TNC's Weeds Information Management System (WIMS):
A Tool for Invasive Weed Mapping & Management

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Summary:
TNC's Weeds Information Management System (WIMS) is a Microsoft Access-based relational database application that is designed to assist natural resource managers in managing their weed data. WIMS keeps track of three types of data records: weed occurrences (GPS point locations), assessments (size and status of the weed infestation to facilitate monitoring over time), and all management treatments applied to those weed infestations.

Once data are entered into WIMS, data can be easily exchanged between multiple users, exported in NAWMA (North American Weed Management Association) standards, and written to shapefiles for mapping in any standard GIS program. A variety of reports (including Pesticide Use Reports) can also be easily generated. Additionally, WIMS can be used on a handheld computer with GPS to facilitate data capture in the field. When using WIMS on a handheld unit with an ArcPad interface, a site manager can use background imagery and other GIS layers for mapping weeds and collecting associated data, then upload that new data into the WIMS Access database with a few mouse clicks!

How can WIMS help you & your weed work?
WIMS works to help you organize, map, and keep track of your weed-related data. Specifically, WIMS can tell you:

- What weeds do I have for a given area?
- Where they are located spatially?
- Are weed patches changing (expanding, contracting) over time?
- What management actions did I take? When?
- What resources did I spend (staff & volunteer time, money) on managing a specific patch of weeds?
- Are resources being spent effectively & efficiently?

How WIMS is Used – Data Flow & Exchange

WIMS Access Desktop Database
(PC desktop or laptop)

1. Customize WIMS for your project: Plant List, herbicide list, Areas, etc.

2. Enter data manually (paper forms) or collect field data on a handheld unit

3. Share data!

Import Data:
- Excel
- other shapefiles

Export Data:
- Excel spreadsheet
- NAWMA output
- Reports

GIS Export to create shapefiles, to be opened in ArcMap or ArcView

How is WIMS Organized?
The most basic unit within WIMS is the weed Occurrence. All Assessments are tied to a specific Occurrence, and each Occurrence can have *n* Assessments associated with it. Treatments can encompass one to many Occurrences.

What is WIMS & what can WIMS do?
WIMS is a MS Access relational database which sits on your desktop/laptop computer, and works to keep track of all of your weed-related data! WIMS is designed to record occurrences of weeds across the landscape regardless of ownership and conservation status. It also tracks assessments of those occurrences over time (size of infestation, etc.), records all management activities for those infestations, as well as keeps track of how much time is spent doing these management activities.

Occurrences: Weed occurrences are recorded as points, and include basic information such as weed species, location (latitude/longitude), the management unit that this patch occurs in, etc. This initial occurrence can also specify ownership of land, township, range, if there is a management plan for it, etc.

Assessments: Assessment records keeps track of how the weed occurrence patch is changing over time, with or without treatments. Assessments can be chronicled as either linear polygons or as polygons, and quantitative assessments of cover, density, biomass or frequency can be recorded.

Treatments: WIMS works to keep track of all management activities applied, including any manual and mechanical methods used, biological control agents (microbes, fungi, insects), grazing animals, prescribed fire, and chemical treatments. Information attached to each treatment includes among others: what was done, effort (staff and volunteer time) and resources (money) spent, area treated, percent of occurrence treated, herbicide and adjuvant information needed to generate Pesticide Use Reports, weather conditions at time of application, etc.

What else can WIMS do?
WIMS can share easily data between multiple users, and can also produce a variety of reports and outputs, including:

Reports: Pesticide Use Reports, Weed Inventory by County or Site, treatments by area, biological control agent used, hours worked by staff and volunteers, etc.

Sample Reports that can be automatically produced by WIMS

Excel spreadsheets/NAWMA standards: All data from the database can be exported and shared with partners as Excel spreadsheets. Data can also be readily exported to Excel in the NAWMA format.

GIS Integration: All location data can be exported as either lat./long. minutes or UTM units into true ESRI shapefiles, which may then be imported into any standard GIS program.

Shapefiles produced by WIMS of the weed data from the USFWS Ottawa Refuge, Ohio, and readily displayed onto a map

Situation in the Field...

Weed Occurrence in the Field
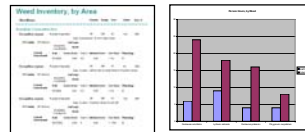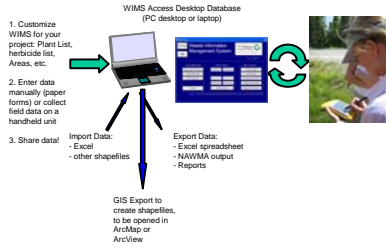
Weed Assessment in the Field

Weed Treatment in the Field

Data Entered into the WIMS Access Database

Sample Data Collected on a Handheld Computer

Narrative description of location

Easy to use pull-down Plant Lists are easily customizable for your site

Lat/long info is automatically retrieved from the attached GPS unit

Each Assessment record becomes associated with one and only one Occurrence record

WIMS can automatically calculate the gross and infested area

Separate tabs for size, cover, density, frequency or biomass measurements

WIMS can keep track of herbicide and adjuvant use, and can even calculate total amt of product used!

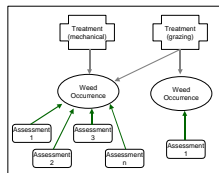Each Treatment can be associated to one-several weed Occurrences

Approximate Cost* for WIMS:

WIMS Desktop Database

WIMS MS Access Database	Free (download)
GPS unit + paper forms	$100+

Handheld Unit (optional)

ArcPad software	$500
Handheld computer + GPS	$350 – $3,500+

*Assuming that you already have MS Office (with MS Access), and an optional GIS program

Conclusions:
- WIMS can easily capture and organize weed Occurrence, Assessment, and Treatment information.
- Accuracy and speed of data transfer is much improved.
- WIMS can greatly improve the efficiency of our adaptive management and monitoring efforts, improving our management decisions.
- WIMS can increase our effectiveness at larger scales, by building partnerships and easily sharing weed-related data.

For more info on WIMS:

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