



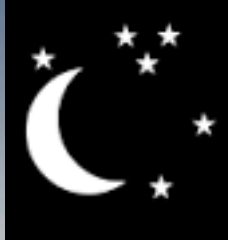
The New Guinea flatworm *Platydemus manokwari* in Florida: Current Status and Concerns

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What is “*Platydemus*”?

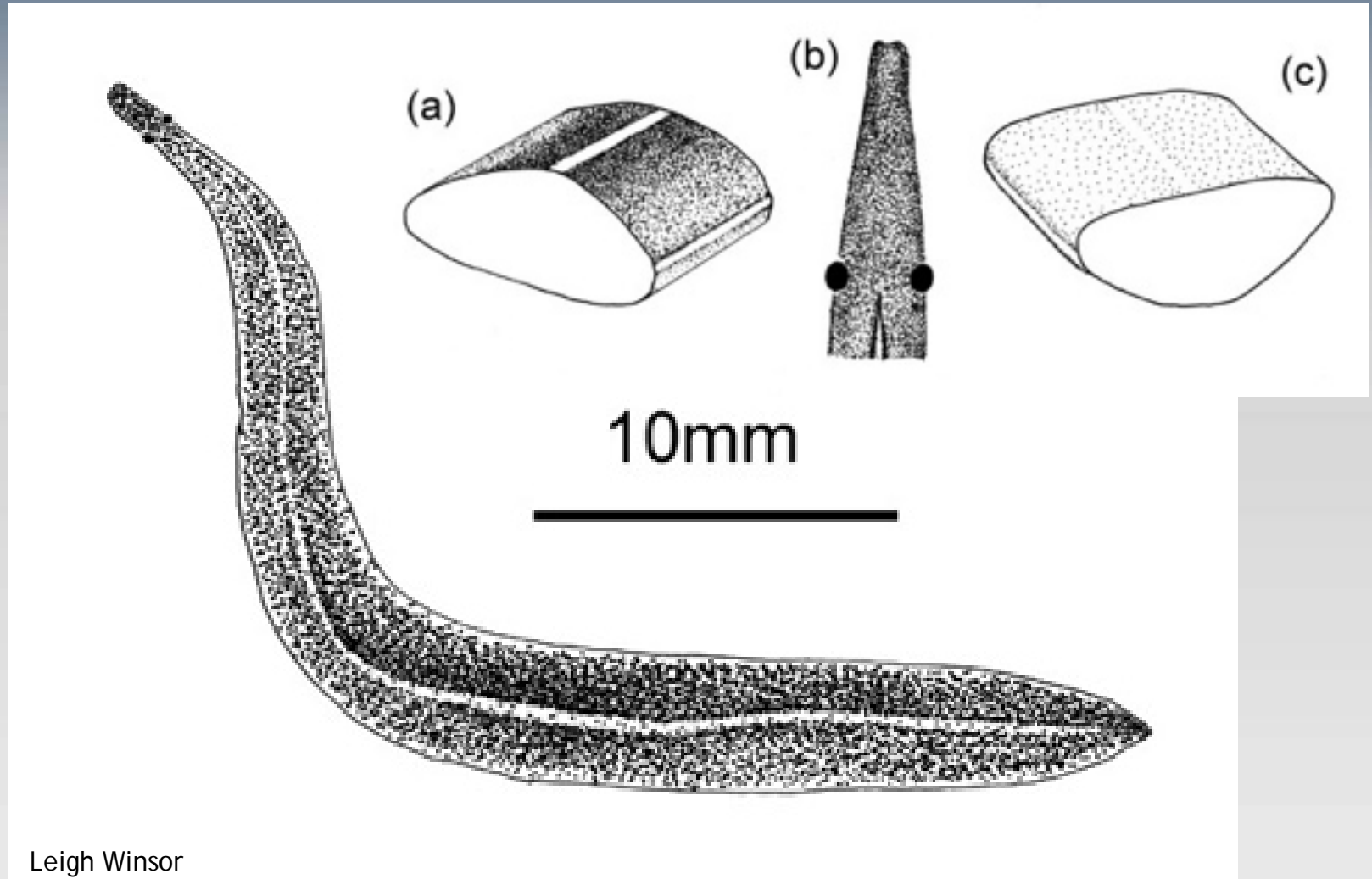


Terrestrial flatworm tapered body, eye spots,
“snout”;
Longitudinal stripe, sometimes hard to see;
Often appear mostly black.



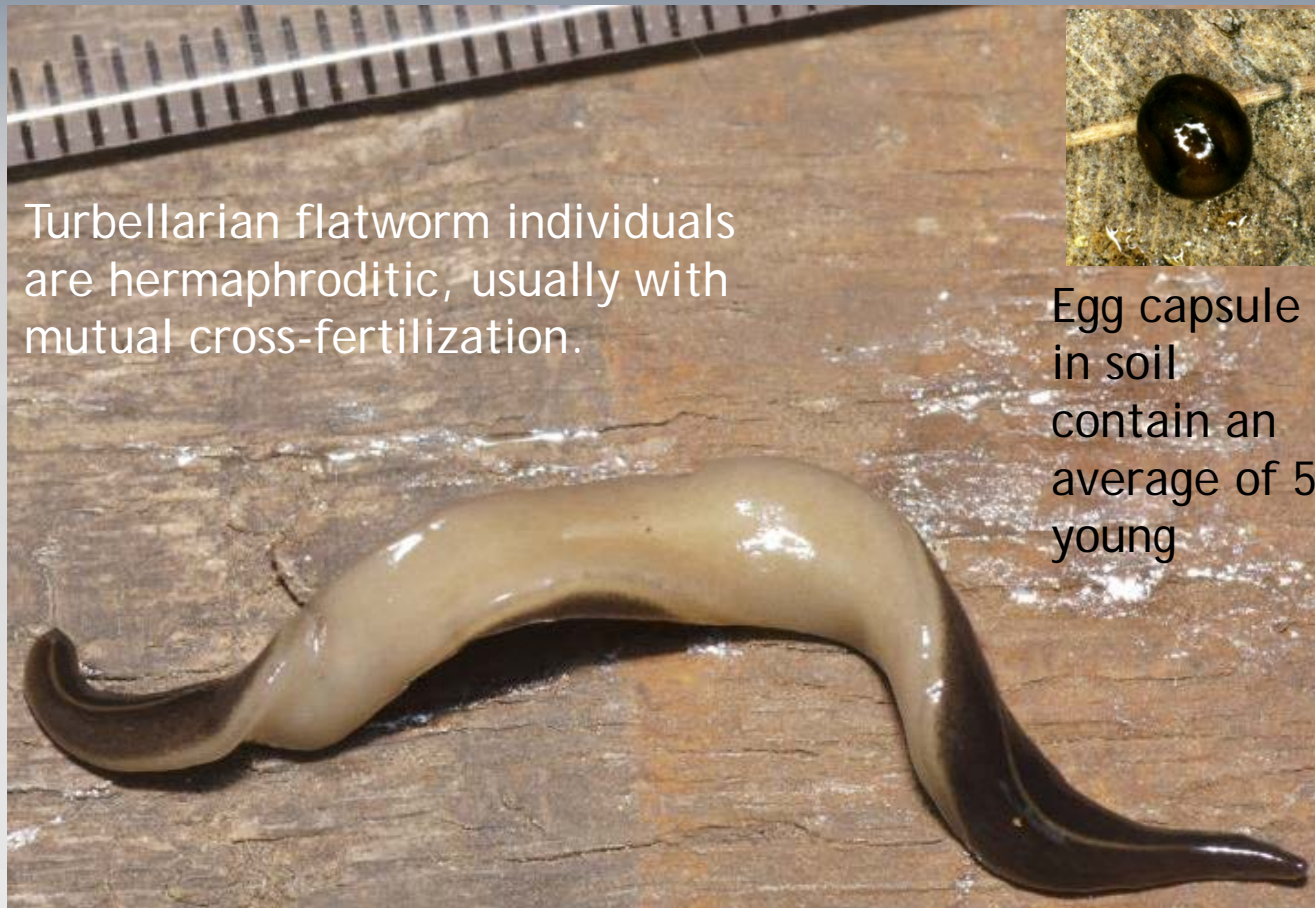
Shinji Sugiura, Ogasawara Islands Japan

Recognizing *Platydemus* flatworms



Leigh Winsor

Appearance and Reproduction

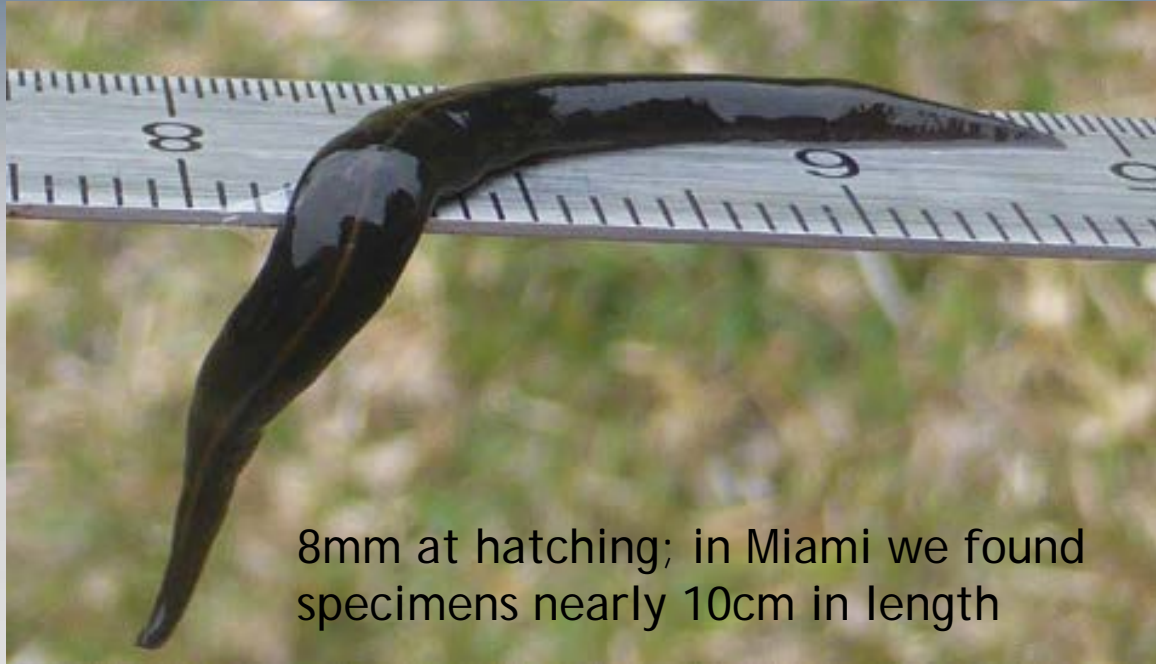


Turbellarian flatworm individuals are hermaphroditic, usually with mutual cross-fertilization.

Egg capsule in soil contain an average of 5 young

Justine *et al.* PeerJ 2015 New Caledonia, Cocoon photo by Leigh Winsor

Size



8mm at hatching; in Miami we found specimens nearly 10cm in length

Justine et al. PeerJ 2015

Feeding and Prey

*Preferred prey are snails (hatchlings, juveniles, adults)

*Also will consume earthworms, other flatworms, terrestrial nemertean, and isopods



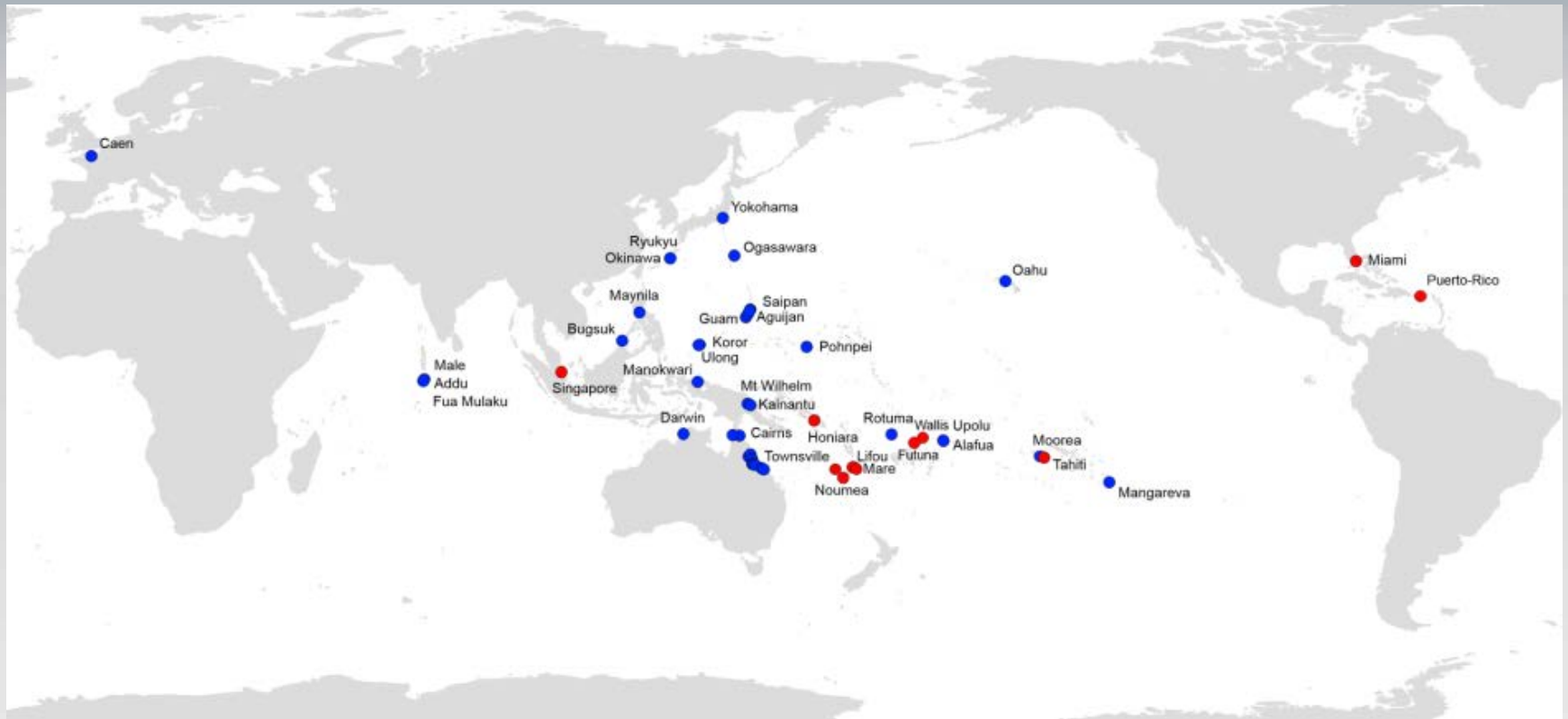
Concerns regarding *Platydemus* flatworms:

- Where introduced in other regions, is considered the **cause of extinction** and/or **dramatic decline of native species**, particularly **snails** (*e.g.* Cowie 2008)
- Is considered one of the **World's 100 worst invasive species** (Global invasive Species Database)
- Can carry *Angiostrongylus*, a parasitic nematode that can infect and cause severe **gastrointestinal or central nervous system diseases in humans** (CDC).

First report of *Platydemus manokwari*



Travels of *Platydemus manokwari*



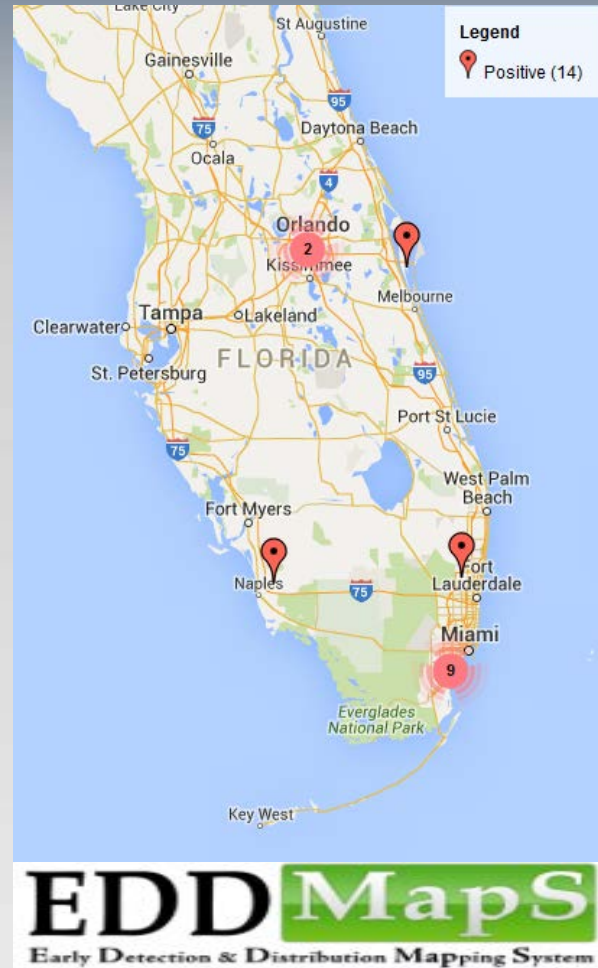
Justine *et al.* PeerJ 2015

How are *Platydemus* flatworms spreading?

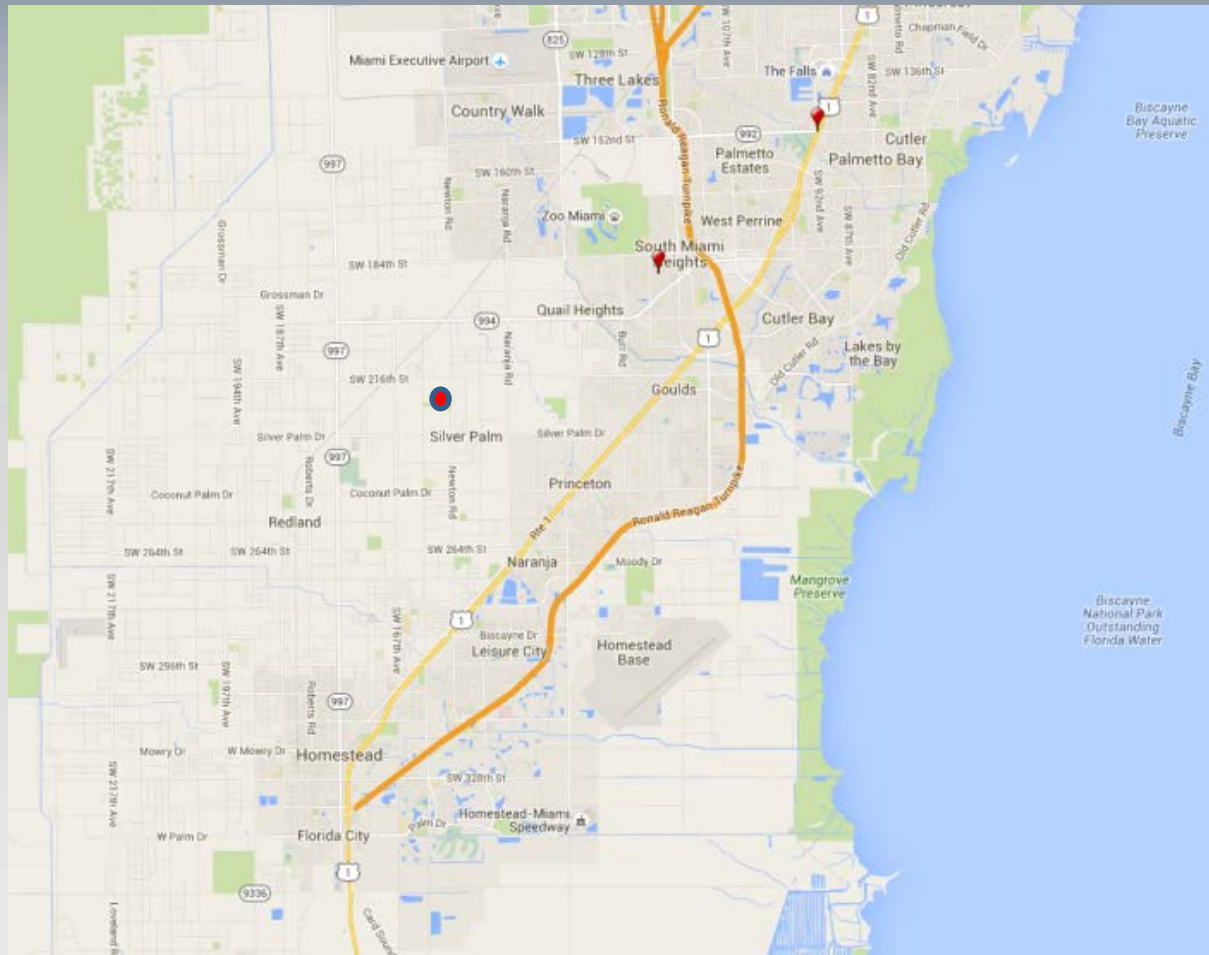
- Reported rate of natural dispersal is limited, **between 30** (Winsor 1990) and **180 Meters per year** (Muniappan 1987) over suitable habitat/conditions
- Other routes are **accidental** or **intentional** introduction



Platydemus flatworms in Florida



Platydemus flatworms in Castellow Hammock Preserve



Castellow Hammock Preserve



Florida's tree snails are unique tropical aspects of extreme south Florida's fauna.

Stock Island Tree Snail (*Orthalicus reses reses*), a federally protected species, and the Banded Tree Snail (*Orthalicus floridanus*) also are found in some south Florida hammocks.



Bill Frank, www.jaxshells.org

Castellow 33: Aug.-Sept. 2015



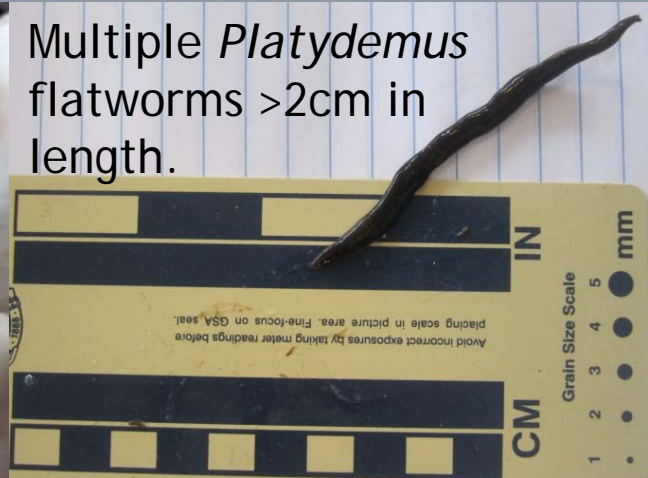
- More than 295 found dead (recent kills) on 25 August 2015
- Only five (5) living *Liguus* sp. tree snails documented during this survey.

Castellow 33 Aug.-Sept. 2015



Note *Platydemus* flatworm in *Liguus* tree snail aperture

Multiple *Platydemus* flatworms >2cm in length.



- *Platydemus* specimen collected from *Liguus* sp. aperture 2.4m above the ground
- Climb in pursuit of prey (Sugiura & Yamaura 2009)



Genetic Analysis confirms ID of *Platydemus* flatworms from Castellow 33, South Miami-Dade County, West Palm Beach and Sanibel Island.

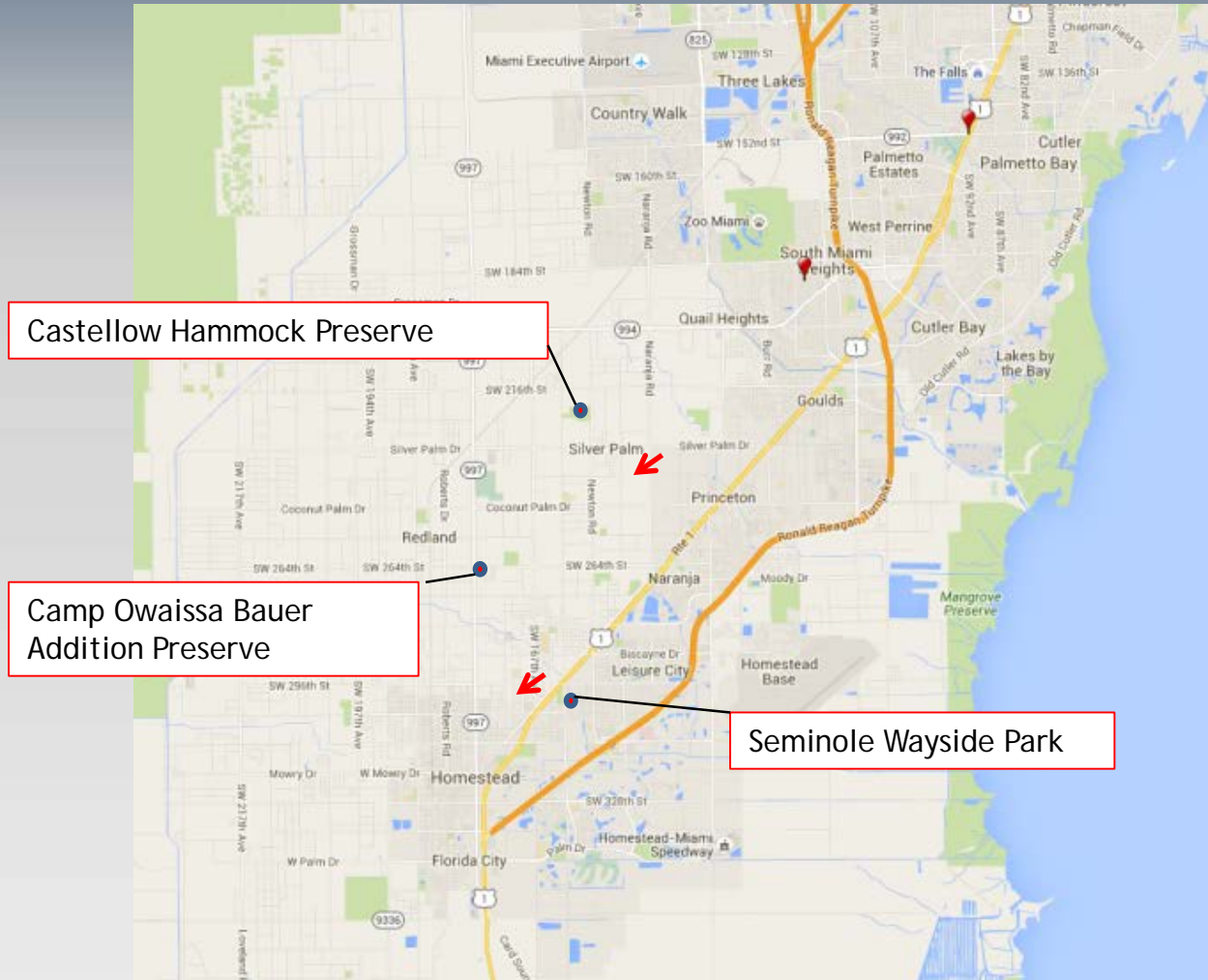


Camp Owaissa Bauer Addition

Four miles south of Castellow Preserve, we did not find the same signs of mass mortality of *Liguus* or *Orthalicus* tree snails.



Imperiled Tree Snail Populations (*Liguus fasciatus*)



What needs to be done?

- Determine **extent and connectedness** and Genetic ID of populations of *Platydemus* flatworms, especially near populations such as *Liguus* and *Orthalicus* spp. Engage citizen scientists/ community to assist in this process.
- Assay **population health** of *Liguus* and *Orthalicus* spp. in natural areas (is *ex situ* conservation warranted at this time?)
- Establish **monitoring/bait stations** in sensitive natural areas
- Develop other **rapid methods of assaying presence** of *Platydemus* (e.g. Dogs)
- Natural dispersal of *Platydemus* flatworms reported to be limited, so **determine human-mediated mechanisms** of spread locally and **intervene if possible** (e.g. phytosanitary measures).
- Check *Platydemus* populations for **presence of parasites/pathogens**.

Acknowledgements:

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- **Alex Salcedo**, TERRA Environmental Research Institute, Miami-Dade County Public Schools
- **Mary Yong Cong**, Science GALS Program Miami, Division of Plant Industry, Florida Department of Agriculture and Consumer Services



Liguus fasciatus

Alex Salcedo

Liguus fasciatus with *Platydemus manokwari* in shell.



Orthalicus floridensis