

There's an App for that!

Encouraging the public to use their
smartphones to save trees

Chuck Barger

Associate Director – Information Technology and Invasive Species

University of Georgia

Center for Invasive Species and Ecosystem Health



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Bugwood

- Started 1994
- Entomology, Forestry and Information Technology
- Served as State Survey Coordinator for Cooperative Agricultural Pest Survey Program (Regulated Pests) – 20+ years
- Collected slides from across country, released PhotoCDs and ForestryImages website focused on Forest Health



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Center for Invasive Species and Ecosystem Health

*Utilizing partnerships & information
technology to advance invasive
species, forestry & agriculture
education*



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Agriculture

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**Invasive
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River to River CWMA

Photo: Napalese browntop

Chris Evans, River to River CWMA

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Welcome Back,

Random



European spruce bark beetle

Photo by Gyorgy K. Horvath
Research Institute for Forestry

Statistics

132,434 images
14,678 subjects
1,688 photographs

News & S

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Invasive and Exotic Species to North America

any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem; and whose introduction does or is likely to cause economic or environmental harm or harm to human health.

Plants



Insects



Pathogens



Other Species



NEWS

- [Scientists Find Evidence of Casuarina Hybrids](#)
- [40 new species found in New Guinea](#)
- [How prepared is the U.S. to meet future botanical challenges?](#)
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LINKS

- [Pest Tracker](#)
- [USDA APHIS PPQ - Pest Detection](#)
- [USDA Forest Service - Invasive Species Program](#)
- [National Invasive Species Information Center](#)
- [Global Invasive Species Database](#)
- [North American Plant Protection Organization](#)
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The Nature Conservancy



Protecting nature. Preserving life.



Global Invasive Species Team

The Nature Conservancy Global Invasive Species Team Website

TNC's Global Invasive Species Team (GIST) was disbanded in March 2009. The GIST web site including the Element Stewardship Abstracts, images and INVASIPEDIA were in danger of becoming lost. Invasive.org in collaboration with the Global Invasive Species Team, is pleased to announce that the GIST web site has been archived.

[More info...](#)



Invasive Plant Atlas of the U.S.

This web site is a collaborative project between the National Park Service and



Cogongrass Road Crew Training Resources

Cogongrass (*Imperata cylindrica*) is

Funded by USDA APHIS PPQ to support CAPS Program

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BUGWOOD
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**Over 60,000
registered users**

PPS

APS

Early

Forest

extension
more mind reach

Invasive Species

**FOREST PESTS
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Three Items of Interest


- Forest Pests Toolbox
- Reporting Apps with EDDMapS
- Field Guide Apps



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FOREST PESTS OF NORTH AMERICA

Native and Non-native insects, diseases, and weeds of urban, managed, and natural forests



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Leah Bauer, USDA Forest Service Northern Research Station, bugwood.org

ABOUT THIS SITE

The purpose of this website is to provide images and information of insects, diseases, weeds, and abiotic factors that cause damage to urban, managed, and natural forests. This site aggregates pictures, publications, and tools from many sources and packages the resources in an easy, searchable format. This site is intended to be used by homeowners, land managers, volunteers, urban foresters, county agents, outreach educators, and anyone else interested in identifying and managing their trees and forests.

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Brian Kunkel, University of Delaware, Bugwood.org

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Urban Foresters

Identification and Management_Websites and publications for identification, management, and control options of damage agents of forests and ornamental trees

- [A Field Guide for Ground Checking Southern Pine Beetle Spots](#)
- [A Field Guide for the Identification of Invasive Plants in Southern Forests](#)
- [A Management Guide for Invasive Plants in Southern Forests](#)
- [An Aerial Observer's Guide to Recognizing and Reporting Southern Pine Beetle Spots](#)
- [Bark beetle outbreaks and fire: a devastating combination for Central America's pine forests](#)
- [Bark Beetles of Southern Pines - Identification and Control](#)
- [Biological Control of Arthropod Forest Pests of the Western United States: A Review and Recommendations](#)
- [Bugwood - Forest Pest Control](#)
- [Cal Poly Urban Forest Ecosystems Institute - ForesTree - Health info](#)
- [CAPS Screening Aids](#)
- [Characteristics and distribution of potential ash tree hosts for emerald ash borer](#)
- [Classical Biological Control of Pest Insects of Trees in the Southern United States: A Review and Recommendations](#)
- [Control Priorities for the Southern Pine Beetle](#)
- [Cost-Effective Tree Removal and Utilization Strategies to Address Invasive Species Attacks](#)
- [Distinguishing Immatures of Insect Associates of Southern Pine Bark Beetles](#)
- [Douglas-Fir Beetle](#)
- [Fir Engraver](#)
- [Forestry Images](#)
- [Guide to Insects borers of North American broadleaf trees and shrubs](#)
- [Gypsy Moth Handbook](#)
- [How to identify and control noninfectious diseases of trees](#)
- [How to Identify Common Insect Associates of the Southern Pine Beetle](#)
- [Identification and Biology of Southern Pine Bark Beetles](#)
- [Insects and Diseases of Trees in the South](#)
- [Integrated Pest Management in Southern Pine Forests](#)
- [IPED: Early Detection Targets](#)
- [IPM Images](#)
- [Ips Bark Beetles in the South](#)
- [I-Tree - IPED](#)
- [Jeffrey Pine Beetle](#)
- [Mountain Pine Beetle](#)
- [Mulch Guide](#)
- [Pine Engraver in the Western US](#)
- [Recovery plan for Laurel Wilt on Redbay and Other Forest Species](#)
- [Red Turpentine Beetle](#)
- [Roundheaded Pine Beetle](#)
- [Silviculture Can Reduce Losses from the Southern Pine Beetle](#)
- [Site, Stand, and Host Characteristics of Southern Pine Beetle Infestations](#)
- [Southern Pine Beetle in Central America How to Recognize, Prevent and Control Outbreaks](#)
- [Southern Pine Beetles Can Kill Your Ornamental Pine](#)
- [Spruce Beetle](#)
- [Sudden Oak Death Diagnostic Guide](#)
- [The Atlas of Forest Insect Pests](#)
- [The Southern Pine Beetle](#)
- [The Southern Pine Beetle](#)

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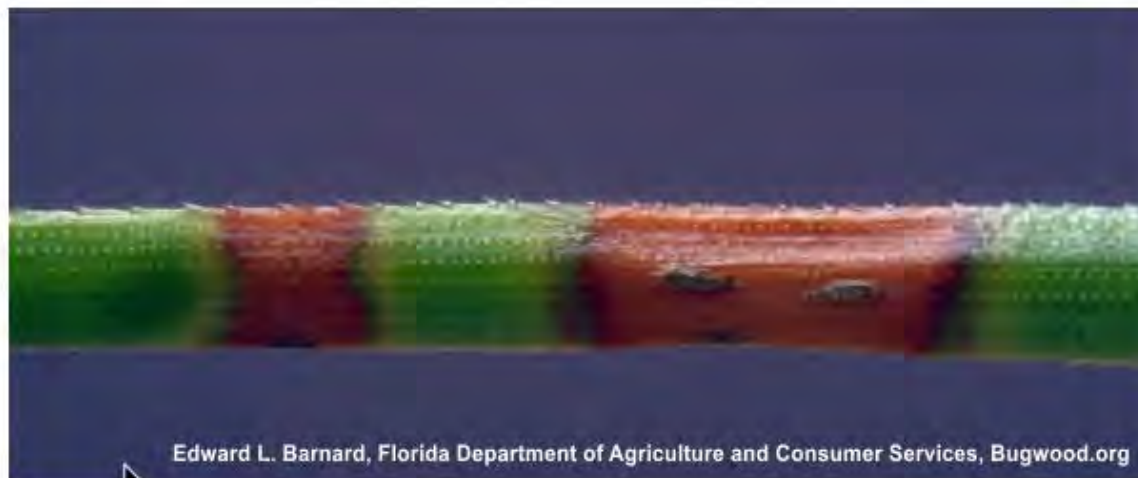
Insects

Diseases

Weeds

Other Agents

Damage Agents



Edward L. Barnard, Florida Department of Agriculture and Consumer Services, Bugwood.org

Damage agents are anything that can cause injury or death to a host tree, including insects, diseases, weeds, and abiotic factors.

Choose the primary cause of the damage in the bar on the left and narrow down the results to the suspected or known damage agent. Once a final selection is made, information and pictures of the agent will be displayed.



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Bark Beetles & Phloem Boring

Wood Boring

Terminal, Shoot, Twig & Root

Seed, Cone, Flower & Fruit

Sapsucking Insects & Mites

Gall Makers

Other Important Insects

Diseases

Weeds

Other Agents

Damage Agents - Insects



Chris Evans, River to River CWMA, Bugwood.org

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Choose the primary cause of the damage in the bar on the left and narrow down the results to the suspected or known damage agent. Once a final selection is made, information and pictures of the agent will be displayed.



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Seed, Cone, Flower & Fruit

Sapsucking Insects & Mites

Gall Makers

Other Important Insects

Diseases

Weeds

Other Agents

Insects - Foliage Feeding

141 records



Sort by:

Subject



go

Subject	Scientific Name	Order	Family
pine false webworm	<i>Acantholyda erythrocephala</i> (Linnaeus)	Hymenoptera	Pamphiliidae
western blackheaded budworm	<i>Acleris gloverana</i> (Walsingham)	Lepidoptera	Tortricidae
eastern blackheaded budworm	<i>Acleris variana</i> (Fernald)	Lepidoptera	Tortricidae
fall cankerworm	<i>Alsophila pometaria</i> (Harris)	Lepidoptera	Geometridae
birch leafroller	<i>Ancylis discigerana</i> (Walker)	Lepidoptera	Tortricidae
Peigler's oakworm moth	<i>Anisota peigleri</i> Riotte	Lepidoptera	Saturniidae
orangestriped oakworm	<i>Anisota senatoria</i> (J.E. Smith)	Lepidoptera	Saturniidae
spiny oakworm	<i>Anisota stigma</i> (Fabricius)	Lepidoptera	Saturniidae
pinkstriped oakworm	<i>Anisota virginiensis</i> (Drury)	Lepidoptera	Saturniidae
fruittree leafroller	<i>Archips argyrospila</i> (Walker)	Lepidoptera	Tortricidae
uglynest caterpillar	<i>Archips cerasivorana</i> (Fitch)	Lepidoptera	Tortricidae
baldcypress leafroller	<i>Archips goyerana</i> Kruse	Lepidoptera	Tortricidae
larger boxelder leafroller	<i>Archips negundana</i> (Dyar)	Lepidoptera	Tortricidae
birch sawfly	<i>Arge pectoralis</i> (Leach)	Hymenoptera	Argidae
arborvitae leafminer	<i>Argyresthia thuiella</i> (Packard)	Lepidoptera	Yponomeutidae
pine tube moth	<i>Argyrotaenia pinatubana</i> (Kearfott)	Lepidoptera	Tortricidae
coconut scale	<i>Aspidiotus destructor</i> Signoret	Hemiptera	Diaspididae
Texas leafcutting ant	<i>Atta texana</i> (Buckley)	Hymenoptera	Formicidae
oak skeletonizer	<i>Bucculatrix pinalis</i> (Muesebeck)	Lepidoptera	Bucculatricidae

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gypsy moth

Lymantria dispar (Linnaeus)

BUGWOODWiki
Article

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Overview

The gypsy moth, currently established in North America, is a European native that was accidentally introduced into New England in the late 1800's during an attempt to rear an alternative silk producing insect. Its current range extends from Maine to North Carolina and west across Pennsylvania and into Virginia, West Virginia, Ohio, Michigan, and Wisconsin. Spread occurs as a result of both natural flight of the moth and the attachment and transport of egg masses on vehicles. Gypsy moth is known to feed on over 300 trees and shrubs. Favored hosts include oak, apple, alder, basswood, birch, poplar, sweet gum, willow, and hawthorn. Less favored host species include hickory, maple, cherry, cottonwood, elm, black gum, larch, sassafras, and hornbeam. Some mortality even occurs in white pine. Many other plants may be fed upon. The gypsy moth has one generation per year. From June to mid-July, the female attaches buff-colored, velvety egg masses to sheltered places on outdoor objects. These masses allow the insect to overwinter and may contain up to 1,000 eggs. Masses are also embedded with female abdominal hairs that may act as an allergen. The eggs hatch in April or May. Young larvae chew small holes in leaves, while older larvae consume entire leaves except for the larger veins and midribs. The whole tree may be defoliated, resulting in reduced growth and loss of vigor, as well as reduced aesthetic, recreational, and wildlife values. If total defoliation is experienced over several years, mortality may result. The older caterpillars are 1 1/2 – 2 1/2 inches long and are easy to identify by the tufts of hair on each segment and the pattern of blue and red dots on their backs. The gypsy moth pupates in dark brown pupal cases located in sheltered locations. Male gypsy moths have a 1 1/2 inch wingspread with light tan to brown wings marked with wavy, dark bands across the forewing. Females are white, larger than males with a wingspread of 2 1/2 inches, and flightless. There is also an Asian strain of the gypsy moth (AGM) that was identified in 1991. AGM has a much broader host range and the females are active fliers due to their larger wingspan. These factors would allow AGM to spread much faster than the European strain and be even more damaging.

Resources

- [Insects and Diseases of Trees in the South](#) - USDA Forest Service
- [A Guide to Common Insects and Diseases of Forest Trees in the Northeastern United States](#) - USDA Forest Service
- [A Field Guide to Common Insect Pests of Urban Trees in the Northeast](#) - Vermont FRR

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Conifer

Hardwood

Host Trees



Paul Wray, Iowa State University, Bugwood.org

Host Trees are the trees that are affected by a damage agent. Knowing the species and affected areas of the tree can lead to a positive identification of the damage agent.

Choose the type of tree on the left to view pictures of the trees as hosts for damage agents.



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Conifer

Hardwood

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Buckeye (Aesculus)

Alder (Alnus)

Madrone (Arbutus)

Birch (Betula)

Hornbeam (Carpinus)

Hickory (Carya)

Chinkapin (Castanopsis)

Hackberry (Celtis)

Redbud (Cercis)

Dogwood (Cornus)

Persimmon (Diospyros)

Beech (Fagus)

Ash (Fraxinus)

Host Trees - Hardwood



Chris Evans, River to River CWMA, Buwood.org

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Birch (Betula)

Hornbeam (Carpinus)

Hickory (Carya)

Chinkapin (Castanopsis)

Hackberry (Celtis)

Redbud (Cercis)

Dogwood (Cornus)

Persimmon (Diospyros)

Beech (Fagus)

Ash (Fraxinus)

Honeylocust (Gleditsia)

Gordonia (Gordonia)

Silverbell (Halesa)

Holly (Ilex)

Walnut (Juglans)

Sweetgum (Liquidambar)

Yellow-poplar (Liriodendron)

Tanoak (Lithocarpus)

Hardwood - Oak (Quercus)

55 records

Sort by:

Subject	Scientific Name	Order	Family
twolined chestnut borer	<i>Agrilus bilineatus</i> (Weber, 1801)	Coleoptera	Buprestidae
fall cankerworm	<i>Alsophila pometaria</i> (Harris)	Lepidoptera	Geometridae
orangestriped oakworm	<i>Anisota senatoria</i> (J.E. Smith)	Lepidoptera	Saturniidae
pinkstriped oakworm	<i>Anisota virginiensis</i> (Drury)	Lepidoptera	Saturniidae
oak anthracnose	<i>Apiognomonia errabunda</i> (Roberge ex Desm.) Höhn.	Diaporthales	Valsaceae
fruittree leafroller	<i>Archips argyrospila</i> (Walker)	Lepidoptera	Tortricidae
Armillaria root rot	<i>Armillaria mellea</i> (Vahl:Fr.) P. Kumm.	Agaricales	Marasmiaceae
Armillaria root rots	<i>Armillaria</i> spp. (Fr.:Fr) Staude	Agaricales	Marasmiaceae
Hypoxylon canker of oak	<i>Biscogniauxia atropunctata atropunctata</i> (Schwein.) Pouzar	Xylariales	Xylariaceae
black rot fungus	<i>Botryosphaeria stevensii</i> Shoemaker	Incertae sedis	Botryosphaeriaceae
oak skeletonizer	<i>Bucculatrix ainsliella</i> Murtfeldt	Lepidoptera	Bucculatricidae
oak wilt	<i>Ceratocystis fagacearum</i> (T. W. Bretz) J. Hunt	Microascales	Ceratocystidaceae
flatheaded appletree borer	<i>Chrysobothris femorata</i> (Olivier, 1790)	Coleoptera	Buprestidae
Columbian timber beetle	<i>Corthylus columbianus</i> Hopkins, 1894	Coleoptera	Curculionidae
pecan carpenterworm	<i>Cossula magnifica</i> (Strecker)	Lepidoptera	Cossidae
fusiform rust	<i>Cronartium quercuum</i> f.sp. <i>fusiforme</i> (Hedgc. & N. Hunt) Burdsall & G. Snow	Uredinales	Cronartiaceae

EDD Maps

Early Detection & Distribution Mapping System



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So, what do we need?

**Common
Operating
Platform**

**Easy
Electronic
Reporting**



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Invasive Species Mapping Made Easy!

EDDMapS, started in 2005 with Southeastern U.S. focus, is now providing a picture of the distribution of invasive plants across the U.S.

Currently working with USFS to collect plant data and complete maps



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Invasive Species Mapping Made Easy!



EDDMapS, started in 2005, is now providing a picture of the distribution of invasive species across the U.S. and Canada

- ✓ Fast and easy to use - no knowledge of GIS required
- ✓ Web-based mapping of invasive species distribution to help fill gaps and identify "leading edge" ranges
- ✓ Facilitates Early Detection and Rapid Response implementation with online data entry forms, e-mail alerts and network of expert verifiers
- ✓ One Database for both local and national data
- ✓ Data can be searched, queried and downloaded in a variety of formats
- ✓ Cooperates with and aggregates data from other invasive species mapping projects
- ✓ Custom/hosted applications can be quickly and inexpensively developed



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

Who's Using It?

- ✓ Southeast Exotic Pest Plant Council
- ✓ Alaska Exotic Plant Information Clearinghouse
- ✓ Missouri River Watershed Coalition
- ✓ Biological Control Agents of Weeds
- ✓ Florida Invasive Species Partnership
- ✓ Invaders of Texas
- ✓ Mid-Atlantic Invasive Plant Council
- ✓ Appalachian Trail Conservancy
- ✓ EDDMapS Alberta - Alberta Invasive Plants Council
- ✓ National Wildlife Refuge Early Detection Network for New England
- ✓ Outsmart Invasive Species
- ✓ Invasive Plant Atlas of New England
- ✓ What's Invasive - Coming Soon

Statistics

1,864,249 County Reports
1,044,721 Point Reports
2,295 Species / 9,601 Users

Educational Resources

- ✓ EDDMapS: Invasive Plant Mapping Handbook
- ✓ EDRR Training Workshop Handouts
- ✓ EDDMapS Florida Training Video
- ✓ EDDMapS Florida Animals Training Video
- ✓ EDDMapS Missouri River Watershed Coalition Training Video
- ✓ Mid-Atlantic Early Detection Network Training Video
- ✓ EDDMapS for Forest Pests: Reporting?

Map It!

Zap It!

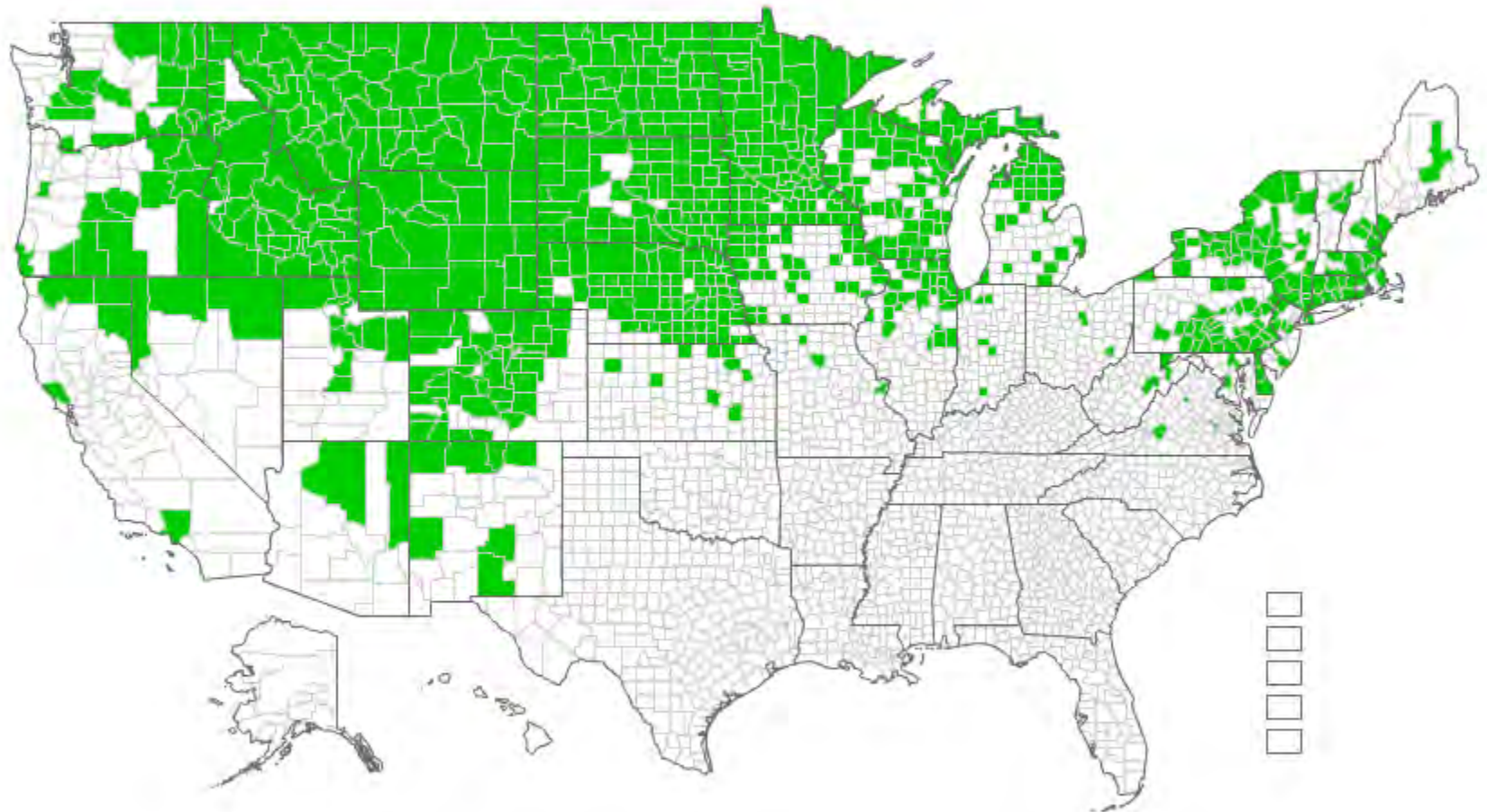
Map it Again!

leafy spurge

Euphorbia esula L.

USDA PLANTS Symbol: EUES
Invasive Plant Atlas

Distribution Maps: State / Southeast / Points on Google Maps



Japanese honeysuckle

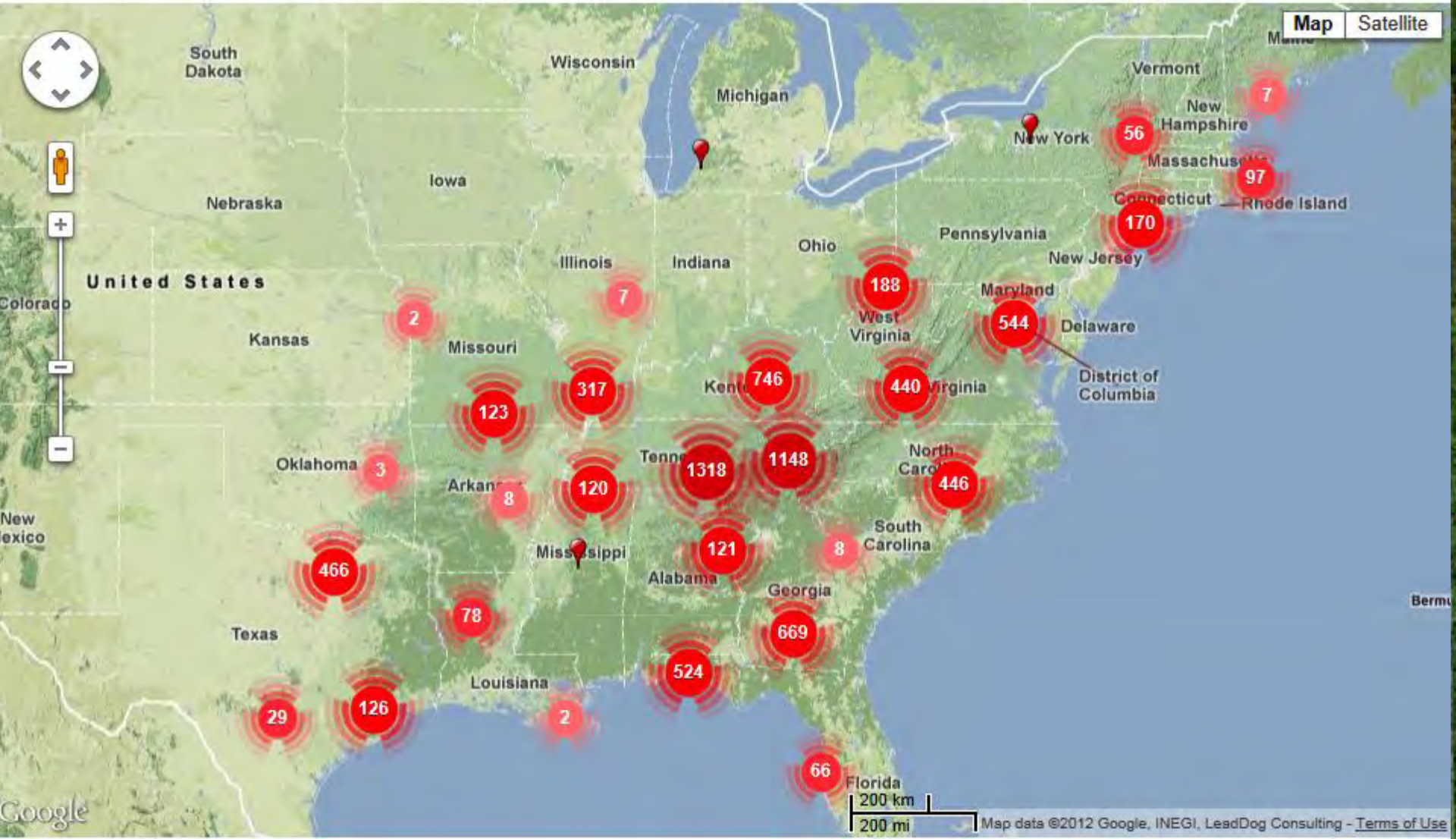
Lonicera japonica Thunb.

USDA PLANTS Symbol: LOJA
Invasive Plant Atlas

Load Time: 191 ms

[Print](#) [Excel](#) [Google Earth](#)

[Map](#) [Satellite](#)



EDD Maps

Early Detection & Distribution Mapping System

**Easy Electronic Reporting for
Early Detection and Rapid
Response**



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Report an Invasive Species Occurrence

Please provide as much information about the sighting as possible.

Species:

Begin typing scientific or common name and then select species from dropdown.
If the pest is not listed or is unknown, type and choose "unlisted plant" or "unknown plant" from the list and describe the plant in the Comments section below.



Pest:

Infestation:

Observation Date: (?)

Infested Area: Select One (?)

Gross Area: Select One (?)

Habitat: Select One (?)

Canopy Closure: Select One (?)

Abundance/Density:

Plant Description: ☐ Mature ☐ Sapling/Immature ☐ Seedling/Rosette ☐ In Flower ☐ In Fruit ☐ Seeds ☐ Dormant/Dead ☐ Unknown

Location:

Specify the location where you observed the pest, by first selecting the county from the dropdown. Then move the marker on the map to the correct location. If you move across county lines the new county will be displayed. You can also enter the lat/long in the fields below and then click the "Jump to Point" button.

County:



Latitude:
Must be expressed in Decimal Degrees (XX.XXXX) and DATUM NAD83/WGS84



5369591



Distribution Maps

Report Sightings

Species Information

Tools & Training

My EDDMapS

About

Burmese python

Python molurus ssp. bivittatus Kuhl, 1820



Multiple Points



Single Point



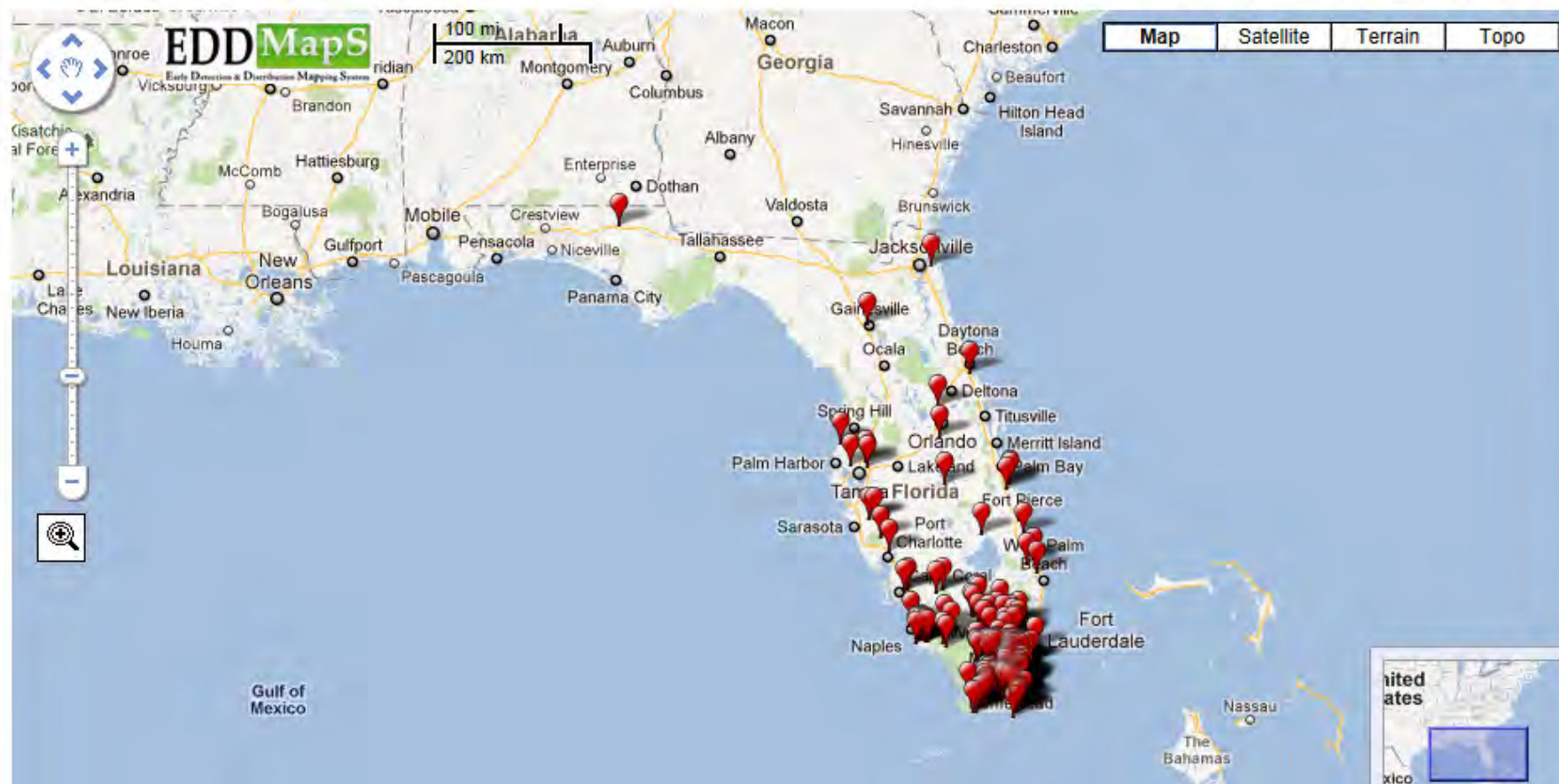
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[Excel](#)



[Google Earth](#)



Field Identification of Select Native and Nonnative Reptiles in Florida



U.S. Army Corps
of Engineers



**Everglades Cooperative Invasive
Species Management Area**

Introduction

The continued proliferation of large, invasive reptiles poses a considerable threat to the natural areas of Florida. Past experience shows successful control requires early detection and a rapid response. Thus, receiving timely observations from individuals in the field is perhaps the most important step in the process. This set of field cards has been developed to assist field personnel in the identification of priority reptile species, and provide direction regarding how and where to report such observations. Help prevent the spread of nonnative species by following these three steps.

Step 1: Be Prepared

Improve your chances of spotting nonnatives by driving at slow speeds and minimizing the distractions in your vehicle. Scan likely habitats through open windows to improve visibility. Engage as many available observers as possible. Carry equipment that assists in making accurate observations: binoculars, a digital camera, a measuring tape, and GPS unit. Being prepared can result in high-quality observations and help ensure your safety.



Report Sightings by Phone or Online at:
1-888-IVE-GOT1 (1-888-483-4681)
www.IveGot1.org

First printing, 2010.



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SHARED

- Home Sharing

GENIUS

- Genius

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- iTunes DJ
- 90's Music
- Classical Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played
- Audible

App Store > Reference > UGA Center for Invasive Species and Ecosystem Health



Free App

Category: Reference
Released: Jul 15, 2010
Version: 0.9
0.9
10.4 MB
Language: English
Seller: Charles T. Barger
© 2010 University of Georgia Center for Invasive Species and Ecosystem Health

Rated 4+

Requirements: Compatible with iPhone and iPod touch. Requires iOS 4.0 or later.

Ivegot1

Description

This App is a Field Identification of Select Native and Nonnative Reptiles in Florida. It was developed to provide easy access to identification characteristics of common native and nonnative reptiles in Florida. Successful control of nonnative species requires early detection and a rapid response. Receiving timely observations from individuals in the field is perhaps the most important step in the process. This App has...

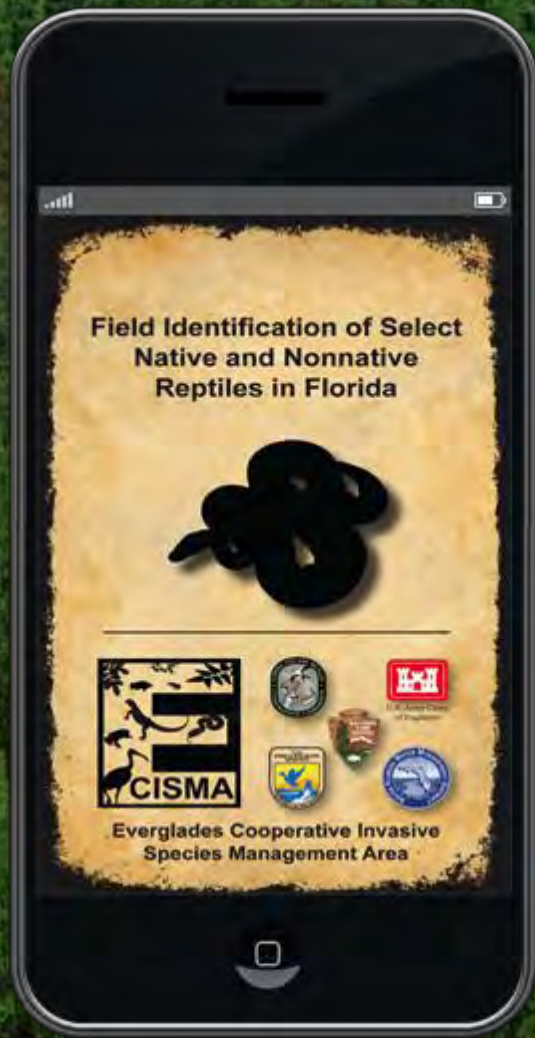
...More

UGA Center for Invasive Species and Ecosystem Health Web Site > Ivegot1 Support >

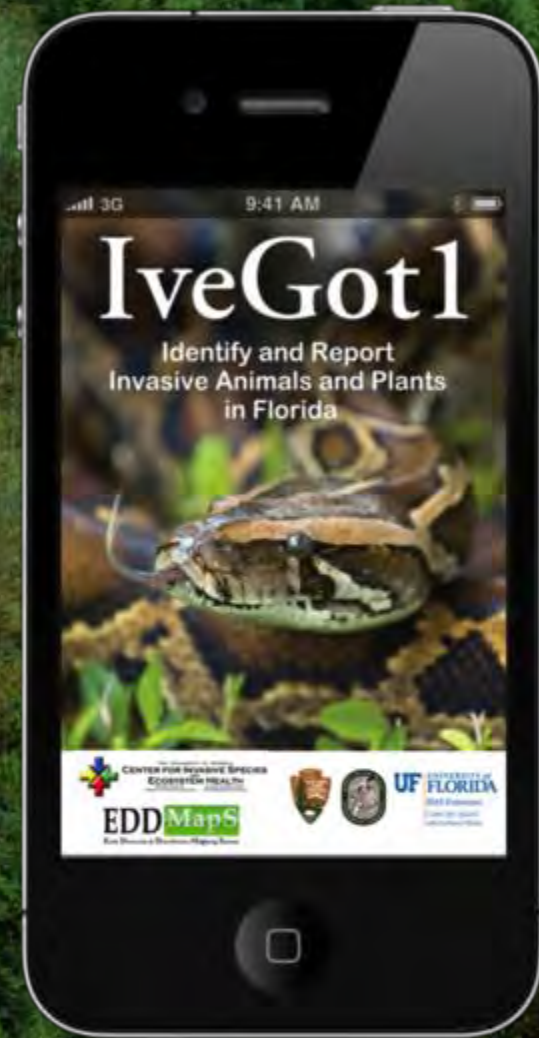
iPhone Screenshots



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- Released July 15, 2010
- Over 3400 downloads
- ID Guide Only



- Released October 4, 2011
- ID and Report Animals and Plants in Florida



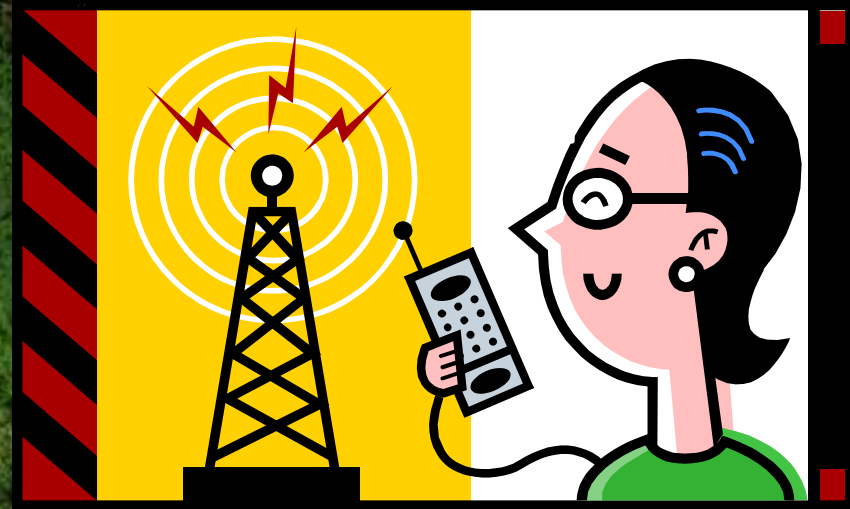
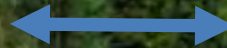
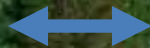
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The Ultimate Always-With-You Pest & Invasive Species Reporting Tool





Identificati
Manager

Alert and
Notifications

BUGWOOD
Image Database System
images.bugwood.org

CONTENT

PAGES

EDD MapS

Early Detection & Distribution Mapping System

NEWS SOURCE

ATA

Invasive Species in Florida?



Yep, we've built an App for that!

IveGot1 now brings the power of EDDMapS to both your iPhone® and Android™ devices.

IveGot1 was developed by the University of Georgia Center for Invasive Species and Ecosystem Health through a cooperative agreement with the National Park Service, in cooperation with the Florida Fish and Wildlife Conservation Commission and the University of Florida Center for Aquatic and Invasive Plants.

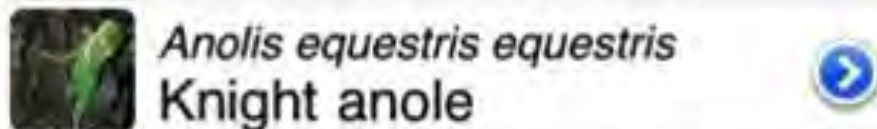
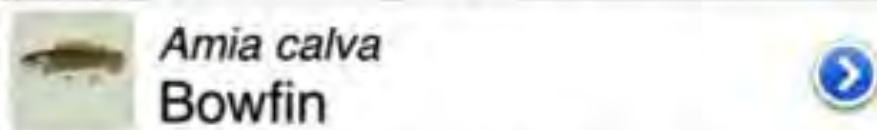
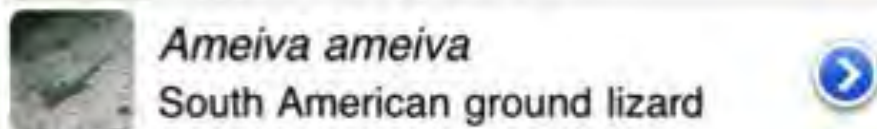
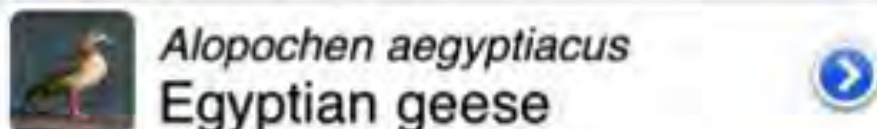
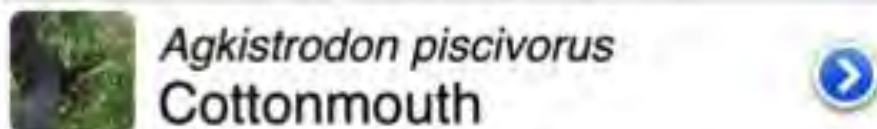
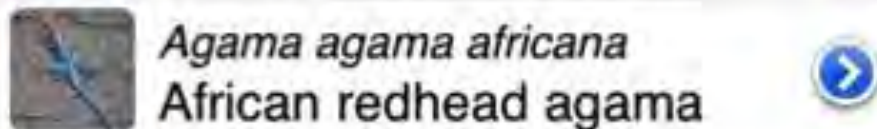
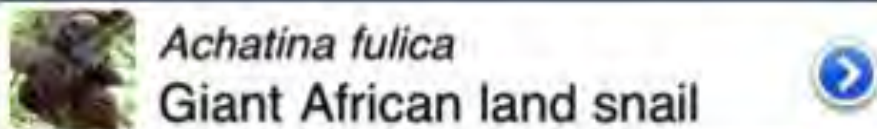
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Report an Animal



Back

Observation

Save

Common boa

Boa constrictor

09-27-2011 10:04 EDT

Latitude 31.477211695941

Longitude -83.525077965597

Accuracy 50

One

Multiple

Notes

Back

Information



Burmese python

Python molurus ssp. bivittatus

Status: Nonnative, Invasive

Length: Maximum length 25 feet

Body: Not as stout as other python species

Pattern: Network of dark blotches along back and sides (like the pattern of a giraffe); blotches are irregular, not net-like, diamond-



Animals



Plants



Upload



Maps



More

Back

Animals



Animals

Plants



Animals



Plants



Upload



Maps



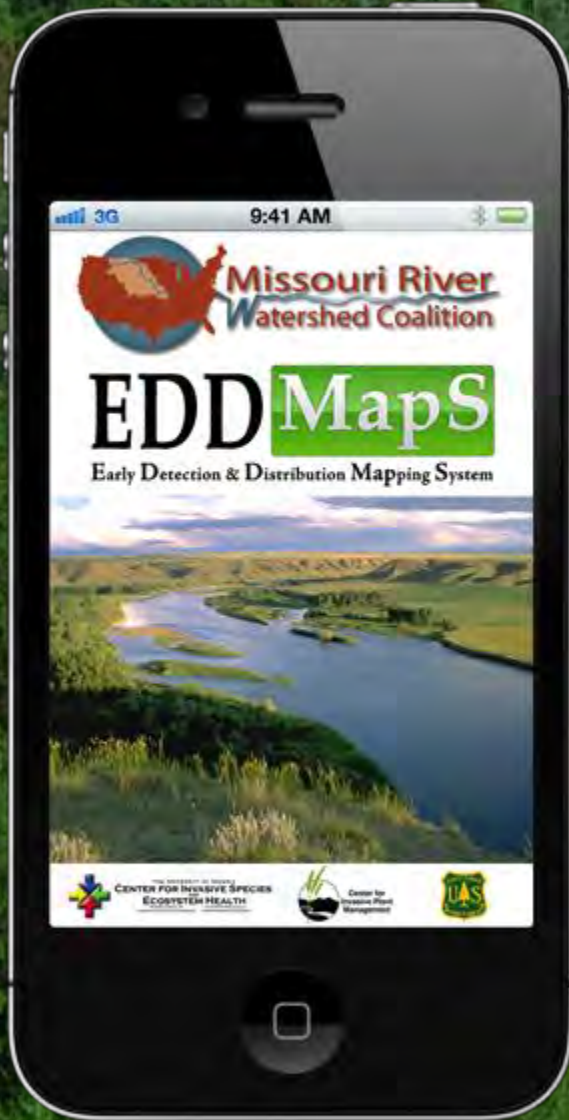
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Current Projects



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MRWC - EDDMapS

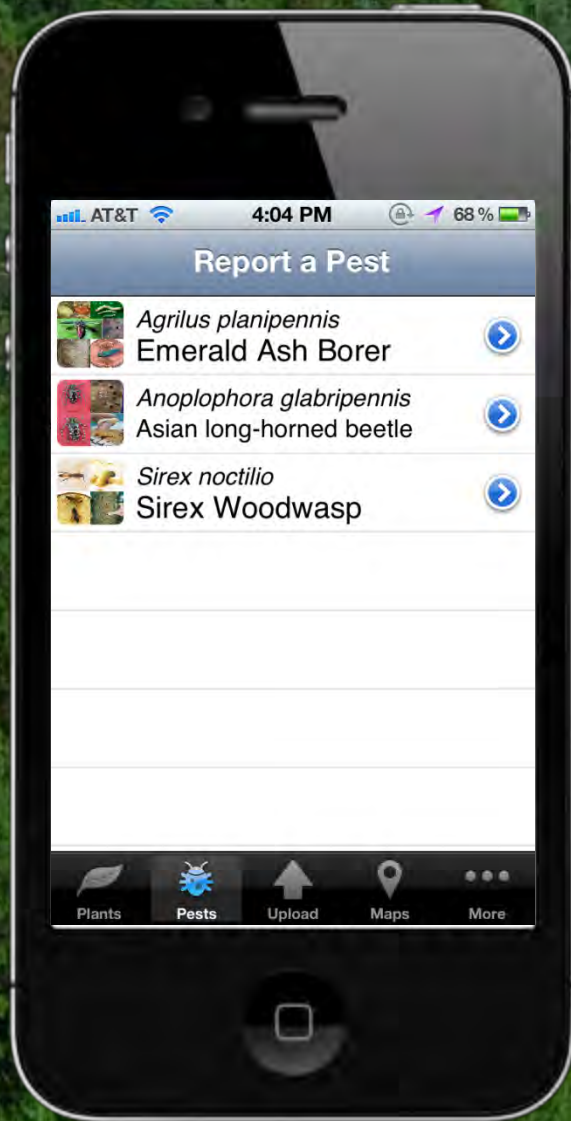


- Focus on State Noxious Weeds
- Reports are sent to State Weed Coordinator
- Reports are not displayed until verified



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Outsmart Invasives



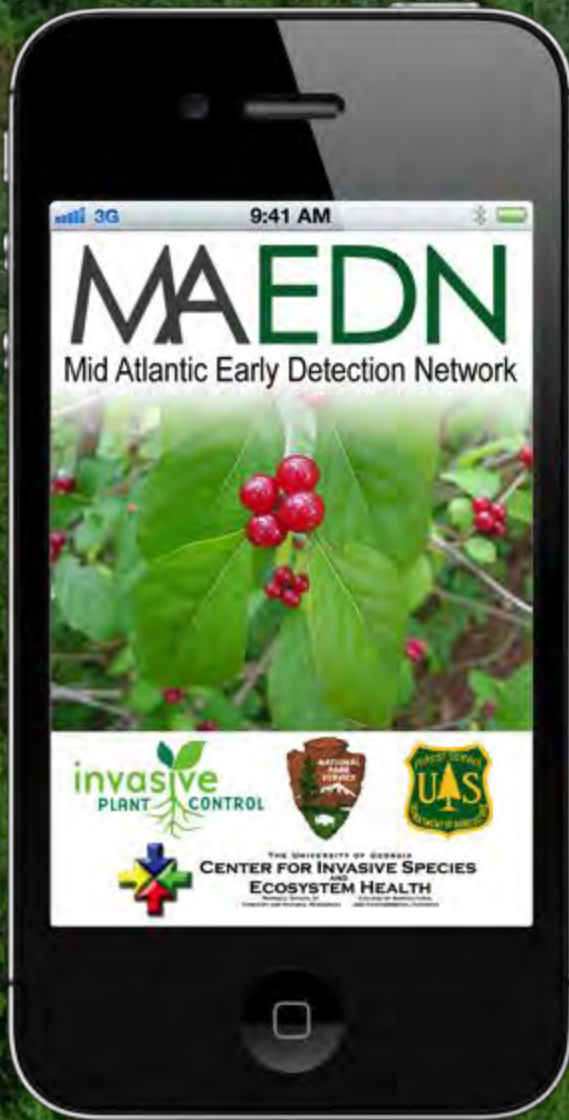
- USFS Northeast region project with University of Massachusetts Amherst
- Had seen IveGot1 and came to us to develop similar app for them



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MAEDN

- Working with University of Maryland Extension to include regulated species and verification contacts for Mid-Atlantic region



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Report a Pest

-  *Agrilus planipennis*
Emerald Ash Borer
-  *Anoplophora glabripennis*
Asian Longhorned Beetle
-  *Epiphyas postvittana*
Light brown apple moth
-  *Halyomorpha halys*
Brown marmorated stink bug
-  *Lymantria dispar*
Gypsy moth
-  *Popillia japonica*
Japanese beetle
-  *Sirex noctilio*
Sirex Woodwasp



Pests



Plants



Upload



Maps



More

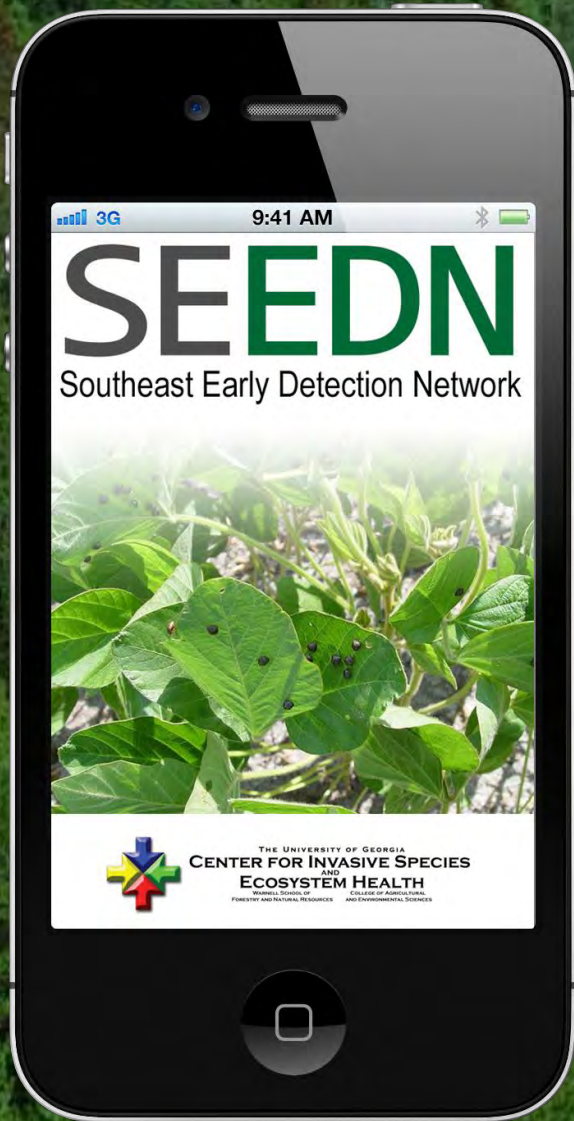
PNEDN

- 2011 ODA Farm Bill project
- Contracted with UGA to develop app and website
- Built using existing EDDMapS frameworks



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SEEDN



- Developed for non regulatory plants and pests
 - Kudzu Bug was primary focus
- Working with Clemson to modify existing SEEDN iPhone and Android smartphone apps to
 - Allow reporting of regulatory species
 - Include images and descriptions of those species
 - Include notification and review mechanism for handling these reports



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Great Lakes Early Detection Network



School of Environment & Natural Resources
College of Food, Agricultural & Environmental Sciences



Terrestrial Plants
Aquatic Plants
Insects
Plant Pathogens
Aquatic Invertebrates
Fish
Animals
Fish and Animal Diseases



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Terrestrial Invasive Plant Early Detection Mapping

The map on the right shows the reported locations of invasive plants and weeds of concern in Minnesota. Choose your species of concern to see reported locations as overlays or "clusters":



Clusters are color-coded based on the total number, shown in the middle of the symbol. Click on the cluster to zoom in closer.

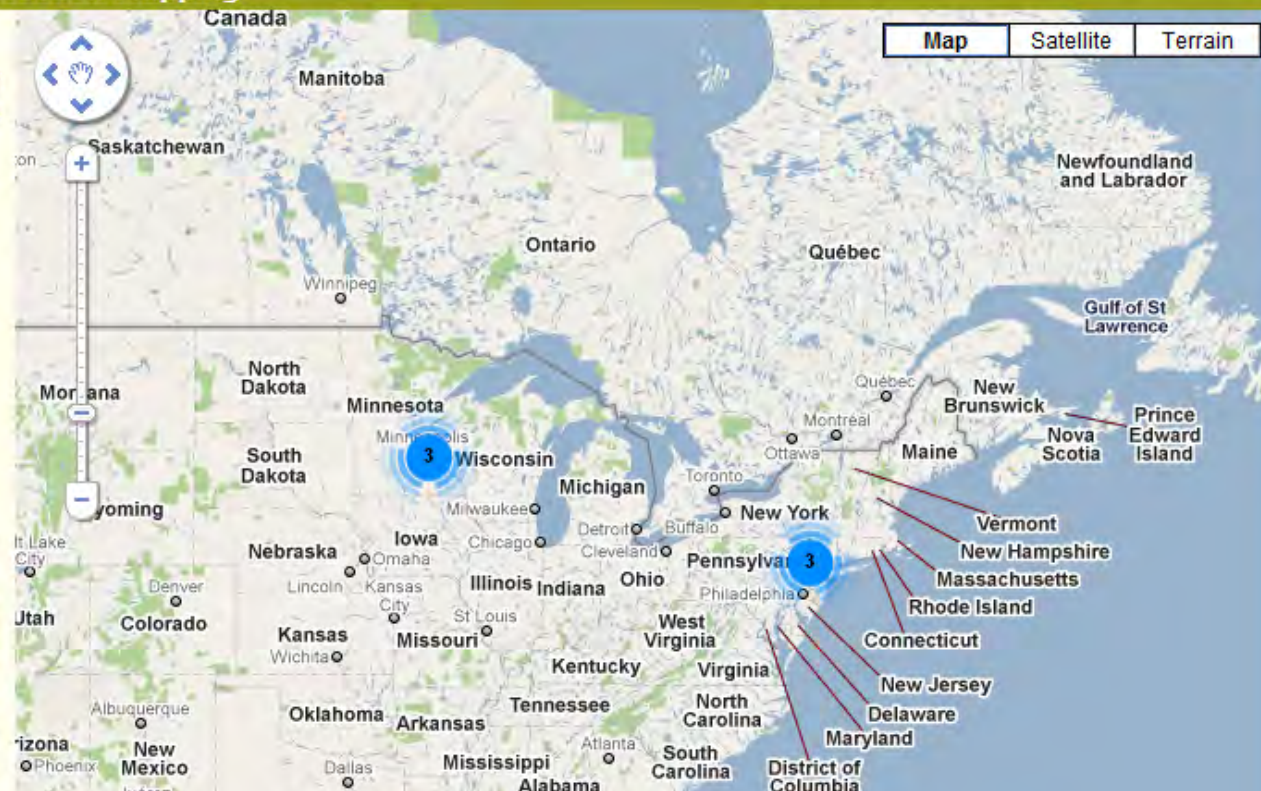
Narrowleaf bittercress

Scientific Name:
Cardamine impatiens

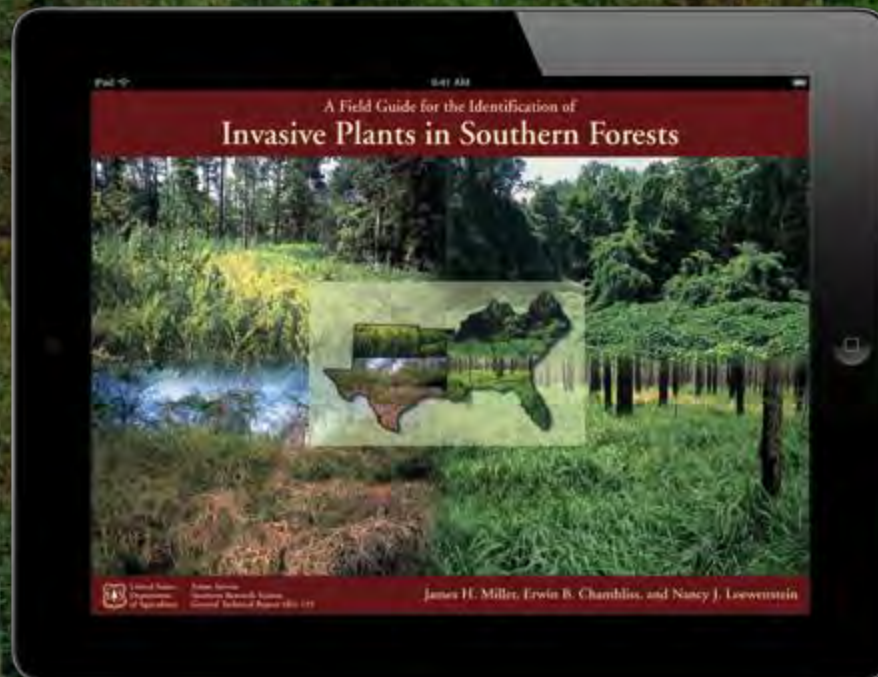
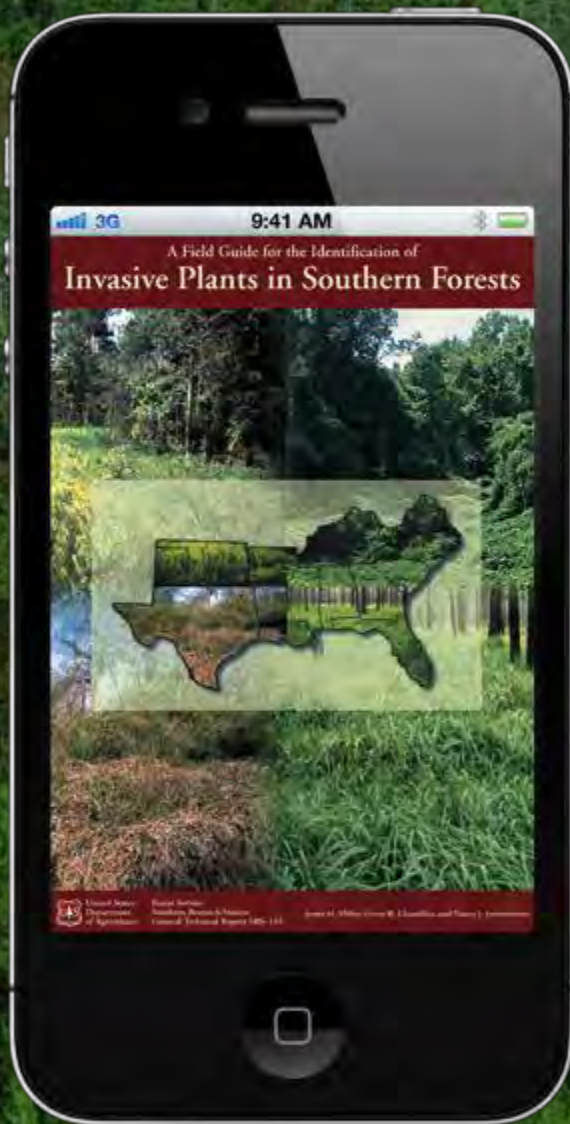
Minnesota-Area reports:
3

To enter your own observations or see more species, visit our partners:

EDDMapS
Early Detection & Distribution Mapping System



**Working with Minnesota Dept. of Agriculture to implement
EDDMapS for First Detectors/Master Gardeners
as part of 2012 Farm Bill**



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App Store > Reference > UGA Center for Invasive Species and Ecosystem Health



Downloaded

This app is designed for both iPhone and iPad

Category: Reference
Released: Jan 25, 2012
Version: 0.9
Size: 282 MB
Language: English
Seller: Charles T. Barger
© The University of Georgia - Center for Invasive Species and Ecosystem Health

Rated 4+

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iOS 4.3 or later.

More by UGA Center for Invasive Species and Ecosystem Health



JustGott - Identify and Report Invasives

Invasive Plants in Southern Forests: Identification and Management

Description

This app is based on the U.S. Forest Service publication: A Field Guide for the Identification of Invasive Plants in Southern Forests. Invasions of nonnative plants into forests of the Southern United States continue to go unchecked and only partially unmonitored. These infestations increasingly erode forest productivity, hindering forest use and management activities, and degrading diversity and wildlife habitat. Often called nonnative, exotic, nonindigenous, alien, or noxious weeds, they occur as trees, shrubs, vines,...

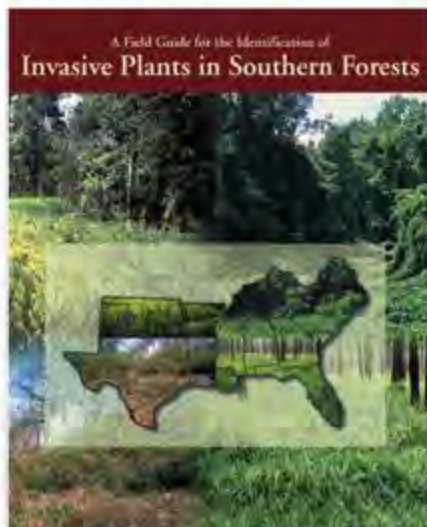
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UGA Center for Invasive Species and Ecosystem Health Web Site >

Invasive Plants in Southern Forests: Identification and Management Support >

Screenshots

iPhone iPad



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Beetles**True Bugs****Sawflies & Wasps****Moths & Butterflies****Other Pests**

Forest Pest Insects in North America: a Photographic Guide



R. G. Van Driesche¹, J. H. LaForest², C. T. Barger², R. C. Reardon³
and M. V. Herlihy¹

¹ University of Massachusetts, PSIS/Entomology

² University of Georgia, Center for Invasive Species and Ecosystem Health

³ U.S. Forest Service, Forest Health Technology Enterprise Team

FHTET-2012-02



UMASS
AMHERST



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The University of Georgia

Buprestidae

bronze birch borer*Agrilus anxius***emerald ash borer***Agrilus planipennis***flatheaded apple tree borer***Chrysobothris femorata***goldspotted oak borer***Agrilus auroguttatus***hickory spiral borer***Agrilus torquatus***soapberry borer***Agrilus prionurus***twolined chestnut borer***Agrilus bilineatus*

Cerambycidae

Asian longhorned beetle*Anoplophora glabripennis***Japanese pine sawyer***Monochamus alternatus*

R. G. Van Driesche¹, J. H. LaForest², C. T. Barger², R. C. Reardon³
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FHTET-2012-02



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Buprestidae

bronze birch borer*Agrilus anxius***emerald ash borer***Agrilus planipennis***flatheaded appletree borer***Chrysobothris femorata***goldspotted oak borer***Agrilus auroguttatus***hickory spiral borer***Agrilus torquatus***soapberry borer***Agrilus prionurus***twolined chestnut borer***Agrilus bilineatus*

Cerambycidae

Asian longhorned beetle*Anoplophora glabripennis***Japanese pine sawyer***Monochamus alternatus*

Adult of emerald ash borer

Credit: David Cappaert, Michigan State University

emerald ash borer*Agrilus planipennis***Orientation to Pest**

Emerald ash borer, *Agrilus planipennis* Fairmaire, is an invasive borer from northeast Asia threatening North American ash trees (*Fraxinus*). It was first detected near Detroit, Michigan and likely was introduced in the 1990s. It is now found in 14 other states and two Canadian provinces, and the infested range is expanding rapidly. Emerald ash borer attacks and kills healthy ash trees from ones several inches in diameter to mature trees. Massive mortality to ash of several species has occurred since the species' invasion in both landscape plantings and natural ash-dominated communities, especially in riparian areas. Larvae feed on phloem and make serpentine galleries that girdle and kill trees when the larval densities are high. Mature larvae tunnel into sap wood to pupate. In northern areas (e.g., Michigan), a single generation may require two years, but in mid-Atlantic states (e.g., Maryland), a generation can be



Buprestidae

bronze birch borer*Agrilus anxius***emerald ash borer***Agrilus planipennis***flatheaded appletree borer***Chrysobothris femorata***goldspotted oak borer***Agrilus auroguttatus***hickory spiral borer***Agrilus torquatus***soapberry borer***Agrilus prionurus***twolined chestnut borer***Agrilus bilineatus*

Cerambycidae

Asian longhorned beetle*Anoplophora glabripennis***Japanese pine sawyer***Monochamus alternatus***emerald ash borer***Agrilus planipennis***Orientation to Pest**

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Hosts Commonly Attacked

Most North American *Fraxinus* species are susceptible, but so far the most affected species have been white (*Fraxinus americana* L.), green (*Fraxinus pennsylvanica* Marshall), and black (*Fraxinus nigra* Marshall) ash.

Distribution

The North America infested area is centered on Michigan. Extensive infestations exist in Ontario, Illinois, Indiana, Ohio, Kentucky, Pennsylvania, and Maryland, and smaller infested areas are found in Quebec, Minnesota, Iowa, Wisconsin, Missouri, Tennessee, New York, Virginia, and West Virginia (as of 2010).

Biological Control Agents

Natural enemies of emerald ash borer that have been collected in the native range (especially in China and Russia) include two larval parasitoids (the eulophid *Tetrastichus planipennisi* Yang and the braconid *Spathius agrili* Yang), and an egg parasitoid, *Oobius agrili* Zhang and Huang (Hymenoptera: Encyrtidae). Additional parasitoids have been identified and are under consideration for importation, including *Spathius* n. sp. and *Antanycolus picipes* Telenga from Russia. One group of native North American parasitoids, braconids in the genus *Atanycolus*,



Buprestidae

bronze birch borer*Agrilus anxius***emerald ash borer***Agrilus planipennis***flatheaded appletree borer***Chrysobothris femorata***goldspotted oak borer***Agrilus auroguttatus***hickory spiral borer***Agrilus torquatus***soapberry borer***Agrilus prionurus***twolined chestnut borer***Agrilus bilineatus*

Cerambycidae

Asian longhorned beetle*Anoplophora glabripennis***Japanese pine sawyer***Monochamus alternatus*

Feeding stage larvae of emerald ash borer: full grown 4th instar

Buprestidae

bronze birch borer*Agrilus anxius***emerald ash borer***Agrilus planipennis***flatheaded appletree borer***Chrysobothris femorata***goldspotted oak borer***Agrilus auroguttatus***hickory spiral borer***Agrilus torquatus***soapberry borer***Agrilus prionurus***twolined chestnut borer***Agrilus bilineatus*

Cerambycidae

Asian longhorned beetle*Anoplophora glabripennis***Japanese pine sawyer***Monochamus alternatus*

UGA1193003

Chewed bark on twig, caused by maturation feeding of adult Asian longhorned beetles

Geometridae

spear-marked black moth

Rheumaptera hastata

spring cankerworm

Paleacrita vernata

western hemlock looper

Lambdina fiscellaria

winter moth

Operophtera brumata

Lasiocampidae

Siberian moth

Dendrolimus sibiricus

eastern tent caterpillar

Malacosoma americanum

forest tent caterpillar

Malacosoma disstria

Lymantriidae

Douglas-fir tussock moth

Orgyia pseudotsugata

browntail moth

Euproctis chrysorrhoea

Larvae of forest tent caterpillar feeding

Credit: Gerald J. Lenhard, Louisiana State University

forest tent caterpillar

Malacosoma disstria

Orientation to Pest

Forest tent caterpillar, *Malacosoma disstria* Hübner, occurs throughout Canada and the United States and is a generalist defoliator that feeds on a variety of hardwood trees. In the north and west of the United States (and southern Canada), trembling aspen (*Populus tremuloides* Michx.) is preferred. In the southern United States, various gums (*Nyssa* spp. and *Liquidambar styraciflua* L.) and oaks (*Quercus*) are the common hosts. However, during outbreaks, larvae will



Geometridae

spear-marked black moth

Rheumaptera hastata

spring cankerworm

Paleacrita vernata

western hemlock looper

Lambdina fiscellaria

winter moth

Operophtera brumata

Lasiocampidae

Siberian moth



gypsy



Cancel

gypsy moth

Lymantria dispar

rosy gypsy moth

Lymantria mathura

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Cynipidae

Asian chestnut gall wasp*Dryocosmus kuriphilus*

Diprionidae

European pine sawfly*Neodiprion sertifer***European spruce sawfly***Gilpinia hercyniae***Swaine jack pine sawfly***Neodiprion swainei***Virginia pine sawfly***Neodiprion pratti***hemlock sawfly***Neodiprion tsugae***introduced pine sawfly***Diprion similis***redheaded pine sawfly***Neodiprion lecontei*

Pamphiliidae

pine false webworm*Acantholyda erythrocephala*

Larvae of red-headed pine sawfly

UGA0284090b

Credit: Gerald J. Lenhard, Louisiana State University

Beetles**True Bugs****Sawflies & Wasps****Moths & Butterflies****Other Pests**

Forest Pest Insects in North America: a Photographic Guide

Van Driesche, R.G., J.H. LaForest, C.T. Barger, R.C. Reardon, and M.V. Herlihy. 2012. *Forest Pest Insects in North America: a Photographic Guide*. USDA Forest Service. Forest Health Technology Enterprise Team. Morgantown, WV. FHTET-2012-02.

Preface

The photos present in this App are intended to help foresters, urban landscaping employees, or others working with trees recognize some of the common pest insects affecting trees in North America and understand their life cycles and how they damage trees. The information was drawn from book, websites, factsheets, and some original literature. This App is not a guide for specialists. In many groups, such as the bark beetles and aphids, confirmation of species identity requires attention to details not visible in photos with comparisons to other similar species and use of keys. Sources for further information (websites and articles) are given at the bottom of each species' page; however, an exhaustive review of the literature was beyond the scope of this project. In most cases, pages on individual species were reviewed by experts with direct knowledge of the species (acknowledged below). While any residual mistakes remain mine (Roy Van Driesche), I am deeply indebted to the many people who greatly improved pages on particular insects with their comments, photos and edits.

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Agrilus anxius

emerald ash borer >

Agrilus planipennis

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Agrilus auroguttatus

hickory spiral borer >

Agrilus torquatus

soapberry borer >

Agrilus prionurus



Forest Insects

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to Z

Scientific Name

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About

Beetles

goldspotted oak borer



Adult goldspotted oak borer



Credit: Mike Lewis, Center for Invasive Species Research



Images



Details

Beetles

goldspotted oak borer



Adult goldspotted oak borer



Credit: Mike Lewis, Center for Invasive Species Research



Images



Details

goldspotted oak borer

Agrilus auroguttatus

Orientation to pest

Goldspotted oak borer, *Agrilus auroguttatus* Schaeffer, is an oak-attacking buprestid native to mountains in southern Arizona. This pest invaded southern California, likely having been moved in firewood taken by campers into public campgrounds in the region. It has killed more than 80,000 oaks in California's native oak-savannahs and is of concern as an ecological pest. It is still spreading due to unrestricted movement of firewood out of the affected parts of southern California, and the ultimate extent of potential damage is not yet known. The biology of this species is very similar to that of other *Agrilus*



Images



Details

Hosts commonly attacked

The species most affected are coast live oak (*Quercus agrifolia* Née) and California black oak (*Quercus kelloggii* Newb.). Canyon live oak (*Quercus chrysolepis* Liebm.) is affected to a lesser degree. See http://en.wikipedia.org/wiki/Agrilus_coxalis

Distribution

Goldspotted oak borer occurs as a native species in southern Arizona and as an invader in southern California. A related species, now known as *Agrilus coxalis* Waterhouse, is native to southern Mexico and Guatemala.

Important biological control agents related to this pest species

Natural enemies of this species are relatively unknown, but surveys are being conducted in the pest's native



Images



Details

Scientific Name

A

pine false webworm

Acantholyda erythrocephala

eastern spruce gall adelgid

Adelges abietis

cooley spruce gall adelgid

Adelges cooleyi

balsam woolly adelgid

Adelges piceae

hemlock woolly adelgid

Adelges tsugae

bronze birch borer

Agrilus anxius

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Common Name

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ambermarked birch leafminer

Profenusa thomsoni

ambrosia beetle

Xyleborus celsus

ambrosia beetle

Xyleborus affinis

ambrosia beetle

Xyleborus ferrugineus

ambrosia beetle

Xyleborus xylographus

ambrosia beetles

Xyleborus spp.

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Forest Insects



Scientific Name



Common Name



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Scientific Name



Common Name



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gypsy



Cancel

gypsy moth

Lymantria dispar

rosy gypsy moth

Lymantria mathura

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Preface

The photos present in this App are intended to help foresters, urban landscaping



Forest Insects



Scientific Name



Common Name



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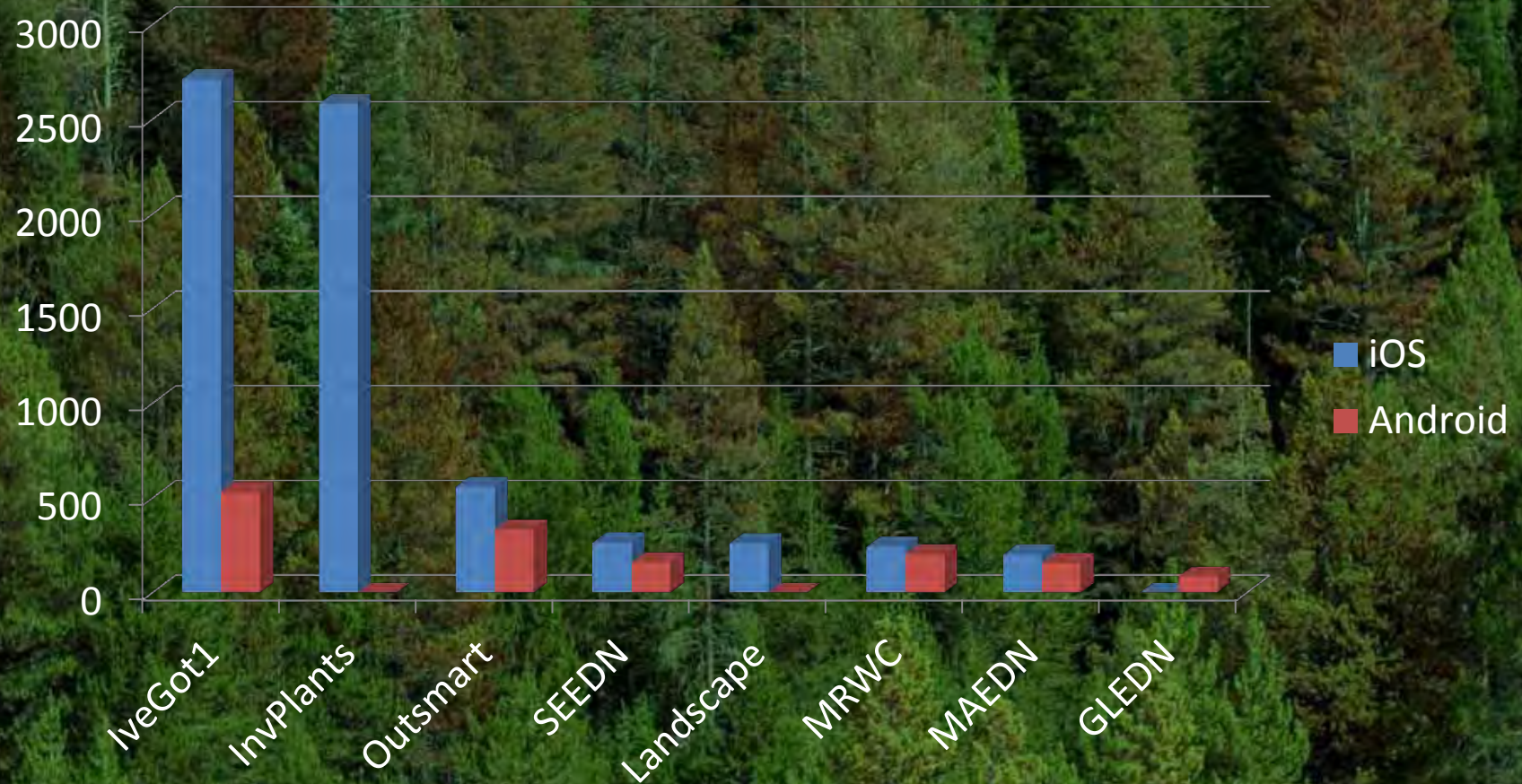
Under Development

- iBiocontrol – Field Guide and Reporting of Biological Control Agents of Invasive Plants
- National Park Service – National Park Invasive Plant App
- 3 years smartphone development – first USFS, NPS and USFWS apps
- 16 apps

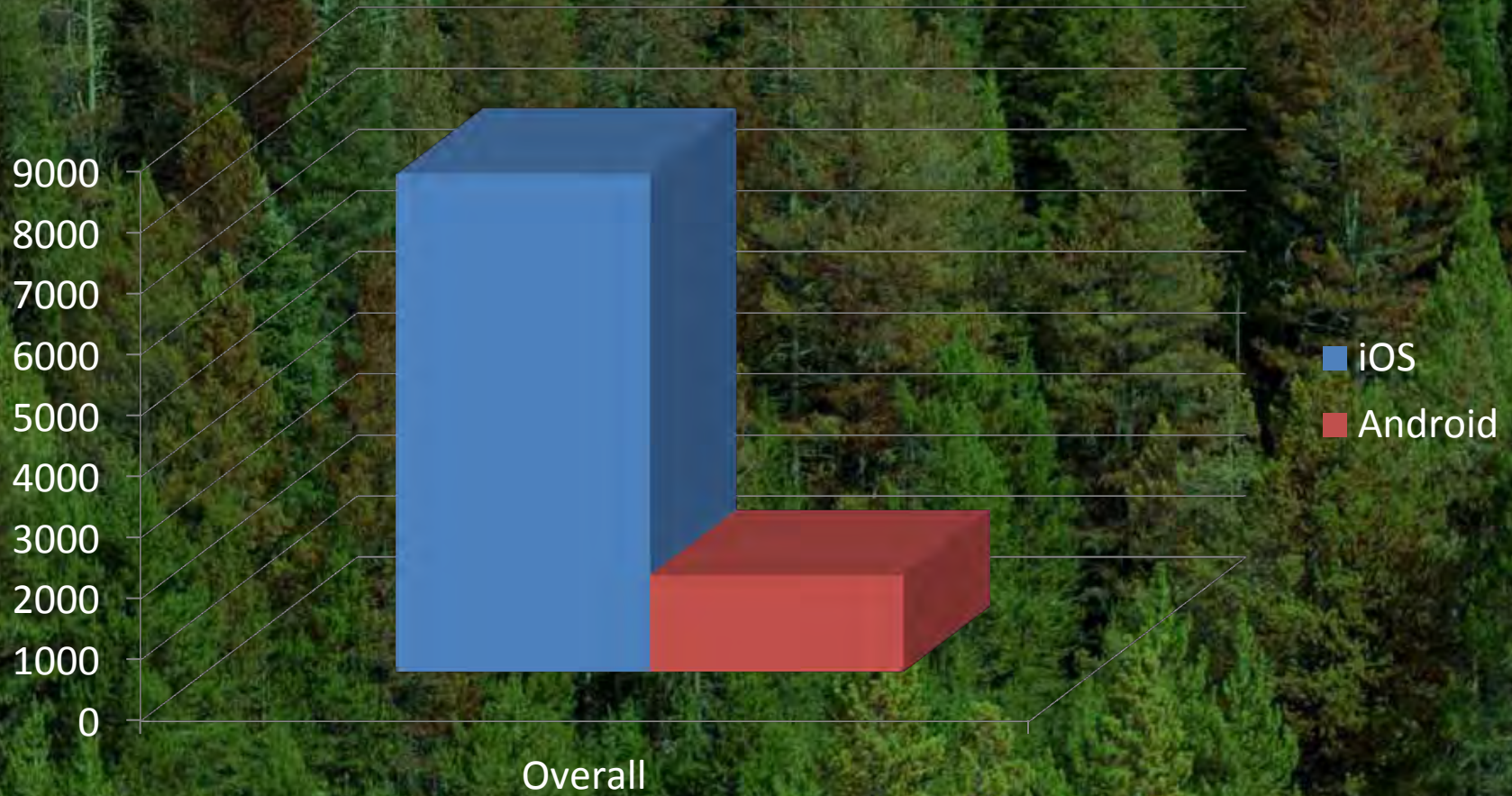


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App Downloads





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IveGot1 - Identify and Report Invasive Animals and Plants in Florida

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The Center for Invasive Species & Ecosystem Health

The Center is involved in numerous grant funded projects and cooperative agreements relating to

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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
- It is not and was never meant to be in competition with NAPIS or IPHIS, or programs like Healthy Urban Tree Initiative
- No regulated pests are mapped/displayed until verified (if ever)



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
- History and experience building tools for forest pests, numerous partners, long-term sustainability
- Working with APHIS and FICMNEW on App standards



EDD Maps

Early Detection & Distribution Mapping System

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