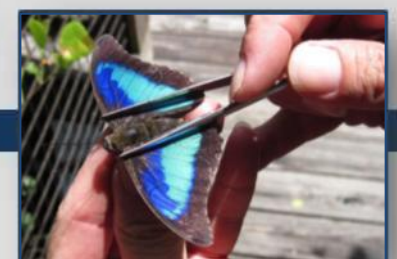


INVASIVE ANIMAL OPERATIONS UPDATES

Invertebrates:

Laurel Wilt, Giant African Snails,
Platydemus manokwari



Invertebrate Overview

- Laurel Wilt
 - Everglades expansion
 - Tony Pernas, LeRoy Rodgers
 - Tolerance in *Persea borbonia* and future restoration
 - Dr. Marc Hughes
- Giant African Snail
 - Distribution and management
 - Julio Rodriguez
 - William Torres
- *Platydemus manokwari*
 - Detection and distribution
 - Dr. Mary Yong Cong
 - Dr. David Robinson

Laurel Wilt: Impacts, Expansion, and Future in the Everglades



LeRoy Rodgers, Tony Pernas



sfwmd.gov

EVERGLADES CISMA

Laurel Wilt (*Raffaelea lauricola*)

- Vascular fungus
- Primary vector is
 - redbay ambrosia beetle (*Xyleborus glabratus*)



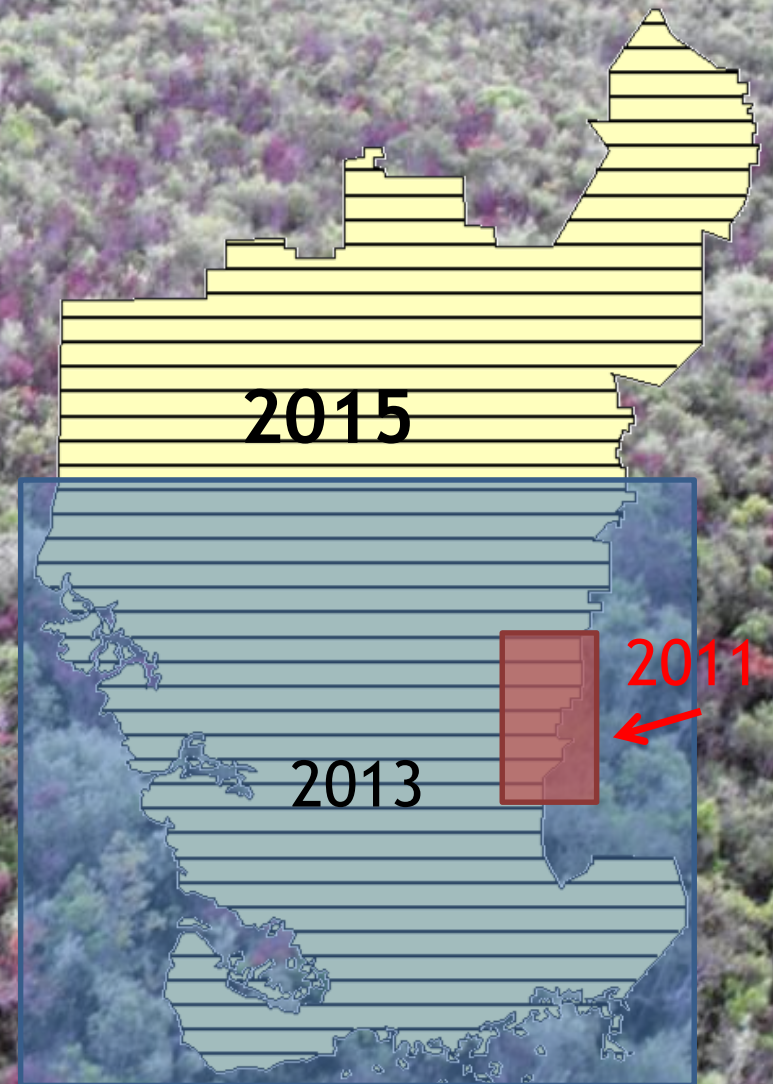
- Lethal to Lauraceae
 - Redbay (*Persea borbonia*)
 - Swampbay (*Persea palustris*)
 - Avocado (*Persea americana*)



(Clockwise from left)
Mike Thomas, FDACS 2008
LeRoy Rodgers, SFWMD 2013
Andrew Derksen, FDACS 2010

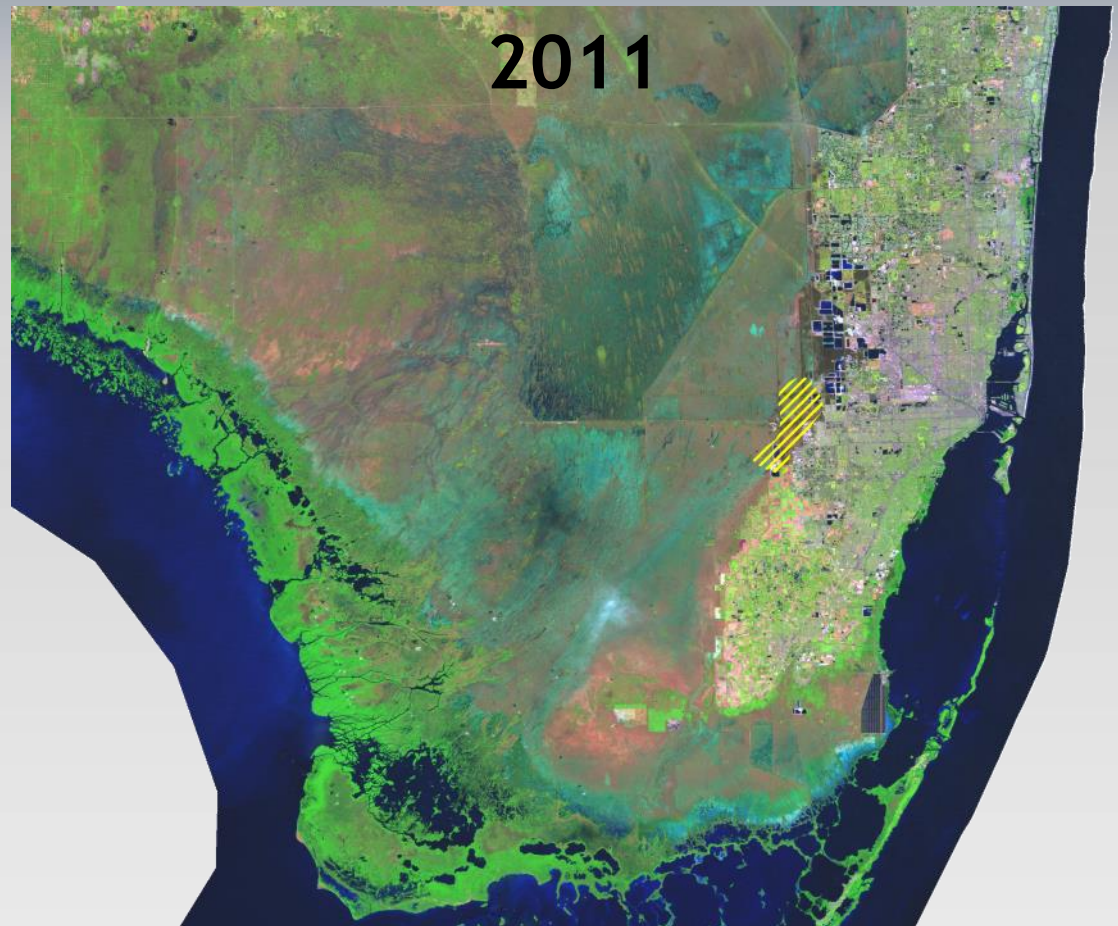
Everglades Laurel Wilt Mapping Events

- **2011:**
Collaboration
with FDACS-DPI
- **2013:**
SFWMD/NPS LW
Inventory
- **2015:**
SFWMD/NPS
Systematic
Reconnaissance
Flights (SRF)



Extent of Occurrence 2011

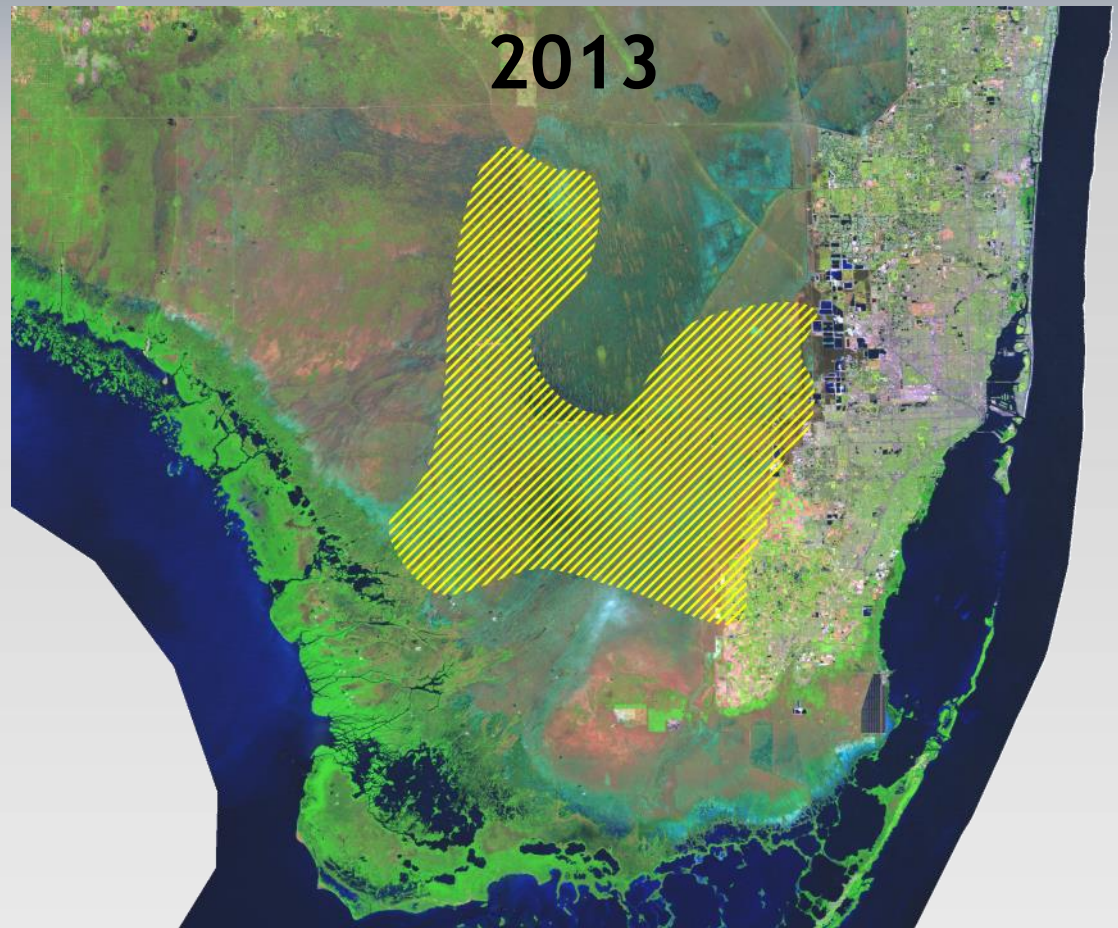
- 5,624 ha



EVERGLADES CISMA

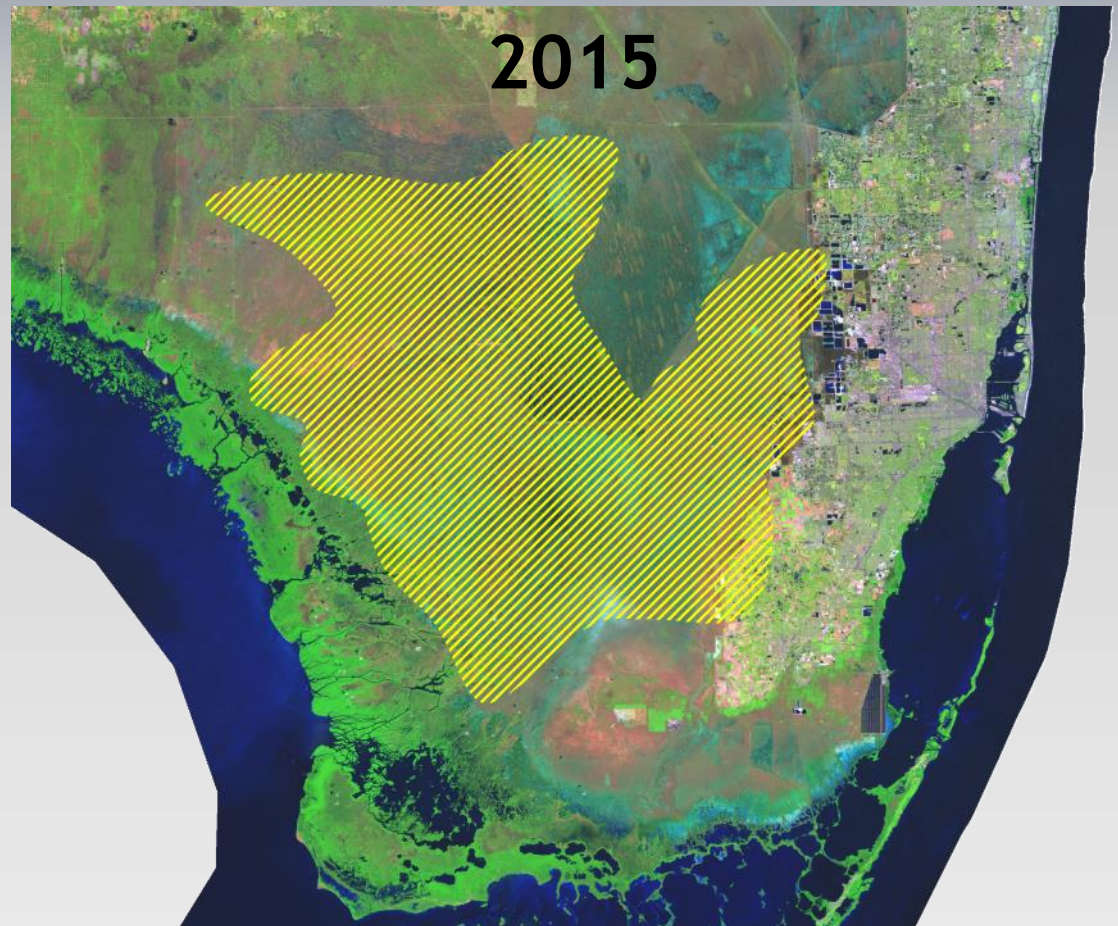
Extent of Occurrence 2013

- 5,624 ha
- 189,757 ha



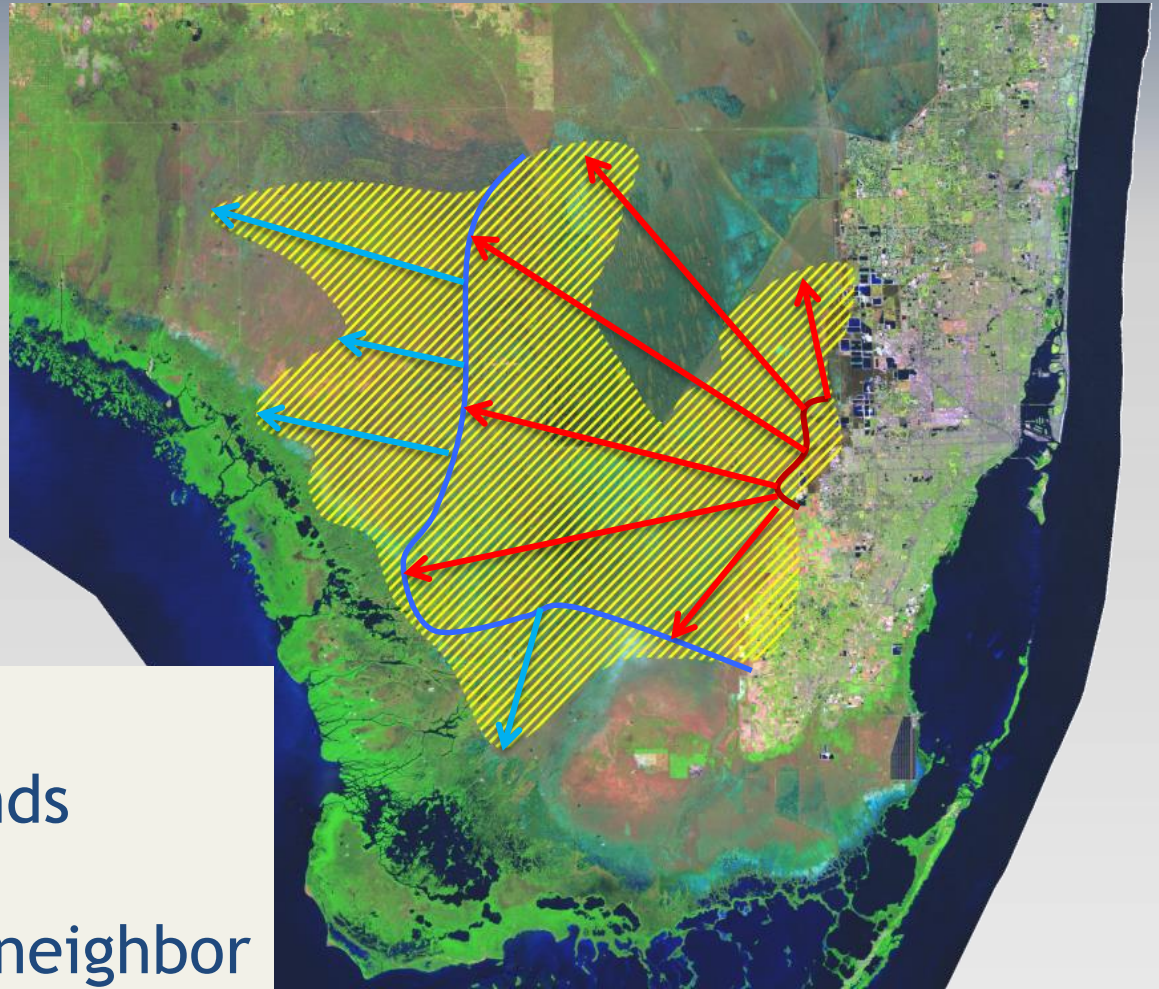
Extent of Occurrence 2015

- 5,624 ha
- 189,757 ha
- 372,052 ha



Expansion Rate

- 2011-13
 - 26.6 km/yr
- 2013-15
 - 16.2 km/yr



- Mean Min Distance between tree islands
 - 1.1 km
- Maximum nearest neighbor
 - 11.6 km

Imagery Interpretation

- Preliminary evaluations to determine extent of canopy disturbance
- Compared 2013 and 2014 imagery in known infestation areas
- Digitized symptomatic trees to calculate proportion of canopy disturbance



January 2013



December 2014

Tree Island: 1 acre

Laurel Wilt: 0.03 acres

Percent Cover: 3%



*Percent cover estimates are based on December 2014 Google Earth imagery



Tree Island:
2.6 acres

Laurel Wilt:
0.55 acres

Percent Cover:
21%

*Percent cover estimates are based on December 2014 Google Earth imagery.

Fate of Infected Swamp Bays?

- Very little ground based data available
- Several observations of resprouting
 - Will/when resprouts be affected eventually?
 - Additional stress on coppicing trees from deer browsing and flooding?

“...it seems likely that most, if not all, mature swamp bays will disappear from Everglades tree islands in the near future.”

James Snyder 2014

The background of the slide is a close-up photograph of a branch of a tree with several green, oval-shaped leaves. Some leaves are in sharp focus, while others are blurred in the background. The lighting is bright, suggesting a sunny day. The text is overlaid on semi-transparent white rectangular boxes.

Tolerance in *Persea borbonia* and Future Restoration

Marc A. Hughes and Jason Smith
School of Forest Resources and Conservation
University of Florida

Resistance Screening Trials

- Survivors taken from twelve field sites in FL, GA, SC
 - 31 tree genotypes (4-6 replicates per tree)
- Injected with 3.0×10^3 conidia/tree (vector capacity)

Field plot, pre-inoculation, 2014

Results (2010 - 2014)

- 7 tolerant clones (FGC, HIA ,HIL + **FGJ, CIH, FCP, CIG**)
- Lower: Rate, AUDPC and Disease severity
- No mortality among clones
- Trees showed a consistent tolerance among replicates
- Re-inoculation had no effect on disease development

PRELIMINARY AND CAUTIOUS CONCLUSIONS!

- Project is ongoing and will require larger sample sizes and more natural conditions

2014 Trial

12 weeks
after
inoculation



Tolerant



Not Tolerant



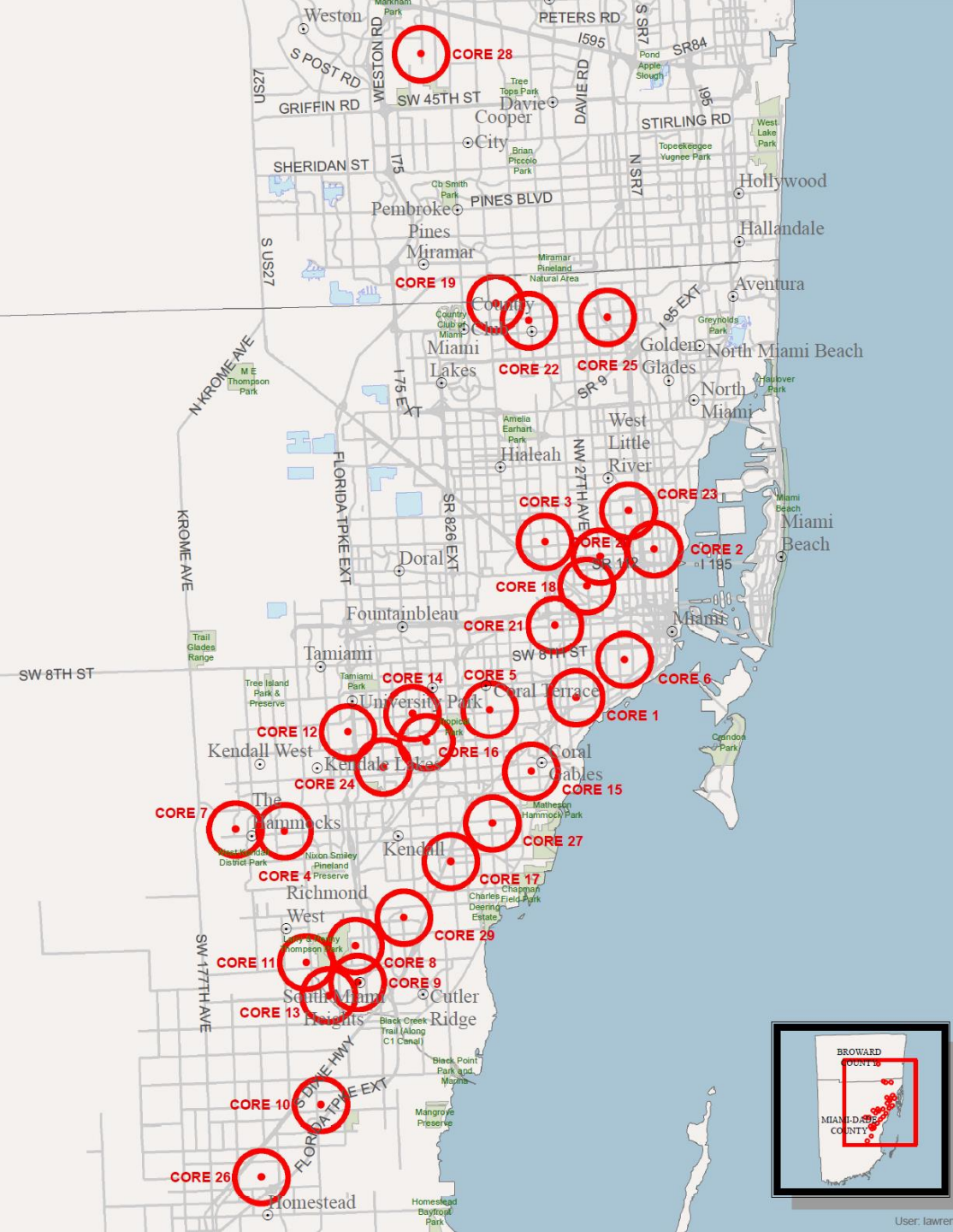
Giant African Snail (*Lissachatina fulica*)

- 
- Broadly polyphagous
 - Rapid developmental cycle
 - Sexual maturity in six months
 - 45 viable eggs per month
 - Vectors rat lungworm (*Angiostrongylus spp.*)

Giant African Snail

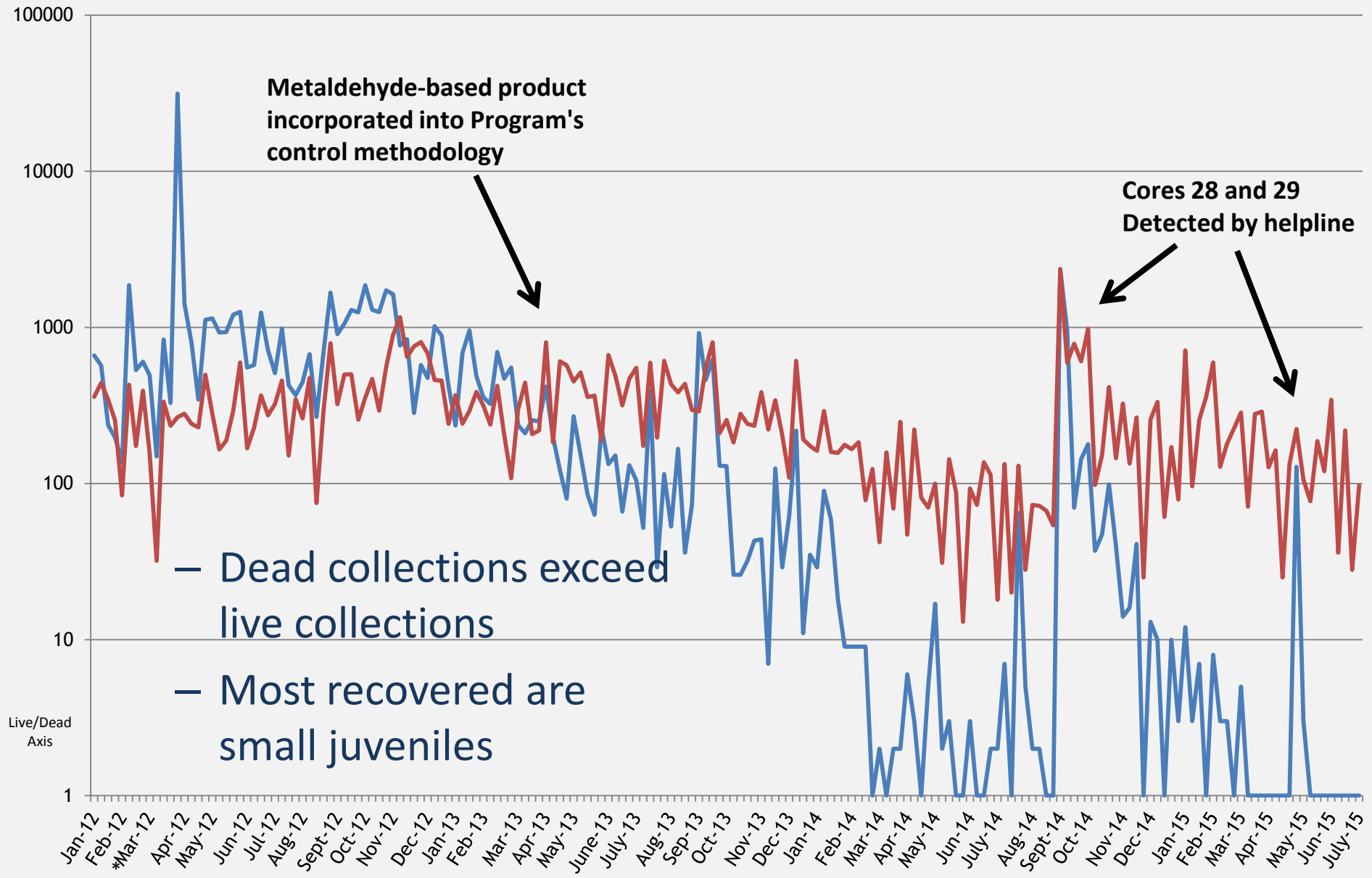
29 infestations

- Increase of two new cores
 - One in Broward County
- 4,500+ parcels under survey
- 51% of properties surveyed have not had a detection for more than a year
- 40% clean for two years
- 13% clean for three years or longer



GALS Eradication Program

Logarithmic Live/Dead Snail Track From 2012 to Present



*Note: In order to avoid drastically skewing the graph, we have removed the 31,000 retroactive snails added to the total count.

— Live — Dead

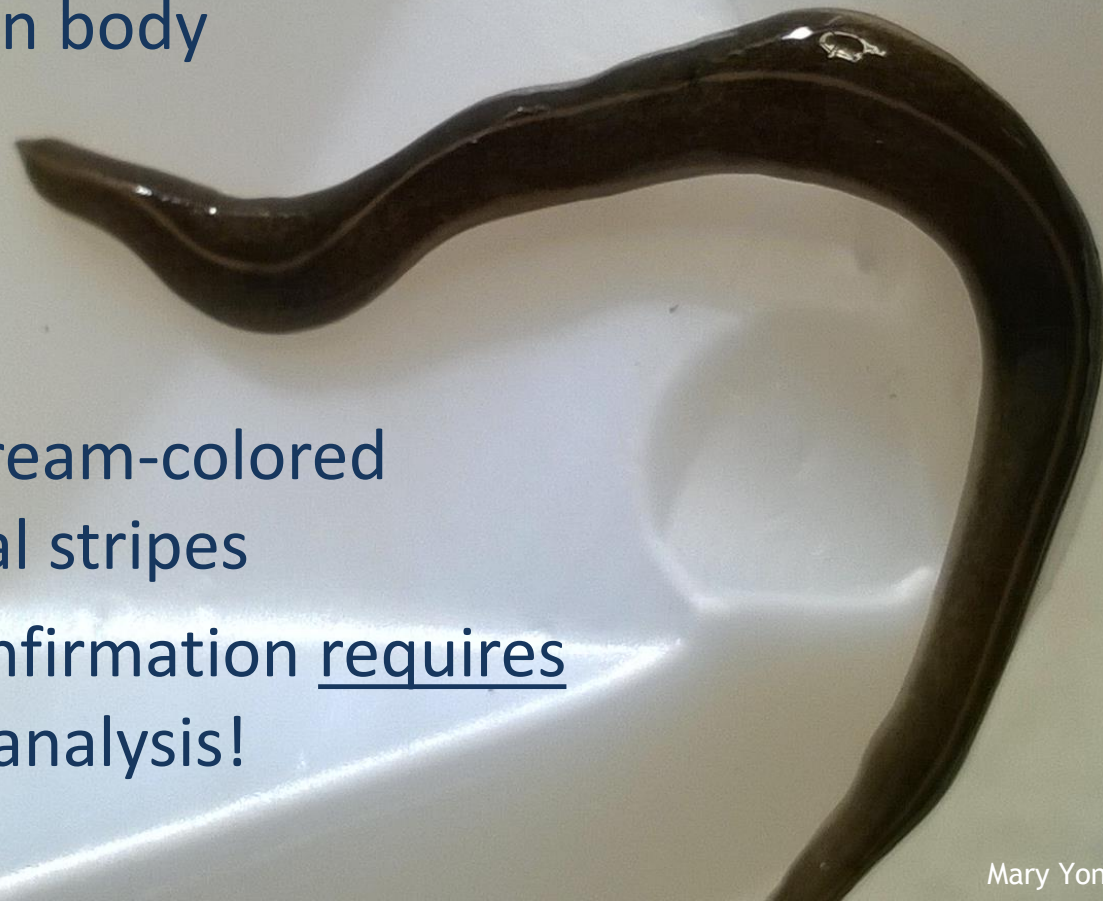
Platydemus manokwari



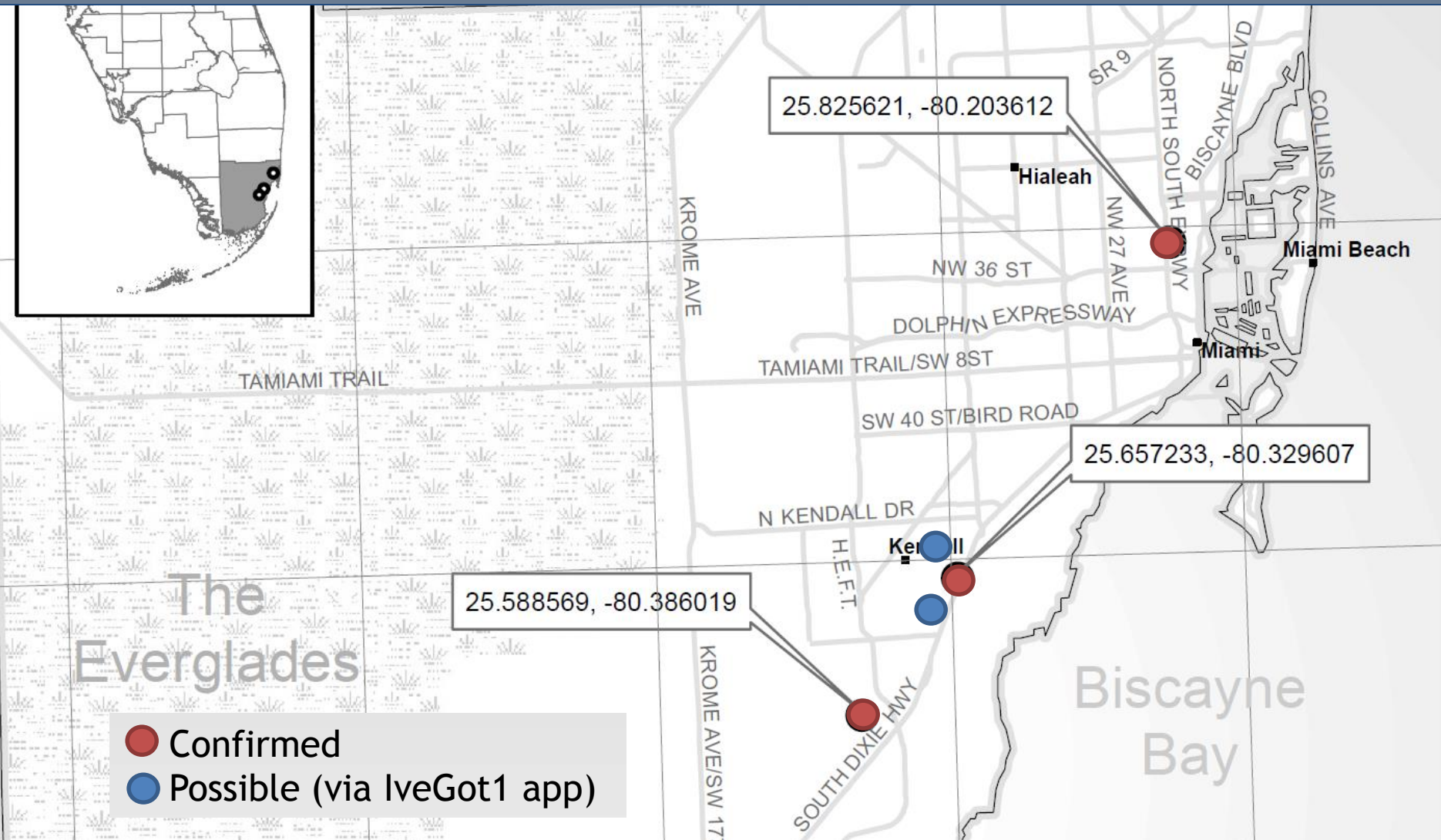
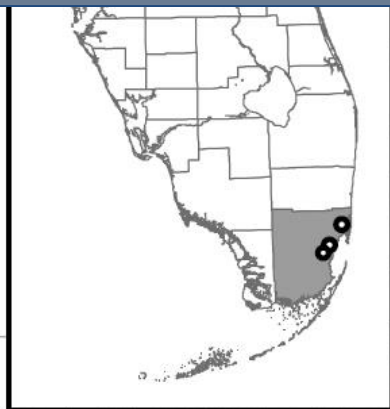
- Originally from New Guinea
- Predatory snail-eating flatworm
- First detected in August 2012 by snail program

Appearance

- Pointy “nose” and tail
- Two grey eyespots
- Olive-brown body
- Two thin cream-colored dorsolateral stripes
- Species confirmation requires molecular analysis!



Current Florida Distribution



Questions?

