Why Created?
Forest Pests of North America
Integrated Pest Management
Photo CD Series
Bugwood Image Database System

www.forestryimages.org
www.invasive.org
www.ipmimages.org
www.insectimages.org

254,000 images available covering 23,000 subjects from 2400 photographers
Launch web interface in 2001 with 3,500 images
Support from USFS, APHIS, NIFA
Nonnative Invasive Plants of Southern Forests
A Field Guide for Identification and Control

United States Department of Agriculture
Forest Service
Southern Research Station
General Technical Report SRS–62

James H. Miller
Invasive Plants of the Eastern United States: Identification and Control

Technical Coordinators:
Charles T. Bargeron, David J. Moorhead, G. Keith Douce,
Richard C. Reardon and Arthur E. Miller

The University of Georgia, USDA APHIS PPQ and USDA Forest Service
Forest Health Technology Enterprise Team. FHTET-2003-08
What about Maps?
Lots of Maps
The Invasive Plant Atlas of New England’s (IPANE) mission is to create a comprehensive web-accessible database of invasive and potentially invasive plants in New England that will be continually updated by a network of professionals and trained volunteers. The database will facilitate education and research that will lead to a greater understanding of invasive plant ecology and support informed conservation management. An important focus of the project is the early detection of, and rapid response to, new invasions.
North American Invasive Plant Mapping Standards

Approved by:
North American Weed Management Association
May 7, 2002
So, what do we need?

Common Operating Platform

Easy Electronic Reporting
Invasive Species Mapping Made Easy!

EDDMapS, started in 2005 with Southeastern U.S. focus, is now providing a picture of the distribution of invasive species across North America.
Who Funds?
Primary External Funding
EDDMapS West

EDDMapS West was originally developed and launched for the six Missouri River Watershed Coalition headwater states of Colorado, Montana, Nebraska, North Dakota, South Dakota, and Wyoming in September 2010.

Thanks to tremendous interest throughout the West, and support from the Montana Noxious Weed Trust Fund and the US Forest Service-State and Private Forestry Program, the system quickly expanded to include seven additional western states (Idaho, Kansas, Missouri, Nevada, Oregon, Utah, and Washington) in 2011.

EDDMapS West is:
- Fast and easy to use - no knowledge of GIS required
- Allows for reporting of select invasive plant species in the western states
- Automatically alerts state weed coordinators when reports are entered
- Automatically alerts EDDMapS West users of verified reports
- Generates distribution maps for reported species
- Links to Invasive.org information and images

Early detection of new invasive species infestations and rapid, coordinated responses are needed to eradicate or contain invasions before they become too widespread and control becomes technically and financially impossible. Prevention and early detection/rapid response efforts are most effective when information is shared at the regional level.

It is going to take all of us- land owners, land managers, universities, recreationists, agency personnel, and concerned citizens- working together and sharing information as quickly as possible, to keep ahead of new invaders. We encourage you to use EDDMapS West to report sightings of invasive species; and we also encourage additional western states to join the EDDMapS West effort.
Typical Users?
Citizen Science and Professional Users

EDDMapS aggregates data from other invasive species mapping projects across North America with 3 million records coming in as “bulk data”.

However, 152,962 records have been entered via web or smartphone. With:

- 98% of reporters have <1000 reports
- 94% of reporters have <100 reports
What is EDDMapS?

Real time tracking of invasive species occurrences
Local and national distribution maps
Electronic early detection reporting tools
Library of identification and management information

BRING THE POWER OF EDDMapS TO YOUR SMARTPHONE

Introducing BugwoodApps - comprehensive mobile applications that engage users with invasive species, forest health, natural resource and agricultural management

iPhone | iPad | Android
Report an Invasive Plant Occurrence

Species

Pest:

*Search for a species:*

- *Ligustrum amurense (Amur privet)*
- *Ligustrum japonicum (Japanese privet)*
- *Ligustrum lucidum (glossy privet)*
- *Ligustrum obtusifolium (border privet)*

Infested Area (?):

Habitat (?):

Abundance:

Location

State:

New Jersey

Latitude (?):

Longitude (?):

State:

New Jersey

Select County

Latitude (?):

Longitude (?):

Map | Satellite

Seeds | Dormant/Dead | Unknown
Bulk Data Uploader

Batch Name (something you will recognize)

Reporter Name (who should these reports go under)
Joe LaForest

Select files
Add files to the upload queue and click the start button.

Drag files here.

Add Files

Upload  clear

If you are receiving a File Extension error or having trouble uploading a file please email mdfiles@uga.edu or bugwood@uga.edu and we will add your file extension to our accepted list.
kudzu (Pueraria montana var. lobata)
Brazilian peppertree
*Schinus terebinthifolius* Raddi

32603 points
## Brazilian peppertree

*Schinus terebinthifolius* Raddi

<table>
<thead>
<tr>
<th>Record ID</th>
<th>4130966</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status</td>
<td>Positive</td>
</tr>
<tr>
<td>Location</td>
<td>Miami-Dade County, Florida</td>
</tr>
<tr>
<td>Source</td>
<td>Everglades Digital Aerial Sketchmapping</td>
</tr>
<tr>
<td>Project</td>
<td>EDDMapS Florida</td>
</tr>
<tr>
<td>Comments</td>
<td>Everglades Digital Area Sketchmapping data 2012-2013</td>
</tr>
<tr>
<td>Gross Area</td>
<td>3.86460804939 acres</td>
</tr>
<tr>
<td>Coordinates</td>
<td>25.7205963135, -80.6956253052</td>
</tr>
<tr>
<td>ReporterAffiliation</td>
<td>SFWMD/USNP</td>
</tr>
<tr>
<td>Surveyor</td>
<td>LeRoy Rodgers and Tony Pernas</td>
</tr>
<tr>
<td>Observation Date</td>
<td>January 1, 2012</td>
</tr>
<tr>
<td>Date Entered</td>
<td>December 1, 2014</td>
</tr>
<tr>
<td>Year Accuracy</td>
<td>To the Year</td>
</tr>
<tr>
<td>Percent Cover</td>
<td>15</td>
</tr>
<tr>
<td>Source Type</td>
<td>Joint Federal/State/County</td>
</tr>
</tbody>
</table>

![Image of Brazilian peppertree distribution](image_url)
Scope of Data
Statistics

3,371,784 County Reports
2,216,542 Point Reports
5,314 Species
15,507 Reporters/Sources
44,899 Users
## Scope of Taxa

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td>4157</td>
</tr>
<tr>
<td>Wildlife</td>
<td>538</td>
</tr>
<tr>
<td>Diseases</td>
<td>252</td>
</tr>
<tr>
<td>Insects</td>
<td>228</td>
</tr>
</tbody>
</table>
EDDMapS 2017

• Average 105 reports a day in 2017 from web or smartphones

• Most reports in a day: 980 on April 13, 2017

• 38,555 Reports in 2017 from 4,805 reporters covering 825 species
Observations sent to EDDMapS by year

- **2012**: 10,000
- **2013**: 20,000
- **2014**: 30,000
- **2015**: 40,000
- **2016**: 50,000
- **2017**: 60,000

**Graph Details:**
- **Web**, **iOS**, and **Android** categories are represented.
- **2016** shows a significant increase compared to previous years.
EDDMapS Florida Statistics

What were the reports?
Overall

Animals
- 18%

Plants
- 82%
EDDMapS Florida Statistics

What were the reports?
- Smartphones
- Animals
- Plants

58%
42%
Example types of analyses used for
Positive

Treated

Negative

Eradicated
Japanese honeysuckle
Lonicera japonica Thunb.


Legend:
- Negative (728)
- Eradicated (1)
- Treated (150)
- Positive (10983)
Easy, powerful invasive species management tracking software for land managers

Click to learn more and register
Not A Member? Register Here:

To complete the registration process, please follow the numbered steps below. The EDDMapS registration page will open in a new tab when you click on #1. Complete this, return to this page, and click on #2 to link your EDDMapS account to PAMF. Once both steps are complete, you are ready to access the PAMF web hub!

1. Register for an EDDMapS account here
2. Register for access to the PAMF web hub with your EDDMapS credentials here

© 2016
Welcome to the Spatial Invasive Infestation and Priority Analysis (SIIPA) Tool in EDDMapS

- SIIPA Tool Overview

The Spatial Invasive Infestation and Priority Analysis (SIIPA) tool's webmap version is designed to use data from the Early Detection Distribution and Mapping System (EDDMapS) and apply a prioritization framework to the data, with the goal of assisting property owners, land managers, and project managers with designing a treatment plan for their invasive plant populations.

- Prioritization Basics
- The SIIPA Model
- SIIPA Model in EDDMapS
- Contact Us

Get Started
Select Your Weed Records

- Directions

First: Zoom into your area of interest on the map. As you zoom in, you will begin to see all of the weed points.

Next: You can filter the data by applying any of the OPTIONAL filters:

- Common Name
- Scientific Name
- Weed Rank (Florida Exotic Pest Plant Council class 1 or class 2: weeds)
- Year
- State Name
- County Name

Finally: Select one of drawing tools in the toolbar and draw the polygon around your area of interest.

The model will automatically move you through the steps as you execute each function.

Common Name is

Scientific Name is
What does system do that the other systems do not? What makes it unique?
New Report

Single Reports

Web Forms
Smartphone Apps
Embedded Web Forms
Reporting API

Bulk Data

One Time Dumps
Data Sharing Partners
GISIN Mirror

EDDMapS
Early Detection & Distribution Mapping System
Data Entry
New Report

Regulated

State Agency Contact
Federal Agency Contact
Species Verifier
Location Verifier
Project Verifier

Not regulated

State Verifier
CISMA/CWMA Verifier
County Verifier
Park/Site Verifier

No Verifier

EDDMapS Admin

Verification Process
Subject: crapemyrtle bark scale (Eriococcus lagerstroemiae)
Location: Gillespie County, Texas

Who would receive the verification e-mail?
- Dave Creech (dcreech1@hotmail.com)
- Erfan Vafaei (erfan.vafaei@ag.tamu.edu)
- Laura Miller, Texas A&M (lmiller@ag.tamu.edu)
- Mengmeng Gu, Texas A&M (mgu@tamu.edu)
- Mike Merchant, Texas A&M (m-merchant@tamu.edu)

Is the subject in the regulated species list?
- No

Has the subject been previously reported
- in Texas? Yes
- in Gillespie County? No

What apps/projects currently support reporting it?
- EDDMapS
- Southeast Early Detection Network
- US Army Corps of Engineers Invasive Species

What Invasive Species Lists is it on?
- Southeast Early Detection Network - Insects
How could the system be leveraged for state-specific needs?
#MapitMonday: Eurasian water-milfoil - Snap a picture & report sightings to #EDDMapS Ontario or call 1-800-563-7711.

CFIA Canada @CFIA_Canada · Aug 26
Heading out to play #PokémonGo? Keep an eye out for #invasivespecies and report them using #EDDMapS via @invspecies

5 easy steps to get you started using EDDMapS Ontario

1. Download the App
2. Sign In or Sign Up on EDDMapS App
3. Take a Photo using your phone
4. Answer Questions using your phone
5. Save & Submit your report

The University of Georgia Center for Invasive Species and Ecosystem Health
EDDMapS
REPORT INVASIVE SPECIES
LIZARDS  PYHTONS  CHAMELEONS  FISH
IveGot1.org  1-888-Ive-Got-1
This incident shows how important it is to report sightings of nonnative wildlife including constrictor snakes like this one. If you see nonnative fish and wildlife please report them to our Invasive Species Hotline at 1-888-IveGot1 (1-888-483-4861), online at IVEGOT1.org or by using the free smart phone app IVEGOT1.
Pulling it all together - Pest Information Site

www.eddmaps.org/cmbs

www.kudzubug.org
EDDMapS – Kudzu Bug
EDDMapS – Kudzu Bug

Static Map Embed code:
<a title="kudzu bug (Megacopta cribraria) January 1, 2009 - December 31, 2015" href="http://www.kudzubug.org/distribution">

Dynamic Map Embed code:
<iframe src="/maps.eddmaps.org/edddmapscustomcounty.cfm?map=5&legend=bottom" frameborder="0" allowfullscreen="true">

Map link:
http://www.kudzubug.org/distribution_map.cfm
Project Description: University and USDA Entomologists are teaming up to map the location and population density of a newly invasive insect, the Brown Marmorated Stink Bug (BMSB), *Halyomorpha halys*. You can help us track and the insect in urban environments in the United States by joining the project to put BMSB on the map.

- Representative elementary and middle schools in each of the 48 continental United States are receiving this invitation to participate in the ‘March Madness Citizen Science Project to Find Stinky’.
- Students and parents interested in participating in the project will begin by taking an image of your BMSB and send your image to: [www.eddmaps.org/bmsb/report/](http://www.eddmaps.org/bmsb/report/). Once confirmed, report your findings daily.
- Follow the guidelines on the BMSB Project website to get started.

Let the March Madness Citizen Science Project Begin!
Plant damage by pathogens and insects can **enhance** or **suppress** invasive plants...

...but so much is unknown!

> Which invasive plants have damage?
> Where in the U.S. does the most damage occur?

Help us detect damage on invasive plants!

> Add-on to invasive plant record submission
> Answer a few questions and snap a picture
If/how does it coordinate with other systems now?
<table>
<thead>
<tr>
<th>Major Data Sources</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>USDA PLANTS Database, USDA NRCS</td>
<td>356,312</td>
</tr>
<tr>
<td>Biota of North America Program</td>
<td>343,662</td>
</tr>
<tr>
<td>International Biological Information System Database</td>
<td>238,082</td>
</tr>
<tr>
<td>Forest Inventory and Analysis Database, U.S. Forest Service - SRS</td>
<td>153,922</td>
</tr>
<tr>
<td>Minnesota Department of Natural Resources</td>
<td>137,644</td>
</tr>
<tr>
<td>Alaska Exotic Plants Information Clearinghouse Database</td>
<td>128,964</td>
</tr>
<tr>
<td>Idaho Department of Agriculture</td>
<td>126,047</td>
</tr>
<tr>
<td>Florida Natural Areas Inventory Database</td>
<td>124,306</td>
</tr>
<tr>
<td>Midwest Invasive Species Information Network Database</td>
<td>109,976</td>
</tr>
<tr>
<td>Oregon State Office Database, Bureau of Land Management</td>
<td>93,213</td>
</tr>
<tr>
<td>Other 15497 Users</td>
<td>1,559,656</td>
</tr>
</tbody>
</table>
7,850,064 Observations

~200,000 ”invasive species” records are being harvested

http://gimmefreshdata.github.io
Top 50 Invasive Species in the West

Data Sharing Initiative Workshop in Denver
March 14-15, 2018
Recommendations Coming Soon
“...establish guidance for data management standards, formats, and protocols.”
NISC Data management Guidance

• Completed in Spring, 2018.
• Input is welcome now.
• Meant to help mobilize and manage invasive species data to mutual benefit of federal agencies, states, tribes, and NGOs.
• Provides a “rally call” to leverage the best return on investment on what has been accomplished to date.
• Will contribute to continued interaction with the White House Office of Office of Science and Technology Policy (OSTP).
There is a tool for every job...

- Early Detection
- Verification
- Alerts
- Visualization

- Monitoring and Management
- Data Sharing and Collaboration

EDDMapS
Early Detection & Distribution Mapping System
Any gaps in the system?
Smarter Apps

- Interactive Keys
- Management Recommendations
- On demand resources
- Project updateable content
Other Gaps

- Better use of ESRI ArcGIS technologies
- Aquatic Animals
- Better engagement of States with limited data annual data submission
- Federal agency data sets
- Better searching tools/technologies
Key Points

- Available Now!
- Fast and easy to use - no knowledge of GIS
- Aggregate data (not replace) from other systems
- Working toward “complete” county level distribution
- Tool/platform to Facilitate Early Detection and Rapid Response implementation with online data entry forms, e-mail alerts and network of expert verifiers
Key Points

- EDDMapS is a tool that can be used to enhance existing programs
- It is up and working now, and was built to be easily customizable
- Free to use, long term commitment from UGA to support as key product of Center
- States don’t have to “buy” in and data is freely shared
- Tool for Educating and Involve Others on the Problem
Key Points

- One important point to remember is that the public needs something as easy as possible, thus integrating regulated pests with non regulatory plants make sense (IveGot1 model)

- However, we must all work together to make this happen and provide feedback to user when they report something
## Information Management for EDRR

<table>
<thead>
<tr>
<th>EDRR Action</th>
<th>Information Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection</td>
<td>• What should be reported?</td>
</tr>
<tr>
<td></td>
<td>• How is it reported?</td>
</tr>
<tr>
<td>Responders Alerted</td>
<td>• Who has jurisdiction?</td>
</tr>
<tr>
<td></td>
<td>• Is it new to the county, state, U.S?</td>
</tr>
<tr>
<td>Rapid Assessment</td>
<td>• Is the identification correct?</td>
</tr>
<tr>
<td></td>
<td>• Has a risk assessment been done?</td>
</tr>
<tr>
<td>Response</td>
<td>• What management options are available?</td>
</tr>
<tr>
<td></td>
<td>• What was done and was it effective?</td>
</tr>
</tbody>
</table>
Information Management Recommendations

- Accessible
- Funded
- Standardized
- Shared
Thanks!
cbargero@uga.edu
www.eddmaps.org
apps.bugwood.org
www.bugwood.org