



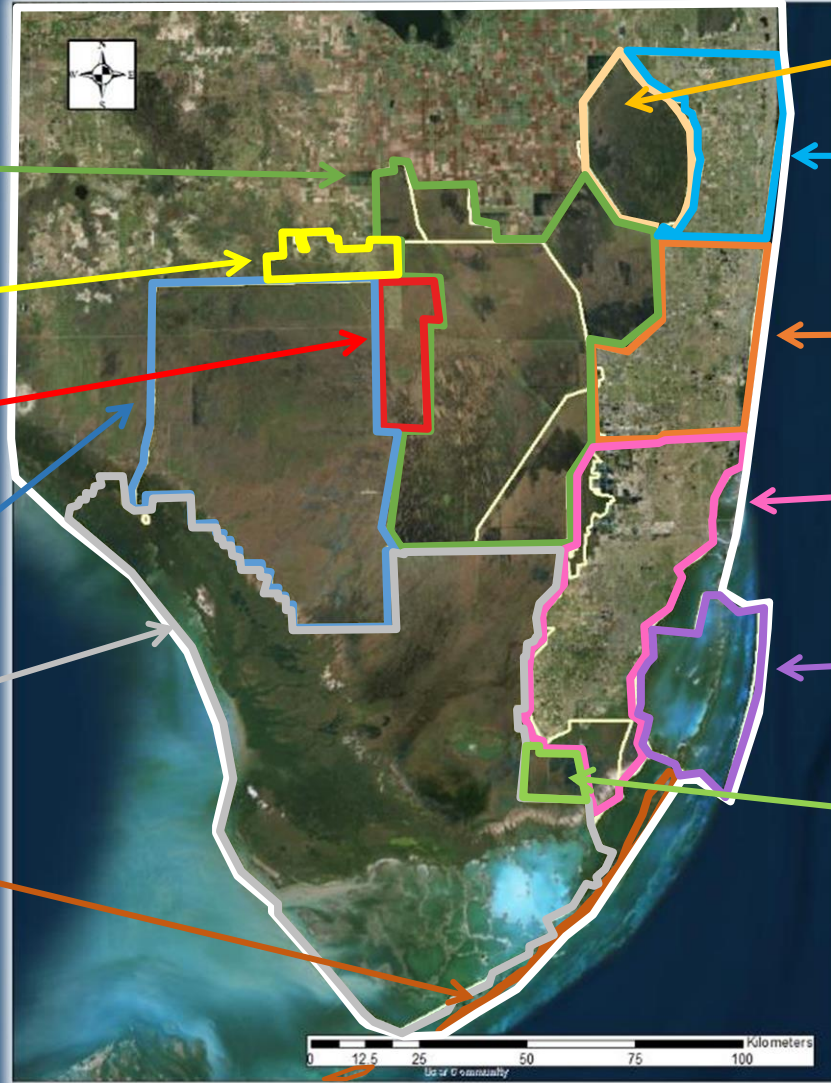
# Invasive Plant Operations Overview

Elena Suarez, Broward Co.  
Hillary Cooley, NPS  
Amy Peters, SFWMD  
Jimmy Lange, Fairchild  
Brendon Hession, SFWMD

21<sup>st</sup> Annual Summit

# ECISMA Footprint

South Florida Water Management District



USFWS-Loxahatchee

Palm Beach County

Broward County

Miami-Dade

Biscayne National Park

Southern Glades WEA

Everglades Complex  
Wildlife Management Areas

Big Cypress Reservation

Miccosukee Reservation

Big Cypress National Preserve

Everglades National Park

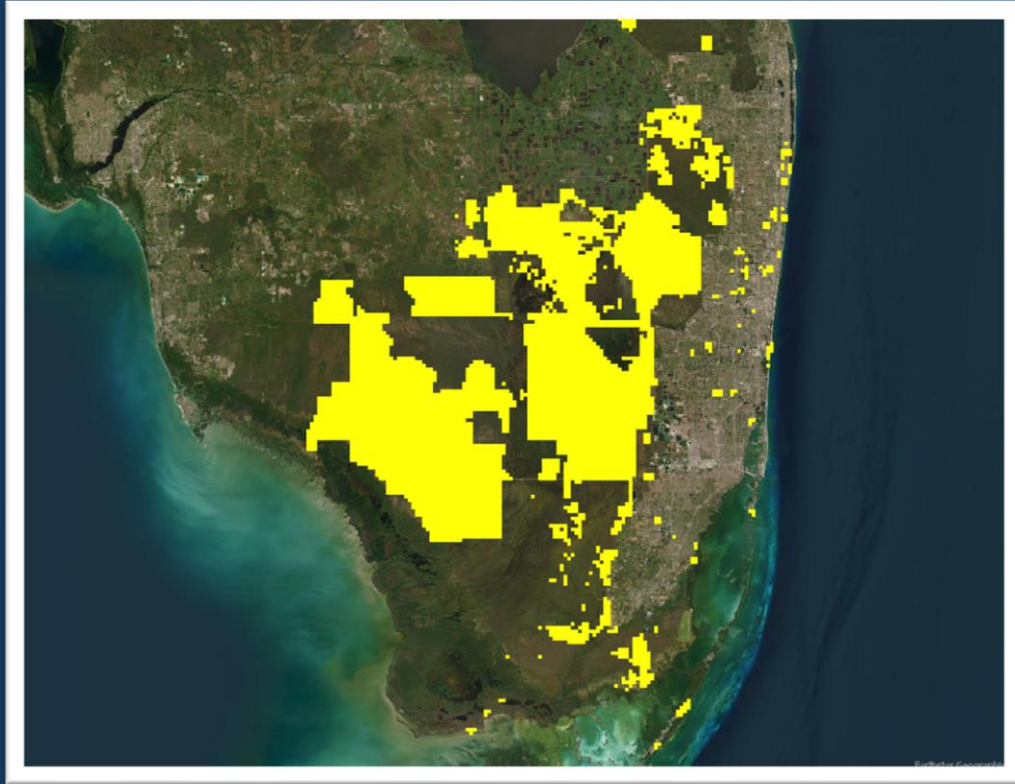
Monroe  
County



Everglades Cooperative Invasive Species Management Area

2023/2024

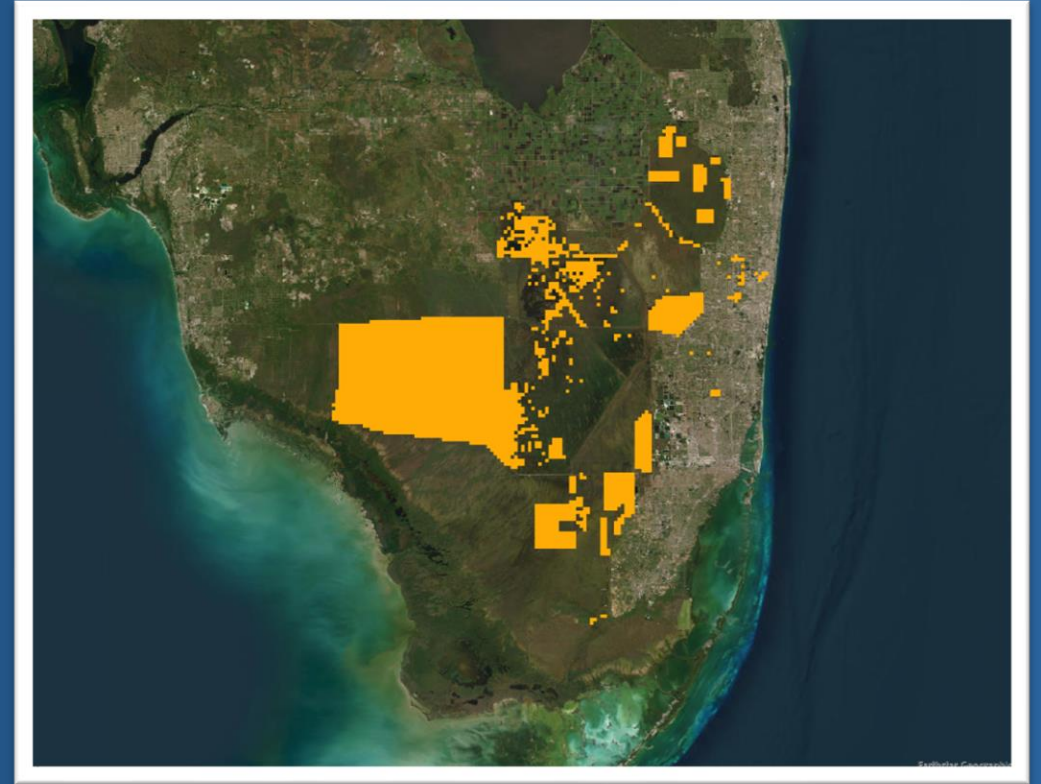
Combined Treatments: ALL SPECIES



1,185,705 acres

2024/2025

Proposed Treatments



518,339 acres



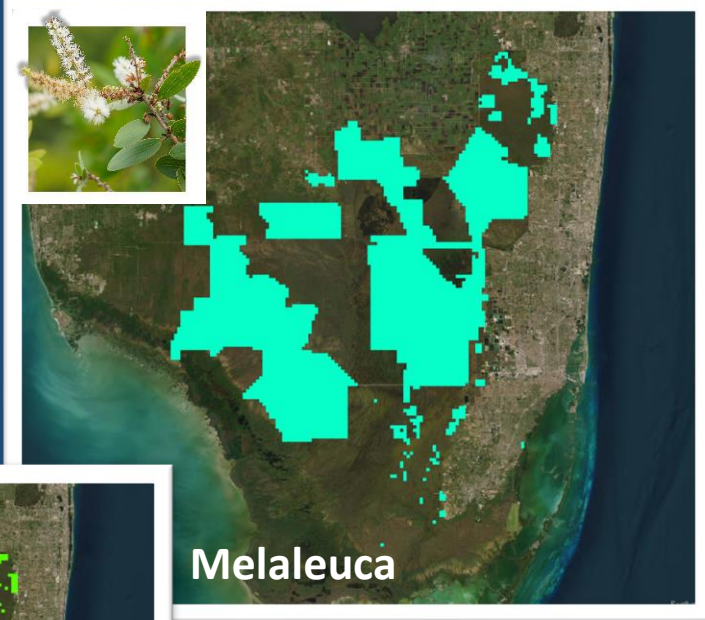
Everglades Cooperative Invasive Species Management Area

# 2023/2024 Combined Treatments



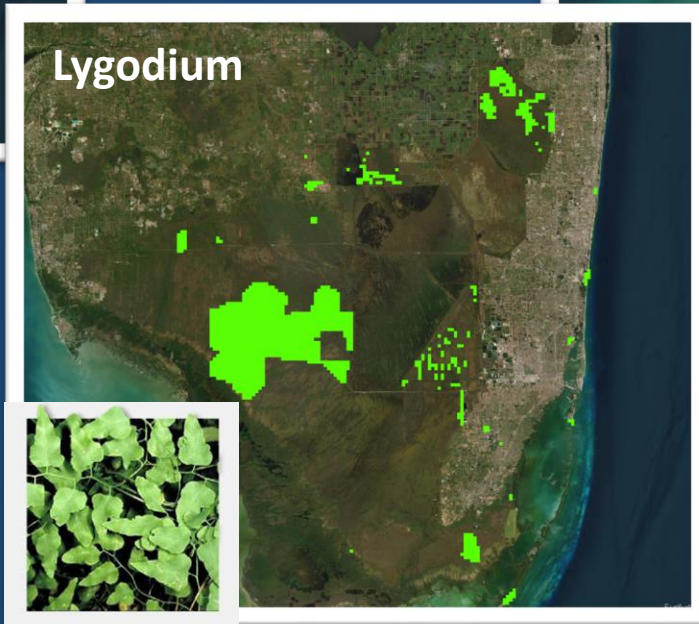
**Brazilian Pepper**

37,670 acres

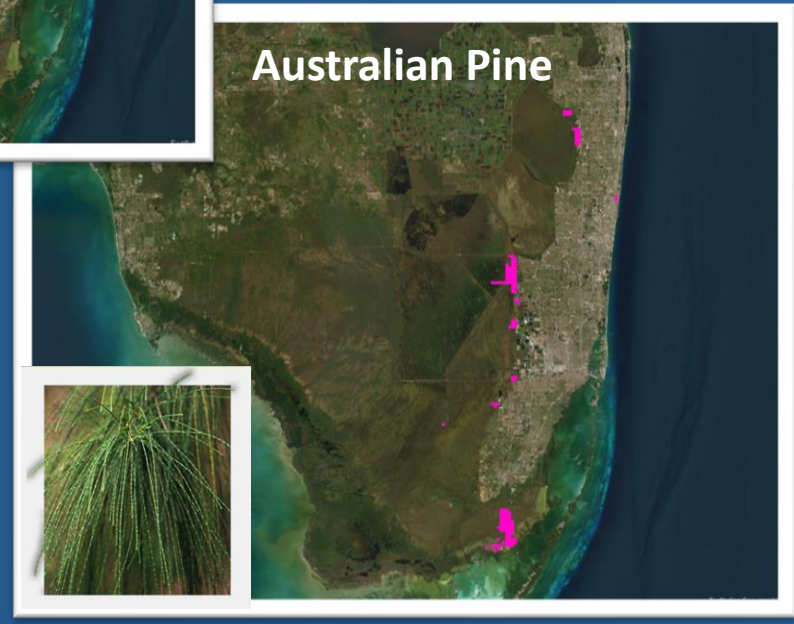


**Melaleuca**

940,683 acres



**Lygodium**



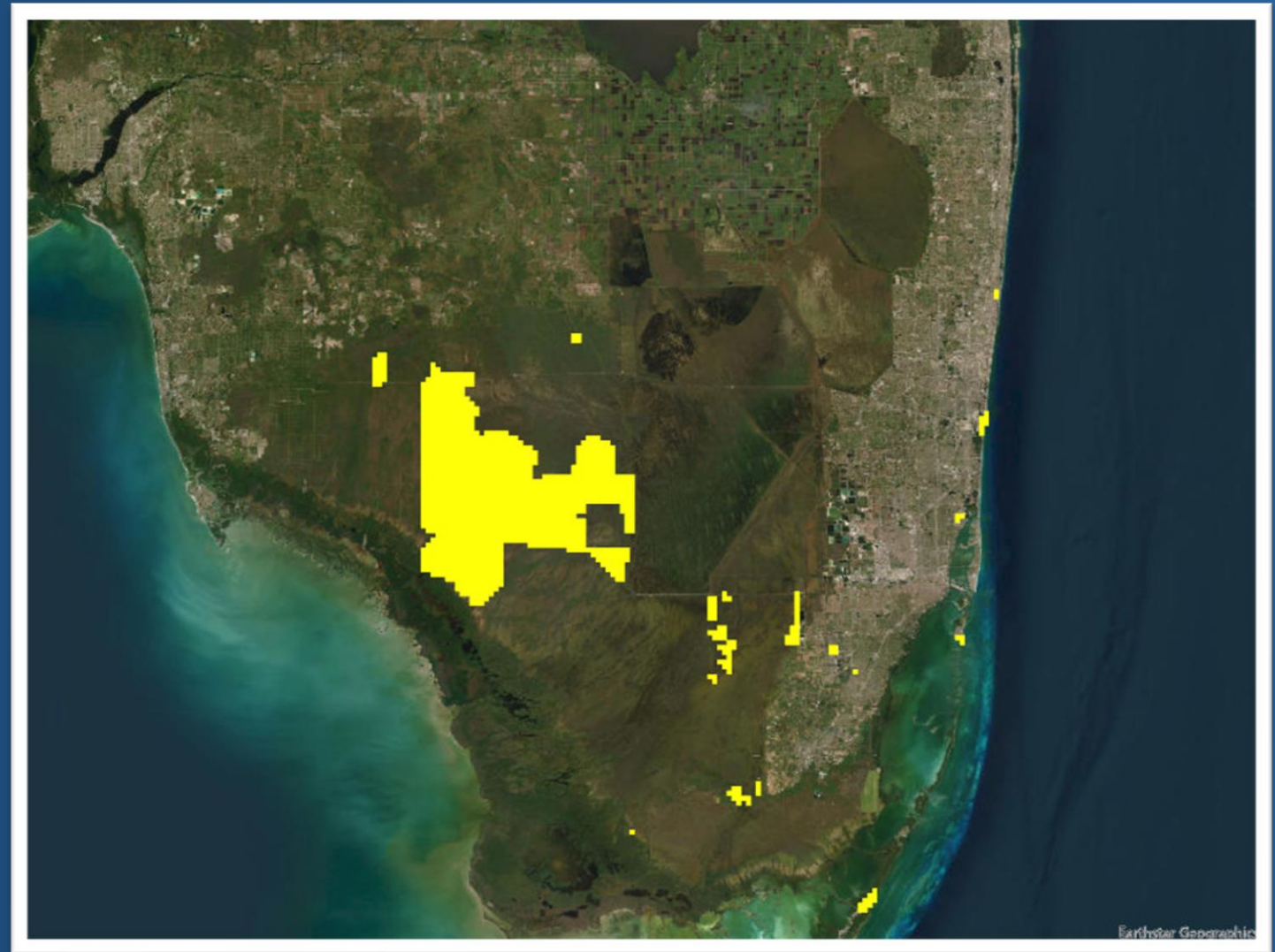
**Australian Pine**

6,052 acres



# 2023/2024 Treatments Florida Fish and Wildlife Conservation Commission Invasive Plant Management Section (IPMS)

Operations Update	
Acres Treated	37,260
Treatment Costs	\$5,390,000.00
Projects Funded	23



Everglades Cooperative Invasive Species Management Area

# 2023/2024 Treatments South Florida Water Management District

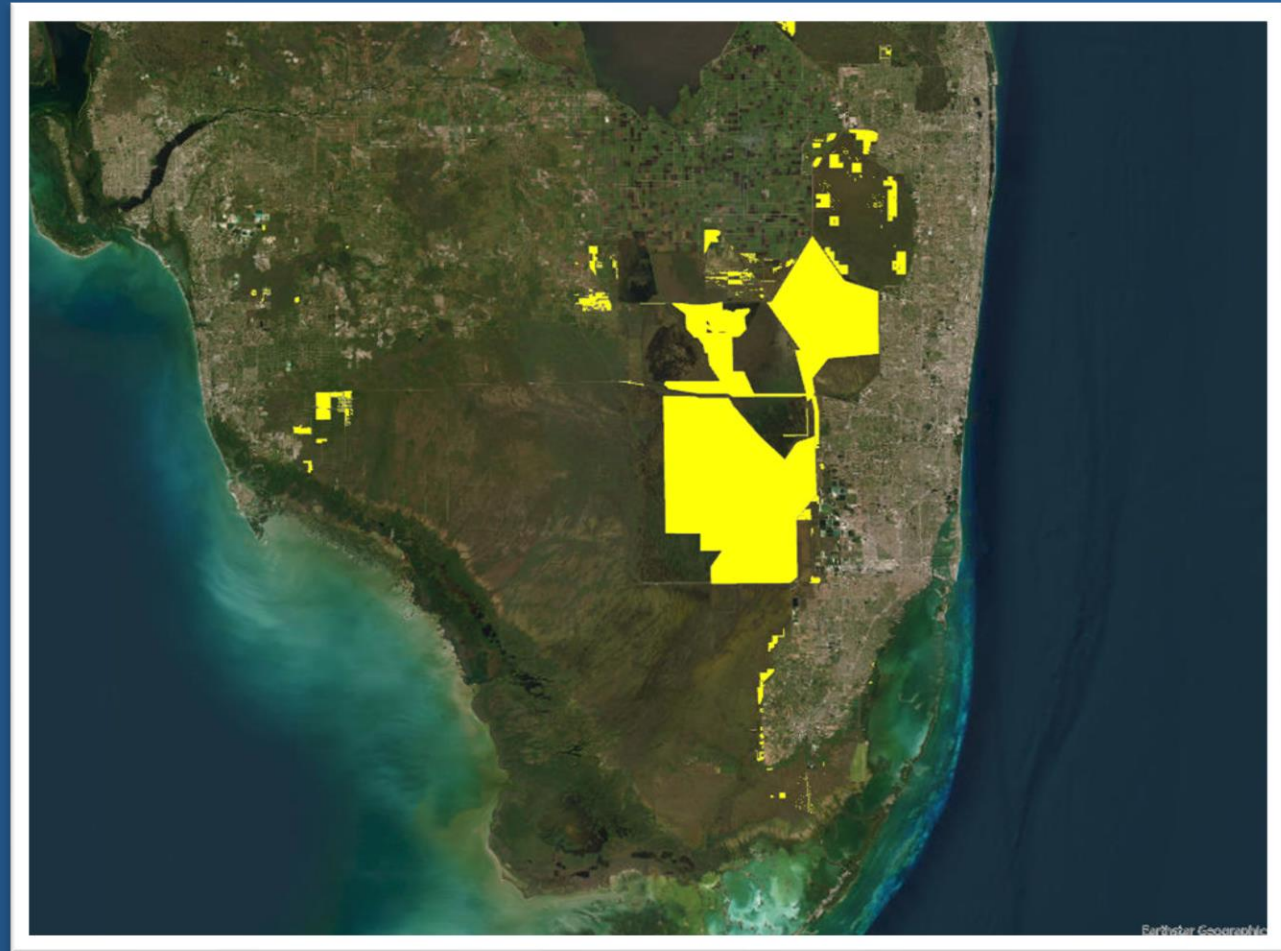
## Treatment Map

### Operations Update

 **Priority Species** Australian pine, Brazilian pepper, Cogongrass, Green hygro, Melaleuca, Mission grass, Napier grass, Old World climbing fern, Primrose willow, Roundleaf toothcup, Shoebutton ardisia, Torpedograss, West Indian marsh grass, Wright's nutrush, Crested floating heart

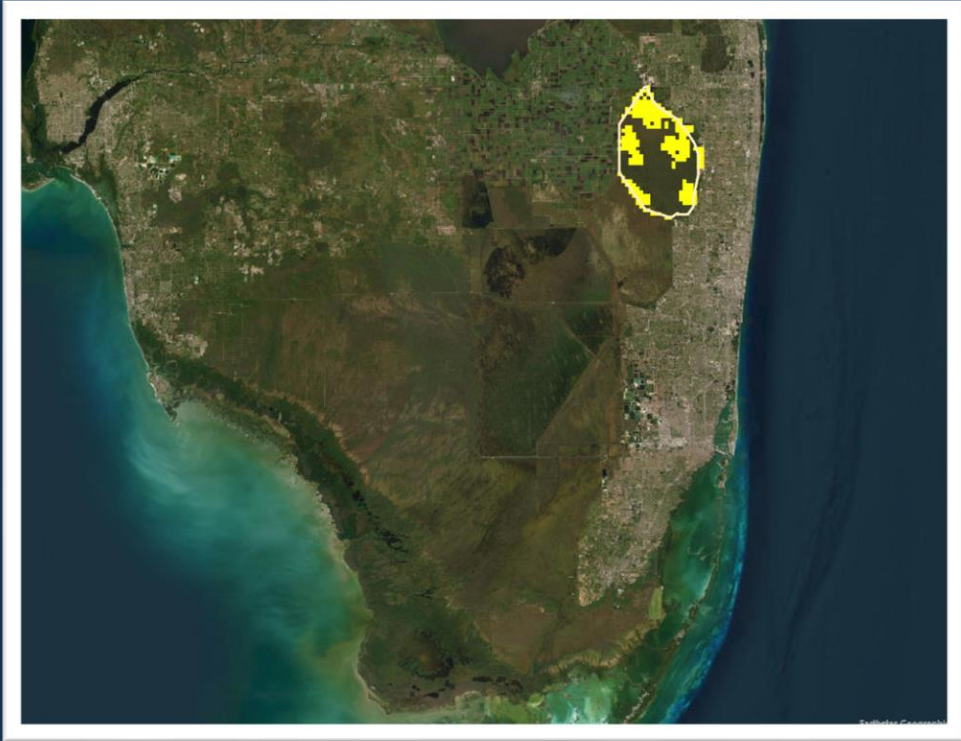
 **Acres Treated** 391,535

 **Treatment Costs** \$7,770,054







# 2023/2024 Treatments: Loxahatchee (USFWS)

## Treatment Map



## Operations Update

 <b>Priority Species</b> Bishopwood, Brazilian pepper, Carrotwood, Earleaf acacia, Java plum, Laurel fig, Melaleuca, Old World climbing fern, Scleria spp., Shoebutton ardisia, Surinam cherry, Turkey berry	<b>Other Target Species</b> Cuban bulrush, napier grass, water lettuce, Senegal date palm, rosary pea, climbing cassia, guava, giant brake fern, castor bean, Australian pine, arrowhead vine, elephant ear
 <b>Newly Detected Species</b>	Club begonia ( <i>Begonia cucullate</i> ), Cogon grass ( <i>Imperata cylindrica</i> )
 <b>Acres Treated</b>	1,991 ac
 <b>Treatment Costs</b>	\$323,984.60



## 2023/2024 Treatments: Loxahatchee (USFWS) - Highlight



American Conservation Experience (ACE) interns, Casey Bradley (left) and Jared Stroman (right) conducting invasive reptile monitoring at the Refuge



Everglades Cooperative Invasive Species Management Area

# 2023/2024 Treatments: Palm Beach County (ERM)

## Treatment Map

### Operations Update

#### Priority Species

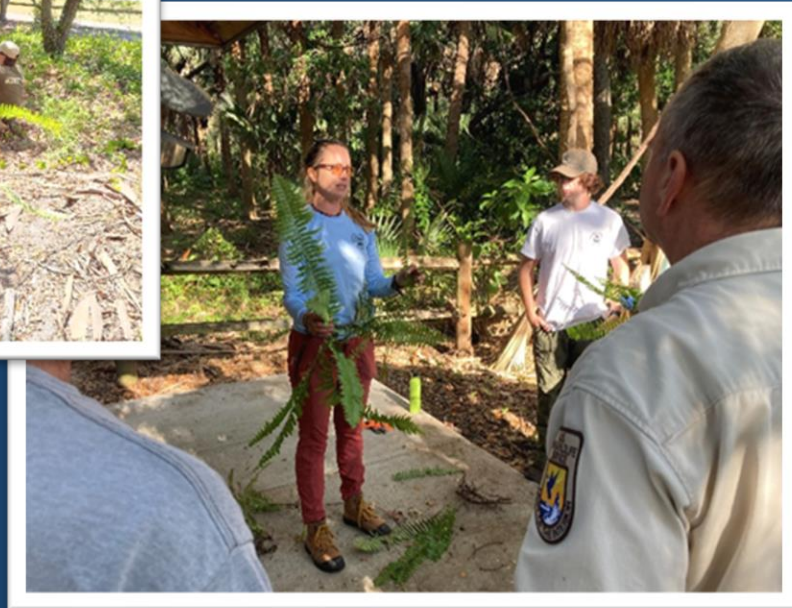
Air-potato, Areca palm, Arrowhead vine, Australian-pine, Balsam pear, Bishopwood, Brazilian pepper, Carrotwood, Chinese violet, Cogongrass, Earleaf acacia, Golden pothos, Hydrilla, Indian crabgrass, Java plum, Kalanchoe, Madagascar periwinkle, Melaleuca, Napiergrass, Natal grass, Old World climbing fern, Oyster-plant, Pangolagrass, Paragrass, Peruvian Primrosewillow, Pink tabebuia, Rosary pea, Seaside Mahoe, Shoebuttan ardisia, Showy rattlebox, Smooth rattlebox, Surinam cherry, Tropical girdlepod, Torpedograss, Umbrella tree, Yellow nutgrass

 EDRR Species  
West Indian marsh grass



# 2023/2024 Treatments: Palm Beach County (ERM) - Highlight




PBC ERM Hosted an ECISMA  
workday at Delray Oaks  
Natural Area



Everglades Cooperative Invasive Species Management Area

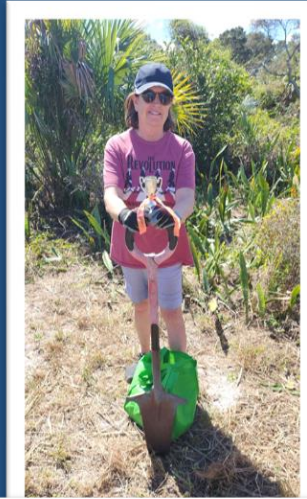
# 2023/2024 Treatments: Galaxy Sand Pine Scrub

## Treatment Map

Operations Update	
 <b>Priority Species</b>	Guinea grass, Ganges primrose, Mother of millions, Asparagus fern, Natal Grass, Shoebuttan ardisia, Balsam pear, Bowstring hemp, Rosary pea, Umbrella tree
 <b>Newly Detected Species</b>	Royal poinciana tree
 <b>Acres Treated</b>	7 ac



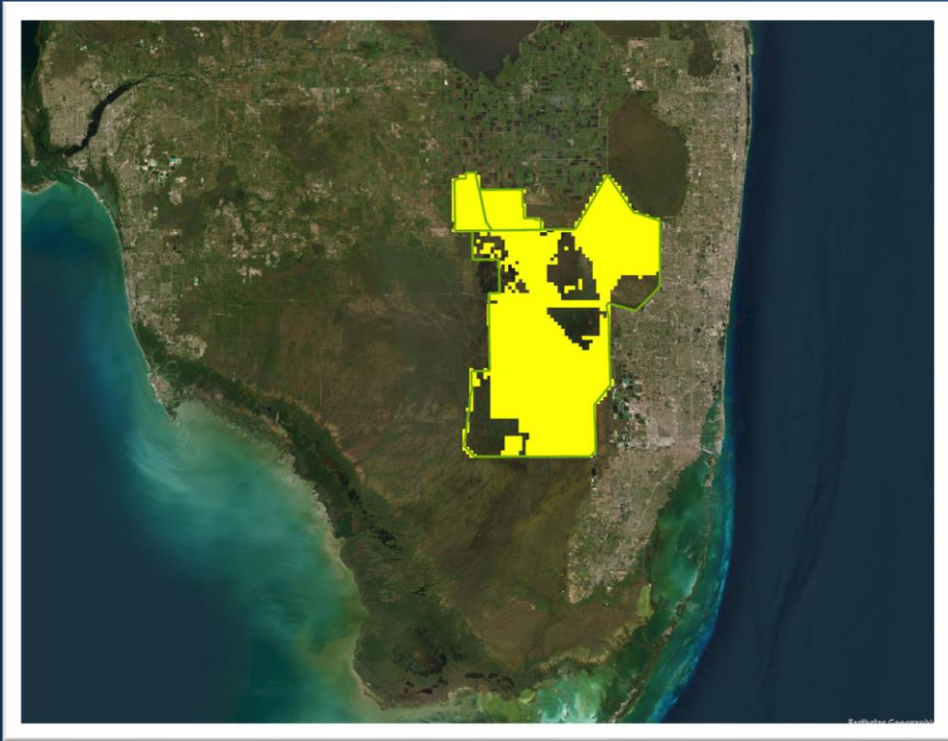
# 2023/2024 Treatments: Galaxy Sand Pine Scrub - Highlight







Everglades Cooperative Invasive Species Management Area

# 2023/2024 Treatments: FWC Everglades Complex Wildlife Management Areas (ECWMA)

## Treatment Map



## Operations Update

 <b>Priority Species</b>	Old World climbing fern, Brazilian pepper, Napier grass, Day jessamine, Arrowhead vine, Java plum, West Indian marsh grass, Para grass, Primrose willow, Melaleuca, Torpedograss, Cogongrass, Wild taro, Lantana, Cuban bulrush, Castor bean, Wright's nutrush
 <b>Other Target Species</b>	Sea-hibiscus
 <b>Acres Treated</b>	13,803 ac
 <b>Treatment Costs</b>	\$1,371,148.00



# 2023/2024 Treatments: FWC ECWMA - Highlight



Brazilian Pepper Thrip  
(*Pseudophyllothrips ichini*)



# 2023/2024 Treatments: Broward County

## Operations Update

### Priority Species

Air-potato, Areca palm, Arrowhead vine, Australian pine, Bishopwood, Black sage, Brazilian pepper, Carrotwood, Catclawvine, Earleaf acacia, Golden pothos, Inchplant, Jasmine spp., Java plum, Kalanchoe spp., Melaleuca spp., Old World climbing fern, Oysterplant, Rosary pea, Sewervine, Shoebuttan ardisia, Snake plant, Spurgecreeper, Surinam cherry, Umbrella tree, Winged yam

 Other Target Species  
Santa Maria, Seaside Mahoe



**Acres Treated**

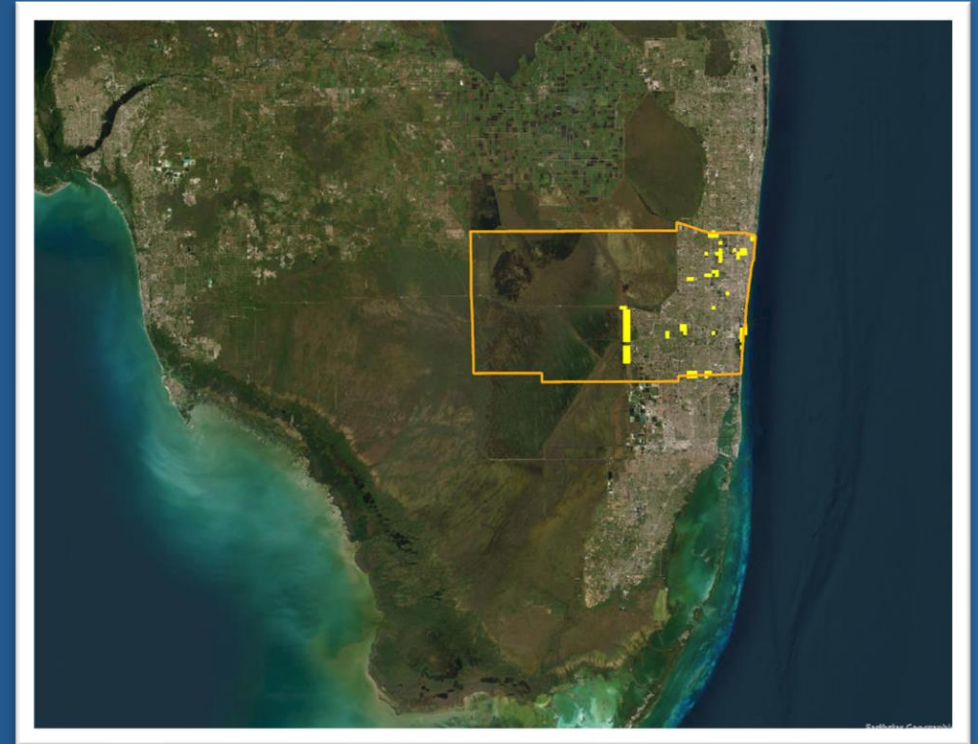
1248 ac



**Treatment Costs**

\$550,602.36

### Treatment Map





# 2023/2024 Treatments: Broward County - Highlight

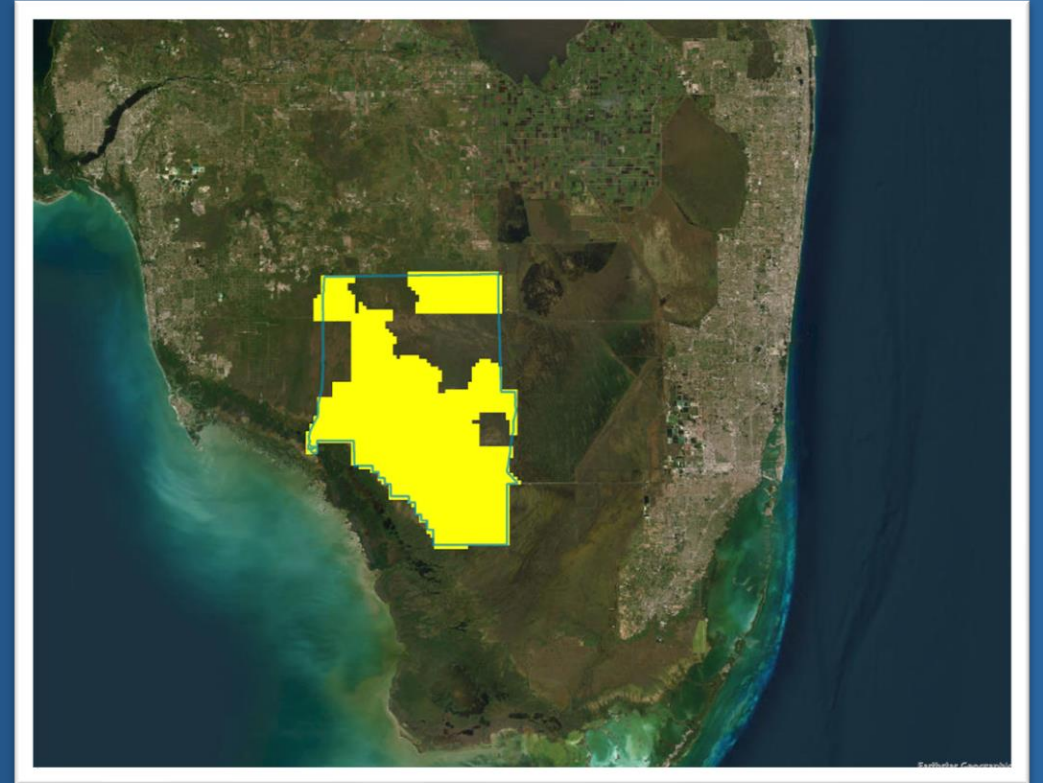


Everglades Cooperative Invasive Species Management Area

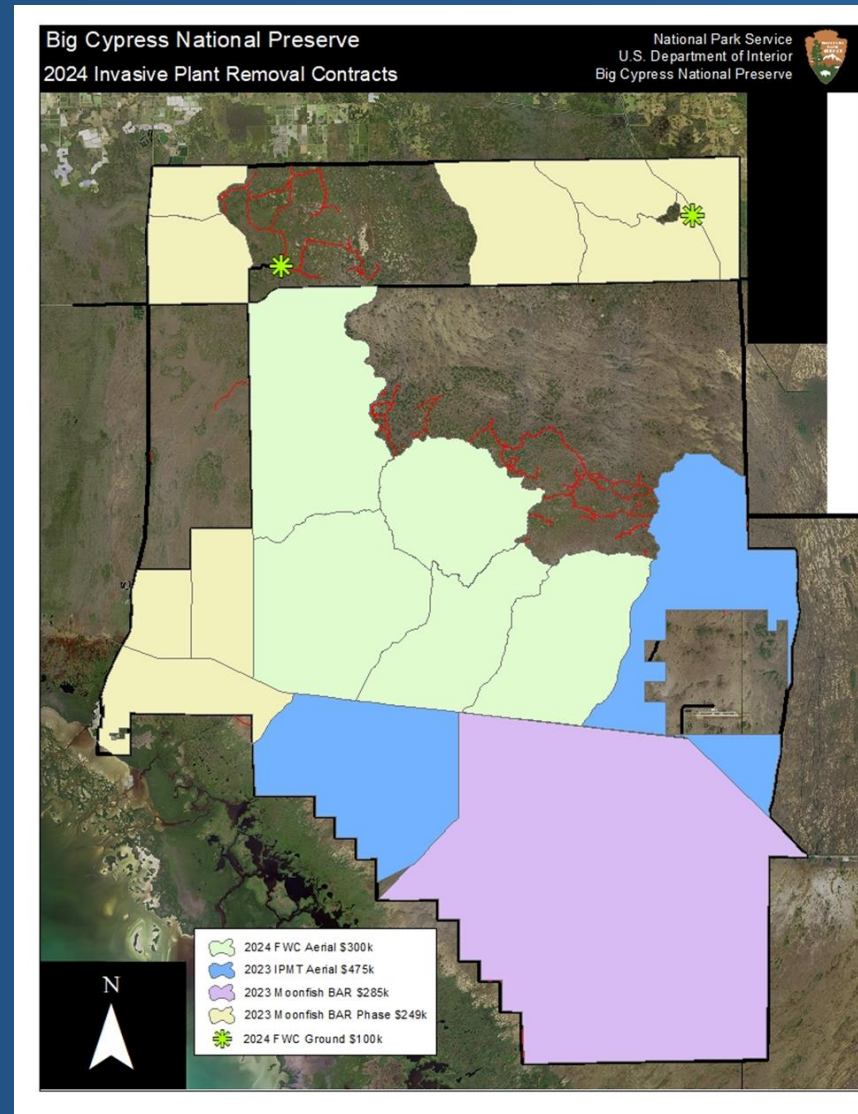
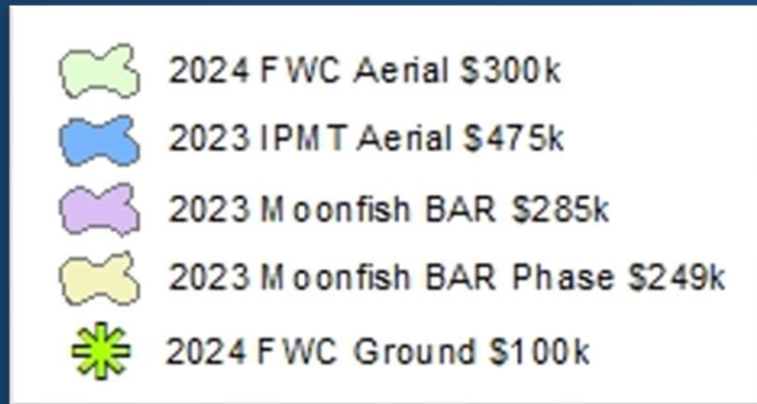
# 2023/2024 Treatments: Big Cypress National Preserve

Treatment Map

Operations Update	
 <b>Priority Species</b>	Lygodium, Melaleuca sp.
 <b>Other Target Species</b>	Ardisia, Java Plum
 <b>Acres Treated</b>	622,312 ac
 <b>Treatment Costs</b>	\$1,409,000.00





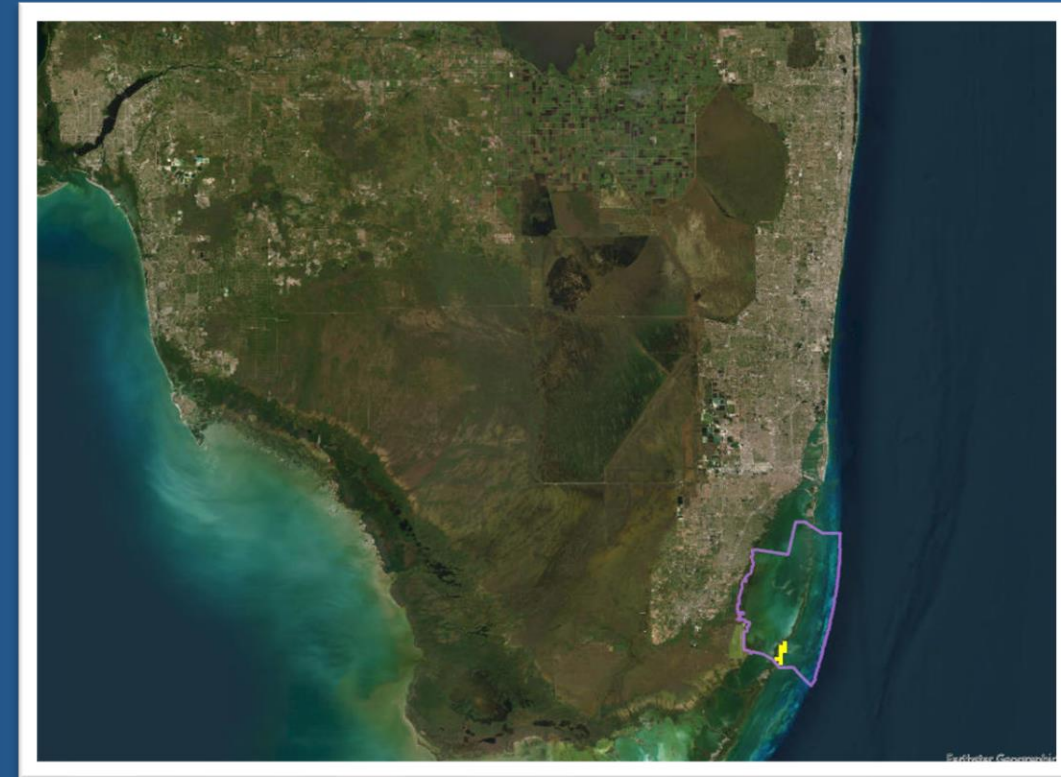
# 2023/2024 Treatments: Big Cypress National Preserve



# 2023/2024 Treatments: Biscayne National Park

## Treatment Map





Operations Update	
 <b>Priority Species</b>	Latherleaf ( <i>Colubrina asiatica</i> ) Seaside Mahoe ( <i>Thespesia populnea</i> ) Brazilian Pepper ( <i>Schinus terebinthifolius</i> ) Hawaiian Half-flower ( <i>Scaevola sericea</i> ) Snake Plant ( <i>Dracaena trifasciata</i> )
 <b>Acres Treated</b>	~380 acres swept

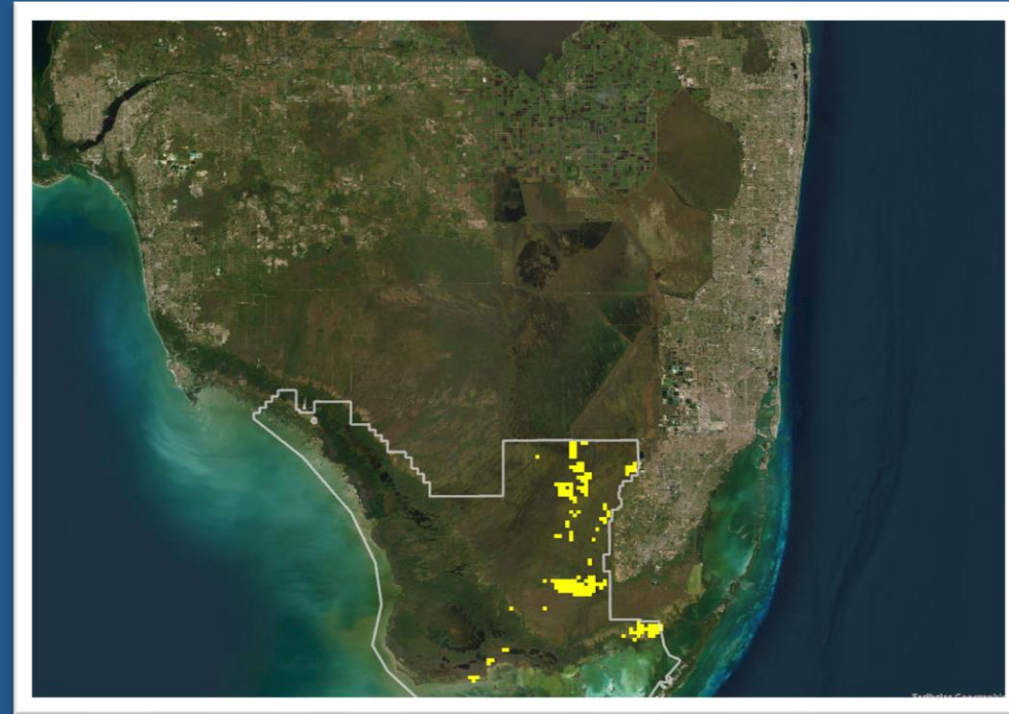


# 2023/2024 Treatments: Everglades National Park

## Treatment Map

### Operations Update

 <b>Priority Species</b>	Australian-pine ( <i>Casuarina equisetifolia</i> ) Brazilian pepper ( <i>Schinus terebinthifolia</i> ) Melaleuca ( <i>Melaleuca quinquenervia</i> ) Old World climbing fern ( <i>Lygodium microphyllum</i> ) Shoebuttan ardisia ( <i>Ardisia elliptica</i> )
 <b>Other Target Species</b>	Lead tree ( <i>Leucaena leucocephala</i> ) Latherleaf ( <i>Colubrina asiatica</i> )
 <b>Acres Treated</b>	3,868 swept 326 canopy
 <b>Treatment Costs</b>	\$1,053,184.46

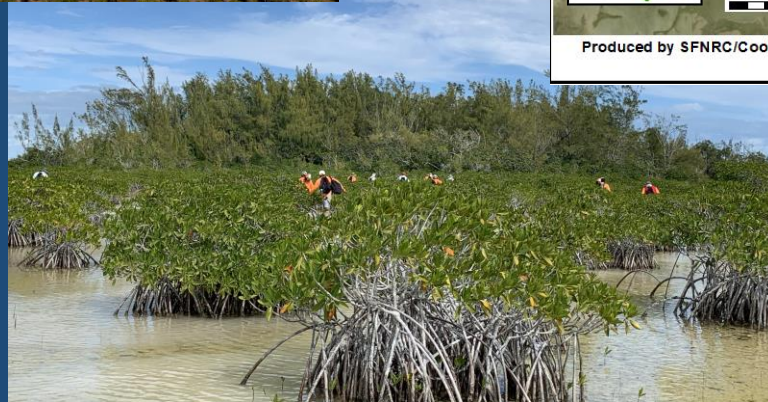
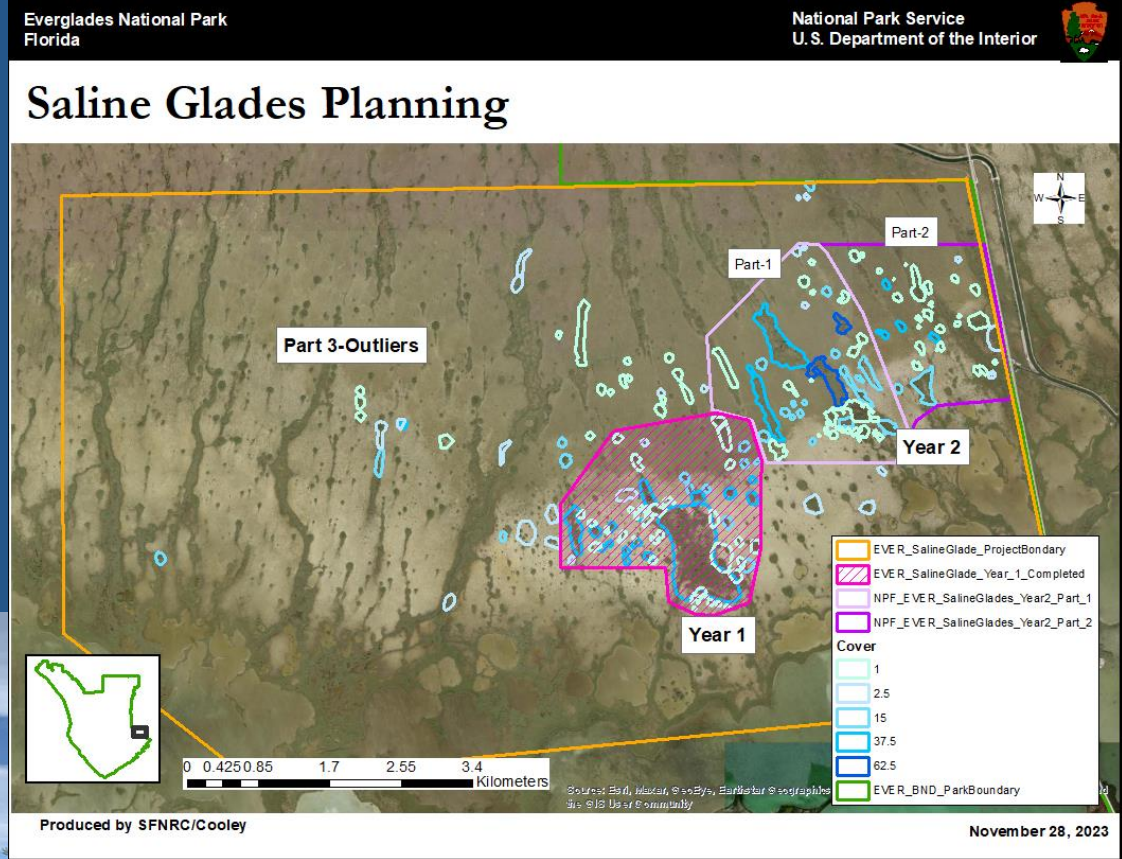


Everglades Cooperative Invasive Species Management Area

# 2023/2024 Treatments: Everglades National Park



(credit: Federico Acevedo - NPS)



(credit: Environmental Quality Inc. (EQI))

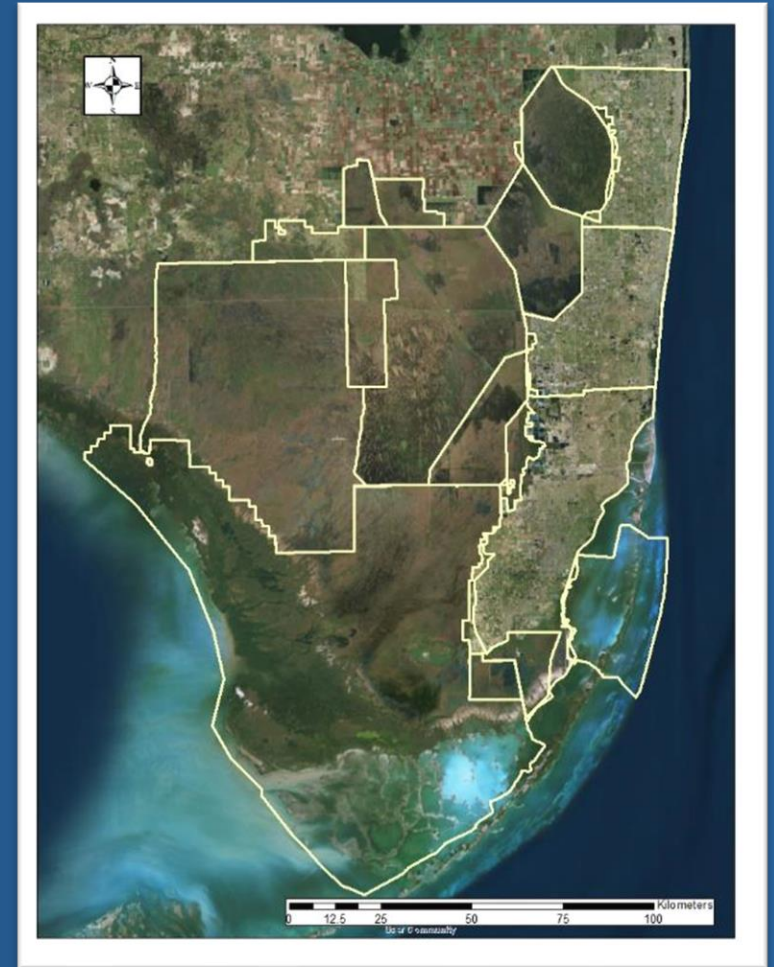


# 2023/2024 Treatments: Everglades National Park – Hole in the Donut

## Operations Update

 <b>Priority Species</b>	<i>Ardisia elliptica, Casuarina equisetifolia, Cenchrus purpureus, Imperata cylindrica, Ludwigia peruviana, Lantana strigocamara, Neyraudia reynaudiana, Panicum repens, Psidium guajava, Schinus terebinthifolius, Stenotaphrum secundatum, Urocloa mutica</i>
 <b>Other Target Species</b>	<i>Abrus precatorius, Canavalia brasiliensis, Leucaena leucocephala,</i>
 <b>Acres Treated</b>	2,288.15 ac- In house
 <b>Treatment Costs</b>	Unknown

## Treatment Map



# 2023/2024 Newly Detected Species (Everglades National Park)

***Lygodium japonicum*** (Japanese climbing fern)  
Hole in the Donut- Daniel Beard mound,  
Miami-Dade County)



(credit: Regan Little- NPS)



(credit: Regan Little- NPS)

***Distimake quinquefolius*** (rock rosemary)  
Hole in the Donut- 2019 mound, Miami-Dade  
County)



(credit: Kevin Brooks- NPS)



(credit: Kevin Brooks- NPS)



# 2023/2024 Newly Detected Species - Loxahatchee (USFWS)

Club begonia (*Begonia cucullata*)



Florida Plant Atlas- S. Denton

Cogon grass (*Imperata cylindrica*)



Invasve.org -UGA



# 2023/2024 Newly Detected Species - Broward County Parks



(c) Bart Wursten

*Blighia sapida* (ackee;  
Fern Forest)



(c) George Rogers

*Digitaria bicornis*  
(Asian crabgrass;  
Military Trail)



(c) Keith Bradley



(c) Jimmy Lange

*Borreria diacrodonta*  
(=*Diacrodon compressus*;  
One seed false buttonweed;  
Miramar Pineland)



# 2023/2024 Newly Detected Species - Broward County Parks

## *Blighia sapida* (ackee; Fern Forest)



Popular fruit tree; three-lobed capsule w/ large black seeds and white-yellow fleshy, edible arils



(c) Jimmy Lange

New growth hairy, twigs angled, wrinkly



(c) Jimmy Lange

Large compound leaves; subopposite leaflets, aborted terminal leaflet (classic Sapindaceae)



(c) M. Nee MOBOT



# 2023/2024 Newly Detected Species - Broward County Parks

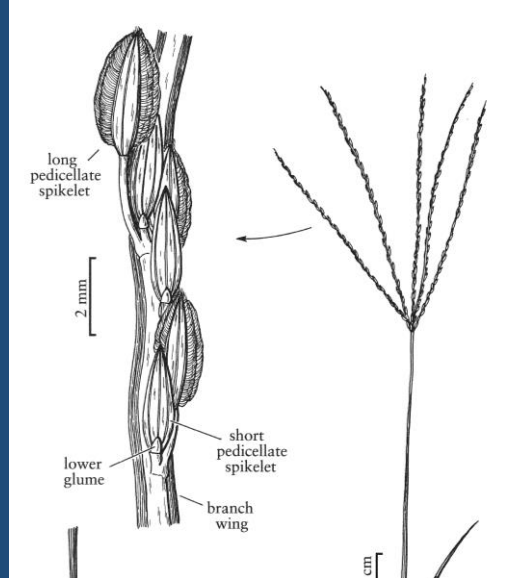
## *Digitaria bicornis* (Asian crabgrass; Military Trail)

Typical digitate panicle



(c) George Rogers

Paired spikelets; heteromorphic (different)

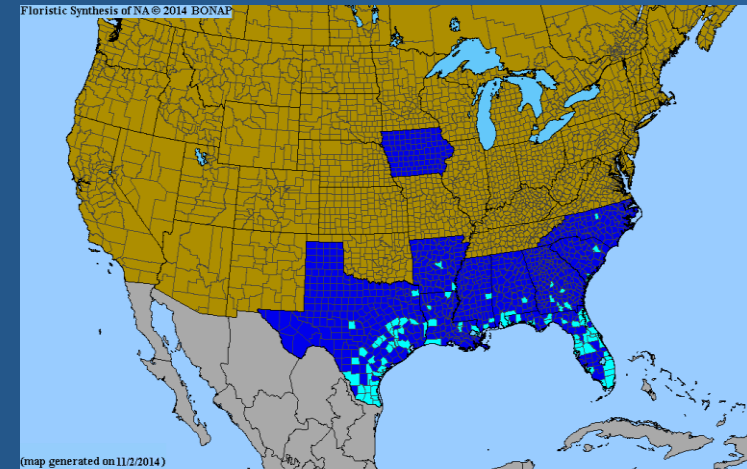


(c) Utah State University

Pedicillate with marginal hairs



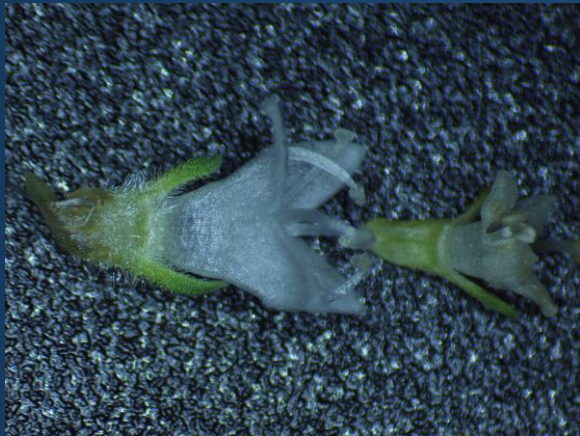
(c) Keith Bradley



# 2023/2024 Newly Detected Species - Broward County Parks

## *Borreria diacrodonta* (= *Diacrodon compressus*; One seed false buttonweed; Miramar Pineland)

Flowers 2-3x *S. verticillata*



(c) Jimmy Lange

Capsules indehiscent; one seeded; 3-4x *S. verticillata*

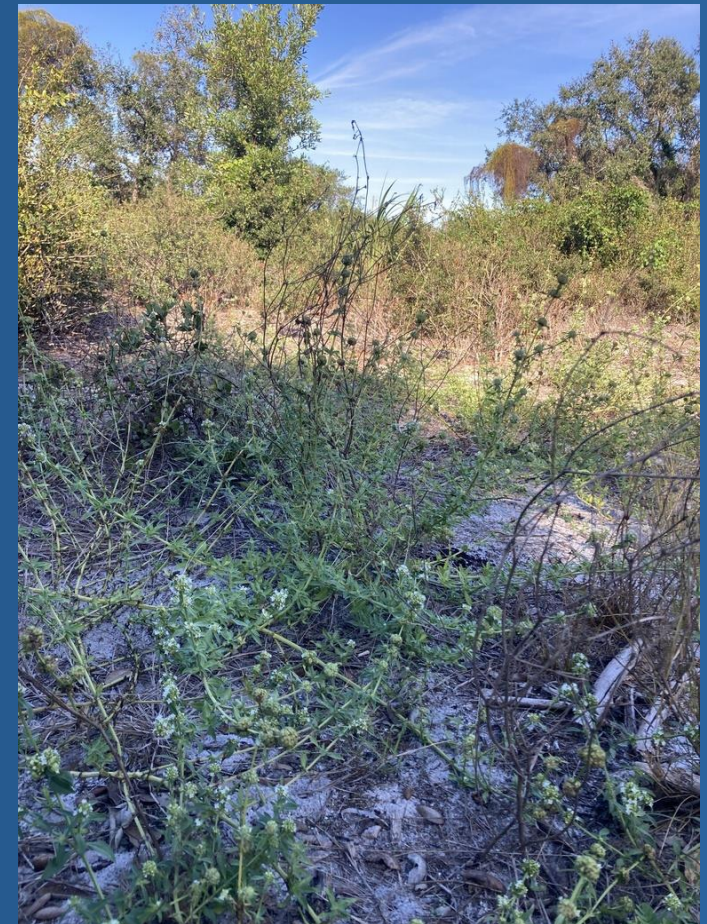


(c) Jimmy Lange



(c) Jimmy Lange

Weedier habit



(c) Antonio Rodriguez



(c) Jimmy Lange

Small, white flowers in hemispherical glomerules (heads); stipules beneath make a "cup"



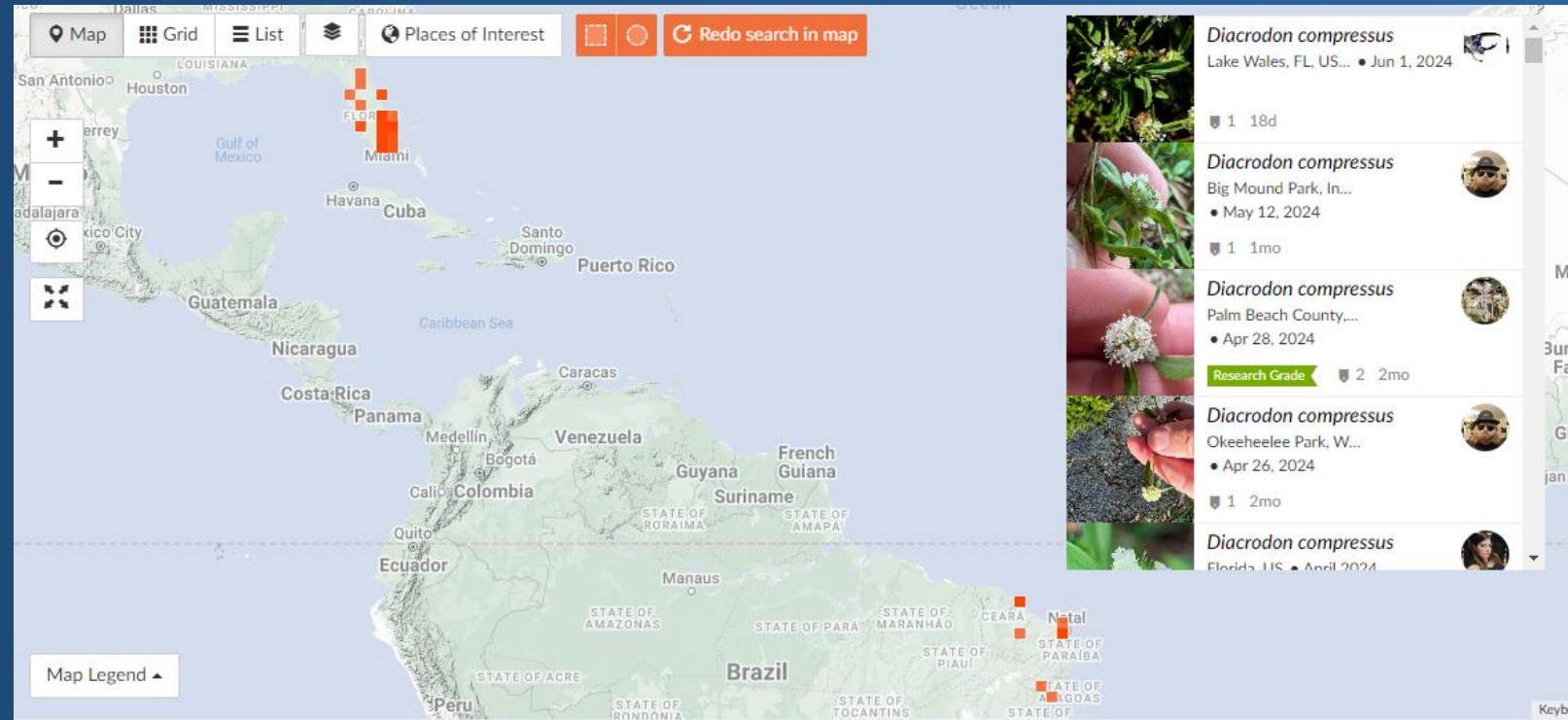
(c) James K. Wetterer



# 2023/2024 Newly Detected Species - Broward County Parks

*Borreria diacrodonta* (= *Diacrodon compressus*; One seed false buttonweed; Miramar Pineland)

- Endemic to Eastern Brazil and surrounding areas
- Present in Florida, mistaken as *S. verticillata* for over 50 years!
- Occurs as lawn weed, but takes on different habit and nature in sandy uplands.



# 2023/2024 Newly Detected Species (Florida)

## *Oenothera rosea* (Rose evening primrose; ruderal in disturbed marl, Redlands, Miami-Dade County)

- Native to southwestern US, Cuba, Jamaica, C and S America
- Introduced in Europe, Asia, Africa
- Invasive in Japan, South Africa, and Zimbabwe (Invasive Species of Japan; CABI)
- FACW; Canyonlands, riverbanks, disturbed areas



(c) Kew POWO



(c) Backyard Nature

Small, pink flowers with floral tube  
and paired, reflexed sepals



(c) Jimmy Lange

Decumbent (out and up)  
to erect from rosette



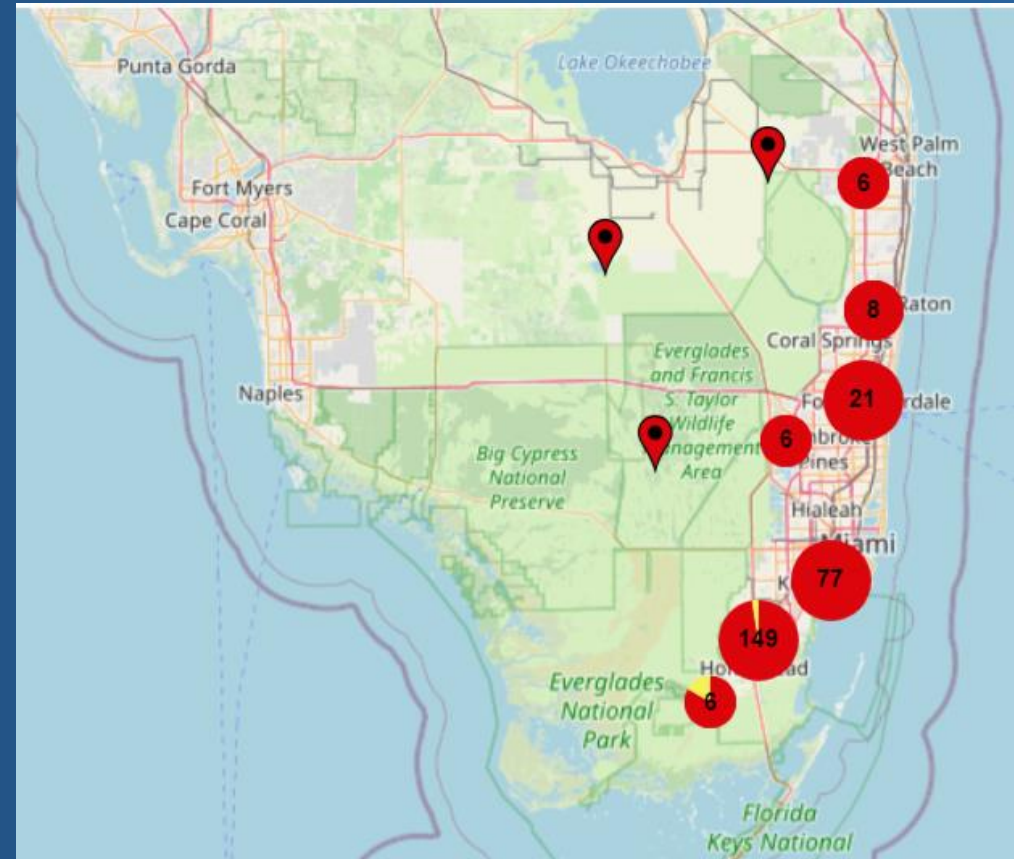
# 2024 ECISMA EDRR Plant List

- 49 species
- Added 1 new species
  - *Hyparrhenia hirta*
- Goal of reducing to a more practical number of EDRR, perhaps adding categories such as “priority”, “containment”, etc.



# 2023 ECISMA EDRR EDDM Maps Saved Query











- 271 locations with records
- 29 species
  - As of 6/25/2024
- 60 observations in 2010
- 4 in 2022
- 2 since 6/24/2023
- 5 total treatments



# 2024 ECISMA EDRR iNaturalist Project

- “ECISMA EDRR Plants”
- 1,212 observations
- 43 species (added *Hyparrhenia hirta* IN 2024)
- 185 (148) identifiers
- 595 (449) observers
- 5 observations in 2016
- 166 so far in 2023
  - As of 6/24/2023
- 293 since 6/24/2023

The screenshot displays the iNaturalist project page for 'ECISMA EDRR Plants'. The header includes the project name and logo, and an 'About' section describing the project's goal to detect and monitor plant species in the Everglades Cooperative Invasive Species Management Area. The main content area shows a grid of species observations with photos and counts:

Overview	1,212 OBSERVATIONS	43 SPECIES	185 IDENTIFIERS	595 OBSERVERS	Stats
 242 observations Deviltree <i>Alstonia macrophylla</i>	 174 observations Java Glorybower <i>Clerodendrum speciosissimum</i>	 135 observations Pink Trumpet-Tree <i>Tabebuia heterophylla</i>	 99 observations Indian Beech Tree <i>Milletia pinnata</i>	 89 observations Elliptic Yellowwood <i>Ochrosia elliptica</i>	
 45 observations Rousselia humilis	 41 observations Saga Tree <i>Adenantha pavonina</i>	 34 observations Feathered Mosquito Fern <i>Azolla pinnata</i>	 34 observations Ribbon Fern <i>Ophioderma pendulum</i>	 29 observations Cudjoewood <i>Bonellia macrocarpa</i>	



Everglades Cooperative Invasive Species Management Area

Loxahatchee National Wildlife Refuge (Water Conservation Area 1)



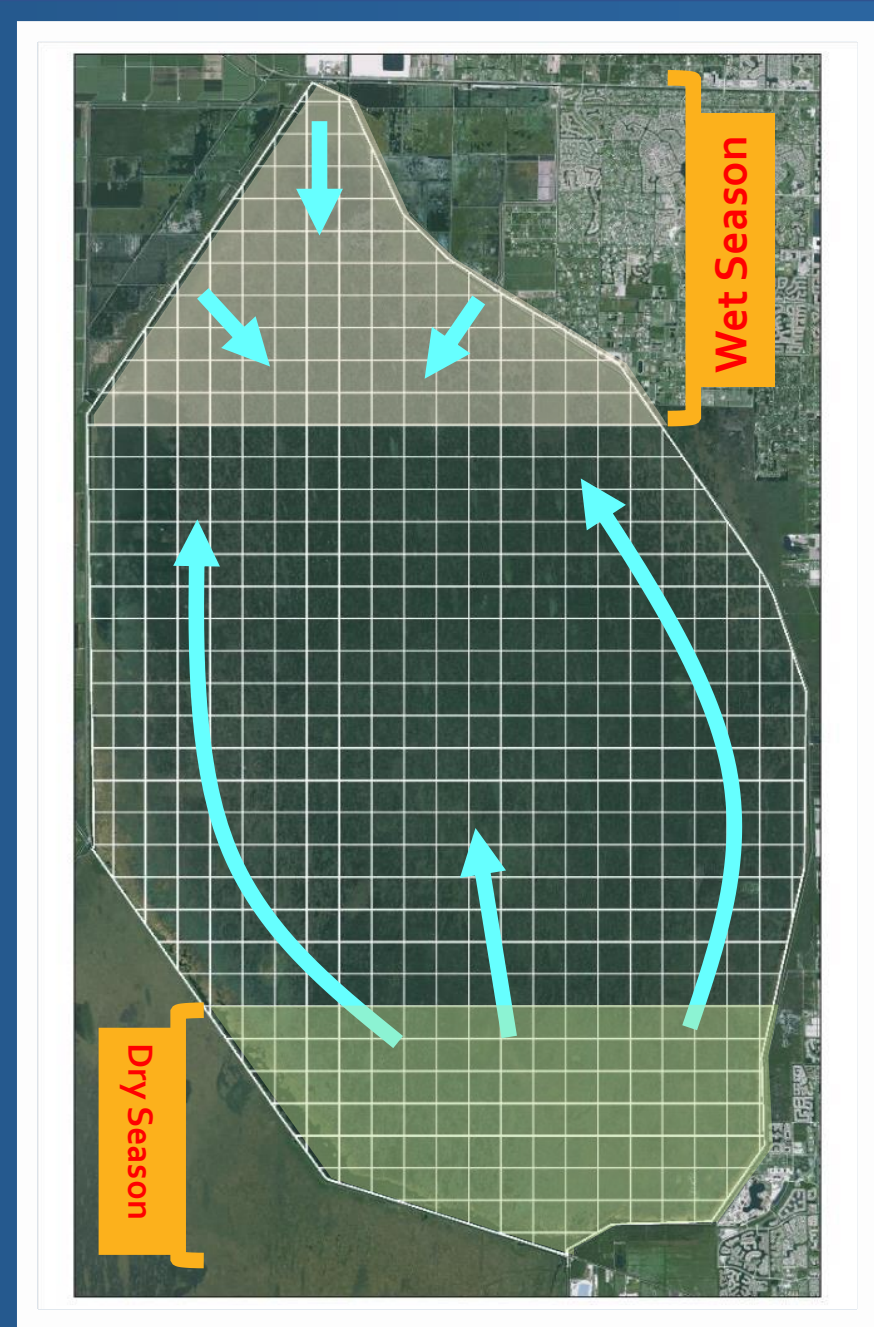
# Overview

- Joint effort between SFWMD, FWC, FWS
- Program Goal: Achieve maintenance control of priority invasive plants
- Primary focus is melaleuca and lygodium
  - Also crested Scleria lacustris, floating heart, Azolla, and West Indian marsh grass



# Strategy

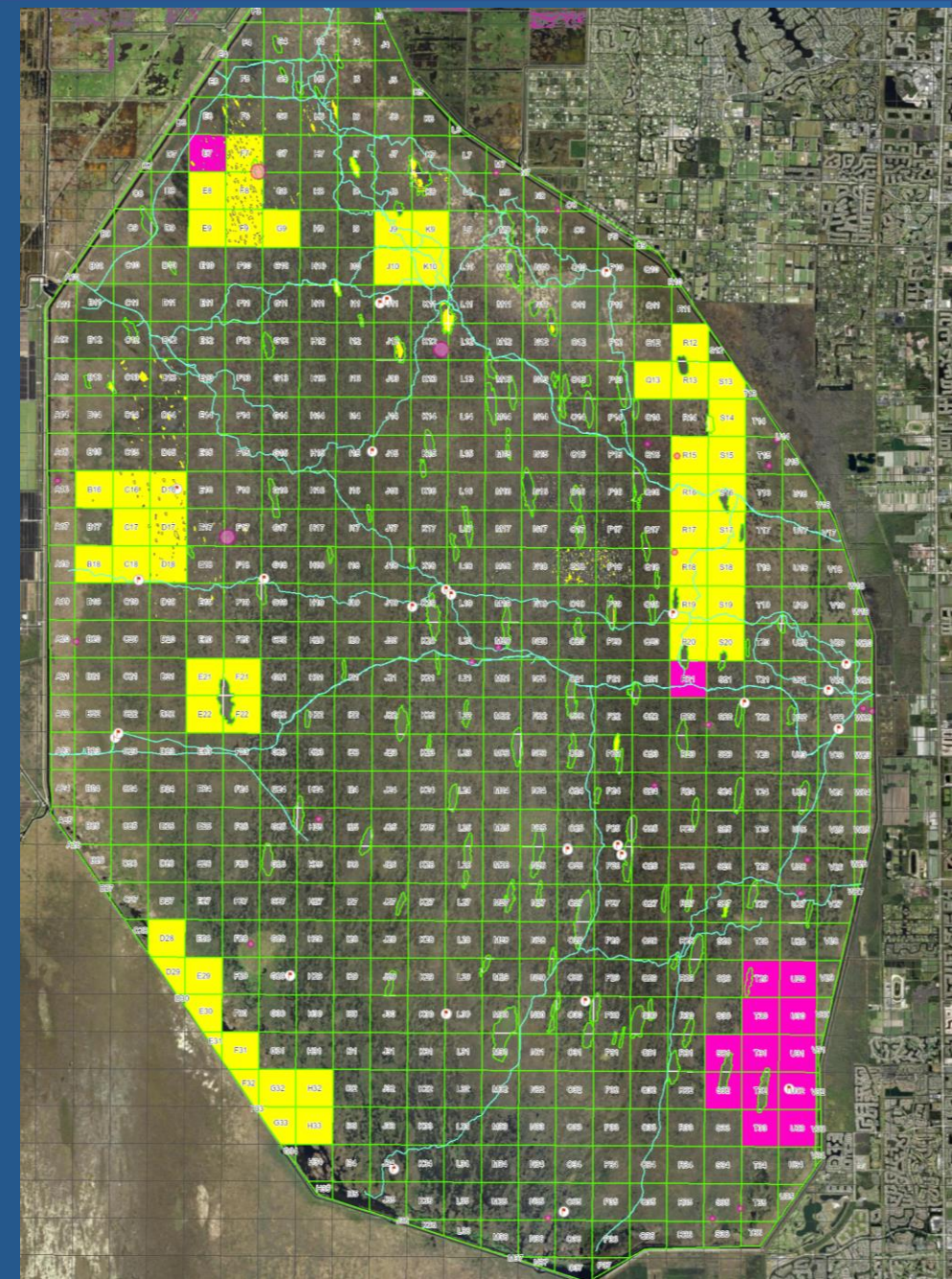
- Utilizing 1 km grid and ground/aerial-based monitoring to assess, plan, and track treatments
- Coordinating herbicide treatments with USFWS burn program
- Take advantage of hydrology to target seasonally accessible areas.
- Categorize large strand tree islands based on canopy status and infestation levels then schedule treatments accordingly.



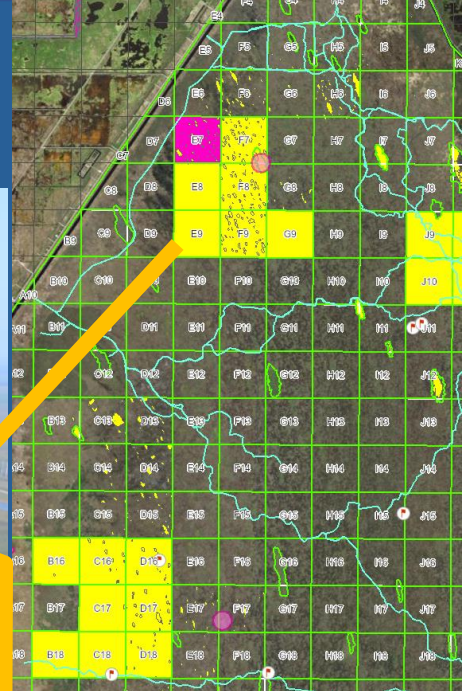
# A years update

Species	Acres Covered	Acres Treated
OWCF	1,401	690
Melaleuca	31,141	2,639
Scleria	405	41

- “The Wall” progress
- “last Dance Fire” work
- Aerial application integration



# The Wall



- FWC Funded
- 1500 acres of initial Melaleuca

# Last Dance Fire area

- USFWS funded project
- Goals
  - Complete all re-treatments
  - Push into untreated melaleuca blocks
  - Get whole block into a contiguous state of maintenance
- Work around protected species
- Keep up yearly work on EDRR species

Bald Eagles nest



Everglades Cooperative Invasive Species Management Area



Initial treatment line



*Scleria lacustris* work in dead melaleuca heads

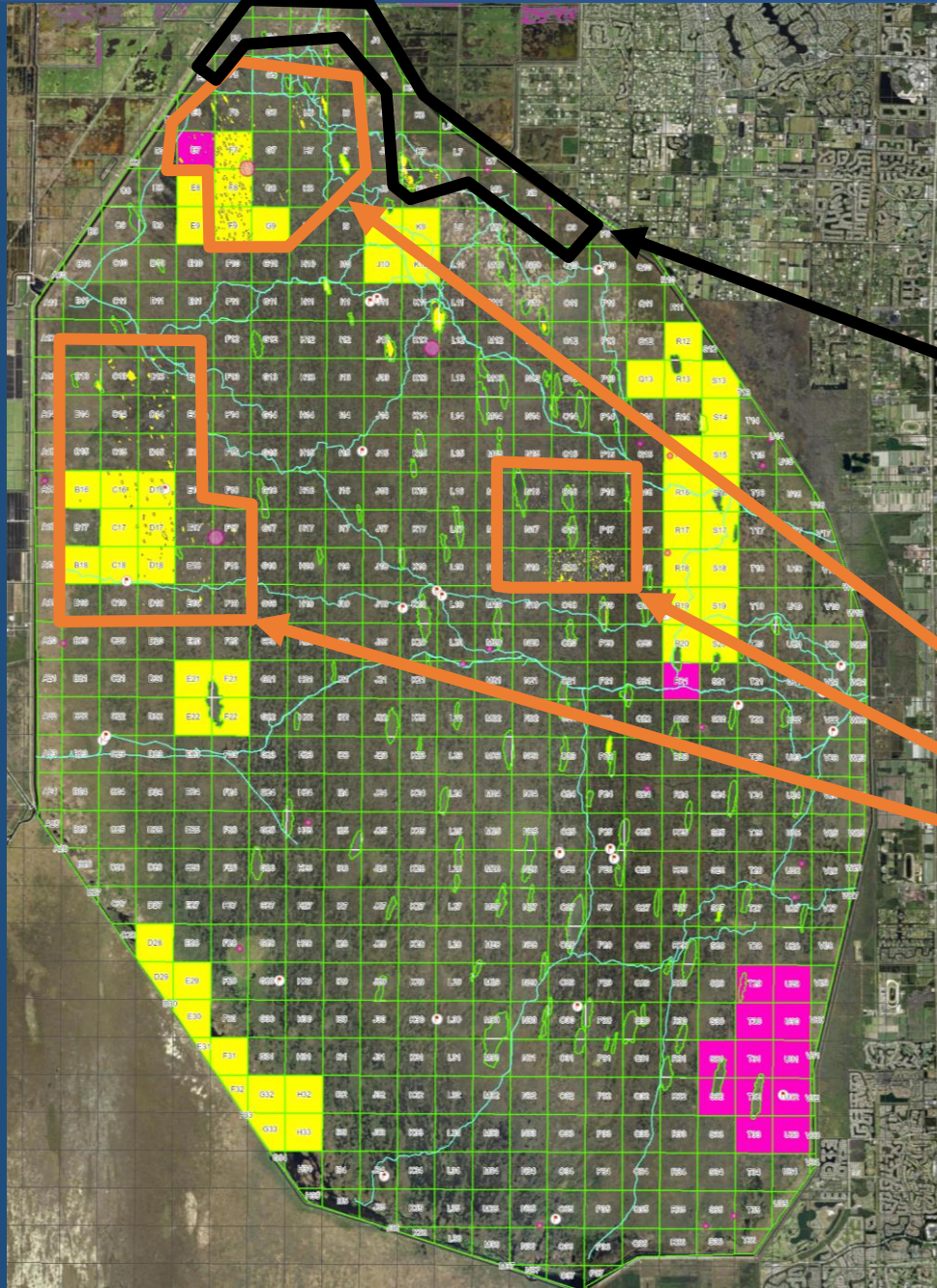


Sawgrass plain melaleuca heads



# Aerial treatment

- 20-acre melaleuca trial
  - Glyphosate/Imazapyr treatment at 3qt/3qt per acre
    - 5 acres at 10GPA fine nozzles
    - 5 acres at 10GPA course nozzles
    - 5 acres at 5GPA fine nozzles
    - 5 acres at 5 GPA course nozzles.
- 500 acres of Lygodium treated
  - 20GPA: 120fl Glyphosate, 8fl Dyne-Amic and 4oz Induce
- 150 acres spot sprayed melaleuca
  - Treated at 5%/5% Glyphosate/Imazapyr



# Aerial spot spray



Everglades Cooperative Invasive Species Management Area

# Aerial Lygodium work



Prescription – 120fl Glyphosate, 8fl Dyne-Amic and 4oz Induce

Everglades Cooperative Invasive Species Management Area

## Questions



## Questions



*Think locally, Act neighborly*  
invasive species know no boundaries!

