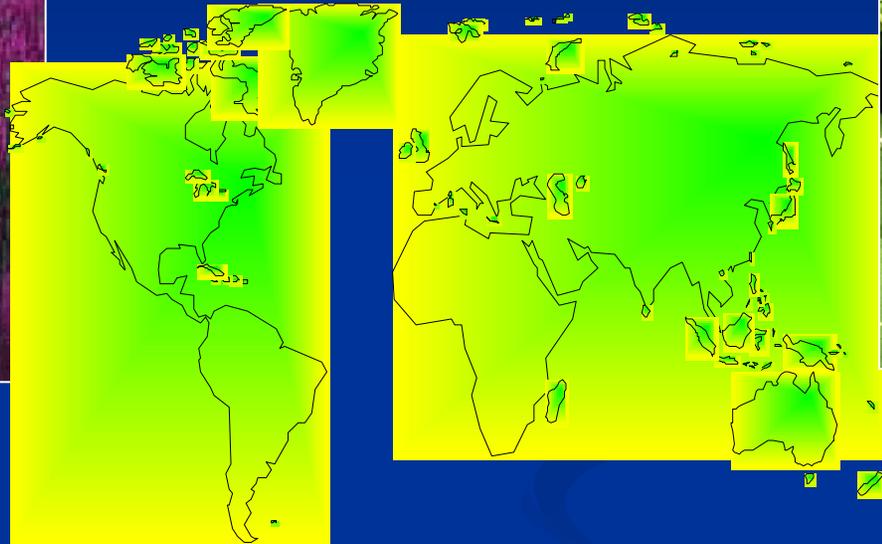


# Invasive Species - Coming to America

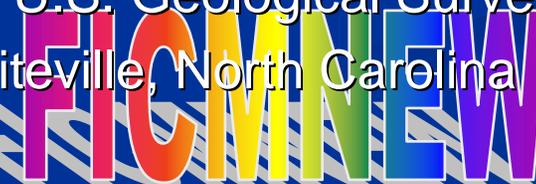
## *New Strategies for EDRR in Manitoba*

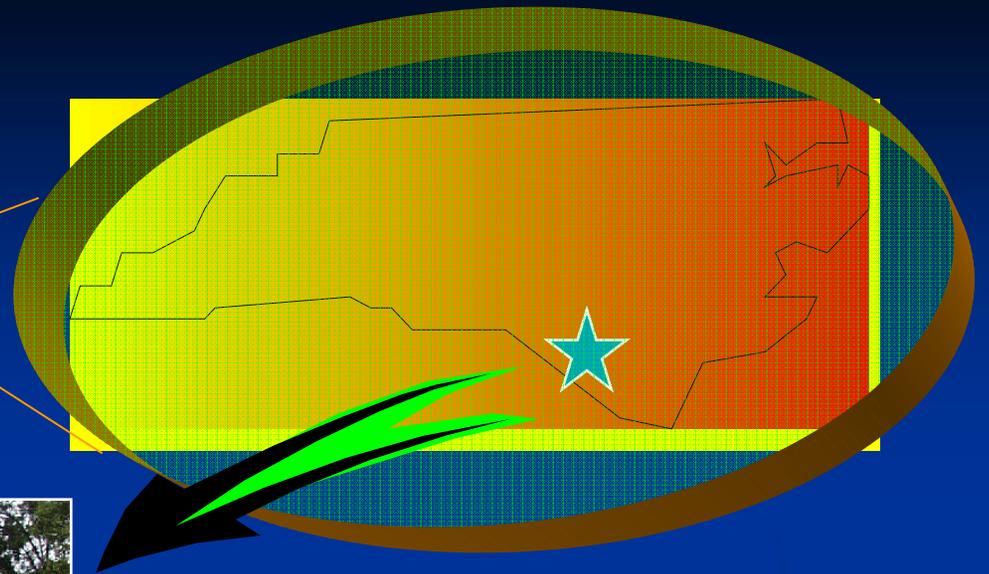
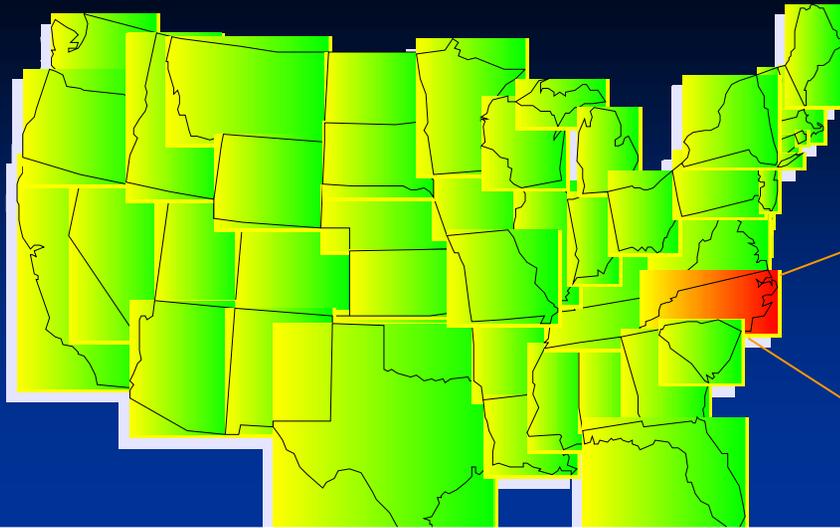


Randy G.  
Westbrooks

U.S. Geological Survey

Whiteville, North Carolina, US





**USGS BRD**

**Whiteville, North Carolina**



Green Swamp – Venus Flytrap

“One of the penalties of an ecological education is that one lives along in a world of wounds. Much of the damaged inflicted on land is quite invisible to laymen. An ecologist may either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise”.

Aldo Leopold

*A Sand County Almanac*, 1949.



# Invasive Species in America

## ■ Creation of Invasive Species

- Free Living Exotic Species
- Native Species – Remove Top Predators



## ■ Uncontrolled Introductions

- 50,000 Introduced Species and Varieties
- 1,500+ Introduced Invasive Plants

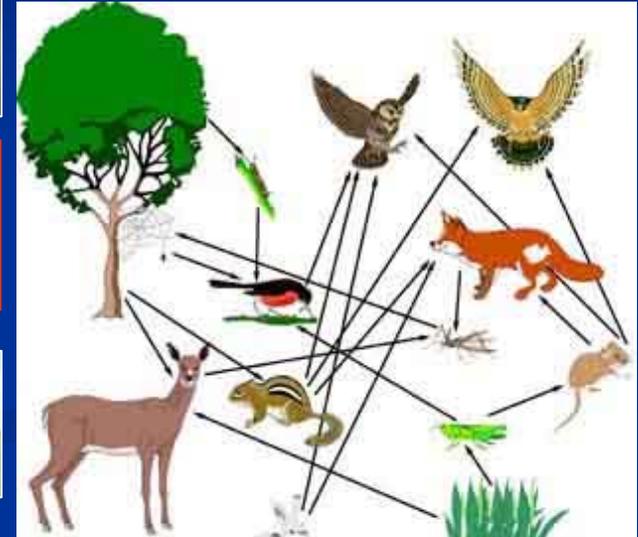


## ■ Impacts on Human Health

- Spread of Disease; Injury, Stings

## ■ Ecological Impacts

- Outcompete / Hybridize with Natives
- Destroy Habitat (Gypsy Moth)
- Alter Ecosystems (*Melaleuca* in FL)
- Alter Fire Cycles (Cheatgrass in the West)
- #2 Threat to Endangered Species (400/958 spp.)



## ■ Economic Impacts

- Food and Fiber Production
- Increased Losses and Control Costs (\$150 Billion)



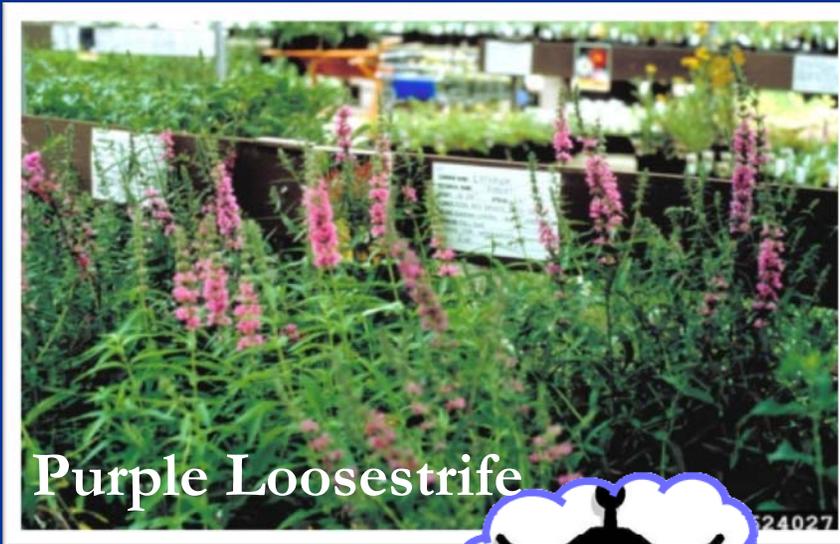
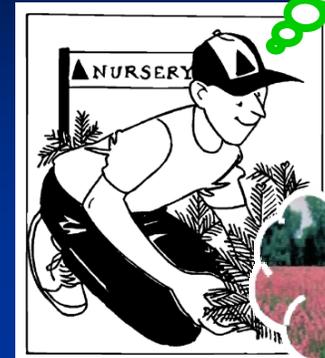
*'Seek first to understand... Then to be understood'*

Stephen Covey

The 7 Habits of Highly Effective People, 1989



Private Land Owners



Purple Loosestrife



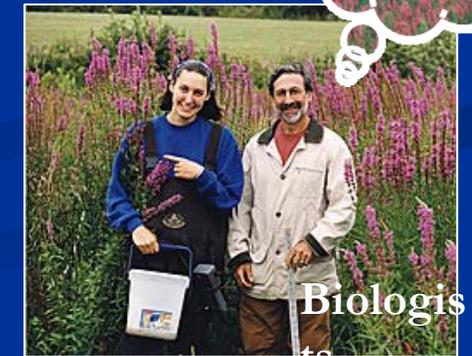
Public/Private Conservation Land Management



The Public

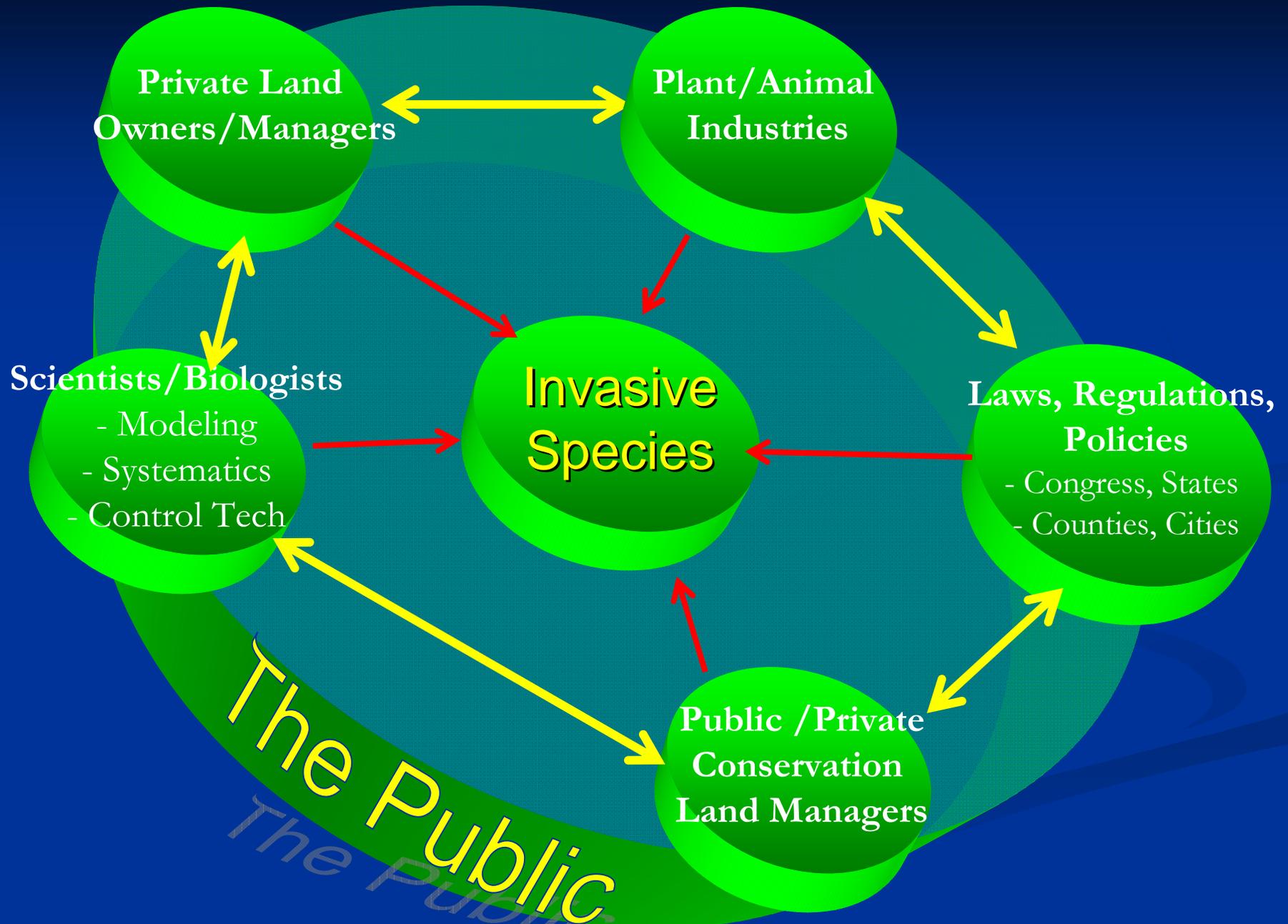


Federal, State, Local Government



Biologists,

# Invasive Species Interest Groups

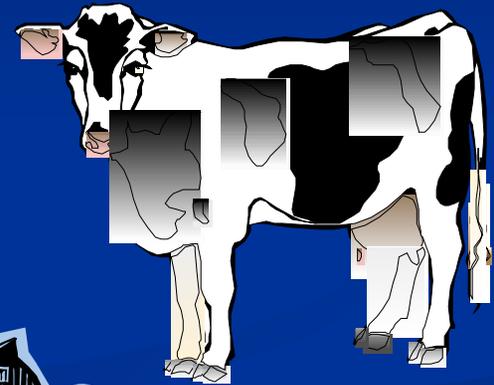


# The Great American Exchange

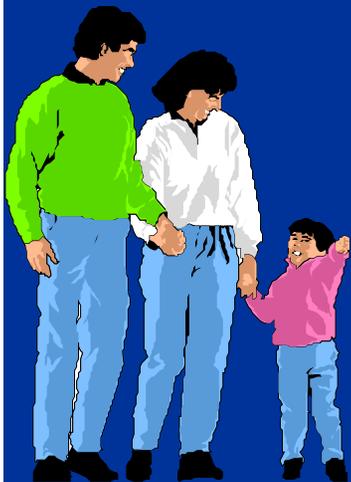
Panama Land Bridge, 3 Million Yr. BP

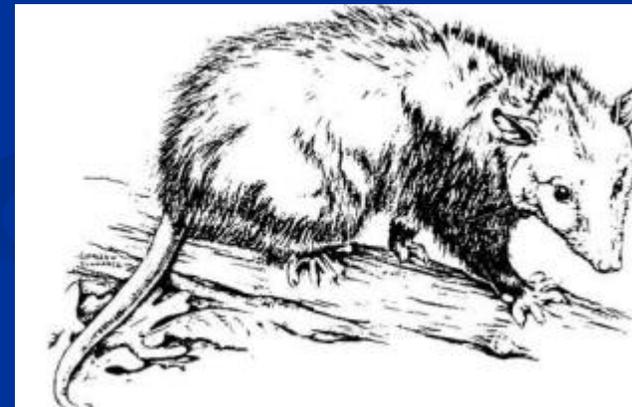


# Root of the Problem....



Only 2% of the U.S.  
Population are still  
Engaged in Agricultural  
Production or Land Management.....





“Houston, we have a Problem.....”

# Four Major Types of Invasive Species....



Aquatic  
Nuisance  
Species

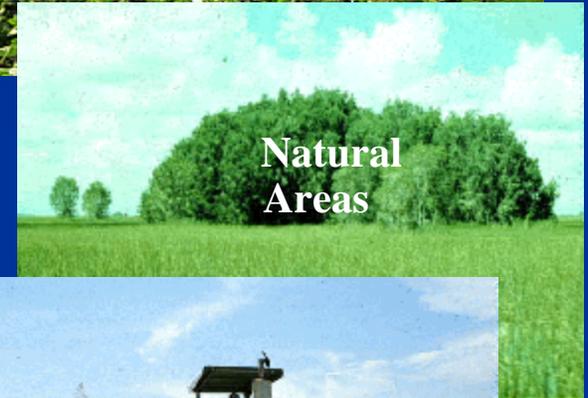


Forests



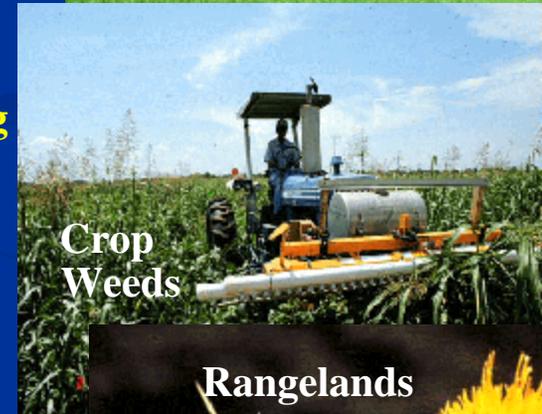
Injurious  
Wildlife

Invasive  
Plants



Natural  
Areas

(4,200+  
Free Living  
Exotics)



Crop  
Weeds

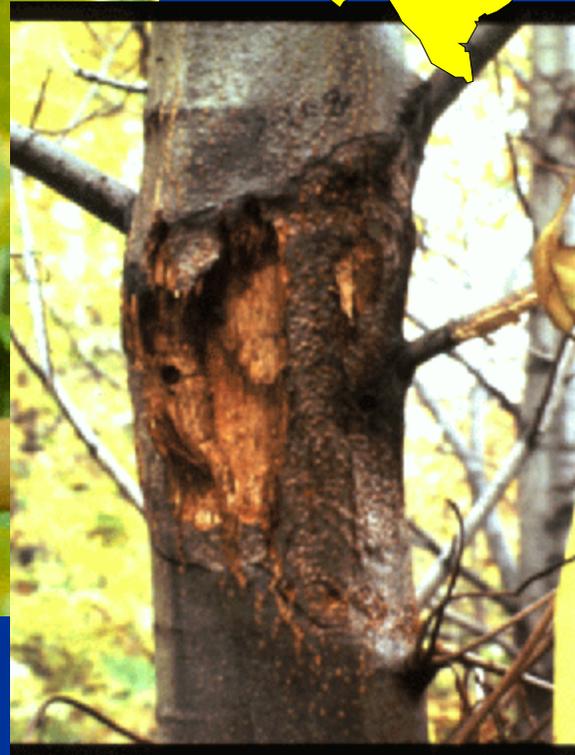
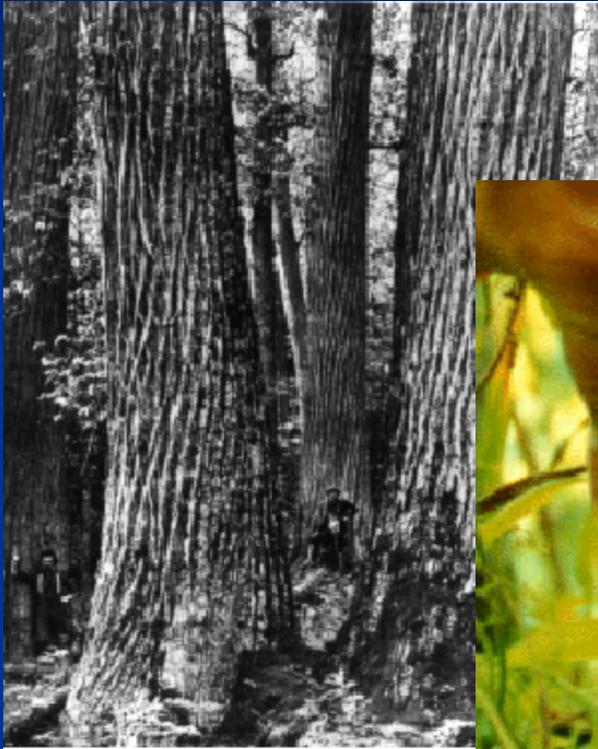
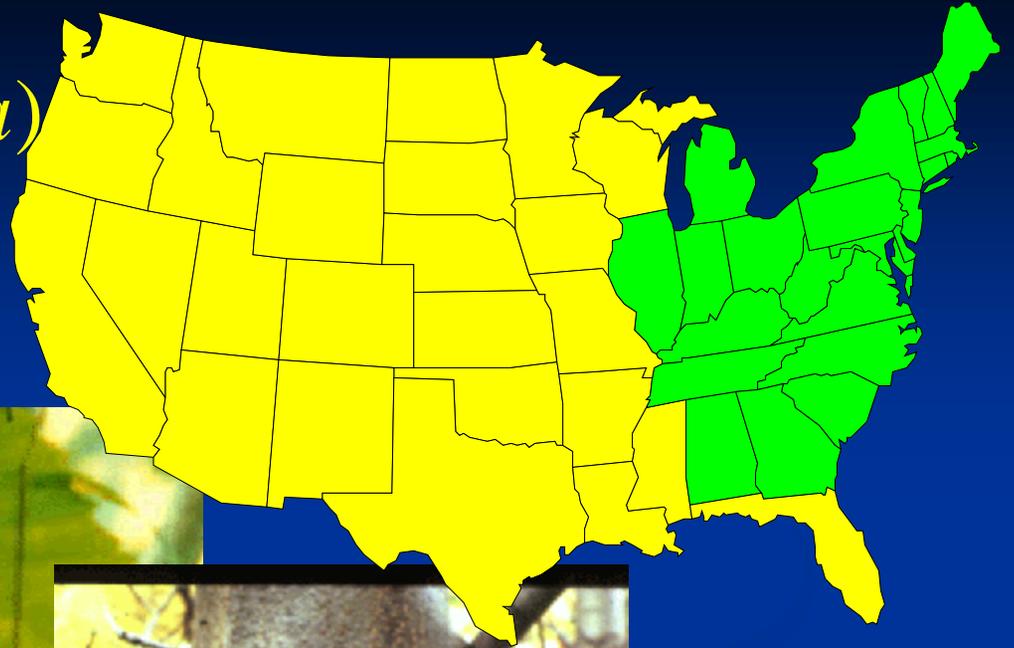


Insects  
and  
Diseases

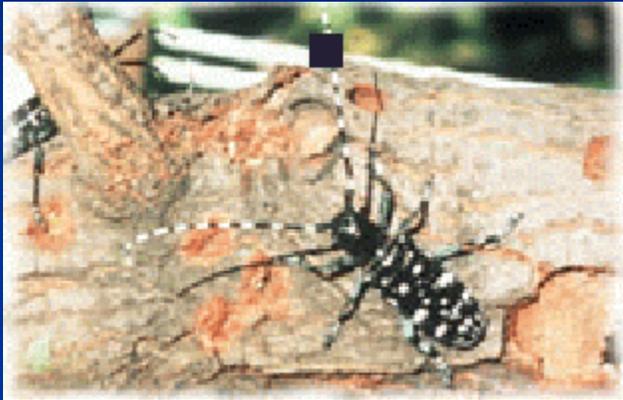
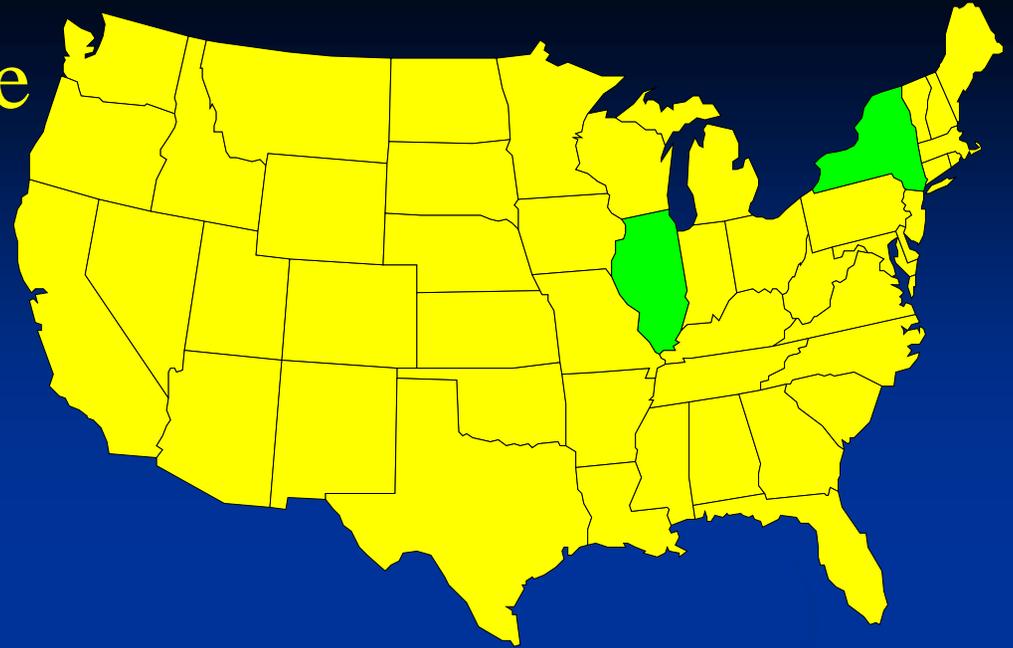


Rangelands

# Chestnut Blight (*Cryphonectria parasitica*)



# Asian Long-horned Beetle (*Anaplophora glabripennis*)



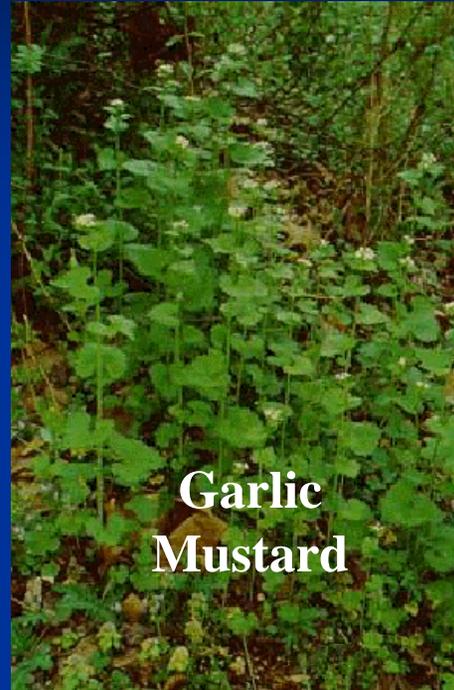
# Invasive Plants!



- 🌍 18,000 Native Plants in North America
- 🌍 4,200 Exotics with Free Living Populations
- 🌍 19% Exotics!

# Invasive Plants of the Northeast

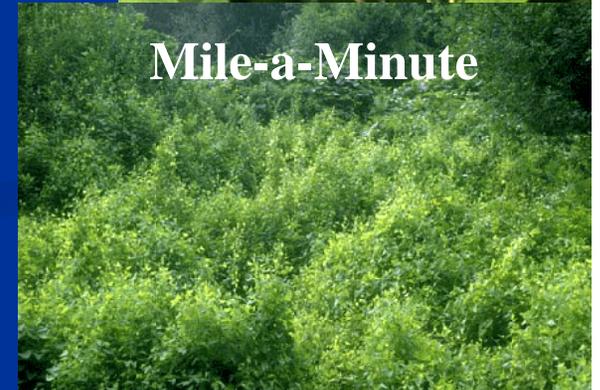
Purple  
Loosestrife



Garlic  
Mustard



Mile-a-Minute



Mud Mat

# Invasive Plants of the Southeast



Hydrilla



# Invasive Plants of the Midwest



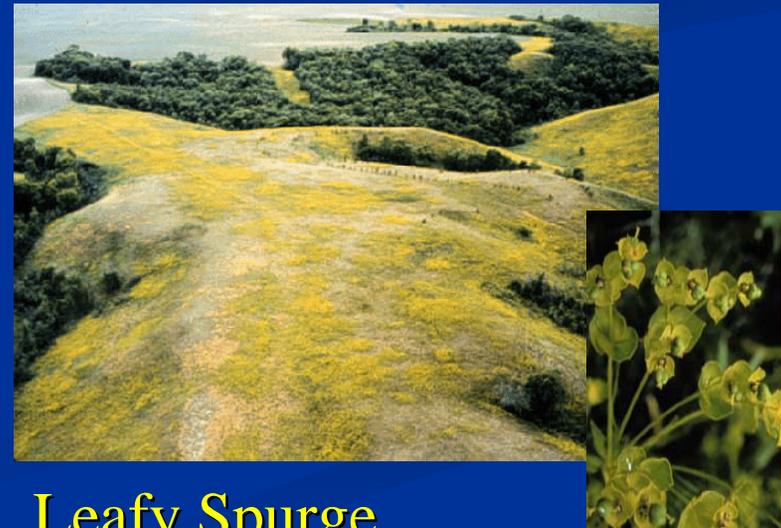
Johnsongrass



Lespedeza



Grecian Foxglove

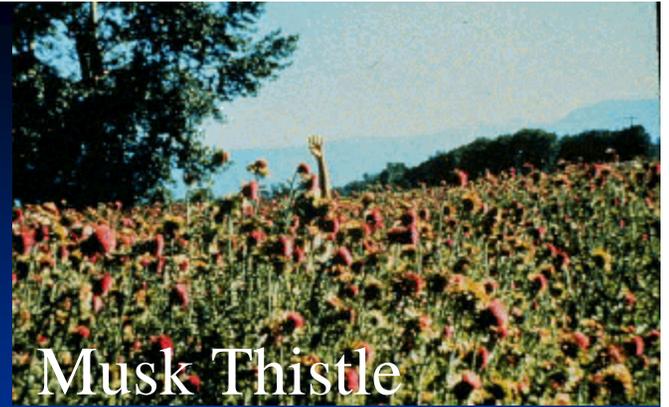


Leafy Spurge

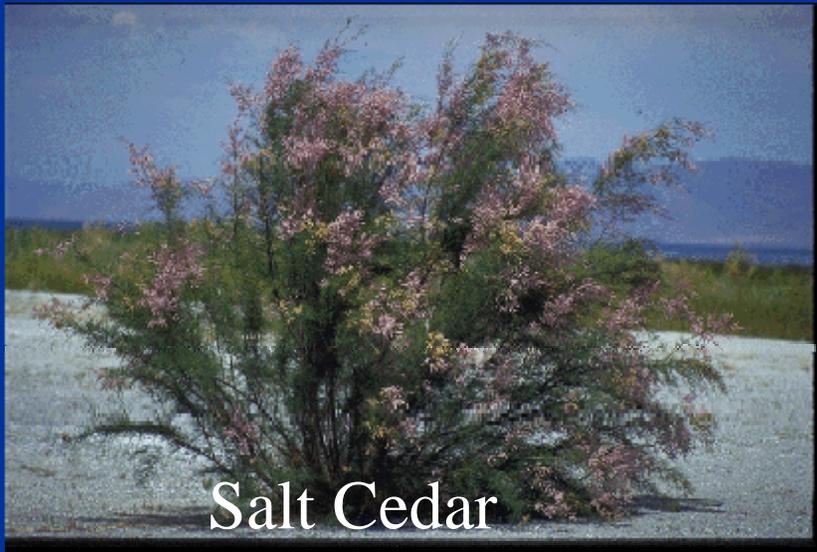
# Weeds in the West.



Leafy Spurge



Musk Thistle



Salt Cedar



Cheat Grass



Chemicals Degrade  
over Time.....



Biological Invaders  
Reproduce and Spread

## Biological Pollution vs Chemical Pollution

**Native to Central America**



**Native to Eurasia**



**Native to Asia**



**Native to Asia**



**Value of American Agriculture: \$195 Billion per Year.....**



Old World Climbing Fern and Melaleuca.  
Native Bush in Queensland, Australia.

Lessons Learned: Invasive Plants are Plants out of Place....

# Strategies for Defense



**Pest Free  
Production**



**Preclearance**



**Exclusion  
(Prohibited Lists)**

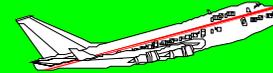
**Detection  
Containment  
Eradication**

**Control**

**Other  
Countries**

**USA**

**Traditional Crop  
Protection Strategies**



# USDA & DHS. First Line of Defense.....



**Lesson Learned:  
Regulatory  
Exclusion is about  
5% Effective!**



**Land Border Crossings....**



**Beagle Brigade**

# Federal/State Cooperative Weed Eradication Projects. 1958-2005.

## ■ Successful Projects

- **Witchweed** (*Striga asiatica*). NC, SC. 1958-Current
- **Hydrilla** (*Hydrilla verticillata*), CA. 1980-1995.
- **Tropical Soda Apple** (*Solanum viarum*). FL, GA, SC, NC, TN, AL, MS, PA. 1995-2006.
- **Japanese Dodder** (*Cuscuta japonica*). SC. 1991-1997.
- **Small Broomrape** (*Orobanche minor*). VA, NC, SC, GA, OR. 1991-2001.
- **Giant Hogweed** (*Heracleum mantegazzianum*). PA. 1995-2006.
- **Giant Salvinia** (*Salvinia molesta*). SC, NC. 1995 - 2006.

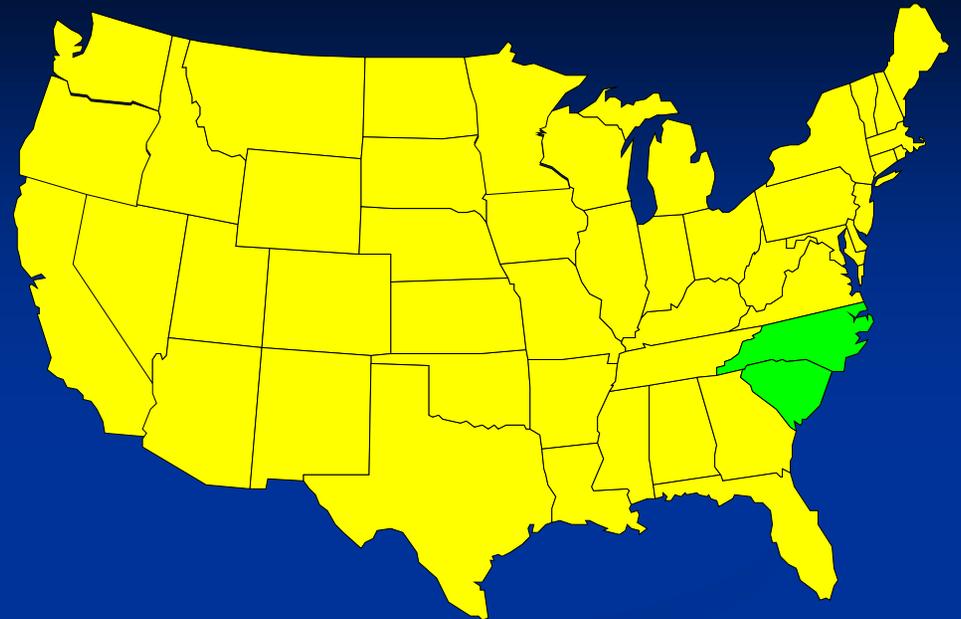
## ■ Unsuccessful Projects

- **Common Crupina** (*Crupina vulgaris*), ID, WA, OR. 1981-1991.
- **Goatsrue** (*Galega officinalis*), UT. 1981-1996.
- **Catclaw Mimosa** (*Mimosa pigra*). FL. 1985-1992.
- **Wild Sugarcane** (*Saccharum spontaneum*). FL. 1991.
- **Wetland Nightshade** (*Solanum tampicense*). FL. 1995.

Lessons Learned: Develop Capacity for Interagency Partnering.



1956

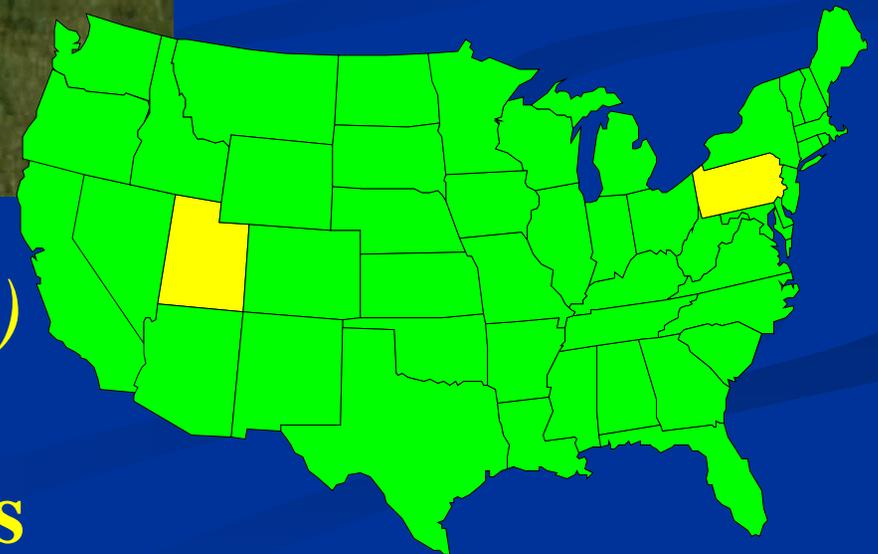


**Witchweed (*Striga asiatica*)**

A Parasitic Weed of Grass Crops  
from Africa in the Eastern  
Carolinas.

# Witchweed in the Carolinas.....





Goatsrue (*Galega officinalis*)

● **Infested States**

# U.S. National Invasive Species Campaign

## ■ Federal Interagency Coordination

### ■ FICMNEW (1990)

- 1995 – National Weed Summits (CO, FL, NM)
  - BLM Survey – Weeds Increased from 2-9 Million Acres; 4,600 Acres/Day
- 1997 - National Invasive Plant Strategy
- 1998 – Pulling Together Challenge Grant Weed Management Program
- 1998 – Weed Fact Book

### ■ ANS Task Force (1990)

### ■ Invasive Terrestrial Animals & Plants Committee (ITAP - 2004)

## ■ National Oversight and Coordination

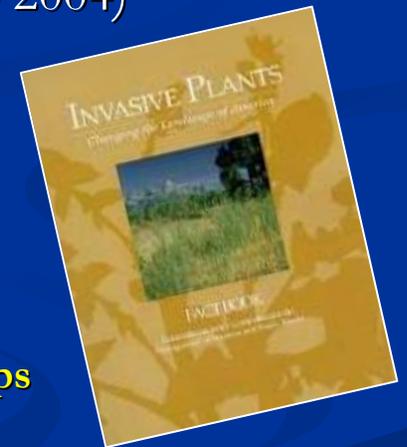
### ■ Presidential Executive Order 13112 (1999)

### ■ National Invasive Species Council (2001)

### ■ National Invasive Species Management Plan (2001)

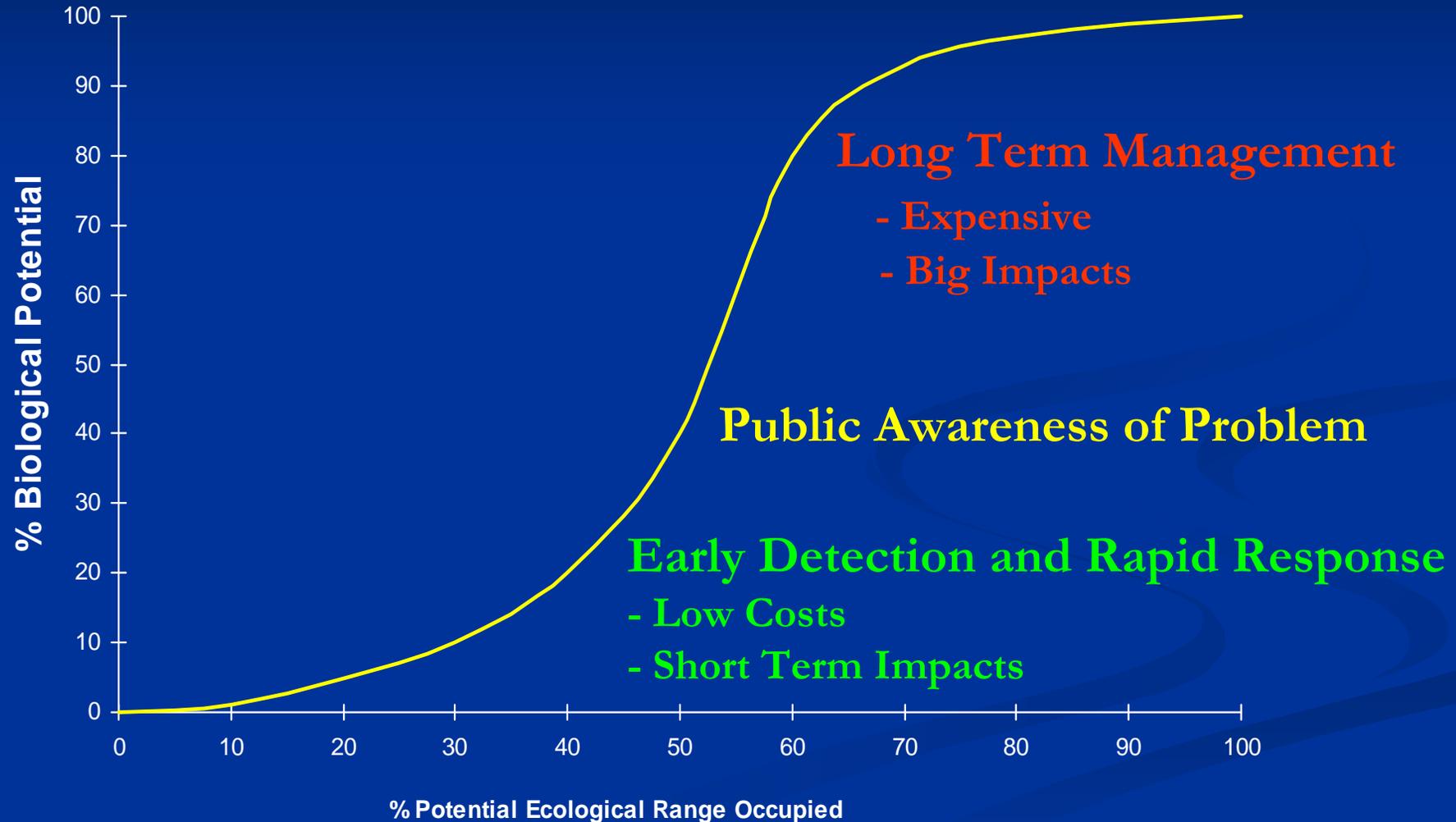
#### ■ 67 Major Objectives

- **1. Build New Capacity - Local, State, and Regional Partnerships**
- **2. Early Detection and Rapid Response (EDRR)**
- **3. Outreach and Education**



<http://www.invasivespecies.gov>

# Why a Strategic Approach to EDRR?



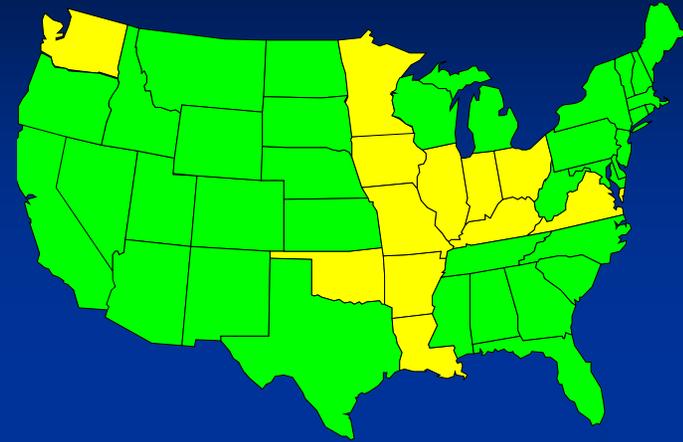
# Invasive Species are like Dominoes



**EDRR** .....  
**Weeds Won't Wait!**

# State Invasive Species Partnerships

- Interagency Coordination
- Stakeholder Involvement
  - ~30 Agencies, Tribes, NGOs, Industry, Land Owners
- Subgroups
  - State Weed Team, ANS Panel
  - Insect/Disease Team
  - Injurious Wildlife Team
- Strategic Plan and Vision
  - State/Local Regulations
  - **State EDRR Framework**
  - Control/Restoration
  - State/Local Regulations
  - Research Needs
  - Outreach/Education

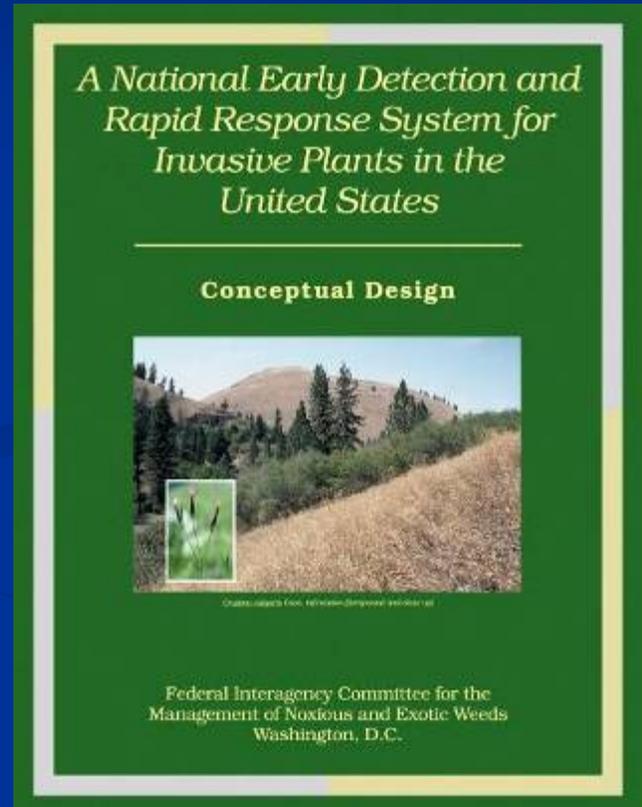


**2001:** Alaska Committee for Noxious and Invasive Plant Management

# National EDRR System for Invasive Plants

## Processes

- **Early Detection and Reporting**
  - Agency Field Personnel
  - Trained Volunteers
  - General Public
- **ID and Vouchering**
  - Cooperating Botanists
- **Rapid Assessment of New Species**
  - Federal and State Scientists
- **Rapid Response**
  - Land Owners; Interagency Task Forces



**U.S. National EDRR System for Invasive Plants**  
Information Flow

Data Synthesis, Mapping  
(IRANE, IPAMS)

ID, Vouchering  
(State Botanists)

Early Detection Network

**New Species Becomes Established**

New National Record

New State Record

Rapid Assessment  
(FICMNEW EDRR Committee)

Technical Support

Rapid Response  
(Invasive Plant Task Force)

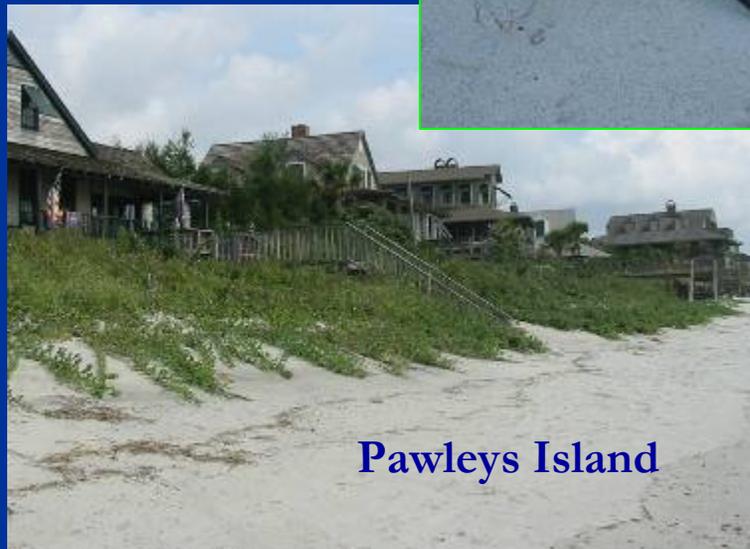
Rapid Assessment  
(State EDRR Committee)

# Carolinas Beach Vitex Task Force

(*Vitex rotundifolia*) - EDRR Pilot Project



Debordieu Beach



Pawleys Island

- SC, NC - Sea Turtle Network
- SC Native Plant Society
- SC-EPPC, NC-EPPC
- SC Nursery & Landscape Association
- Clemson, NCSU, USC
- SCDNR, NCDENR
- USDA FS, USGS, FWS



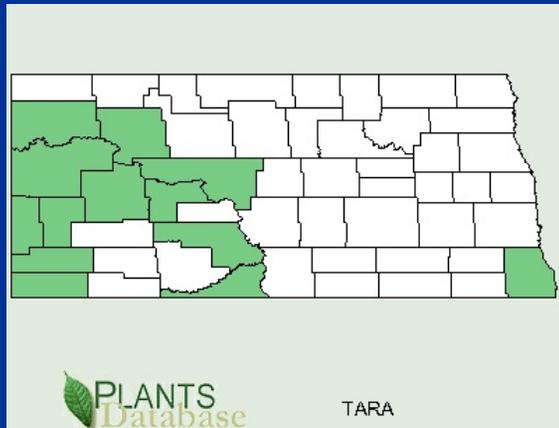
# 2008 - Progress in Addressing Beach Vitex



**Betsy Brabson,  
Sea Turtle Volunteer,  
Georgetown, S.C.**

# - High Profile Invaders - *Not Yet Present in Manitoba*

- Common Water Hyacinth (*Eichhornia crassipes*)
- Curly Leaf Pond Leaf (*Potamogeton crispus*)
- Saltcedar (*Tamarix* spp.)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)



# Advantages of EDRR

- EDRR does not restrict trade and movement of species that may or may not become invasive.
- EDRR addresses only species that have established free living, self perpetuating populations.
- EDRR causes minimal and short impacts on the invaded habitat.
- EDRR aims to restore the invaded habitat to a natural balance.

# Evolution of Public Welfare Concepts

## ■ 2000 BC - Ancient Greece – Democracy, Slavery, Polygamy

### ■ Democracy

- 1311 – England - Magna Charta
- 1776 – USA Created

### ■ Human Rights

- 1861 – Slavery Abolished
- 1912 – Voting Rights for Women
- 1954 – School Integration
- 1964 – Civil Rights Act

### ■ Crop Protection

- 1912 - Federal Plant Quarantine Act
- 1974 – Federal Noxious Weed Act – Listed Weeds Prohibited Entry
- 2000 – Federal Plant Protection Act

### ■ Environmental Protection

- 1964 – FIFRA, Warnings About Tobacco
- 1970 – EPA Established
- 1980s-90s – Public / Private Nuisance Ordinances and Statutes on Smoking

## ■ Biological Protection – Invasive Species

- 1973 – Endangered Species Act
- 1990 – National ANS Act
- 1993 - OTA of Technology Assessment Report on HNIS
- 1994 – FICMNEW and TN-EPPC Formed
- 1999 - Presidential Order #13112
- 2000 – National Invasive Species Council
- 2001 - National Invasive Species Management Plan
- 2007 – Importation of Plants and Animals Still Permitted Unless Prohibited
- 2010 - *African Animals on the Great Plains?!?!*
- 2038 – ??

# A New Biological Protection Ethic

## ■ Environmental Protection Ethic - 20<sup>th</sup> Century

- Wildfires
  - Smokey Bear
- Chemical Pollution and Hazardous Waste
  - Silent Spring; EPA
- Anti-Littering Campaigns
  - Woodsy Owl - Give a Hoot, Don't Pollute
- Recycling (1980s)

## ■ Biological Protection Ethic – 21<sup>st</sup> Century

- Biological Pollution
- New Paradigm on Exotic Species
  - 'Use Plants that are not spread by the Wind – Water – Animals – Birds.....'



Ellen Koch with Beach Vitex.  
Caswell Beach, NC. 2006.

## The Future: What will it be??

- 12 European Knapweeds in the American West.....
- 140 More in Europe...

Russian Knapweed (*Centaurea repens*)



When you get a good idea like EDRR...



Let it  
Shine!



Weeds Won't Wait!