and Area Surveys which capture changes in plant communities through weed eradication and by passive or active revegetation. Timing of the data collection will depend upon several factors, including landowner permission, when the eradication is to take place, and weather and stream conditions. Follow-up monitoring will be conducted at least once per year for three to five years following eradication in order to assess its effectiveness.

Initial surveys and monitoring data collection is done using the Weed Information Management System (WIMS) database application, version 3.0. The WIMS 3.0 application and support materials can be found at <http://teamarundo.org/survey/>. Support for partners is provided by the Sonoma Ecology Center GIS & Information Services Program, co-developers of the WIMS 3.0 application. The data system design is compliant with the North American Weed Management Association's International Standards for Inventory, Monitoring, and Mapping of Invasive Plants.

II. Data Collection Protocol

Partners are trained in the standard protocol and the use of GPS, maps, and photo documentation to develop the survey and monitoring data necessary to track the success and cost of eradication and monitoring efforts over the time period of the project and beyond. Data gathered is described below. For more information see <http://teamarundo.org/survey/>

A. Initial Site Assessment and Arundo Observations

An initial site assessment and Arundo observations are collected as part of the partner's Arundo Eradication Plan, which is required before any eradication work is undertaken. The information collected in this initial assessment guides the planning of the project, from landowner contact to choosing the appropriate eradication methods. The assessment may be done rapidly using simple paper forms with drawings on paper maps, or the WIMS application may be used. If a rapid assessment is done, more thorough data will be collected at the time of first treatment. This data will be used as the baseline description of the site so that it can be compared with data obtained during follow-up monitoring. All partners are required to collect baseline, treatment, and follow-up monitoring data, and to report it, as described below.

The data collected in a *rapid assessment* includes:

- Area descriptions with information about owner and other contacts, permission, and instructions for access.
- A weed occurrence description, with species name and a point or polygon on a map.

The data collected for a *complete baseline description* includes:

- Area descriptions with information about owner and other contacts, permission, and instructions for access.
- A survey for each area, noting and describing presence or absence of Arundo and other weeds, other (especially native) plant populations, and disturbances.
- Weed occurrence descriptions, with species name and GPS data (centroid point).
- A Weed Assessment for each Weed Occurrence, with a GPS polygon showing the extent of the population, and data describing the status of the weed such as percent cover, distribution, and phenological stage.
- A session log, recording the crew and staff time required to accomplish the observations.
- Photos of the surveyed areas and weed populations associated with a GPS point and compass direction.

B. Treatment/Revegetation Log

Data collected at the time of treatments includes:

- A Weed Assessment for each Weed Occurrence being treated (see above).
- A Treatment record describing the eradication or revegetation methods used.
- A Session record, recording the crew and staff time required to accomplish the treatments and observations.
- Photos of the treated areas and weed populations associated with a GPS point and compass direction.

C. Follow-Up Monitoring

Monitoring will be done to document and evaluate the success and costs of Arundo control and any revegetation efforts, and allow a comparison of the methods employed. Monitoring information will be collected several times over a period of three to five years. GPS points from the original survey are used to navigate to the treated Arundo stands. The information to be collected is described above under Initial Site Assessment and Arundo Observations, and the data collected will be the same. Repeated observations of site environmental quality and Arundo population status will allow for evaluation of the success of treatment. Photos of the site and treated Arundo will be taken from established photo-points for before and after comparisons.

III. Data Storage and Reporting by Partners

Field data collected by Eradication Partners is to be entered into the Weed Information Management System (WIMS). The weed manager creates and manages the data at his or her personal computer. The data collected by partners is sent to Sonoma Ecology Center on a quarterly basis for combination into a single GIS so it can be viewed and analyzed together for Arundo locations, spread, impact, and eradication method effectiveness. This digital, standardized data can also be readily combined with other important California weed databases such as CalFlora, the California Information Node of the National Biological Information Infrastructure (CAIN), and shared with others such as TNC and California state agencies.

IV. Data Analysis and Sharing

Monitoring using this protocol will enable the analysis of the cost and effectiveness or outcome of the eradication and any revegetation effort employed, the amount of *Arundo* eradicated, and changes in the plant populations at the invaded site. Individual partners may create reports at any time showing acreage of weeds treated and untreated, staff hours spent on the project, methods used and their results, and costs of the treatments. Data combined for the ten partners will be analyzed together to compare effectiveness of different methods and similar methods used in different locations. Locations of weed populations, the organizations working at those sites, and data describing treatments will be displayed on the dynamic map server on the Team *Arundo del Norte* website. Analysis results will be shared when they become available using the website. Data will be filtered for publication on the web to protect the privacy of landowners.