EDRR Survey for Non-Native Bark and Ambrosia Beetles in Florida *and* Laurel Wilt Overview / Update

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2008 Everglades Invasive Species Summit

Exotic Bark and Ambrosia Beetles

- Coleoptera: Curculionidae: Scolytinae
- Phloem or xylem-inhabiting insects
- One of the most frequently intercepted insect groups at U.S. ports
  - 1985-2000: about 5000 interceptions
  - 1985-2005: 18 new species established in N. Am.
- Introduced via solid wood packing material

Figure 7. *Scolytus schevyrewi.*

Figure 8. *Xylosandrus mutilans.*

Figure 6. *Xyleborus glabratus.*

Xyleborine Ambrosia Beetles

Easily transported and established:

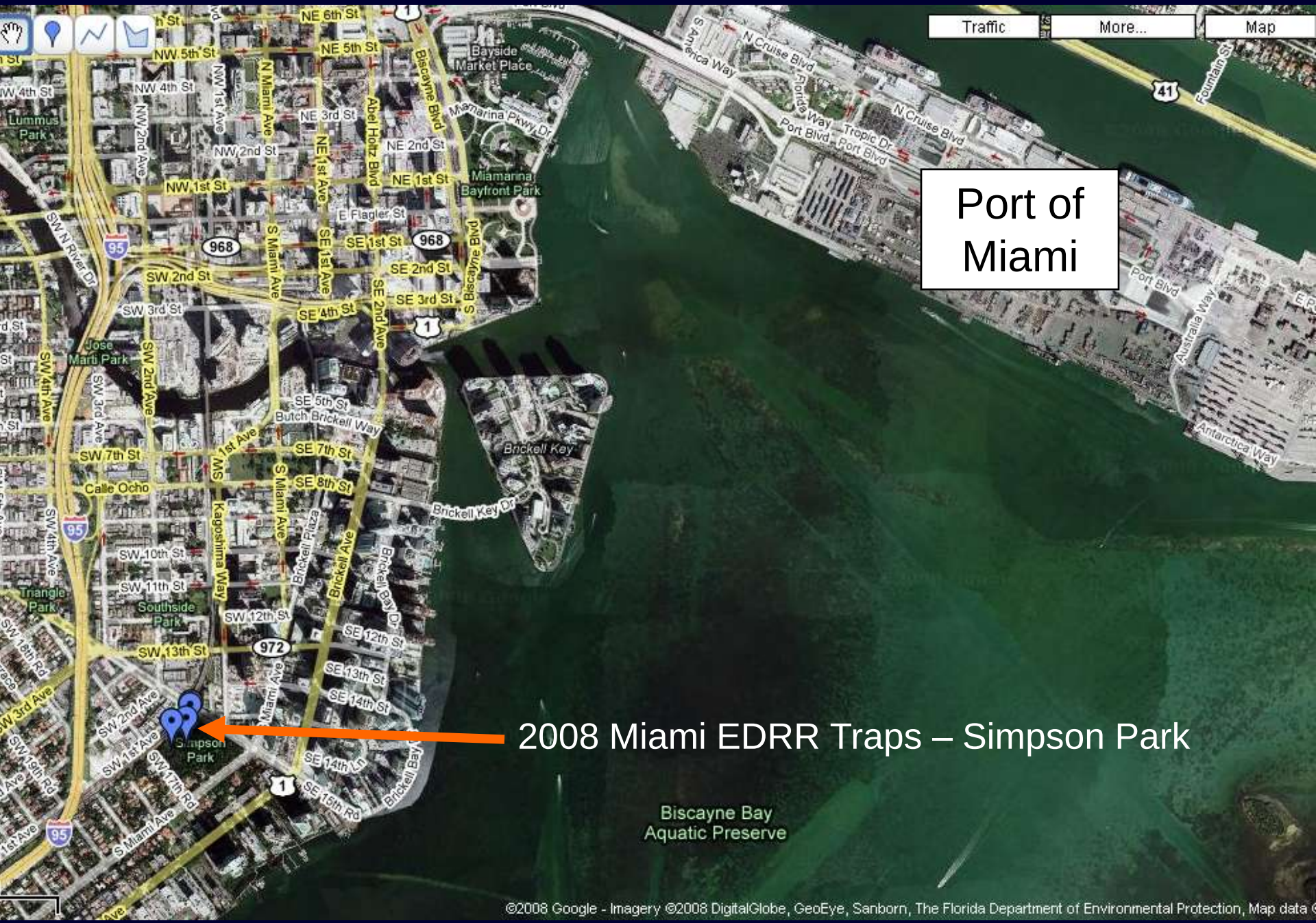
- Relationship with fungi
- Skewed sex ratio
- Partial parthenogensis and sib-mating
- Broad host range
- Warm/humid climate

Early Detection Rapid Response Survey Project

- Coordinated by USDA Forest Service, APHIS
- Cooperative project with other federal and state agencies, universities
- Pilot Phase from 2001-2005:
  - Develop rapid detection protocol for exotic Scolytinae as framework for detection of other invasive species
  - Detected 5 new established species in N. America (22 states, 310 sites)
- National implementation in 2007, goal of 15-18 states per year (1/3 country) on rotating basis

Florida EDRR Participation 2007 and 2008

- 6-7 sites per year in Florida, selected in communication with CAPS survey staff
- 3 funnel traps per site, each w/ different lure
- Placed at forested sites near places where SWPM is introduced, discarded (ports, warehouses, landfills, urban woodlots)


Traffic
More...
Map
Port of Miami
2008 Miami EDRR Traps – Simpson Park
Biscayne Bay Aquatic Preserve
Bayside Market Place
Miamarina Bayfront Park
Brickell Key
Simpson Park
Jose Marti Park
Lummus Park
Triangle Park
Southside Park
Calle Ocho
Butch Brickell Way
Brickell Key Dr
Port Blvd
N Cruise Blvd
Tropic Dr
Florida Way
Australia Way
Antarctica Way
Fountain St
NE 6th St
NE 5th St
NW 5th St
NW 4th St
NE 3rd St
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Biscayne Blvd
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NW 1st Ave
NE 1st Ave
SE 1st Ave
SE 2nd Ave
SW 1st Ave
SW 2nd Ave
SW 3rd Ave
SW 4th Ave
Brickell Ave
Brickell Plaza
Brickell Bay Dr
Kagoshima Way
Miami Ave
SW N River Dr
968
972
95
41
1
©2008 Google - Imagery ©2008 DigitalGlobe, GeoEye, Sanborn, The Florida Department of Environmental Protection, Map data

Lindgren Funnel Traps

- Ethanol
- Ethanol + Alpha-Pinene
- “Ipslure”

- Monitored for 20 weeks (10 collections)

- Samples prescreened by FDOF for 16 common spp., unknowns sent to regional taxonomist

2007 Sites

- **Pensacola****
- **Panama City****
- Gainesville
- **Fernandina Beach****
- **Ft. Lauderdale****
- Naples

2008 Sites

- **Jacksonville****
- Gainesville
- **Cape Canaveral****
- St. Petersburg
- **Bradenton****
- **West Palm Beach****
- **Miami****

****port**

2007 Results and 2008 progress

- 2007: Over 14,500 Scolytinae collected, 41 species (11 non-native)
  - 2 new Florida records, but no new pests
    - *Xyleborus dispar* (European, N. Am. since 1817)
    - *Xyleborus intrusus* (Native to US)
- 2008: collections in progress
  - 1 “new” species to N. America from Palm Bch.
    - *Coptoborus pseudotenuis* (Central and S. Am.)
    - But..prior specimen from 2004 in Royal Poinciana recently discovered
- Bottom Line: No Bad News Yet

EDRR Survey for Bark and Ambrosia Beetles

- Will likely continue participating in future years given Florida's many ports of entry and the damage potential of this pest group

- Acknowledgments
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  - Palm Beach County ERM: Matthew King
  - USDA Forest Service: Bob Rabaglia, Don Duerr
  - Anthony Cognato (Michigan State University)

Laurel Wilt: A Destructive New Disease of Redbay, Avocado and Related Plants in the Southeastern U.S.

Dr. Bud Mayfield, Florida Department of Agriculture and Consumer Services, Division of Forestry

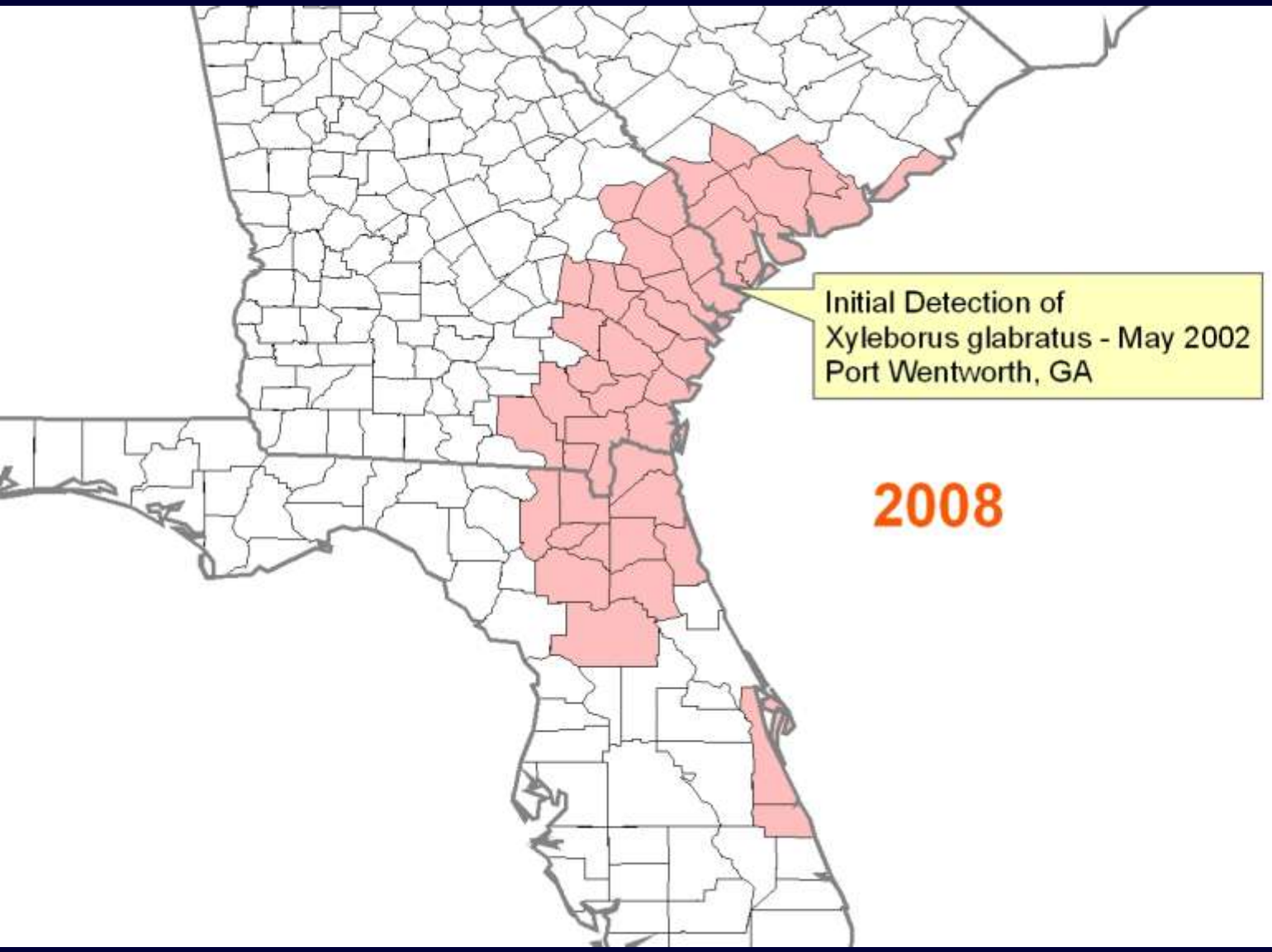
Redbay (*Persea borbonia*)
Family: Lauraceae

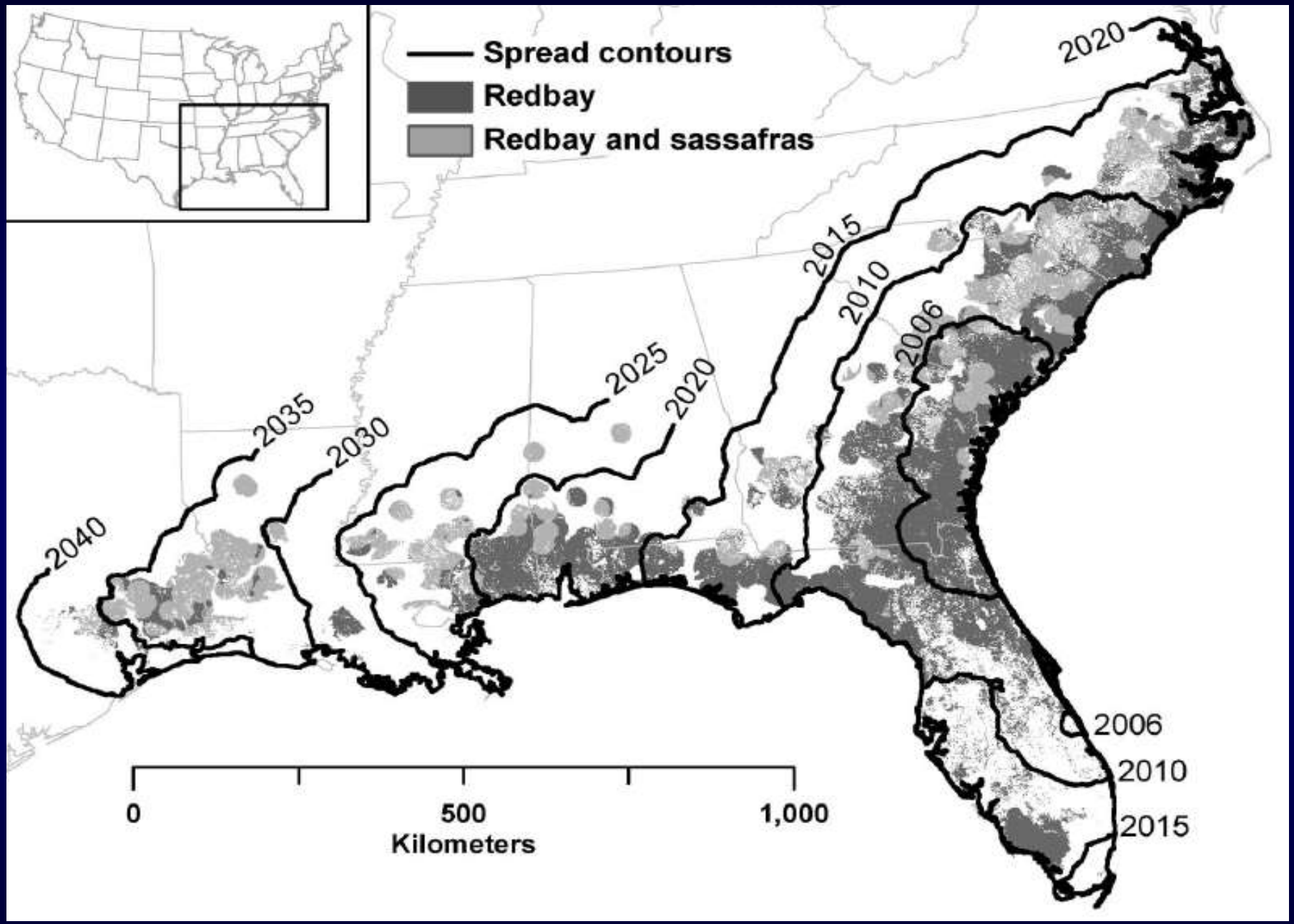
- Aromatic, broadleaved, evergreen of SE coastal plain
- Other closely-related “bay” species or varieties (swamp, silk)
- Wide habitat variety
- Cultural value: culinary, woodturning
- Fruits utilized by variety of wildlife
- *Persea* bays are only host of Palamedes swallowtail larvae

Redbay Ambrosia Beetle (*Xyleborus glabratus*)

- Native to Asia
- In US, only known to attack plants/trees in the laurel family (Lauraceae)
- Not known to attack loblolly bay or sweetbay
- Transmits a fungus (*Raffaelea lauricola*) into the sapwood that plugs the flow of water

R.J. Rabaglia et al. 2006. Ann. Entomol. Soc. Am. 99(6):1034-1056.

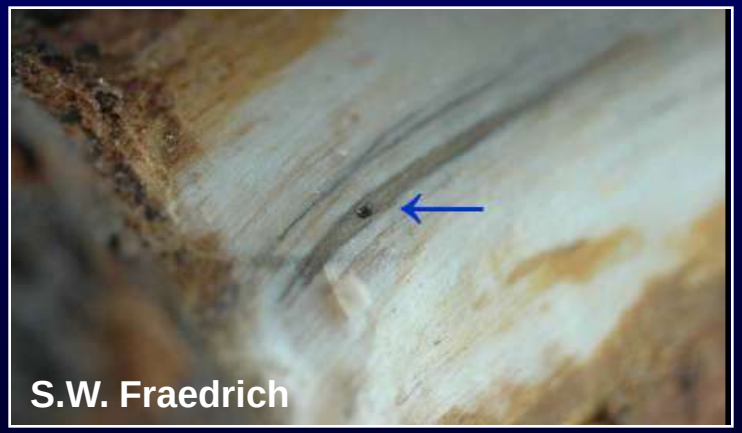

Initial Detection of
Xyleborus glabratus - May 2002
Port Wentworth, GA
2008



F. H. Koch and W. D. Smith 2008. Environ. Entomol. 37(2): 442-452

Laurel Wilt: Symptoms

- Initial beetle hits:
  - Occur on healthy trees
  - Difficult to find
- Initial sign of infection:
  - Drooping and discoloration of leaves



Laurel Wilt: Symptoms

September 2005 → Same tree, May 2006

Eventually crown wilts with a reddish to purplish brown discoloration. Dead leaves tend to remain a year or more.

Symptoms: black discoloration in sapwood

Symptoms

- Sawdust tubes: result of attacks by
  - *X. glabratus*
  - other ambrosia beetles
- Occurs after tree wilts & dies
- Female *X. glabratus* emerge to attack and infect new hosts

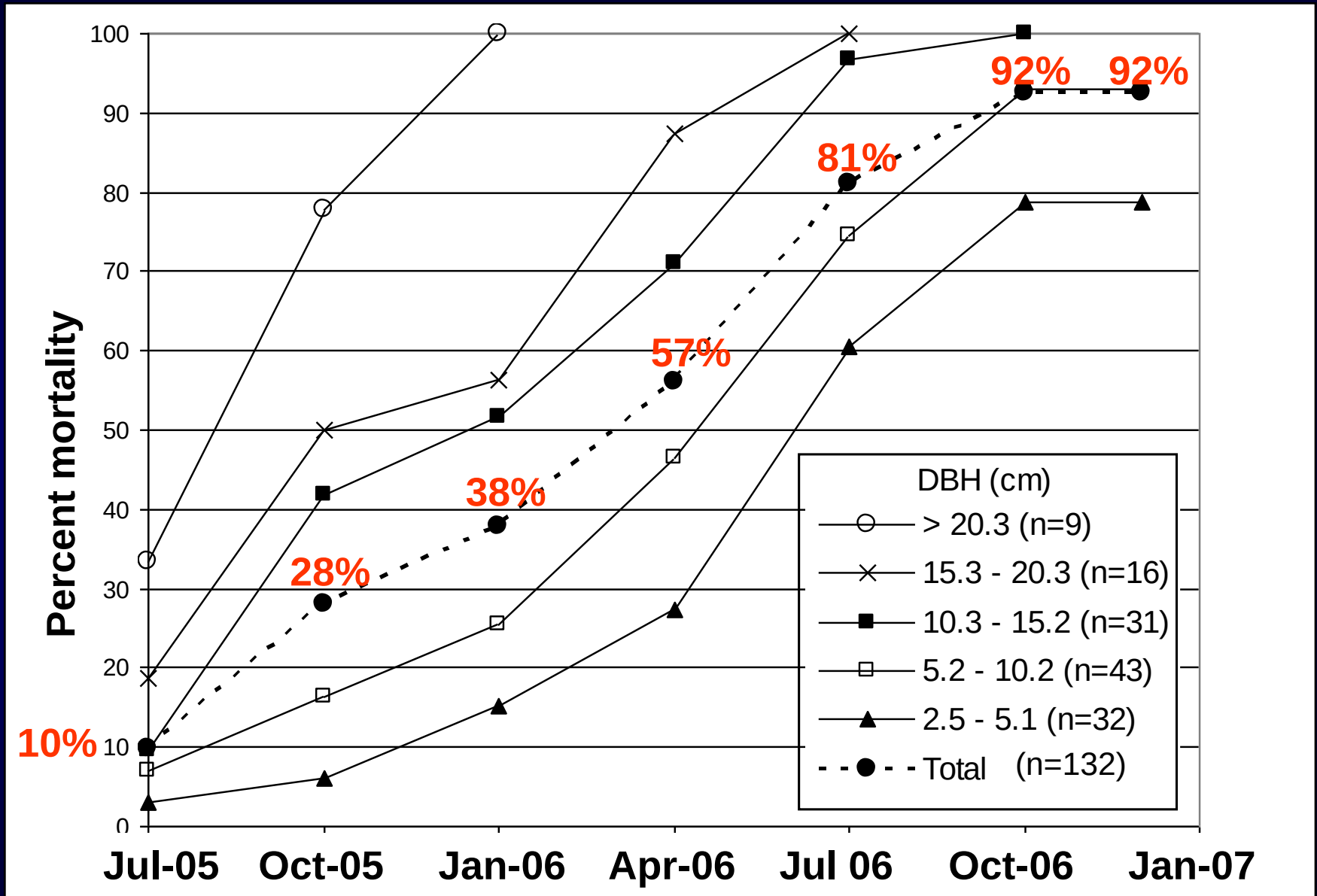
Florida trees in the Lauraceae

Please be on the lookout for Laurel Wilt symptoms in:

- Redbay
  - *Persea borbonia*
- Swamp bay
  - *Persea palustris*
- Avocado
  - *Persea americana*
- Silk bay
  - *Persea humilis*
- Sassafras
  - *Sassafras albidum*
- Pondspice
  - *Litsea aestivalis*
- Northern Spicebush
  - *Lindera benzoin*
- S. Spicebush (pondberry)
  - *Lindera melissifolia*
- Lancewood
  - *Ocotea coriacea*
- Love vine, Devil's gut
  - *Cassytha filiformis*
- Pepperleaf sweetwood
  - *Licaria triandra*
- Camphor tree
  - *Cinnamomum camphora*

Impact

Redbay mortality curve at Ft. George Island, FL



S.W. Fraedrich et al. 2008. Plant Disease 92: 215-224

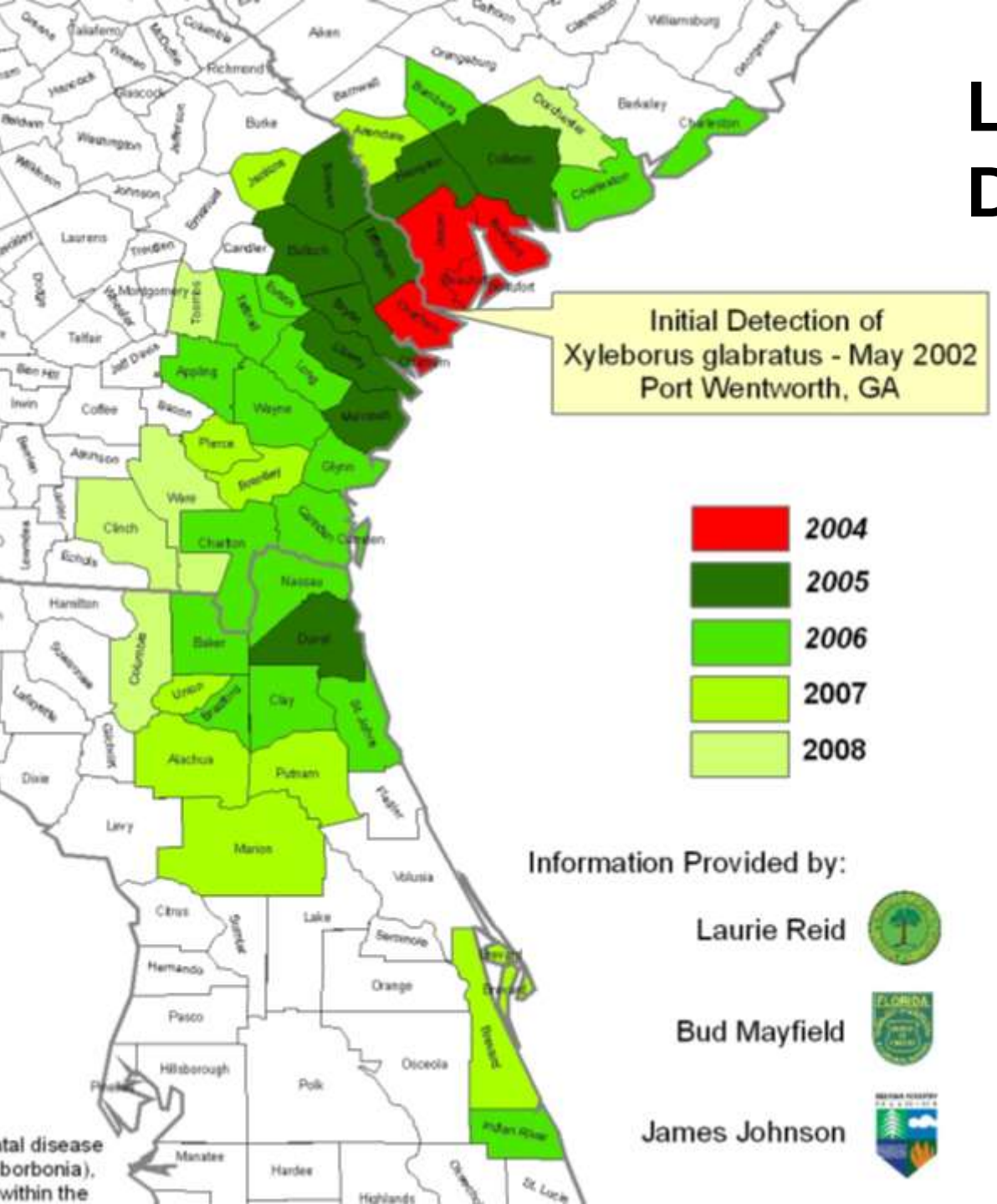
Current and Potential Impacts

- Changes in forest composition
- Aesthetic and economic impact – shade trees
- Detriment to redbay dependent fauna (?)
- Detriment to endangered or threatened Lauraceous species (?)
- Economic impact on avocado industry (extent?)

Some Management Options

- Avoid transporting woody material of redbay or other dead/dying Lauraceae
- Sanitation: past attempts have failed but are few in number; at best would probably only slow disease progression
- Fungicides: Root-flare injection of propiconazole inhibits disease development in pre-treated redbays. Duration? Inoculation Pressure? (Mayfield et al. in press)
- Contribute to redbay seed collection effort
- Report new county detections for educational purposes

Laurel Wilt Distribution Map



Counties in which Laurel Wilt has been detected as of June 2008

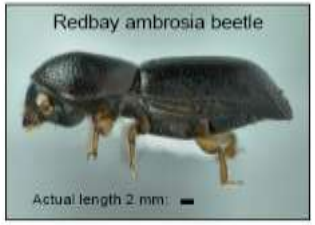
PEST ALERT

DON'T TRANSPORT REDBAY FIREWOOD

Non-native insects, diseases and invasive plants are major threats to our nation's forests. Of current concern in Florida is the accidental introduction of the **Redbay Ambrosia Beetle and its associated fungus from Asia**. This beetle is killing redbay trees at an alarming rate, and related trees like sassafras are also at risk. This exotic tree-killing pest can spread to new areas through the movement of infested wood.

- **Please do not bring redbay firewood from places outside the local area.**
- **If you have already brought redbay firewood from somewhere else, burn all of it thoroughly.**

Dying redbays



Ambrosia beetle sawdust

Tree killed by redbay ambrosia beetle and lethal fungus

Florida Department of Agriculture and Consumer Services, Division of Forestry
CHARLES H. BRONSON, Commissioner · MICHAEL C. LONG, Director · www.fl-dof.com

www.fs.fed.us/r8/foresthealth/laurelwilt

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