

California Invasive Plant Mapping Organization Profiles June 2006

Agencies or organizations represented: CA Department of Boating and Waterways, Bureau of Land Management, CalFlora, CA Department of Fish and Game, Department of Water Resources, San Francisco Estuary Invasive Spartina Project, National Park Service, CA State Parks, US Geological Survey

CA Department of Boating & Waterways

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What invasive plant data does your organization collect? What species, features, and geographic areas are included?

DBW collects and “maps” GPS point and line features indicating where treatment of *Egeria densa* and water hyacinth occur and where water quality samples are taken. This data includes the type of samples collected, water temperatures, dissolved oxygen levels, pH, wind speed, type and amount of control agents etc.

What techniques does your organization use to collect data?

- Trimble GPS
- Aerial survey with hyperspectral analysis

How regularly is data collected? Is it part of an ongoing program?

Our data is part of our on-going program. Pre season aerial survey with hyperspectral analysis is done annually.

How is data stored locally by your organization? Is it accessible through a GIS application?

We use ArcSDE/SQL Server, ArcIMS, ArcInfo, ArcView and ArcPad in the collection, processing and recording of our data.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

We use the data collected to monitor treatments, for NPDES/ Biological Opinion reporting purposes. Data is also used for special studies, management planning etc.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

We are beginning to map pre and post season using the Hyperspectral analysis methods, working with UC Davis to identify specific submerged plant spectrums and improving on the many possibilities the hyperspectral analysis offers (refer to Susan Ustin from the UC Davis Center for Spatial Technologies and Remote Sensing).

Bureau of Land Management

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The BLM Weed Mapping and Database is currently being piloted in 4 or 5 states this year. It should be available for all BLM and our cooperators to use by this time in 2007. It will be web based. The database capabilities includes spatial applications:

1. tracking weeds treated
2. tracking herbicide applications
3. tracking biocontrol releases
4. tracking other treatments
5. tracking inventories and findings

Calflora

Contacts: John Malpas jmalpas@calflora.org, Roy West rwest@monocot.com.

What invasive plant data does your organization collect? What species, features, and geographic areas are included?

- Calflora collects occurrence data on all species considered to grow wild in California by PLANTS, ICPN, and Cal-IPC. Geographic area: the whole state.

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What techniques does your organization use to collect data?

- Calflora solicits data contribution from educational institutions, organizations (eg. CNPS chapters), and individuals. For some contributions, Calflora staff and volunteers do the data entry.

How regularly is data collected? Is it part of an ongoing program?

- Some new data is entered every week.

How is data stored locally by your organization? Is it accessible through a GIS application?

- Data is stored in a database table. It is available for download to be viewed in a user's GIS app, or viewable with the Calflora Map Viewer.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

- Calflora is most interested in preparing an accurate distribution of various weed species.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

- It would be a great advantage to have some recent, systematically collected weed datasets to experiment with.

California Department of Fish and Game

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What invasive plant data does your organization collect? What species, features, and geographic areas are included?

The DFG Pesticides Investigations Lab request data from managers of DFG wildlife areas and ecological reserves. Information collected includes species, infestation by size class (e.g 10 – 100 acres)— Data is numeric – not mapped. If pesticides were used, the data includes what products were used and in some cases the application method and rate.

Land managers are required to submit a Pesticide Use Recommendation Form to be reviewed by DFG's in-house PCA for each proposed pesticide use and must also submit a Pesticide Use Record Form.

What techniques does your organization use to collect data?

Primarily visual estimates in the field or windshield surveys

How regularly is data collected? Is it part of an ongoing program?

Annual program but some variation from year to year in terms of which areas data is sent in for.

How is data stored locally by your organization? Is it accessible through a GIS application?

Written report - tables summarizing information and also showing data collected from each property separately.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

These reports are used to keep track on a statewide basis of what weeds exist on DFG lands, which are most prevalent and what treatment is being conducted.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

There is not a statewide invasive plant mapping program on DFG lands. Some Wildlife Areas or Ecological Reserves might have maps they have prepared on their own.

Dept. of Water Resources

What invasive plant data does your organization collect? What species, features, and geographic areas are included?

DWR monitors invasive plants in areas relevant to the State Water Project, e.g., California Aqueduct, Lake Oroville SRA, Suisun Marsh, Yolo Bypass, Delta. Only large stands of common weeds are mapped (e.g., Arundo), and casual monitoring for high-risk species (e.g., purple loosestrife, hydrilla) is done by field biologists.

What techniques does your organization use to collect data?

Mapping large stands from aerial photographs, GPS data collection of all significant stands in project areas, identification of all unknown species found during fieldwork (esp. aquatics)

How regularly is data collected? Is it part of an ongoing program?

Data are collected irregularly and as-needed.

How is data stored locally by your organization? Is it accessible through a GIS application?

Data are stored as GIS files.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

Inventory, monitoring, planning

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

We are trying to develop a standardized and regular monitoring program for invasive spp., esp. those for which eradication/containment is possible (e.g., loosestrife, red sesbania), and periodically inform all field biologists about species to look for.

San Francisco Estuary Invasive Spartina Project

Contacts: Katy Zaremba, Mapping and Monitoring Coordinator (kzaremba@spartina.org); Ingrid Hogle Monitoring Manager (ibhogle@spartina.org) Erik Grijalva, Field Operation Manager (ekgrijalva@spartina.org) or Peggy Olofson, Project Director (prolofson@spartina.org).

What invasive plant data does your organization collect? What species, features, and geographic areas are included?

The ISP monitors the San Francisco Estuary and outer coast marshes annually to determine the abundance and distribution of non-native *Spartina* (annual *inventory* or census) and to determine *Spartina* treatment efficacy. (The ISP Control Program coordinates numerous estuary-wide landowners/managers *Spartina* treatment).

What techniques does your organization use to collect data?

GPS field based mapping and monitoring supplemented with color IR aerial photo interpretation. We use Trimble GeoXTs and a specifically written *Spartina* Monitoring Data Dictionary.

How regularly is data collected? Is it part of an ongoing program?

Annual inventory and treatment efficacy data is collected as a part of the Invasive *Spartina* Project supporting the Control Program. The annual Monitoring Program will be ongoing, provided adequate funding, until the weed is determined to be “eradicated”.

How is data stored locally by your organization? Is it accessible through a GIS application?

The ISP Inventory and treatment efficacy monitoring data is currently stored primarily in GIS, as shapefiles, and is managed primarily using MS Excel. This season the ISP Monitoring Program will convert the data management to a Geodatabase. The ISP Control Program has developed an Access database that will be integrated with the Monitoring Program Geodatabase.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

All of the above.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

- As noted above, The ISP Monitoring Program is moving toward establishing a Geodatabase to manage the Inventory and Treatment Efficacy data.
- The Program is looking towards the possibility integrating the with WIMS data with the *Spartina* database and vice versa.
- The Program may also be researching the potential value of hyperspectral data and computer based/automated mapping of wetlands for *Spartina*. This would involve the development of a prototype system (computer algorithm) for detecting *Spartina* using both airborne and satellite imagery.

National Park Service

(Includes CA Exotic Plant Management Team, Inventory & Monitoring Networks, and 16-18 park units that collect invasives data.)

Contacts: Various. For EPMT, Bobbi Simpson (Bobbi_Simpson@nps.gov); for Networks and Parks, Andrea Williams (Andrea_Williams@nps.gov) can serve as information disseminator.

What invasive plant data does your organization collect? What species, features, and geographic areas are included?

Parks are not unified in their data collection effort, with the exception of the EPMT. Some parks only collect data on a few species, others have a list of up to 70 plants they may treat, a subset of which are mapped. Almost all parks track removal activities, and have a list of invasive plants. Parks can be found throughout the state: from coastal Southern, Central, and far Northern California; to the Sierra Nevada; to the southeastern desert region. Such disparate locations mean parks as a whole track hundreds of species in numerous areas. Several parks have their own Access-based databases, many of which are simple evolutions of the original Excel spreadsheet which tracked the basic who, what, where, when (and sometimes how much) of exotics removal. Most databases include the following (required) fields: site/management unit; date; species. Several include reporter; worker type, number, hours (for treatment); area cleared and % cover. Some note ease of access (topography, poison-oak/other vegetation issues), and type of work group the patch could be appropriate for. At least one park has a geodatabase.

APCAM (the Alien Plant Control and Monitoring database) is the standard database for the EPMT, built on the Natural Resource Database structure from Inventory & Monitoring. APCAM is NAWMA-compliant, allows for the collection of data related to the inventory, monitoring and control of exotic plants. In addition, data regarding weather, collected plant material, digital photographs, budgetary tracking, and spatial relationships can be stored by APCAM. Some parks also use APCAM. The EPMT travels to 12-13 partner parks per year, and collects data at all of them.

What techniques does your organization use to collect data?

Most parks and the EPMT use a combination of GPS units (with or without a data dictionary) and paper maps and data sheets to collect data. Some use PDA's linked to GPS, with or without ArcPad.

How regularly is data collected? Is it part of an ongoing program?

For the EPMT, data is collected whenever crews are in the field; collection and management are part of the ongoing program. With most parks, data collection is consistent for some species or areas but not others. Often removal tracking (for hours/acres reporting) is more regular than spatial data collection (where and how big the patches are).

How is data stored locally by your organization? Is it accessible through a GIS application?

Park data is generally stored in a central database, and spatial data eventually stored with the corporate GIS. Often, with larger parks, issues with multiple users and servers

can cause problems. Also, some GIS data may be stored on an individual project manager's computer until the project is nearly complete, and then the files will be transferred over. Metadata is nearly nonexistent.

The EPMT stores data on its computers in APCAM, which is linked through the Infestation ID to spatial data.

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

Parks and the EPMT use spatial data largely for planning or reporting purposes—making maps to show where species are or were to show interested parties, be they funders, staff, volunteers, etc.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

Parks would like to be able to better share data and collect negative data to help with early detection efforts. The EPMT is mandated to use APCAM; some parks also use it, and rumors have circulated that it may be mandated for park reporting purposes. The San Francisco Area Network and its member parks are beginning the move to WIMS, largely to share a common database with other WMA participants; if the move is successful, other parks may adopt it. A crosswalk between APCAM and WIMS is essential. Some parks also have multiple organizations collecting data in one park, and the current WIMS setup does not capture this well (administration data necessitates the duplication of areas across organization and projects?), nor does the setup allow for importing lists easily. Some parks would like a web-based application for data entry and upload so park cooperators can add their data, but this runs up against security issues. Needs for “Best Data Management Practices” are apparent—should parks store spatial data by species, or by year? How do you know if your shapefile is complete? How often should data be backed up?

Other questions include: What is a patch? How do you track efficacy, and link it in a shareable way to treatment method? How do you link fire or plot data to invasive species information? How can you use mapping information for modeling?

State Parks

Background

The Natural Resource Division of State Parks has embarked on a weed mapping program for all park districts. The use of handheld GPS devices will be used employing a series of weed mapping tools developed for use in ArcPad. The data collected is based on a modification of WIMS. It should be noted that not all invasive plants will be mapped in every park unit. Based on prior data regarding infestations of invasive species and individual park units, funding and timeframe, as well as other variables, priorities are being set as to which species will be mapped and when. Currently we have a series of testers in different parts of the state evaluating the application of the mapping tools and subsequent database for a selection of invasive species. The idea behind the whole program is to capture baseline data regarding infestations and treatment. If the resource professional wants more in depth information and more detailed mapping the program does allow for that.

When the testing is complete and the final development of the application is done the program will be a fully functional mapping program that will capture data on occurrence, assessment and treatment. Said data will then be compiled into a central geodatabase. The development of this program was inclusive utilizing the knowledge of field ecologists as well as managers and GIS professionals.

Tools

As mentioned before data is captured at three different phases (Occurrence, Assessment and Treatment). Each tool has a series of tabs with pull-down menus or data entry fields. Some fields are required while others are not. A warning does pop-up if a required field is not attributed.

The first tool is for occurrence. It is designed to quickly capture the general location of the infestation by using a point feature. A series of tabs captures the basics on occurrence, area, attributes, photographs and coordinates.

The next tool captures assessment data using a polygon feature. Location/extent is mapped with this tool that will include statistical information regarding the infestation.

The third tool is the treatment area, again using a polygon feature. Captured is information on the type of treatment and subsequent information depending on the type of treatment used.

Next Steps

The development of this program is ongoing. Field testing is still being applied and mapping priorities are still being developed. There will also be a training phase to bring everyone involved up to speed.

Contact

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U.S. Geological Survey

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What invasive plant data does your organization collect? What species, features, and geographic areas are included?

We collected distribution and abundance of all non-native plant species within selected disturbed (anthropogenic) sites in Yosemite, Sequoia and Kings Canyon National Parks. This included campgrounds, developments, corrals/pack stock holding areas, trail segments, road segments.

What techniques does your organization use to collect data?

We collected GPS data on survey area perimeters and trail/road segment locations. We estimated abundance by species within surveyed area, and recorded vegetation type and vegetation structure to correlate with species occurrence.

How regularly is data collected? Is it part of an ongoing program?

Data were collected over a two year period. National Park Service followed up with control programs and additional surveying in burned and riparian areas.

How is data stored locally by your organization? Is it accessible through a GIS application?

Data are available in GIS format and in a final report that summarizes species occurrence by site, sites in which each species occurred, patterns of species occurrence, comparison of composition among sites, species priority rating for control efforts (Gerlach et al. 2003).

How does your organization use invasive plant spatial data? Inventory, monitoring treatments, strategic planning?

The NPS used resulting spatial data to plan control efforts.

Where is invasive plant mapping headed in your organization? What additional needs have been identified?

We have no plans currently to do additional invasive plant mapping. NPS took our recommendations for surveys of naturally disturbed areas and have been surveying burned areas and riparian areas. This is also evolving into development of an invasive species early detection system focused on varying degrees of fire severity in wildland fire areas. Inventory work occurs regularly following wildland fires. We identified the need to determine the extent of Kentucky bluegrass (*Poa pratensis*) and *Poa palustris* invasion in montane meadows.