



# Invasive Exotic Species in the Northern Everglades: A Regional Perspective

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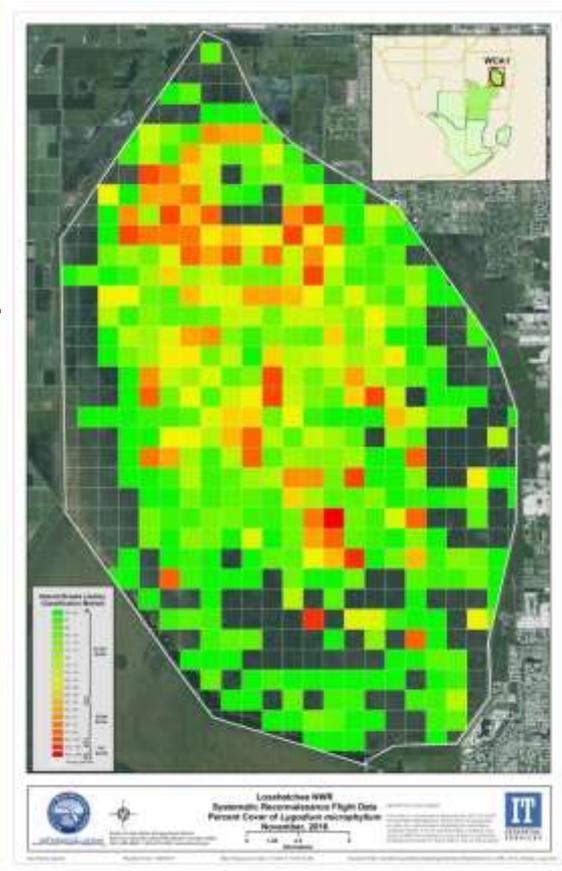
# Challenges w/ Invasive Exotic Control

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- **Northern Everglades is susceptible**
- **Access requires specialized equipment/crews**
- **Dynamic water levels**
- **Funding**



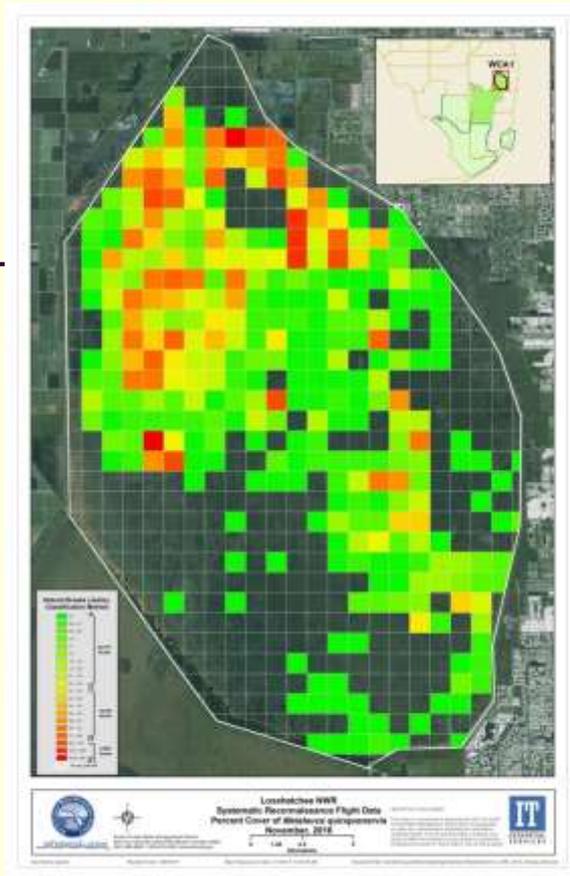
# *Lygodium microphyllum*



- 102,000 acres or 71% with *Lygodium* present.
- 87,000 acres or 60% of the Refuge in 'light' category for *Lygodium*.



# Melaleuca quinquenervia



- **79,000 acres or 55% with *Melaleuca* present.**
- **62,000 acres or 43% of the Refuge in 'light' category for *Melaleuca*.**



# Integrated Control Methods

- Chemical
  - Aerial & Ground
- Mechanical
  - 'Cookie Cutter'
- Fire
- Biological



# Biocontrol



- CERP
  - USDA
- Biocontrols
  - Brown lygodium moth & mite (over 600,000 released since 2014)
  - Melaleuca psyllid, weevil, gall fly
- Tool only

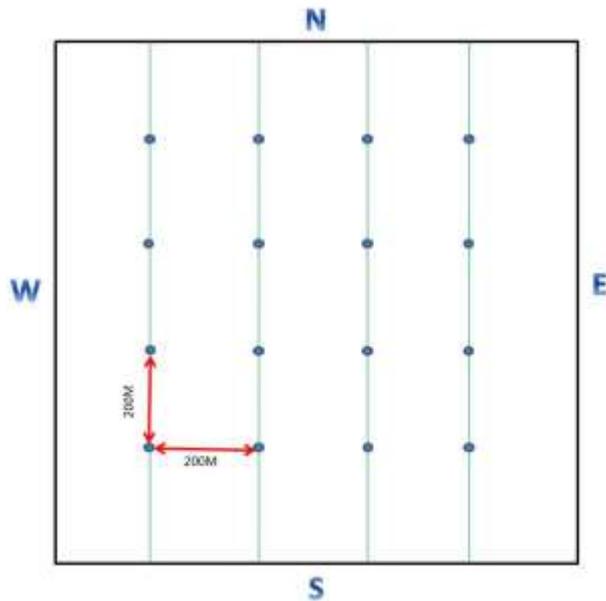
# Lygodium Moth Damage

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# Research & Best Control Technologies

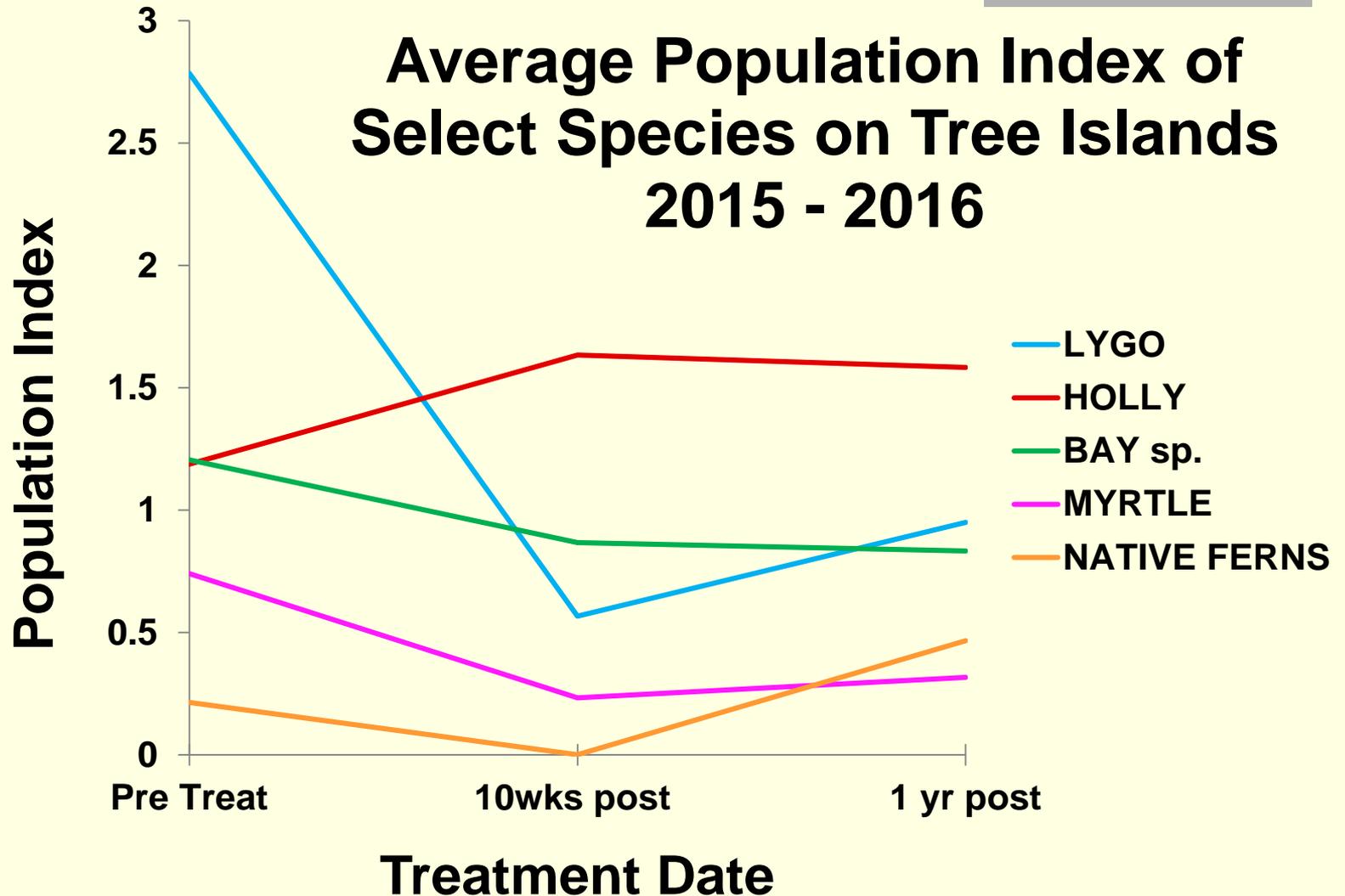
Category	Percentage	Description
0	0	no live plants
1	.1 - 5.0	very sparse
2	6.0 - 15.0	sparse
3	16.0 - 25.0	moderate
4	26.0 - 50.0	high
5	51.0 - 75.0	very high
6	76.0 - 100.0	uniformly present



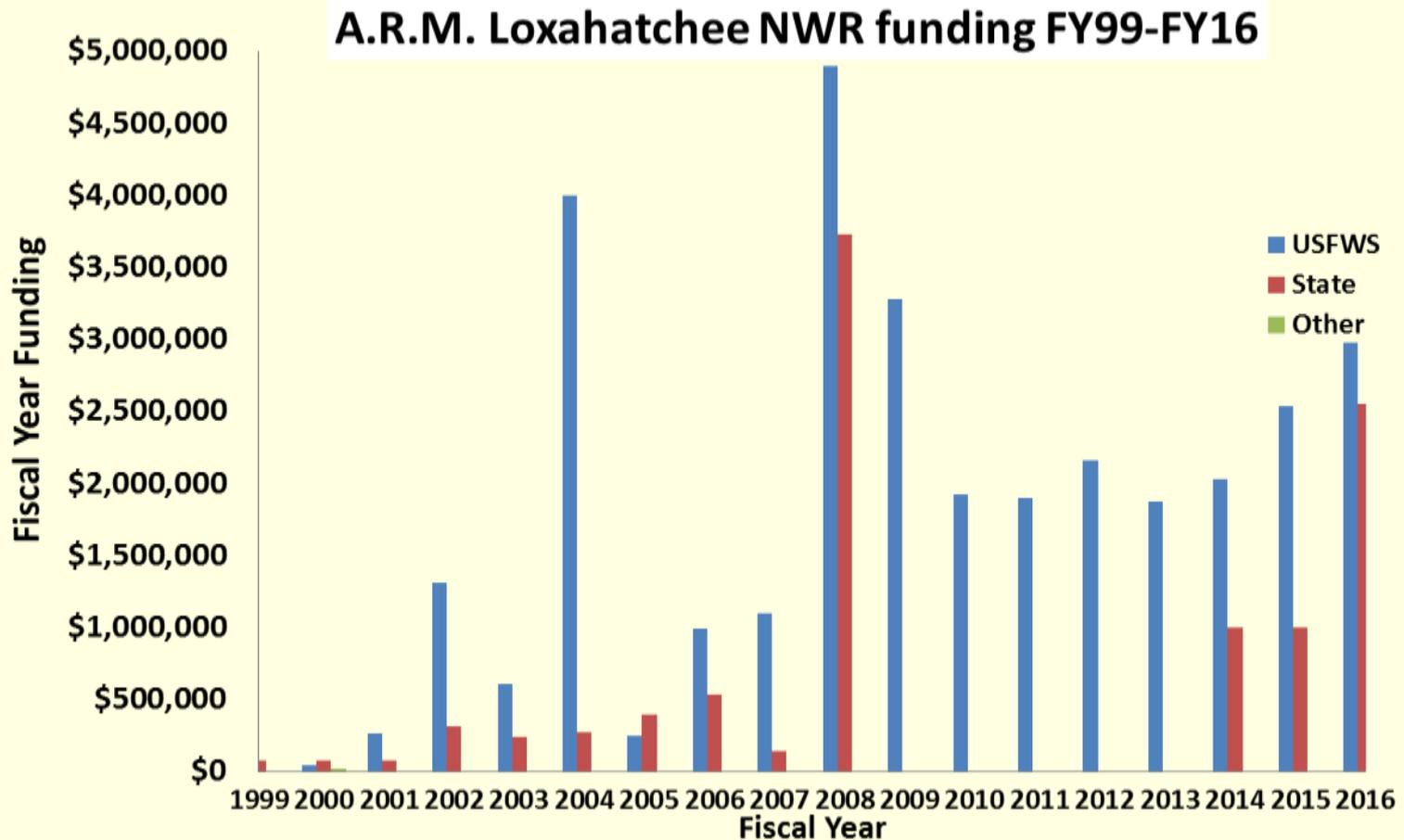
**Ecology ???**  
**Cost effective \$\$\$**

Figure 1: 16 survey points along 4 transects in each 247 acre cell.

# Research & Best Control Technologies



# Invasive Plant Control Funding

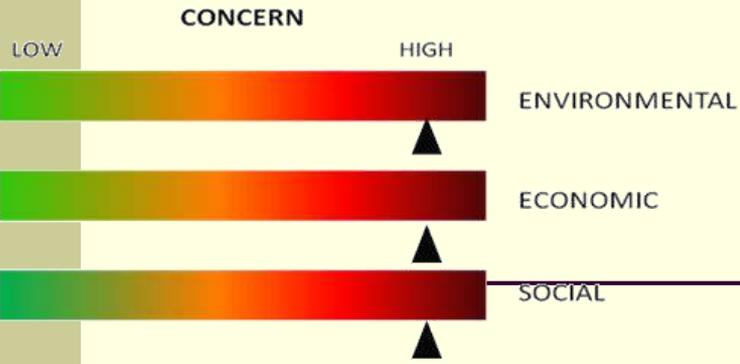


# Plant Funding \$\$\$

- **Estimate need of \$5 million for 5 years and \$3 million each year thereafter for maintenance control of Melaleuca and Lygodium.**
- **2000 - 2016**
  - **USFWS has allocated \$32,127,095 for exotics treatments.**
- **Since 2002, USFWS has treated 425,319 acres.**
- **In 2015, the USFWS allocated \$2,532,332 to exotic contracts out of a total budget of \$5,237,411 (48%).**
- **In 2016, USFWS spent \$2,973,378 for control of priority invasives (Melaleuca and Lygodium).**



# Pythons

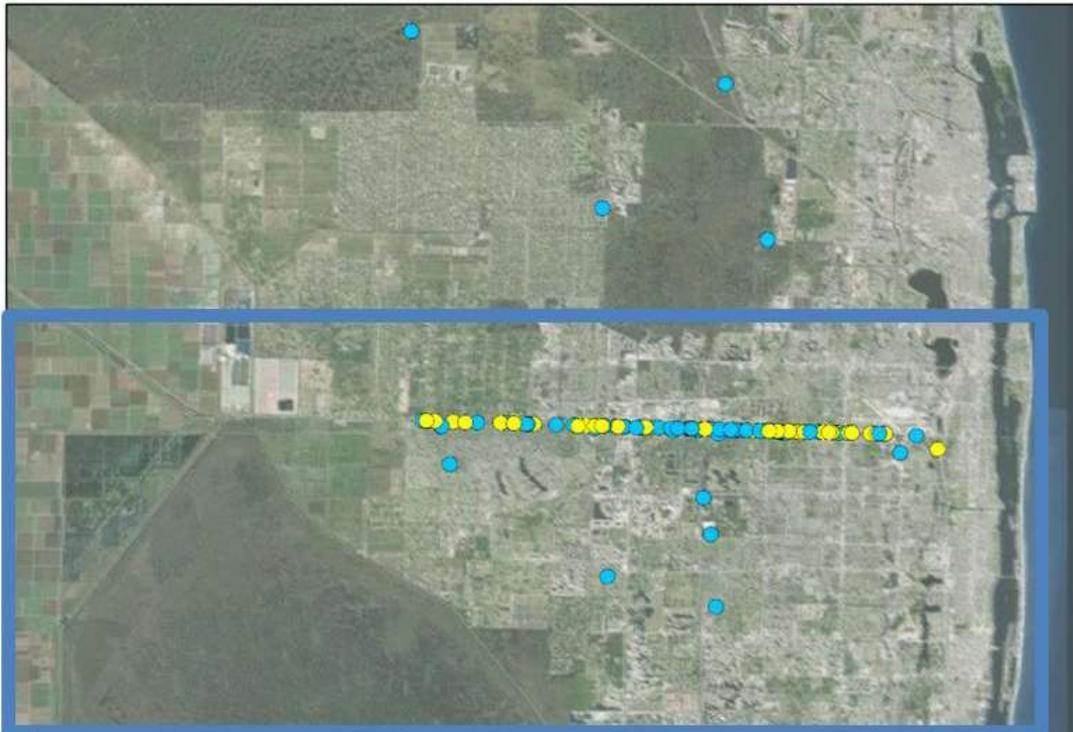


# Python Prey

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<http://myfwc.com/wildlifehabitats/profiles/>



- Interagency Nile monitor management workshop - 4/6/16
- Contain and eradicate
- Levee clearing



Arthur R. Marshall  
Loxahatchee  
National Wildlife  
Refuge



- Removals
- Observations

Source: USFWS 2016

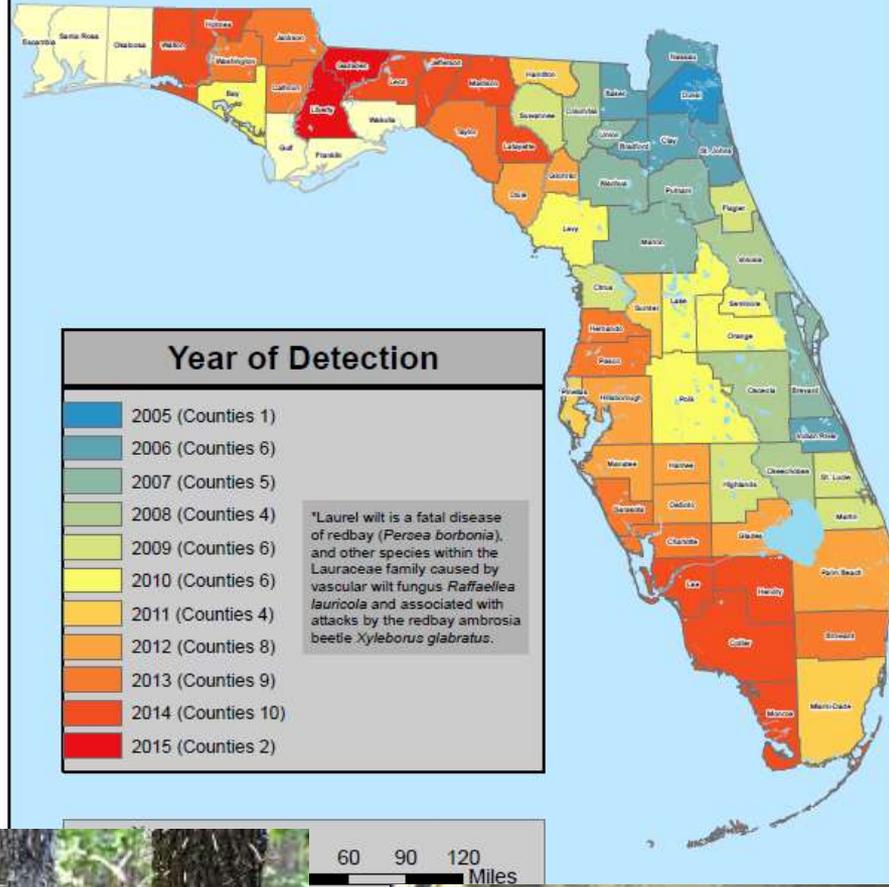
Source: Esri, DigitalGlobe, GeoEye, USDA, USGS, AeroGRID, IGN, USFWS, Aerial, User Contributed



# Laurel Wilt - A.R.M. Loxahatchee NWR



# Distribution of Counties with Laurel Wilt Disease\* by Year of Initial Detection (Florida)



# Early Stages of Recovery

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# Early Stages of Recovery

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***THANK YOU!!***

