

Everglades National Park Non-native Aquatics Monitoring

Jeff Kline



Invasive Species Programs

- **Non-native fish monitoring**
- Description
 - Monitoring of non-native fish distributions in ENP
- Objective
 - Detect changes in distribution on non-native species.
 - Park-wide network for early detection
- Partners
 - Cooperator projects (FIU, USGS, National Audubon, et al.)
 - FWS Asian swamp eel project
- Start/End Dates
 - Park-wide since 2004
- Status
 - Ongoing
- Funding (FY): ~\$12,000 not including staffing.
- Annual Summary
 - Now 16 species of non-native fishes in ENP
 - 7 of these since 2000



Invasive Species Programs

- **Non-native apple snails**
- Description
 - Monitoring the invasion of non-native apple snails in ENP
- Objective
 - Track the changes in distribution of the island apple snail at Shark Valley
- Partners-FIU, UF, FDACS
- Start/End Dates
 - May 2005-
- Status
 - Ongoing
- Funding (FY): Small pot of LAPS funds
- Annual Summary
 - Continue our regular survey-Much fewer eggs so far in 2008
 - Surveyed all border canals in 2008-Many in L-29 Canal!
 - *Pomacea insularum* and *P. diffusa*



Priority Animal Species

- **My Personal Aquatics perspective**

- The most recent introductions
- Most abundant
- And those not in ENP yet!



African jewelfish



Island apple snail



Yellowbelly guapote

Image by Windser Aguirre

- **Newly Detected Animal Species**

- Asian swamp eel Dec 2007
 - Originally in the C-111 canal
 - Collected south of C-111 by National Audubon Society



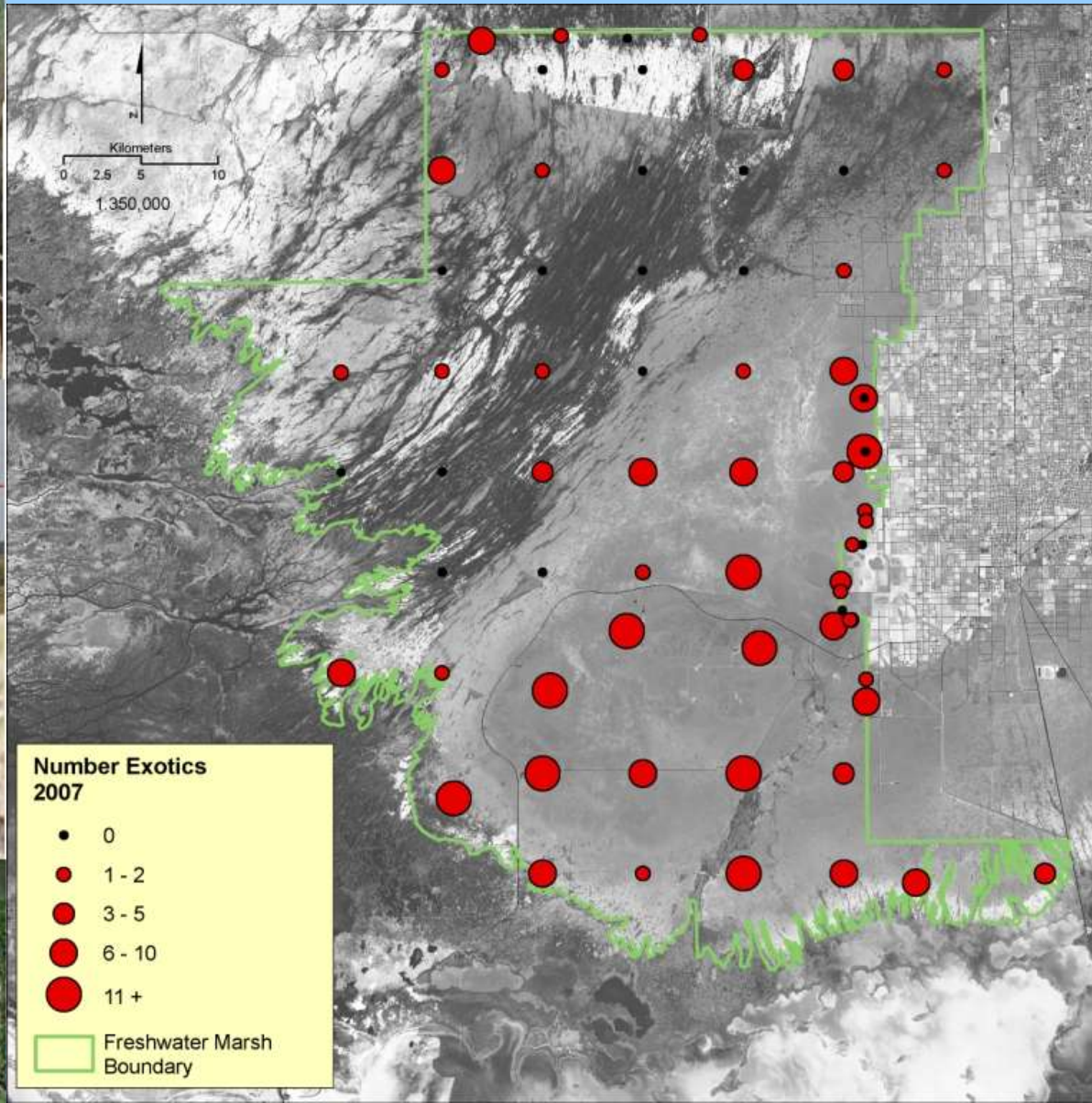
Monitoring

- Fish monitoring
 - 50 Sites park-wide sample-Annually
 - Other monitoring efforts-ENP and cooperator
 - Misc observations
- Non-native apple snail
 - *Pomacea insularum*
 - Old Tamiami Canal survey every 8-10 days
 - Since May 2005
 - *P. diffusa* at Frog City
 - 2008 survey of border canals

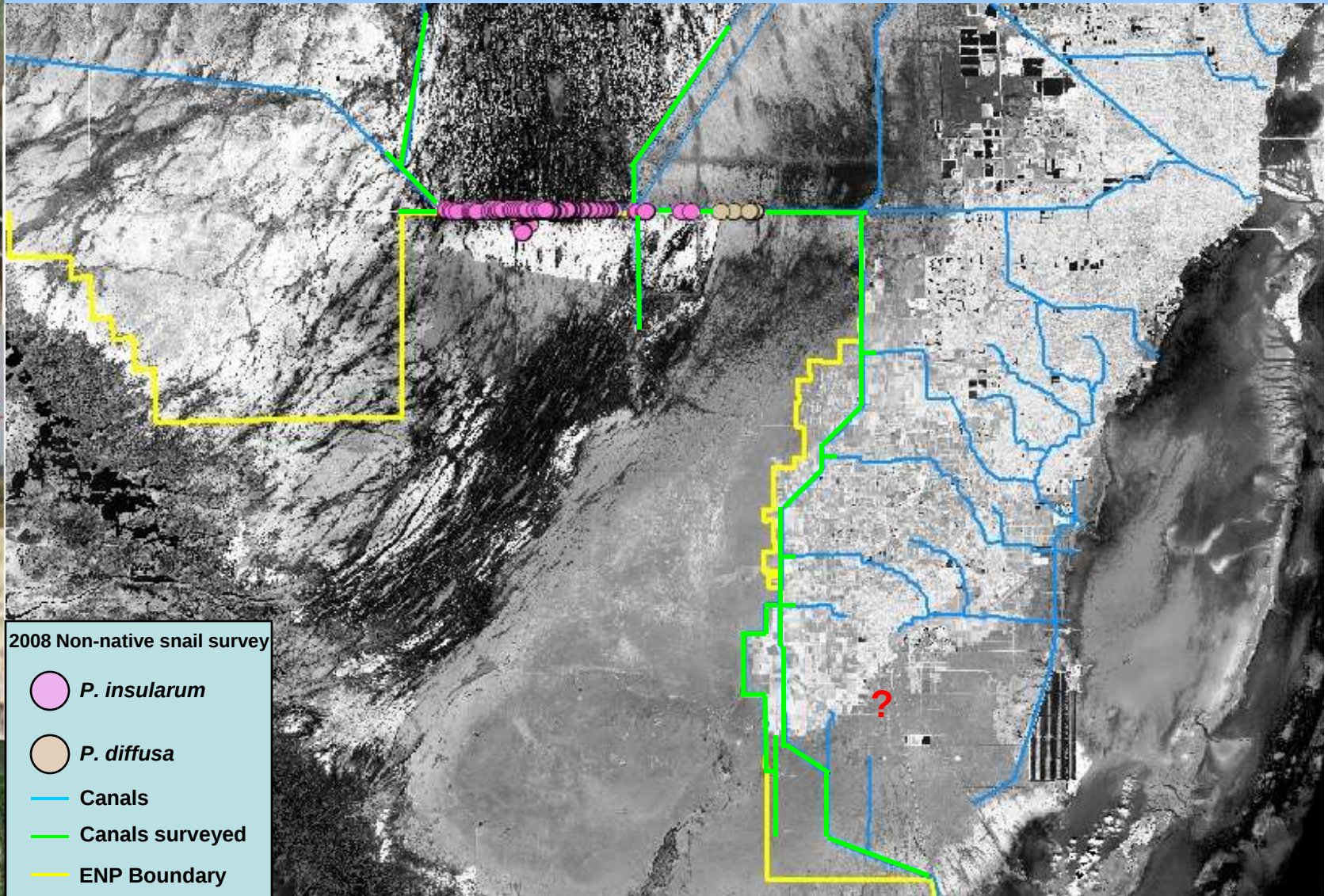


Monitoring-Fish

- General distribution similar to previous years
- African jewelfish continue to expand-27 of the 50 random grid sites



Monitoring- Non-native apple snails



Planned monitoring efforts (2009-)

Detection of new invasive exotic fish using long-term monitoring of canals adjacent to South Florida National Parks.

- Cooperative effort
 - South Florida/Caribbean Inventory and Monitoring Network
 - Everglades National Park



Monitoring objective

- To detect new non-native fish species which can then be targeted for control by CISMA.
- Monitor canals along the borders of Everglades National Park (L-31W, L-29, C-111) using mainly electrofishing.



Justification

Early detection of new invasive species and detection outside of ENP allows for the greatest opportunity for successful control and possible prevention of the establishment of breeding populations within the parks.



Everglades National Park

Exotic Animal Program

Skip Snow



Invasive Species Programs

- **Burmese Pythons in South Florida: Scientific Support for Invasive Species Management**
- **Description:** The purpose of this project is to provide science support to develop control measures for Burmese pythons (*Python molurus bivittatus*) and to evaluate impacts of pythons on native biological diversity. Four areas of study are being investigated: (1) radio telemetry and habitat utilization, (2) gut content analysis, (3) thermal biology, and (4) trap development.
- **Objective:** To contain and control invasive exotic snakes throughout South Florida.
- **Partners:** USNPS, USGS, USFWS, SFWMD, UF, Davidson College
- **Start/End Dates:** Dec 2005 – ongoing pending funding
- **Status:** Ongoing
- **Funding (FY):** USNPS (only) FY08 \$128,700 (not including staff time)
- **Project Highlights (see poster or UF factsheet for details)**
 - Gut content analysis has yielded 14 species of mammals, 24 species of birds, and 1 reptile; including the federally endangered Key Largo woodrat and a juvenile wood stork.
 - Telemetered pythons made long movements (up to 78 Km), especially during periods of high water, showing tremendous dispersal abilities.
 - Experimental trap testing underway in ENP.
 - Two prototype trap designs deployed in the field.

Trap Development



Python Diet – Juvenile Wood Stork



Invasive Species Programs

- Invasive Species Education and Outreach
- **Description:** The publication and distribution of information and educational materials intended to inform our community about the impacts of invasive exotic species in the south Florida region and to encourage responsible actions to prevent further release and spread.
- **Objective:** To prevent the release and spread of invasive exotic species throughout South Florida.
- **Partners:** USNPS, FPL/SFNPTTrust, FWC, Ferris Greeney Foundation
- **Start/End Dates:** Oct 2006 – 2008 (pending funding)
- **Status:** Ongoing
- **Funding:** USNPS, grants, donations \$56,306 (not including staff time)
- **Project Highlights:**
 - Don't Let It Loose curriculum guide, 226 teachers trained.
 - Electronic Field Trip, over 12,000 participants in first year.
 - 4,000 Burmese python factsheets (ENP version)
 - 10,000 Don't Let It Loose stickers.
 - 436,000 Florida Invaders newspaper insert.
 - FloridaInvaders.org website

Captain Python Goes to DC



Needs and Opportunities

- Python trap development and field implementation studies
- Python population assessments on periphery of known range
- Establishment of a state-wide toll free number and web site for pet disposal
- Develop public relation campaign and a regional rapid response team for Florida Keys
- Eradication of Boa Constrictor on and around Deering Estate

Pet Amnesty Day and Others



Priority Animal Species

• Priority Animals

Feral Pig (*Sus scrofa*)

Purple Swamphen (*Porphyrio porphyrio*)

Sacred Ibis (*Threskiornis aethiopicus*)

Large Constrictors (ROCs and *Boa constrictor*)

Monitor Lizards (*Varanus spp.*)

Tegu Lizards (*Tupinambis spp.*)

Caiman (*Caiman crocodilus*)

European Starling (*Sturnus vulgaris*) - localized concern in pine rocklands

Common Myna (*Acridotheres tristis*) – localized concern in pine rocklands

• Newly Detected Animal Species

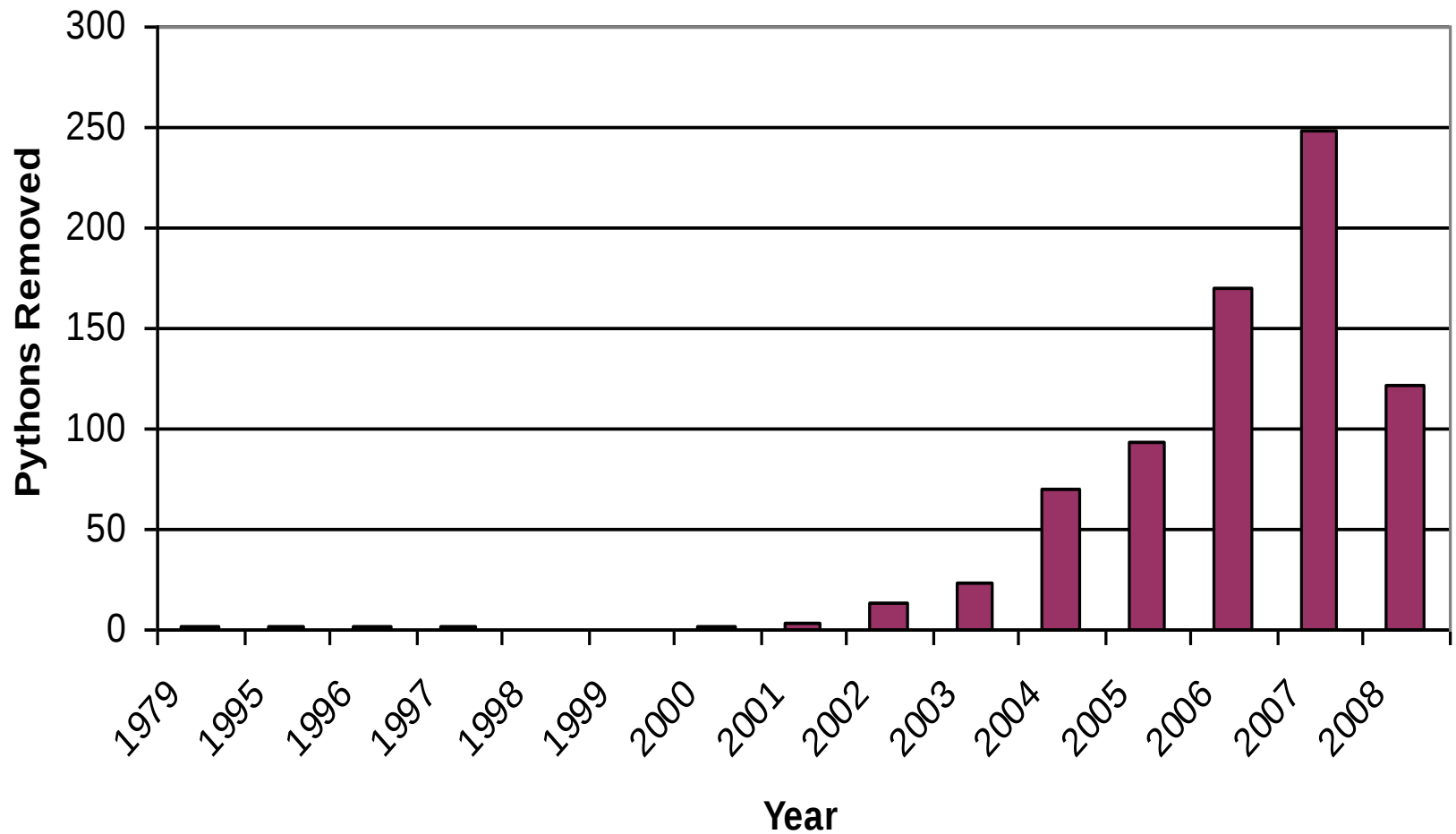
Gold Tegu (*Tupinambis teguixin*) – in park

Nile Monitor (*Varanus niloticus*) – nearby

Newly Detected Animal Species



Accounting



Monitoring Hot Spots L-29



Monitoring Hot Spots L-29

32 pythons removed from 5 miles of canal bank; 11 m, 21 f
About 826 pounds of pythons.



Future

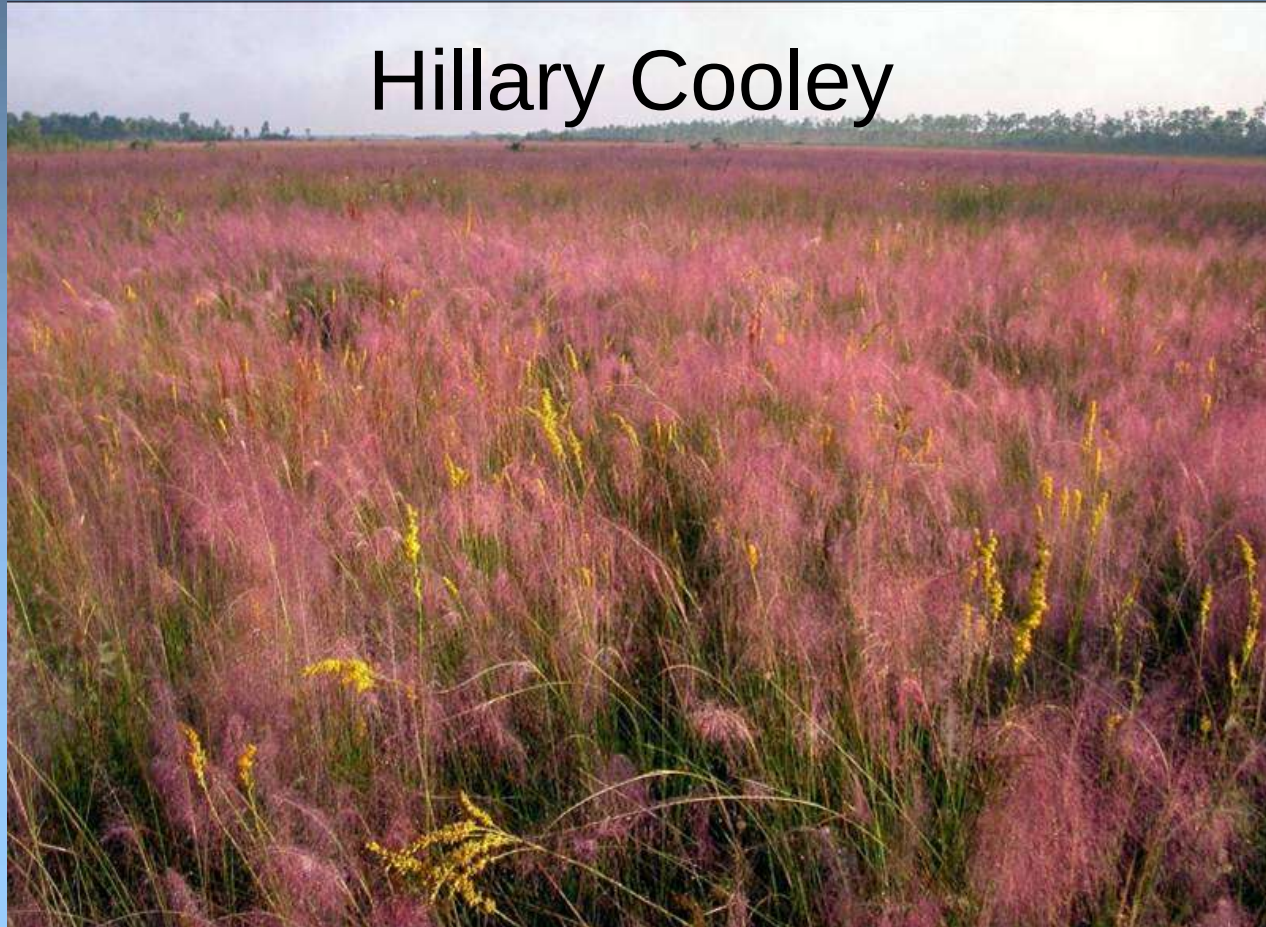
Organized surveillance of a sampling of South Florida habitat sharing the characteristics and timing as informed by the Hot Spot experience (L-29, L-67x, C-110, and others).

- Look in similar places at similar times
- GIS analysis to help find or refine those places
- Use organized volunteers as well as staff



Everglades National Park Exotic Vegetation Management

Hillary Cooley



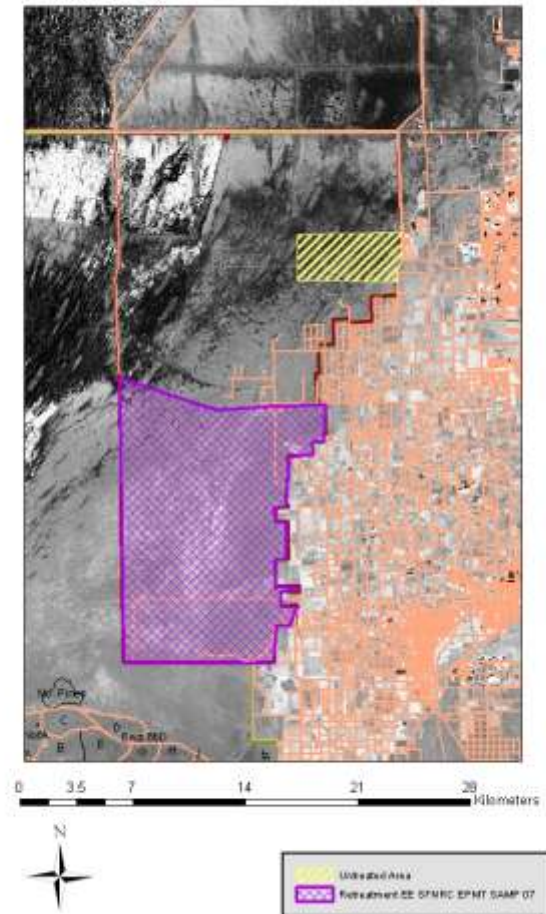
Everglades National Park Exotic Vegetation Management

- **East Everglades Acquisition Area**
 - **Re-treatment of melaleuca and Australian pine**
- Description
 - Re-treat melaleuca and Australian pine using chemical, mechanical and biological controls
- Objective
 - Follow-up on initial treatment of melaleuca and Australian pine
- Partners
 - Re-treatment- EVER-SFNRC (FY2007-\$340,000)
 - Initial treatment- FDEP, SFWMD, DERM/SAMP, DERM/ACOE, ACOE, NPS-FLCEPMT, NPS-CCI, NPS-LWCF, BASF
- Start/End Dates
 - October 2007-January 2008
- Status
 - ongoing
- Funding (FY): Funding from NPS-EPMT, BASF and possibly from DERM/ACOE
- Annual Summary ~45,000 acres re-treated in FY2007

Everglades National Park Exotic Vegetation Management



East Everglades Acquisition Area



Everglades National Park Exotic Vegetation Management

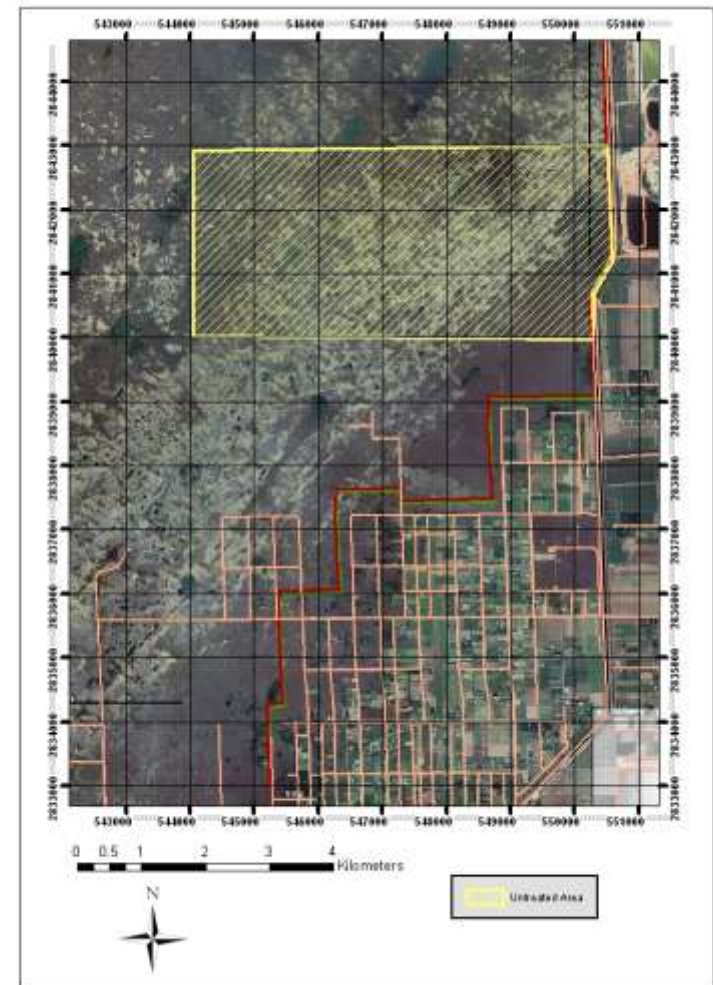
- **BASF Melaleuca Grant Project**
- Description
 - Re-treat melaleuca and Australian pine using chemical, mechanical and biological controls
- Objective
 - Follow-up on initial treatment of melaleuca and Australian pine
- Partners
 - BASF (\$27,000)
- Start/End Dates
 - July 14, 2008-present
- Status
 - ongoing
- Funding (FY):
- Annual Summary:
- ongoing



Everglades National Park Exotic Vegetation Management



BASF Project Area



Everglades National Park Exotic Vegetation Management

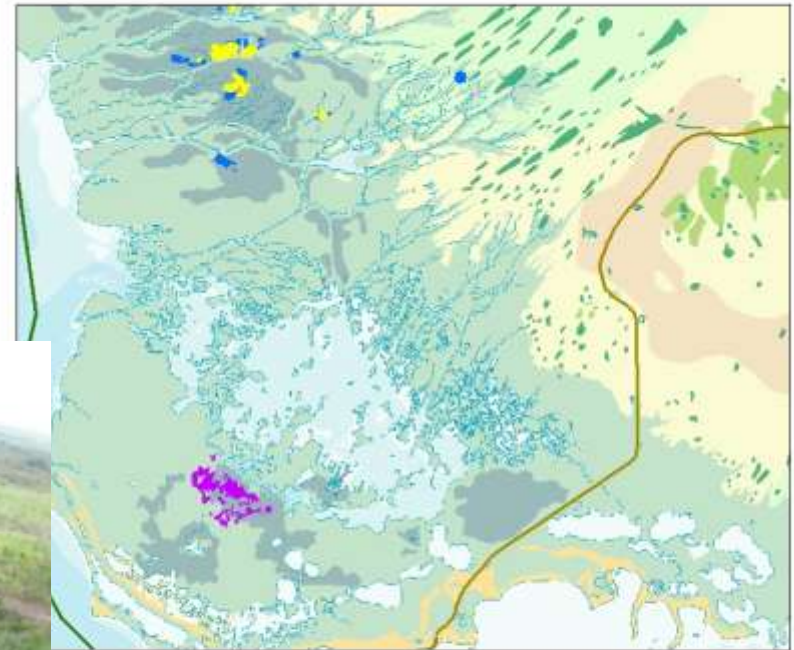
- **Lygodium Aerial Spray-Cape Sable**
- Description
 - Treat *Lygodium microphyllum*
- Objective
 - Keep *Lygodium microphyllum* from increasing in the area it covers within Everglades National Park
- Partners
 - FDEP, SFWMD
- Start/End Dates
 - June 24, 2008- June 29, 2008
- Status
 - ongoing
- Funding (FY): Not funded for FY2009
- Annual Summary
 - 1,300 acres treated in 2008 sprayed
 - (850 acres)



Everglades National Park Exotic Vegetation Management



**Lygodium treatment
in Everglades National Park**



0 10,000 20,000 40,000 Meters



Legend

- 2006 Treatment Area
- 2007 Treatment Area
- 2008 Treatment Area

Priority Plant Species

- **Priority Plants**

- All FLEPPC 2007 category I and II
(Top *Melaleuca quinquenervia*, *Casuarina equisetifolis*, *Lygodium microphyllum*, *Schinus terebinthifolius*, *Thespesia populnea*, *Colubrina asiatica*)

- **Newly Detected Plant Species**

- *Phymatosorus scolopendria* (serpent fern)
Cyrtopodium polyphyllum and additional areas of *Lygodium microphyllum*

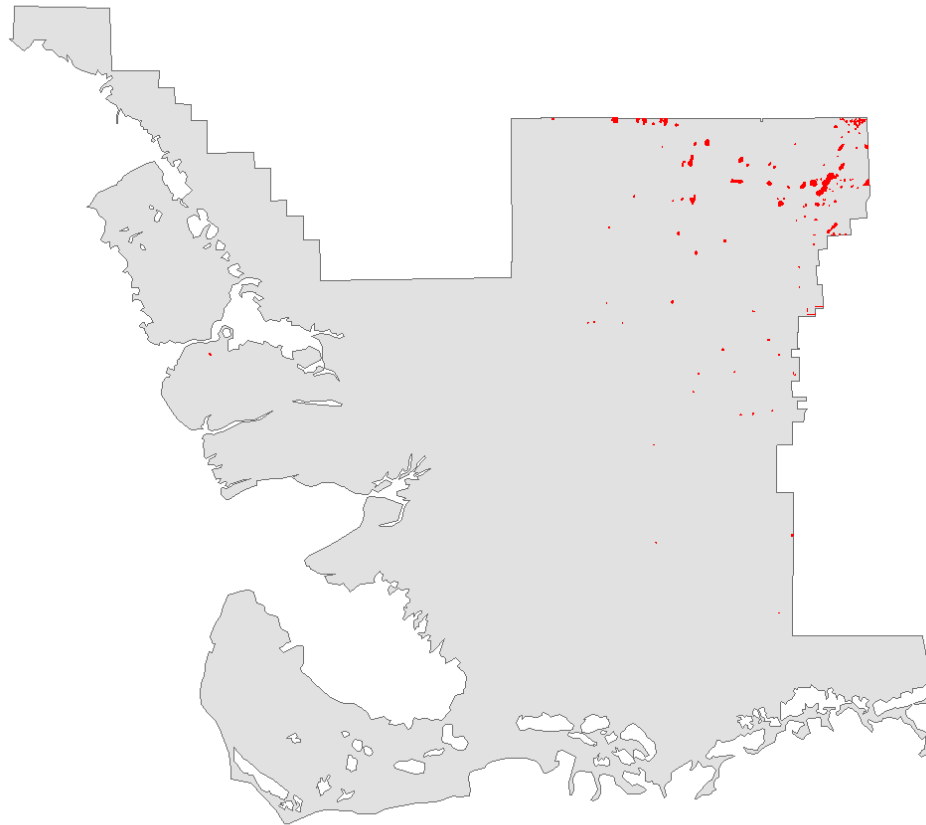
Monitoring

- SRF Digital Sketch maps, FLCEPMT plots and Fire Effects plots



Digital Aerial Sketch Mapping

Everglades National Park

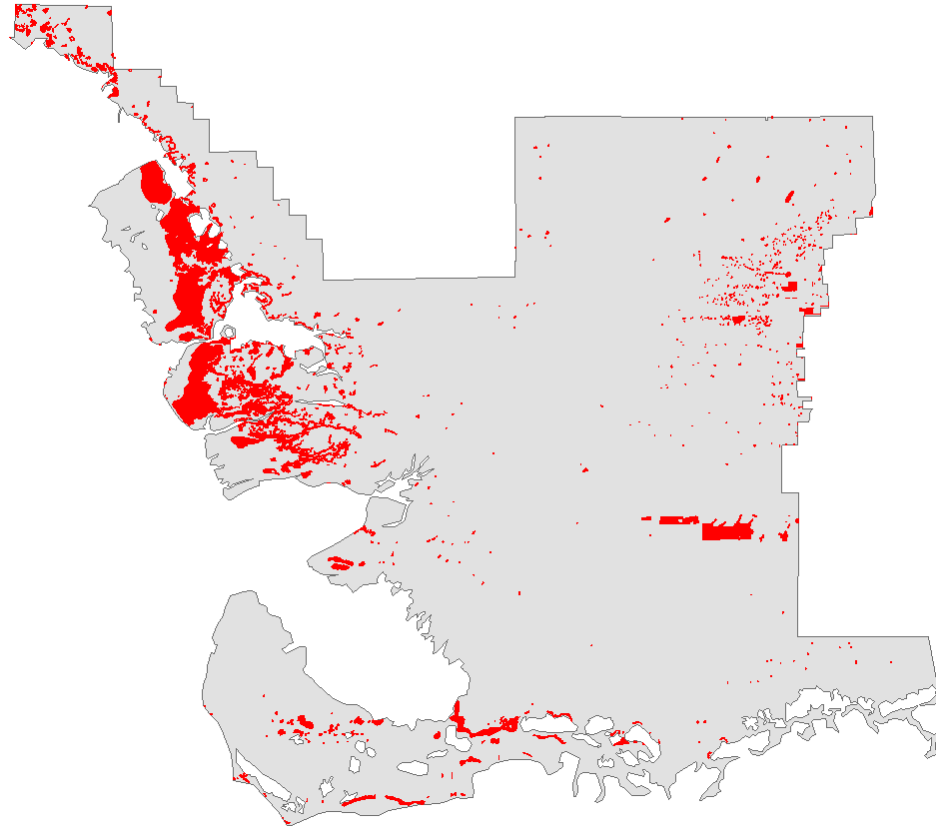


Melaleuca

Coverage Class	Acres
High	14
Medium	1395
Low	885
Total	2294

Digital Aerial Sketch Mapping

Everglades National Park

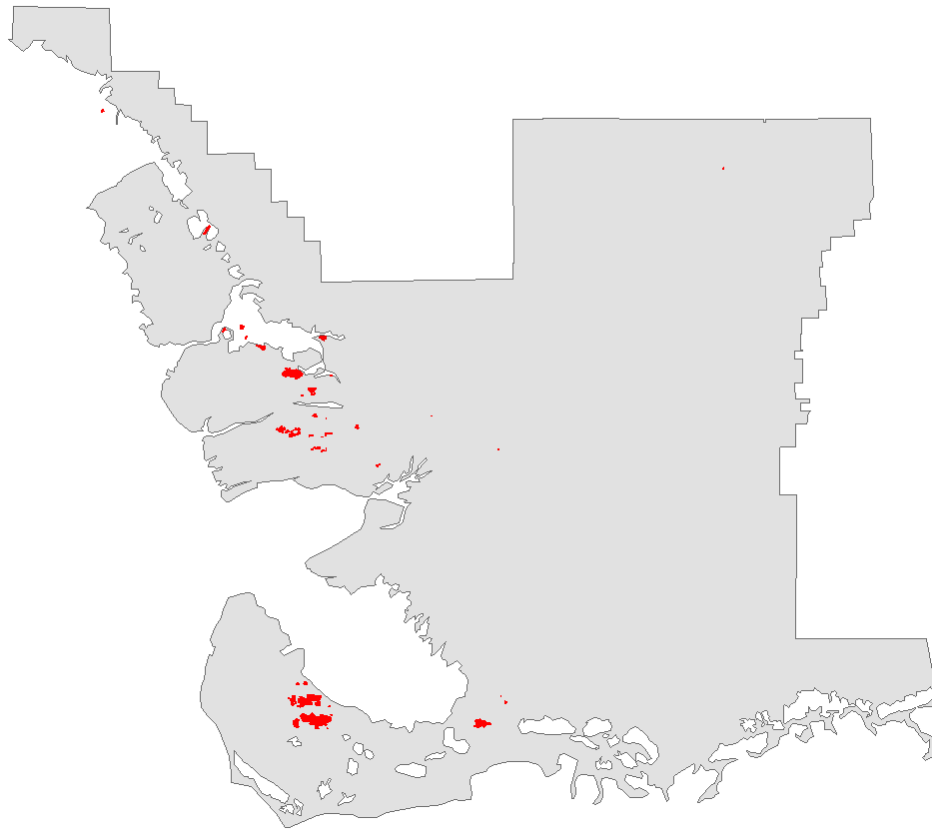


Brazilian Pepper

Coverage Class	Acres
High	7793
Medium	28494
Low	1089
Total	37376

Digital Aerial Sketch Mapping

Everglades National Park



Old World Climbing Fern

<u>Coverage Class</u>	<u>Acres</u>
High	190
Medium	2184
Low	54
Total	2428

Digital Aerial Sketch Mapping

Everglades National Park

Legend

- Australian Pine
- Burma Reed
- Napier Grass
- Everglades Natl Park Boundary



Australian Pine

Coverage Class	Acres
High	57
Medium	363
Low	411
Total	831

Burma Reed

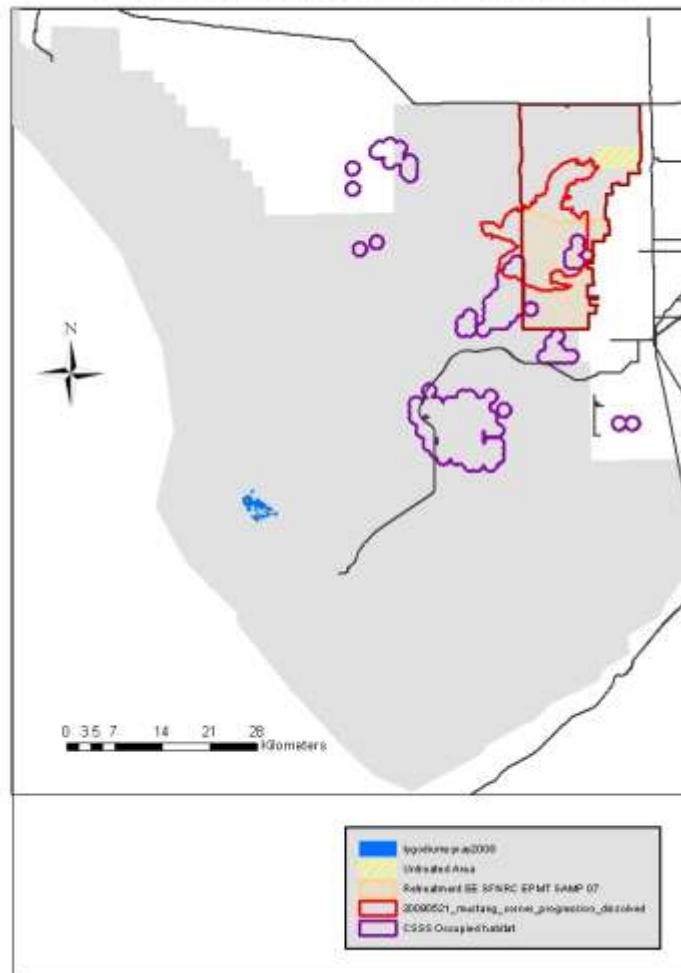
Coverage Class	Acres
High	30
Medium	60
Low	
Total	90

Napier grass

Coverage Class	Acres
High	25
Medium	207
Low	
Total	232

Fiscal Year Treatments: FY 2008 and FY2009

FY2008 and FY2009 Projects



- FY2008-still planned-
East Everglades
initial and re-
treatment
-FLCEPMT
(\$148,081)
-SAMP/DERM
(\$54,752)

FY2009-Still
unknown-possible
MOA with Miami-
Dade/ACOE