

# Invasive Species - Coming to America

## Other Invasive Species.....



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# Four Major Types of Invasive Species....



Aquatic  
Nuisance  
Species



Forests



Natural  
Areas



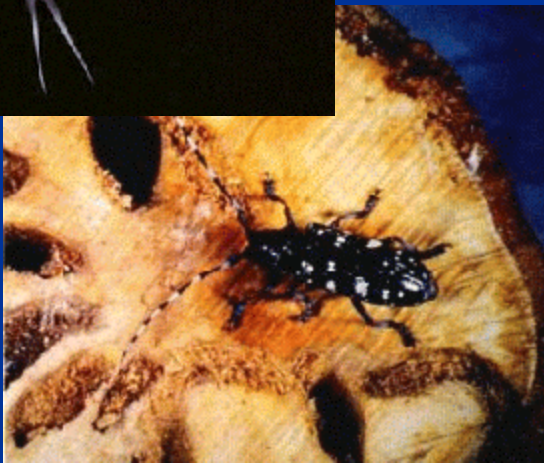
Injurious  
Wildlife

Invasive  
Plants

(4,200+  
Free Living  
Exotics)



Crop  
Weeds



Insects  
and  
Diseases



Rangelands

# Aquatic Nuisance Species.

## ■ ANS Factoids

- 21 Billion Gallons Ballast Water Per Year - (USA)
- 3,000 ANS Moving in Ballast Water Around the World

## ■ ANS Taxa

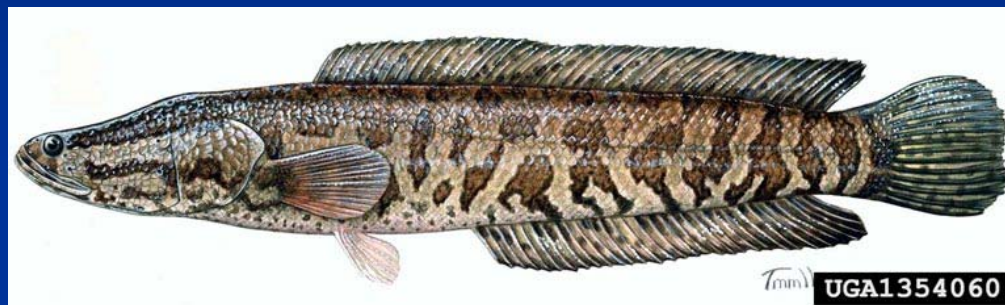
- Aquatic Weeds (Water Hyacinth)
- Aquatic Invertebrates (Zebra Mussel)
- Aquatic Vertebrates (Nile Perch)





## 3.5.1. Case Study – Illegal Introduction of Northern Snakehead Fish in USA.

- **Origin - China**
- **Threat - Voracious Predator**
  - Prohibited under Federal/State Laws
- **First Detection**
  - 2002 - Maryland – Eradicated
- **Current Status**
  - Reproducing Population in Potomac River
- **Reason for Introduction**
  - Asian Cuisine
- **Reason for Release**
  - Asian Prayer Ritual



# Chinese Mitten Crab in California.

- **Burrowing Crab (From China)**
- **Introduction to USA**
  - 1990s – San Francisco Bay, Delta
    - Ballast Water
- **Threat**
  - Native Invertebrates – Fresh/Brackish Waters
  - Commercial Fishing and Shrimping Operations
  - Intermediate Host for Oriental Lung Fluke



# American Chestnut

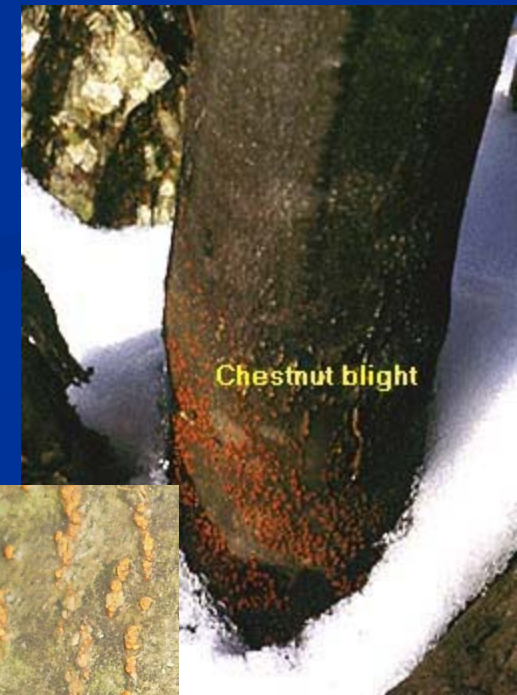
*Castanea dentata*

- Predominant Tree in Eastern America
  - 25-30% of Trees in Eastern Forest
  - Reddish-brown Wood Lightweight, Soft, Easy to Split, Resistant to Decay, Warping, Shrinking,
  - Nuts Used for Food
- Native Range – ME to MS



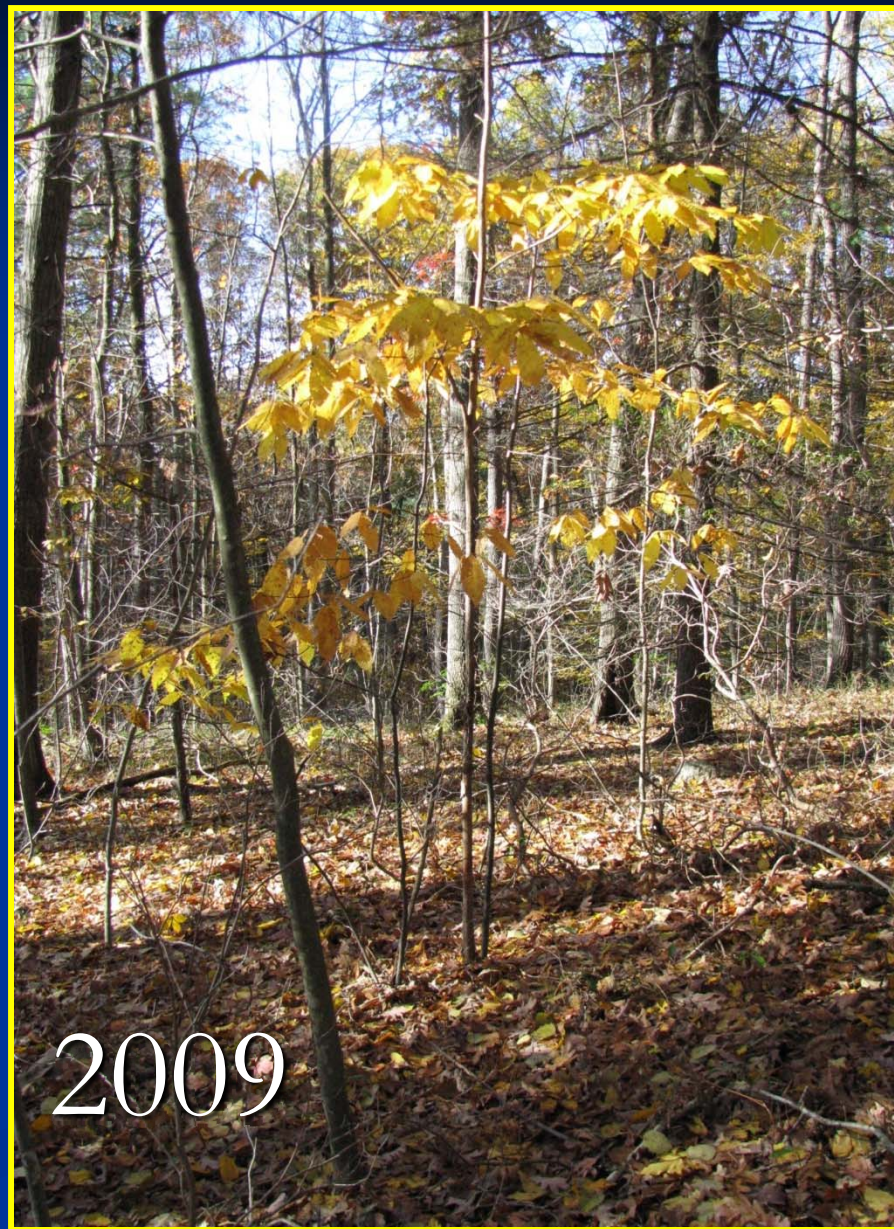
# Demise of the American Chestnut

- 1825 – Root Pathogen (*Phytophthora cinnamomi*)
  - Initially Killed ACT in Southern Range
  - End of Century – Killed most ACT in Low, Most Areas
- 1904 – Chestnut Blight (*Cryphonectria parasitica*)
  - Panic Logging
- 1950s – Swept Through Entire Range – Killing Most Mature Trees
  - 3-4 Billion Trees Killed
- Lasting Effects on Forest Ecosystem
  - Decreased Leaf-litter Processing Rates
  - Decreased Quality of Leaf-Litter Inputs
  - Decreased Rates of Aquatic Invertebrates
  - Increased Input of Large Woody Debris into Streams
  - Decreased Abundance of Cavity-Nesting Birds





# American Chestnut Tree in New Hampshire



# Surviving Tree in Maine.....



# Laurel Wilt Disease - 2002

- **2002** – Red Ambrosia Beetle (*Xyleborus glabratus*) Captured in Traps near Warehouses in Port Wentworth (Savannah), GA (Savannah Area)
- **2003** – Significant Redbay (*Persea borbonia*) Mortality on Hilton Head Island, SC
- **2004** – Mortality caused by Unknown Wilt - *Raffaelea* species (*Raffaelea* is the imperfect stage of an *Ophiostoma* species)
- **2008** – Redbay and Sassafras throughout Southeast at risk.....



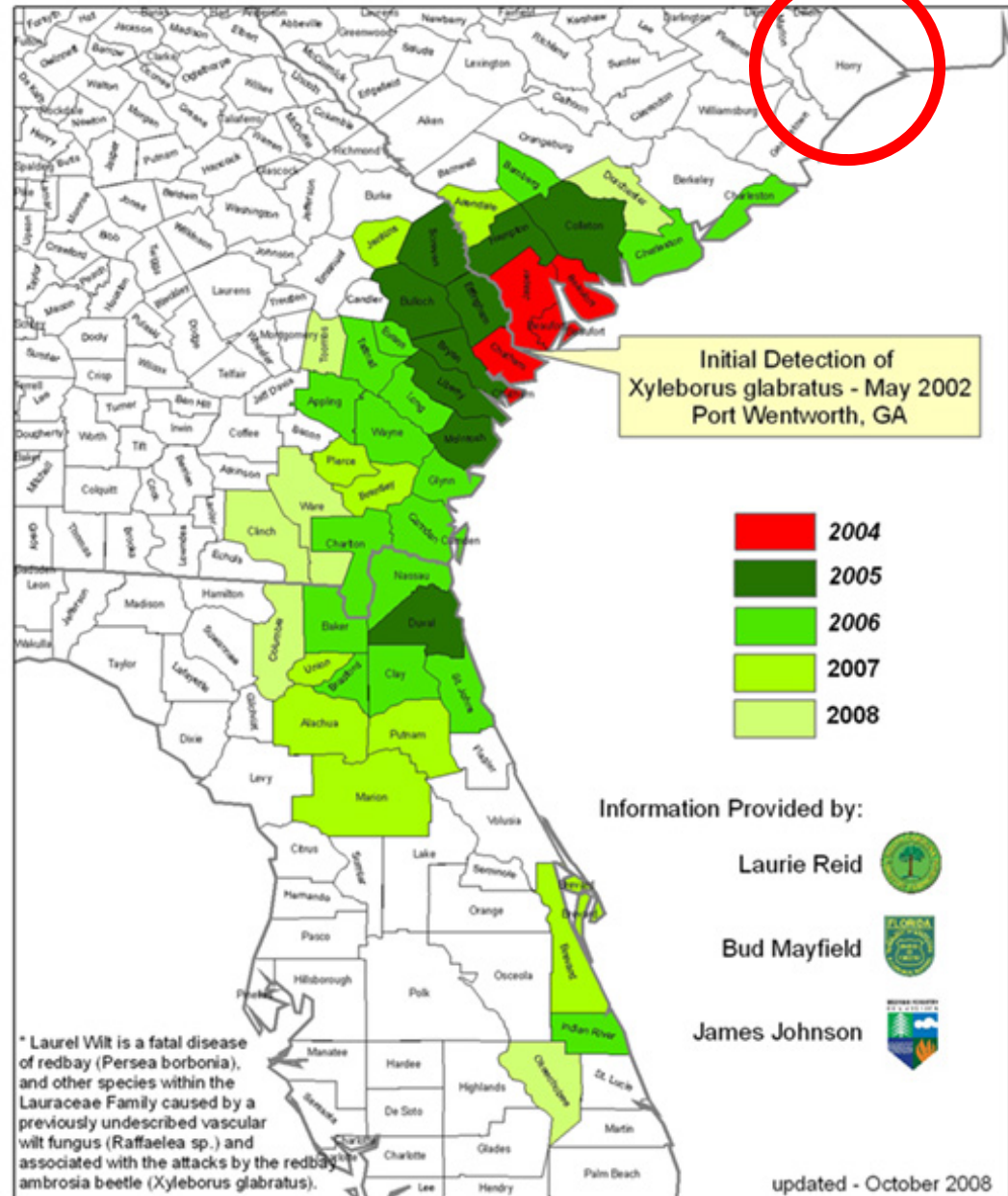
Healthy and Infected Redbay.



# Current Distribution of Laurel Wilt Disease – October, 2008

## Horry County, SC, Fall, 2009.

Distribution of Counties with Laurel Wilt Disease\* Symptoms,  
by Year of Initial Detection



# Smuggling IVS by Sea, Air, Road, and Rail.

## Case Study: Smuggling Parrots from MEX to USA.

- **Regulation of Poultry and Birds**
  - Serious Diseases (Avian Influenza, Exotic Newcastle Disease)
  - 1971 Outbreak of Newcastle Disease in California – Eradicated at Cost of \$56 Million
- **Smuggling of Parrots - Factoids**
  - **2 Million –**
    - # Parrots Traded Internationally Per Year
  - **250,000 –**
    - # Imported Legally in to USA as Pets
  - **25,000 –**
    - Estimated # Smuggled from MEX
  - **25,000 –**
    - Estimated # that Die in Transport
  - **\$15 –**
    - Price of Parrots in MEX
  - **\$250-\$1,000 –**
    - Price of Parrots in USA
  - **Parrot Smuggling –**
    - Second Largest Illegal Border Business Next to Drugs
  - **Inhumane Smuggling Techniques**
    - Drugged - Stuffed into Wheel Covers of Cars, Engine Air Filter Compartments, Sealed Door Panels, Hidden in Fruits and Vegetables



# Insects.

- 30 Million Insect Species
- 500,000 Species of Beetles
- Desert Locust
  - Africa, Middle East, Asia
  - Swarms –
    - 1,200 km<sup>2</sup>
    - 96 Billion Individuals
    - 240,000 Metric Tons
  - Losses
    - Morocco – 1954 (\$50 Million in 6 Weeks)
    - Ethiopia – 1958 (167,000 Tons of Grain – Feed 1 Million People for a Year)

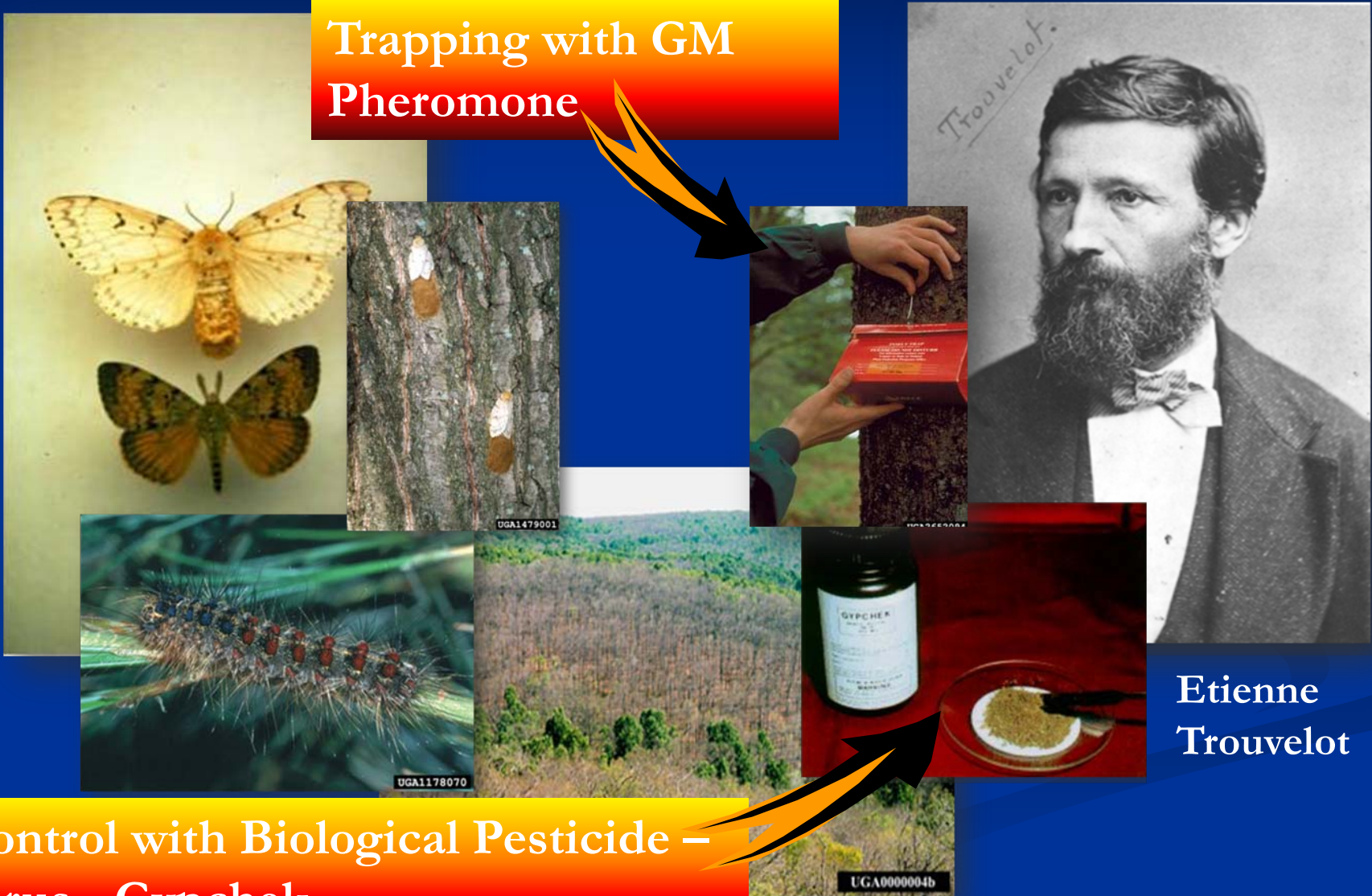


Mauritania, July, 1994

# Gypsy Moth - 1869

(*Lymantria dispar*)

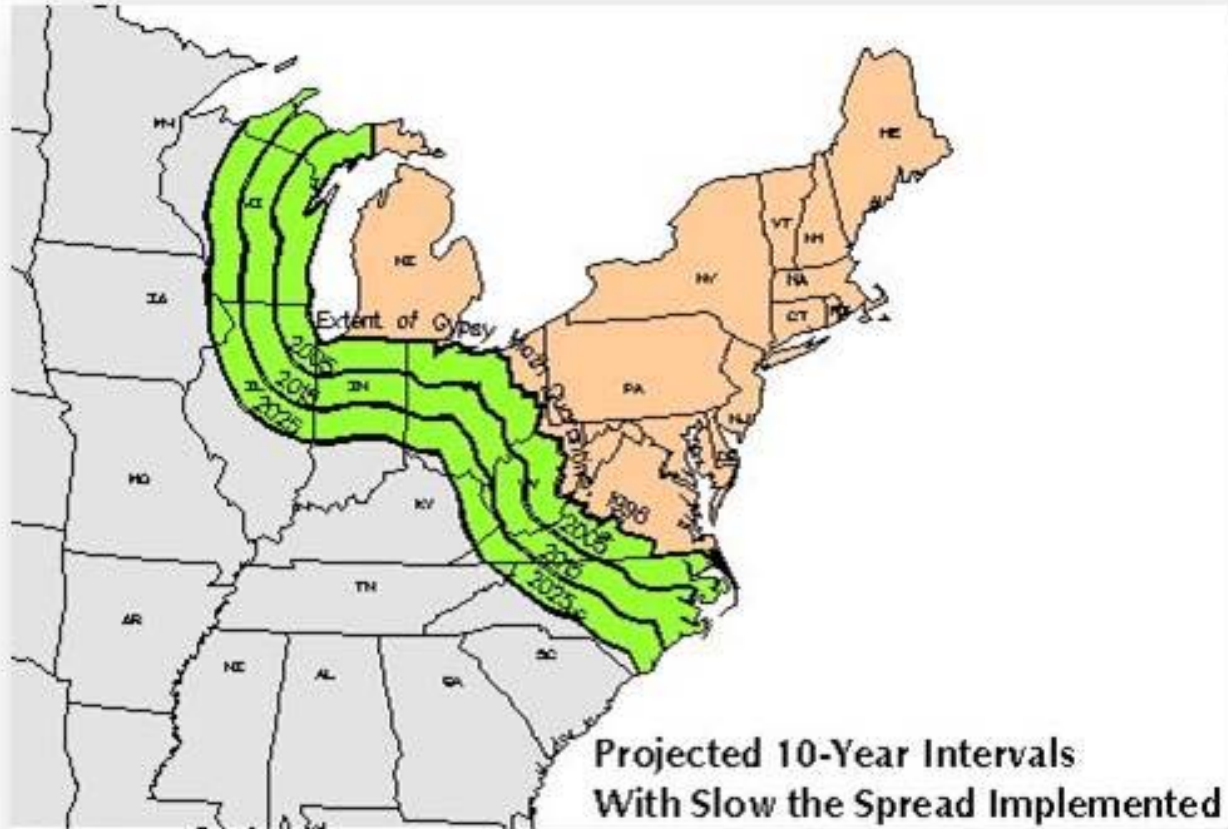
Trapping with GM  
Pheromone



Etienne  
Trouvelot

Control with Biological Pesticide –  
Virus - Gypchek

# Gypsy Moth in the USA



	Established by Consensus		Being Eradicated		Found
	Established by Survey		Eradicated		Not Found



# Red Imported Fire Ant

(*Solenopsis invicta*)



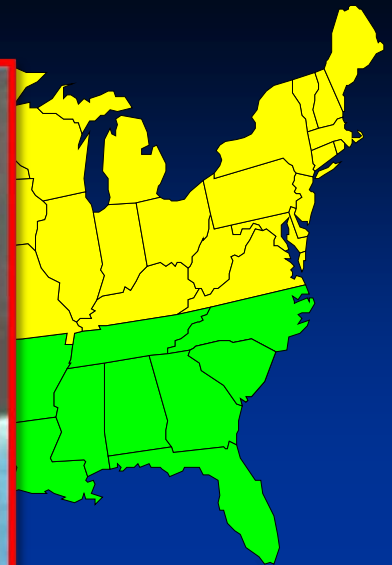
**Origin:** South America

**Introduction to US:** Port of Mobile, Alabama

**Beneficial Uses:** None

**Impacts:** Outcomes include serious health effects on humans and domestic animals

**Control:** Toxic



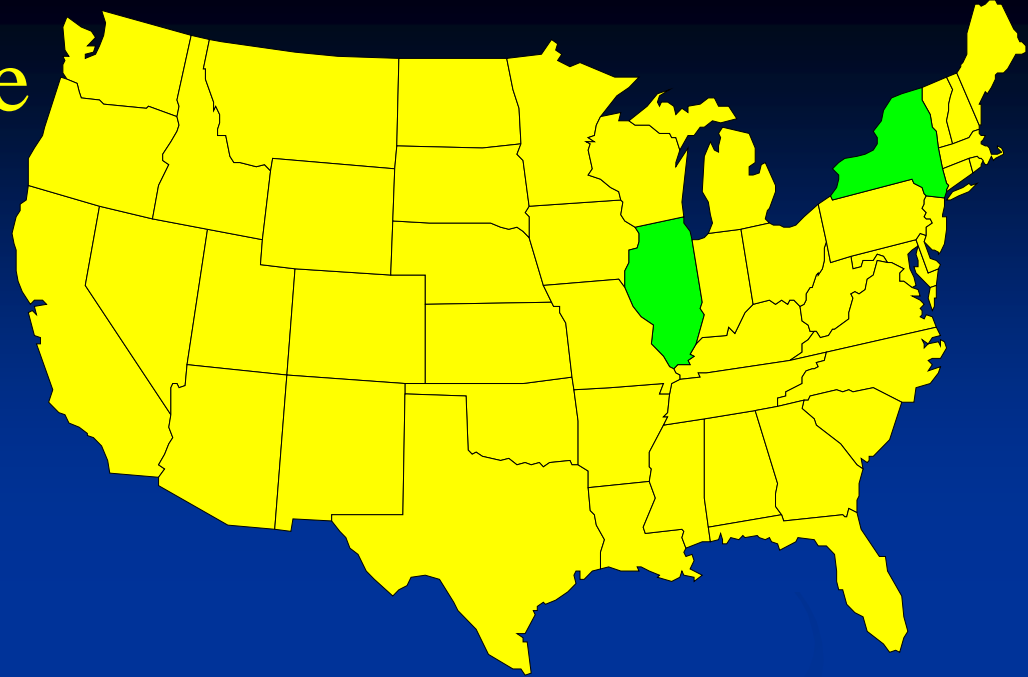
Red Imported Fire Ant Mound....

# Asian Gypsy Moth.

Sunnypoint Military Ocean Terminal – July, 1993

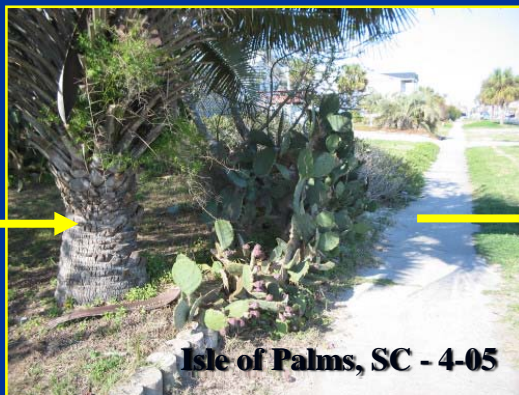
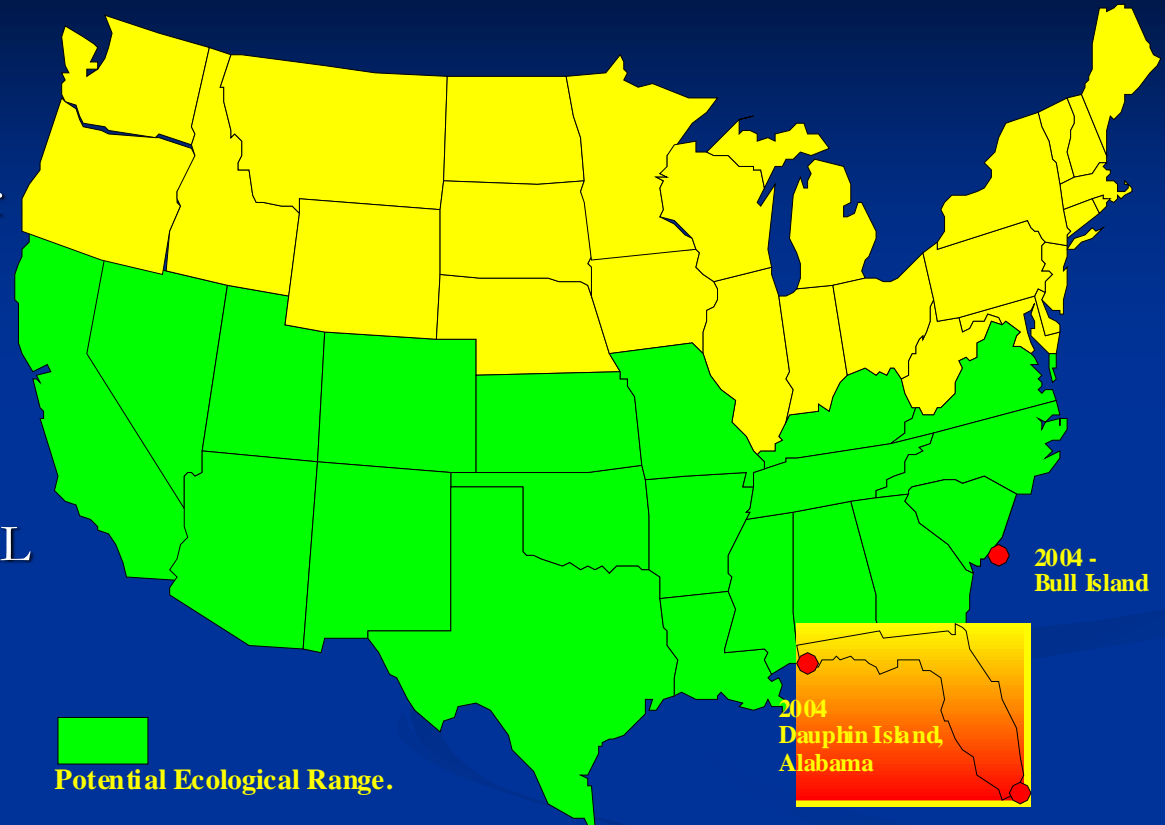


# Asian Long-horned Beetle (*Anaplophora glabripennis*)



# Cactus Moth – 'Round the World in 80 Years

- 1920s – Biocontrol Agent in Australia
- 1960s – Biocontrol Agent for Native Cactus in Caribbean Island
- 1989 – Detected in Florida Keys
- 2004 – Detected in SC and AL
- 2004 – Current Sentinel Sites on Public and Private Conservation Lands



# Emerald Ash Borer – 2002.

*Agrilus planipennis*

- Native to Asia
- Introduced in Solid Wood Packing
- 2002 – Detected in MI
- Federal/State Quarantine
  - Trees, Logs, Firewood
  - Destroy all Ash Trees within 800 M
- 2004 - \$350 Million Pledged

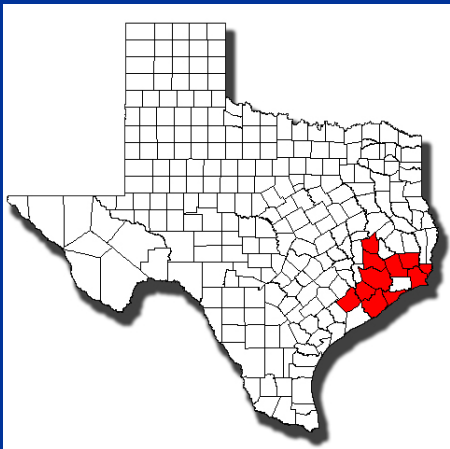




# Raspberry Crazy Ant in Houston, TX – 2002.



[Click to watch video](#)



[Crazy Raspberry Ant Fact Sheet – TX A&M](#)

# Injurious Wildlife.

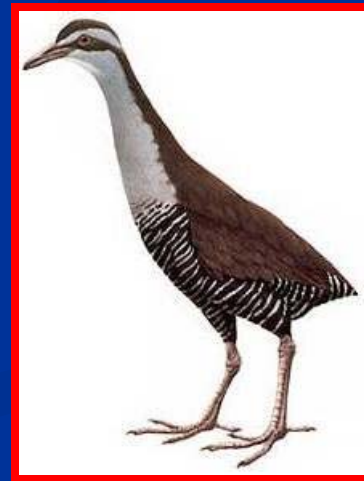
- Terrestrial Vertebrates
  - Intentionally Established
  - Game Animals
  - Domestic Animals
- IW Examples
  - Nutria - USA
  - Eastern Gray Squirrel - Europe
  - Australian Brushtail Possum - NZ





# Brown Tree Snake in the South Pacific.

- **BTS** – Native to Papua New Guinea
- **1947** – Spread to Guam; Postwar Construction Equipment
- **1950s** – Sighted Inland from Seaport
- **Late 1960s** – Dispersed Throughout Island
- **Mid-1970s** – Endemic Birds Found Declining
  - **BTS** – 13,000 per Square Mile
  - **Extinctions**
    - 2/3 Native Bats
    - 5/11 Native Lizards
    - 9/12 Native Birds
- **Electrical Outages**
- **Spread in Wheel Wells of Aircraft**
  - Hawaii, other Islands



## Guam Rail

- 1965 – 50,000 Birds
- 1985 – 50 Birds

# Case Study – Pet Animals Released.

## Burmese Pythons in the Florida Everglades.

### ■ Huge International Trade in Exotic Animals

- **70** - # Shipments of Exotic Animals at Miami Intl. Airport
  - Lizards, Snakes, Tarantulas

### ■ Burmese Python in the USA - Factoids

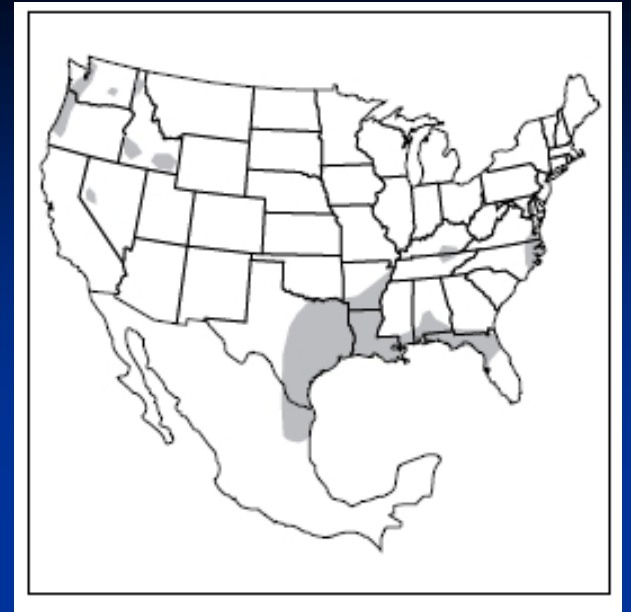
- **22/24** –
  - # Pythons Species Legally Available in USA
- **144,000** –
  - # BP Imported into USA, 2001-2006
- **\$20.00** –
  - Price of Hatchling
- **5 Meters** –
  - Size of Mature BP
- **68** –
  - # BP Captured/Killed in Florida Everglades



# Nutria – 1899. (*Coypus myocaster*)



Adult Nutria



Exposed Marsh

USFWS



McIlhenny Company,  
Avery Island, LA

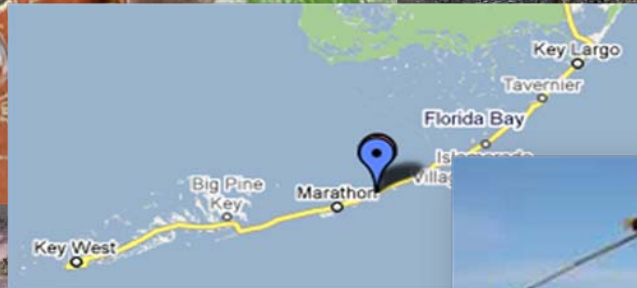
# American Beaver. (*Castor canadensis*)



**2007-2008 North Carolina Beaver  
Management Assistance Program.**

# Gambian Pouch Rat – 1999.

*(Cricetomys gambianus)*



# Feral Pigs on North Island, SC.

*(Sus scrofa)*



# Coyote in the Carolinas....

(*Canis latrans*)

