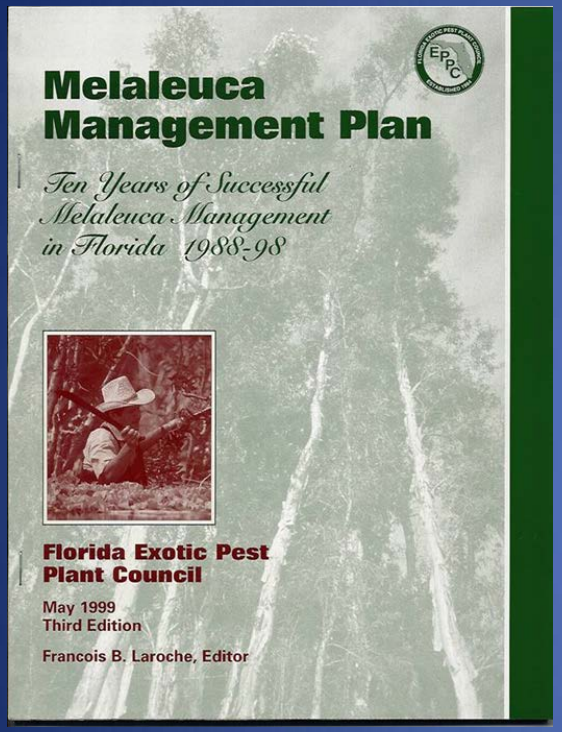
Everglades Cooperative Invasive Species Management Area

Tony Pernas
Florida/Caribbean EPMT
National Park Service

Florida's Non-native Flora and Fauna

- 1150 Insect spp.
- 900 Plant spp.
- 196 Bird spp.
- 47 Reptile spp.
- 32 Fish spp.
- 30 Mammal spp.
- 6 FW Invert. spp.
- 4 Amphibian spp.
- 66 Marine spp.

South Florida and Invasive Species


Melaleuca
Management Plan
Ten Years of Successful
Melaleuca Management
in Florida 1988-98
Florida Exotic Pest
Plant Council
May 1999
Third Edition
Francois B. Laroche, Editor

History

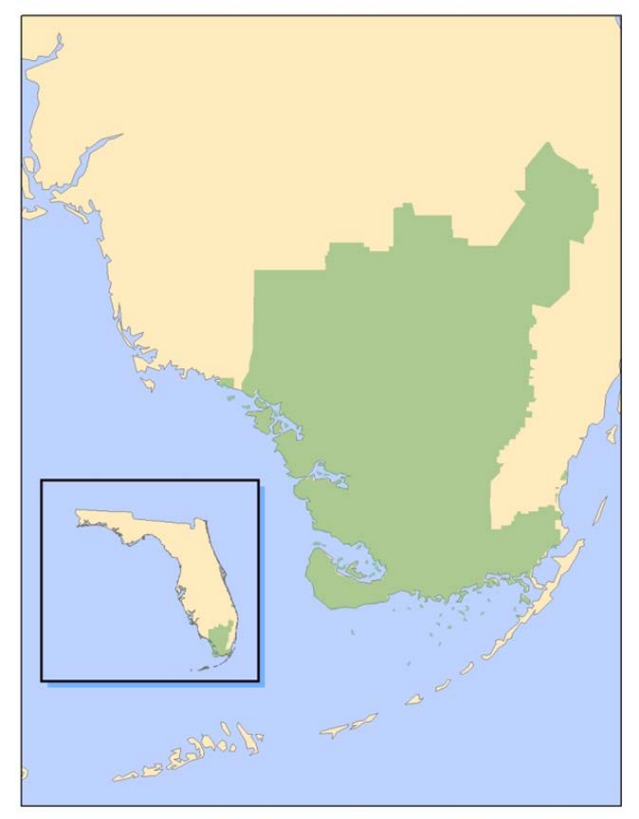
- 07/04 – Everglades Invasive Species Summit
- 07/05 – Second Invasive Species Summit
- 07/06 – Third Summit (ECISMA is Established)

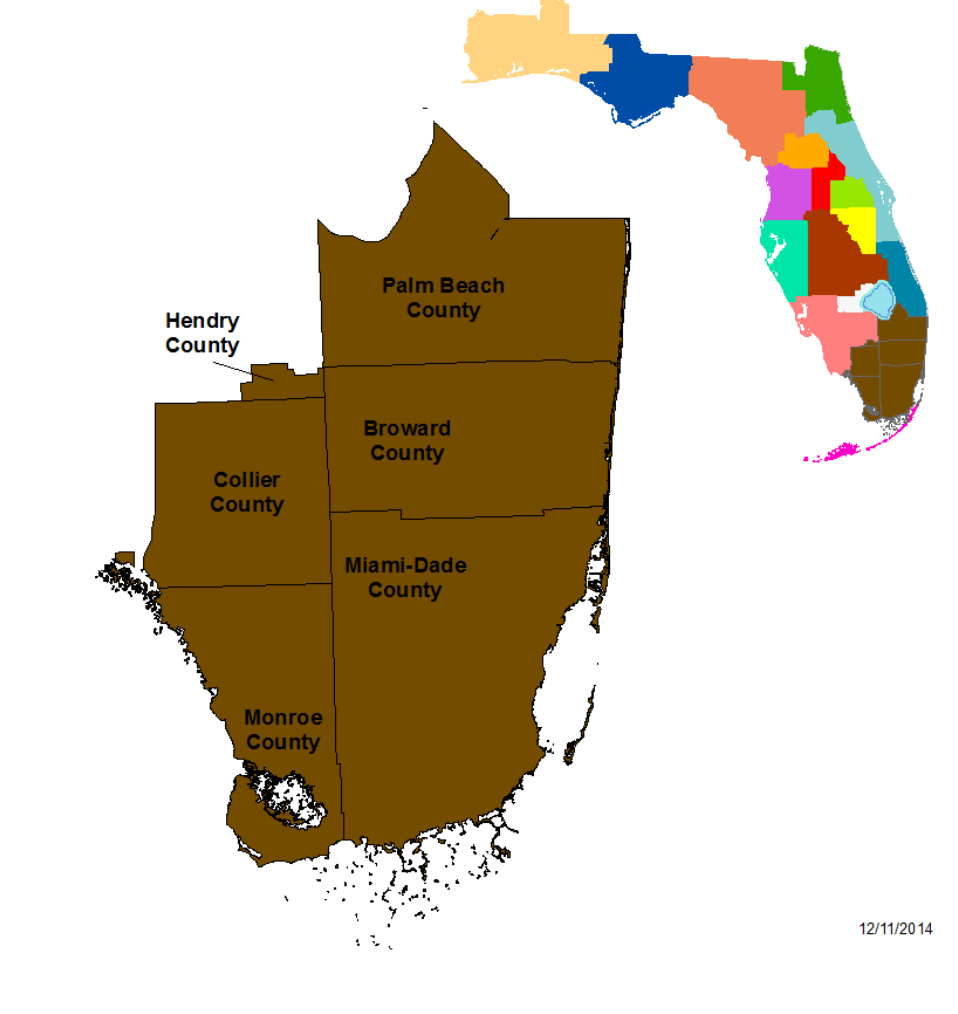
What is the Everglades CISMA?

A formal partnership of federal, state, and local government agencies, tribes, individuals and various interested groups that manage invasive species in the Everglades area, based on the CWMA model

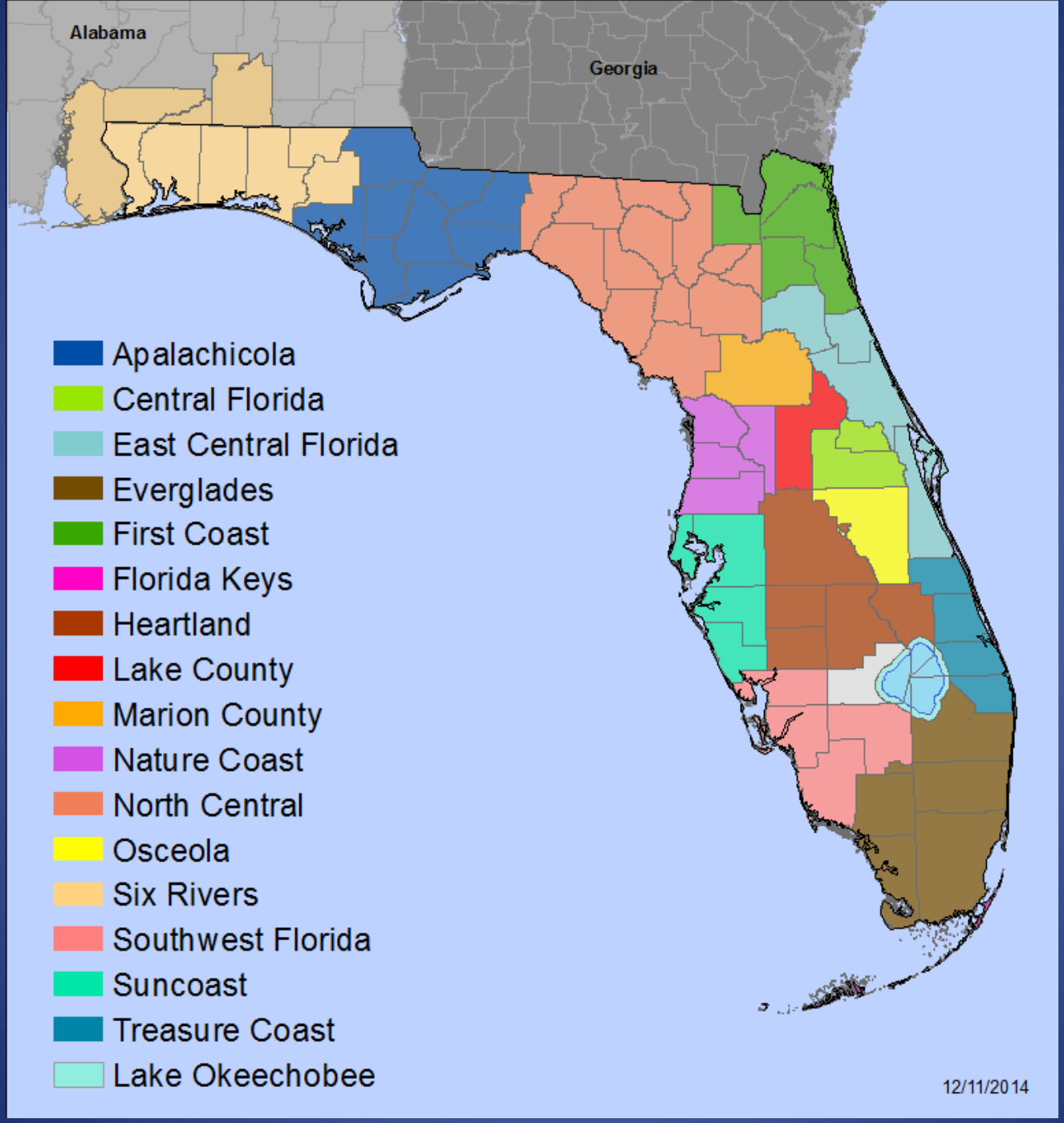
Mission:

To improve the effectiveness of invasive species control by sharing information, innovation and technology across borders





4 million acres


Alabama
Georgia
Apalachicola
Central Florida
East Central Florida
Everglades
First Coast
Florida Keys
Heartland
Lake County
Marion County
Nature Coast
North Central
Osceola
Six Rivers
Southwest Florida
Suncoast
Treasure Coast
Lake Okeechobee
12/11/2014

Partners

Federal: U.S. Department of Agriculture, U.S. Geological Survey, U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. National Park Service, , U.S. Army Corps of Engineers

State: Florida Fish and Wildlife Conservation Commission, Florida Department of Agriculture and Consumer Services, Florida Department of Transportation, Florida Department of Environmental Protection, South Florida Water Management District

Local Governments: Broward county, Miami-Dade County, Palm Beach County

Tribes: Miccosukee Tribe of Indians of Florida, Seminole Tribe of Florida,

NGO's: The Nature Conservancy, Everglades Foundation

Universities: University of Florida, Florida International University, Auburn University, Florida Atlantic University, University of Miami

Private: Florida Power and Light, Fairchild Tropical Botanic Garden

2008 MOU:

Federal: U.S. Fish and Wildlife Service, U.S. National Park Service, , U.S. Army Corps of Engineers

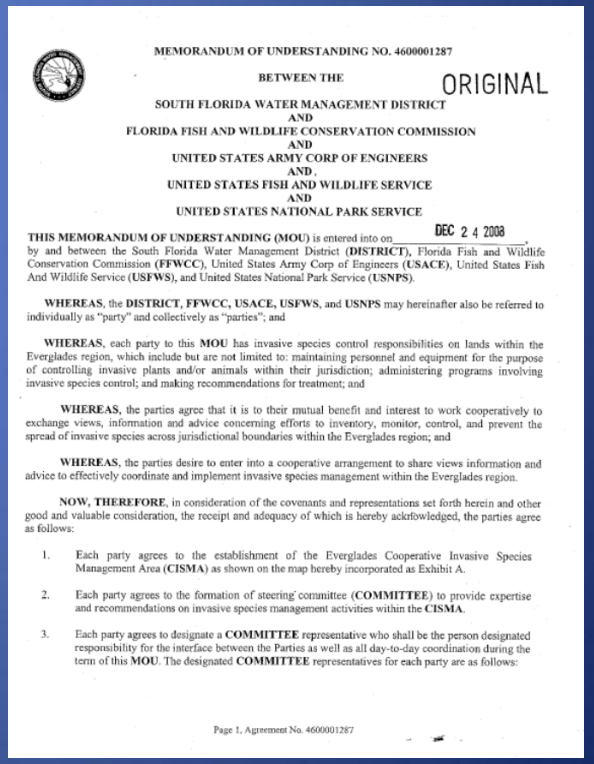
State: Florida Fish and Wildlife Conservation Commission, South Florida Water Management District

Local Governments: Miami-Dade County

2013/2014 MOU Additions:

Federal: U.S. Department of Agriculture

Local Governments: Broward County



MEMORANDUM OF UNDERSTANDING NO. 4600001287

BETWEEN THE

ORIGINAL

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
AND
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
AND
UNITED STATES ARMY CORP OF ENGINEERS
AND,
UNITED STATES FISH AND WILDLIFE SERVICE
AND
UNITED STATES NATIONAL PARK SERVICE

THIS MEMORANDUM OF UNDERSTANDING (MOU) is entered into on DEC 2 4 2008, by and between the South Florida Water Management District (**DISTRICT**), Florida Fish and Wildlife Conservation Commission (**FFWCC**), United States Army Corp of Engineers (**USACE**), United States Fish And Wildlife Service (**USFWS**), and United States National Park Service (**USNPS**).

WHEREAS, the **DISTRICT, FFWCC, USACE, USFWS**, and **USNPS** may hereinafter also be referred to individually as "party" and collectively as "parties"; and

WHEREAS, each party to this **MOU** has invasive species control responsibilities on lands within the Everglades region, which include but are not limited to: maintaining personnel and equipment for the purpose of controlling invasive plants and/or animals within their jurisdiction; administering programs involving invasive species control; and making recommendations for treatment; and

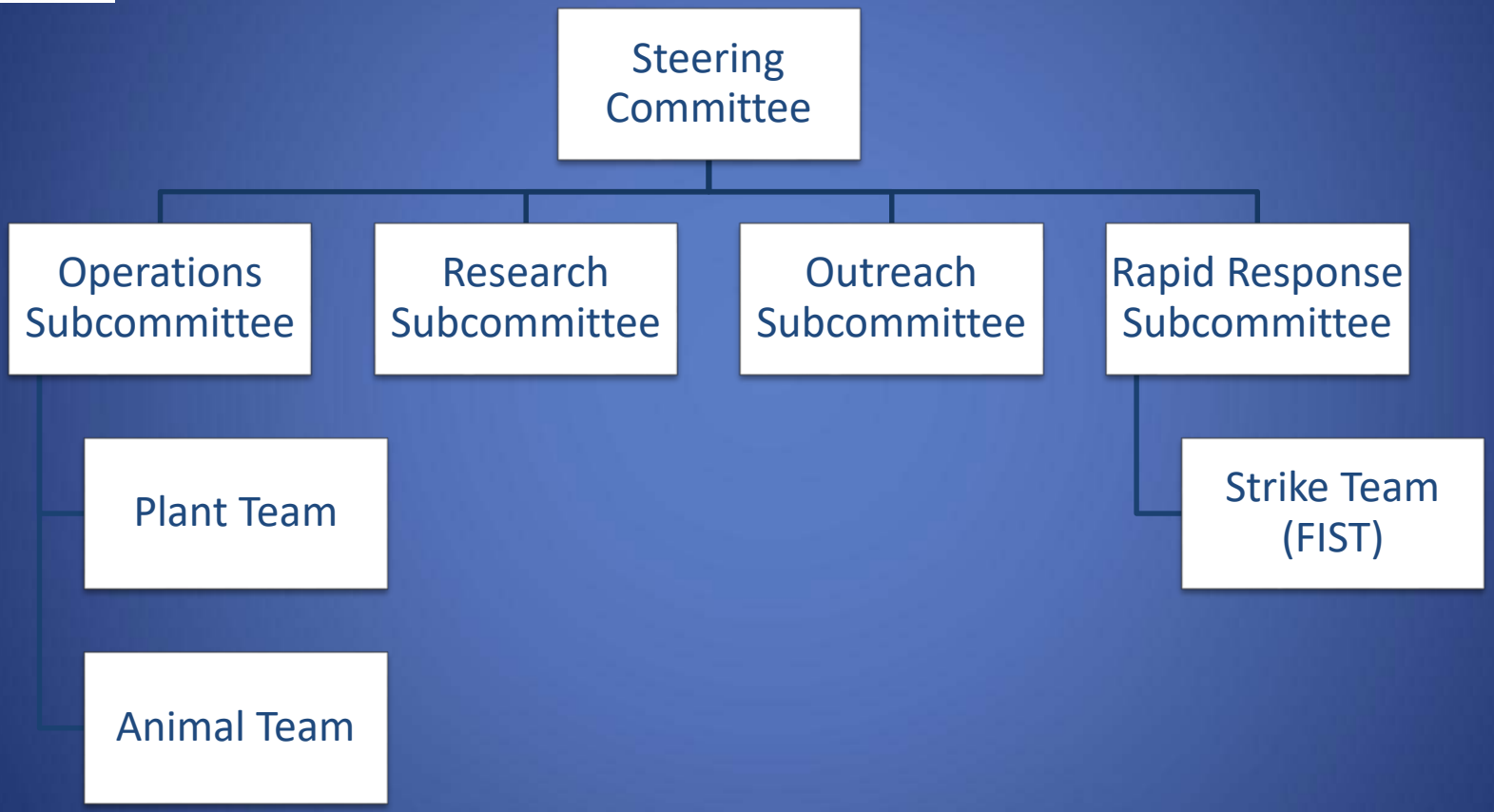
WHEREAS, the parties agree that it is to their mutual benefit and interest to work cooperatively to exchange views, information and advice concerning efforts to inventory, monitor, control, and prevent the spread of invasive species across jurisdictional boundaries within the Everglades region; and

WHEREAS, the parties desire to enter into a cooperative arrangement to share views information and advice to effectively coordinate and implement invasive species management within the Everglades region.

NOW, THEREFORE, in consideration of the covenants and representations set forth herein and other good and valuable consideration, the receipt and adequacy of which is hereby ackrfowledged, the parties agree as follows:

1. Each party agrees to the establishment of the Everglades Cooperative Invasive Species Management Area (**CISMA**) as shown on the map hereby incorporated as Exhibit A.
2. Each party agrees to the formation of steering committee (**COMMITTEE**) to provide expertise and recommendations on invasive species management activities within the **CISMA**.
3. Each party agrees to designate a **COMMITTEE** representative who shall be the person designated responsibility for the interface between the Parties as well as all day-to-day coordination during the term of this **MOU**. The designated **COMMITTEE** representatives for each party are as follows:

Everglades CISMA Organizational Chart



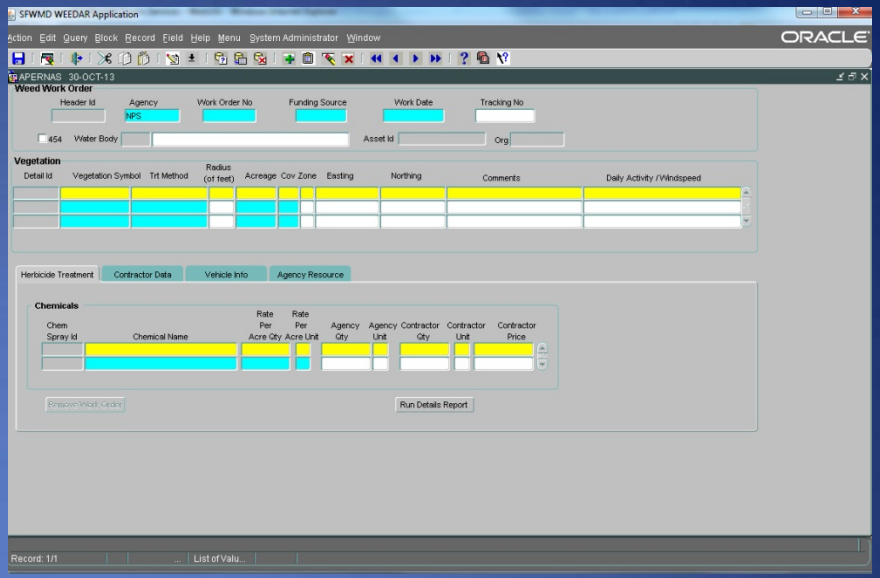
Goals:

- **Integrate coordination, control and management strategies**
- **Integrate outreach efforts**
- **Provide for Information and technology transfer**
- **Early detection and rapid response of new invasive species**

Annual Invasive Species Summits

Integrate coordination, control and management strategies

- WEEDAR Database
- Federal Contracts



	Document No.	Document Title	Page 7 of 32
	P11PC22500	Exotic Species IDIQ 8(a)	

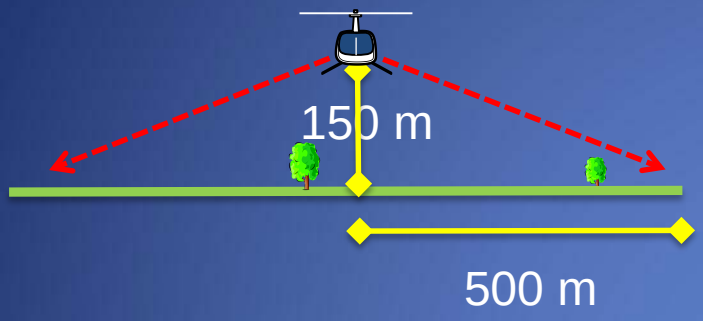
SECTION C -- DESCRIPTIONS AND SPECIFICATIONS

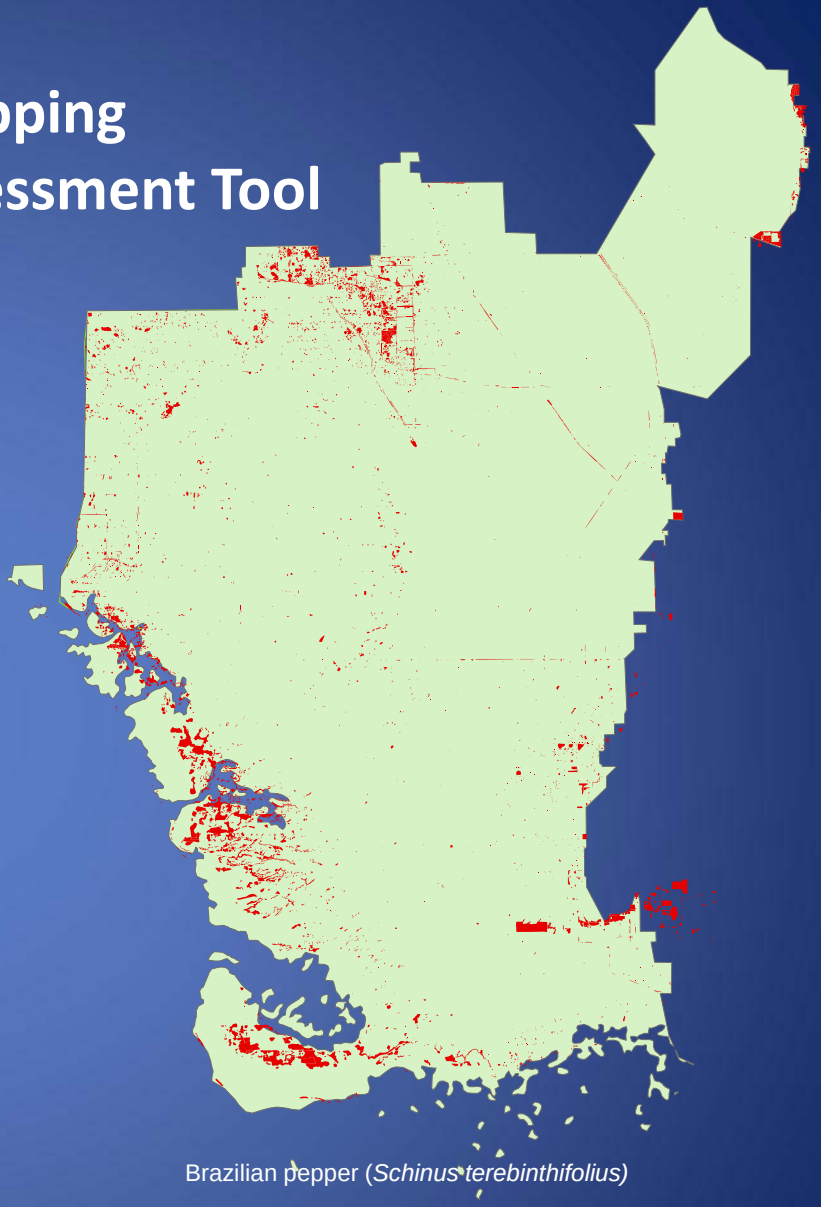
C.1 1489.210-110 STATEMENT OF WORK/SPECIFICATIONS NOVEMBER 2002

SECTION 1: Exotic Plant Control
GENERAL DESCRIPTION OF WORK
The work to be performed consists of the Contractor furnishing all labor, equipment, personal protective equipment (PPE), herbicides, dyes and adjuvants for the control of exotic pest plants. Work will be performed for the Department of Interior (DOI) includingthe National Park Service (NPS), Fish and Wildlife Service (FWS), and the Bureau of Land Management (BLM). Other Federal agencies such as the United States Forest Service (USFS), Federal Lands Highway Division (FLHP) and United States Army Corps of Engineers (USACOE) may also access the contract award(s) through the establishment of Interagency Agreements. Performance will be located primarily along the coastal plain in the States of Texas, Louisiana, Mississippi, Alabama, Florida, the US Virgin Islands Georgia, South Carolina and North Carolina. The coastal plain will be defined as the ecoregion from the Gulf of Mexico/Atlantic shoreline inland approximately 100 miles for the continental US.

Integrate coordination, control and management strategies

DASM
Digital Aerial Sketch Mapping
Region Wide Invasive Plant Assessment Tool
(4 million acres)



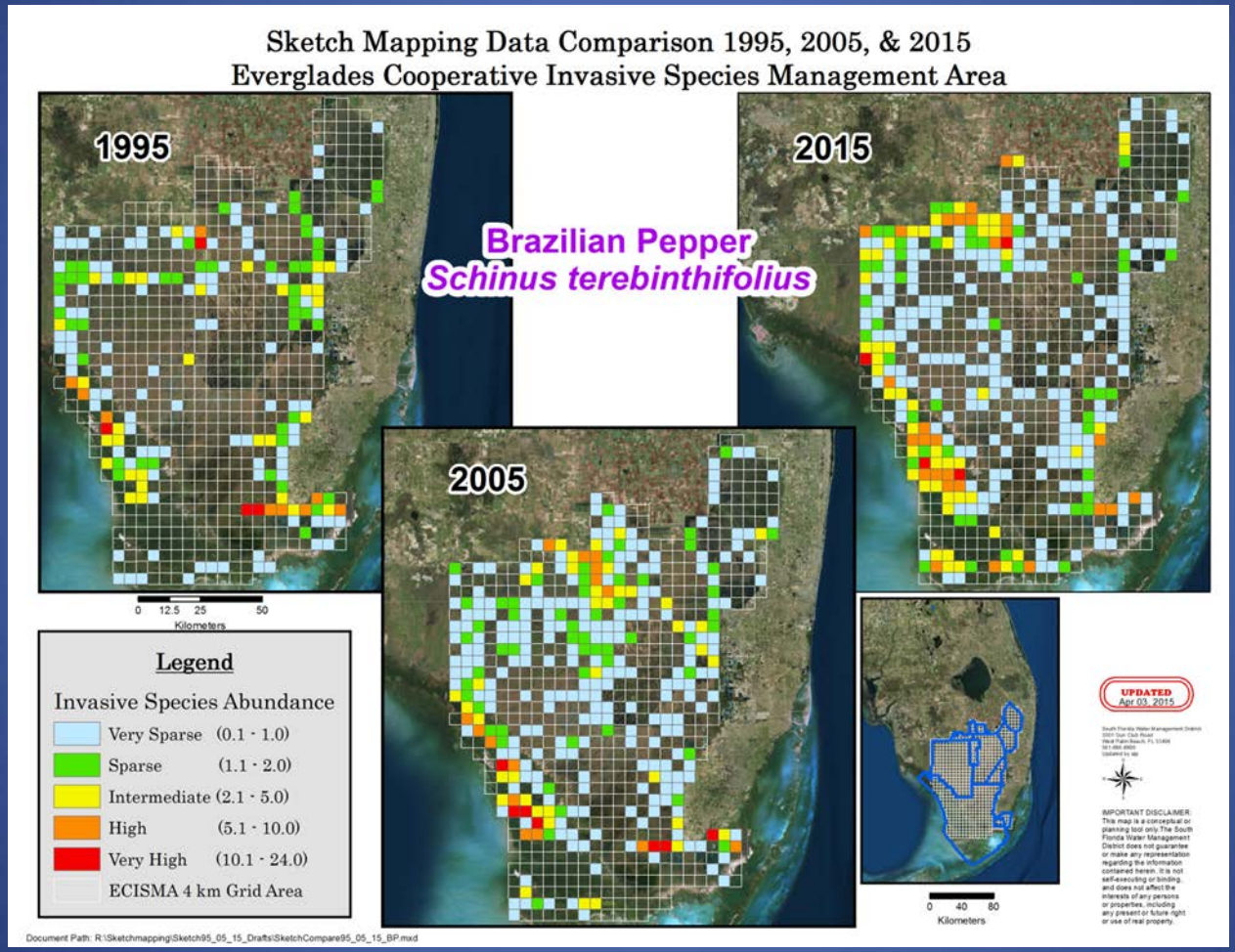


Brazilian pepper (*Schinus terebinthifolius)*

74,226 acres

Integrate coordination, control and management strategies

1995, 2005 and 2015 Systematic Reconnaissance Flight Data



Laurel Wilt in Big Cypress National Preserve

Integrate coordination, control and management strategies

Red Ambrosia Beetle *(Xyleborus glabratus)*

(Native to India, Japan, Mynamar and Taiwan)

Raffaelea lauricola - Ophiostomatales

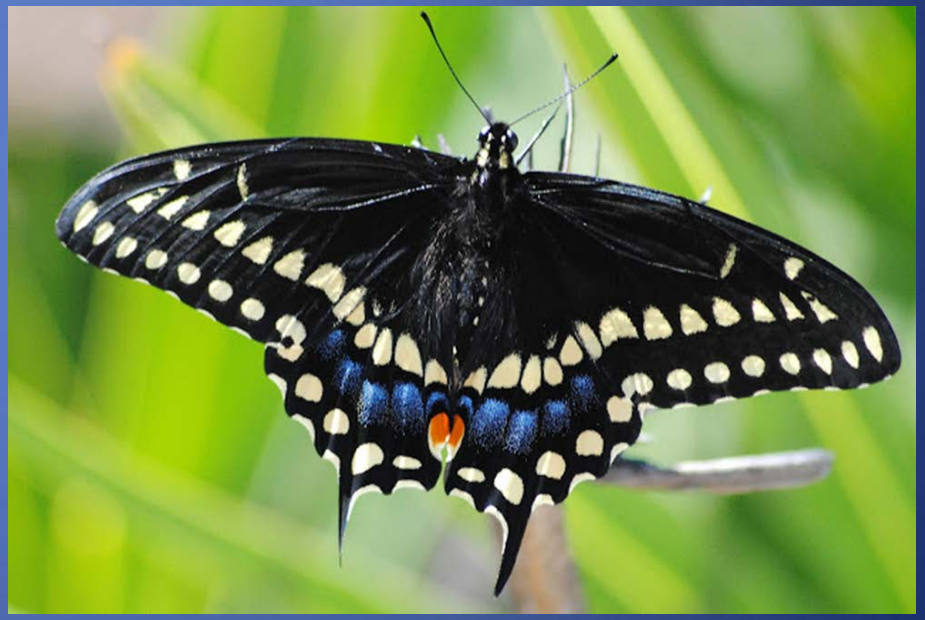
Integrate coordination, control and management strategies

Swamp Bay (*Persea palustris*)

Integrate coordination, control and management strategies

Wildlife

- Fruit is eaten by birds, bears, rodents etc.
- Larvae host for Palamedes Butterfly *(Papilio palamedes*)



Integrate coordination, control and management strategies

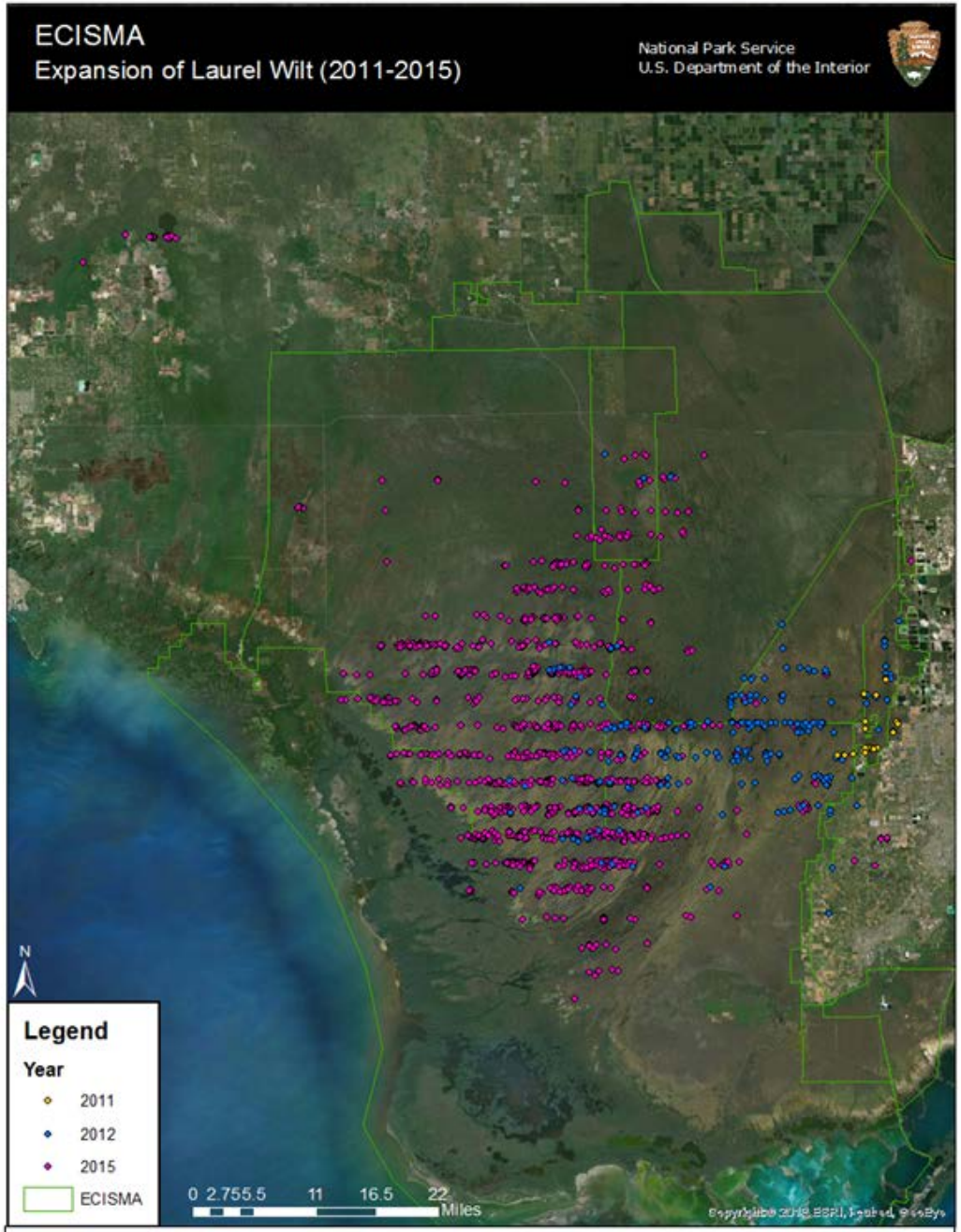


Figure 1. All data points collected by the two observers. The epidemic is clearly moving from east to west across the ECISMA. It is evident that about half of Big Cypress is now infested.

Integrated Outreach Efforts

- Website (www.evergladescisma.org)
- *Public Events*
  - -Pet Amnesty Days
  - - Other Outreach Events
- "Don't Let It Loose" Bill Board Campaign
- Social Media (Facebook, Twitter)
- Kiosk
- Non-Native Fish Round-Up

2014 ECISMA Newsletter

CISMA

Everglades Cooperative Invasive Species Management Area

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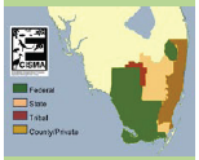


Newsletter

VOLUME 5 JULY 2014

The total eradication of brightly colored panther chameleons from a Broward County site was one of this year's success stories. (Photo courtesy Pat Howell, Broward County Parks)

Rapid Response success for nonnative wildlife

by Jennifer Ketterlin Eckles

FISST Puts the Hammer Down!

The Florida Invasive Species Strike Team (FISST) is the field team under the Everglades Cooperative Invasive Species Management Area (ECISMA) Rapid Response Subcommittee that is deployed to respond to new sightings of primarily nonnative wildlife within ECISMA's footprint. The team is comprised of a number of ECISMA members and partners with response capabilities and is directed by the affected land managing agency for any given response.

The team has had a number of rapid response successes over the past year. Two significant rapid response success stories were the removal of a Nile crocodile from Everglades National Park (ENP) and the discovery and possible eradication of panther chameleons on a Broward County property.

Nile Crocodile

In February of this year, while searching for Burmese pythons, members of the Swamp Apes, a volunteer group with ENP, spotted and photographed an odd crocodilian in the Chekika area of the park. The animal was identified as a Nile crocodile based on the photo and the identification was later confirmed by a field team. With authorization from ENP, the University of Florida (UF) led an interagency team comprised of ENP rangers, Florida Fish and Wildlife Conservation Commission (FWC) staff, and members of the Swamp Apes to successfully remove the animal. On Sunday, March 9, 2014, the team began an operation to remove the animal alive or dead. After several hours of using nets to corral the crocodile into a small section of a canal, the animal was harpooned and captured alive. Based on physical markings, the crocodile was identified as the same individual that eluded FWC and UF after it had been sighted two years earlier. The animal grew over two and a half feet from the time it was last reported. Due to the rapid response efforts of the interagency team, the five and a half foot-long Nile crocodile was successfully identified and removed.

Panther Chameleon

Last July, a Broward County employee reported removing an adult panther chameleon from a county owned property to the Early Detection and Distribution Mapping System (EDDMapS) website (www.eddmaps.org). After receiving this report, staff from UF and FWC searched the property the following night and found a juvenile panther chameleon. Subsequent surveys over the next few weeks resulted in the removal of a third juvenile chameleon. During this time, the group also received reports of three more animals from different occupants of the neighborhood, including one adult that was removed and two of unknown age found dead on the road. It is unknown whether this represents a breeding population or the release of multiple age classes. The team has since conducted follow-up surveys to determine if there is a breeding population established in the area, but no chameleons have been found or reported since late July. More follow-up surveys will be conducted in 2014 but the team is hopeful that this population has been extirpated. ♦

This Nile crocodile eluded authorities for two years, but was finally identified and removed from Everglades National Park this year. (Photo courtesy of Michael Rochford, University of Florida)

The long and winding road toward *Lumnitzera* eradication: common questions and answers

by Jennifer Possley, Fairchild Tropical Botanic Garden

The green, capsule-like fruit of *Lumnitzera racemosa* floats and contains a single seed. (Photo by Jennifer Possley, Fairchild Tropical Botanic Garden)

Flowers of *Lumnitzera racemosa*. (Photo by Dennis Giardina, FWC)

2014 marks the sixth year in the Everglades Cooperative Invasive Species Management Area (ECISMA) effort to eradicate *Lumnitzera racemosa* from the mangroves surrounding Fairchild Tropical Botanic Garden and Matheson Hammock Park. This Asian mangrove escaped from cultivation at Fairchild and produced tens of thousands of seedlings that went unnoticed for decades, in part because *Lumnitzera* looks very similar to the native white mangrove.

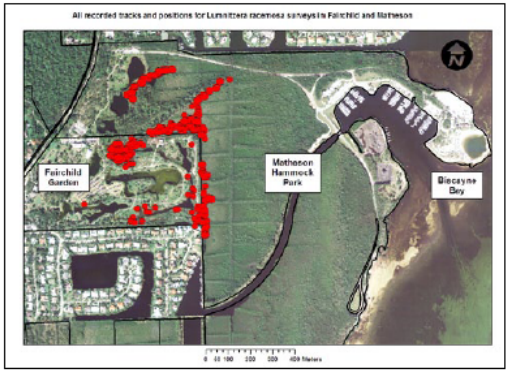
On January 24 and March 13 of 2014, ECISMA held additional volunteer workdays, during which more than two dozen hard-working volunteers came from seven agencies to survey for outliers and remove hundreds of stems from the infested area.

Lumnitzera eradicating does not depend on volunteer efforts alone. Thanks to the Florida Fish and Wildlife Conservation Commission (FWC), funding was provided to employ private exotic plant control contractors in 2010, 2012 and 2014. The strategy has been to use contractors for the heavily infested areas near Fairchild's northern border, and to use staff and volunteer surveys to remove outliers beyond the main infestation.

The struggle to eradicate this extremely aggressive invader has been tougher the group expected, and has drawn interest from numerous plant biologists and ecologists, both local and out-of-state. Below are the five most commonly asked questions:

1. What do the fruit/seeds look like, and how are they dispersed?

Lumnitzera flowers are small, white, five-petaled, and emerge in the fall. The fruits are buoyant, single-seeded green capsules which look similar to those of our native white mangrove. Unlike the native black, white, and red mangrove species, *Lumnitzera* fruits are not viviparous (seedling development



This map shows many of the locations where *Lumnitzera* has been found and removed since 2008. ECISMA has conducted searches of unoccupied areas surrounding each cluster, and in March 2014, expanded the survey areas even further to the east and south to ensure there are no other occurrences. (Map by Jennifer Possley, Fairchild Tropical Botanic Garden)

(CONTINUES ON PAGE 3)

- **Integrate outreach efforts**

2014 ECISMA Newsletter

LUMNITZERA (CONTINUED FROM PAGE 2)

A handful of *Lumnitzera* seedlings removed from a dwarf mangrove stand in Matheson Hammock in January 2012, two years after the last known reproductive trees were removed. At this stage, seedlings are very difficult to distinguish from those of the white mangrove. The most noticeable differences between the two are that *Lumnitzera* has alternate leaves while the white mangrove has opposite leaves, and *Lumnitzera* leaves lack a true petiole (the stalk attaching the leaf blade to the stem) and the leaf margin tapers gradually to the stem. (Photo by Jennifer Possley, Fairchild Tropical Botanic Garden)

does not begin while the fruit is still attached to the tree). This lack of vivipary in *Lumnitzera* may unfortunately contribute to its ability to form a seed bank. *Lumnitzera* fruits float and are water-dispersed, though it is easy to imagine that a hurricane could also blow the lightweight ripe fruit significant distances, which may explain the patchy distribution observed today.

2. Where are all the seedlings coming from?
Although the group believed that they removed the last reproductive *Lumnitzera* trees four years ago, they continue to find thousands of seedlings. Some scientists insist that the explanation for this phenomenon is that the ECISMA group must have left reproductive trees, because mangroves do not have seed banks (whereby dormant seeds remain viable in the soil for years). While it is possible that the group may have left a reproductive tree or two, they have not found any despite searches. Furthermore, a few reproductive trees cannot possibly explain the volume of new *Lumnitzera* seedlings that searchers find emerging from the soil every year adjacent to an area where a large stand of reproductive *Lumnitzera* once stood. The consensus of the ECISMA group whom have been working on this eradication effort is that there must be a seed bank, and the seeds definitely persist for at least 4 years or longer.

3. How does ECISMA know it hasn't spread further?
ECISMA doesn't know whether *Lumnitzera* has spread further. There is hope that it is contained within the boundaries of Matheson Hammock Park. Over the past six years, dozens of knowledgeable biologists have scoured the area to try to determine the extent of the infestation, and have only found plants within 400 meters of Fairchild Garden. It seems that for the most part, *Lumnitzera's* floating seeds have been contained by the network of mosquito ditches that criss-cross the mangroves. Thankfully, repeated surveys of the Biscayne Bay shoreline by canoe or kayak have not turned up any *Lumnitzera*. Fingers are crossed… and biologists keep looking.

4. Should *Lumnitzera* be on Early Detection and Rapid Response (EDRR) lists all over Florida?
This is a tough question. The short answer is "no." *Lumnitzera racemosa* looks very similar to the native white mangrove, *Laguncularia racemosa*. Sounding the alarm state-wide for what is a highly localized problem could result in mistaken identities and removal of the protected native mangroves. To date, ECISMA has spent hundreds of survey hours by foot, canoe and kayak searching for *Lumnitzera* beyond the 19-acre area where it has already been documented, and the group will be conducting many more surveys. All indications are that it is a localized problem. However, (going back to that asterisk), if ECISMA finds reproductive *Lumnitzera* beyond the original eradication area at any future date, there will likely be a call for this species to be placed on EDRR lists throughout southeast Florida.

5. Is *Lumnitzera* is here to stay?
ECISMA continues to believe that *Lumnitzera* can be eradicated. It is increasingly clear, however, that eradication will need to be a long-term effort. At some point, the seed bank will become depleted, but biologists will need to keep surveying for years to find any plants that were missed, or the occasional seed that managed to survive in the soil longer than the others. The group holds the vision that in a few years from now, they can conduct annual surveys with ECISMA volunteers and remove only a few dozen seedlings during each survey. Thanks to all of the ECISMA partners and plant contractors for sharing in the efforts, and their continuing support. ♦

ECISMA needs more dedicated volunteers like Alex Cunningham from USDA-APHIS-PPQ who can really sink their teeth into the *Lumnitzera* eradication effort. Contact Jennifer at jpossley@fairchildgarden.org to participate next time! (Photo by Dennis Giardina, FWC)

IveGot1 App: easy and efficient reporting app has expanded capabilites

by Karan Rawlins and Chuck Bargeron

Data collected by the IveGot1 app is currently reported as a single point. (Image courtesy EDDMapS.org)

The IveGot1app makes collecting and reporting information on invasive plant and animal species in Florida quick, easy and accurate.

It allows users to see images and read descriptions of the invasive species and view distribution maps of existing infestations.

Most importantly,the app maskes it easy for users to submit invasive species observations directly from the field from any smart phone. These reports are automatically uploaded to the Early Detection and Distribution Mapping System (EDDMapS) and e-mailed directly to local and state verifiers for review.

When users in the field report sightings of invasive animals and plants, researchers can better assess the extent of the infestations and make better management decision to treat new infestations before they become firmly established, the way species such as Melaleuca trees and Burmese pythons have in the past.

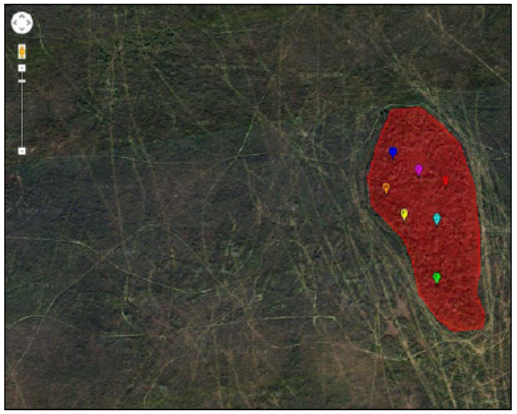
The goal of IveGot1 is to make identification and reporting as easy and efficient as possible.

Technology is always advancing and the IveGot1 app is keeping up. As new software and hardware become available, the information technology professionals at Bugwood Center for Invasive Species and Ecosystem Health are hard at work keeping the app up to date.

The updates for IveGot1 are available free of charge for download to any Apple iPhone, Apple iPad, Android phone or Android tablet.

Two exciting updates will be available for the IveGot1 app in the near future. One update will provide the ability to map negative data. Users will be able to survey a trail and report that it is free of a specific invasive species. Negative data gives land managers a more complete picture of the areas they manage.

Currently, users can report an infestation as point data, using just one set of GPS coordinates that correspond to just one point on earth. Another update in the works will allow users to report an infestation as a polygon rather than a point. A polygon is a two dimensional figure with straight sides and angles, for example, a triangle, square or octagon. The ability to report and read data as an area rather than a single point is a powerful tool for researchers and land managers. It more accurately reflects the reality on the ground for large problem areas, for example, a field infested with tallow trees. ♦



A polygon map provides data on invasive species on a tree island in the Everglades. (Image courtesy EDDMapS.org)

- **Integrate outreach efforts**

2014 ECISMA Newsletter

Redwing: another EDRR species in Miami's "Redland" area

by Jennifer Possley, Fairchild Tropical Botanic Garden, and Jane Dozier, Miami-Dade County Parks, Recreation and Open Spaces Department, Natural Areas Management Division

Photos by Jennifer Possley, Fairchild Tropical Botanic Garden

The infructescence (cluster of fruits) of redwing appears in the winter.

Redwing is a woody vine native to Mexico, Central and South America. It climbs into the forest canopy and its flowers and fruits are often out of reach. Flowers and fruits are present during winter months, making it much easier to find. The fruits of redwing are called "samaras" and look similar to the "helicopters" that fall from maple trees. They are deep red, hence the name "redwing." The taxonomy for redwing is complicated. All of the major taxonomic authorities use different scientific names, including *Heteropterys beecheyana, Heteropterys brachiata, Banisteria beecheyana, Banisteria brachiata, Banisteria sanguinea* and others. The common name "redwing" is easier to use and remember.

Herbarium labels at Fairchild Tropical Botanic Garden indicate that redwing was introduced to south Florida from Colombia and Guatemala by David Fairchild, and was planted in Fairchild (where it has since been removed, presumably for weedy tendencies) as well as at the University of Florida Tropical Research and Education Center in Homestead, Fla.

Today, redwing has only been documented in two places in Florida, both of which are in Miami-Dade County. One is The Barnacle Historic State Park, a nine-acre park in Coconut Grove. The other location is the vicinity of Castellow Hammock, where we have documented infestations in three separate Environmentally Endangered Lands (EEL) preserves and six adjacent private parcels, in an area spanning approximately 100 acres. While redwing has likely been in this area for at least 20 years, it was first collected there in 2004.

Our effort to combat redwing began in November 2011, when Miami-Dade County and Fairchild biologists held a small workday to removed hundreds of redwing seedlings from Chernoff Hammock. We repeated our efforts again, during an Everglades

Redwing's woody vines are similar to that of jasmine in color, size, and coiling, but they lack the corky furrows found in *Jasminum* s

(CONTINUES ON PAGE 6)

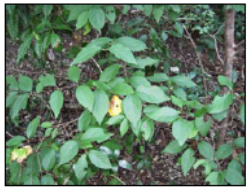
REDWING EDRR (CONTINUED FROM PAGE 5)

Cooperative Invasive Species Management Area (ECISMA) work day in late 2013. Miami-Dade County Natural Areas Management crews, with assistance from EEL preserve managers, have recently begun to treat redwing in other county-owned parcels in the area.

Battling pest plant invasions on public lands is only half the battle. Suspecting that redwing had a strong foothold on adjacent private properties, we conducted windshield surveys and contacted private landowners to access their properties. To date, we have had direct contact with three of the six private property owners with known or suspected infestations. We treated a small infestation at one property, and instructed the owners of a second property how to treat the infestation themselves, by hand-pulling seedlings, removing ripe fruit within reach, cutting large stems and applying an herbicide containing triclopyr.

Close-up of redwing flower and fruit.

Dennis Giardina applies Garlon to the stump of a large redwing vine.



Redwing has ovate (broader at the base), opposite leaves.

We found more than we bargained for at the third property, where redwing covered almost six acres. In half of that area and despite the property owner's attempts since 1999 to fight the invasion, redwing had smothered all vegetation with a habit reminiscent of kudzu or Old World climbing fern. Such a frightening vision caused us to (a) realize how truly invasive redwing is, and (b) revise our eradication strategy.

We can now see that eradicating redwing from the Castellow Hammock area is going to be a long-term effort.

Our immediate priority is to remove all infestations from county preserves. Our secondary objectives are to contact all private landowners and work with them to remove small infestations. Lastly, we have our eyes on the horizon for a very large volunteer effort or an appropriate source of funding to treat the core infestation on private land.

Based on these recent finalings, there are plans to petition the Florida Exotic Pest Plant Council (FLEPPC) to add redwing to its list of invasive plants. ♦

This massive redwing infestation on private property near Castellow Hammock preserve has a habit reminiscent of highly invasive species such as kudzu or Old World climbing fern.

- **Integrate outreach efforts**

2014 ECISMA Newsletter

Exotic Pet Amnesty Program continues to assist in placement of exotic pets throughout Florida

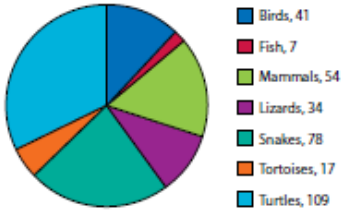
by Liz Barraco, FWC

Since the first event in 2006, the Exotic Pet Amnesty Program has increased its reach steadily over the years. In 2013, seven Exotic Pet Amnesty Day events were held in Florida, two of those within the Everglades Cooperative Invasive Species Management (ECISMA) footprint. Exotic Pet Amnesty Day events provide opportunities for pet owners to surrender their exotic pets, no questions asked. All healthy, surrendered animals are available for adoption by pre-approved adopters the same day. The Exotic Pet Amnesty Day events serve as opportunities to educate the public on exotic species in Florida and responsible pet ownership. In addition to the Exotic Pet Amnesty Days events held throughout the year, people can contact the 888-IveGot1 hotline for assistance in finding a new home for their exotic pet. In total, 340 animals were placed into new homes through the Exotic Pet Amnesty Program in 2013. Of the animals placed, 188 were surrendered during Exotic Pet Amnesty Day events while 152 were placed through calls to the 888-IveGot1 hotline. For more information about the Exotic Pet Amnesty Program, visit MyFWC.com/Nonnatives or call the Exotic Species Hotline at 888-IveGot1 (888-483-4681). ♦

Animal Surrenders by CISMA in 2013

Cooperative Invasive Species Management Area (CISMA) Name	# of Events	Number of Animals Surrendered		
		Event	Hotline	Total
Apalachee Regional Stewardship Alliance CISMA	0	0	2	2
Central Florida CISMA	0	0	9	9
East Coast CISMA	0	0	16	16
Everglades CISMA	2	94	50	144
First Coast Invasive Working Group	0	0	19	19
Heartland CISMA	0	0	9	9
Lake County CISMA	0	0	1	1
Marion County Invasive Species Mgmt. Council	0	0	1	1
Nature Coast CISMA	0	0	10	10
North Central Florida CISMA	1	7	7	14
Six Rivers CISMA	1	15	7	22
Southwest Florida CISMA	2	30	6	36
Suncoast CISMA	1	42	13	56
Treasure Coast CISMA	0	0	1	1
Out of State	0	0	1	1
Total	7	188	152	340

Types of Animals Placed in 2013

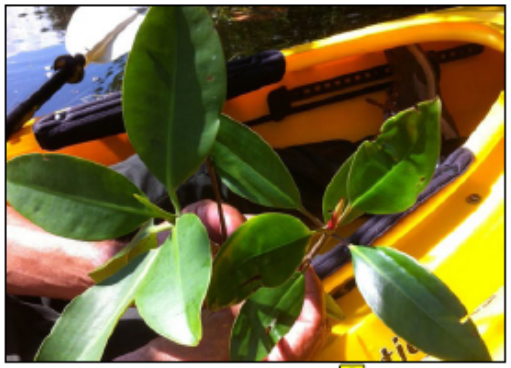


Dr. Frank Ridgely from Zoo Miami examines a bearded dragon surrendered at Exotic Pet Amnesty Day in Broward County. (Photo by Ashley Taylor, FWC volunteer)

Murray Stanford (FWC) introduces the public to non-native fish at Exotic Pet Amnesty Day at Zoo Miami. (Photo by Jennifer Ketterlin Eckles, FWC)

The other exotic mangrove: *Bruguiera gymnorrhiza* at Kampong National Tropical Botanical Garden

by Dennis J. Giardina, Florida Fish and Wildlife Conservation Commission



Buds of *Rhizophora mangle* (left) and *Bruguiera gymnorrhiza* (right). (Photo by Dennis Giardina, FWC)

On a morning in March 2014, a group of Everglades Cooperative Species Management Area (ECISMA) partners visited the Kampong Tropical Botanic Garden. After a brief meeting in the living room of what was once David and Marian Fairchild's home, Kampong curator David Jones and Harvard Professor Emeritus and mangrove expert Barry Tomlinson led the group outside and down the slope of the backyard on Biscayne Bay to a small strip of land between two man-made boat basin canals where in 1940, two specimens of the non-native mangrove species *Bruguiera gymnorrhiza* were planted.

Bruguiera gymnorrhiza is native to the diverse mangrove forests of East Africa, Asia, Australia and the Western Pacific.

The two specimens came from a collection made in Sulawesi, Indonesia. In his memoirs, David Fairchild wrote that he hoped his *Bruguiera* trees would eventually fruit and spread along the coast line, brightening it with their red flowers.

In 2008, after *Lumnitzera racemosa*, another species of exotic mangrove, was found to be invading the native mangrove forests of Fairchild Tropical Botanic Garden and neighboring Matheson Hammock County Park, a review of the records of the other non-native mangrove species planted at both Fairchild and Kampong Botanical Garden prompted an inspection of their collections.

Saplings side by side, *Bruguiera gymnorrhiza* (left) and *Rhizophora mangle* (right). (Photo by Dennis Giardina, FWC)

Of the fourteen documented exotic mangroves that were planted at Fairchild, five remained. Interestingly, out of a total of 14 *Bruguiera gymnorrhiza* trees planted there between 1952 and 1971, none remained.

Of the two *Bruguiera* trees that were planted at the Kampong, one was found to be alive and well, along with at least 86 more of them in the understory. A local survey was carried out and a 21 by 21 meter research plot was established around the remaining mature tree to determine the seedling density and rate of spread of the population. As the group walked along the pathway in the middle of the forested peninsula, they were able to spot the specimen tree, which was almost 75 years old, pretty quickly. The bark was very dark and the structure of the tree reminiscent of a mature sweet bay magnolia.

Bruguiera gymnorrhiza propagule showing characteristic ribs that look a bit like okra. (Photo by Dennis Giardina, FWC)

Bruguiera gymnorrhiza flower calyx (the outermost whorl of sepals that cup the petals of a flower). (Photo by Dennis Giardina)

Bruguiera gymnorrhiza is a close relative of our native red mangrove, *Rhizophora mangle*, and it took a while for the group to be able to distinguish the smaller *Bruguiera* from red mangroves of the same size. Their foliage is strikingly similar and when they are seedlings and saplings, they look a lot alike.

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- **Integrate outreach efforts**

2014 ECISMA Newsletter

EXOTIC MANGROVE (CONTINUED FROM PAGE 8)

The ECISMA group with Dr. Barry Tomlinson (left to right) Kevin Gray, Dennis Giardina, Andrew Derksen, Barry Tomlinson, Jennifer Possley, Gwen Burzycki and Dallas Hazelton) (photo by David Jones)

The leaves of *Bruguiera* have much more prominent drip tips. The petioles (leaf stalks) and buds have a distinctive reddish color. The propagules of the two species are similarly shaped but unlike the smooth exterior of red mangrove propagules those of *Bruguiera* are subtly ribbed, appearing a bit like okra.

As the group became better at identifying *Bruguiera*, they flagged the ones they came across that did not bear tags from the 2008 plot. During the survey, the ECISMA group was able to verify that *Bruguiera* persists in the three separate polygons where they were originally mapped.

The group felt somewhat relieved that *Bruguiera gymnorrhiza* population at the Kampong did not appear to be as aggressively invasive as the other exotic mangrove, *Lumnitzera racemosa*. After the survey, the ECISMA group and David Jones committed to reconvening in April to

Jennifer Possley with *Bruguiera gymnorrhiza* seedling (photo by Dennis Giardina, FWC)

Peninsula at Kampong with white polygons indicating where *Bruguiera gymnorrhiza* was mapped in 2008 (photo by Dennis Giardina, FWC)

resample the 2008 plot and do a much more exhaustive survey at the Kampong and along the coastline in the vicinity, especially in the pockets of mangroves to the north.

It is reasonable to expect that the original tree has been reproductive for at least half a century and that the inshore current has potentially carried away many *Bruguiera* propagules over the years. *Bruguiera* seedlings are remarkably shade tolerant and it is possible that they could have established over time in the dark interior of native mangrove stands if high tides and storm events were repeatedly able to deposit enough of them there.

The ECISMA partners who have participated in the five-year-long effort to eradicate *Lumnitzera racemosa* are understandably wary of exotic mangrove species. They had hoped to be able to declare *Lumnitzera* gone, but after hundreds of man-hours and tens of thousands of dollars spent by the Florida Fish and Wildlife Conservation Commission, surveyors are still finding thousands of seedlings per acre per year at Matheson Hammock, four years after it was believed that the last reproductive tree was removed. Those involved in the ongoing effort agree that it is very fortunate that the *Lumnitzera* infestation is the result of an introduction from a single site.

For most invasive species, there is a "lag phase," a period of time between introduction and "critical mass," when an invasive species population explodes and begins to impact ecosystem composition, structure and function. For some species like *Lumnitzera*, that period is short. For 10

Certainly other related mangrove species have proven to be invasive, including our native red mangrove, *Rhizophora mangle*. In 1902, red mangroves from South Florida were planted on Molokai in the Hawaiian Islands, which, because of their remoteness, never had endemic mangrove species. By 1917, it was recorded on neighboring Oahu and now it has been documented throughout the archipelago, negatively impacting native plant and animal communities and proving very difficult to control. At least five other mangrove species were introduced to Hawaii during the early 20th Century. While none of those have spread like red mangrove, two of them have developed into self-sustaining populations. One is another south Florida native, buttonwood, *Conocarpus erectus*. The other species is *Bruguiera gymnorrhiza*. ♦

"Mangroves as Alien Species: Case of Hawaii" by James A. Allen: http://bit.ly/mangHaw

"Are mangroves in the tropical Atlantic ripe for invasion? Exotic mangrove trees in the forests of South Florida" http://bit.ly/mangflo

For everything you always wanted to know about mangroves * but were afraid to ask, download the United Nation's Food and Agriculture Organization paper "The World's Mangroves 1980 – 2005" http://bit.ly/everythingmang

Python Patrol: FWC's newest Early Detection and Rapid Response program

by Jenny Novak, FWC

Python Patrol graduating class photo, January 2014, Port Charlotte (photo courtesy of FWC)

Python Patrol is an Early Detection/ Rapid Response (EDRR) training program that recruits and trains natural resource workers, outdoor enthusiasts and concerned citizens. The three elements of the program are python detection and identification, hands-on experience in the safe and humane capture of exotic constrictors and accurate data reporting. Created by The Nature Conservancy, Python Patrol is now administered by the Florida Fish and Wildlife Conservation Commission (FWC) with the program headquartered in Homestead.

Recent data analysis by the University of Florida shows that the population of Burmese pythons (*Python molurus bivittatus*) in south Florida is moving north and west out of Everglades National Park. Increasing the number of people looking for, reporting, and removing pythons is a critical component in preventing the establishment of pythons in new areas. Pythons are hard to find, and detection rates for pythons have been shown to be significantly higher for people that have received training or have experience looking for pythons. Providing trainings that teach detection skills will allow more citizen scientists to effectively participate in stopping the spread of this invasive species.

The goal for 2014 is to host training workshops in south and southwest Florida, with special emphasis on conservation areas in Collier, Lee and Broward Counties. The primary target audience includes law enforcement officers, natural resource workers for state, local, federal and tribal governments, and outdoor recreationalists. FWC offers two types of free Python Patrol workshops:

- **Detector Workshop**
  Detector workshops include information on Burmese pythons in Florida, rules and regulations, python detection, species identification and data reporting. There is no hands-on component. This training is for people who do not wish to capture snakes, but want to learn about pythons, how to identify them and what information to collect and report should they see one.

Captain Jeff Fobb of Miami-Dade Fire Rescue's Venom Response Unit teaches safe and humane capture and handling techniques. Fobb explains constrictor behavior while a Burmese python demonstrates coiling during a recent class. (Photo courtesy DOI)

Workshop participants get hands-on experience in a recent Responder workshop in Davie. (Photo courtesy FWC)

- **Responder Workshop**
  Responder workshops cover everything addressed in the Detector workshops and include information on the associated permitting process and safe capture techniques. Participants also receive hands-on experience catching wild Burmese pythons. This training is for people who work or recreate outdoors, are likely to encounter pythons, and are interested in learning how to safely and humanely capture them. People who take the responder workshop can join a network of FWC volunteers to help look for and remove pythons reported to the agency through the Exotics Species Hotline (888-Ive-Got1).

Groups of eight or more people are encouraged to contact the Python Patrol Coordinator (Jenny.Novak@MYFWC.com or 305-224-428[illegible]) to inquire about scheduling their own workshops. Up to two Responder Workshops or three Detector workshops can be scheduled for the same day.

For more information, visit: http://publish.fwc.state.fl.us/wildlifehabitats/nonnatives/python/python-patrol

- **Integrate outreach efforts**

2014 ECISMA Newsletter

Giant brake fern in the Everglades

by Tony Pernas, Christen Mason and LeRoy Rodgers

The tiny, dark sori (spore-producing reproductive structures) are borne along the inrolled margins (edges) on the underside of the pinnules (smaller "leaflets" in a compound leaf). (Photo by Christen Mason, FWS)

Giant brake (Pteris tripartita) is a large fern native to tropical Asia. This large ornamental fern has very stout stems with tall, three-parted fronds. The petiole (leaf stalk) is straw to reddish brown colored and can grow to be one to one and a half meters long. The large leaf blades are deltoid (triangular) in shape and pinnate-pinnatifid (remaining sufficiently connected to each other that they are not separate leaflets).The pinnule (leaflet) margins are entire (smooth) to finely toothed. The sori (spore-producing structures) are borne along the revolute (inrolled) margins on the underside of the pinnules.

Giant brake has naturalized in the West Indies, Central America, South America and is one of four Pteris species that has escaped cultivation in Florida. It is found in low, moist habitats and appears to require continually saturated soils.

In a 1957 article on cultivated ferns in the American Fern Journal, C.V. Morton states that giant brake was sold by Royal Palm Nurseries of Oneco, Florida beginning in 1896. The species was described as "reaching a height of 6 feet, forming a magnificent specimen." Morton describes the species escaping cultivation and said that it was common in various locations in the Pompano, Fla. area by 1928. Giant brake was first vouchered in Florida in 1928 by John K. Small in a cypress swamp west of Pompano. "Vouchered" means that a specimen has been collected and pressed, and sent to a herbarium to verify the species and document a finding. It usually represents a new record for an area. In 1959, it was recorded and vouchered by Frank Craighead in Miami-Dade County on Old Cutler Road. It has since been vouchered in Desoto, Hillsborough, Martin, Palm Beach, Polk and Volusia counties.

Giant brake is found in a variety of Florida habitats including wet flatwoods, cattail stands, floodplains, hardwood swamps, cypress swamps and hardwood hammocks.

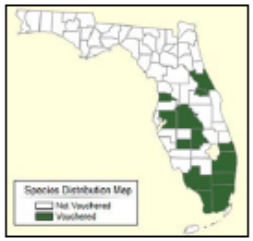
Giant brake fern thrives in shaded areas. (Photo by David Black, SFWMD)

Giant brake was found growing in a tree island in Water Conservation Area (WCA) 3B (Broward County) during the 2013 Everglades digital aerial sketch mapping (DASM) flight. Subsequent ground visits revealed that roughly two acres of the tree island understory contained scattered to dense patches of giant brake. The plant was found in both dense shade and open canopy gaps within the tree island.

Giant brake was spotted again during the 2014 DASM flights. This time, the plant was observed growing in the southwestern part of the Arthur R. Marshall Loxahatchee National Wildlife Refuge (LNWR). Scattered patches were spotted within a roughly 60-acre area, with a total of no more than eight acres of infestation. The giant brake occurred on floating peat mats and openings in dense cattail stands and appeared stunted and chlorotic (pale and yellow). Giant brake was already known to occur in the cypress strands on the east side of the refuge. While there have been no records documenting significant invasiveness of this species, land managers are reluctant to leave it untreated in these areas of recent establishment. Treatment of the fern has been completed in WCA 3B, with a follow up treatment planned, if necessary. Giant brake locations in the refuge are within a current treatment unit and ground crews have been instructed to treat the fern when it is encountered. The fern has not been documented on tree islands within the refuge and it is hoped that this early eradication effort will prevent tree island establishment inWater Conservation Area 1.

The growth habitat of giant brake fern is somewhat stunted in open, sunny areas. (Photo by Christen Mason, FWS)

A sample of the fern has been pressed and laminated for future training purposes, to aid land managers in identification. It is possible that the giant brake has established in other natural areas and hasn't been reported. Future decisions and actions could be influenced by the extent of this fern's distribution. ♦



Giant brake fern has been documented and verified in several counties in Florida. (Map from www.florida.plantatlas.usf.edu/Plant.aspx)

The South Florida Ecosystem Restoration Task Force by Carrie Beeler, DOI

The South Florida Ecosystem Restoration Task Force (SFERTF) consists of members who are top level policy makers, representing tribal, federal, state, and local government, working together on the largest ecosystem restoration project in the world: the greater Everglades ecosystem.

Invasive exotic species threaten our environment, economy, culture, and human health. Combatting invasive exotic species is integral to successful South Florida Ecosystem Restoration and the sustainability of South Florida.

The stakes are high

The SFERTF has been concerned about invasive exotic species and their impacts on South Florida's ecosystem for more than a decade. The South Florida Ecosystem is ecologically unique and imperiled by numerous threats. The South Florida Ecosystem is also home to:

- a culturally diverse population of almost 8 million residents, including two Indian tribes,
- world renowned recreational opportunities, and
- strong agricultural and tourism-based economic engines.

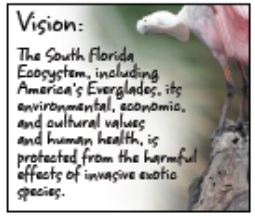
A Framework

In July 2013, the South Florida Ecosystem Restoration Task Force directed its Working Group and Science Coordination Group to develop a *Strategic Action Framework (Framework)* on invasive exotic species. The Department of Interior's Office of Everglades Restoration Initiatives coordinated the drafting of the Framework in collaboration with an extensive and diverse set of partners, including members of the Task Force, Working Group, Science Coordination Group, and the Everglades Cooperative Invasive Species Management Area (ECISMA).

The SFERTF, along with members of the Everglades Cooperative Invasive Species Management Area (ECISMA) and other partners, are developing this Framework in order to enhance our collective ability to combat invasive exotic species

This framework aims to:

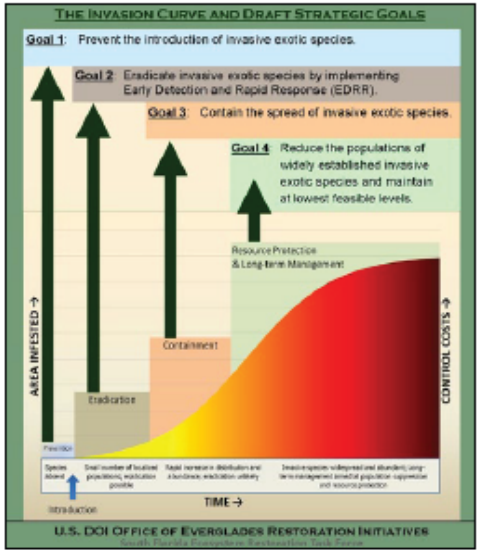
- Help decision-makers understand the connections between goals, strategies and tactics;
- Maximize the extent to which the current capacity for partnership is l everaged to meet common goals;
- Help decision-makers make wise and timely investment decisions in the battle against invasive exotics; and
- Define success and provide for accountability.



The Invasion Curve as the organizing principle

The Framework initiative has developed four goals organized around the invasion curve. The curve depicts, at a glance, the ability to combat invasive exotic species in terms of time, resources, and likelihood of eradication or containment.

The left-hand side of the invasion curve represents the best chance for long-term success. Since eradication of widely established invasive species is rarely achieved, a long-term commitment to controlling established species is required to protect the natural resource. Long-term suppression of these established species is a challenge and is costly. Thus, early detection and control of new invasive species results in lower overall environmental impact and economic cost along with a higher likelihood for eradication. ♦



- **Integrate outreach efforts**

2014 ECISMA Newsletter

Dalechampia vine continues to present challenges

by Pat Howell, Natural Resources and Land Management Section, Broward County Parks

Dalechampia is a twining vine with three-lobed leaves and stinging hairs on all parts of the plant. Two large, showy bracts (modified or specialized leaves) hug the flowers. (Photo by Pat Howell, Broward County Parks)

Dalechampia scandens is an invasive vine native to East Central Africa and the Cape Verde Islands, the Arabian Peninsula, Mexico, Central and South America including the West Indies.

The first documented location for this vine in the United States was at Anne Kolb Nature Center in Hollywood, Florida in 2000, where it showed up near the butterfly garden. *Dalechampia* is the larval host of the *Hamadryas* or "cracker" butterflies. The male butterflies produce an unusual "cracking" sound as part of their territorial displays. At this time, the pale cracker (*Hamadryas amphichloe*) only occasionally strays into Broward County from the West Indies or Cuba.

Dalechampia is a twinning vine with three-lobed leaves and stinging hairs on all parts of the plant, with the possible exception of the root. Two large, showy bracts (modified or specialized leaves) hug the flowers. When the mature flower capsule dries, the seeds rupture explosively, dispersing the seeds several meters from the parent plant.

In 2006, *Dalechampia* was found in Tradewinds Park in Coconut Creek in Broward County. The park is more than 626 acres, and is divided by Sample Road (a six-lane highway), and is bounded by the Florida Turnpike to the east. This plant was observed growing into the tops of south Florida slash pine (*Pinus elliottii*) on the northeast corner and into the cypress domes on the southwest corner of the park.

A vine removal project in Tradewinds Park in 2010 and 2011 was unsuccessful in removing *Dalechampia*. On January 24, 2014, the Everglades Cooperative Invasive Species Management Area (ECISMA) Early Detection Rapid Response (EDRR) team located and marked *Dalechampia* locations with GPS throughout Tradewinds Park. Three of the cypress domes on site are currently being treated.

In 2006, *Dalechampia scandens* was found along the firebreaks of the Military Trail Scrub Site, also in Broward County. Despite a 2010 a wildfire and multiple chemical treatments, the population at this site has not yet been successfully removed.

The plant has been found growing in pine flatwoods, sand pine scrub, cypress domes, and adjacent to mangrove swamps and the Intracoastal Waterway. Currently, all three sites in Broward County are undergoing chemical treatments.

Dalechampia scandens plant was more recently found in the University of South Florida's Botanical Garden in Tampa.

View herbarium specimens of *Dalechampia scandens* on the Atlas of Florida Vascular Plants Institute for Systematic Biology Website: http://bit.ly/1dalechampia ♦

Distribution *Dalechampia scandens* within Tradewinds Park in Broward County. Map courtesy Michael Middlebrook, Broward County Parks)

Large snails and tiny pink eggs: new research suggests invasive snail eggs may be best left alone

by and photos by April S. Ostrom, Palm Beach Atlantic University

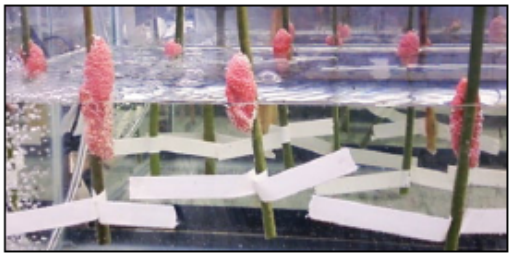
Shell of the large invasive snail, *Pomacea maculata* (formerly known as *Pomacea insularum*)

A non-native freshwater snail species of the *Pomacea* genus *Pomacea maculata* (formerly known as *Pomacea insularum*) has become established in Florida, Texas and Hawaii. The snails were native to South America, and were probably introduced to the United States from aquarium release ("aquarium dumping"). This non-native snail feeds on aquatic plants and invertebrates and a single female can lay approximately 2,000 to 4,000 bright pink eggs each week. This snail is a threat to agriculture and native wetland ecosystems in the United States. Moderately effective methods of control include biological control, pesticides and draining heavily infested areas followed by manual removal.

A study was done to investigate two other proposed methods of control, dislodging or flooding the eggs. The objectives of the study were to compare the hatching success of unsubmerged egg clutches with the hatching success of partially submerged egg clutches, compare the growth rates and determine if snails hatched in submerged conditions are viable to a shell length that exceeds 25 millimeters (one inch), the average size of an adult snail of reproductive age.

During the study, researchers observed that eggs in unsubmerged conditions had an average hatching success of 47 percent. Eggs in partially submerged conditions had an average hatching success of 43 percent and floating eggs (which had been dislodged from the vegetation where they had been deposited) had an average hatching success of 30 percent. A moderate estimate of a10 percent hatchling viability to reproductive age in partially submerged eggs could result in 60 to 80 snails per clutch. With an average of 2,064 eggs per clutch, 60 to 80 snails could potentially produce more than 12,000 viable offspring in one week.

Adult non-native snails measuring 30 millimeters (slightly larger than an inch) in size.



The egg clutches of invasive snails are distinctive, with many tiny pink eggs. They look much different than those of the native apple snails, which have fewer, larger white eggs and are sensitive to inundation by water.

Pink eggs – leave them alone?

Due to the plight of the endangered Snail Kite, it is fairly common knowledge that the white eggs of native apple snails are sensitive to inundation by water. Recent research suggests that the idea of knocking the bright pink egg clutches of invasive apple snails into the water to try to get rid of them may not be such a good idea. In the study, invasive snail eggs still had a moderate reproductive success rate even if they were partially submerged or floating. Since the eggs may still be viable, it is possible that "knocking down" pink eggs into the water (despite the best intentions) may actually facilitate dispersal and make thousands of tiny eggs even more difficult for predators to find and eat.

Non-native *Pomacea* species have become the most serious apple snail pests, attacking a wide range of crops, with impacts in South-East Asia, Thailand, Vietnam, Malaysia, Indonesia, China, Taiwan, Japan and Philippines. *Pomacea* species infestations in 1990 cost the United States $28 to 45 million. A thorough understanding of this species is crucial to be able to control this ongoing invasion.

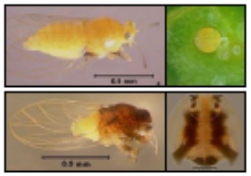
Read the complete study: **An Assessment of Submersion as a Mechanical Control Technique of Pomacea insularum Eggs in Southern Florida, USA**, by April S. Ostrom, Thomas C. Chesnes published in *Natural Resource and Conservation*: http://bit.ly/1hzKVCd ♦

- **Integrate outreach efforts**

2014 ECISMA Newsletter

Gall-forming psyllids: promising biological control agents for Brazilian peppertree

by James Cuda, Rodrigo Diaz, Veronica Manrique, Alissa Berro, Patricia Prade, Marcelo Vitorino and William Overholt, UF/IFAS



Adult and nymph of *Calophya latiforceps* (top) and *Calophya terebinthifolii* (bottom). Note contrasting dark and light regions on *Calophya terebinthifolii*. (Photos by Lindsey Christ, UF/IFAS)

Brazilian peppertree (*Schinus terebinthifolia*) is an aggressive, rapidly colonizing woody shrub of disturbed habitats, natural communities and conservation areas in southern California, Florida, Hawaii, Texas and several Caribbean islands.

Introduced into Florida from South America as a landscape ornamental in the late 19th century, Brazilian peppertree escaped cultivation and is widespread throughout the ecosystems in central and south Florida, most notably the Everglades. This invasive shrub grows rapidly, displaces native vegetation, tolerates a wide range of environmental conditions and is a prolific seed producer.

Direct contact with the plant may cause irritation to sensitive people. Ingestion of the berries may intoxicate birds and mammals, and is sometimes toxic to livestock, especially horses. For example, several flocks of Cedar Waxwings (*Bombycilla cedrorum*) recently died in California from trauma after gorging on the overripe berries and colliding with hard objects.

Brazilian peppertree also contributes to other invasive species problems. For instance, it is an important alternate host for the naturalized Caribbean root weevil (*Diaprepes abbreviatus*), a major pest of commercial citrus, ornamental plants and some agricultural crops in Florida and California. In southwest Florida, the invasive black spiny-tailed iguana (*Ctenosaura similis*), introduced from Latin America, survives on the leaves of Brazilian peppertree during the winter months.

The rapid growth and spread of Brazilian peppertree is due in part to hybrid vigor, its ability to chemically and physically exclude other plants. A lack of natural enemies was the rationale for initiating a classical biological control program in Hawaii in the 1950s, and in Florida in the mid-1980s.

The goal of biological control is to introduce a complex of natural enemies into Florida that are capable of selectively attacking and reducing the invasiveness of Brazilian peppertree. Several arthropod natural enemies that occur in South America were identified that are capable of restricting seed production and reducing the vigor and growth rate of seedlings and young plants. Biological and host range studies were initiated for several of these natural enemies to determine their suitability for release in Florida. Two of these natural enemies that have biocontrol potential are leaflet galling psyllids of the genus *Calophya*. *Calophya terebinthifolii* was described as a new species in the last decade, and *Calophya latiforceps* was only recently described. Both psyllids attack Brazilian peppertree in South America.

Nymphs developing within pit galls (circular depressions) on the leaflets cause extensive foliar pitting, cessation of growth and defoliation. The rationale for using *Calophya* species as biological control agents is based on a similar, although unintentional, introduction of a related species into California that caused widespread damage to the commonly planted ornamental Peruvian peppertree, *Schinus molle*. The invasive psyllid *Calophya schini* which was first discovered in California in1984, caused extensive damage to Peruvian peppertree. However, in California where Brazilian peppertree often co-occurs with *Schinus molle*, field observations indicated that Brazilian peppertree was immune to attack by this psyllid. This finding confirmed the high degree of host specificity exhibited by these *Calophya* psyllids. A laboratory colony of *Calophya terebinthifolii* has been established, and host range testing of *Calophya latiforceps* was completed. A petition for field release of *Calophya latiforceps* will be submitted to the Technical Advisory Group for Biological Control Agents of Weeds in 2014. Acquisition of the two *Calophya* psyllids was made possible via licenses issued by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), which is Brazil's equivalent to the Environmental Protection Agency EPA in the United States.

Research on Brazilian peppertree biological control is supported by grants from Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Industrial and Phosphate Research Institute. ♦

Leaflets of Brazilian peppertree galled by *Calophya latiforceps* (left) and *Calophya terebinthifolii* (right). (Photos by Rodrigo Diaz, UF/IFAS).

Update on operational activities for nonnative reptiles

by Jennifer Ketterlin Eckles

UF and FWC are conducting spectacled caiman surveys and removals of in Miami Dade and Broward Counties. (Photo courtesy UF)

Numerous agencies and their contractors continued management activities within the Everglades Cooperative Invasive Species Management Area (ECISMA) footprint for several populations of reproducing nonnative lizards and one crocodilian in 2013. Staff from Florida Fish and Wildlife Conservation Commission (FWC), South Florida Water Management District (SFWMD), University of Florida (UF), Miami-Dade County Parks, Recreation, and Open Spaces (MDC PROS), Everglades National Park (ENP), the National Park Service (NPS) and United States Geological Survey (USGS) coordinated on surveying, trapping, and removing animals in order to maximize efforts.

Joy Vinci (UF) and Jake Edwards (FWC) excavate a nest located via their female tegu telemetry project. (Photo courtesy FWC)

ECISMA partners used remote camera traps, live traps, and driving surveys to monitor distribution and collect biological data on Argentine tegus lizards in southern Miami-Dade County during the 2013 tegu trapping season and the same operations are underway in 2014. FWC and UF are partnering to conduct a telemetry study on female tegus in 2014. For this study, radio transmitters are surgically implanted in female tegus and their location and movements are tracked every other day. This study will help managers learn more about nesting behavior and female dispersal patterns which can be used to make decisions on future control efforts.

FWC and UF are conducting spectacled caiman surveys, coupled with removal in Miami-Dade and Broward counties. In addition, FWC, UF and SFWMD staff are conducting Nile monitor surveys in Palm Beach and Broward counties in order to determine the distribution of animals in Palm Beach County and to confirm or deny a breeding population in Broward County.

Finally, under contract with FWC, UF is leading ECISMA partners to conduct Oustalet's and veiled chameleon surveys in on-going efforts to eradicate Oustalet's chameleons and to get a better handle on the distribution of separate veiled chameleon populations throughout Miami-Dade County.

The following table summarizes the number of each of these species removed from breeding populations within the ECISMA footprint in 2013, in order of species priority. ♦

Tegu eggs excavated from a nest made of vegetation on an elevated patch of marsh in Miami-Dade County. (Photo courtesy FWC)

Jake Edwards (FWC) with 18 eggs removed from the tegu nest. The eggs are hard like bird eggs. (Photo courtesy FWC)

Species	County	Number Removed	Primary Participants
Argentine black and white tegu	Miami-Dade	183	FWC, UF, MDC PROS, ENP, NPS, & USGS
Nile monitor	Palm Beach	7	UF, FWC, SFWMD
spectacled caiman	Miami-Dade	42	UF, FWC, SFWMD
Oustalet's chameleon	Miami-Dade	85	UF, FWC, ECISMA
veiled chameleon	Miami-Dade	32	UF, FWC, ECISMA

- **Integrate outreach efforts**

2014 ECISMA Newsletter

Mikania micrantha 2013: eternal vigilance?

by Andrew Derksen, FDACS/DPI and Jane Griffin Dozier, Miami-Dade County PROS

Photos by Jane Griffin Dozier, Miami-Dade County PROS

The distinctive leaf of *Mikania micrantha*.

2013 was the fourth full year of surveys and management for the exotic climbing vine, *Mikania micrantha*, in the Redland Agricultural Area. While its total range has not expanded and few new properties have been added in the last two years, the vine continues to persist in many areas in spite of management efforts. Currently over a hundred parcels of land are infested with *Mikania micrantha*, a decline of almost forty parcels since peak observations were detected by surveys in 2011.

The majority of the *Mikania* infested parcels continue to be those owned and managed by commercial nurseries, which represent slightly less than half of all infestations detected. Greater awareness of the vine and aggressive control efforts by nursery owners resulted in the removal of almost thirty nurseries from the list of affected properties in the last two years.

In spite of regular management efforts and inspections by Florida Department of Agriculture plant inspectors, many infestations persist. Contaminated blocks will continue to be placed under quarantine until vine removal is witnessed by Plant Inspection staff. Infested nurseries will then remain under compliance agreement and subject to biannual inspection until such time as the Redlands are declared *Mikania*-free.

With a recovering economy, the number of unregulated, "out of business" commercial properties and abandoned homes have declined. Many of the new home and business owners do not appreciate the climbing vine's rampant growth over structures and they remove it. Abandoned properties that remain usually contain the largest and densest infestations and when this weed goes unchallenged, it runs amok. These properties also serve as a reservoir for re-infestation, and at least a third of all infested properties share a border or are in close proximity to one of these "bad actors."

Another continuing concern is the occurrence of *Mikania* in Miami-Dade County-managed natural areas. To date, the vine has been detected in and around five preserves, and in one non-preserve park. The County's management efforts conducted by the Parks, Recreation, and Open Spaces Department's Natural Areas Management (NAM) and the Department of Environmental Resources Management's Environmentally Endangered Lands (EEL) programs, have greatly reduced these infestations, and apparently eliminated the *Mikania* populations on two of the properties. However, to the frustration of county crews and biologists, two new areas were discovered in 2013 and early 2014. One occurred at a park where treatment has been ongoing, and there was another entirely new occurrence at a

Mikania micrantha was found in the locations marked on red on this map showing the 2013 survey area. (Map courtesy of USDA)

(CONTINUES ON PAGE 18)

MIKANIA MICRANTHA (CONTINUED FROM PAGE 8)

Leslie Johnson, part of the Natural Areas Management (NAM) crew, treats *Mikania micrantha* at "ground zero" where the plant was first positively identified.

A crew hand-pulls *Mikania* at Camp Owaissa Bauer, a county park, to avoid impacts to the native plant community, including two endangered and imperiled species of passionflower.

county preserve. In some areas, crews must rely exclusively on hand-pulling, due to the close proximity of two native, endangered passionflower species.

At least twenty parcels of land that had been reported as *Mikania*-free over the last two years had new infestations reported within forty feet of their first detection. The largest of these "new" and resurgent parcels were found along the railroad tracks that cut between nurseries in the Homestead area.

Odinor Jean-Baptiste sprays *Mikania* seedlings.

While the persistence of this weed in heavily managed areas and its ability to survive below detection thresholds remain a cause for concern, there is hope. The overall size and density of individual patches of *Mikania micrantha* have diminished considerably in the last three years. Infestations that used to cover acres of property now exist as small patches.

Most importantly, in spite of regular surveys outside of the known infested range in the Redlands, this vine has yet to be detected west of SW 217 Avenue and only once was it found north of SW 184Street. Only one population has been identified east of U.S. 1, and none beyond the Florida Turnpike.

Though surveys and management of the exotic climbing vine *Mikania micrantha* must continue, the road ahead still looks like a long, slow path to victory. ♦

Rotala rotundifolia: a new canal invader in south Florida

By Lyn A. Gettys, UF/IFAS FLREC and Phil Tipping, USDA/ARS IPRL

Inflorescence of *Rotala*. (Photo courtesy Lyn Gettys, UF)

Description

Rotala (*Rotala rotundifolia*), also known as dwarf *Rotala* and roundleaf toothcup, is an introduced freshwater aquatic weed that persists year-round in south Florida. The species has both submersed (completely underwater) and emergent (originating underwater and emerging past the surface) forms, which differ in a number of ways. The leaves are small (less than 2 centimeters long) and arranged in groups of two or three around hot-pink stems in both forms, but emergent *Rotala* has fleshy, bright-green, rounded leaves and submersed *Rotala* has darker green or reddish leaves that are thin and lanceolate (sword-shaped). Growth habit differs between the forms as well. Low-growing populations of emergent *Rotala* creep along shorelines and banks, with plant height rarely exceeding 15 centimeters. Submersed plants form tight, mounded colonies in water as deep as 2 meters, but eventually grow to reach the surface of the water, where they form dense mats that block light penetration and impede water flow. *Rotala* produces spikes of small, bright pink-to-fuchsia flowers, but plants tips must be aerial (out of the water) for flowering to occur.

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- **Integrate outreach efforts**

2014 ECISMA Newsletter

ROTALA ROTUNDIFOLIA (CONTINUED FROM PAGE 18)

Emergent (top) and submersed (bottom) vegetative growth on *Rotala*. (Photos courtesy Lyn Gettys, UF).

Invasion history and habitat

Rotala was introduced through the aquarium and water garden industry due to its attractive stems, leaves and flowers and ease of cultivation. The species is a relative newcomer to Florida and was first found in Coral Springs in Broward County in 1996. It has since established large but mostly isolated populations throughout south Florida and is especially problematic in canals in Lee and Collier counties. The extremely dense submersed populations and large, thick surface mats produced by *Rotala* greatly reduce ecosystem quality because oxygen level and light penetration are hampered. In addition, water flow is restricted due to the excessive growth of the species. Many infested canals are part of the south Florida flood control system and the ability to move large volumes of water quickly is critical, so management of this aquatic weed is a major concern for resource managers and water managers alike.

Control

Herbicides: Only a few aquatic herbicides that have been tested thus far provide an acceptable level of control of *Rotala*. Topped-out emergent growth can be "burned back" with glyphosate, but does not result in long-term control. Endothall and flumioxazin do not cause measurable damage to the species, and diquat (at 400 parts per billion) provides only around 80 percent control. On the other hand, applications of triclopyr and 2,4-D (either product at 2 parts per million) can be expected to result in total or near-total control of *Rotala*. Both of these herbicides are organo-auxins, which mimic naturally occurring plant hormones that regulate growth. These products kill weeds by causing unusual growth (such as growing too quickly and depleting the plant's reserves needed for normal growth) in target weeds but they are known to cause significant damage at very low concentrations to sensitive species as well. Therefore, many auxins have lengthy irrigation restrictions, meaning water treated with these products cannot be used to water crops, lawns, landscapes or greenhouse plants until the concentration of auxin falls below a level stated on the herbicide label. The effects of all labeled aquatic herbicides on *Rotala* are currently being evaluated in the hopes of identifying other products that may control the species with shorter irrigation restrictions.

Mechanical harvesting: Although mechanical harvesting is used as a management tool to reduce populations of a number of aquatic weeds, using this technique for *Rotala* control is challenging for a number of reasons. *Rotala* is heavier than many submersed weeds such as hydrilla and this puts additional stress on machinery and necessitates more trips between the infested site and the offload location. Also, offloading harvested material onto the canal bank may be an effective practice when mechanical harvesting is used to control hydrilla, but it can actually spread populations of *Rotala* along the canal bank because the species grows quite well as a shoreline plant. As a result, plant material should be transported far from water or hauled to a landfill, which can be prohibitively expensive. In addition, *Rotala* propagates mostly by vegetative means, so the fragments that are produced during mechanical harvesting may result in spread of the species.

Biocontrol: Organisms that feed on plants are classified as "host-specific" or "generalist" herbivores. Host-specific herbivores attack only a single species of plant and will not damage other species, while generalist herbivores attack and damage many species. Host-specific herbivores can sometimes be introduced from a weed species' native range and used as biological control (or "biocontrol") agents because they can help to control the target weed without endangering desirable native plants. In fact, organisms that are being studied for their use as biocontrol agents must be host-specific or they cannot be released in the U.S. Biological control with insects has not been considered to date. The first step in initiating this process would be to conduct a feasibility study in order to evaluate the pros and cons and guide future actions. A close relative of *Rotala*, purple loosestrife (*Lythrum salicaria*), has been successfully managed in the northeastern U.S. with four species of weevils. Although *Rotala* is currently only a problematic weed in south Florida, its range will probably expand and make it a more visible target for biological control efforts. It is also a weed in Australia where the U.S. Department of Agriculture Agricultural Research Service (USDA-ARS) Australian Biological Control lab could play a leading role (as they did with melaleuca) should any decision be made to initiate a control project. In Australia, *Rotala* has become naturalized in areas of New South Wales and Queensland and is recognized as an invasive species.

Rotala infestation in a flood control canal in Naples. (Photo courtesy Lyn Gettys, UF).

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ROTALA ROTUNDIFOLIA (CONTINUED FROM PAGE 19)

Rotala infestation after treatment with glyphosate. (Photo courtesy Lyn Gettys, UF)

Although it cannot be shipped to Western Australia or Tasmania because of quarantine restrictions, other states still allow its importation. Scientists there expect this will change as the weed expands it range and increases its impact. Informal consultations have already taken place between the Invasive Plant Research Lab in Ft. Lauderdale and the Australian Biological Control Lab in Brisbane about conducting informal surveys in Asia as part of other projects.

There are generalist insect herbivores such as *Syrnicita obliteralis* that attack the plant in Florida, but they do not seem to be suppressing the plant to any useful extent. Triploid grass carp, another generalist herbivore, has been evaluated on a small scale for *Rotala* control, but there is no evidence thus far that these fish actually eat the species.

Summary

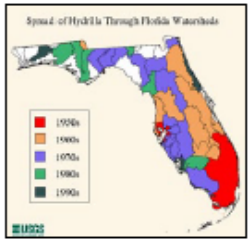
Rotala is a new and noxious weed in south Florida and causes significant problems for resource managers. Although mechanical methods can be used to manage *Rotala*, this technique is expensive and can foster spread of the species. Two aquatic herbicides provide good control of *Rotala*, but both are organo-auxins with significant irrigation restrictions, which precludes their use in many of south Florida's infested canals. The University of Florida's Institute of Food and Agricultural Sciences Fort Lauderdale Research and Education Center and the USDA are working to develop additional recommendations for control of the aquatic weed *Rotala* in canals and hope to identify other treatment options that can be employed to control *Rotala* without the irrigation restrictions associated with organo-auxin herbicides. Biological control may be an option but a feasibility study remains to be done. ♦

Mechanical harvesting (top) and regrowth (bottom) of R[illegible] (Top photo courtesy Ellen Allen, SFWMD[illegible]er photo courtesy Lyn Gettys, UF).

UF/IFAS *Hydrilla* Integrated Pest Management

by James P. Cuda, Jennifer L. Gillett-Kaufman, Ken T. Gloeil, Verena-Ulrike Lietze and Emma N.I. Weeks

Hydrilla (*Hydrilla verticillata*), an invasive submerged aquatic plant, has spread to almost every county in Florida and has been in the Everglades since the 1950s. When left unmanaged, this aquatic weed causes damaging infestations that choke out native vegetation, clog flood control structures, impede navigation and recreation, and are costly to manage.



Spread of *Hydrilla verticillata* infestations in Florida since the introduction of this aquatic plant in the 1950s. The counties marked in white have not reported an occurrence of *Hydrilla*. (Map courtesy of the U.S. Geological Survey, Department of the Interior/USGS)

The invasive aquatic plant *Hydrilla* arrived in Florida through the aquarium trade in the early 1950s. Its accidental release and the absence of natural enemies, which regulate *Hydrilla* in its native range, enabled this aggressive submersed plant to spread to nearly every freshwater body in the state. By the early 1990s, *Hydrilla* populations occupied more than 140,000 acres of Florida's lakes and rivers. Heavy reliance on herbicides to control these infestations has led to increasing incidences of herbicide-resistant biotypes.

Research scientists and extension specialists at the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS), the Florida A&M University, and the U.S. Army Corps of Engineers are tackling the issue of herbicide-resistant *Hydrilla*. The mission

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- **Integrate outreach efforts**

2014 ECISMA Newsletter

HYDRILLA (CONTINUED FROM PAGE 20)

Hydrilla infestation in a canal between East Lake Tohopekaliga and Lake Tohopekaliga, Kissimmee, Florida. (Photo by Emma Weeks, UF/IFAS)

is to find economical and environmentally friendly control strategies to reduce management costs and ultimately create more favorable recreational areas on lakes and rivers that have become almost unusable because of dense *Hydrilla* infestations.

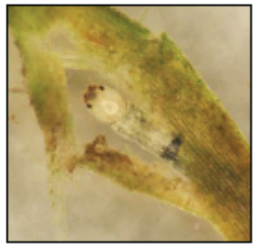
For detailed information, visit: http://entomology.ifas.ufl.edu/hydrilla

Scan the QR code to link directly to the UF/IFAS *Hydrilla* IPM Project website:

The team of the U.S. Department of Agriculture (USDA)-funded UF/IFAS *Hydrilla* Integrated Pest Management (IPM) Project is investigating the hypothesis that the integration of an herbivorous insect, the *Hydrilla* tip-mining midge (*Cricotopus lebetis*), with a fungal plant pathogen (*Mycoleptodiscus terrestris*) and/or low doses of the herbicide imazamox is a viable strategy for long-term sustainable management of *Hydrilla*.

Watch a short narrated learning lesson about the *Hydrilla* tip mining midge: http://bit.ly/1GHYlte

As part of the extension efforts, the UF/IFAS *Hydrilla* IPM Project team has developed educational platforms to help resource managers understand how new control strategies can fit into an Invasive Pest Management (IPM) plan for *Hydrilla* in Florida.



Larva of the *Hydrilla* tip-mining midge inside a damaged shoot tip of *Hydrilla*. (Photo by Dana Denson, Reedy Creek Improvement District)

During 2014, the team partnered with Florida LAKEWATCH to deliver seminars to Florida citizens who have access to lakefronts and are involved actively in citizen science by performing water quality assessments.

Pesticide license holders can earn a continuing education unit (CEU) by taking the *Hydrilla* IPM online course and sending a small fee for processing. To learn more (even if CEUs are not needed) visit the UF/IFAS *Hydrilla* IPM website where the Hydrilla IPM CEU Course workbook can be downloaded for free: http://entomology.ifas.ufl.edu/hydrilla

Branched stem (top) and root (bottom) of *Hydrilla*. (Photo by Lyle Buss, UF/IFAS)

Subscribe to the quarterly UF/IFAS *Hydrilla* Integrated Pest Management (IPM) Newsletter: http://bit.ly/1g2v7Fu

The team would like to acknowledge the financial support provided by the U.S. Department of Agriculture, National Institute of Food and Agriculture, Risk Avoidance and Mitigation Program (grant 2010-02825).

The UF/IFAS *Hydrilla* IPM Project Extension Team

James P. Cuda (jcuda@ufl.edu)

Jennifer L. Gillett-Kaufman (gillett@ufl.edu)

Ken T. Gioeli (ktgioeli@ufl.edu)

Verena-Ulrike Lietze (vlietze@ufl.edu)

Emma N.L. Weeks (enlweeks@ufl.edu)

Friends of Everglades CISMA, Inc. provides flexible funding for rapid response

by Joseph Ryan Steele, President and Executive Director of Friends of Everglades CISMA, Inc.

Invasive species are a growing threat to the Everglades ecosystem. The Everglades Cooperative Invasive Species Management Area (ECISMA) is a formal partnership of federal, state, and local government agencies, tribes, individuals and various interested groups that work together to manage invasive species in south Florida.

Once established, invasive species become difficult, if not impossible to fully eliminate, and management becomes a necessary and often expensive procedure. Early Detection and Rapid Response (EDRR) is an effective method to combat these species by eliminating individuals and populations before they become established. New invasive threats are constantly emerging, and it can be a challenge to request and find funding for new projects quickly when budgets are typically dedicated to specific projects in advance.

Friends of Everglades CISMA, Inc. (FOE) is a nonprofit organization designed to raise funds for Everglades CISMA. Some of these funds are used as a quick, flexible funding source for projects that require immediate response. FOE recognizes the importance of EDRR as well as continued mitigation efforts, which include research and removal of current invasive threats.

FOE incorporated on May 6, 2013, and has received exemption from Federal Income tax under 501 (c) (3) of the Internal Revenue Code. Donations to FOE, Inc. are tax deductible. Activities are governed by a board of directors including Joseph Ryan Steele (President), and ECISMA co-chairs Tony Pernas (National Park Service) and Dennis Giardina (Florida Fish and Wildlife Conservation Commission).

Friends of Everglades CISMA is currently seeking donations for projects including Brazilian peppertree removal, laurel wilt research and mitigation, Mikania micrantha (commonly known as Bitter Vine, Climbing Hemp Vine or American Rope) removal, educational program and EDRR funds for newly emerging invasive species. If you would like to make a donation to help fight invasive species in south Florida, please go to the Friends of Everglades CISMA Web page at www.friendsofecisma.org. ♦

FRIENDS OF CISMA

Everglades Cooperative Invasive Species Management Area

USACE File Photo

Follow us on Twitter @ECISMA https://twitter.com/ECISMA

'Like' Everglades CISMA on Facebook http://bit.ly/ECISMAFB

CISMA

Everglades Cooperative Invasive Species Management Area

ECISMA was created to formalize cooperation among land management agencies to improve the effectiveness of exotic species control by sharing information, innovation and technology across borders through a memorandum of understanding with the ultimate goal of helping to ensure the success of the Comprehensive Everglades Restoration Plan.

ECISMA contact information:

Tony Pernas
U.S. National Park Service
18001 Old Cutler Road, Suite 419
Palmetto Bay, FL 33157
786-249-0073
Tony_Pernas@nps.gov

Dennis J. Giardina
Everglades Region Biologist
Florida Fish and Wildlife Conservation Commission
298 Sabal Palm Road
Naples, FL 34114
239-229-5403
Dennis.Giardina@myfwc.com

www.evergladescisma.org

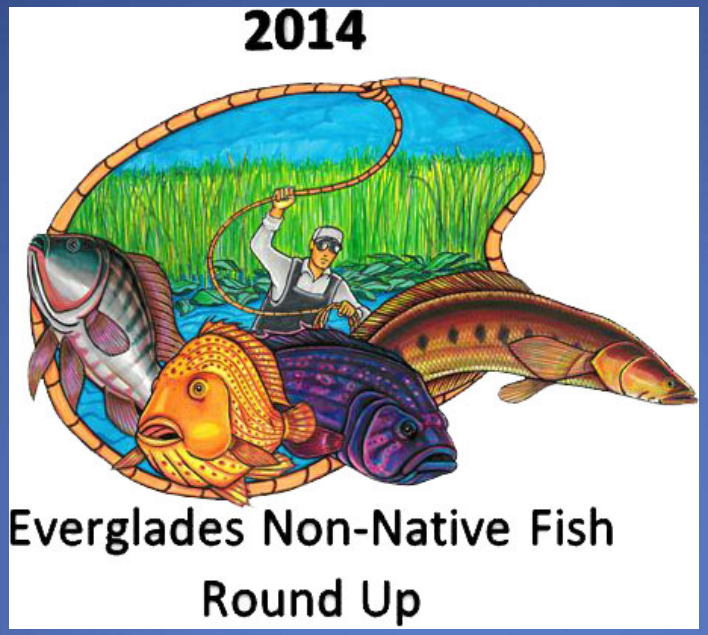
2014 ECISMA Newsletter
Editor: Erica Skolte
Designer: Jennifer Knudsen, MFA

Agency/Organization Abbreviations

DOI - Department of Interior
EEL (Miami-Dade County) - Environmentally Endangered Lands
FDACS/DPI - Florida Department of Agriculture and Consumer Services / Division of Plant Industry
FWC - Florida Fish and Wildlife Conservation Commission
IRC - Institute for Regional Conservation
PROS (Miami-Dade County) - Parks, Recreation, and Open Spaces
NPS - National Park Service
SFWMD - South Florida Water Management District
TNC - The Nature Conservancy
UF - University of Florida
USDA - U.S. Department of Agriculture
USFWS - U.S. Fish and Wildlife Service

- **Integrate outreach efforts**

5th Annual Non-Native Fish Roundup



Goals:

- Raise public awareness about the potential negative impacts of releasing non-native fish into Florida waters.
- Encourage anglers to target these nonnative species for consumption.
- Gather data into non-native fish distribution and abundance that can assist in their management.

Locations

1) Miami-Dade
Miccosukee Arches
172th Ave. and US 41

2) Broward
University of Florida Research Center
3205 College Ave.
Davie, Fl. 33314

3) Collier County Conservancy of Southwest Florida
Environmental Science Division
1495 Smith Preserve Way
Naples, Florida 34102

CISMA
Everglades Cooperative Invasive Species Management Area

Southwest Florida
CISMA
Cooperative Invasive Species Management Area
Southwest Florida
Cooperative Invasive Species Management Area

Round Up will be a one day event open to all anglers (shore or boat) fishing in the Everglades area.
All participants will receive a shirt.
PRIZES will be awarded for:

- Largest fish (not including Snakehead)
- Largest Snakehead
- Largest aggregate catch (not including Snakehead)
- Largest aggregate catch of Snakehead only
- "Slam" prize to the angler that catches the greatest number of non-native species.

Includes Junior Categories

2014 Non-Native Fish Round-up

- 55 people registered cross the three counties.
- 580 pounds of invasive fish were caught
- New exotic fish documented Marbled-Pin Catfish (Leiarius marmoratus)

2014 Non-Native Fish Round-up

- **Integrate outreach efforts**

The Miami Herald

Posted on Sat, Jun. 25, 2011

Exotic fish are catch of the day at tournament

By Susan Cocking

Plantation landscaper Steve Papp cleaned up monetarily and ecologically in Saturday's one-day nonnative fish roundup tournament in the Everglades.

Papp won $325 for bringing more than 77 pounds of snakeheads, blue and spotted tilapia, Mayan and yellow-bellied cichlids, suwife catfish and jaguar guapote to the scales on Tamiami Trail east of Krome Ave. Runner-up Jack Gleason of Boca Raton weighed 19 snakeheads totaling 29 pounds, 14 ounces — including the tournament's largest fish at 8 pounds, 6 ounces.

William Reyes of Miami Springs finished in third place overall with 21 pounds, 13 ounces of exotic fish.

"I think it was a really good success," said tournament organizer Tony Pernas of the Everglades Cooperative Invasive Species Management Area. " It really helped raise awareness of nonnative fish and the threat they pose to the Everglades ecosystem."

All 28 anglers weighed at least one fish in the second annual contest, which was put on by a consortium of federal, state and local government agencies, and tribal and conservation groups. Sponsors Eagle Claw hooks and JD's Custom Baits provided identification kits and fishing tackle for the anglers.

The top contestant fished from shore instead of a boat. Papp said he covered about 35 miles in his truck, plumbing Broward canals from SR 84 north to Sample Road and from U.S. 441 west to University Drive. He said casting plastic frogs was an effective technique for catching snakeheads. He cast-netted or snagged some of his other fish.

Papp, who said he is allergic to fish, planned to clean his catch and give it to his in-laws. As for his prizes, "I get to keep the plaques. The money goes to the wife," he chuckled.

6C | Sun Sentinel SunSentinel.com **Wednesday, April 22, 2015** SB

Sports

OUTDOORS

Catching non-native species is rewarding

By Steve Waters
Staff writer

Exotic species are a nuisance in South Florida's lakes and canals, but they're fun to catch and good to eat.

They can also pay off for those who compete in the Everglades Non-Native Fish Round Up.

The sixth annual event, hosted by the Everglades Cooperative Invasive Species Management Area, is May 9. Gift certificates and plaques will be awarded to anglers who catch the most and biggest fish.

Entry fee is $22.09 per angler and you must register by 9 p.m. May 3 at evergladescisma.org/roundup (click on "Online Registration Form").

According to Florida Fish and Wildlife Conservation Commission fisheries biologist Kelly Gestring, the goals of the Round Up include raising awareness about the 22 documented non-native freshwater species in South Florida and removing as many of those fish as possible from local waters.

"We just want to encourage people to go out there and take advantage of these resources," Gestring said, noting that research has revealed low levels of mercury in non-native fish caught in major canals in Broward, Miami-Dade and Palm Beach counties.

Round Up anglers can fish from shore or a boat. All anglers will receive a T-shirt, and prizes will be awarded for the largest fish and the heaviest total weight of their fish, not including snakeheads, in regular and junior divisions.

This year, snakeheads have their own category, as the fish can be much bigger than most non-native species, plus they are plentiful in Broward waters, which puts Miami-Dade anglers at a disadvantage. Prizes will be awarded for the heaviest snakehead and the most total weight of snakeheads in regular and junior divisions.

There also is a non-native slam division for the greatest variety of non-native species weighed in. Gestring said last year's winner caught 13 different species. Peacock bass and grass carp are not eligible.

Fishing is from 7 a.m. to 3 p.m. Fish can be weighed at three sites: The Miccosukee Arches at 172nd Avenue and U.S. Highway 41; the University of Florida Research Center in Davie; and the Conservancy of Southwest Florida Environmental Science Division in Naples.

RICH CLAWGES JR. /COURTESY

Capt. Rich Clawges Jr. and his crew caught and released this giant bluefin tuna estimated at more than 750 pounds while daytime swordfishing out of Lighthouse Point.

Fish of the week

While daytime fishing for swordfish, Capt. **Rich Clawges Jr.** and his crew on Lighthouse Point-based La Nena caught and released a giant bluefin tuna that they estimated at more than 750 pounds.

Clawges said the fight took several hours before the fish came close enough to the boat to identify it as a tuna. The entire crew of La Nena, including owner **Jim Allen** of Texas, **Ryan Goldman** and **Joey Joyce**, took turns bringing up the fish.

Capt. **Alan Zaremba** of Hollywood said his anglers continued to catch big peacock bass in urban canals fly fishing with Clouser minnows and using jigs on spinning and baitcasting outfits.

He guided **Seth Waller** of Wellington and **John Secol** of Davie to 31 peacocks up to 4 pounds in the E-4 Canal. Waller also fished with **Frank Pinello** of Wellington, and they caught 29 peacocks up to 3 pounds in the L-35A and C-13.

Rob Rogenmoger and **Mark Thompson** of Monroe, La., caught 80 largemouth bass and 22 chain pickerel in the L-67A. **Julia Ketner**, 10, caught 10 peacocks up to 4.75 pounds fishing in the C-8 with her grandfather **Wes Winters** of Westhampton, N.Y.

Team SeaHunter had a three-day total of 11 sailfish releases, six by top angler **Bernie Perez**, to top a 40-boat fleet and win the Final Sail tournament and $70,570 Saturday in Key West. OCD was second with 10 releases, eight on Saturday. BAR South was the top team in the four-tournament Quest for the Crest series with finishes of first, 19th, third and fifth, which earned it a total of $358,570.

- Newspapers
- Radio
- Social Media
- Email Messaging

- **Integrate outreach efforts**

Invasive Species Awareness Week

1st Florida Nonnative Fish Catch, Click and Submit Contest

Feb. 21 through March 1, 2015
(National Invasive Species Awareness Week (Feb. 23 through 28, 2015)

Partners:
Florida Fish and Wildlife Conservation Commission
U.S. Geological Survey
U.S. Fish and Wildlife Service
National Park Service
Florida Invasive Species Partnership
University of Georgia
Everglades Cooperative Invasive Species Management Area

Objectives

1) Document the distribution of nonnative fish in Florida using angler-caught fish that are photographed and reported to the FWC through the www.EDDMaps.org reporting system.
2) Increase public awareness of the potential negative impacts of releasing nonnative fish into Florida waters.
3) Encourage anglers to target nonnative species for consumption

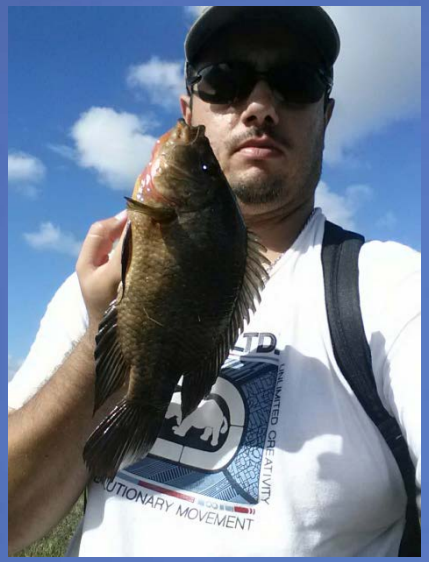
Prizes

All participants have a chance to win a Garmin eTrex 20 GPS and other non-cash prizes. Non-cash prizes include merchandise and promotional items with a total value up to $10/

Most Unusual Catch (Adult)
First Prize - $75 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt
Second Prize - $50 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt
Third Prize - $25 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt

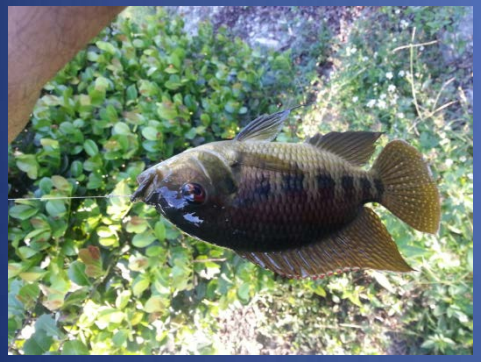
Most Species (Adult)
First Prize - $75 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt
Second Prize - $50 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt
Third Prize - $25 gift certificate to Bass Pro Shop and a Lionfish Be the Predator T-shirt

Butterfly Peacock Bass



Mayan Cichlid

Blue Tilapia



Spotted Tilapia

Thomas Lee (1st place Adult)
Most Species

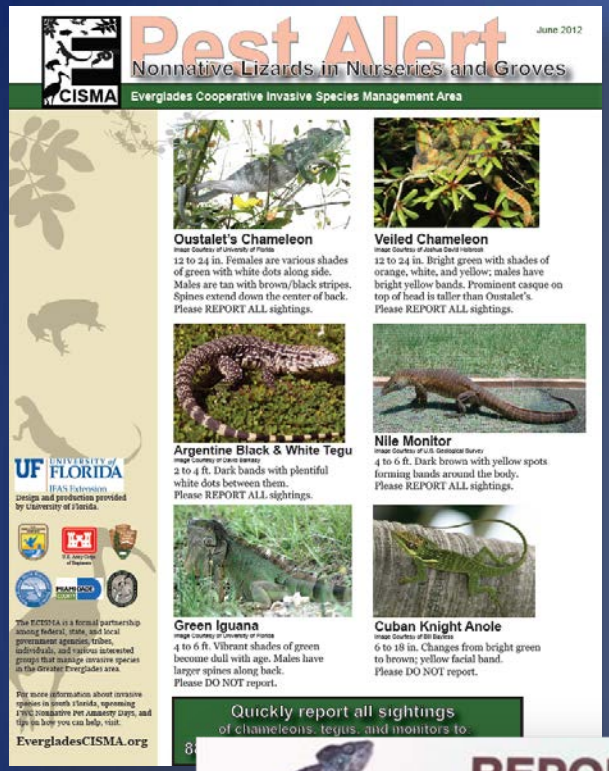
Dillon Gardner (1st place Adult)
Most Unusual Species – Red Tailed Catfish (Miami-Dade)

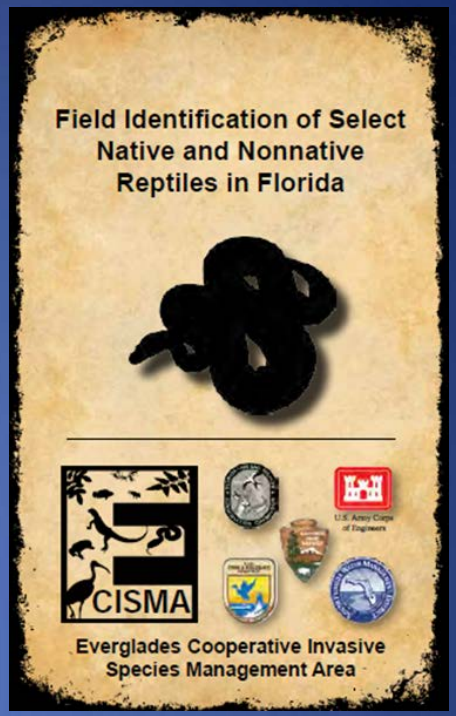
Information and Technology Transfer

- REDDy
- Python Patrol

REDDy
Introduced Reptile
Early Detection
& Documentation

•Pest Alerts/ID Decks etc.





- **Information and technology transfer**

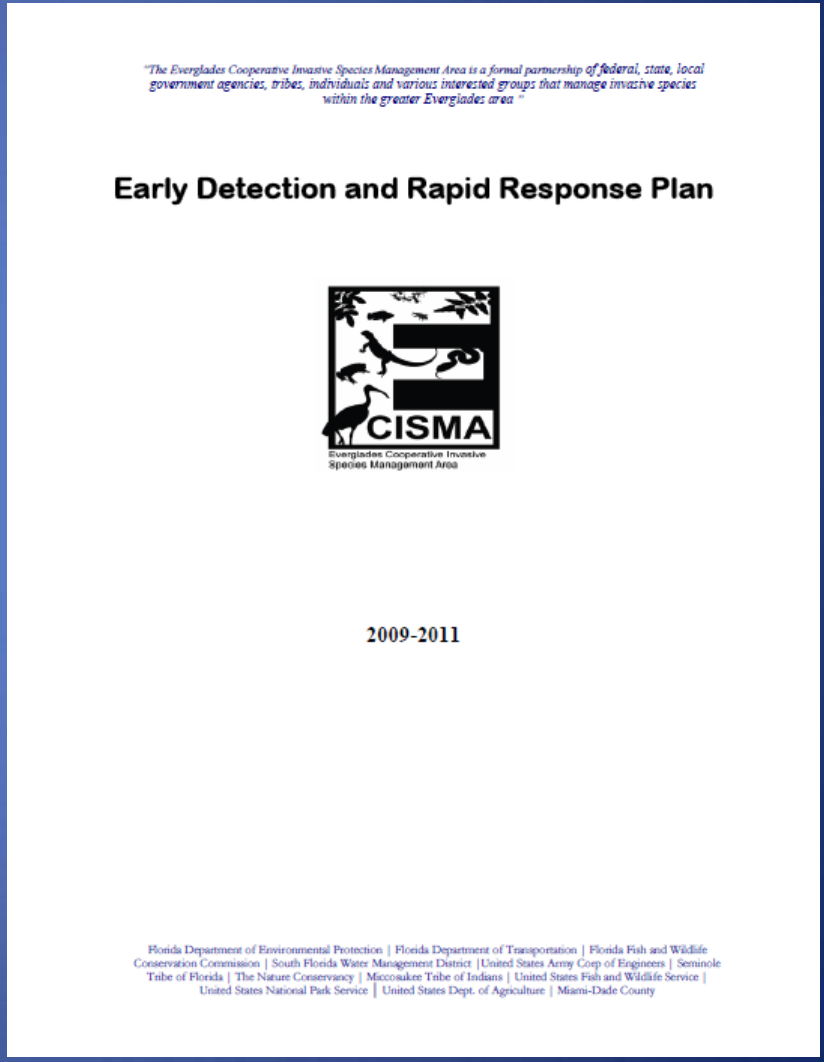
In English, Spanish, Creole

Early Detection/Rapid Response

- EDRR Management Plan

  Objectives:

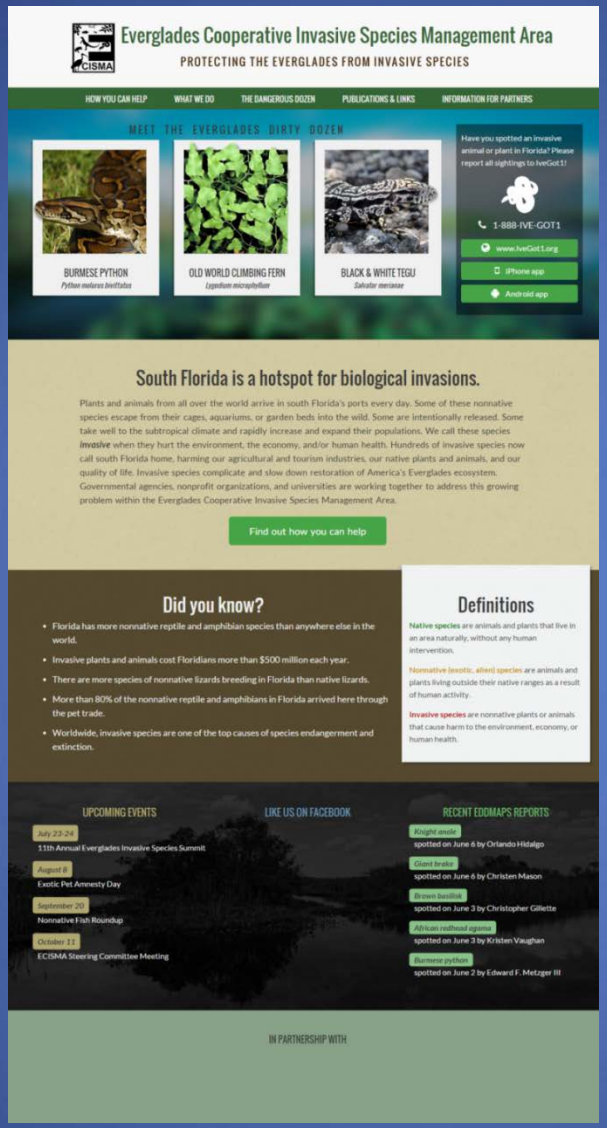
  1) Ensure early reporting of new invasions.
  2) Ensure new species are identified and their risks assessed.
  3) Define decision making responsibility and response protocol
  4) Establish and maintain capacity to act.
  5) Incorporate adaptive management principles in plan implementation.

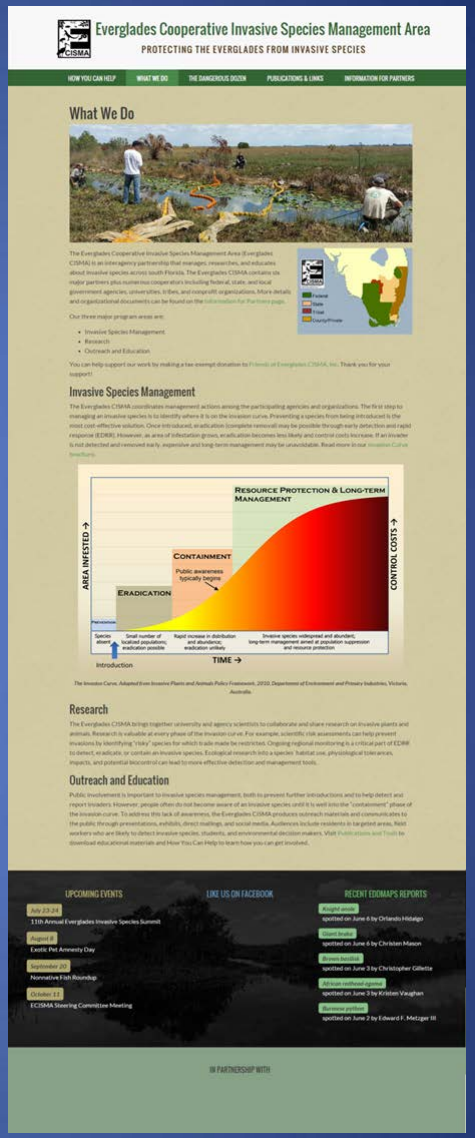


- Early detection and rapid response

Early Detection/Rapid Response

Website



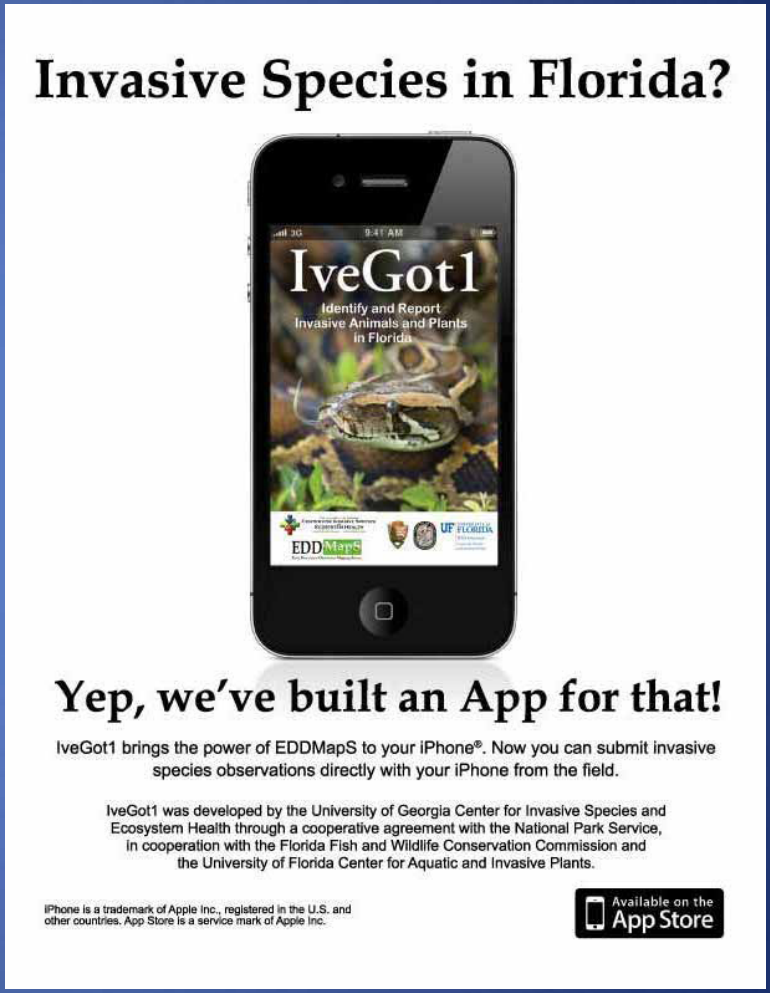


- Early detection and rapid response

Reporting

Hotline: 1-888-Ive got1

Website: www.ivegot1.org



Smartphone Applications

- Early detection and rapid response

EDRR

Plants

Large-Leafed Orange Mangrove
Pacific Black Mangrove
Golden False Beard Grass

Animals

Sacred ibis
African Rock Python
Argentine Black and White Tegu

- Early detection and rapid response

National Tropical Botanical Garden Kampong

This Week in Horticulture: Red-flowered mangrove *(Bruguiera gymnorrhiza*):
A Follow-up Report David Jones, Curator of Living Collections

Shown above is the seven member interagency team who assisted the garden resample and manage the population of red-flowered mangroves thriving in the mangrove preserve, in late May. The piles of green debris next to the group are what remain of Bruguiera after measuring and destroying (by uprooting, cutting, and/or herbiciding) all 85 trees, saplings and seedlings found in the preserve.

Golden False Beard Grass *(Chrysopogon aciculatus)*

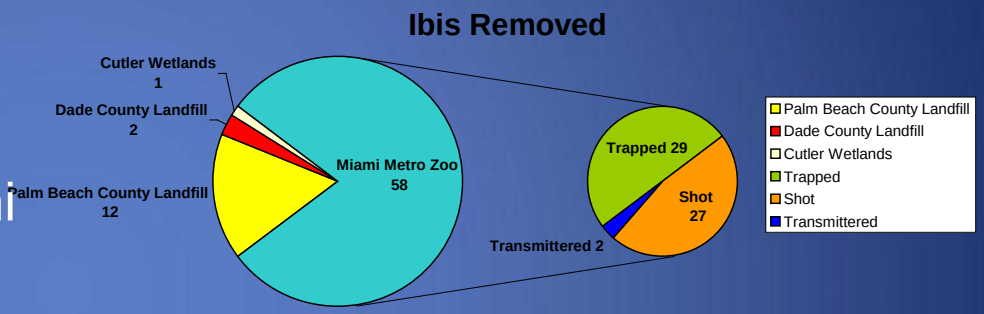
SE Asia

Federal /Florida Noxious Weed

- Early detection and rapid response

Sacred Ibis *(Threskironis aethiopicus)*

- Released by Hurricane Andrew 1992?
- 2005 Breeding at Loxahatchee NWR
- 2006 Numerous sightings at Miami Metro Zoo, Palm Beach Landfill, Homestead Landfill, Cutler Wetlands and Kendall
- 2008 ECISMA EDRR Sacred Ibis Eradication Plan (EA)/USDA Wildlife Services(Funded by Everglades Foundation)
- No sightings since 2011
  - Early detection and rapid response



North African Rock Python *(Python sebae)*

Mounting evidence of NAP population Bird Drive Basin.

Surveys initiated in 2010.

- Early detection and rapid response

- Over 29 captured since 2009
- No reports since August 2014

- Early detection and rapid response

Argentine Black and White tegu (Tupinambis merianae)

2008

- First Identified (Sept. 2008)

2009

- Surveys/Trapping/Necropsy

2010

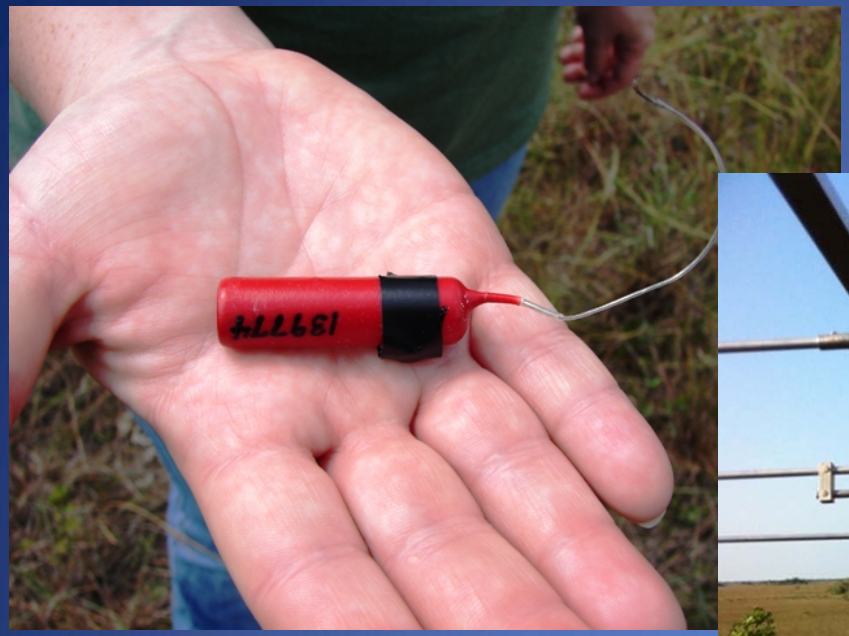
- Surveys/Trapping/Necropsy

2011-2015

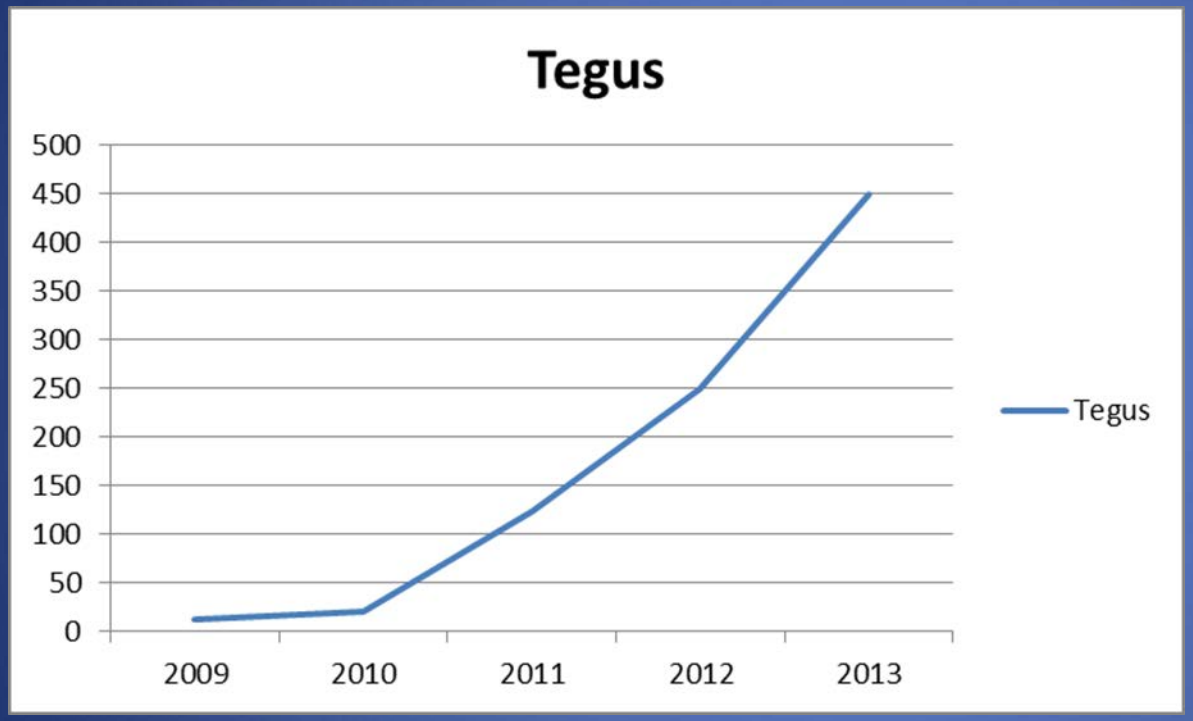
- Surveys/Trapping/Necropsy
- Radio Telemetry
- Camera Traps
- Burrow Camera

- Early detection and rapid response

FWC, NPS, USGS, UF, Zoo Miami, Miami Dade County, FAU



- Early detection and rapid response



2009-2014: 920 tegus

- Early detection and rapid response

Friends of Everglades CISMA Inc

Financial support for the management of invasive species including Early Detection/Rapid Response and outreach activities and/or the success of the Comprehensive Everglades Restoration Plan.

February 28, 2015
Everglades National Park
Shark Valley


42


SPEED LIMIT
15
START
27


START
5


2


11


62


47


60
65
65

Place	Bib	Last Name	First Name	Time
1	12	Lewis	Jonathan	00:19:46
2	2	King	Matthew	00:20:11
3	47	Tevelonis	Mike	00:20:29
4	35	Leidi	Jorge	00:20:55
5	3	D'Amico	Joseph	00:22:07
6	61	Ochoa	Phillip	00:22:18
7	32	Knowles	Brittany	00:22:50
8	58	Jones	Emily	00:23:01
9	22	Urgelles	Raul	00:23:08
10	39	Ceballos	Martin	00:23:16

Jonathan Lewis, USDA

Brittany Knowles, USDA


USDA
ARS
United States Department of Agriculture
Agricultural Research Service
Invasive Plant Research Unit
Fort Lauderdale, FL

DOI
Invasive Species Strategic Action Framework

Enhance collective efforts to combat invasive exotic species

- Help decision makers understand the connection between goals, strategies and tactics;
- Maximize the extent to which the current capacity for partnerships is leveraged to meet common goals;
- Help decision makers make wise and timely investment decsions in the battle against invasive exotics; and;
- Define success and provide fro accountability.

Framework:

- Organizing principle: invasion curve.
- Delineates our shared goals, objectives and strategies.
- Comprehensive list of current and needed actions.