A Web-based Approach to Invasive Species Data Aggregation, Mapping and Decision-making

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New York Natural Heritage Program
The Nature Conservancy

Integrating Invasive Plant Species Data in the Midwest:
Solutions for Data Collection and Management
January 23, 2008
Madison, WI

- Background
- Project Overview
- 3 Sample Applications
- *i*MapInvasives Membership

NatureServe Conference
Maryland 2005 →


58,560 Square Miles
(AK #1, CA #3, CO #8, OR #9,
FL #22, NY #27, NC #29, PA #33, RI #50)
• USGS Topo Quads: 1,059
Copyright 2005 digital-topo-maps.com

FLORIDA

- Invasive Species a primary threat to Florida's biodiversity
- FNAI well positioned to address part of the problem
  - Existing data management infrastructure
  - Expertise managing biodiversity data
  - Botanical and ecological expertise
  - Important complementary data
  - Strong connection with regulatory and planning processes
- Several existing invasive species databases in Florida serving different purposes

Marion County Pilot Project - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://lotmaps.freac.fsu.edu/marion/

Google Go Bookmarks 17 blocked Check AutoLink AutoFill Send to

FLORIDA Natural Areas INVENTORY

Marion County Pilot Project

Filter Results

Plant Species:

Imperata cylindrica

FLORIDA's Invasive Species

Submit your own point.

County	Contact	Date	Density
Imperata cylindrica - *cogon grass*			
Marion	Bronson, Kathy	2001	Scattered plants
Marion	Tancig, Mark	2005	Scattered plants
Marion	Bronson, Kathy	2003	Scattered plants
Marion	Bronson, Kathy	2001	Scattered plants
Marion	Bronson, Kathy	2002	Scattered plants
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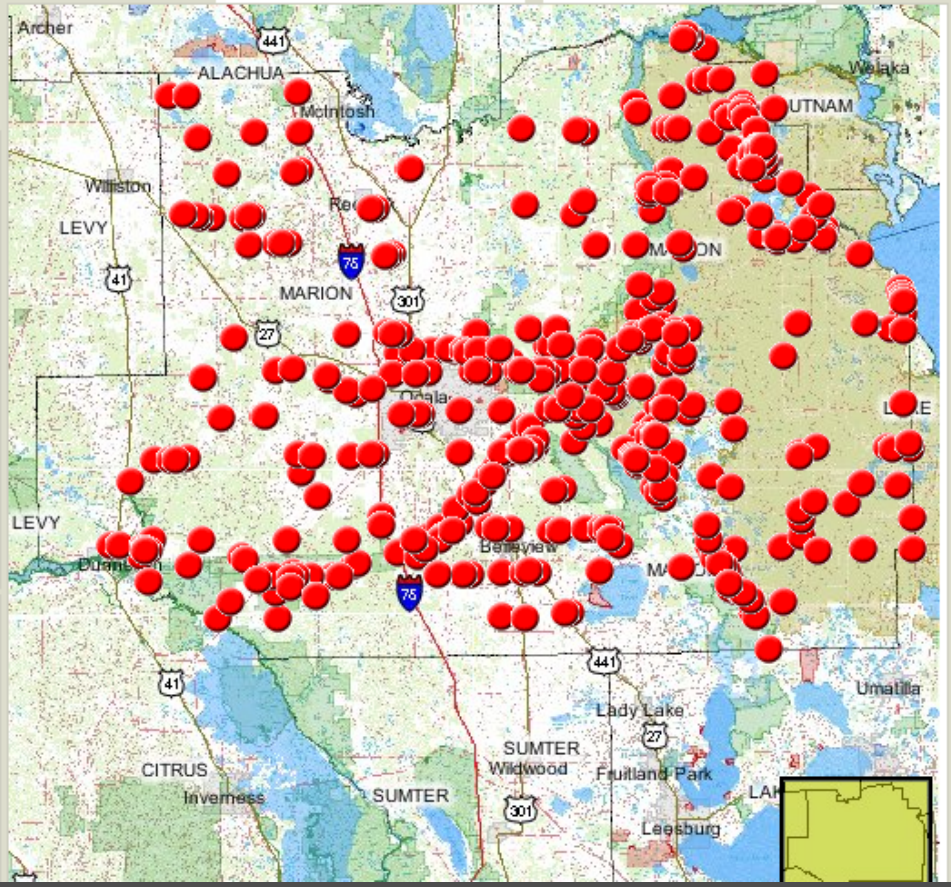


Building on the Prototype

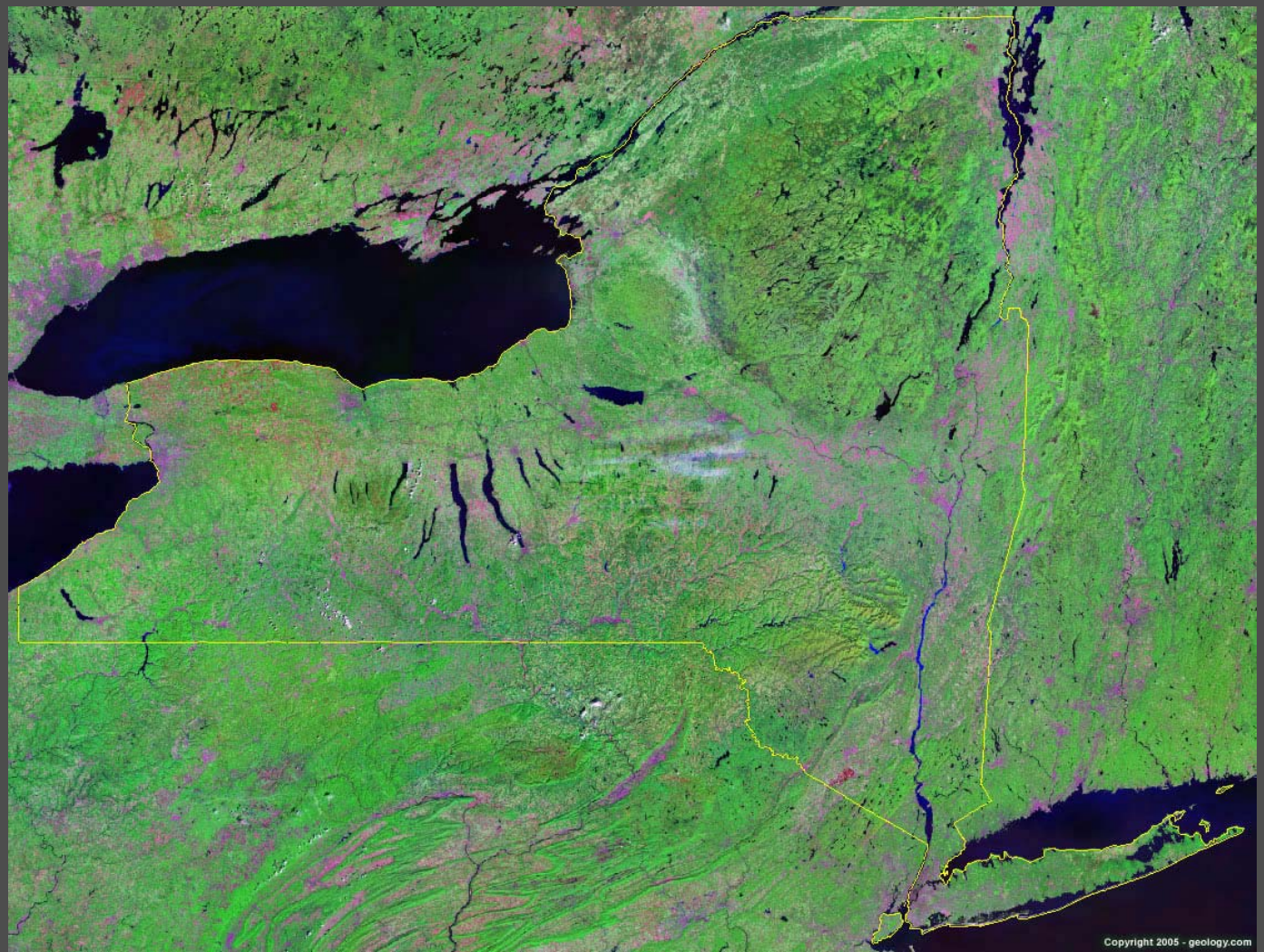
- State-wide GIS-based information
- Accessible on-line
- Query capabilities
- Generate reports
- Allow for data-entry
- Early detection notice
- Serve different user groups by incorporating different levels of capacity within the tool

NEW YORK

47,000 Square Miles

(AK #1, CA #3, MI #11, FL #22, WI #23, **NY #27,** NC #29, PA #33, RI #50)

967 USGS Topographic Quads



New York State
priority conservation areas

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

This map depicts major areas of ecological significance across New York State. These large landscapes harbor rich assemblages of plants, animals and natural communities that are sustained by broad ecosystem processes. Important characteristics of these areas include free-flowing rivers, large lakes, intact forests, coastal processes, fire-dependent ecosystems, and migrating birds and wildlife. The Nature Conservancy is already working to protect most of these areas, and we intend to create programs in the remainder of them over the next several years. Partnerships with like-minded public and private organizations are a key element of our conservation efforts. In addition to the areas shown here, the Conservancy owns and manages a network of 170 nature preserves in New York, and we are conserving land at dozens of smaller sites throughout the state.

0 25 50 100
Miles

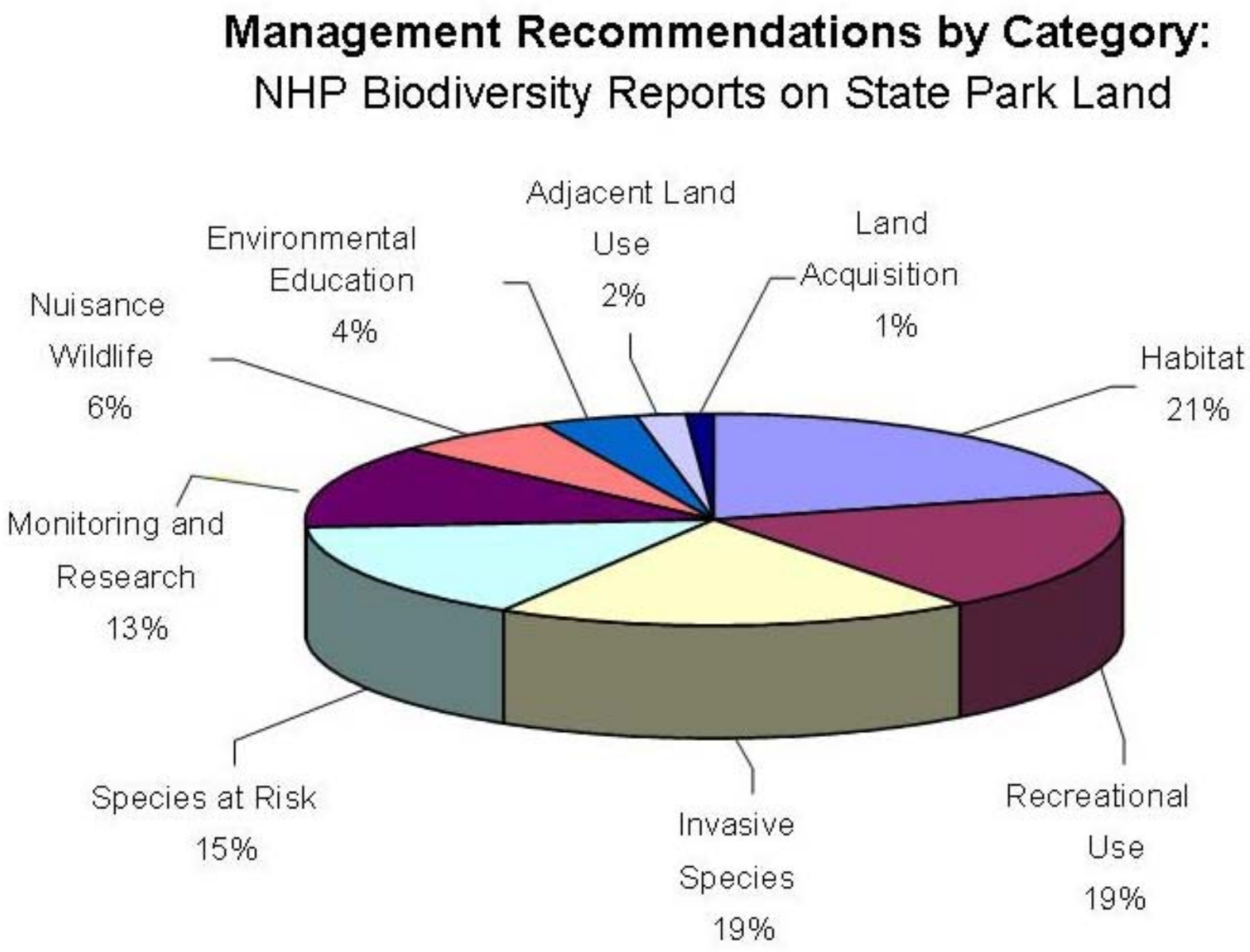
Map Produced by the New York State Office
Feb. 2005

Most Frequent Threats: NY's Priority Landscapes

n=27

- Invasive Species: 20 sites
- Residential Development: 19
- Agricultural Practices: 7
- Non-Point Water Pollution: 7
- Fire Suppression: 7
- Incompatible Forestry: 7
- Hydrologic Alteration / Dams & Barriers: 7
- Incompatible Recreation: 6
- Pests & Pathogens: 6

Total Number of Recommendations = 567



NY ISTF
convened in 2004
Issued Final Report in 2005

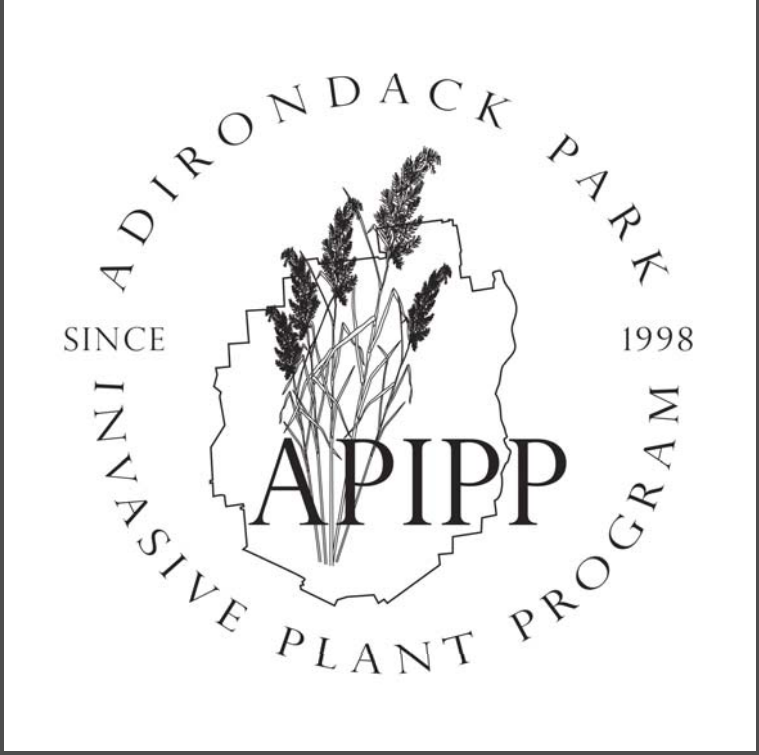
- DEC, Ag & Mkts, DOT
- Thruway and Canal Authority, APA
- OPRHP (Office of Parks Recreation & Historic Preservation)
- TNC, NYNHP, BRI, IPC
- Cornell, SeaGrant

NY ISTF →NY Invasive Species Council & Advisory Committee

"IPANE Model"

- Train Local Volunteers
- Hold training workshops all around New England
- Volunteers enter records into the IPANE database on-line (with a password)

“On-the-ground” Regional Partnerships “PRISMs” (“WMA’s”, “CWMA’s” +)

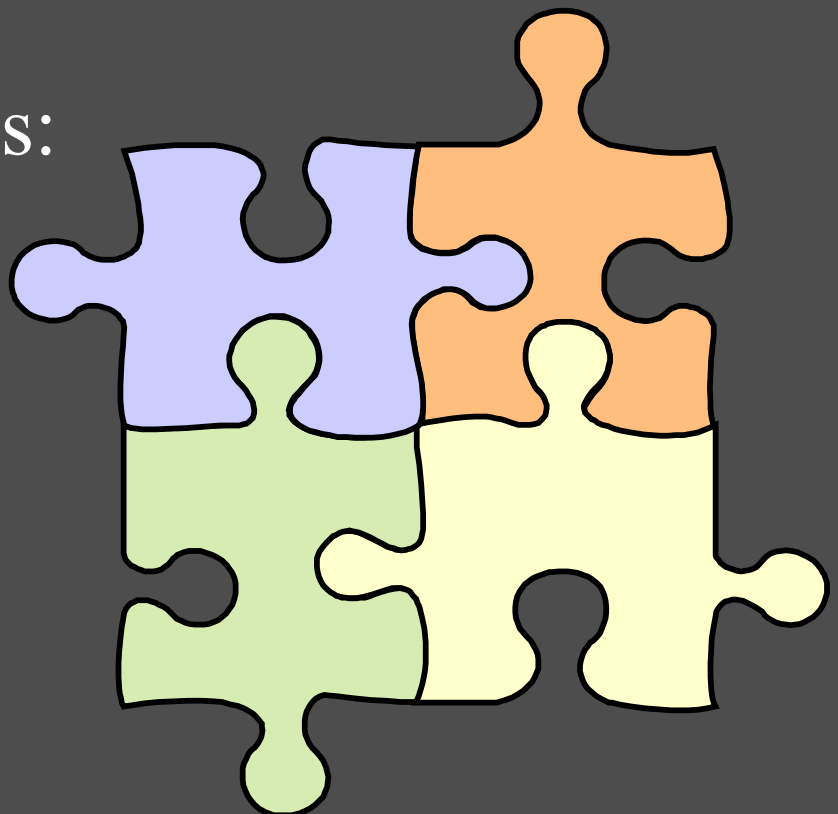



Partnerships for Regional Invasive Species Management (PRISM)
July, 2007
SLELO
APIPP
Lake Ontario
Capital Region
Western NY
Finger Lakes
CRISP
Lower Hudson
LIISMA
The eight PRISMs in New York are composed of a diverse base of state agencies, resource managers, industry, non-governmental organizations, resource users and many others. The PRISMs work to plan regional invasive species management, develop early detection and rapid response capabilities and implement eradication projects. They are also a great way for citizens to get involved!

Local information → "Big Picture"

- Assessment ("main fire or spot fire?")
- Prevention/Early Detection/Rapid Response
- Strategic Planning
- Focusing scarce resources:

  "Bang for the Buck"



Recommendation #5 of ISTF: "New York State should establish a state-wide database clearinghouse for all taxa of invasive species ….."

Trained Volunteers & Field Professionals

Maps & Analysis

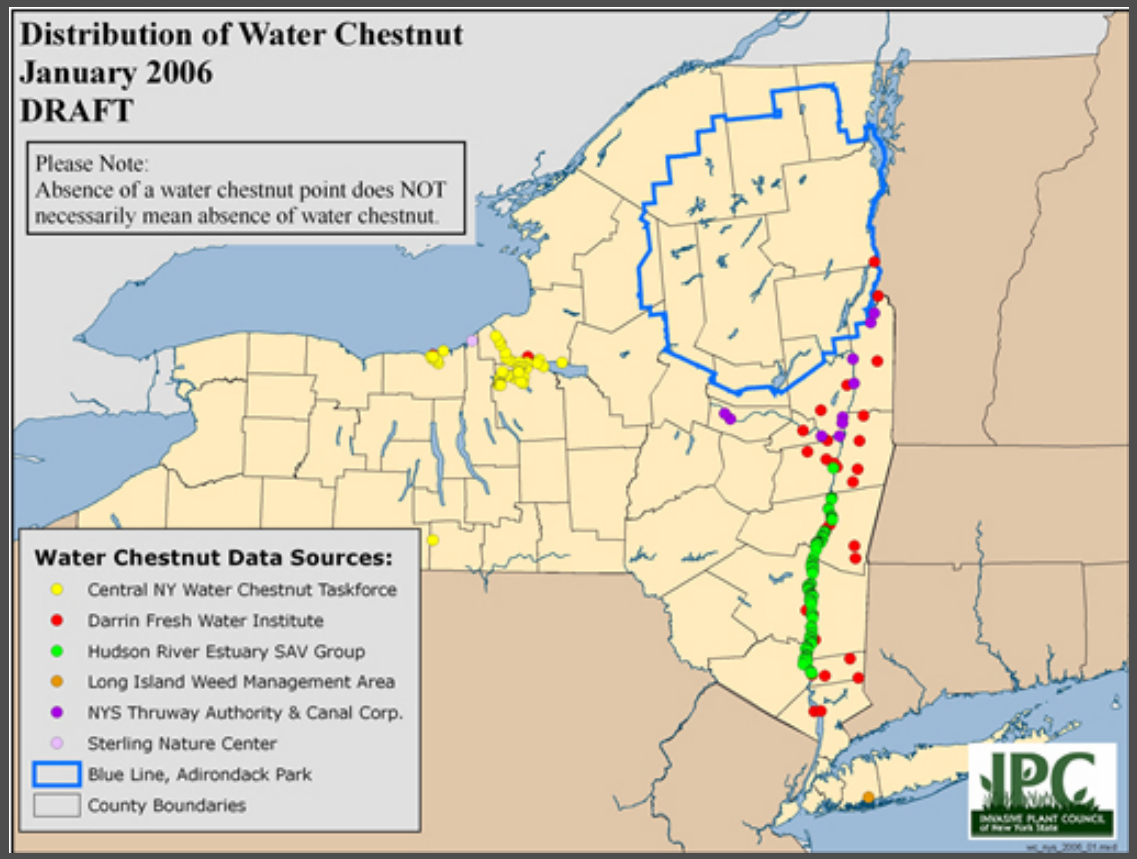
New York Natural Heritage Program

Data Needed to Support:

- **SWAP** (State Wildlife Action Plans) – Competition from invasive species identified as top threat to freshwater fish and mollusks in CSWP
- DEC State Lands **Unit Management Plans**
- Guide State Park **Master Plans**
- TNC **Conservation Action Plans**
- **PRISMs**
  - ED *by Species*
  - ED *by Location*

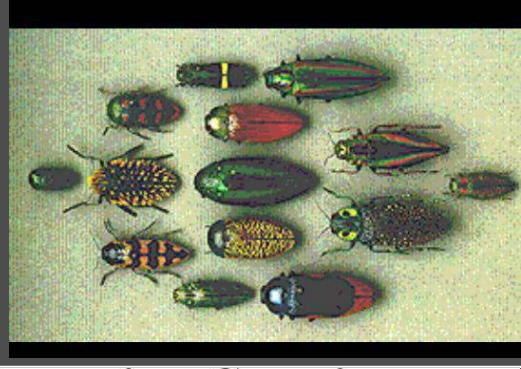
Rapid Response
by species

- Facilitate Quick On-the-ground response to *New Invaders*



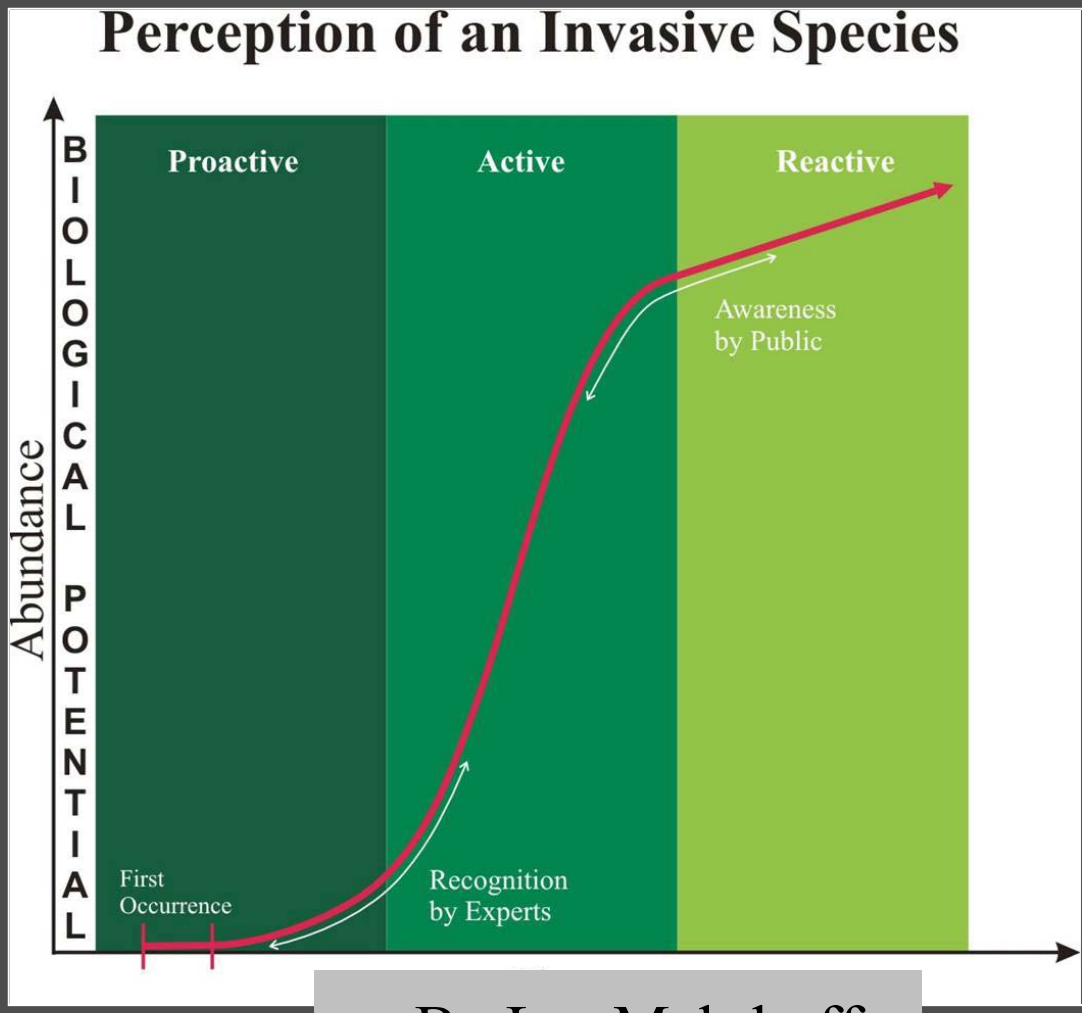
Rapid Response *by Location*
Invasive Species Prevention Zones

Invasive Species Database
For Action



Supporting:

- On-the-ground work of land managers.
- Early Detection (ED) by location & ED by species
- Invasive Species decision-makers



- By Les Mehrhoff

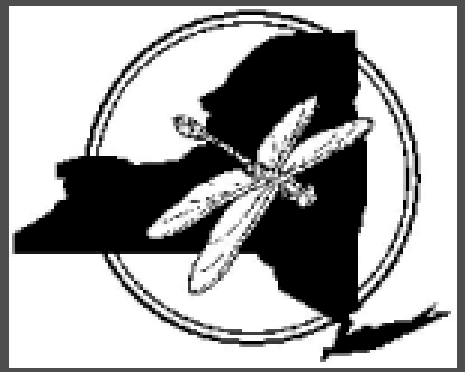
- National Prototype
- All-taxa
- Geographic Information System (GIS)
- On-line
- Import from WIMS and other applicable databases

(inter)National Prototype

- Florida Natural Areas Inventory
- NY Natural Heritage Program
- TNC Invasive Species Team
- NatureServe

NatureServe

FLORIDA Natural Areas INVENTORY



The Nature Conservancy
Protecting nature. Preserving life.™

All-taxa


Photograph by Michael Bohne

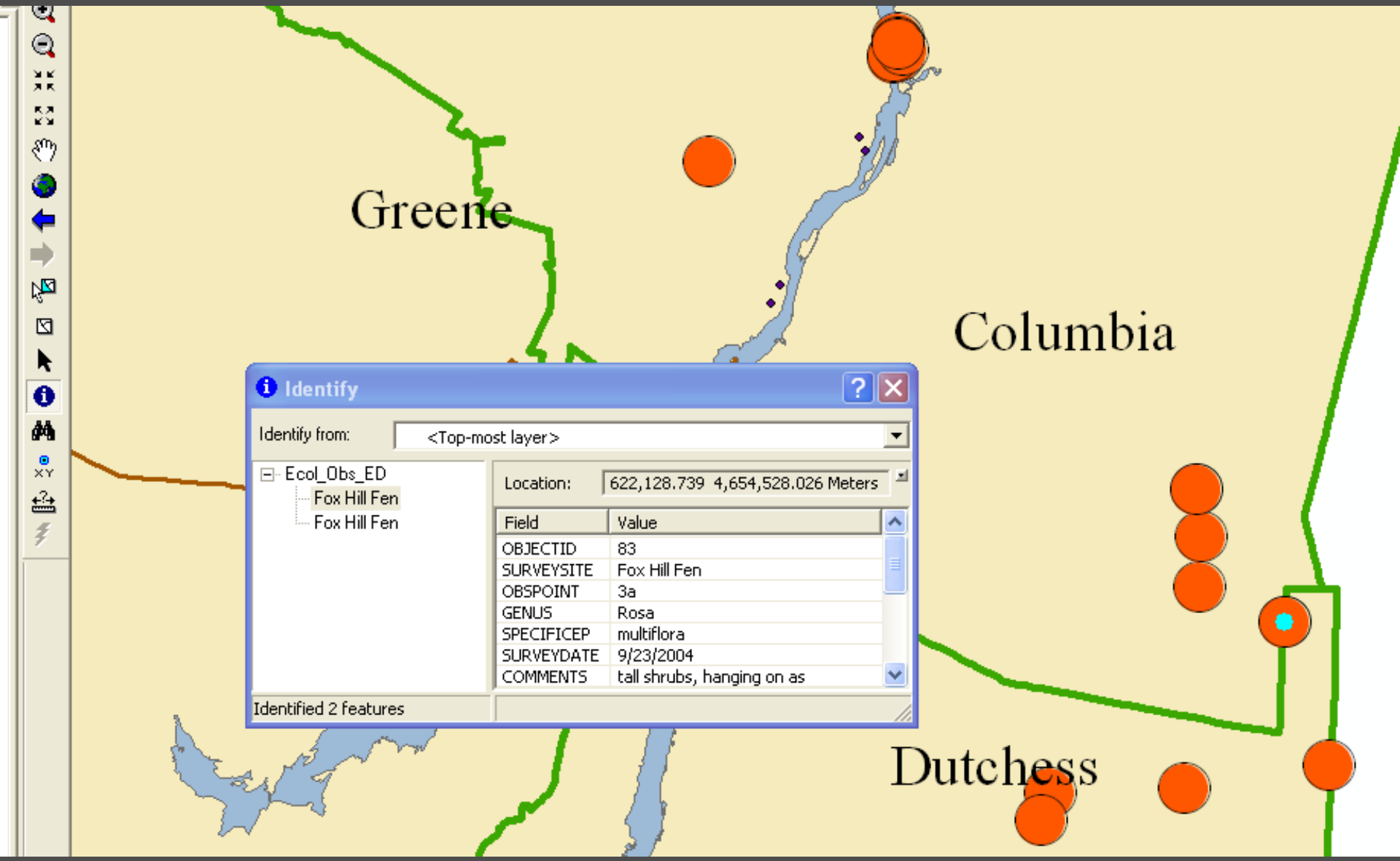

16 TH
1
2
3
4


UGA2106098

UGA1349011


MW
UGA3970056

GIS = Map + Data *& spatial analysis*

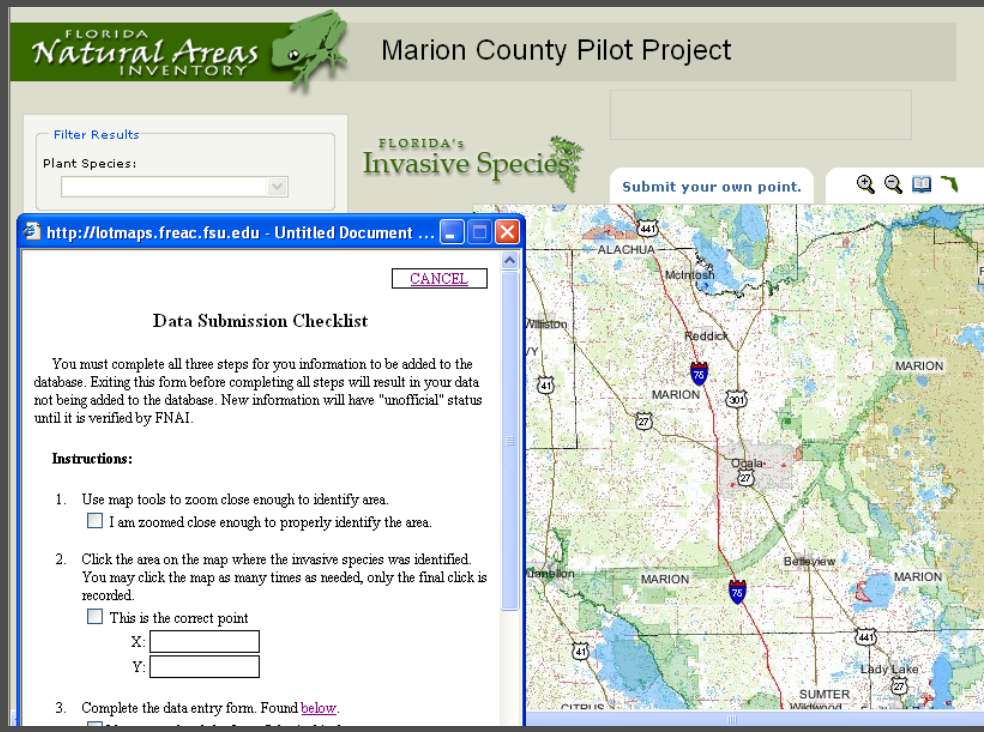


On-line

* Ability to view maps & run data queries on-line

* On-line data entry
(with a password)

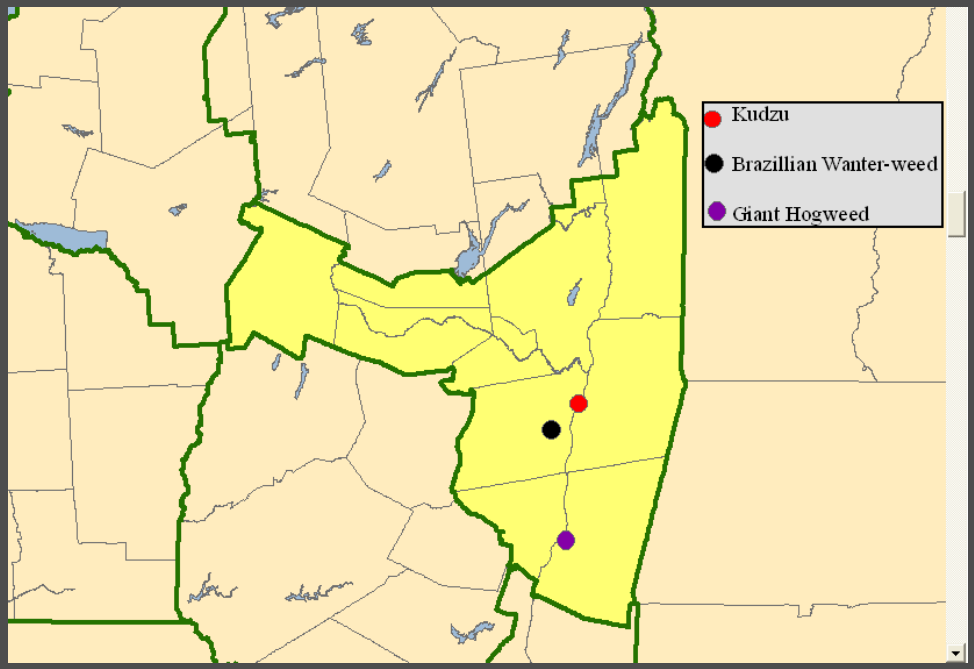
* On-line reporting from the public
(followed-up & verified by trained volunteer or professional)



Import Data

- WIMS (Access application)
- “WIMS-Lite” (ArcPad application)
- WEEDAR (Florida)
- CAPS data (Cooperative Agricultural Pest Survey)
- Other

- Early Detection List
  (1, 2 or 3 locations)



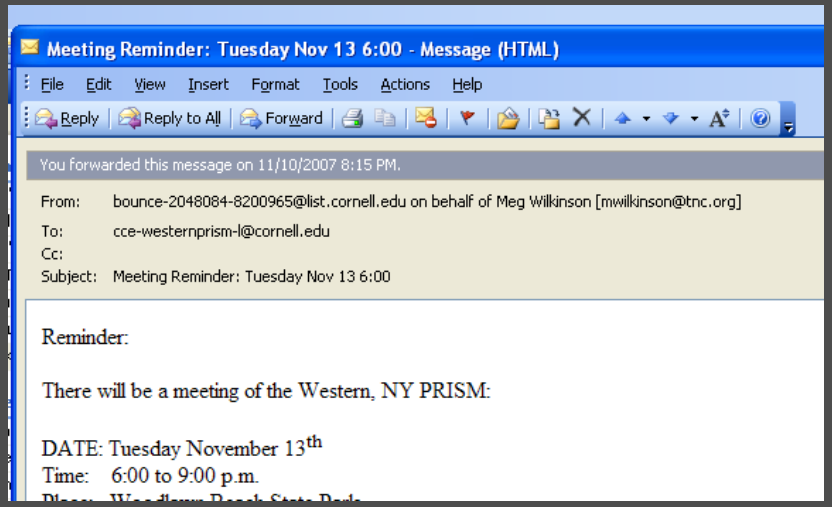
- Approaching Region List

May, 2007: NY State Early Detection Invasive Plants by Region.
REGION: Capital Region

AR: "Approaching Region". *Available data indicate that these plants are not present in this region; however, they are known to occur in adjacent regions or in a state adjacent to this region.*

Scientific Name	*Preferred Common Name (Other Names)*
Actinidia arguta	Hardy Kiwi (Hardy Kiwifruit)
Aira caryophyllea	Silver Hairgrass
Aralia elata	Japanese Angelica Tree
Buddleja davidii	Orange-eye Butterfly-bush
Butomus umbellatus	Flowering-rush
Cabomba caroliniana	Carolina Fanwort
Caragana arborescens	Siberian Peashrub
Cardamine hirsuta	Hairy Bitter-cress
Cardamine impatiens	Narrowleaf Bittercress (Bushy Rock-cress)
Carex kobomugi	Japanese Sedge; Asiatic Sand Sedge
Centaurea solstitialis	Yellow Star-thistle
Cirsium palustre	Marsh Thistle (European Marsh Thistle)
Clematis terniflora	Japanese Virgin's-bower (Sweet Autumn Clematis, Yam-leaf clematis)
Crupina vulgaris	Common Crupina
Cytisus scoparius	Scotch Broom

- Automated ED email Alerts
  - Automated Early Detection Email Alerts by Region



Oregon's Feral Swine

•Feral Swine are becoming a big problem in Oregon. Their rooting and wallowing activities cause serious erosion to river banks and areas along streams and facilitate invasion of noxious weeds. Feral swine are capable of consuming virtually all available oak mast, thereby competing with native wildlife and severely limiting oak regeneration.

•The Oregon Department of Fish and Wildlife's Conservation Strategy has identified a number of **Conservation Opportunity Areas**. These areas represent valuable biodiversity in the state. Strategies are developed to promote the conservation of these areas.

•The following slides show how this system can help Oregon better determine where to concentrate resources when Feral Swine threaten oak regeneration.

Oregon's Feral Swine

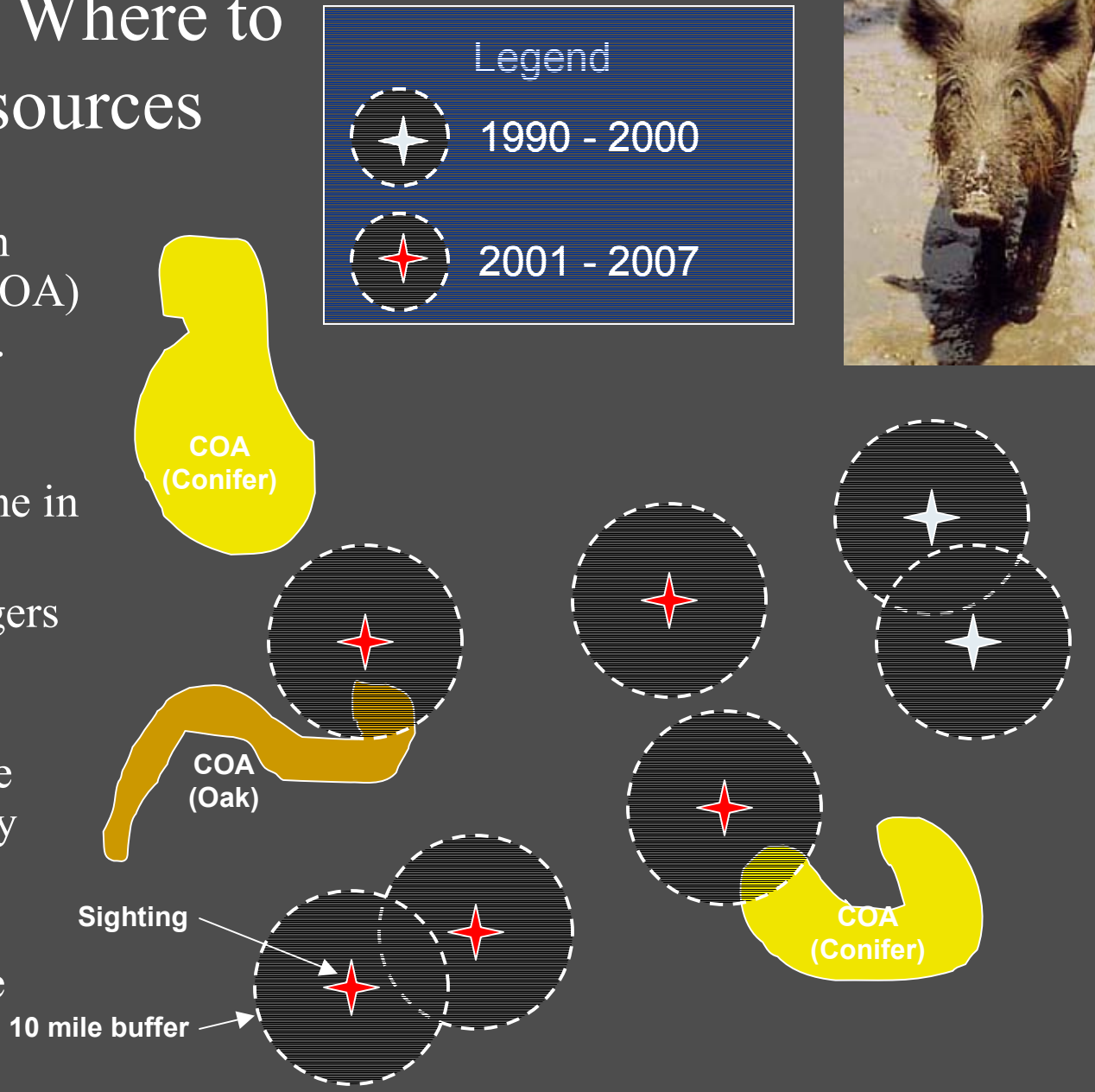
- Animals move around. We record animal sightings but we need to add a reasonable buffer to reflect the animals' movement and range.

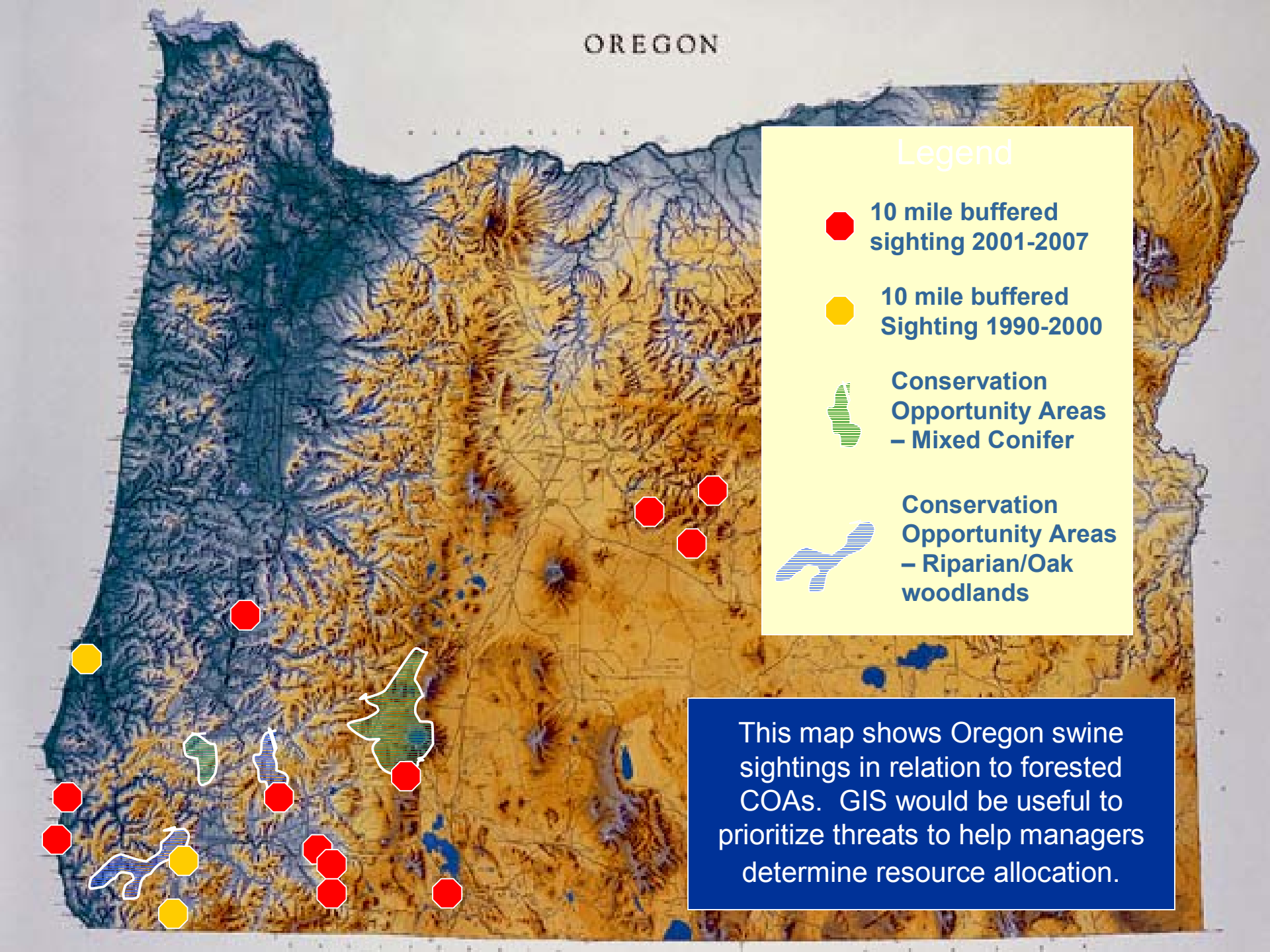
- The next map shows the location of sightings each with a 10-mile buffer.

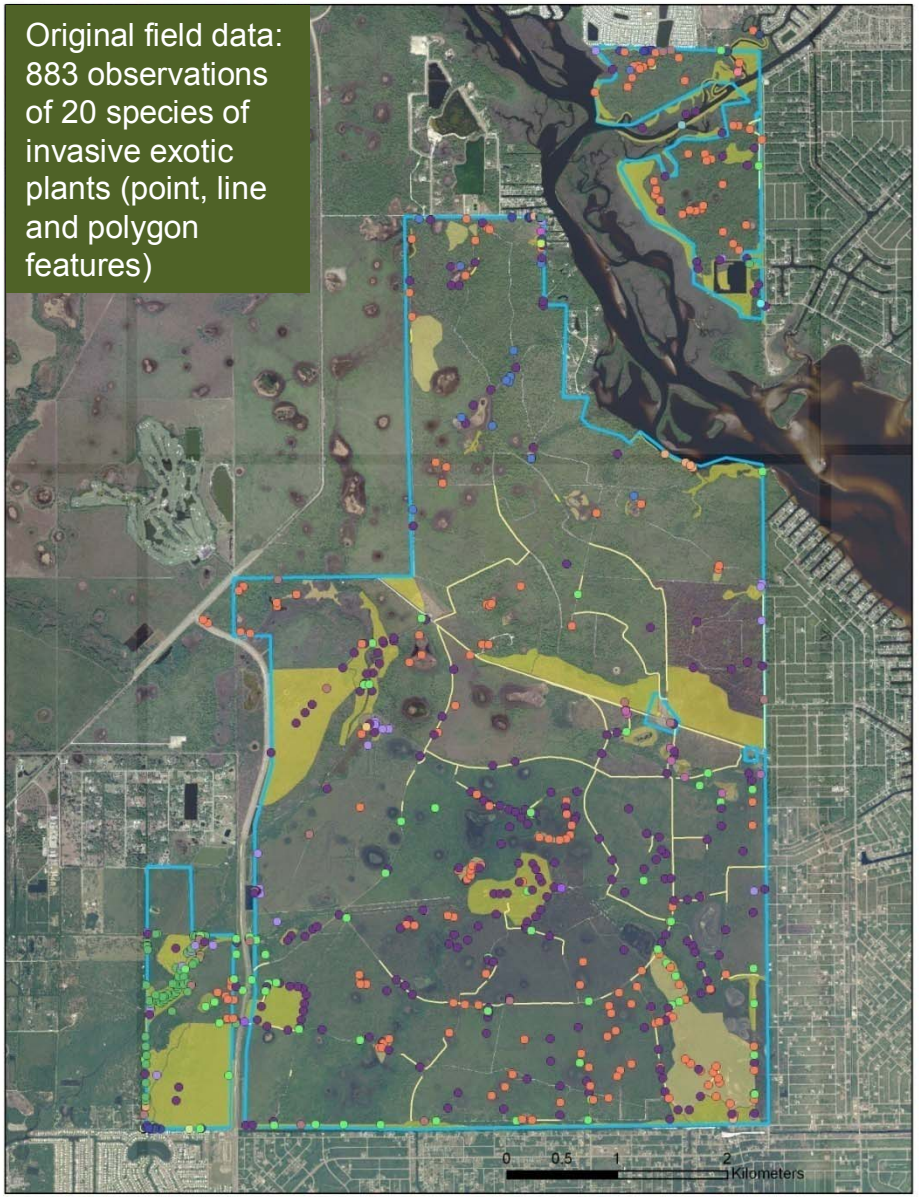
- The date of sighting is maintained to allow for historical analysis.

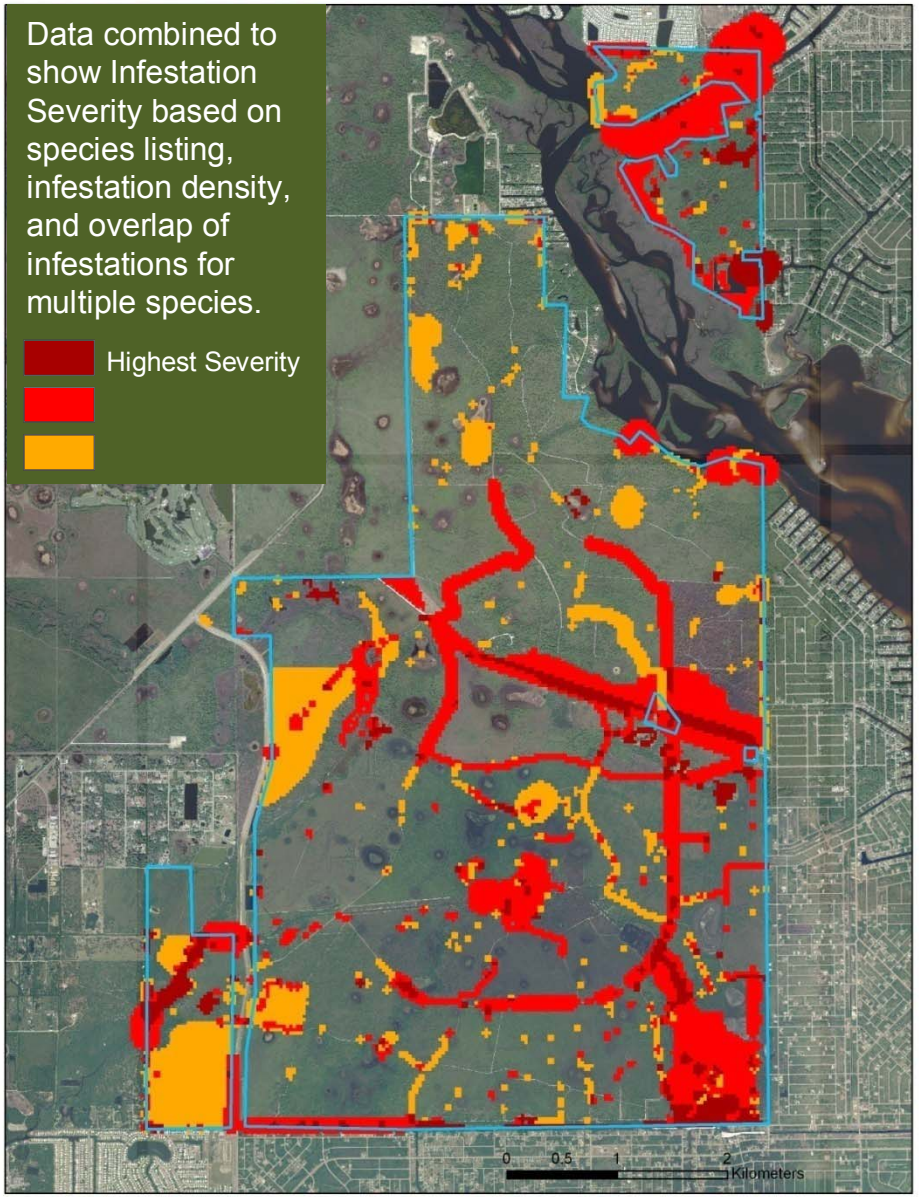
Sample GIS Application to Demonstrate Where to Apply Resources

- Feral Swine range reaches Conservation Opportunity Area (COA) with conifer and oak.
- Swine in oak area is considered more threatening than swine in conifer forest.
- Where should managers apply containment resources?
- GIS can prioritize the two threats and notify interested parties
- Historic record is maintained for future analysis




OREGON
Legend
10 mile buffered sighting 2001-2007
10 mile buffered Sighting 1990-2000
Conservation Opportunity Areas – Mixed Conifer
Conservation Opportunity Areas – Riparian/Oak woodlands
This map shows Oregon swine sightings in relation to forested COAs. GIS would be useful to prioritize threats to help managers determine resource allocation.



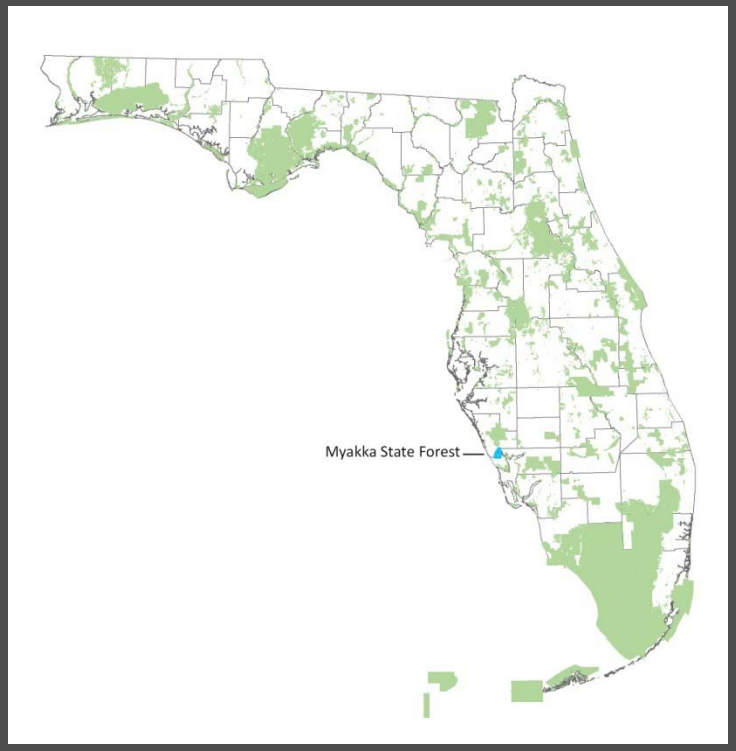


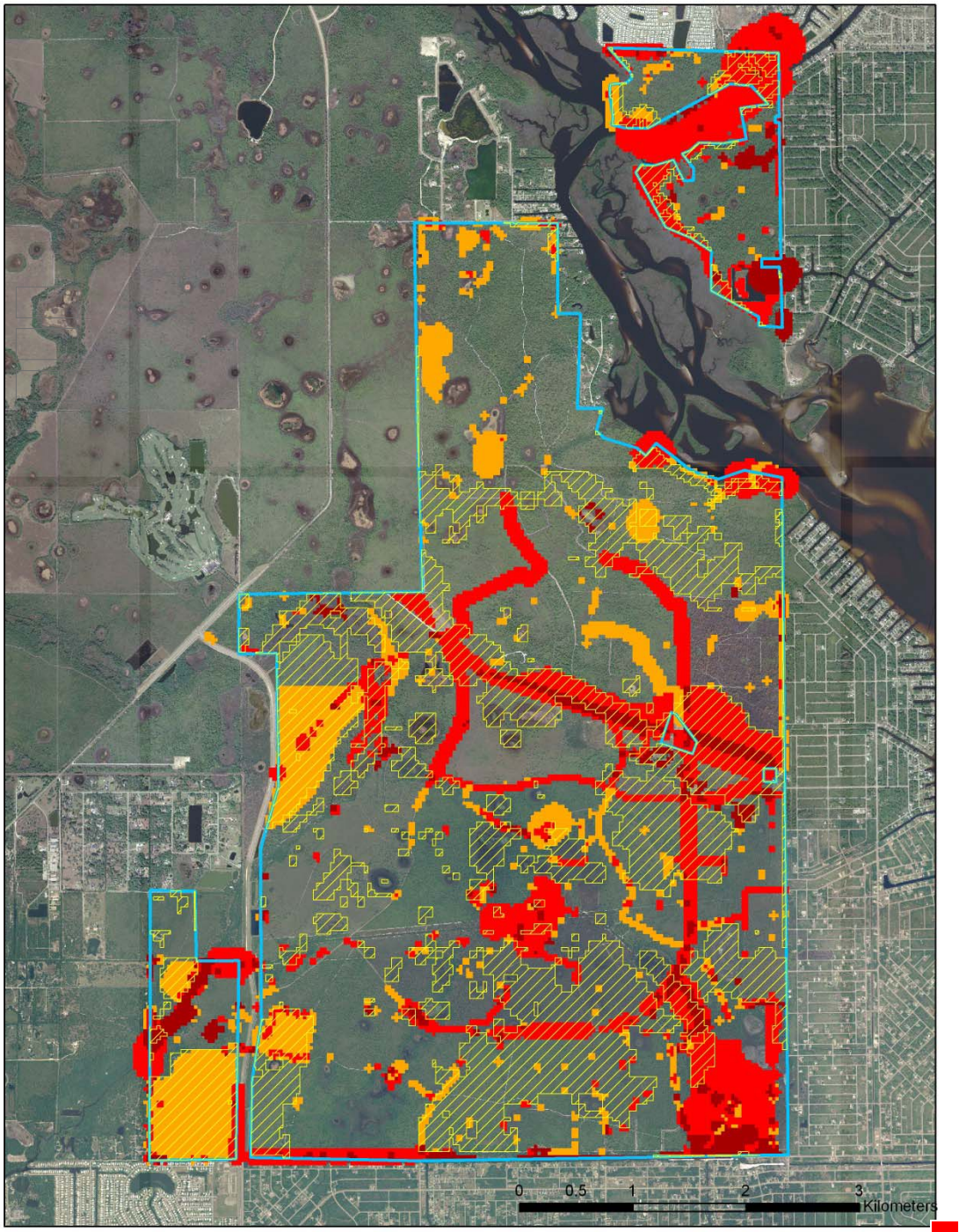
Myakka State Forest in Sarasota County, FL

Overlay of Rare Species Habitat with infestations of invasive exotic plants.

Rare Species Habitat

Infestation Severity	Total Acres of Infestation	Acres that overlap with Rare Species Habitat
	87	35
	1801	803
	900	469
TOTAL	2788	1307





*i*MapInvasives.org

- Module 1, 2008
  - On-line, GIS-based map display and query
    - Plant data
    - Automatically generate ED/AR lists by Region
- Module 2, 2009
  - Animal data
  - On-line data entry with password
  - Upload from WIMS and "WIMS-Lite"
  - Automatically generate ED/AR lists by County
  - Sign up for email alerts

Interested?

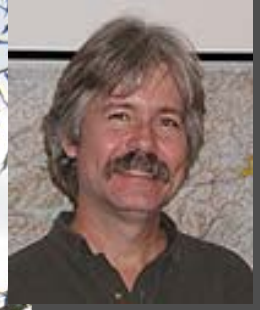
- Speak with a member of the Executive Committee
  - Presentation in your state?
- Identify "Member Organization" for your state
  - Organize partners in your state
- Participate in quarterly *i*MapInvasive conference calls
- 2008 field season work
  - Use WIMS or "WIMS=Lite"

*i*MapInvasives Membership

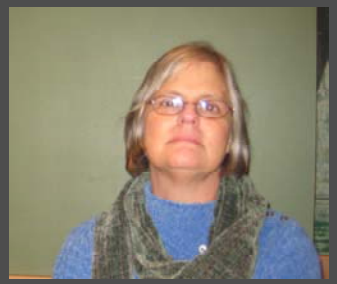
- Member Organization
  - 1 state ←→ 1 Member Organization
  - Set-up Fee (1st year, only)
  - Annual Membership
- Member Organization organizes partners in the state (e.g. DOT & Parks & NGOs, etc.)

Benefits

- Collaborative effort cost-effective
- Member-driven
- Member Organizations suggest upgrades and enhancements to the system
- Coordination across state boundaries
  - *Invasive species ignore political boundaries…*



Contact Us



Thank You
&
Questions?