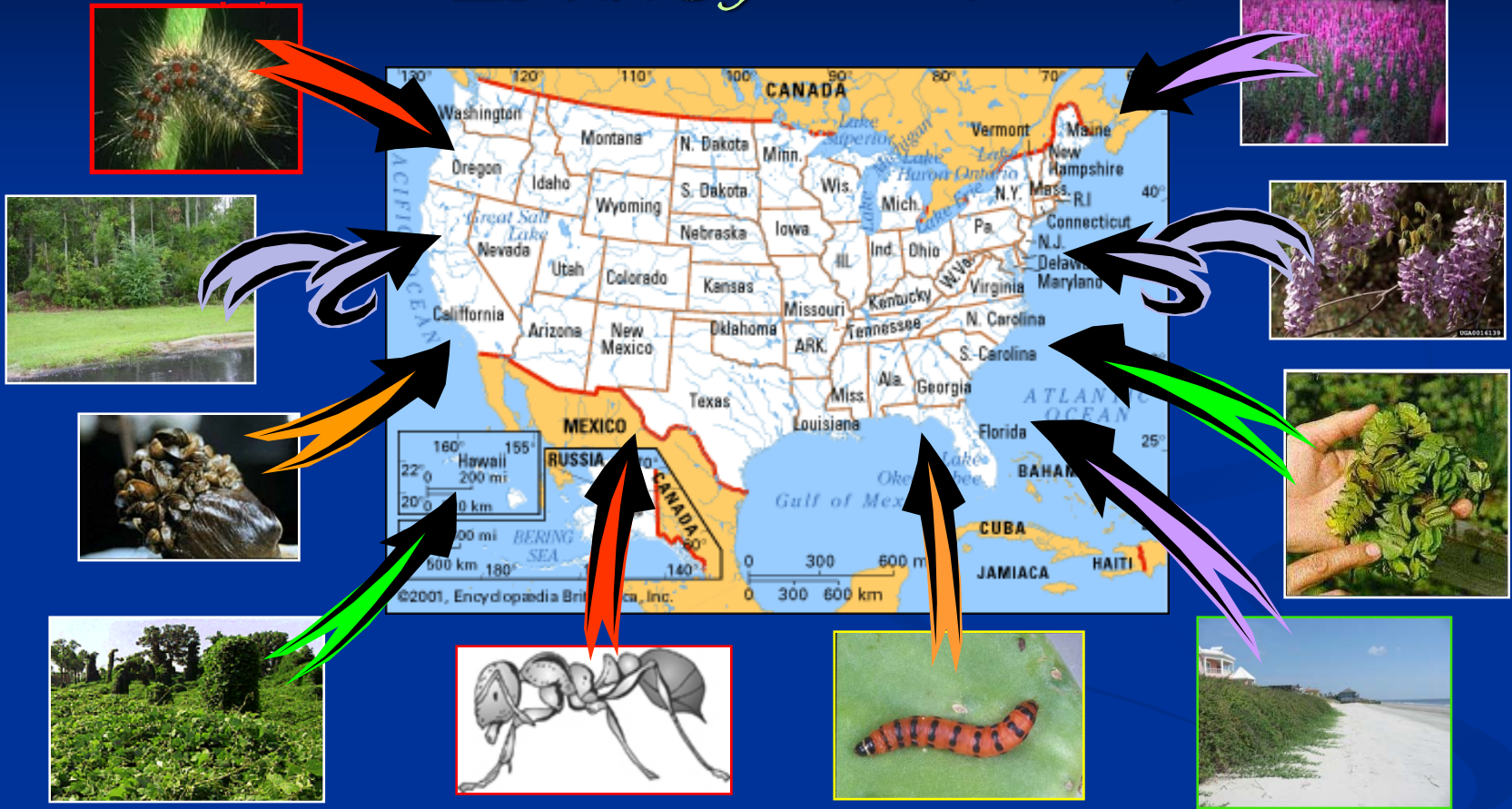


Invasive Species - Coming to America

Major Elements of IVS Prevention - National EDRR System for Invasive Plants



Randy G. Westbrook
USGS BRD
Whiteville, NC



Strategies for Defense



**Pest Free
Production**



Preclearance



**Exclusion
(Prohibited Lists)**

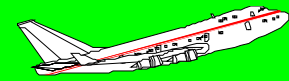
**Detection
Containment
Eradication**

Control

**Other
Countries**

USA

**Traditional Crop
Protection Strategies**



I. Pre-Border and Border Clearance. First Line of Defense Against IAS.

- Production of Pest Free Commodities
- Preclearance at Ports of Export
- Port of Entry Inspection and Clearance



Production of Pest Free Commodities in Exporting Countries.

- Imported Meat from FMD Free Countries
- Certified Raw Wood Products
- Citrus from Disease and Fruitfly Free Countries
- Certified Crop Seeds
 - Weed Free
 - Disease Free
- Establishment of Pest Free Zones
 - Certified Pest Free Zones (IPPC)
 - Pest Free Zones for Biodiversity



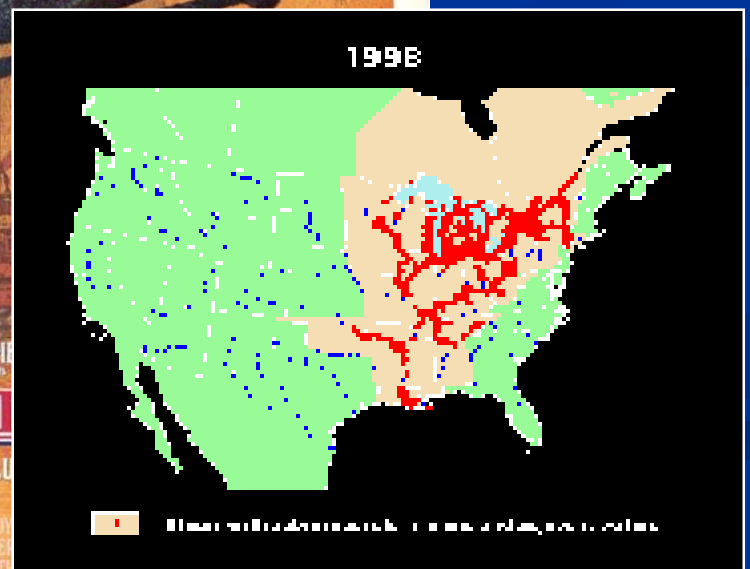
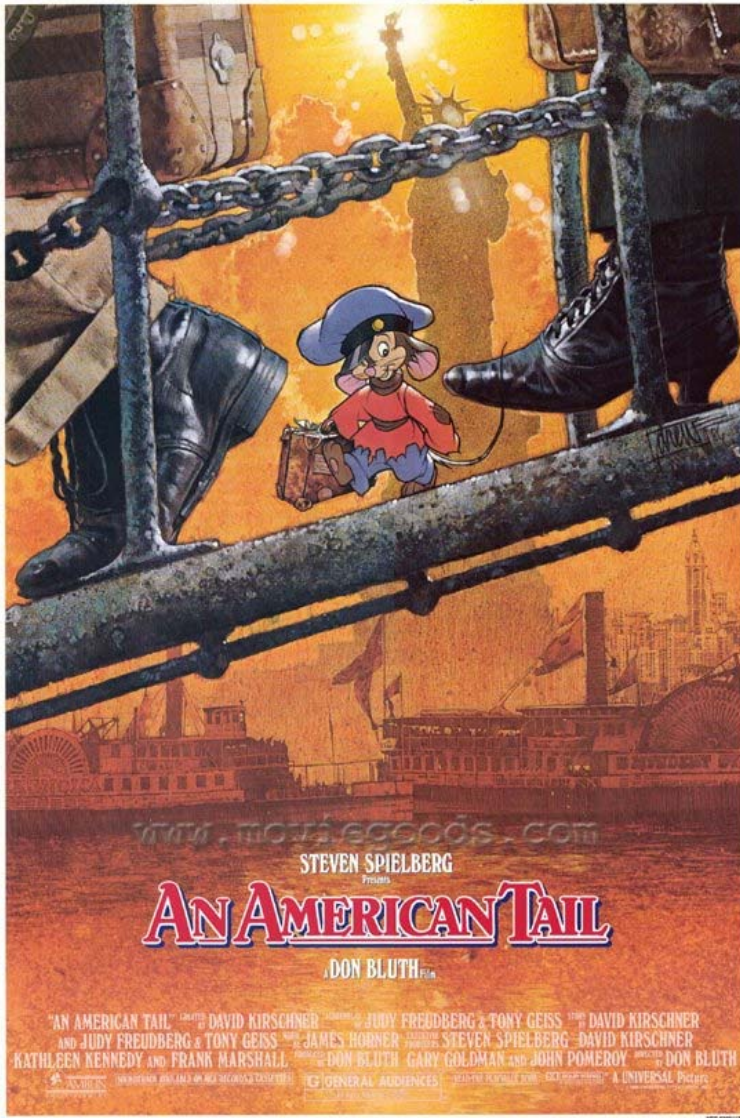
Preclearance at Ports of Export.

- Inspection of High Risk Commodities for Export
- Treatment of Infested Commodities
- Advantages
 - Thorough Examination of Shipment Before Stuffed into Container
 - Mitigation of Problem in Exporting Country
 - Identifies Pest Problems in Crop Production System
 - Facilitates Movement of Shipment Through Port of Entry



Meet Fievel. In his search to find his family, he discovered America.

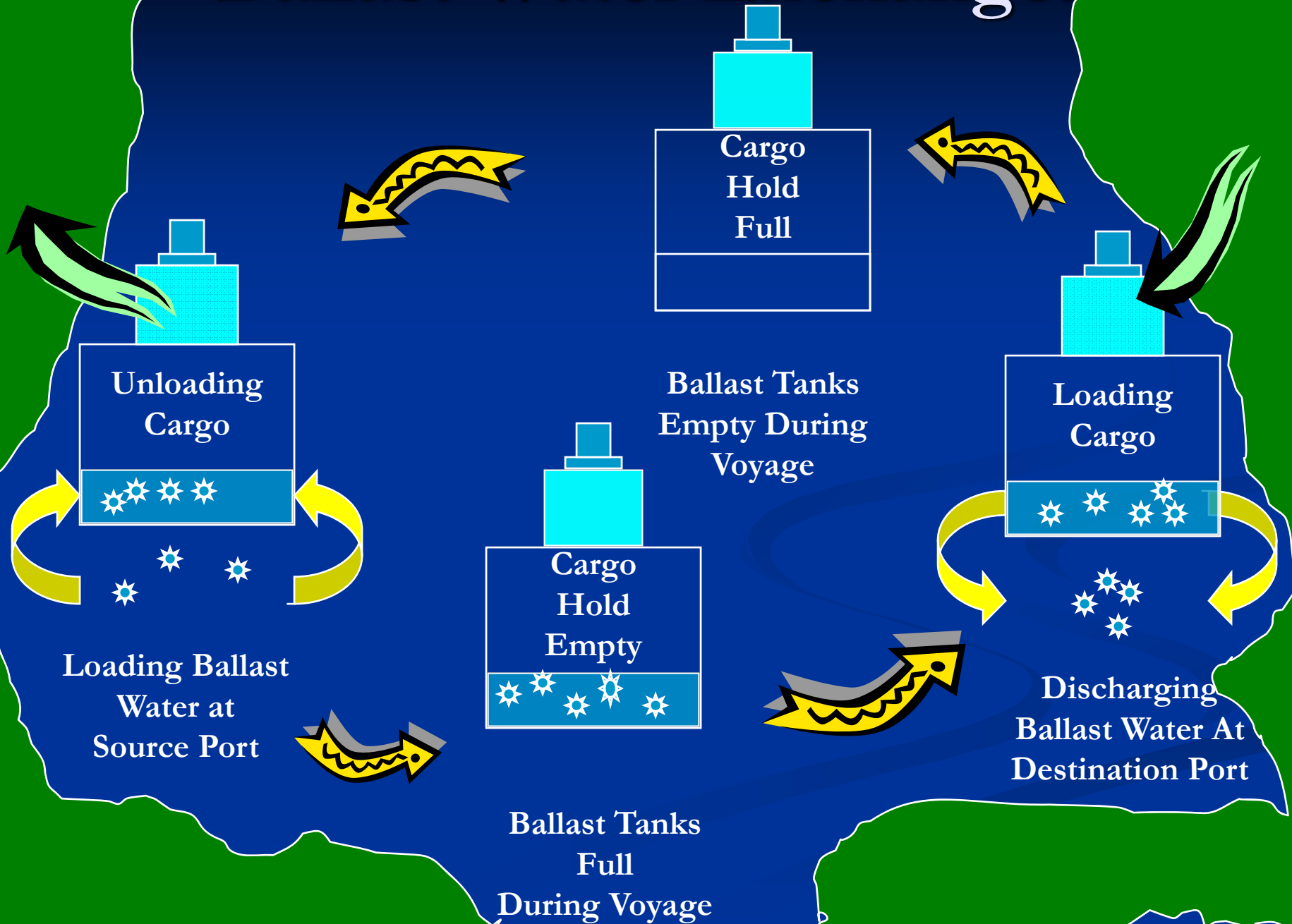
Meet Fievel. In his search to find his family, he discovered America.



Empty Ballast Water Tank



Ballast Water Exchange.



Port of Entry Inspection and Clearance.

- Means of Conveyance
- Intermodal Containers
- People and Baggage
- Cargo and Commodities



Port of Entry Inspection. Basic Equipment.



Intermodal Containers – Modern Shipping Wonder – Bane of Port Inspection.

- ICs – Introduced in 1950s
- Streamlined Global ‘Door to Door’ Shipping
- Convenient – Loading Dock Inspection
- Tailgate Inspection – Sometimes Totally Ineffective



Case Study – Snails on WWII Tanks from Portugal.

- July, 1982 – Shipment of WWII Army Tanks from Portugal Imported Through Charleston, SC
- All Tanks Infested with Snails
- Dock Perimeter Salted
- Tanks Fumigated with Methyl Bromide



Case Study: Extruded Wire Shipments from Ubisa, Spain – Charleston, S.C, 1981.

- Origin – Ubisa, Spain
- Mode of Entry:
Containerized
- Threat: Wood Bracing
Infested with Wood Borers
(Cerambycids)
- Action: Fumigated with
Methyl Bromide



Case Study: Asian Longhorned Beetle in the United States – Contaminant of Solid Wood Packing.

- Origin – China
- Threat – Hardwood Trees
 - Maple, Horse Chestnut, Mulberry, Black Locust, Elm, Birch, Willow, Poplar, Green Ash
- 1996 – New York City
- 1998 – Chicago
- Treatment – None
 - 1,400 Trees Destroyed
- Probably Mode of Entry
 - Untreated Raw Wood Packing



Treatment of IVS at Ports of Entry.

■ Commodity Treatments

- Governed by Strict Regulations

■ Treatment Options

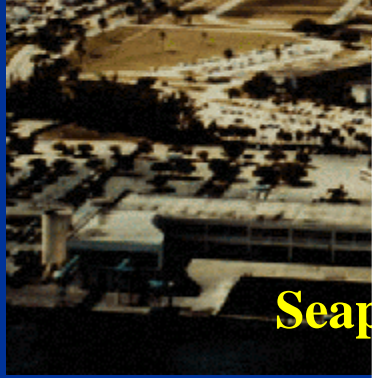
- Treat at Port of Entry
- Forward under Bond for Treatment at Destination
- Reject Entry and Re-Export

■ Treatment Methods

- Chemical Fumigation
 - Methyl Bromide
- Burning of Dunnage
- Treatments for Perishable Commodities
 - Hot-water Immersion
 - Forced Hot
 - Vapor Heat
 - Irradiation



National Ports of Entry – First Line of Defense...



Seap

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



Land Border Crossings....



Beagle Brigade

II. Post-Border Prevention Strategies.

Early Detection and Rapid Response.

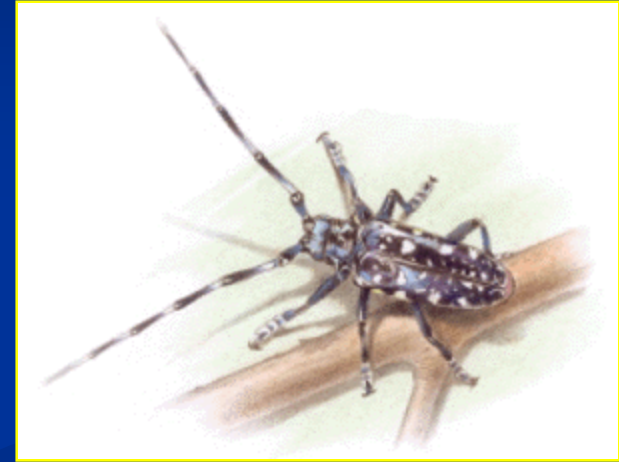
Official Control of Regulated Pests.

■ Quarantine Significant Pests

- **Regulated IAS** – Absent from country, or of limited distribution, and under official control.

■ **Official Control** – Active enforcement and application of mandatory phytosanitary regulations for:

- Containments and eradication of quarantine pests (Asian Longhorned Beetle in the USA)
- Management of regulated non-quarantine pests (Giant Salvinia in the USA)



Federal/State Cooperative Weed Eradication Projects. 1958-2009.

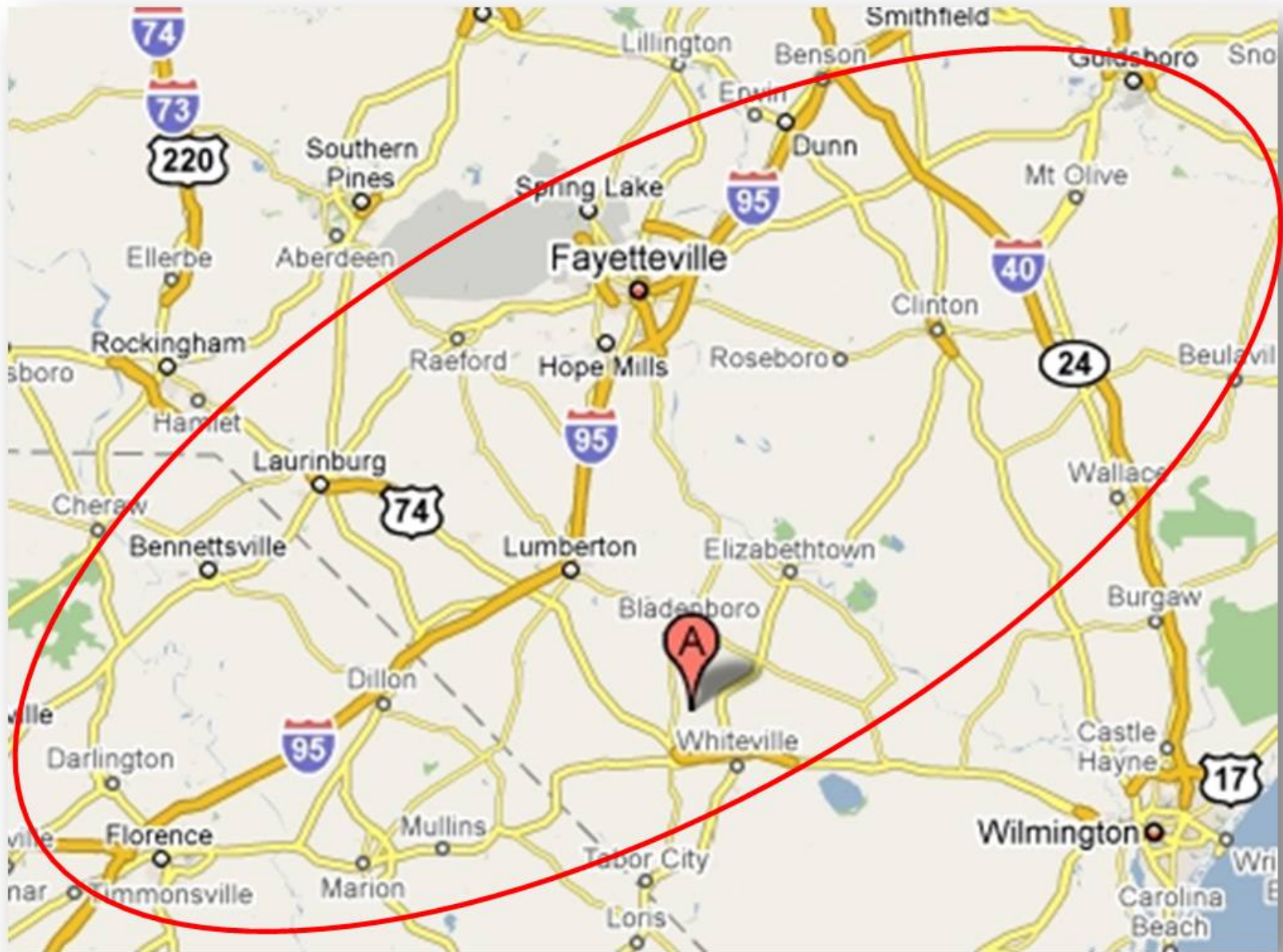
■ Successful Projects

- 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.

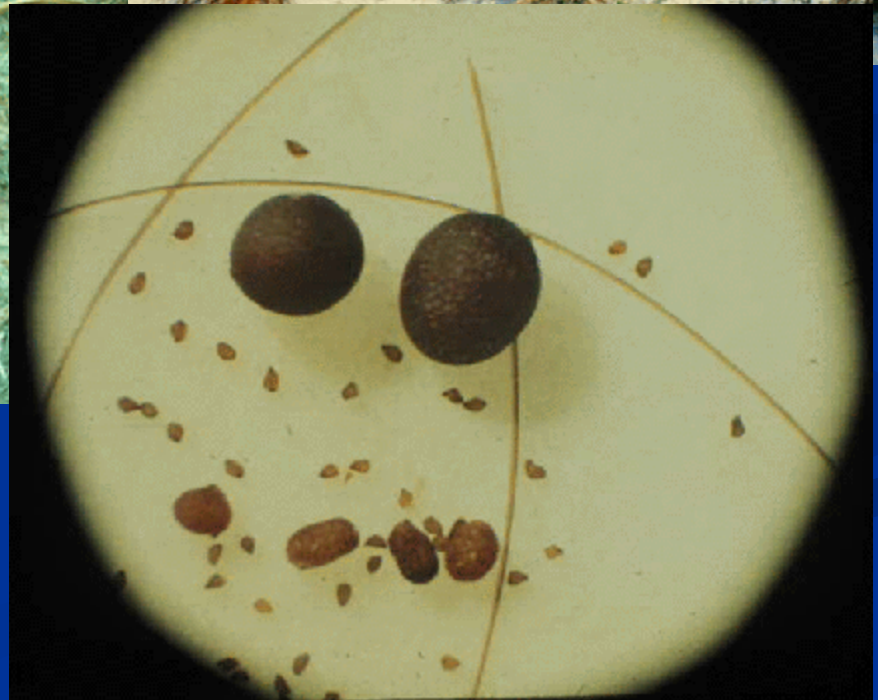
■ Unsuccessful Projects

- 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.



Witchweed in the Carolinas.....



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

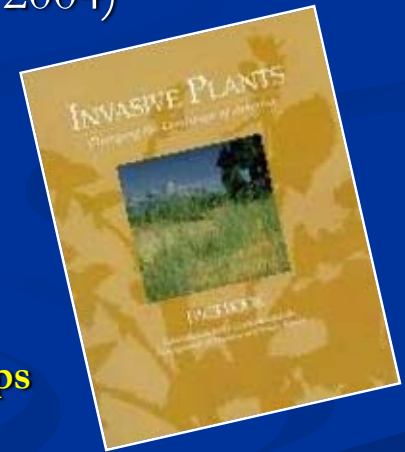
■ Presidential Executive Order 13112 (1999)

■ 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>

National EDRR System for Invasive Plants

Organizational Elements

■ National Level

■ FICMNEW

- National Coordination



■ Regional Level

■ Regional Atlases (IPANE, IPAMS)

- Volunteer Training and Data Synthesis

■ State Level

■ State IPANE

- IPANE



■ State EDRR Coordinating Committees

- Volunteer Network Development, ID and Monitoring, Rapid Assessment

■ Volunteer

■ Personnel

- IPANE



■ Local Level

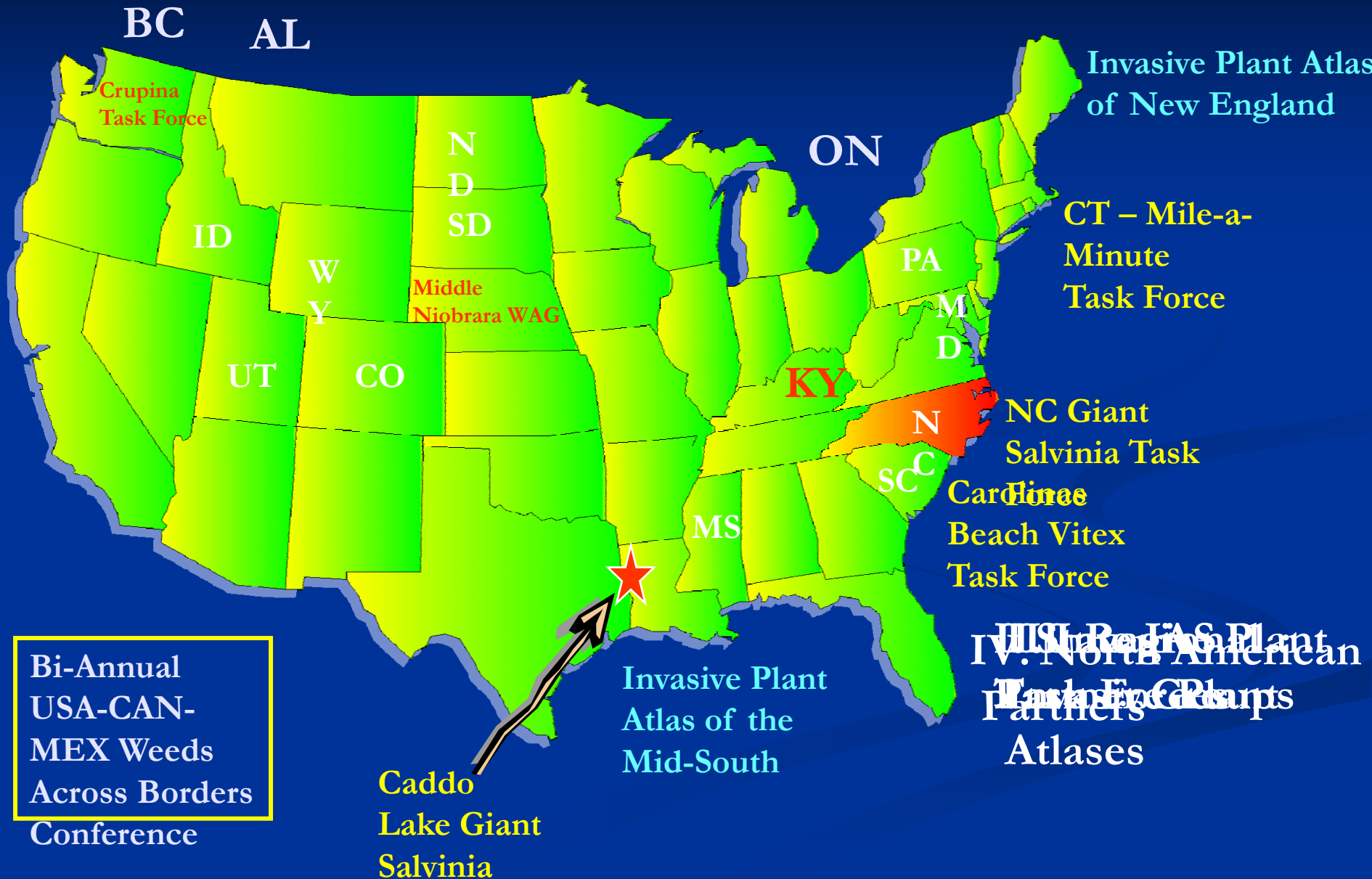
■ Local Agencies (Initial Contacts)

■ Coop. Weed Management Areas; Invasive Plant Task Forces

- Rapid Response

AK

USA - EDRR System Partners





2009 - Progress in Addressing Beach Vitex



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

Cogongrass in the Southeastern USA

(Imperata cylindrica)

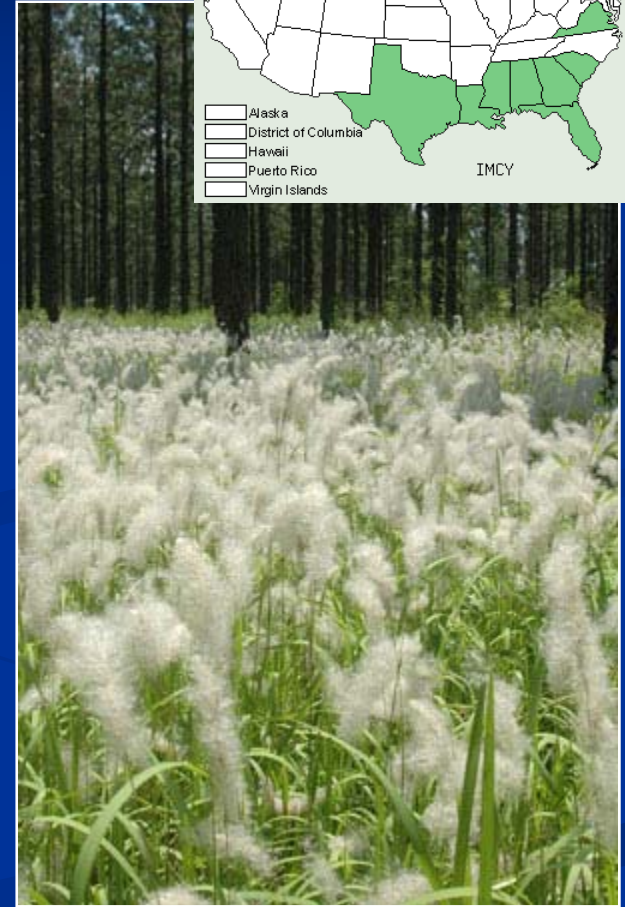
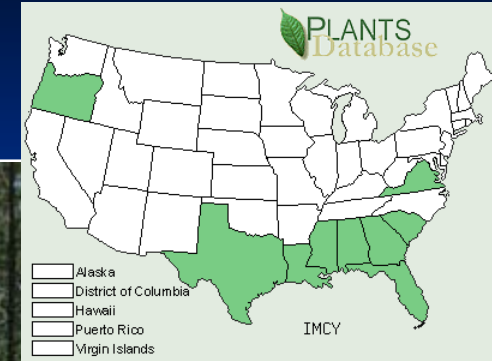
■ Characteristics of Invasiveness

- Perennial, Mat Forming Grass from Africa
- Introduced in 1911 in Grand Bay, Alabama
- Totally Replaces Native Understory
- Causes Hot Wildfires

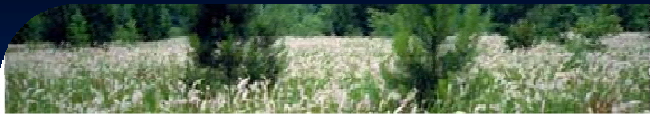
■ Control Recommendations

- Frequent Mowing to Prevent Reproduction
- Persistent Tillage to Expose Rhizomes
- Chemical Treatments (Glyphosate (Roundup), Imazapyr (Arsenal))
 - 2 Applications/Year for 2-3 Years
- Equipment Sanitation
- Detection and Reporting
 - SC-EPPC EDRR Coordinating Committee
 - U-GA Bugwood Network Invasive Plant Mapping Project

■ <http://www.cogongrass.org/>



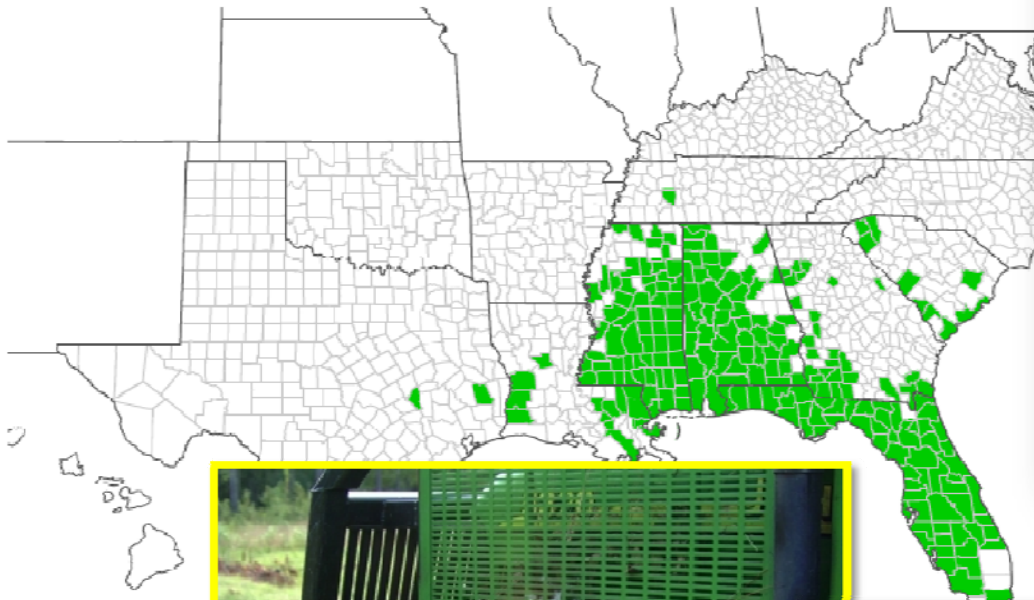
Weed Alert!



Cogongrass

Attacking the Southeast U.S.

Cogongrass Distribution - Southern United States



Cogongrass in Mississippi – 2009

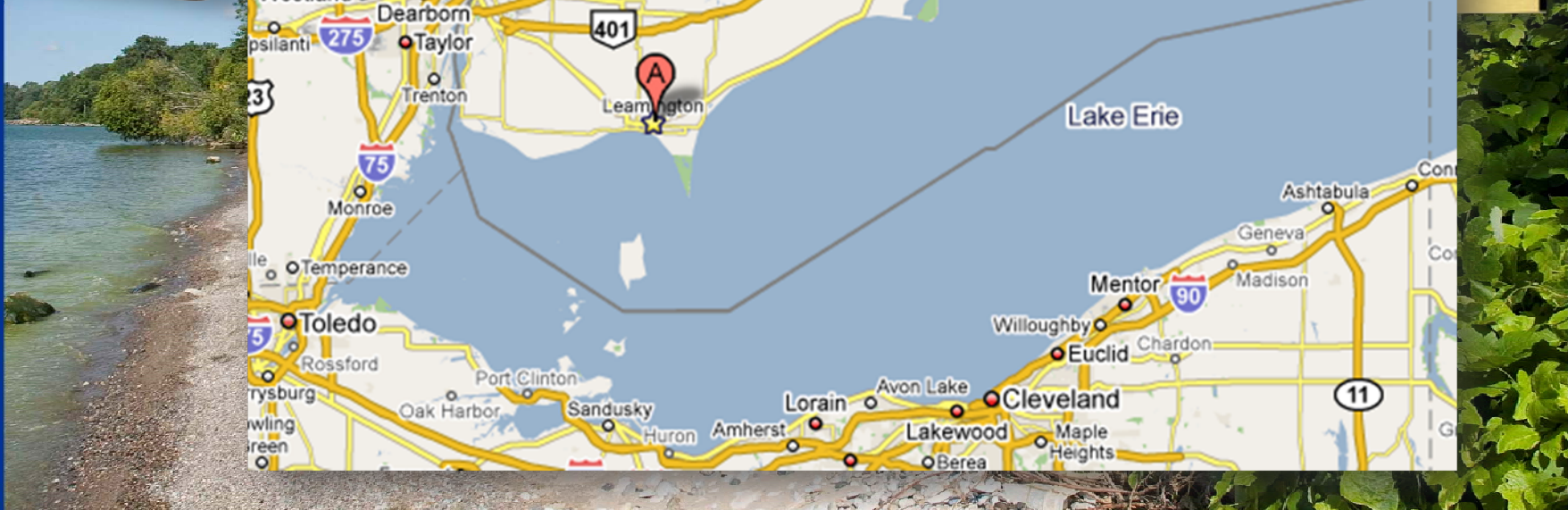
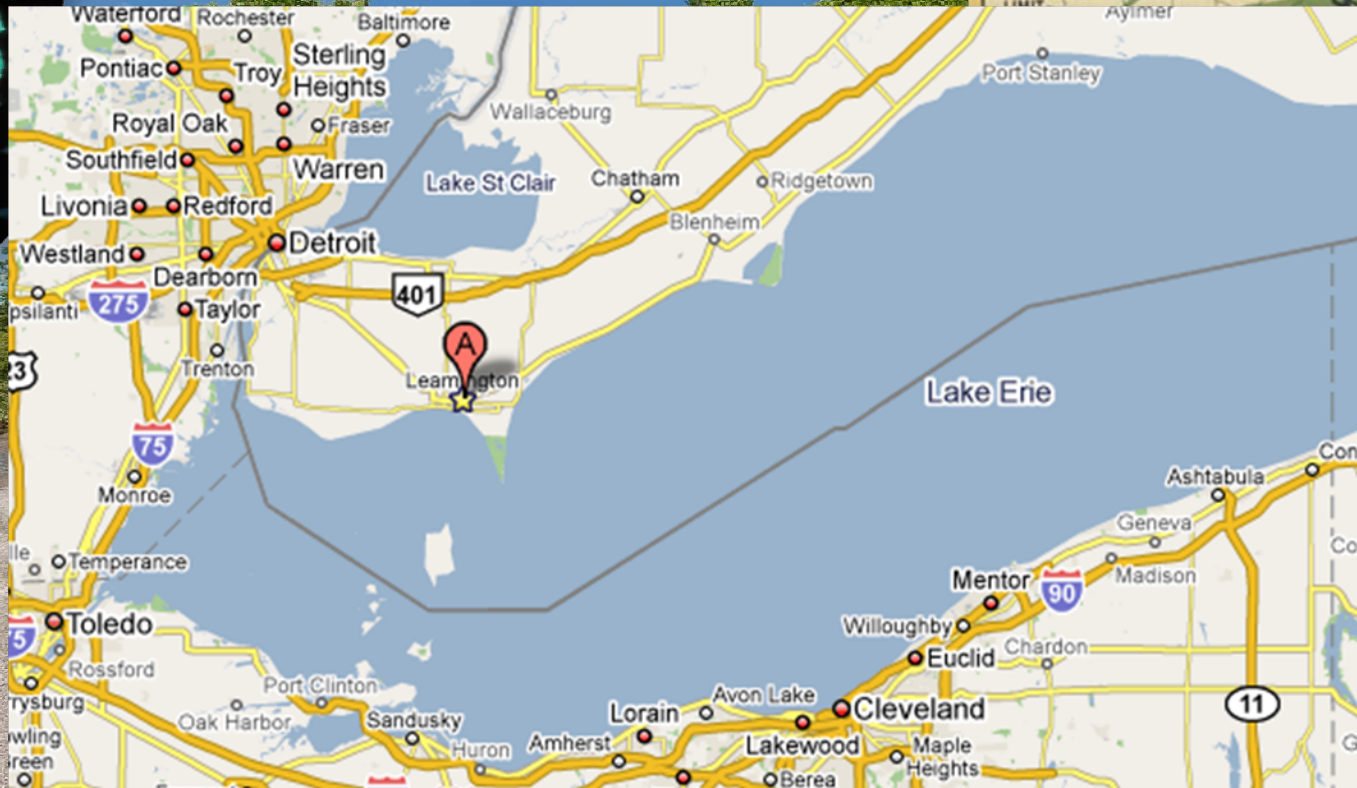
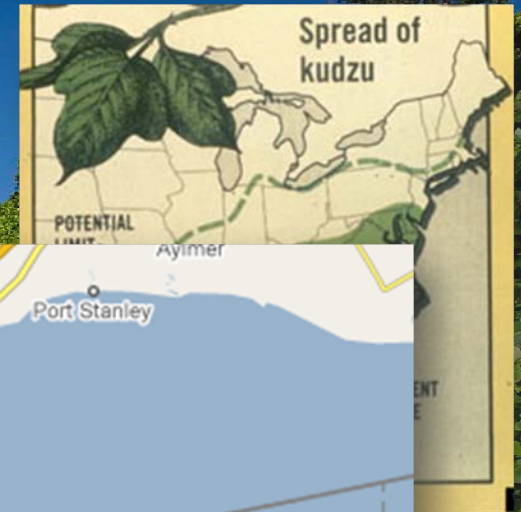
Kenneth Calcote – MS-DACS



Kudzu in Canada

Weed Alert!!

 Ontario
Invasive Plant Council



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.

'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, Scientists

A New Biological Protection Ethic

■ Environmental Protection Ethic - 20th 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 – 21st 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.

Summary.

Four Basic Elements of a National IVS Prevention Strategy.

- Produce Pest Free Commodities in Foreign Countries
- Pre-clear High Risk Cargo at Ports of Export
- Inspect and Treat Imported Cargo at Ports of Entry
- Detect and Eradicate New Invasive Species before they Become Established and Spread