

Updating GeoWeed

Cal-IPC 2012

OUTLINE

- What is GeoWeed
- How is it used
- What changes to GeoWeed are planned for the near future (2-3 years)
- **What changes/improvements would be most helpful to your program**

GeoWeed

GeoWeed is a geospatially data collection and management tool for invasive plants (Access database with an ArcPad toolbar).

GeoWeed allows you to record locations of plants.

Plant populations may be tracked over time using GPS points or polygons.

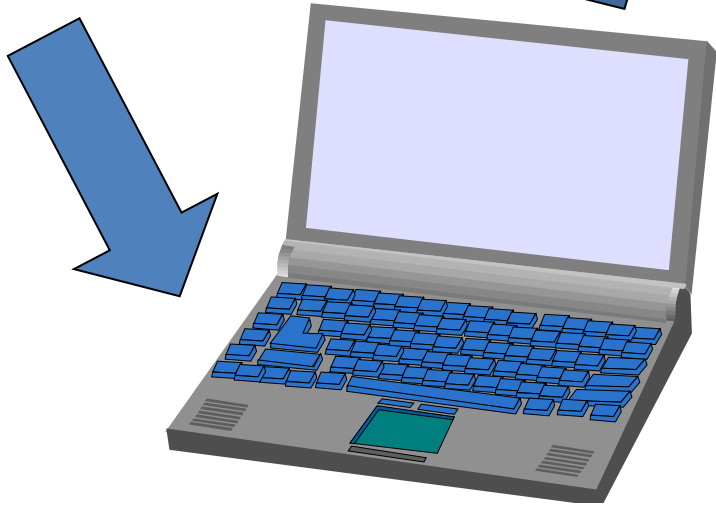
Treatments and labor can be tracked.

GeoWeed uses a superset of the NAWMA weed mapping standard, and contains mostly a superset of the data collected in TNC-WIMS.

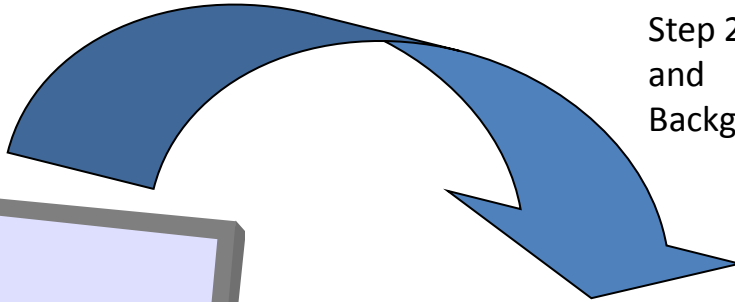
GeoWeed is free and open source software.

GeoWeed Work Flow

Step 1: Download Geoweed



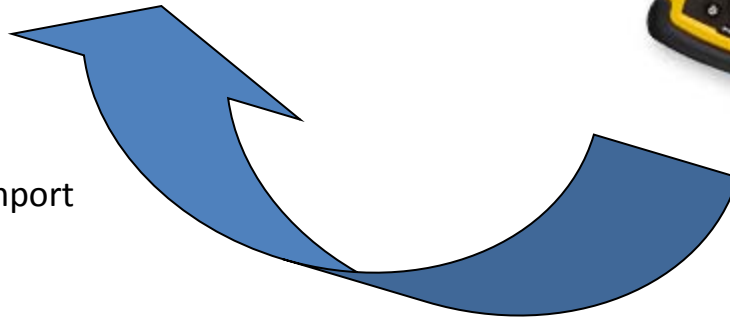
Step 2: GIS Export and Background layers



Step 3: Field Data Collection



Step 4: GIS Import



“OATS” data elements

- Occurrences – species point data
- Assessments – species cover and other parameters (polygon)
- Treatments – action performed on one or more Assessments (polygon)
- Surveys – multi-species survey of defined area
- Work Sessions contain data about the activities of a given crew on a given date: crew, times, distance traveled, etc...
- Regions represent geographic regions in which weeds and work are recorded

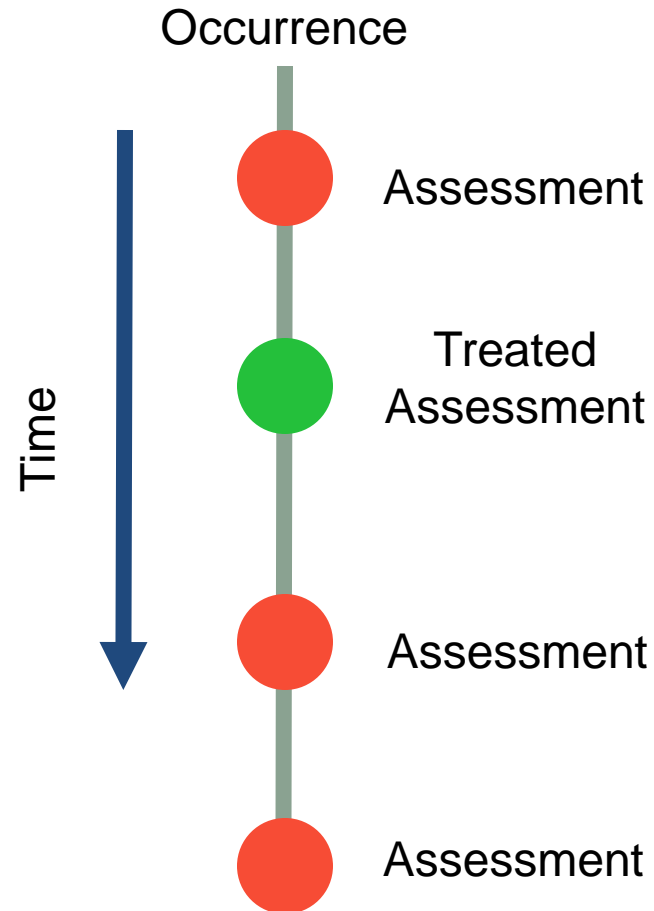
What's the difference between an Occurrence and an Assessment?

- An Occurrence is a species and location
 - Has info that doesn't change with time, common to all Assessments of that occurrence

- An Assessment is a snapshot in time of the state of an Occurrence
 - Has time-changing info as of that date
 - Size (polygon) on that date
 - Phenology
 - For treated Assessments: % treated, “retreatment” flag

The Abacus metaphor

- Occurrence like a wire, is one weed patch over time
- Assessments like beads on the wire, each with a given date, size...



Occurrences

Occurrences

Time



Patch 1A



Patch 1B



Patch 2A



Patch 2B



Patch 3A

Regions

North Meadow

South Meadow

Occurrences

Occurrences

Patch 1A

Patch 1B

Patch 2A

Patch 2B

Patch 3A

Time



Regions

North Meadow

South Meadow

Occurrences

Sessions

Patch 1A

Patch 1B

Patch 2A

Patch 2B

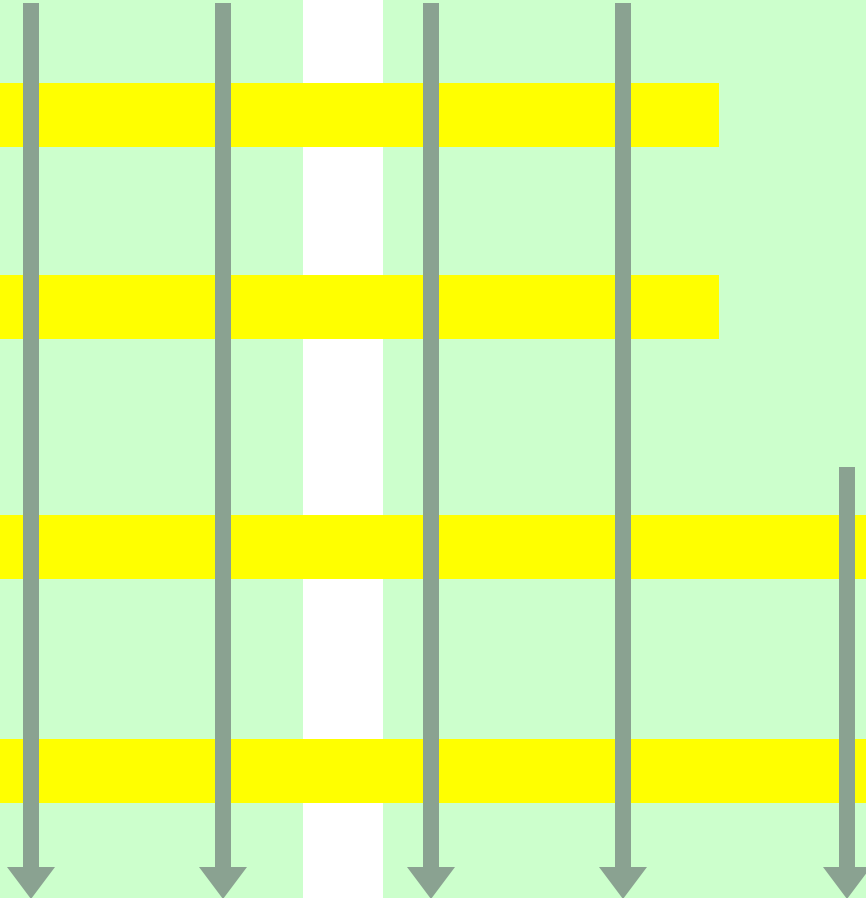
Patch 3A

March 13, 2007

Oct. 10, 2007

June 3, 2008

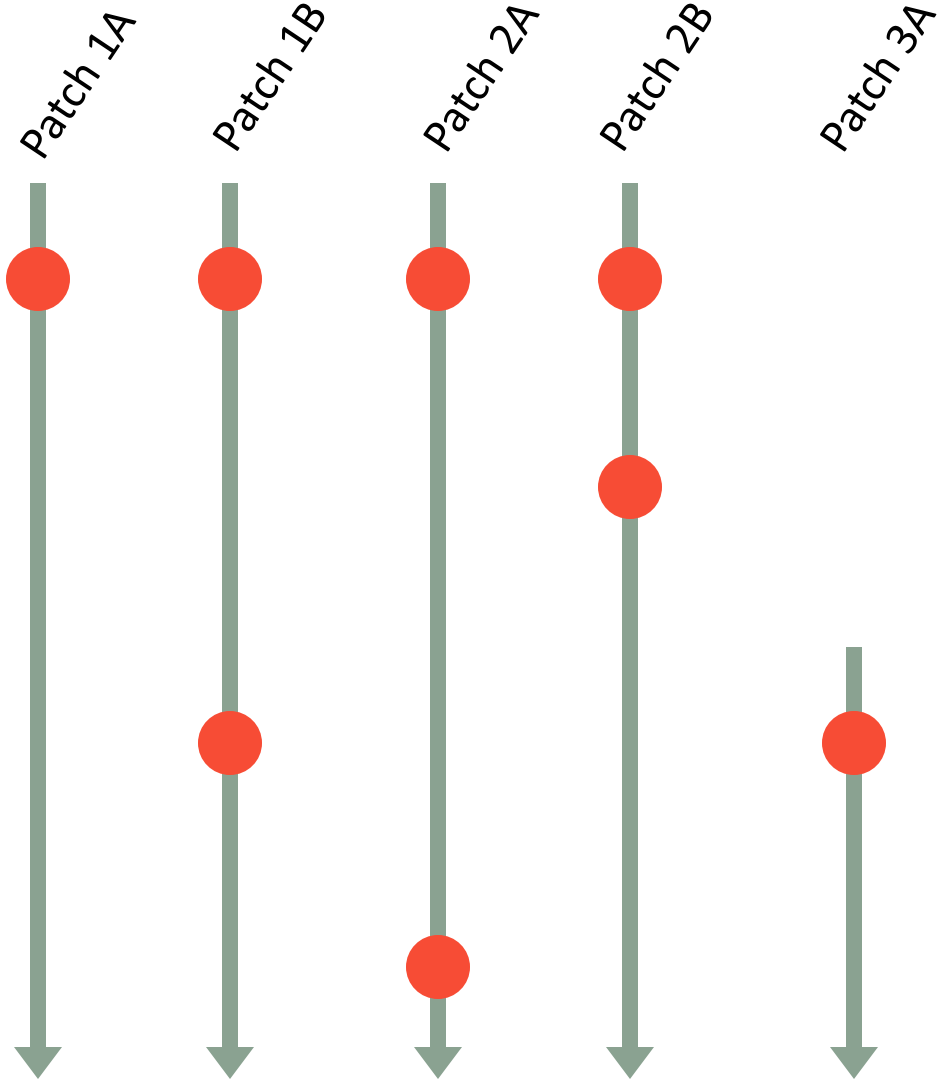
Aug. 13, 2008



Occurrences,
Assessments,
Sessions

Occurrences

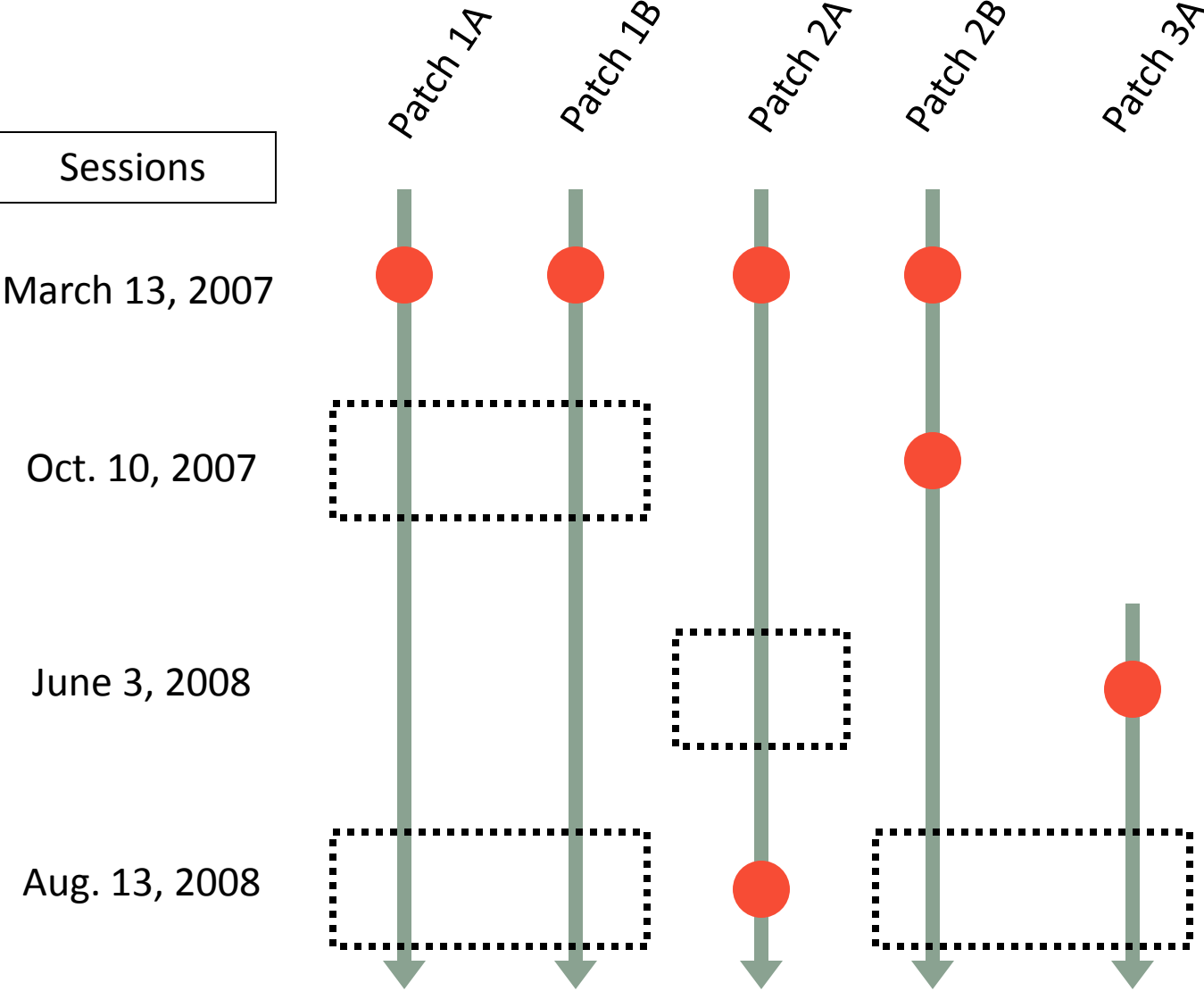
Sessions



+ Treatments

Occurrences

Sessions



+ Treatments,
and treated
Assessments

Occurrences

Sessions

March 13, 2007

Oct. 10, 2007

June 3, 2008

Aug. 13, 2008

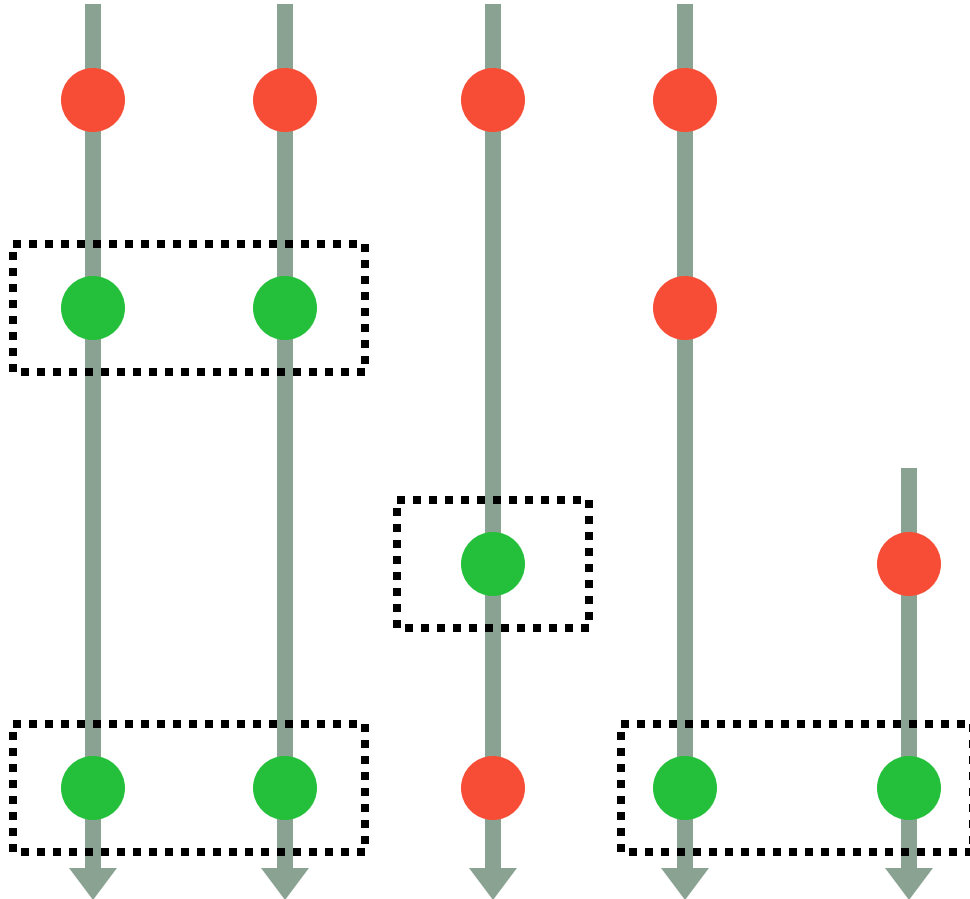
Patch 1A

Patch 1B

Patch 2A

Patch 2B

Patch 3A



The GeoWeed Interface

The screenshot displays the GeoWeed Top Menu interface. At the top left, the title "GeoWeed Top Menu" is shown in a blue header. Below this, the "GeoWeed" logo is prominent. To the right of the logo, two boxes provide system information: "GeoWeed Database Name: NPS Training June 11 2007" and "Database version: 3.1", and "Current Org Group: GOGA Vegetation Management" and "Default Project: Invasive Plant Management". Below the logo, the text "Run version: 3.1.15" is visible. The main navigation area features three tabs: "Data Navigation" (which is highlighted), "Handheld and GIS Operations", and "Administrative Functions". Under the "Data Navigation" tab, there is a "History" section with a dropdown menu showing "16:39:20 Editing Photos" and a "Jump Back" button. The central area is divided into three main sections. On the left, under the heading "Manage your data", there are ten buttons arranged in two columns: "All 459 Occurrences", "All 46 Work Sessions", "All 402 Assessments", "All 275 Regions", "All 9 Treatments", "All 27 Contacts", "All 3 Surveys", "All 2 Projects", "All 3 Photos", and "All 1 Organizing Groups". In the middle, there are three buttons: "About GeoWeed", "Reports", and "Check and Clean", with an "Exit GeoWeed" button at the bottom. On the right, under the heading "Manage your support lists", there are four buttons: "Plants", "Herbicides", "Adjuvants", and "Bioagents". At the bottom left of the interface, there are two lines of text: "Data: C:\GeoWeed\GeoweedData3.1-NPS_Training_June_11_2007.mdb" and "Run: C:\GeoWeed\GeoWeedRun3.1.13g.mdb".

Top Menu

The GeoWeed Top Menu

GeoWeed Top Menu

GeoWeed

Run version: 3.1.15

GeoWeed Database Name: NPS Training June 11 2007
Database version: 3.1

Current Org Group: GOGA Vegetation Management
Default Project: Invasive Plant Management

Data Navigation | Handheld and GIS Operations | Administrative Functions

History: 16:39:20 Editing Photos [v] Jump Back

Manage your data

- All 459 Occurrences
- All 46 Work Sessions
- All 402 Assessments
- All 275 Regions
- All 9 Treatments
- All 27 Contacts
- All 3 Surveys
- All 2 Projects
- All 3 Photos
- All 1 Organizing Groups

About GeoWeed
Reports
Check and Clean
Exit GeoWeed

Manage your support lists

- Plants
- Herbicides
- Adjuvants
- Bioagents

Data: C:\GeoWeed\GeoWeedData3.1-NPS_Training_June_11_2007.mdb
Run: C:\GeoWeed\GeoWeedRuns\1.12g.mdb

One Click to Data Records – OATS+

Creating a New Occurrence

The screenshot shows the GeoWeed web application interface for editing an occurrence. The window title is "GeoWeed editing Occurrences". The main content area displays the following information:

- Occurrence Name:** Sonoma Creek 1
- Plant Name:** Arundo donax
- Recorded by:** DiPietro, Deanne
- State:** CA, **County:** Sonoma
- Primary Region:** SEC Parking Lot
- Date Recorded:** 5/30/2007
- Discovery Year:** 2007
- Latitude:** 38.352116
- Longitude:** -122.520882 (decimal degrees)

Navigation and action buttons include "Filter", "View as Table", "ReCalc", "Top", "Back", "Jump", "New", "Undo", "Save", and "Delete". A "Related Records" sidebar shows "No Current Assessments", "No Assessments", "My Primary Region", and "My 1 Region". A "Recheck" button is located in the bottom right corner of the main content area.

Info Regions USPLS and other Geographic Info Ident Confidence

An Occurrence is a basic observation of a weed plant, patch or population, concentrating on identification and general location. . . It's status at given times may be further described in one or more Assessments.

New Occurrence with Data Entered

Creating an Assessment

GeoWeed 3.1.11f Assessments 15:06:29 Editing Assessments

Record 1 of 1

Filter View as Table ReCalc Top Back Jump

for Occurrence: Current Assessment

Occurrence: Sonoma Creek 1
Species: Arundo donax
Region: SEC Parking Lot
Phenology: Mature
Vegetation:
Distribution:
Notes:
 ReTreatment

Session: 5/30/2007 [13:00 - 16:00] SEC Pre-Training
My Time: 13:30 to 13:50 Labor Hours: 0.33 Auto Calc
PersonHours: 0.666
Recorded By: DiPietro, Deanne

Area (size) Source **Size of Assessment** **# Plants**

LxW 10x20 m desk	Gross	200.0 m ²	Assessed	0
CoverClass 75 - 95%	times % cover	85		
	Infested	170.0 m ²		

Treatment for this Assessment (optional) times % treated: 100 Treated: 0.0 m²

Treatment:

Info Size Calc Density and Misc Photos Current Assessment Coordinates

Area (Size) Calculation

Calculate from Polygon

10 × 20 m

CoverPercent: 85

Size in Hectares

Gross: 0.02000000
Infested: 0.01700000

Related Records

My Occurrence
No Treatments
My Work Session

New Assessment with Data Entered

Creating a Treated Assessment

The screenshot shows the 'GeoWeed editing Assessments' window. The title bar includes 'GeoWeed 3.1.11f Assessments' and a clock showing '17:26:45 Editing Assessments'. The interface is divided into several sections:

- Navigation:** Record navigation (1 of 1), Filter, View as Table, ReCalc, Top, Back, Jump buttons.
- Assessment Details:**
 - for Occurrence: Current Assessment
 - Occurrence: Sonoma Creek 1
 - Species: Arundo donax
 - Region: SEC Parking Lot
 - Phenology: Mature
 - Vegetation: [empty]
 - Distribution: [empty]
 - Notes: [empty text area]
 - ReTreatment:
- Session Information:**
 - Session: 5/30/2007 [13:00 - 16:00] SEC Pre-Training
 - My Time: 13:30 to 13:50
 - Labor Hours: 0.33
 - PersonHours: 0.666
 - Auto Calc:
 - Recorded By: DiPietro, Deanne
- Size of Assessment:**

Area (size) Source	Size of Assessment	# Plants
LxW 10x20 m desk	Gross 200.0 m ²	Assessed 0
CoverClass 75 - 95%	times % cover 85	Treated 0
	Infested 170.0 m ²	
- Treatment for this Assessment (optional):**

times % treated 70	Treated 119.0 m ²
--------------------	------------------------------
- Treatment:** 5/30/2007 [14:00 - 14:30] Chemical

At the bottom, there are tabs for 'Info', 'Size Calc', 'Density and Misc', 'Photos', and 'Current Assessment Coordinates'. A 'Recheck' button is located in the bottom right corner.

An Assessment represents a "snapshot" of the state of an Occurrence on a given date. Each Occurrence will tend to accumulate Assessments over time if it continues to be monitored. Some Assessments are made in conjunction with a Treatment, and serve to describe some part of the area being treated.

Assessment Now Linked to Treatment

The GeoWeed Top Menu

GeoWeed Top Menu

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Run version: 3.1.15

GeoWeed Database Name: NPS Training June 11 2007
Database version: 3.1

Current Org Group: GOGA Vegetation Management
Default Project: Invasive Plant Management

Data Navigation | **Handheld and GIS Operations** | **Administrative Functions**

History: 16:39:20 Editing Photos [v] Jump Back

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About GeoWeed

- Reports
- Check and Clean

Manage your support lists

- Plants
- Herbicides
- Adjuvants
- Bioagents

Exit GeoWeed

Data: C:\GeoWeed\GeoweedData3.1-NPS_Training_June_11_2007.mdb
Run: C:\GeoWeed\GeoWeedRun3.1.13g.mdb

Support Lists – Plants, Herbicides, etc

The GeoWeed Top Menu

GeoWeed Top Menu

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- About GeoWeed
- Reports
- Check and Clean
- Exit GeoWeed**

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Data: C:\GeoWeed\GeoweedData3.1-NPS_Training_June_11_2007.mdb
Run: C:\GeoWeed\GeoWeedRun3.1.13g.mdb

Common Actions – including **Exit**

GeoWeed in the San Francisco Area National Parks

Inventory and Monitoring Program

Golden Gate National Recreation Area

Prioritized Survey Areas

Inventory and Monitoring Program

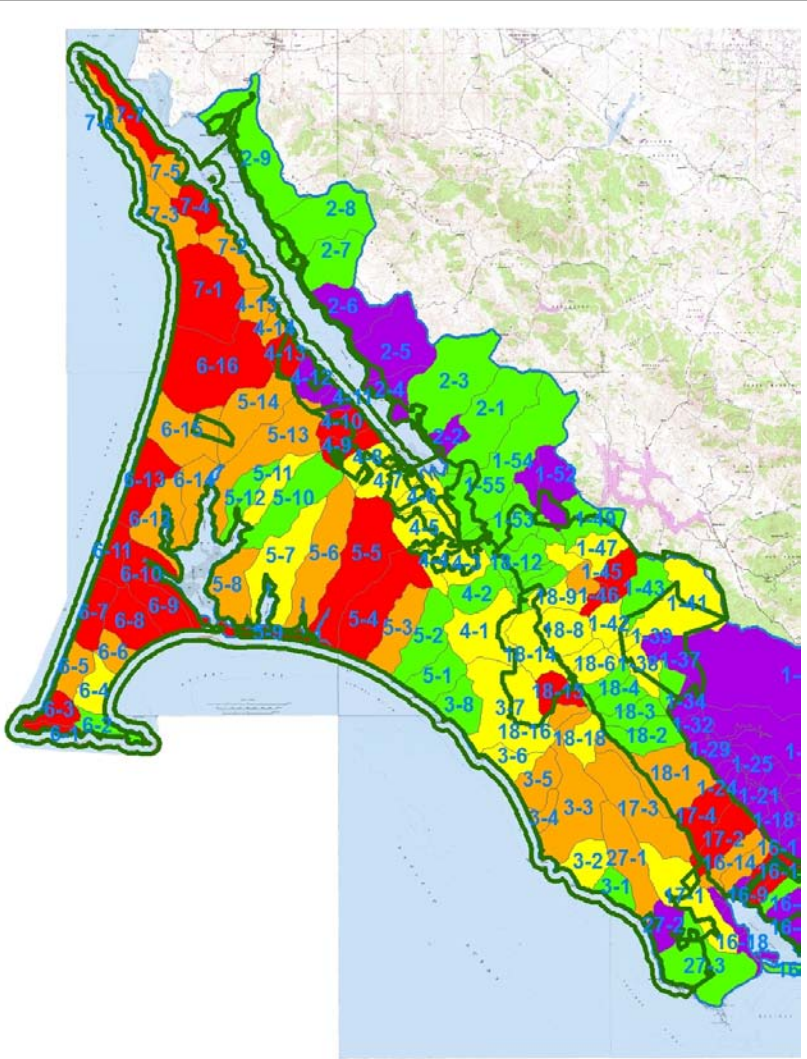
5 year survey cycle

Survey frequency

- High Priority
 - Yearly (5X/5 years)

- Significant &
 Moderate Priority
 - Twice (2X/5 years)

- Low Priority
 - Once (1X/5 years)



Legend

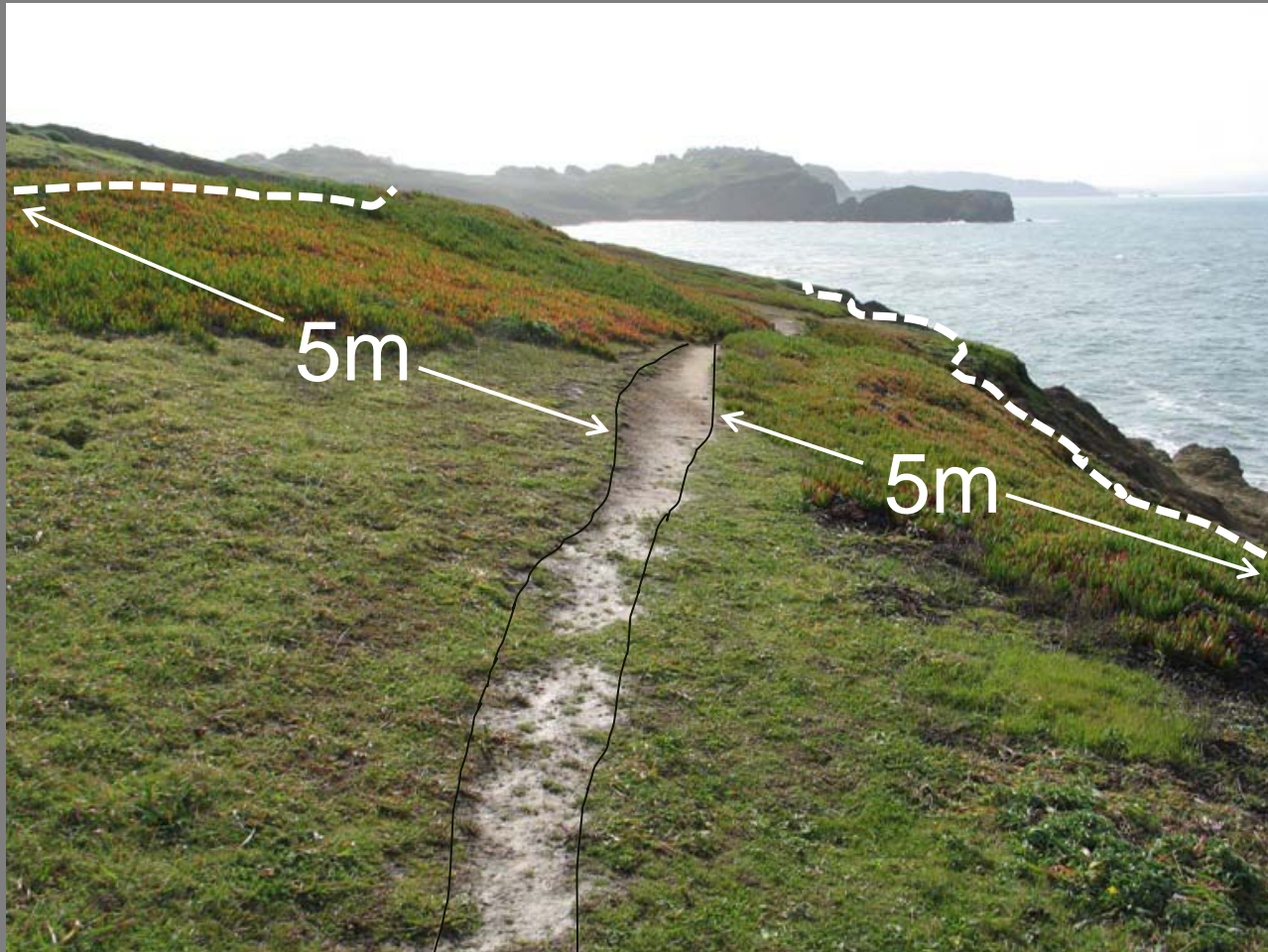
Subwatersheds





Priority level

- HIGH
- LOW
- MODERATE
- OUT OF PARK
- SIGNIFICANT
- PORE Boundary
- GGNRA boundary

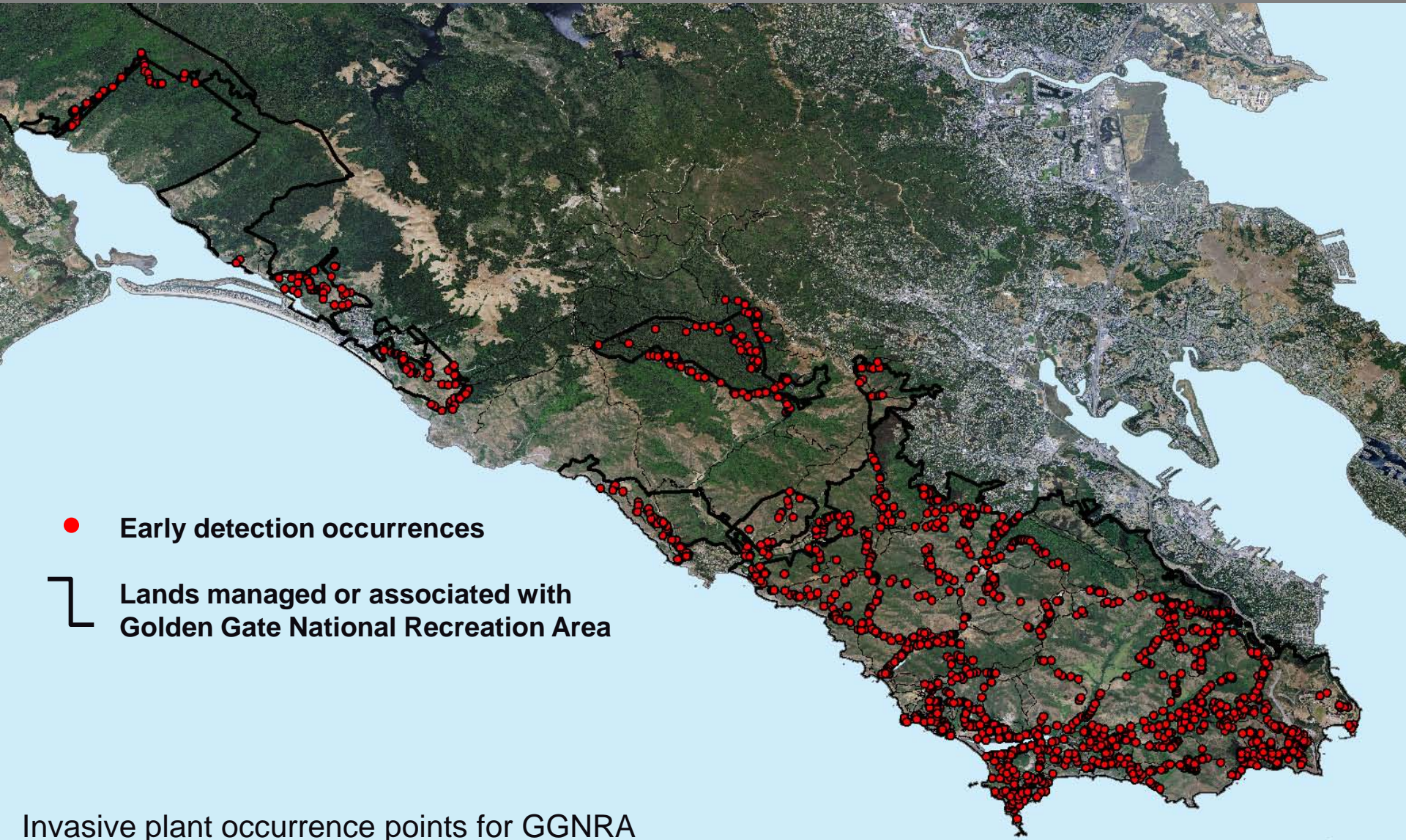
Williams, A. E., S. O'Neil, E. Speith, and J. Rodgers. 2009. Early detection of invasive plant species in the San Francisco Bay Area Network: A volunteer-based approach. Natural Resource Report NPS/SFAN/NRR—2009/136. National Park Service, Fort Collins, Colorado.

Surveys occur within a 5 meter buffer on each side of all roads and trails in the SFAN park units.



Our Priorities	Example	Explanation	Data collected
<p>List 1 (Highest Priority Plants)</p>	 <p>Capeweed</p>	<p>List 1 plants are highly invasive and are typically not widespread. Control or even eradication is often feasible.</p>	<p><i>Point occurrences*</i> and <i>polygon assessments**</i> are recorded for all patches, regardless of their size.</p>
<p>List 2 (High Priority Plants)</p>	 <p>Cape Ivy</p>	<p>List 2 plants are highly invasive and usually more common than List 1 species. Small, outlier patches may be targeted for eradication or control.</p>	<p><i>Point occurrences</i> are recorded for all patches regardless of their size, and <i>polygon assessments</i> are recorded for all patches smaller than 100 m².</p>
<p>List 3 (Medium Priority Plants)</p>	 <p>Sweet fennel</p>	<p>List 3 plants are usually widespread and difficult to control at the scale of the park. Uncommon species of concern are also listed here to improve our understanding of their distribution in the park.</p>	<p><i>Point occurrences</i> are recorded for all patches smaller than 100 m².</p>
<p>List 4 (Lower Priority Plants)</p>	 <p>Rattlesnake grass</p>	<p>List 4 plants include all other exotic species that are not captured by Lists 1 – 3. Typically, these are ubiquitous invasive plants and are beyond control, or they are waifs.</p>	<p>These plants are not mapped. Observers record presence/absence.</p>

Preliminary Results



Invasive plant occurrence points for GGNRA

GGNRA Project Sites



GeoWeed in the Cloud; Support for Inv. Plant Data Management

Collaborators: Dan Glusenkamp (CalFlora; now with CNPS)
Deanne DiPietro (Sonoma Ecol. Center; now with PRBO)

Inventory & Monitoring

Golden Gate N.R.A.

Golden Gate Parks Conservancy

San Francisco Public Utilities Commission

Marin County Open Space District

Point Reyes National Seashore

Audubon Canyon Ranch

CA State Parks

Presidio Trust

BAEDN

Future Changes

Update the desktop version of GeoWeed to current software and create an export function to deliver data to Calflora.

GeoWeed runs on Microsoft Access with an ArcPad field application, both of which need to be continually updated to current versions of Access and Windows.



EXPORT TO CALFLORA

Future Changes

Expand the Calflora database to accept data from GeoWeed.

Calflora is the most logical choice for housing weed monitoring data from GeoWeed and other weed mapping applications, as the Calflora database is the most visited online database for California plants, already houses other invasive plant data management tools, and has a familiar, user-friendly interface.

Calflora - My Observations v. 1.35

Select a subset of your observations with the criteria below.

Scientific Name report Common Name Plant Status any County multiple any

Observer Location Batch

Source Group Association any

Project Access by others any

Observation Date e.g. 2012-12-31 After Before Added to Calflora on

Order by Date Added records with photos In map area include checklists

Column Set Basic Data customize

Alameda
Alpine
Amador
Butte
Calaveras
Contra Costa
Colusa
Del Norte
El Dorado
Fresno
Glenn
Humboldt
Imperial
Inyo
Kings
Kern
Lake
Lassen
Los Angeles
Madera
Marin
Mariposa
Mendocino

ID	Plant	Photo	Observer	Source	Index Date	Observation Date	County	Location Description	Comments
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Future Changes

Support core GeoWeed functions online: “GeoWeed-online”.

We will develop core data management components of the existing GeoWeed desktop application as a set of web utilities accessible from the Calflora server. This will enable users to access their data from any computer with a web browser, reducing the technical support required and keeping the data safe through the years regardless of software and platform changes needed to run GeoWeed.

Future Changes

Modify the existing Calflora smart phone application to be compatible with the ROAST-enabled Calflora weed monitoring database.

