Georgia Invasives

Education and Outreach Throughout the State

Karan A. Rawlins, Invasive Species Coordinator

The University of Georgia
Center for Invasive Species and Ecosystem Health
Warnell School of Forestry and Natural Resources
College of Agricultural and Environmental Sciences

Teamwork

Carol Griffin, Tifton, GA

Teamwork

People in wide a variety of specialties pull together to make this team work

Co-Director and Professor of Silviculture, Co-Director and Professor of Entomology, Information Technology Director, Integrated Pest Management and Forest Health Coordinator, Invasive Species Coordinator, Outreach and Communications Coordinator, Administrative Assistant, Web and Database Programmer, Web and Publication Specialist, Laboratory Technician/Insect Taxonomy, Digital Image Specialist

Teamwork

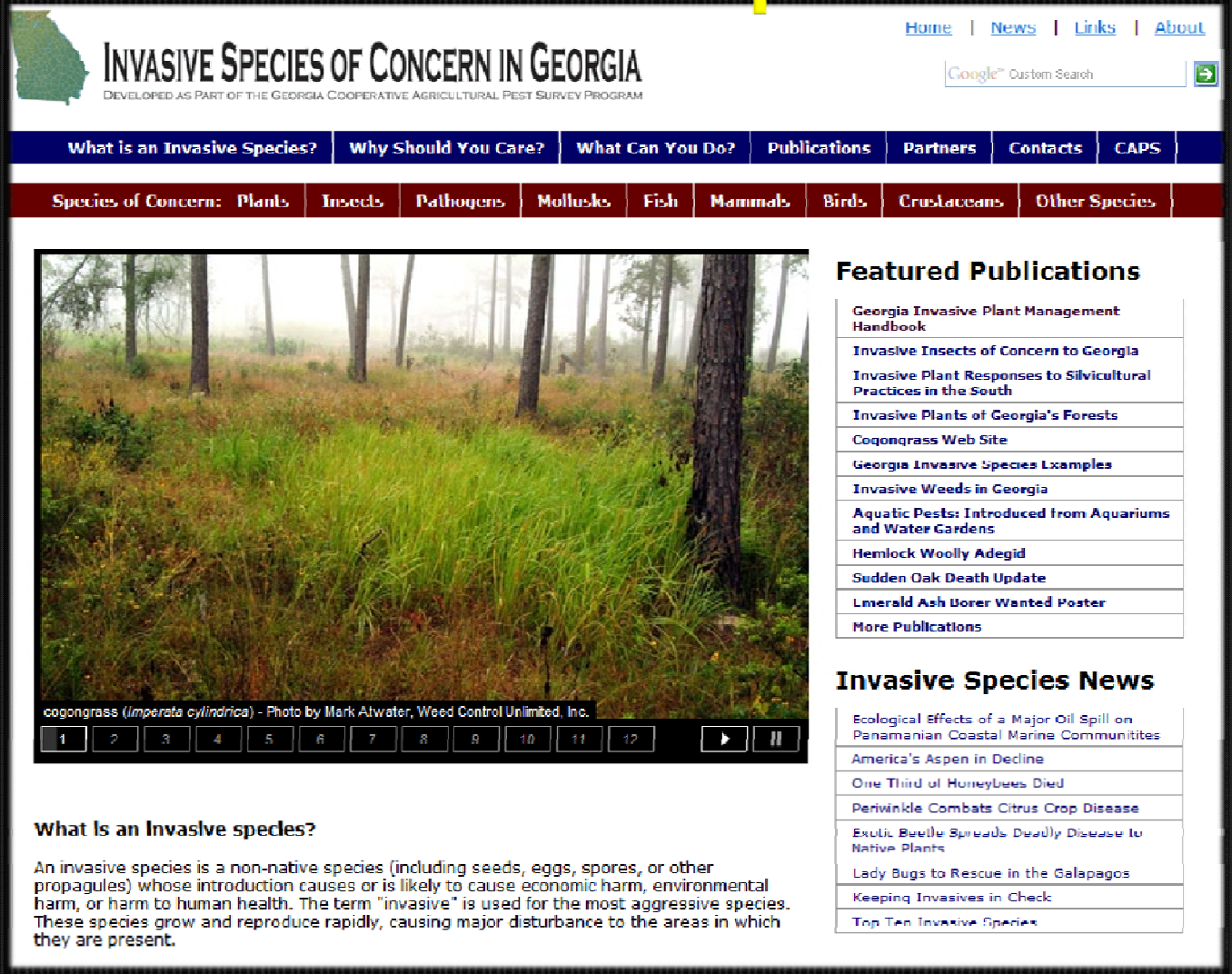
State Partners

- Georgia Forestry Commission
- Georgia Department of Agriculture
- Georgia Department of Natural Resources

Federal Partners

- USDA Forest Service
- USDA APHIS PPQ

Website development for



www.gainvasives.org

Georgia Invasive Plant Management Handbook

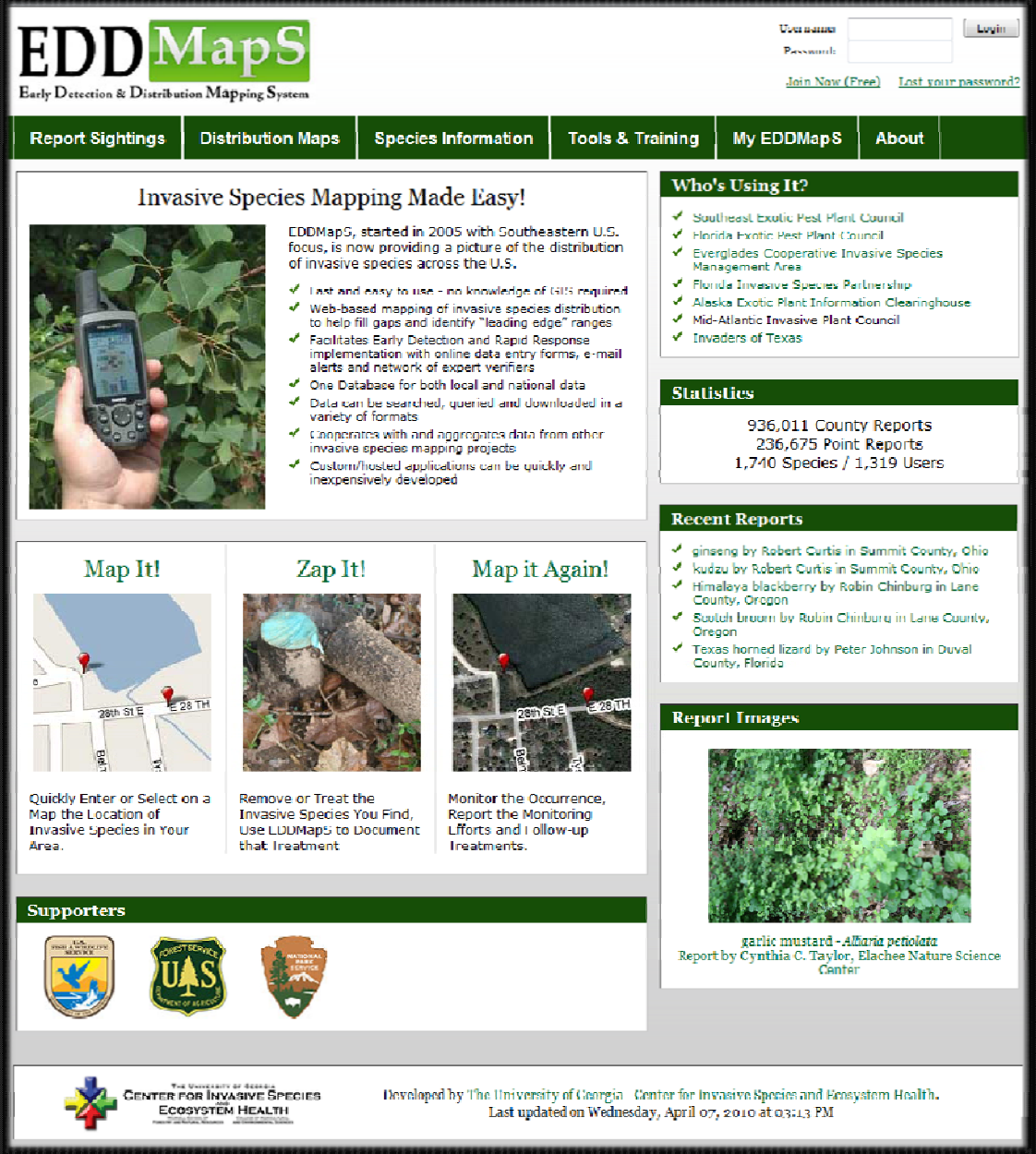
www.gainvasives.org

Handbook: Introduction

The intent of this training is to empower the public to become actively involved in order to more effectively slow the spread of harmful invasive species and reduce their environmental and economic damage.

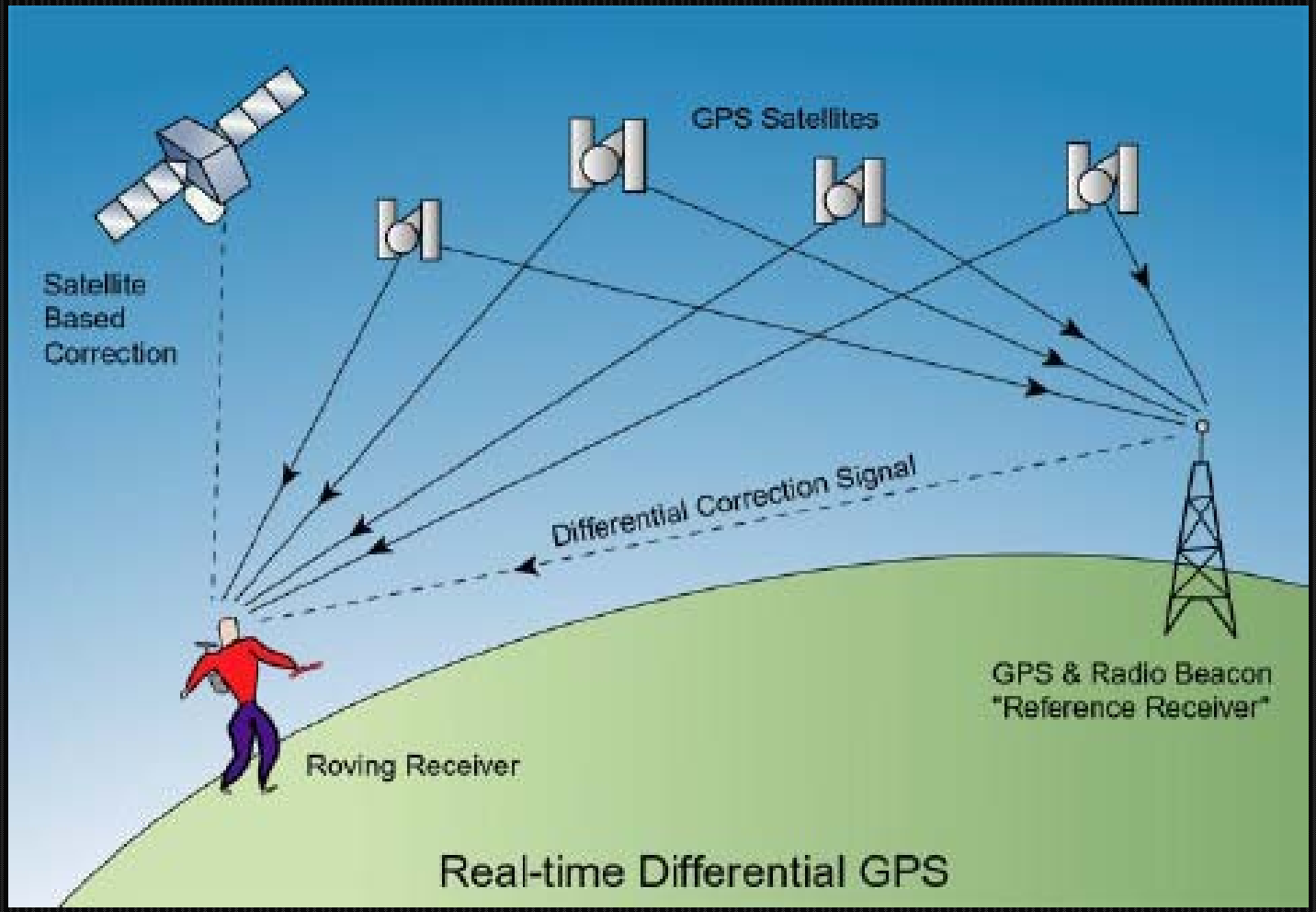
Step-By Step Instructions for Reporting Invasive Plants to EDDMapS

A key component in an invasive species Early Detection & Rapid Response program is the development of species distribution maps. Entering and tracking locations of invasives within and between states can identify the “leading edge” of invasive plants heading our way.



Step-By-Step Instructions for EDDMapS

Handbook - Introduction to GPS



Handbook – Choosing a GPS Receiver

Handbook – Herbarium Specimens

- Plant Collecting Guidelines
- You can make or purchase a plant press
- Mounting Guidelines for Herbarium Sample
- List of Herbaria in Georgia

Handbook – Digital Imaging

Being able to use photographs to verify the species adds validity to the data collected and entered into EDDMapS.

Ronald F. Billings, Texas Forest Service, US, Chris Evans, University of Georgia,
James Miller, USDA Forest Service, Karan Rawlins, University of Georgia.

Handbook – Field Preparation

- Good maps

- Let someone know where you will be going
- Check the weather

- First aid kit

- Check your field equipment

- Be aware of your surroundings.

Clockwise from top center: Chris Evans, River to River CWMA; ibid.; David Moorhead, UGA; ibid.; ibid.; (center) ibid., Bugwood.org

EDRR–Early Detection & Rapid Response

programs help us to monitor plants with the potential to become invasive threats

www.invasive.org

INVASIVE.ORG
Center for Invasive Species and Ecosystem Health

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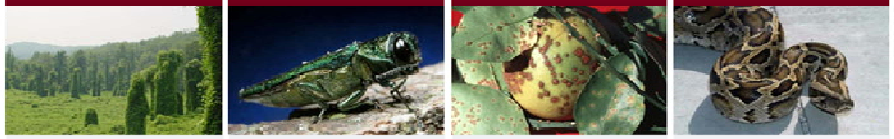
Search: Google™ Custom Search GO

Invasives 101 | Species | Images | Publications | Maps | Videos | Control | EDRR | CWMAs/CISMAs | How to ... | Global

Invasive and Exotic Species of 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



The Nature Conservancy
Protecting nature. Preserving life.

GIST 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 the University of Georgia - Center for Invasive Species and Ecosystem Health. More info...

Invasive Plants of the United States: Identification, Biology and Control

This web site includes 218 invasive plant species in the United States. The focus is to provide identification, ecology, and control information for invasive plants in the United States occurring in aquatic;

Cogongrass Road Crew Training Resources

Cogongrass (Imperata cylindrica) is one of the worst invasive plants we have in the South. This link contains information and resources for Extension agents to conduct a short informational training program for their county road crews. More info...

Invasive Plant Responses to Silvicultural Practices in the South

This guide is intended to aid foresters and managers in the southeastern United States in developing

NEWS

- Ecological Effects of a Major Oil Spill on Panamanian Coastal Marine Communities
- America's Aspen in Decline
- One Third of Honeybees Died
- Periwinkle Combats Citrus Crop Disease
- Georgia Invasive Plant Management Handbook
- More News

LINKS

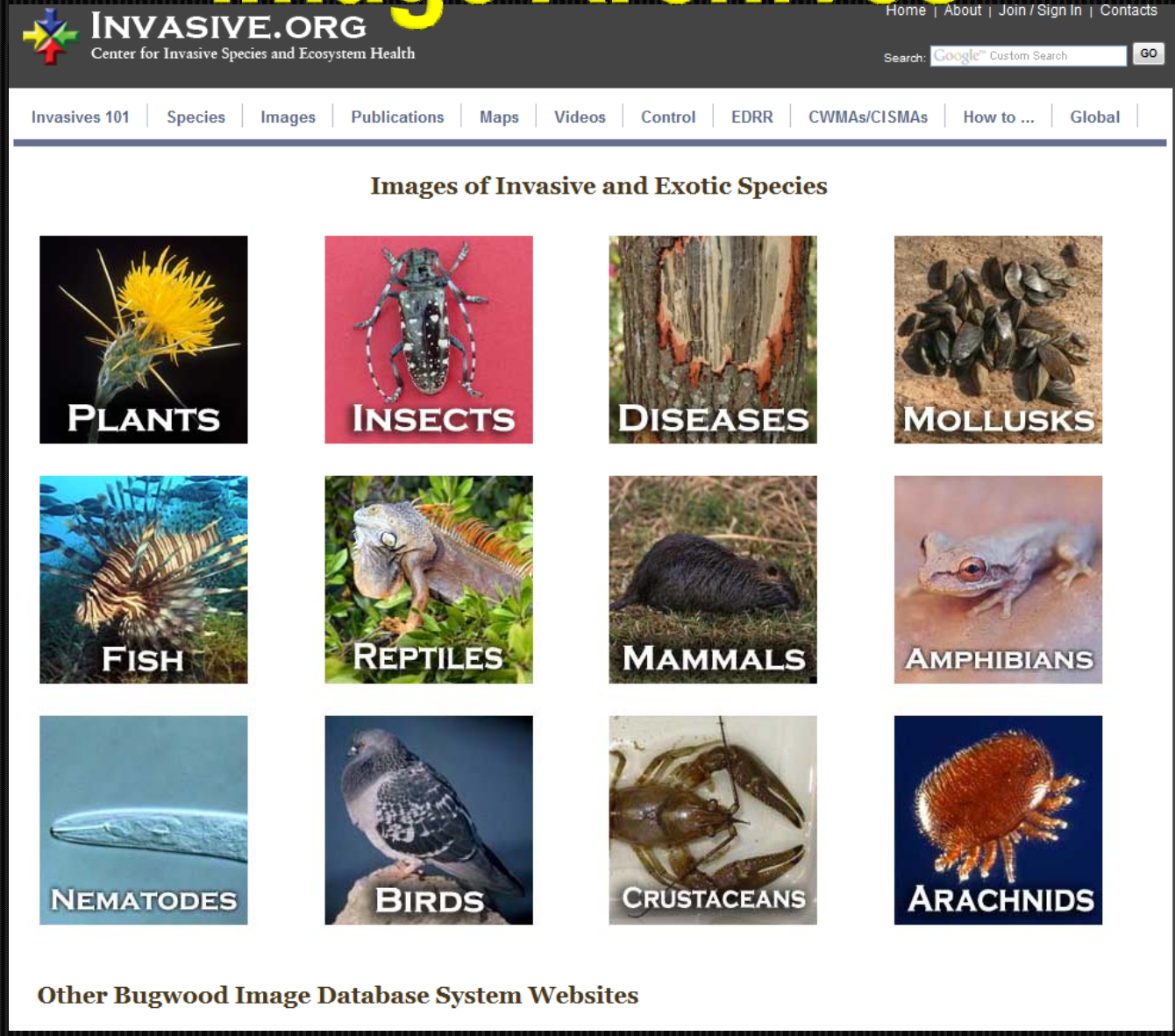
- Pest Tracker
- USDA APHIS PPQ Pest Detection
- USDA Forest Service - Invasive Species Program
- National Invasive Species Information Center
- Global Invasive Species Database
- North American Plant Protection Organization
- European and Mediterranean Plant Protection Organization

SUPPORTERS

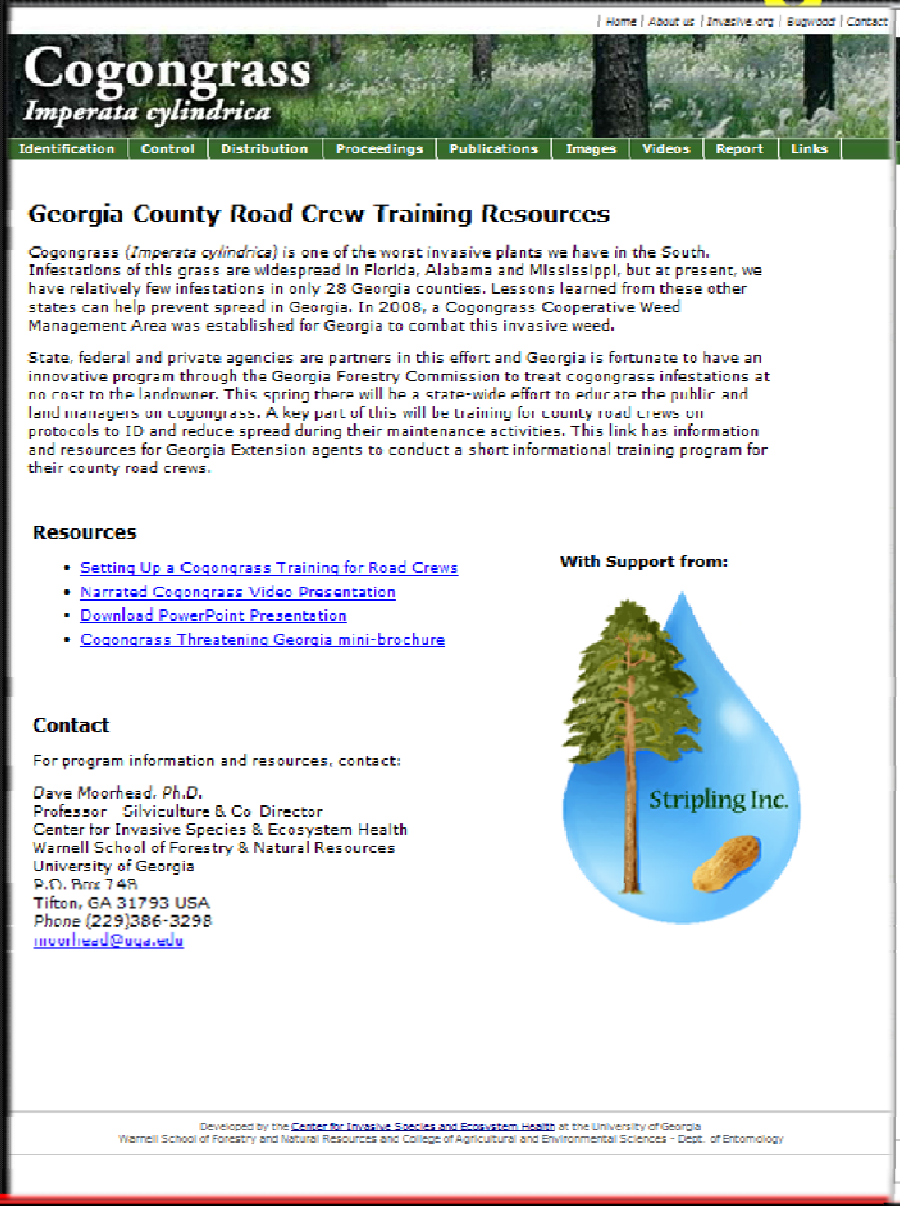
APHIS | USDA Forest Service | CSREES

CONTACT US

Image Archives



www.cogongrass.org



Posters

'6 Most UnWanted'

Posters were sent all across Georgia to:

- State Parks
- County Extension Offices
- Forestry Commission Offices

Examples of Georgia's Invasive Species of Concern

Current Threats

hemlock woolly adelgid
***Adelges tsugae*[4, 20]**

250,000 acres of hemlock in GA
Provide shade and soil stabilization for trout streams (4000 miles in GA)
100,000 – trout fishermen
Kills trees in 2 to 4 years
$9 million for research & suppression in eastern U.S. to date

gypsy moth
***Lymantria dispar*[5, 20]**

Attacks most hardwood trees
Causes widespread defoliation and reduces aesthetic, recreational, and wildlife values.
Recreation (Hiking, fishing, camping, bird watching, etc.) is $1.7 Billion annually in GA
$75,000 annually for detection surveys in GA
10,000 acres treated in GA over last 15 years

boll weevil
***Anthonomus grandis*[6]**

First observed in 1915, eradicated 1991
Decreased cotton yields from 2.8 million bales annually to 112,000 bales annually
Eradication cost was $99.0 million in GA
Continues to cost $5.4 million annually in GA

tropical spiderwort
***Commelina benghalensis*[7,8,9]**

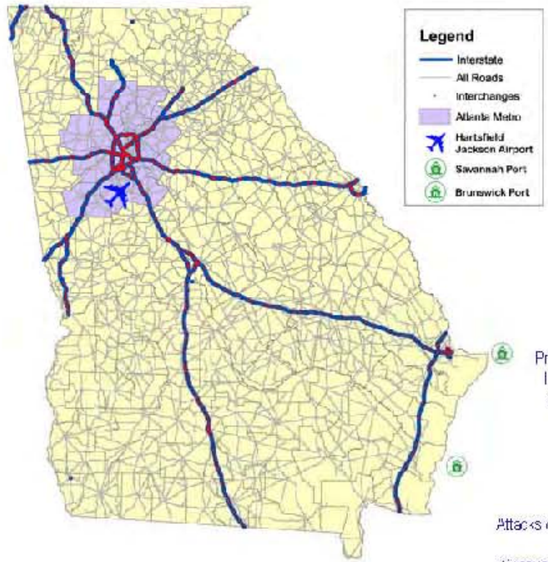
Tolerant to Roundup
90% of GA cotton is Roundup Ready
competes for water and nutrients and smothers the crops (cotton and peanuts)
20 - 40% yield reduction in cotton
40% + yield reduction in peanuts
195,000 acres in GA infested in 35 counties
$1.2 million extra herbicide cost annually in cotton

cogongrass
***Imperata cylindrica*[10,11]**

Has infested nearly 1 million acres in the Southeast U.S.
26 known locations in GA, mostly pine plantations
Burns hot and readily - wildfire/safety hazard
Spreading via contaminated equipment and road work
Forestry is a $20.2 billion/year industry in GA

sudden oak death
***Phytophthora ramorum*[12,13]**

9.8 million acres of oak forests in GA, 15.6% of GA trees
Valued at $33 billion for timber, wildlife, tourism & urban forests
Introduced by nursery trade - a $1.31 billion/year industry
Currently positive only in some nursery plants in GA
Alternate hosts include - camellia, rhododendron, azalea & viburnum
Could devastate GA oaks if spreads to forests



Pathways

1244 miles of interstate highways[1]

18.3 million tons of cargo handled annually through Georgia Ports[2]

767,897 metric tons of cargo handled annually through Hartsfield-Jackson Airport[3]

Potential Threats

Asian longhorned beetle
***Anoplophora glabripennis*[14]**

Introduced in New York & Chicago
Destroyed 10,000 trees,
spent $180 million to eradicate
Could kill 1/3 of urban trees nationwide
a compensatory value of $669 billion

sirex woodwasp
***Sirex noctilio*[15,16]**

80% mortality of pines in Australia
Killed 1.75 million trees in one year
Slash and Loblolly pine both susceptible

garlic mustard
***Alliaria petiolata*[17]**

Dominates hardwood understories
Restricts desired regeneration
Displaces native vegetation and wildlife forages

giant salvinia
***Salvinia molesta*[18]**

Introduced as ornamental garden plant
Produces thick mats that disrupt aquatic food chain
Interferes with recreation, hydroelectric production, drinking water supplies, irrigation and aquaculture

old world bollworm
***Helicoverpa armigera*[19]**

Attacks cotton, peanuts, tobacco, bermudagrass and pines
Reduced cotton yields 50-60% annually in China
Consumed half of foliage of 60% of pines in New Zealand
Developed resistance to insecticides
Introduction would restrict international trade

References
1 - http://www.georgiaencyclopedia.org/nge/Article.jsp?id=h-2423
2 - http://www.gaports.com/
3 - http://www.atlanta-airport.com/sublevels/airport_info/pdfs/Traffic/200512.pdf
4 - http://www.georgiainvasives.org/hwa/hwapublic.pdf
5 - http://www.fs.fed.us/r8/foresthealth/idotis/insects/gm.html
6 - http://pubs.caes.uga.edu/caespubs/pubs/PDF/RB428.pdf
7 - http://www.ars.usda.gov/is/pr/2004/040924.htm
8 - http://www.cropsoil.uga.edu/weedsci/slides/The_Perfect_Storm/index.htm
9 - personal conversation Ted Webster, USDA ARS
10 - http://www.cogongrass.org/
11 - http://www.gfc.state.ga.us/Resources/Publications/ForestMarketing/GAForestProductsFacts.pdf
12 - http://www.georgiainvasives.org/sod/
13 - http://pubs.caes.uga.edu/caespubs/pubcd/SB41-07.htm
14 - http://www.news.ucdavis.edu/products/gallery/anogl1.html
15 - http://www.na.fs.fed.us/spfo/pubs/pest_al/sirex_woodwasp/sirex_woodwasp.pdf
16 - http://www.aphis.usda.gov/ppq/ep/emerging_pests/sirex/pdf_files/sn_npag031114.pdf
17 - http://www.invasive.org/eastern/biocontrol/29GarlicMustard.html
18 - http://www.invasive.org/publications/aphis/gsalvini.pdf
19 - http://www.aphis.usda.gov/ppq/ep/pestdetection/pra/harmigerapra.pdf
20 - personal conversation James Johnson, GFC

Poster Cogongrass

One of the World's Worst Weeds Invades Georgia's Forests

Silvicultural Responses Handbook

Invasive Plant Responses to Silvicultural Practices in the South

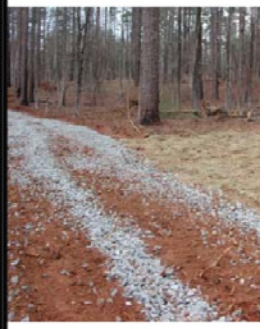
The University of Georgia

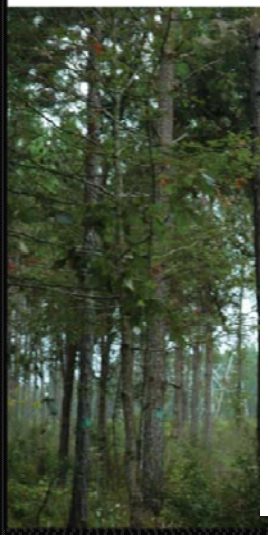
Bugwood Network

BW-2006-03

December 2006

C.
G.





Invas
Tree o
Paulo
Tallow
Autun
Privet
Orient
Japane
Japane
Cogon
Nepal
Garlic
Exotic
Japane

A 0.2
B 1%
C 2%
D 3-5

Invasive Species	Response to Disturbance			
	High Light	Soil Disturbance	Fire	Re-sprout/ re-grow
Tree of Heaven	Promoted	Promoted	Negligible	Yes
Paulownia	Promoted	Promoted	Promoted	Yes
Tallow tree	Promoted	Promoted	Discouraged	Yes
Autumn Olive	Promoted	Promoted	Promoted	Yes
Privet	Promoted	Promoted	Negligible	Yes
Oriental Bittersweet	Negligible	Promoted	Negligible	Yes
Japanese Honeysuckle	Promoted	Promoted	Negligible	Yes
Japanese Climbing Fern	Negligible	Promoted	Promoted	Yes
Cogongrass	Promoted	Promoted	Promoted	Yes
Nepalese Browntop	Promoted	Promoted	Discouraged	No
Garlic Mustard	Discouraged	Promoted	Discouraged	No
Exotic Lespedezas	Promoted	Promoted	Promoted	Yes
Japanese Knotweed	Promoted	Promoted	Negligible	Yes

Invasive Species	Seed Dispersal			
	Wind	Water	Bird	Soil contaminate
Tree of Heaven	Yes	No	No	No
Paulownia	Yes	No	No	No
Tallow tree	No	Yes	Yes	No
Autumn Olive	No	No	Yes	No
Privet	No	Yes	Yes	No
Oriental Bittersweet	No	Yes	Yes	No
Japanese Honeysuckle	No	No	Yes	No
Japanese Climbing Fern	Yes	Yes	No	Yes
Cogongrass	Yes	No	No	Yes
Nepalese Browntop	No	Yes	No	Yes
Garlic Mustard	No	Yes	No	Yes
Exotic Lespedezas	No	No	Yes	Yes
Japanese Knotweed	Yes	Yes	No	No

Invasive Species	Growth Habits				
	Form	Shade tolerant	Flood tolerant	Drought tolerant	Habitat
Tree of Heaven	Tree	Yes	Yes	Yes	Distubed areas
Paulownia	Tree	No	Yes	Yes	Distubed areas
Tallow tree	Tree	Yes	Yes	No	Varied
Autumn Olive	Shrub/tree	Somewhat	No	Yes	Open
Privet	Shrub/tree	Yes	Yes	No	Forests
Oriental Bittersweet	Vine	Yes	No	No	Open woods / Distubed Areas
Japanese Honeysuckle	Vine	Yes	Yes	Yes	Varied
Japanese Climbing Fern	Vine	Yes	Yes	No	Varied
Cogongrass	Grass	Yes	No	Yes	Varied
Nepalese Browntop	Grass	Yes	Yes	No	Moist forests
Garlic Mustard	Herbaceous	Yes	Yes	No	Forests
Exotic Lespedezas	Semi-woody shrub	No	No	Yes	Open woods / Grasslands
Japanese Knotweed	Semi-woody shrub	No	Yes	Somewhat	Open

Invasive Species	Prescribed Fire		
	Control option	Hazard	Post-fire
Tree of Heaven	No	No	Rapid re-growth
Paulownia	No	No	Colonizes quickly
Tallow tree	Yes	No	Re-growth possible
Autumn Olive	No	No	Colonizes quickly
Privet	Yes	No	Rapid re-growth
Oriental Bittersweet	No	No	Re-growth possible
Japanese Honeysuckle	No	No	Rapid re-growth
Japanese Climbing Fern	No	Yes	Rapid re-growth
Cogongrass	No	Yes	Stimulates flowering
Nepalese Browntop	No	No	Establishes on bare soil
Garlic Mustard	Yes	No	Seed bank survival
Exotic Lespedezas	No	No	Scarifies seeds, high rates of germination
Japanese Knotweed	Not Available	No	Not Available

Georgia Invasive Species Task Force

A cooperative approach, to help minimize the impacts of invasive species to Georgia's agricultural and natural resources, between:

Georgia Forestry Commission
The University of Georgia
- Bugwood Network, College of Agricultural and Environmental Sciences, Warnell School of Forestry and Natural Resources
USDA Forest Service
Georgia Department of Agriculture
USDA APHIS Plant Protection and Quarantine

Developed for the Georgia Forestry Commission by C.W. Evans, C. T. Bargeron, D.J. Moorhead and G. K. Douce, The Bugwood Network, The University of Georgia, March 2006. . BW-2006-02.
Images in this publication are available online at *www.invasive.org*

To get involved and learn more about invasive exotic plants in Georgia, please join the Georgia Exotic Pest Plant Council at www.gaeppc.org

References
Nonnative Invasive Plants of Southern Forests: A Field Guide for Identification and Control. James H. Miller. 2003. USDA Forest Service, Southern Research Station

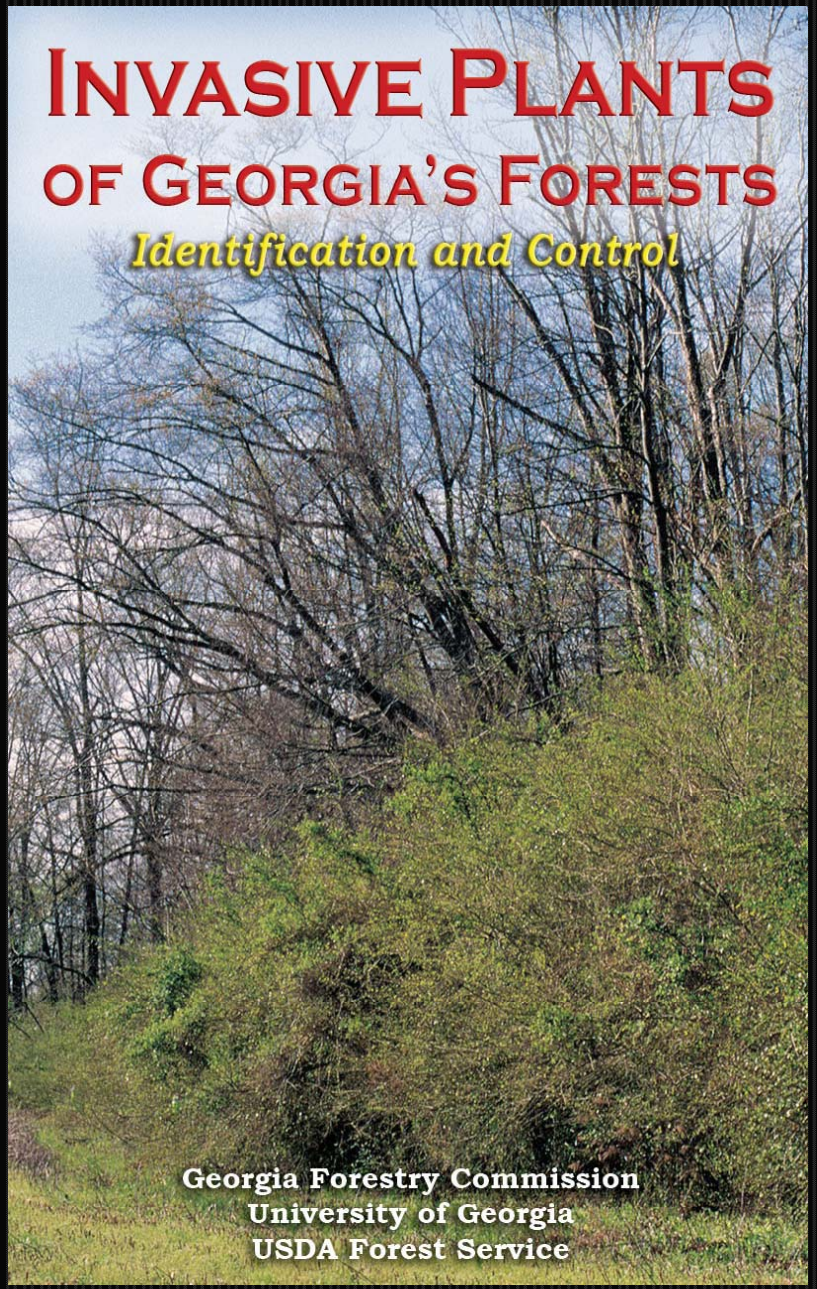
Georgia's Best Management Practices for Forestry
http://www.gfc.state.ga.us/ForestManagement/documents/GeorgiaForestryBMPManual.pdf

Southeast Exotic Pest Plant Council Invasive Plant Manual
http://www.invasive.org/eastern/eppc/index.html

Invasive Plants of the Eastern United States: Identification and Control
http://www.invasive.org/eastern/

Follow all label instructions with any herbicide application.
Mention of any specific herbicide does not represent endorsement by the Georgia Invasive Species Task Force.

www.georgiainvasives.org



Key Identification Features of Cogongrass

Flower/Seed head
- Cylindrical in shape
- 2-8 inches in length (total flower or seed head)
- Silvery white in color
- Light fluffy dandelion-like seeds
- Blooms from late March to mid June (flower timing depends somewhat on local climate)



Leaves
- Blades up to 6 feet long
- About 1 inch wide
- Whitish, prominent midrib, that is often off center
- Margins finely serrate
- Some leaves are very erect, but some may droop or lie flat
- Often light yellowish-green in color
- Could have a reddish cast in fall/ winter or brown after frost or freeze


Key Identification Features of Cogongrass

Plant Base
- No apparent stem
- Leaves appear to arise directly from or close to the ground
- Overlapping sheaths give a rounded appearance to the plant base
- All vegetation doesn't arise from one dense clump, instead the plants are more spread out
- Light-green to yellowish in color, or could be reddish
- Often a lot of thatch around base



Leaf collar/Ligule
- Ligule is a thin-fringed membrane
- Leaf sheaths overlapping, giving the plant a round appearance
- Hairy (the ligule is the most hairy part of the plant, the plant base may also be somewhat hairy)

Field Guide to the Identification of Cogongrass

With comparisons to other commonly found grass species in the Southeast

USDA Forest Service
University of Georgia - Bugwood Network

Key Identification Features of Cogongrass

Rhizome/Roots
- Dense mat
- Many sharp points
- Covered in flaky scales
- Bright white under scales
- Strongly segmented


Rhizomes with scales removed (top) and intact (bottom)


Whole Plant
- Densely growing patches
- Tall grass (up to six feet, averaging 3-4 feet)
- Circular infestations
- Plants often turn brown in winter (at least partially, but may depend on local climate)


Cogongrass Infestation Identification

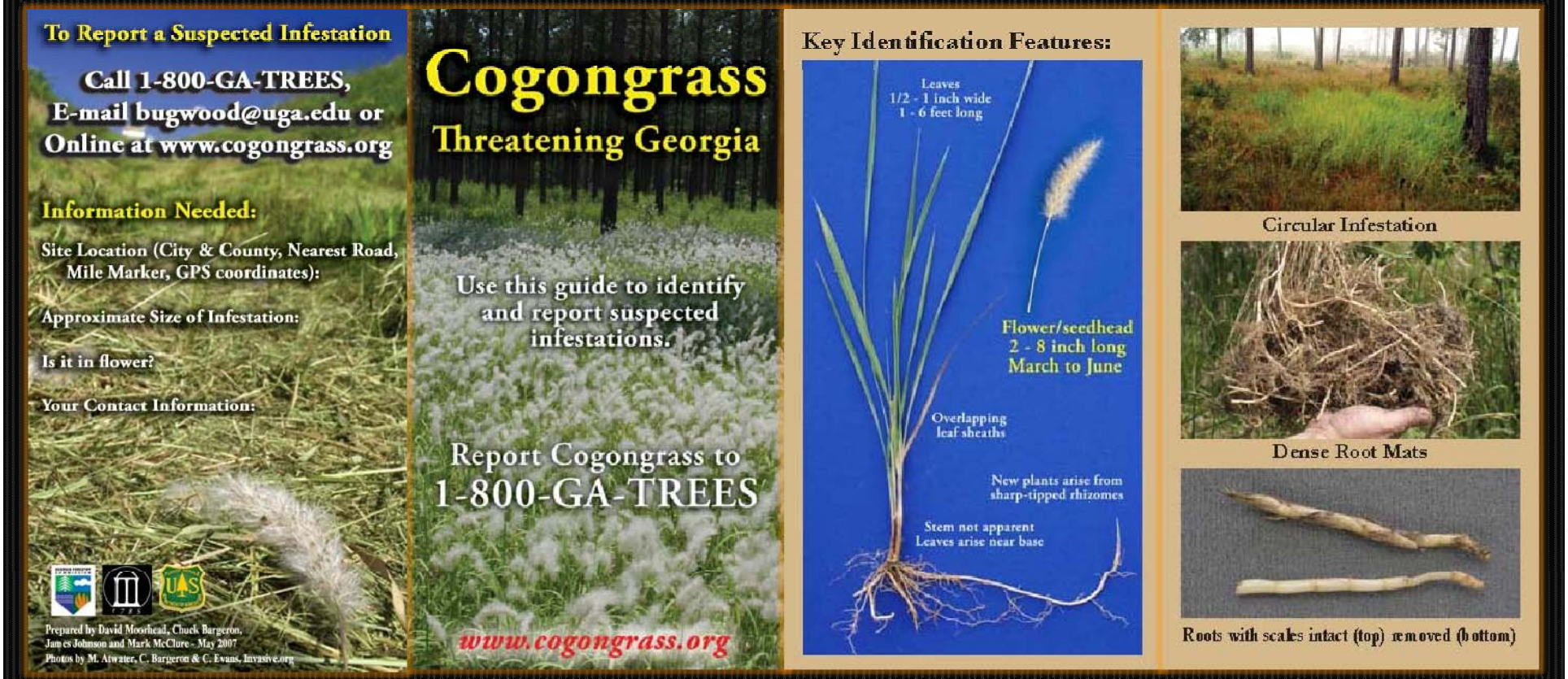
Forest - Flowering

Forest - Non-flowering

Forest - Dormant Season

Utility Rights-of-way

Cogongrass Mini-Flyer



On 3 X 5 inch card stock and folds to business card size

Chinese Tallowtree Mini-Flyer

Report Chinese Tallowtree to www.gainvasives.org

Information Needed:
Site Location
(City/County, GPS Coordinates)
Size of Infestation
Photos of the Plants

Powered by EDDMapS
Early Detection & Distribution Mapping System
www.eddmaps.org
at the Center for Invasive Species & Ecosystem Health

Prepared by Erin Griffin, Karan Rawlins, Chuck Bargeron & David Moorhead
Photos by Karan Rawlins, UGA & Jim Miller, USFS April 2010

Chinese Tallowtree

Triadica sebifera

Use this guide to identify and report suspected infestations

www.gainvasives.org

Leaf

Fruit/Seeds

Popcorn like appearance

Infestation

Seasonal Changes

Japanese Climbing Fern Mini-Flyer

Report Japanese Climbing Fern to www.gainvasives.org

Information Needed:
Site Location
(City/County, GPS Coordinates)
Size of Infestation
Photos of the Plant

Powered by EDDMapS
Early Detection & Distribution Mapping System
www.eddmaps.org
at the Center for Invasive Species & Ecosystem Health

Prepared by Erin Griffin, Karan Rawlins, Chuck Bargeron & David Moorhead
Photos by Chris Evans, River to River CWMA & Ronald F. Billings, Texas Forest Service
April 2010 BW2010-11

Japanese Climbing Fern

Lygodium japonicum

Use this guide to identify and report suspected infestations

www.gainvasives.org

Spore Producing Leaflets
(spores are airborne)

Infestation

Leaflet

Creates Fire Ladders

Coming Soon!

- Best Management Practices for Invasive Species in Georgia - a folding brochure which opens to poster size
- Grades K through 12 - Educational materials development

Coming Soon!

- Organization of Cooperative Invasive Species Management Areas in Georgia
- Cogongrass Video and other Online Invasive Species educational videos
- Educational Power Points

Invasive Species in Georgia

The Problem, the Solution, and What You Can Do to Help



THE UNIVERSITY OF GEORGIA

CENTER FOR INVASIVE SPECIES AND ECOSYSTEM HEALTH

WARNELL SCHOOL OF FORESTRY AND NATURAL RESOURCES

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

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