An update on invasive pests in the Southeast and some thoughts on practical lessons on combatting them

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Presented to: The Agriculture and Rural Development Committee
at the 66th Annual Meeting of the Southern Legislative Conference
Charleston, WV. July 29, 2012

I would like to briefly introduce you to

The Center for Invasive Species

&

Ecosystem Health

as background for the rest of the presentation

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

- Partnership between College of Agricultural and Environmental Sciences & Warnell School of Forestry and Natural Resources
- Work with insects, pathogens, plants & animals of forests, agriculture & natural areas
- Use Information Technology to provide information to scientists, professionals & the public
- Operate and serve 40 Websites

we

- develop, provide & deliver educational programs & information to users
- foster collaboration between our university and state, other university, federal & international partners
- bring together “traditional” agriculture (IPM-focus), regulatory, educational, forestry & natural areas interests
- support county extension agents, farmers, foresters, landowners and homeowners
- provide tools for others to use through IT

Center Projects

- Bugwood Image Database – ID & use
- Bugwood Websites - Invasive.org
- EDDMapS – EDRR
- Smartphone Apps
- Bugwood Wiki - information
- Website Hosting and Development

Support from & Cooperation with:

NIFA

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

APHIS

U.S. FISH & WILDLIFE SERVICE DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

The Nature Conservancy
Protecting nature. Preserving life.™

invasive PLANT CONTROL

ENTOMOLOGICAL SOCIETY OF AMERICA

ISA International Society of Arboriculture

APS

LAND GRANT COLLEGES & STATE UNIVERSITIES 1862 1962

Many international universities and agency contributors

What are Invasive Species?

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.

David Cappaert, Michigan State University;
Johnny Randall, North Carolina Botanical Garden

Not all Exotics are Invasive

98% of U.S. Food System is based on Introduced Species

Exotic Species are also used for:

- **Landscaping / Ornamental Use**
- **Biological Pest Control**
- **Hunting & Fishing**
- **Pets**
- **Biofuels**

Invasive Species Issues Are Relevant to Almost Everyone, BUT …

Many people don’t know and hence don’t care !

Chan Lowe, C2012 Tribune Media Services

Before it is too late !

Invasive Species Issues Transcend:

- Individual Commodities / Crops
- Managed and Unmanaged Systems
- Urban and Rural Areas
- Disciplines, and
- Geographical / Political Boundaries

People are the primary way exotic species move from one place to another

Most invasive species introduced through purposeful transportation vectors, including:

- **commercial trade and trade routes**
- **horticultural plant trade**
- **aquaculture facilities and trade**
- **pet & wildlife trade**
- **biofuels**

The problems aren’t new …

but the speed of introduction and impact is accelerating …

Dutch Elm Disease

Removal of Elm trees cost $100 million/year.

Dutch Elm Disease *Ophiostoma ulmi* originally from Asia afflicted Europe from 1910, reaching North America on imported timber in 1928.

Spores are carried by the elm bark beetle as well as transmitted from tree to tree via root grafts.

American Chestnut Forest

25% of Eastern Deciduous forest were American chestnut before Chestnut Blight

Chestnut Forest Elimination by Chestnut blight

Cotton boll weevil

Anthonomus grandis grandis

Almost put the LAND OF COTTON out of cotton production !

Native to Central America

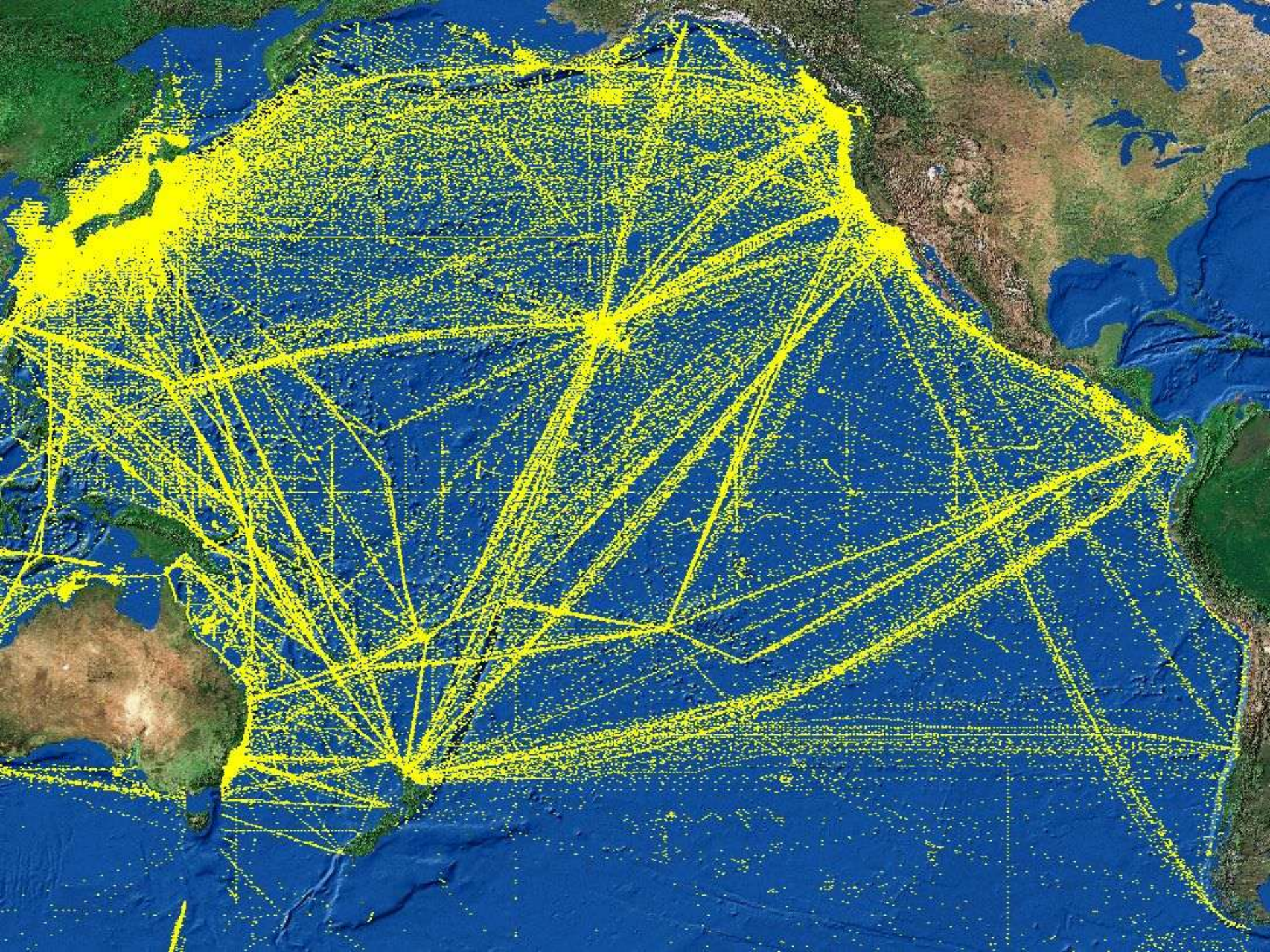
First reported in the US in 1892 and spread rapidly throughout the Cotton Belt

Cost America's cotton producers more than $15 billion

Boll weevil. From Wikipedia

These (invasive) pests are a by product of global trade … Obviously, international trade has tremendous benefits, but it also has costs. The regulations we currently have aren't keeping the pests out.

[J. E. Aukema et al. 2011. , "Economic Impacts of Non-Native Forest Insects in the Continental United States," PLoS ONE 6(9): e24587. doi:10.1371/journal.pone.0024587



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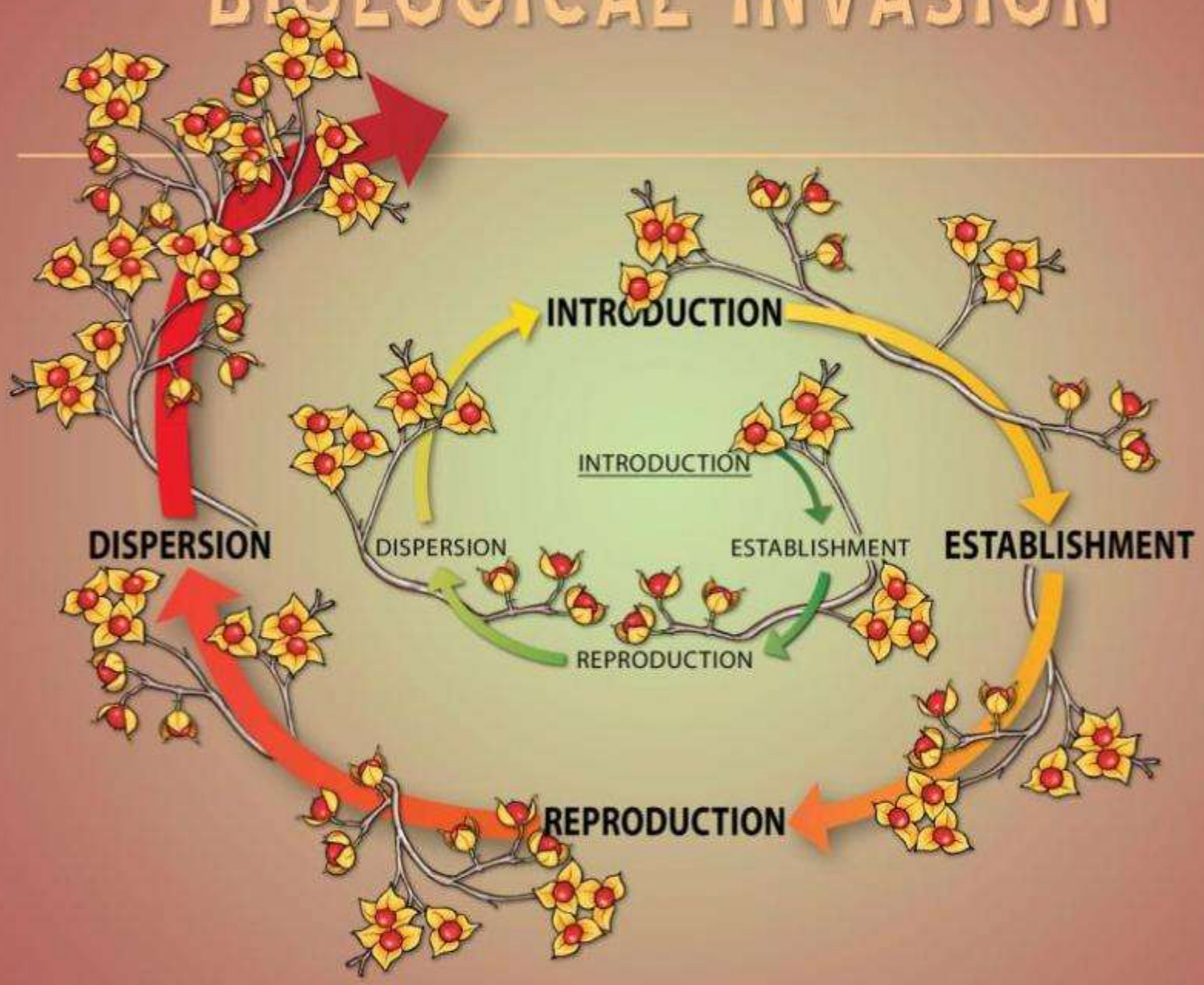
BIOLOGICAL INVASION



Steps for Dealing with Invasive Species

- Assessment and Risk Analysis
- Prevention
- Early Detection
- Rapid Response and Eradication
- Control and Management
- Restoration
- Research
- Public Education and Awareness

Predicting which Plants will become Invasive

Ornamental

- Hardy-easy to grow
- Does not require attention, “care free”
- Easy to propagate
- Showy-abundant flowers
- Attracts birds
- Disease and pest resistant

Invasive

- Habitat generalist
- Out-competes other plants
- Reproduces easily
- Abundant seeds
- Bird-dispersed seeds
- Not affected by native pests and diseases

Lag Phase

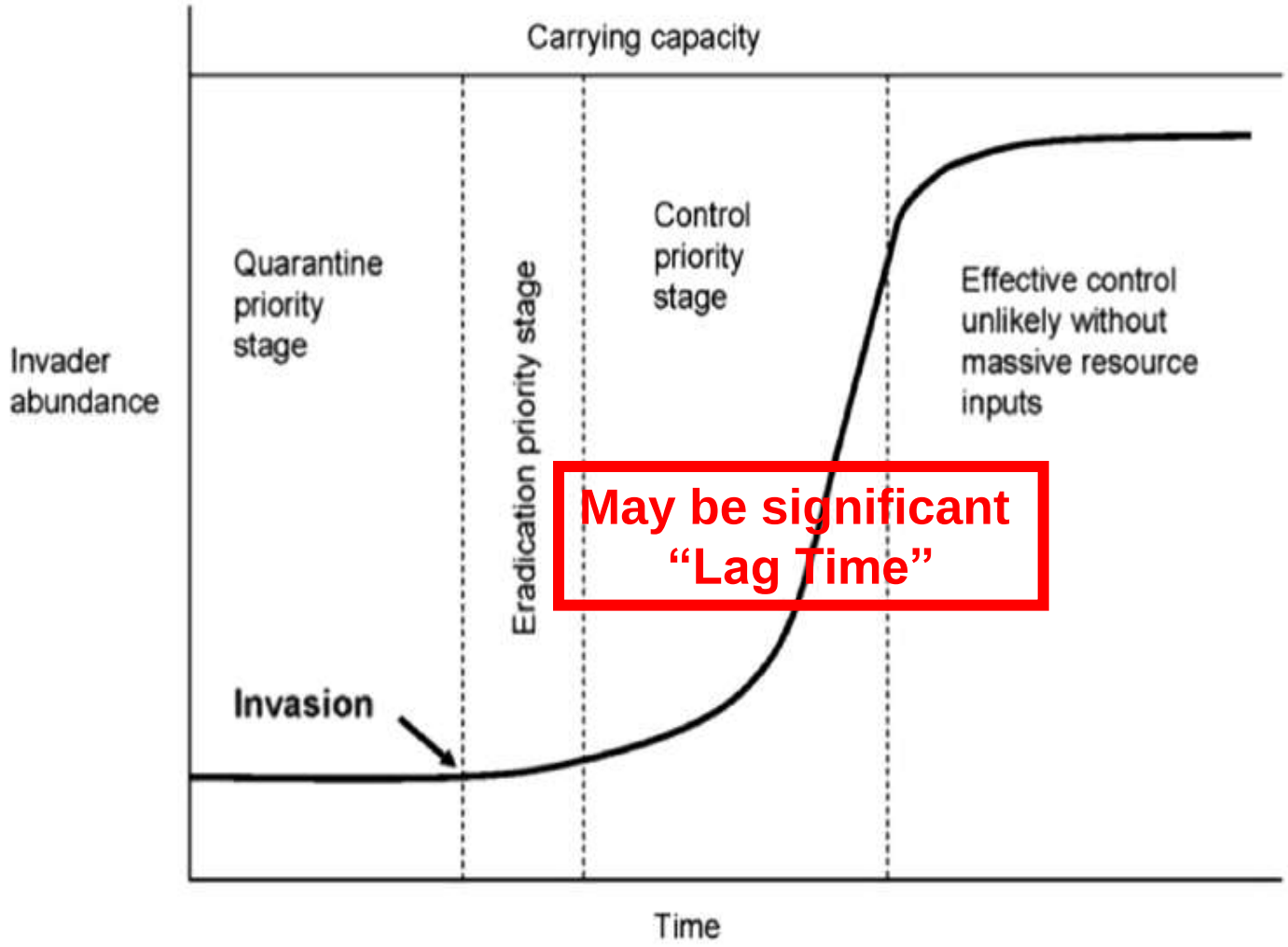
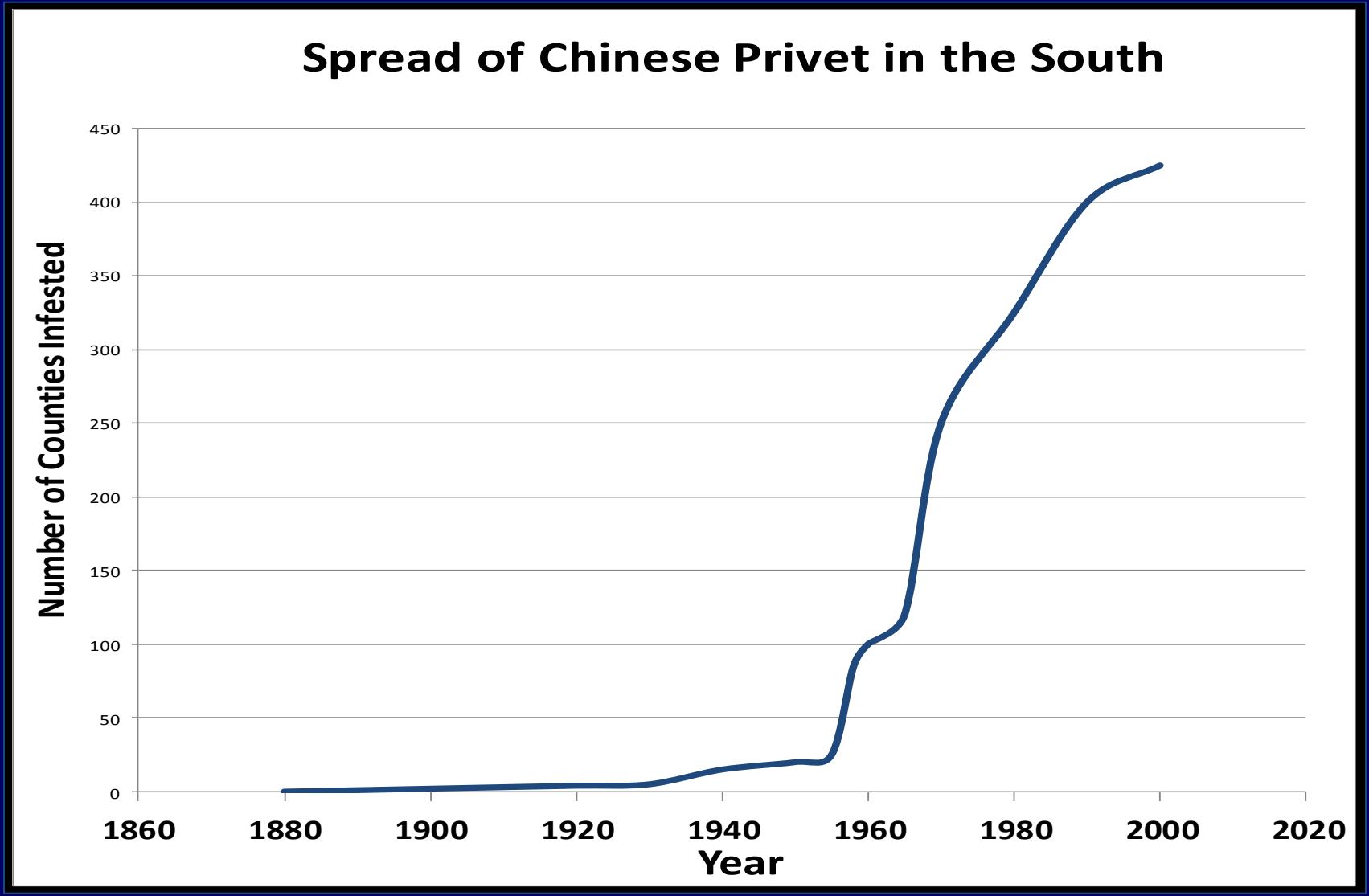
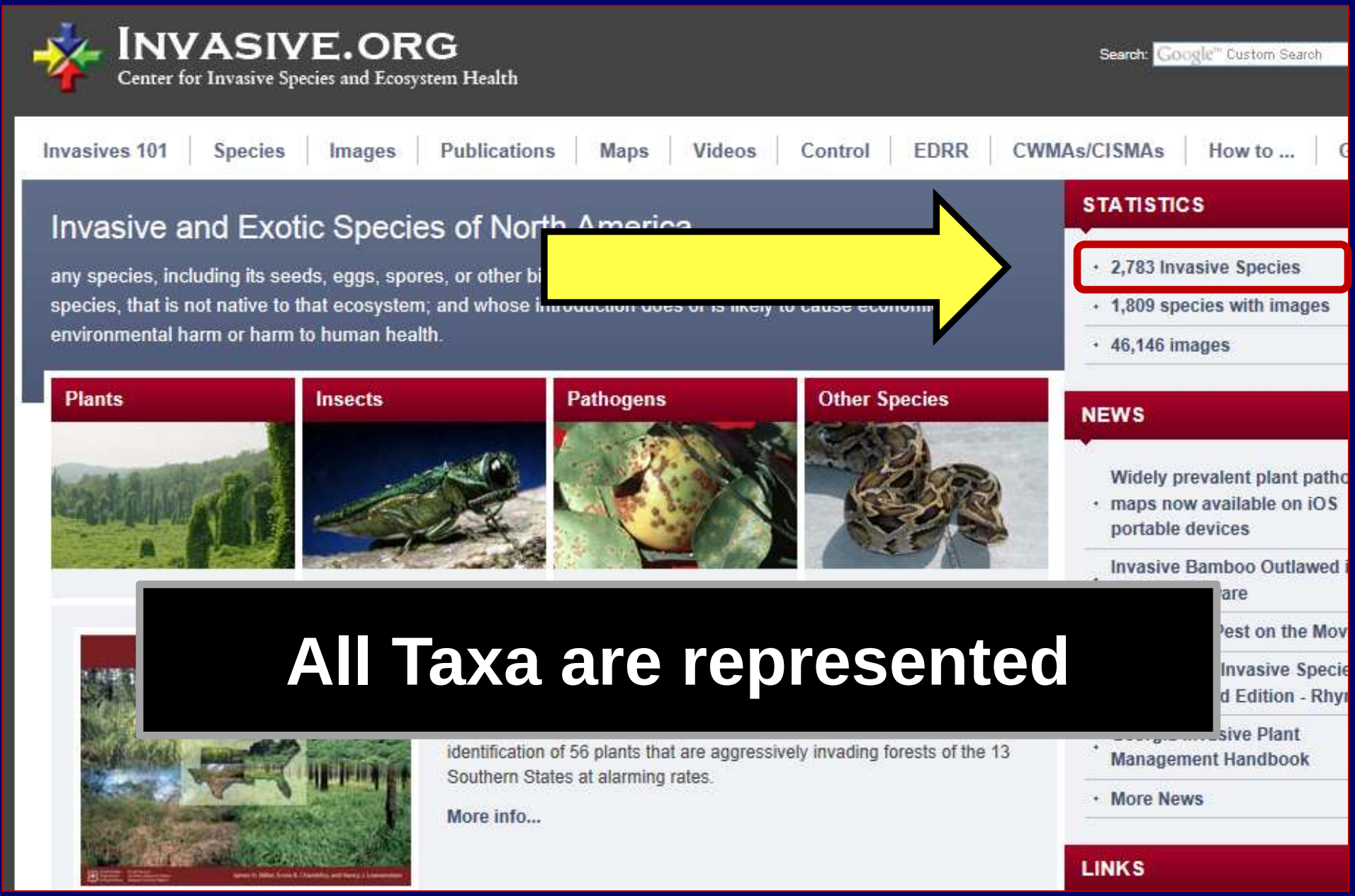


Figure 1. Control costs versus time since exotic invasion. (Redrawn from Hobbs and Humphries 1995.)

Journal of Forestry • September 2009

Lag Phase


Spread of Chinese Privet in the South
Number of Counties Infested
450
400
350
300
250
200
150
100
50
0
1860
1880
1900
1920
1940
1960
1980
2000
2020
Year



All Taxa are represented

Aquatics

Hydrilla verticillata

Native to Asia or Africa, although it is widely spread across the globe.

First introduced into North America as an aquarium plant in the 1950s

D. J. Moorhead Univ of GA

Zebra/Quagga Mussels

- Discovered in Lake St. Clair in 1988
- Quickly spread
- Filter enormous amount of algae
- Accumulate toxins
- Crash Fishery
- Encrusts boats & other items
- Clogs engines, power company and water intakes

Native to Caspian & Black Sea areas

Accidental introductions through ballasts and shipping

Asian Carp

- 3 Species - bighead, silver and black carp
- Grow up to 7 feet long and 110 lbs
- Eat 5-20 percent of body weight / day
- Imported to help clean aquaculture & wastewater treatment facilities
- Escaped into Mississippi River system during flooding and now in Missouri & Illinois rivers
- Threat to Great Lakes fishing industry & spp
- Physical threat to people and property

Asian carp: *Hypophthalmichthys spp*

Native Range: Southern and central China

Introduction Aquaculture escapes

Plants

Current Occupation in Forests and Forest Openings and Edges in Georgia (est. 2008)

Japanese Honeysuckle	739,400 Acres
Privets (7 species)	345,000 Acres
Kudzu	26,600 Acres
Non-native Olives	17,800 Acres
Japanese Climbing Fern	9,200 Acres
Tallowtree	7,000 Acres
Non-native Roses	5,800 Acres
Non-native Wisteria	5,000 Acres
Cogongrass	< 300 Acres

18 Million Acres Occupied by 33 Taxa
9 Percent of Forested Acres in South

Cogongrass
Imperata cylindrica

Native to southeast Asia

Thought to have been accidentally introduced in packing materials with some purposeful for possible forage use

habitats

Cogongrass infestation

- Stops / hampers productive use of forest lands, pastures and other uses
- Complicates right-of-way management and is invading municipalities
- Is highly flammable and presents a high risk to rural homeowners and firefighters
- Destroys wildlife habitat & hunting uses
- Control costs can exceed $200 per acre

J. Miller in Cogongrass Proceedings (2007 Mobile, AL)

Karan A. Rawlins, University of Georgia; USDA APHIS PPQ Archive; James H. Miller, USDA Forest Service; Howard F. Schwartz, Colorado State University; Charles T. Bryson, USDA Agricultural Research Service; James H. Miller, USDA Forest Service; David J. Moorhead, University of Georgia; Joseph LaForest, University of Georgia; John D. Byrd, Mississippi State University

Japanese Honeysuckle
Lonicera japonica

Native to southeast Asia

Horticultural introduction

Small, round, shiny black fruit

Invades many habitats shading out native plants

Non-Native Privets

Native to southeast Asia

<u>Introduction & spread</u>

Horticulture

Local movement

- bird dispersion of seeds
- water

once it is established

Kudzu

Pueraria montana var. lobata

Native to southeast Asia

Widely planted in 1930's as part of governmental erosion control program

Local spread, plant parts on equipment, road maintenance, growth

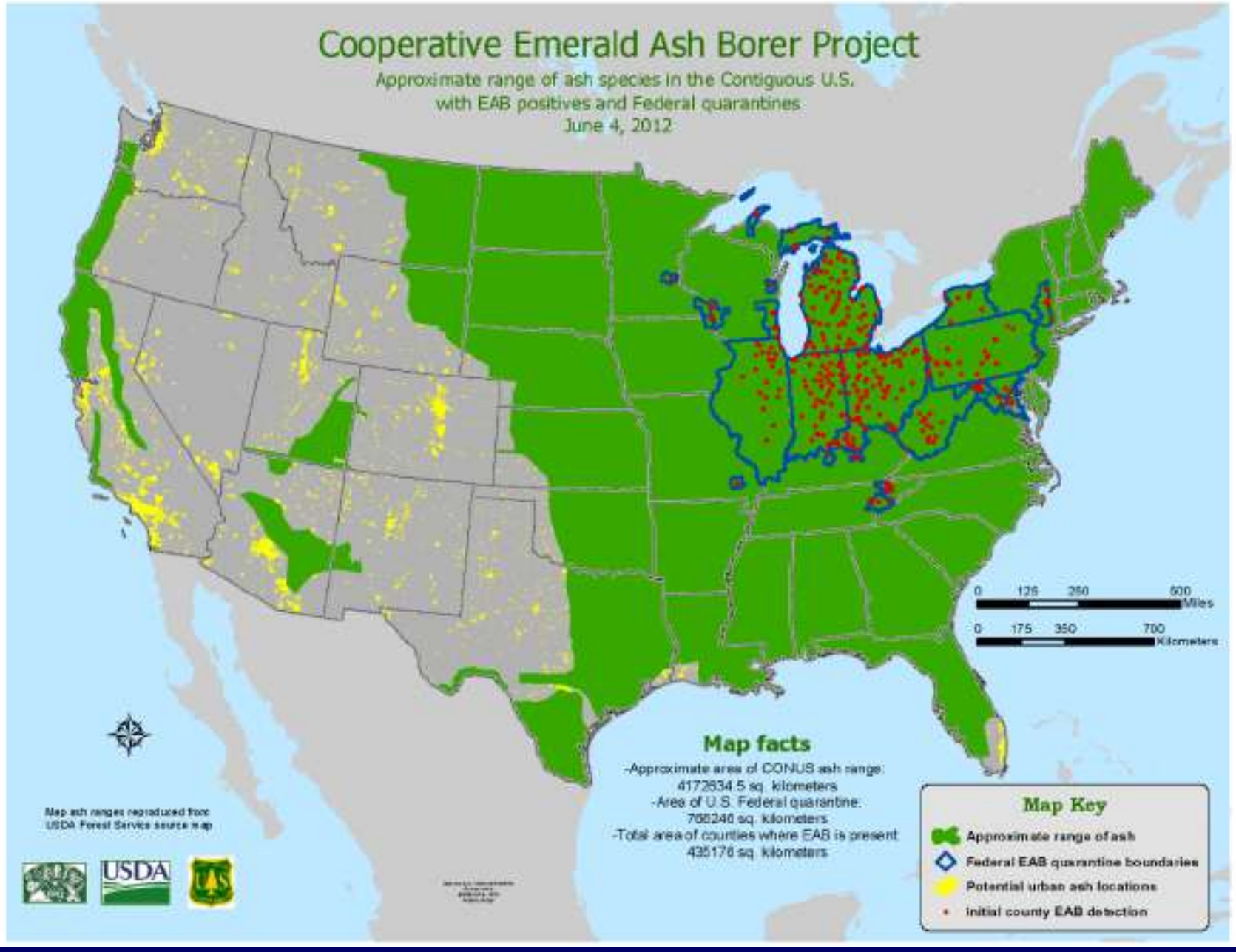
habitats

Emerald Ash Borer

Native to China and other southeast Asian countries

<u>Into US</u>: Accidental introduction via wood pallets and wood packing materials

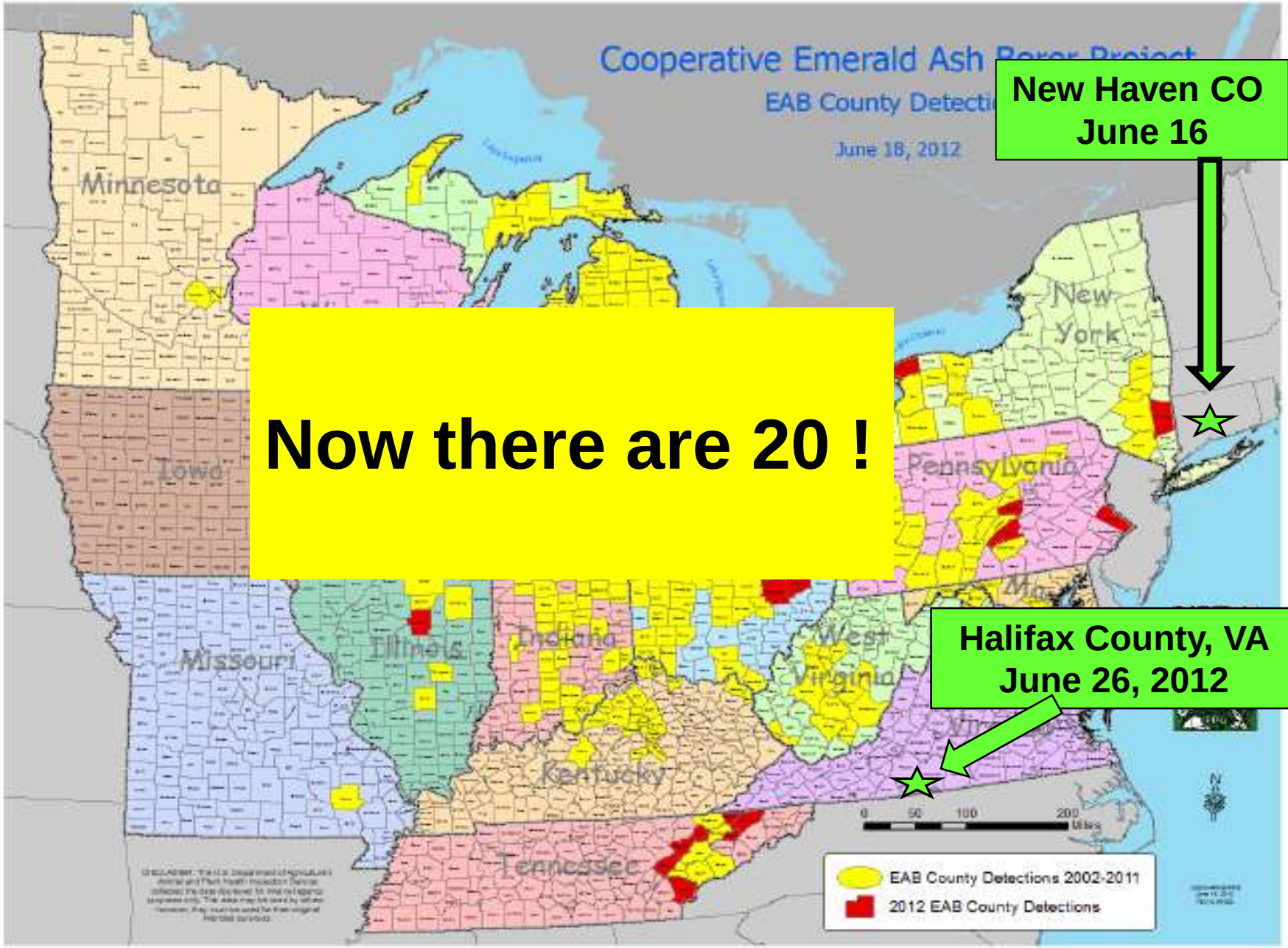
<u>Within US</u>: moving of infested material INCLUDING nursery stock and Firewood


Cooperative Emerald Ash Borer Project
Approximate range of ash species in the Contiguous U.S.
with EAB positives and Federal quarantines
June 4, 2012
0 125 250 500 Miles
0 175 350 700 Kilometers
Map facts
-Approximate area of CONUS ash range:
4172834.5 sq. kilometers
-Area of U.S. Federal quarantine:
766246 sq. kilometers
-Total area of counties where EAB is present:
435176 sq. kilometers
Map Key
Approximate range of ash
Federal EAB quarantine boundaries
Potential urban ash locations
Initial county EAB detection
Map ash ranges reproduced from
USDA Forest Service source map
USDA

As EAB moves through a new area, there is typically 99% + mortality of susceptible ash species !

In these areas, ash trees are frequently comprise a significant % of the dominant trees.

We are seeing significant ecosystem changes in addition to the high economic costs associated with the spread of this pest.



Now there are 20 !

Emerald Ash Borer Damage
Halifax County, VA
Along the Roanoke River
June 26, 2012

C. Asaro, VA DF,

Emerald Ash Borer Damage Along the Roanoke River
Halifax County, VA June 2012

C. Asaro, VA DF

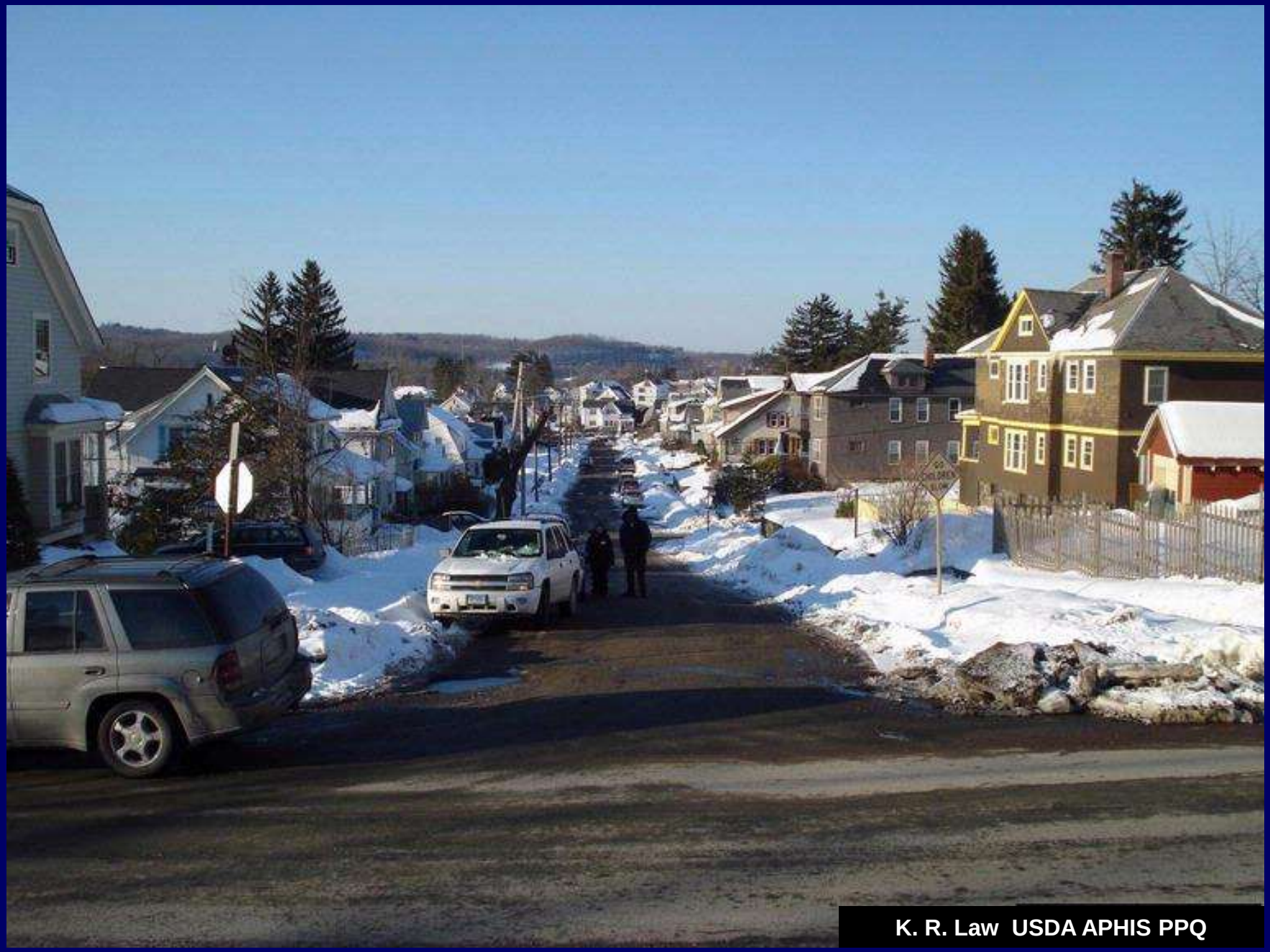
Asian longhorned beetle *Anoplophora glabripennis*

Native to China and other nearby Pacific Rim countries

Introduced in Chicago, Illinois and the New York City area & Worchester, MA through solid wood packing material from China

K. R. Law USDA APHIS PPQ

K. R. Law USDA APHIS PPQ



K. R. Law USDA APHIS PPQ

JOE HELLER ©2007
GREEN BAY PRESS-GAZ.
HAVE CAMPER
WILL TRAVEL
I'M WITH
STUPID
EMERALD
ASH
BORER

Report a Pest About Contact

DONT MOVE FIREWOOD

THE PROBLEM GALLERY OF PESTS BLOG F

Moving firewood spreads forest pests.

Buy it where you burn it, and save trees.

Learn More »

That's What Tree Said Campaign GO

FAQs and General Information GO

No Mueva la Leña, nuestro sitio en Español GO

State-by-State Information GO

VIEW THE GALLERY

Get to know the pests that are destroying our forests.

BURN SAFE WHERE YOU ARE

Keep enjoying your favorite activities while protecting your trees. Here's how to burn safe while:

- Camping
- Hiking & Biking
- Skiing & Snowboarding
- At Home

Hemlock woolly adelgid (HWA) *Adelges tsugae*

HWA was introduced into:

- **Western NA ~ 1924**
- **Eastern NA in 1951**

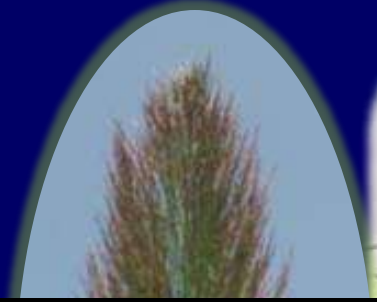
Introduced accidentally (probably) via horticultural trade

Native range: Southeast Asia

Native Range of Hemlock

Biofuels ?

Giant reed
Arundo donax



Native to India

Introduced into the United States in the early 1800s for ornamental purposes

Moves through plant fragments in water & movement of soil

Chinese silvergrass
Miscanthus sinensis

Native to Asia

Introduced into the United States in the late 1800s for ornamental purposes

Production Agriculture

Benghal dayflower *Commelina benghalensis*

Native to Asia and Africa and was first found in the United States in 1963.

Probably accidental hitchhiker on plant trade

T. Webster, USDA ARS, Bugwood.org

kudzu bug *Megacopta cribraria*

A Significant Pest of Legumes

A Potential Biological Control Agent

&

Becoming a Major Nuisance Pest !

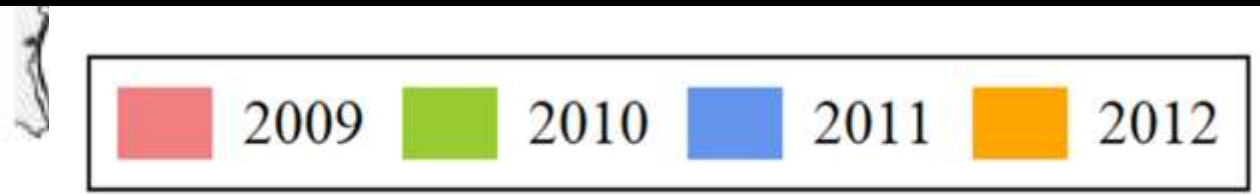
kudzu bug *Megacopta cribraria*
5443641

5407731

Kudzu bug ***Megacopta cribraria***

Native to China and other southeast Asian countries first found in the United States in 2009.

Probably accidental hitchhiker on plant trade



Wildlife Trade

- $10 billion/year legal trade
- $5-20 billion/year illegal trade (largest illicit trade after drugs and arms)
- U.S. one of largest importers: >1 billion live individuals between 2000-2004
- Largely unregulated
- 2000-2004: 2,241 of 2,726 live species imported into U.S. are non-native
- Spread of disease

Burmese python *Python molurus bivittatus*

Native range: Southeast Asia

Introduction pathways

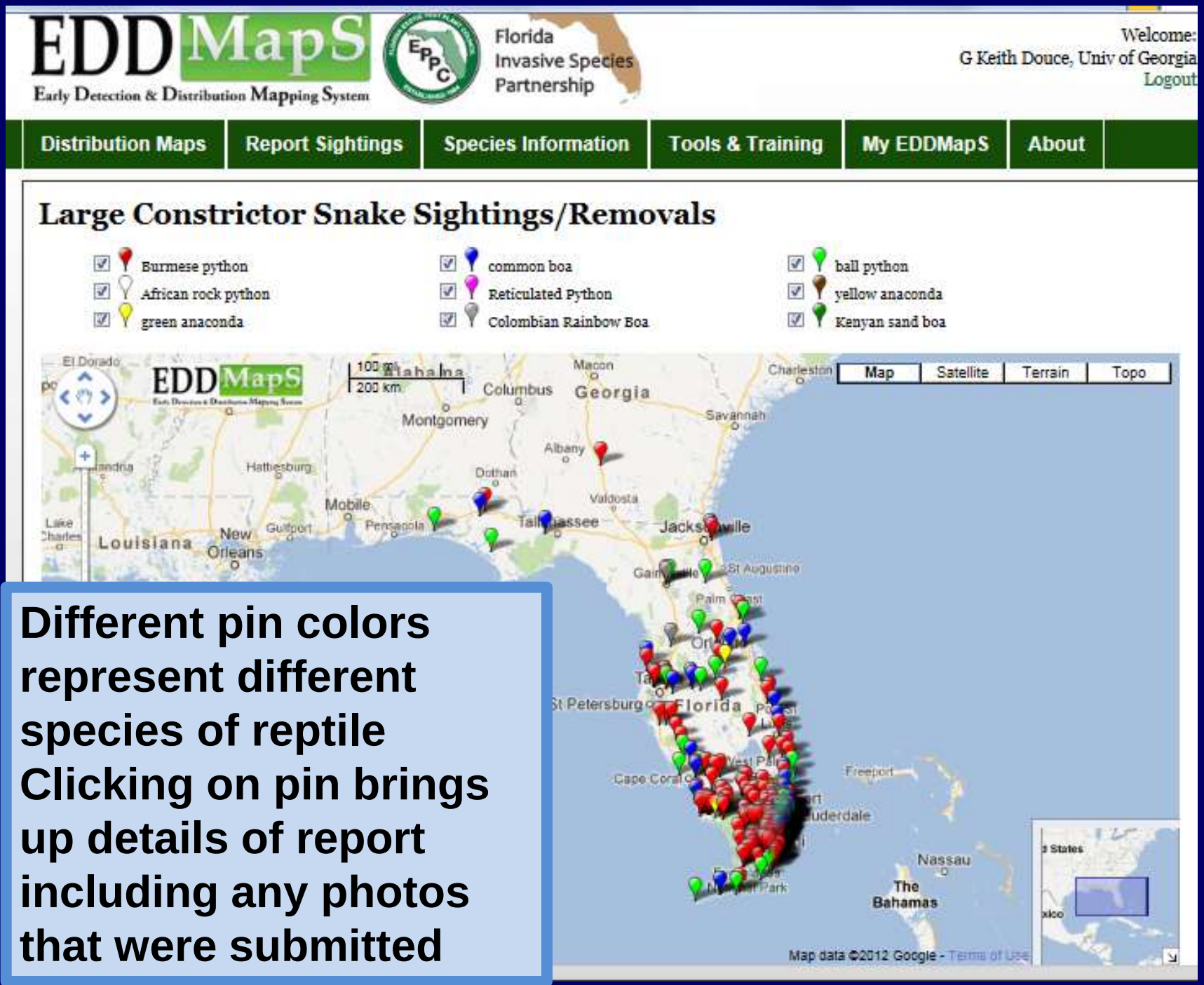
- **Internet sales/postal services:**
- **Pet/aquarium trade:**

Local dispersal methods

- **Escape from confinement:**
- **Intentional release:**
- **Natural dispersal (local):**

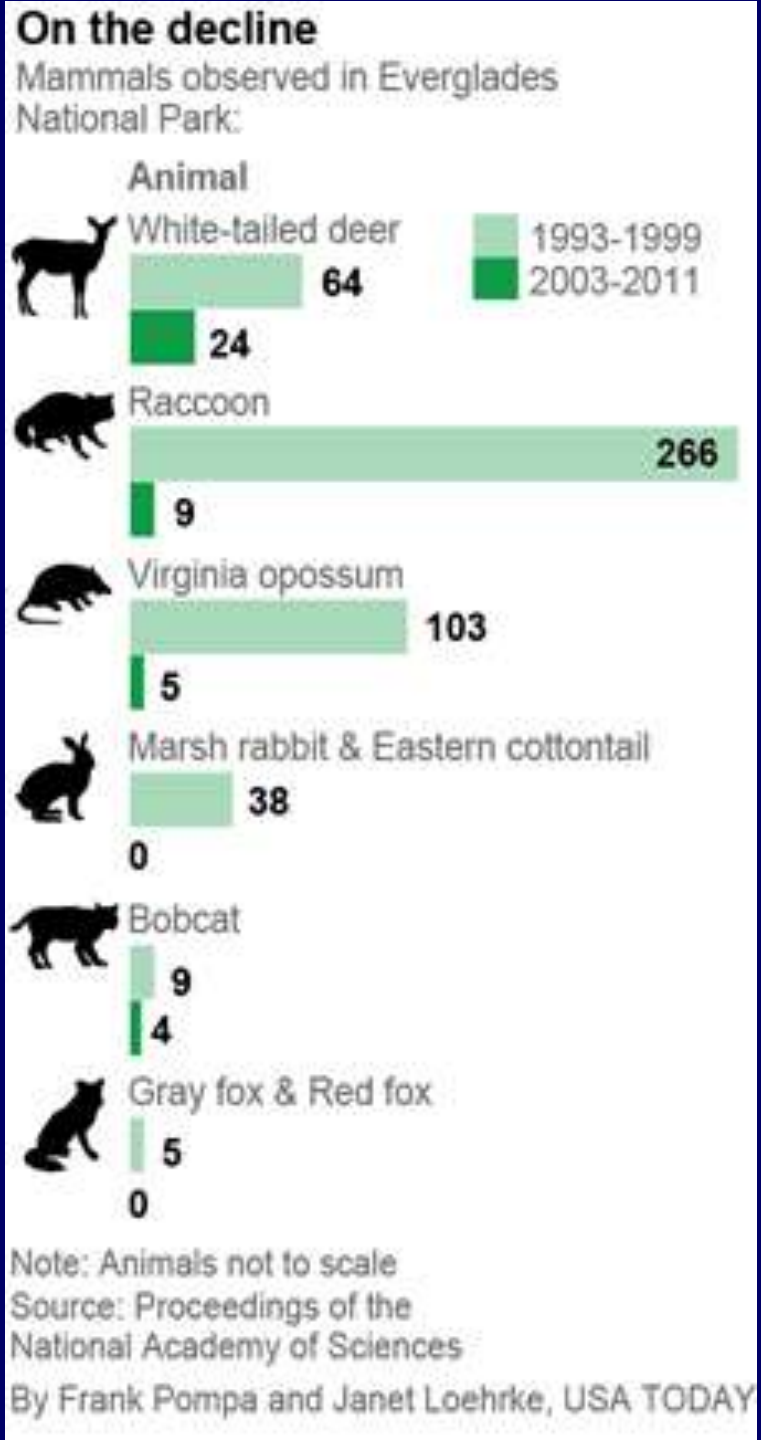
Pythons (*Python ssp)* in the Florida (US) Everglades and Across Florida

162 pound – 15 foot snake captured fall 2011



Different pin colors represent different species of reptile Clicking on pin brings up details of report including any photos that were submitted

A 16-foot Burmese python in the Everglades was found with an adult deer in its belly in Fall 2011


On the decline
Mammals observed in Everglades National Park:
Animal
1993-1999
2003-2011
White-tailed deer
64
24
Raccoon
266
9
Virginia opossum
103
5
Marsh rabbit & Eastern cottontail
38
0
Bobcat
9
4
Gray fox & Red fox
5
0
Note: Animals not to scale
Source: Proceedings of the National Academy of Sciences
By Frank Pompa and Janet Loehrke, USA TODAY

Nile Monitor *(Varanus niloticus)*

Native range: Sub-Saharan Africa

Introduction pathways

- **Internet sales/postal services:**
- **Pet/aquarium trade:**

Local dispersal methods

- **Escape from confinement**
- **Intentional release**
- **Natural dispersal (local)**

Tegu (Tupinambis ssp.)

Native range: South America

Introduction pathways

- Internet sales/postal services:
- Pet/aquarium trade:

Local dispersal methods

- Escape from confinement:
- Intentional release:
- Natural dispersal (local):

Sus scrofa (feral pigs)

are escaped or released domestic animals hybridized by european boar introducted by hunters

Wild Pig Expansion

www.feralswine.org

1991 – 19 States

1993 – 23 States

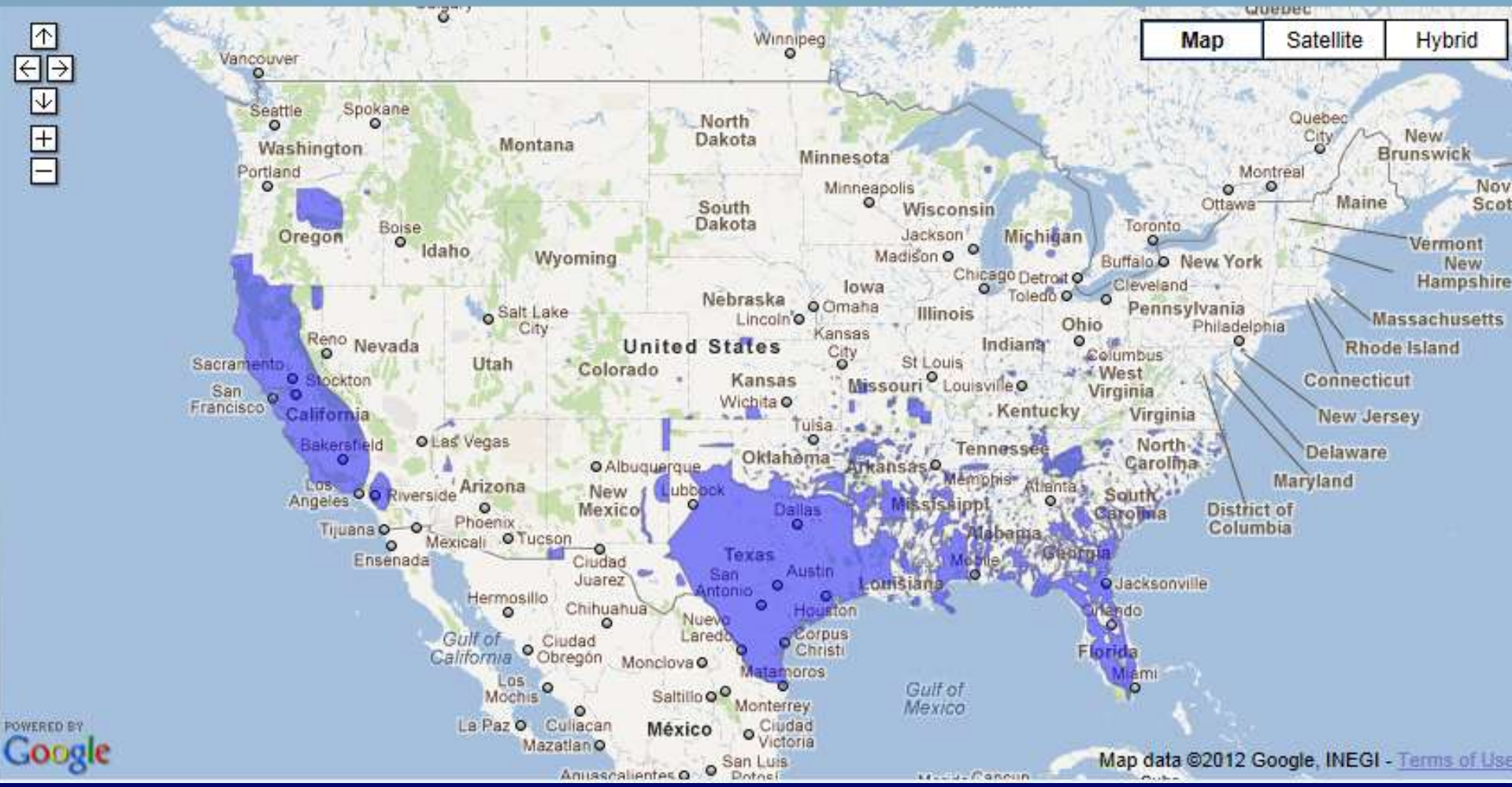
1998 – 26 States

2004 – 28 States

Today – 41 States

National Feral Swine Mapping System

United States Feral Swine Distribution: Map Last Updated on 2012-02-21



Nile Monitor Lizard
Native Range Africa

Wanted dead, not alive
INVADING SPECIES

Northern Snakehead, *Channa argus*

Aliases: *Unknown*

Native Range
China / Southeast Asia

A look at the snakeheads caught in the Potomac and its tributaries in the past two months:

BODY OF WATER	STATE	DATE	LENGTH (in inches)
1 Little Hunting Creek	Va.	May 7	12
2 Potomac River	Md.	12	12
3 Potomac River	Va.	15	13
4 Pohick Bay	Va.	27	14.5
5 Dogue Creek	Va.	June 3	14.5
6 Little Hunting Creek	Va.	17	24
7 Little Hunting Creek	Va.	23	15
8 Mattawoman Creek	Md.	24	17
9 Kane's Creek	Va.	27	18

NOTE: Snakeheads were discovered in Crofton, Md., pond in the summer of 2002—6 adults and approximately 1,000 babies. On April 26, 2004, a 19-inch snakehead was found in Pine Lake in Wheaton (not shown on the map).

GRAPHIC BY LARRY FIDEL AND FARIHANA HOSSAIN—THE WASHINGTON POST

Is it a lost cause?

Are we doomed?

Don’t wait on the Feds

MAYBE IT'S TIME WE ADDRESS INVASIVE SPECIES.
klossner ©04
www.jklossner.com

SO, IT'S TRUE. KUDZU HAS INVADED OUR COUNTY...
...WE'LL HAVE TO MAKE A STUDY AS TO HOW WE CAN BEST ERADICATE IT...
parkerbens@reuben.org

FLORIDA TODAY ©2003
PARKER
BETTER MAKE IT SNAPPY...

Your state(s) can take action !

Steps for Dealing with Invasive Species

- Assessment and Risk Analysis
- Prevention
- Early Detection
- Rapid Response and Eradication
- Control and Management
- Restoration
- Research
- Public Education and Awareness

Cogongrass
Imperata cylindrica

Identification | Control | Distribution | Proceedings | Publications | Images | Videos | Report | Links

Cogongrass Infested States
Click on State to find State Resources

Georgia County Road Crew Training Resources

Information and resources for Georgia Extension agents to conduct a short informational training program for their county road crews. More

The Cultivar 'Red Baron'?

The 'Red Baron' cultivar of *Imperata cylindrica* has bright, showy, blood -red leaf edges. It is frequently sold across the U.S. in plant nurseries and is widely available over the

Alabama Cogongrass Aerial Photographs

In open fields and forests cogongrass initially forms circular infestations that appear light green in summer and light brown in winter as can be viewed in these oblique aerial photographs. In later stages of invasion, circular infestations can merge and linear infestations can form along highways, fences, and around water bodies. More

Identification Field Guide

Cogongrass has a unique combination

News

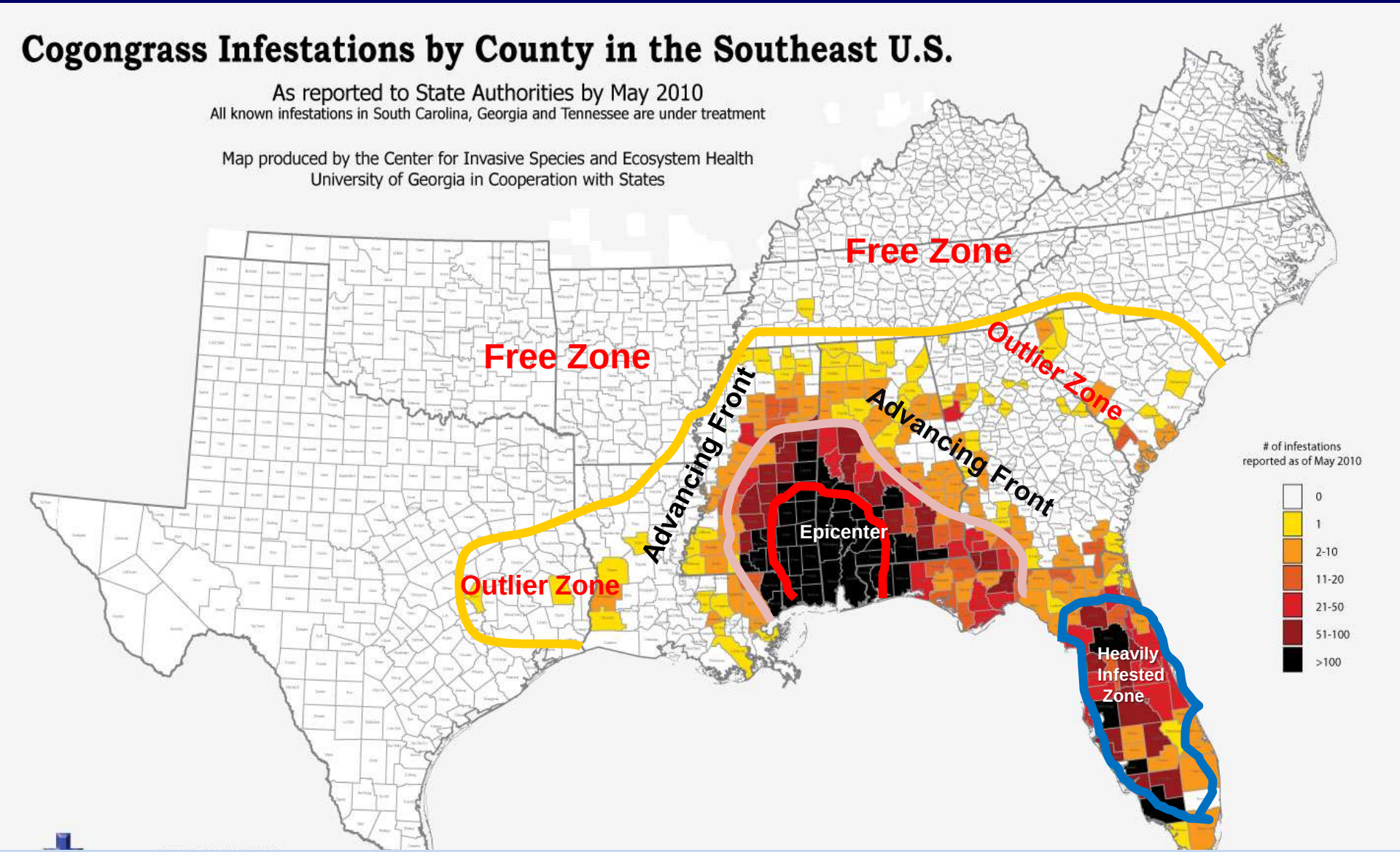
- Cogongrass confiscated at Savannah port
- Six Million for Cogongrass in Alabama
- Florida Cogongrass Cost-Share Program
- More News from the Bugwood Blog

Supported by:

Stripling Inc.

Partners:

APHIS



cogongrass was accidentally introduced into Alabama near Grand Bay about 1911 in packing materials from Japan. Purposeful introductions, primarily for forage production soon followed in other areas of Alabama, Mississippi and Florida

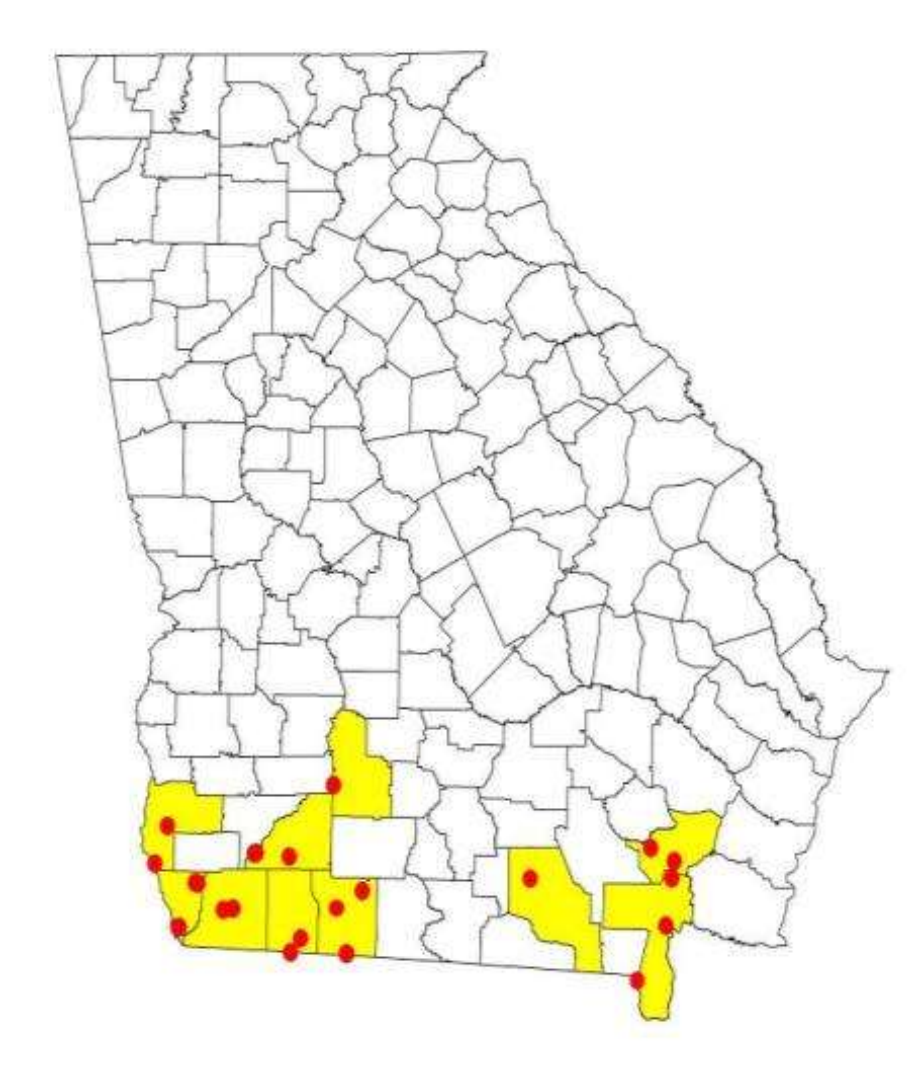
Cogongrass infests

- **500,000 – 1 million acres in AL, MS & FL panhandle**
- **Found southern & central LA, MS, AL& FL**
- **Scattered infestations in GA, east TX, southeast SC and eastern VA**

An aggressive educational / early detection and rapid response / eradication program is being implement in Georgia involving the:

- **Georgia Forestry Commission**
- **USDA-FS**
- **Georgia Department of Agriculture**
- **Center for Invasive Species & Ecosystem Health**
- **University of Georgia Extension Service**
- **USDA-APHIS-PPQ**
- **Natural Resources Conservation Service (NRCS)**

Cogongrass

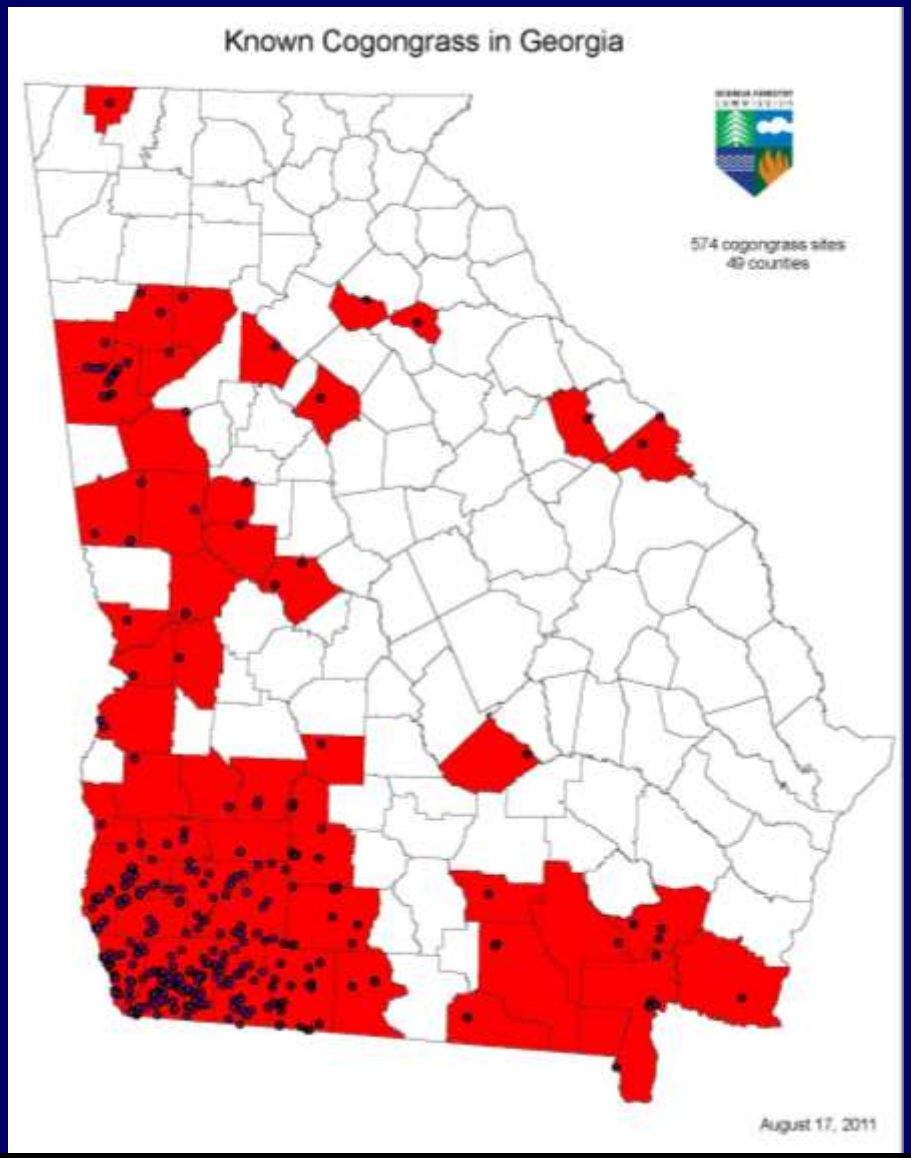


2006

10 Georgia Counties

20 sites

Cogongrass

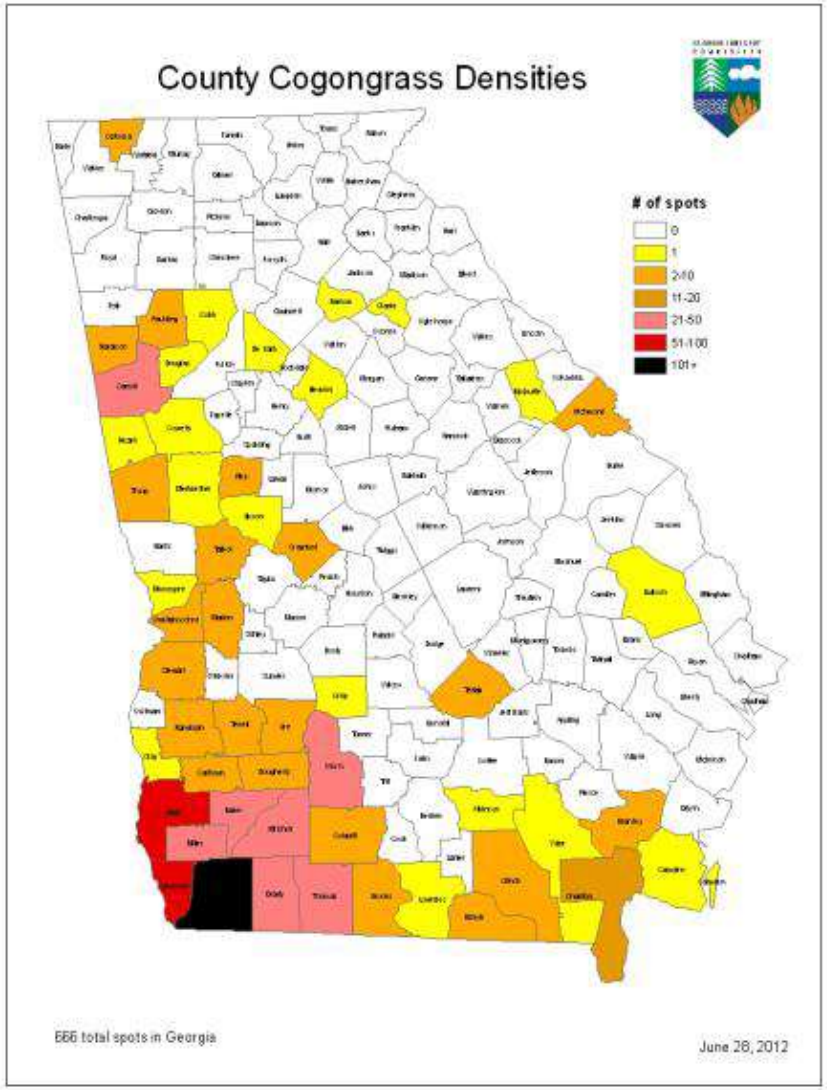


2010

49 Counties

574 sites

Cogongrass



2012

52 Counties

[159 co in GA]

666 sites

Cogongrass

Failure ???

Of the 666 total detected spots in GA

- All Have Been Treated
- ONLY 255 are Active (38 %)
- 111 are considered Eradicated
- 151 treated 1 Year ago now Negative
- 149 treated 2 years ago are Negative
- Overall 62 % of all spots are Negative
- Est << 100 A Infested
- Average spot size 0.23 A

http://www.evergladescisma.org/

Home | FISP | Apps | Contact

Everglades Cooperative Invasive Species Management Area

CISMA

About Us | Meetings | Distribution Maps | Report Sightings | Species Information | Educational Resources | News | Partners

A Cooperative Invasive Species Management Area is a formal partnership of federal, state, and local government agencies, tribes, individuals and various interested groups that manage invasive species and is defined by a geographic boundary. Florida has a long history of invasive species organization cooperation such as the Florida Exotic Pest Plant Council, Noxious Exotic Weed Task Team, Florida Invasive Animal Task Team and Invasive Species Working Group. Everglades restoration poses new challenges for invasive species management and has created a need for a more defined commitment to cooperation among agencies and organizations at higher levels of policy and management.

What's New

- An 'Arms Race' Between Snakes and Humans
- Nonnative Pet Amnesty Day
- Become a nonnative pet adopter
- Ivegot1 iPhone App
- A Summary of Live Animal Importation by the United States
- Giant African Snails
- 2011 Everglades Invasive Species Summit Presentations
- 2011 Everglades CISMA Non-Native Fish Roundup Results

Location

Signatories

US Army Corps of Engineers

Find us on Facebook

100%

9:50 PM

UN-WANTED
in the EVERGLADES
NILE MONITOR
www.DONTLETITLOOSE.org
1-877-CERP-USA

There are a number of state-based campaigns in the western US on:

- **invasive plants**
- **mud snails**
- **invasive water plants**
- **Whirling disease of fish; and**
- **others**

DON'T MOVE FIREWOOD

How you can help:

- Leave firewood at home, do not transport it to campgrounds or parks.
- Use firewood from local sources.
- If you have moved firewood, burn all of it before leaving your campsite.

HELP STOP INVASIVE PESTS

Three recently introduced insects

emerald ash borer

Asian longhorned beetle

Sirex woodwasp

Why should we car about Invasive Species ?

- Ecological Impacts
  - 400 of 958 threatened or endangered species are at risk in U.S. due to competition by invasive species (TNC 1996)
  - 50,000 exotic invasive species in U.S.
  - 5,000 escaped plants in U.S. / 17,000 native plants in U.S.
  - introduction of several tree insect and disease pests in the past has dramatically changed the makeup of American forests

- **Economic Impacts**
  - **> $138 billion US damages, losses and control costs / year (Pimentel et al. 2004)**
  - **Invasive weeds in riparian areas have led to degradation of water quality and increased river flooding**

Direct Impacts on Humans (Health, environmental, H_20, etc.)

The introduction of the chestnut blight pathogen cost us (the U.S.) one of the grandest trees ever to grace our eastern forests, the American chestnut *Castanea dentata*. Within 50 years the chestnut blight killed 3 to 4 billion American chestnut trees, obliterated an entire ecosystem dependent on the tree's bounty, and stilled an economic engine on which Appalachia had run for decades. [AM CHESTNUT FOUNDATION]

Cost / losses to Exotic Forest Insects

Local communities—in the form of homeowners and municipal governments—are bearing the largest cost burden of invasive forest pests.

Annual costs include:

- **$2 billion in local government expenditures for tree damage and removal;**
- **$1.5 billion in lost residential property values;**
- **$216 million in federal government expenditures on management and regulation.**

Aukema JE, et al. 2011. PLoS ONE 6(9): e24587.doi:10.1371/journal.pone.0024587

Impact on emerald ash borer on local government :

By 2005 the City of Ann Arbor MI had over 10,000 dead ash trees in the City's rights-of-way and parks that were killed by emerald ash borer attacks. Cost to the city for this unbudgeted work was approximately $3 million taken from existing budget categories, reducing all other maintenance and repairs.

http://www.a2gov.org/government/publicservices/fieldoperations/forestry/Pages/EmeraldAshBorer(EAB)Information.aspx

Infectious agents introduced to the United States via imports of live animals, 1996-2006

- Exotic Newcastle's Disease
- Heartwater
- Malignant Catarrhal Fever
- Monkeypox Virus
- Viral Hemorrhagic Disease of Rabbits
- Chytridiomycosis
- Ranavirus

These pests are a by product of global trade …

Obviously, international trade has tremendous benefits, but it also has costs. The regulations we currently have aren't keeping the pests out.

[J. E. Aukema et al. 2011. , "Economic Impacts of Non-Native Forest Insects in the Continental United States," PLoS ONE 6(9): e24587. doi:10.1371/journal.pone.0024587

To address invasive species issues in your state consider developing a framework and resources that will enable formation of a viable State Invasive Species Task / Invasive Species Committee.

The State Invasive Species Task / Invasive Species Committee should:

- include representation from key governmental agencies, educational institutions & extension service, private companies & key individuals;
- have some authority / voice;
- have some resources to work with;
- have implicit mandate for cooperation between agencies

Consider

- development of a comprehensive State Invasive Species Plan & involve the aforementioned Task Force / committee
- formation of a “dedicated” Invasive Species trust fund to deal with rapidly developing invasive species problems

Bioenergy

Bioenergy can be an important part of a sustainable energy future, but only if it is produced in a way that safeguards native ecosystems and minimizes the risk of invasion.

Include Biofuel / Bioenergy in your state Invasive Species Plan to

address the long-term implications of using non-native or genetically-altered species to support increased biofuel production

Consider forming a Biofuel trust fund to:

- insure long-term monitoring surveys
- Eradicate escaped populations while small
- carryout effective education

Consider developing a framework and resources that will enable:

- **increased cooperation and collaboration among and between state agencies and educational institutions within your state to deal with invasive species issues**
- **increased cooperation & collaboration across region and between states**

IS THIS SOMETHING THIS COMMITTEE CAN DO ?

There are existing models

State Councils

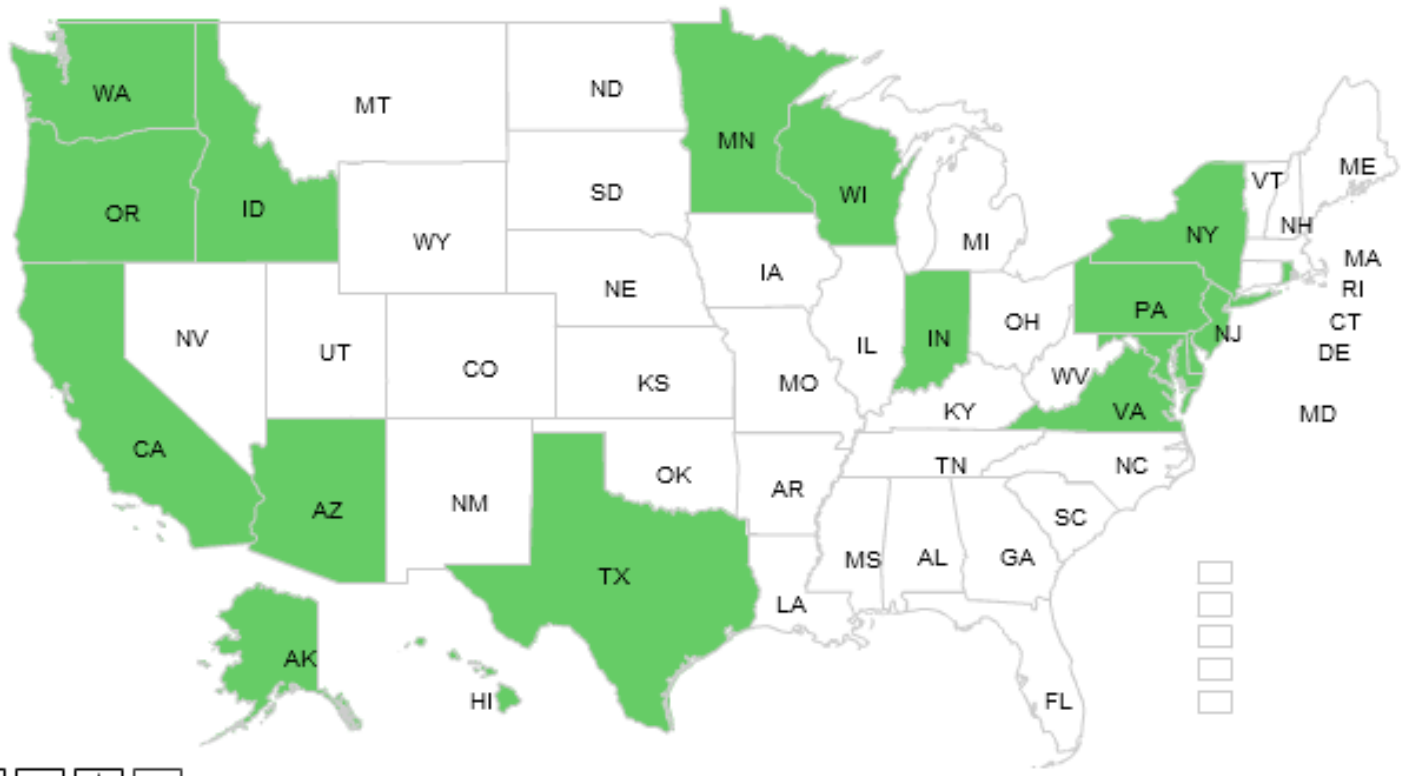
State invasive species councils are **partnerships of agencies and organizations that agree to cooperatively manage invasive species statewide.**

Invasive species councils vary from state to state. Many state councils function under the authority of a state statute, executive order, or Memorandum of Understanding. In some cases, councils comprise government agency leaders who obtain feedback and advice from an advisory council representing natural resource, economic, and health issues in the state.

Three characteristics of a state invasive species council:

- Statewide scope
- Multi-agency representation
- Aquatic and terrestrial multi-taxa interest

NOTE: Many states have multi-agency organizations that focus on managing a particular group of species - for example, noxious weeds or aquatic nuisance species. Contact information for those groups can be found here.



Code of Virginia

Invasive Species

§ 2.2-220.2. Development of strategies to prevent the introduction of, to control, and to eradicate invasive species.

A. The Secretaries of Natural Resources and Agriculture and Forestry shall coordinate the development of strategic actions to be taken by the Commonwealth, individual state and federal agencies, private businesses, and landowners related to invasive species prevention, early detection and rapid response, control and management, research and risk assessment, and education and outreach. Such strategic actions shall include the development of a state invasive species management plan. The plan shall include a list of invasive species that pose the greatest threat to the Commonwealth. The primary purposes of the plan shall be to address the rising cost of invasive species, to improve coordination among state and federal agencies' efforts regarding invasive species prevention and management and information exchange, and to educate the public on related matters. The Secretaries of Natural Resources and Agriculture and Forestry shall update the state invasive species management plan at least once every four years. The Department of Conservation and Recreation shall provide staff support.

B. The Secretary of Natural Resources shall establish and serve as chair of an advisory group to develop an invasive species management plan and shall coordinate and implement recommendations of that plan. Other members of the advisory group shall include the Departments of Conservation and Recreation, Game and Inland Fisheries, Environmental Quality, Forestry, Agriculture and Consumer Services, Health, and Transportation; the Marine Resources Commission; the Virginia Cooperative Extension; the Virginia Institute of Marine Science; representatives of the agriculture and forestry industries; the conservation community; interested federal agencies; academic institutions; and commercial interests. The Secretary of Agriculture and Forestry shall serve as the vice-chair of the advisory group. The advisory group shall meet at least twice per year and shall utilize ad hoc committees as necessary with special emphasis on working with affected industries, landowners, and citizens, and shall assist the Secretary to:

1. Prevent additional introductions of invasive species to the lands and waters of the Commonwealth;

2. Procure, use, and maintain native species to replace invasive species;

3. Implement targeted control efforts on those invasive species that are present in the Commonwealth but are susceptible to such management actions;

4. Identify and report the appearance of invasive species before they can become established and control becomes less feasible;

5. Implement immediate control measures if a new invasive species is introduced in Virginia, with the aim of eradicating that species from Virginia's lands and waters if feasible given the degree of infestation; and

6. Recommend legislative actions or pursue federal grants to implement the plan.

C. As used in this section, "invasive species" means a species, including its seeds, eggs, spores or other biological material capable of propagating that species, that is not native to the ecosystem and whose introduction causes or is likely to cause economic or environmental harm or harm to human health; however, this definition shall not include (i) any agricultural crop generally recognized by the United States

SUPPORT TIPPC

Donate to support the Texas Invasive Plant & Pest Council

Donate

KEEP INFORMED

Sign up for the iWire to get breaking news, events and the species spotlight.

your email SIGN UP

DON'T MOVE FIREWOOD

TEXAS INVASIVE PLANT AND PEST COUNCIL

The Texas Invasive Plant and Pest Council (TIPPC) originated as a motion from the floor at the second statewide Invasive Plant Conference held at the Lady Bird Johnson Wildflower Center, Austin, Texas in November of 2007. Stakeholders from state and federal agencies, conservation organizations, academia, green industry and the public sector had long discussed the need for one unified body to address the threat of invasive species in Texas. On Friday, April 18, 2008, members of the steering committee established at that conference signed the bylaws creating the very first Texas Invasive Plant and Pest Council.

COUNCIL OBJECTIVES

To provide a focus for issues and concerns regarding exotic plants and pests impacting native communities in the Texas;

To facilitate the communication and exchange of information regarding all aspects of invasive pest and plant biology, distribution, control and management;

To provide a forum where all interested parties may participate in meetings and share in the benefits from the information generated and promulgated by this Council;

To promote awareness and an understanding regarding invasive pests and plants and their control across Texas;

To provide expert advice for various interests concerned with invasive pests and plants and review invasive pest and plant management problems and activities and provide updated information for specific management needs; and

To serve as an advisory council regarding funding, research, awareness, policy and management of invasive pests and plants.

COUNCIL OFFICERS

President - Scott Walker, Malcolm Pirnie Inc.
Vice President - Jerry Cook, Sam Houston State University.
Secretary - R. Deborah Overath, Texas A&M University, Corpus-Christi.
Treasurer - Alexander Mathes, Malcolm Pirnie Inc.
Past President - Damon E. Waitt, Lady Bird Johnson Wildflower Center

The IDAHO INVASIVE SPECIES STRATEGIC PLAN

2012-2016

Noxious Weeds

Plants & Insects
Noxious Weeds
Aquatic Program
Bio-Control Program
Cooperative Weed-Management Area
Cost Share Program
Noxious Weed Free Forage
Idaho's Weeds List
FAQs

Idaho Invasive Species Council

Forms, Reports & Publications
Laws & Rules
Other Resources
Contact Information
Inspector's Page

ISDA's Noxious Weed Cost Share Program

The centerpiece of ***Idaho's Strategic Plan for Managing Noxious Weeds*** is the creation of Cooperative Weed Management Areas to mobilize all landowners in an area to work together in stopping the spread of invasive weeds. To accomplish this, the cooperators will use an integrated approach through the development of Integrated Weed Management Plans, to bring available resources and effective weed-fighting techniques to combat the growing invasive weed problem.

The primary purpose of the Idaho State Department of Agriculture's (ISDA's) noxious weed cost share grant program is to accelerate the attack on invasive weeds by *supplementing* local funds and resources, not *replacing* them. Cost sharing is also intended to provide additional incentives for local landowners, officials, and citizens to work collaboratively to develop a more comprehensive and effective noxious weed management program. Through strengthening on-the-ground management the major economic and environmental impacts can be more effectively mitigated, improving the quality of life for all Idahoans.

******2012 Cost Share Application Information******

2011 Cost Share Application Information

ISDA Noxious Weed Cost Share Grant Policy

Cost share grants are not intended to be a substitute or replacement for county or agency funds, or for costs that should legitimately be borne by landowners, consistent with the Idaho Noxious Weed Law. Rather, they are to be used as a supplement to the resources of landowners and county, state, and federal partners, particularly where a true resource crisis exists and for which delaying action for lack of resources would lead to accelerated resource deterioration and economic loss.

P I S C

Governor's Invasive Species Council of Pennsylvania

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- Invasive Species Advisory Committee (ISAC)
- Prevention
- Early Detection and Rapid Response
- Control, Management, and Restoration
- Research
- Education and Public Awareness
- International Cooperation
- Organizational Collaboration and Budget

What Can I Do About Invasive Species?

You are here: Home / ISAC White Papers

ISAC White Papers

ISAC White Paper Overview

- Invasive Species and E-Commerce (May 2012)
- Validation of PCR-Based Assays and Laboratory Accreditation for Environmental Detection of Aquatic Invasive Species (May 2012)
- Marine Bioinvasions White Paper (June 2011)
- Climate Change White Paper (December 2010)
- Green Economy White Paper (June 2010)
- Biofuels White Paper (August 2009)
- Definitions White Paper (April 2006)

ISAC Meetings

2008 - 2010 National Invasive Species Management Plan

Calendar of Events

IS Oversight Mechanism

USDA 2011 IS Research Forum

ISAC White Papers

Meet the Invasive Species Challenge | Know the NISC Plan, Manage the Problem | PREPARE, PREVENT, PROTECT

http://www.invasivespecies.gov/index.html

U.S. Department of the Interior • Office of the Secretary (OS/SIO/NISC) • 1849 C Street, N.W. • Washington, DC 20240
Phone: (202) 513-7243 • Fax: (202) 371-1751 • www.invasivespecies.gov

Biofuels: Cultivating Energy, not Invasive Species

Approved by ISAC on August 11, 2009

Issue

To provide alternatives to petroleum-based energy, the United States (U.S.) government has mandated a greater proportion of plant-based biofuels be integrated into its energy portfolio. However, **certain plant species being proposed for biofuel production in the U.S. are invasive species or are likely to escape cultivation and become invasive**.

U.S. Executive Order (E.O.) 13112[1] defines invasive species as "alien [non-native] species whose introduction does or is likely to cause economic or environmental harm or harm to human health" and states:

> "Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law" … "not authorize, fund, or carry out actions that it

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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

A Field Guide for the Identification of Invasive Plants in Southern Forests

Update of Jim Miller's book now providing information on accurate identification of 56 plants that are aggressively invading forests of the 13 Southern States at alarming rates.

More info...

STATISTICS

- 2,783 Invasive Species
- 1,809 species with images
- 46,173 images

NEWS

- Pest Management for Organic Production Systems
- Kudzu Bug Discovered in Vicksburg, Mississippi
- Spotted Wing Drosophila, An Invasive Pest Threatens Blueberries
- Widely prevalent plant pathogen maps now available on iOS portable devices
- Georgia Invasive Plant Management Handbook
- More News

Dealing with Invasive Species will continue to be an issue

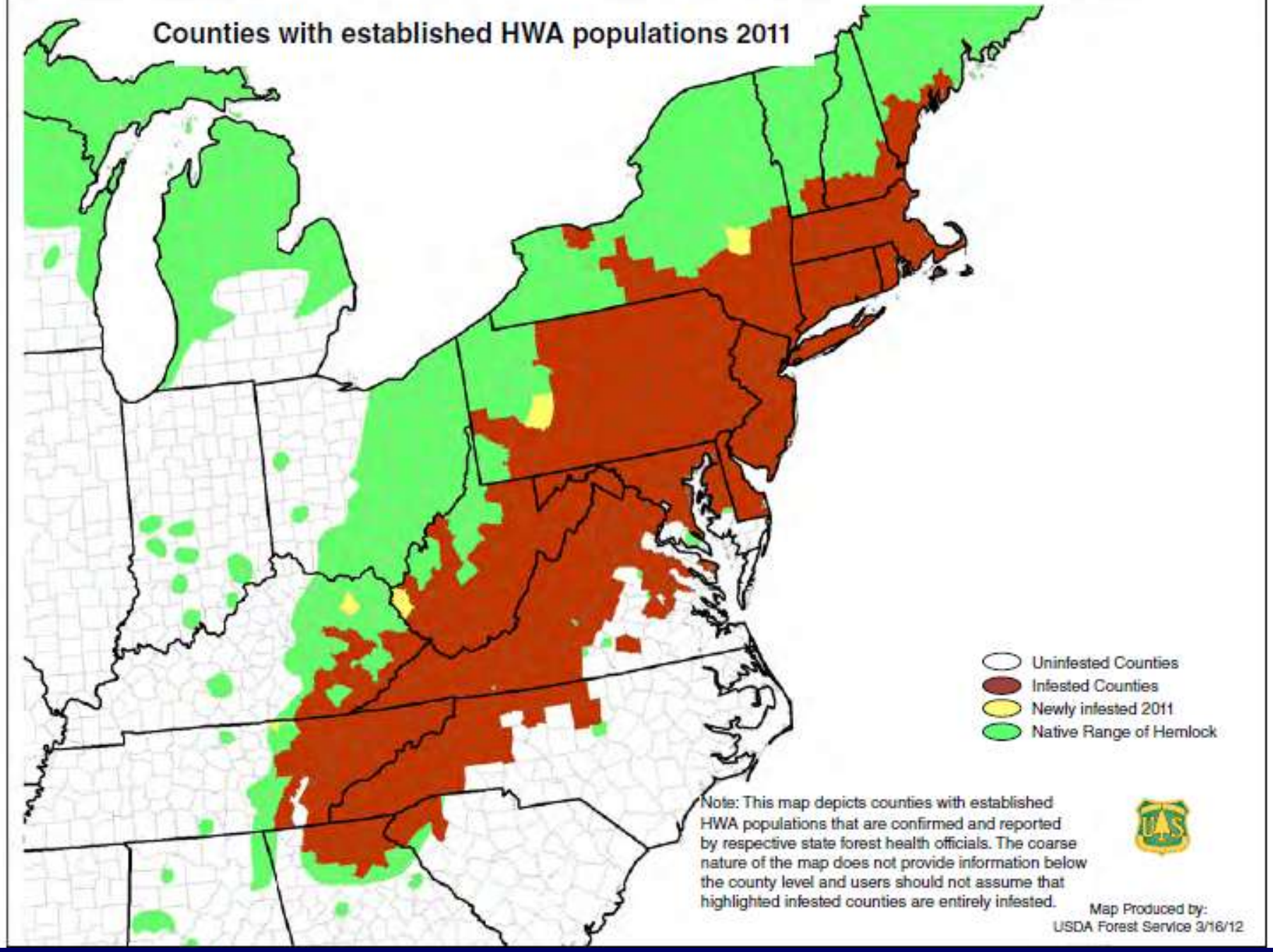
1. Recognize the problem
2. Develop strategies & legislation to reduce establishment
3. Develop strategies & legislation to reduce spread & impact
4. Build strong partnerships
5. Implement campaigns & programs to reach citizens
6. Take Action

Thank You:

Are there any questions?

www.bugwood.org
kdouce@uga.edu

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


Counties with established HWA populations 2011
Uninfested Counties
Infested Counties
Newly infested 2011
Native Range of Hemlock
Note: This map depicts counties with established HWA populations that are confirmed and reported by respective state forest health officials. The coarse nature of the map does not provide information below the county level and users should not assume that highlighted infested counties are entirely infested.
Map Produced by:
USDA Forest Service 3/16/12