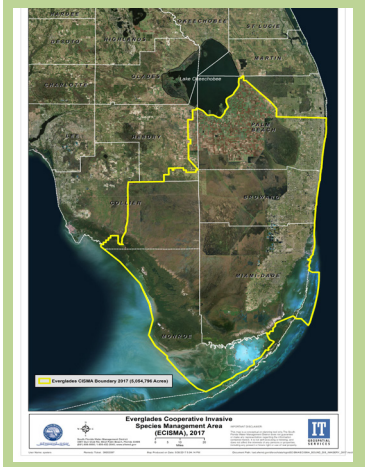
CISMA
Everglades Cooperative Invasive Species Management Area

# Newsletter

VOLUME 10 2020

## TABLE OF CONTENTS






The sun sets over Anhinga Trail boardwalk in Everglades National Park, a popular place for visitors to safely get outdoors during the pandemic. NPS photo.

## ECISMA Partners Persevering Through a Pandemic

*by ECISMA partners*

On March 1st, 2020, Florida had its first documented case of the coronavirus (SARS-CoV-2), or COVID-19 as it's commonly called. While the virus first made its presence known in late 2019, within weeks of infecting Florida, widespread closures started to take effect statewide (Source: World Health Organization). By April 2020, Florida's governor announced a stay-at-home order.

The alliance of partners from federal, state, local government, universities, tribes, and nonprofit organizations that comprise the Everglades CISMA were faced with difficult decisions to temporarily curtail research, education, and management. For some, that meant shifting their focus from control of invasive species to control of the virus to ensure safety of personnel. Some partners, however, were able to tackle both.

The U.S. Geological Survey (USGS) has continued to work throughout the pandemic by shifting many of their activities to telework and by carefully planning their fieldwork so that they continue to maintain employee safety. Many public events were cancelled due to COVID-19, including the 2020 Fish Slams. These are large multi-agency events aimed at sampling areas that are otherwise not regularly visited to document non-native fishes. The Fish Slams also serve as a chance for fishery professionals to get together and share updates, which was not possible this year.

South Florida Water Management District (SFWMD) offices have been temporarily closed since March, but work has not stopped, or even slowed down for its ECISMA members. SFWMD staff are still in the field checking on invasive species removal projects, coordinating planting efforts, participating in prescribed fires and completing surveys. However, the way this work is conducted has changed. Vehicles are not shared, masks are worn and social distancing is required. While cumbersome at first, folks have now adapted to these safety precautions and continue working to protect the Everglades from invasive species.

The University of Florida (UF) instituted travel restrictions mid-March,preventing travel to field sites except for essential activities. Staff moved to remote work locations to ensure safety. After travel restrictions

**CONTINUED ON PAGE 2**

# Partners Persevering Through a Pandemic (CONTINUED FROM PAGE 1)

loosened, UF implemented new safety measures such as mask requirements, social distancing measures, and sanitizing field equipment/vehicles. UF staff have been able to continue research and removal of invasive reptiles and amphibians in remote field locations. In-person outreach shifted to virtual platforms, resulting in wider reach and a unique opportunity to encourage reports of invasive species to IVEGOT1 with more people working from home and looking in their backyards.

Together the Florida Fish and Wildlife Conservation Commission (FWC) Python Action Team Removing Invasive Constrictors (PATRIC) and the South Florida Water Management District (SFWMD) Python Elimination Program (PEP) were able to remain active during the pandemic. The two programs creatively problem solved face to face morphological measuring of pythons by creating and implementing an alternate online remote check-in protocol. Both programs continued to work on Governor Ron DeSantis's initiatives of python program alignment and expansion. Expansion required hiring more contractors and providing those new contractors with full orientations. Historically orientations were in-person but FWC and SFWMD were able to successfully complete orientations through online training platforms.

Additionally, FWC's staff field and contractors were able to continue removing nonnative wildlife during the pandemic. FWC staffs' Nile monitor and tegu surveys and removal efforts continued as normal. There were only minimal interruptions to our contracted tegu trapping efforts across south Florida. EDRR across the state also continued as needed when social distancing was a feasible option for staff.

McKayla Spencer, FWC's Interagency Python Management Coordinator, conducting a safe capture demonstration for a group of youth – all were masked and socially distanced for this demo. FWC photo.

Remarkably, Federal and State partnership invasive plant control efforts in the Arthur R. Marshall Loxahatchee (LOX) NWR marsh interior (WCA 1) continued without any appreciable delays during the Corona virus pandemic. Contractors quickly implemented social distancing practices for crews, and staggered shifts in an effort to limit any virus spread amongst employees. The only complaint from contractors was accessibility to the boat ramps due to congestion from public consumptive users as the Refuge experienced record visitation levels during the initial stages of the pandemic due to county and state park closures. USFWS invasive plant control contracts also continued on fee title lands without any delays. Natural resource staff were permitted to return to work to conduct compliance inspections with managerial approval.

The only negative impacts the Refuge experienced since the pandemic outbreak is a decrease in the ability of natural resource staff to monitor high use, fee title areas for the establishment of new non-native invasive plants, or to target sparse infestations of highly invasive plants due to a mandated telework policy for all but essential employees. The volunteer and environmental education programs have been temporarily suspended which further hampers the ability to secure resources to complete smaller exotics projects. Additionally, invasive reptiles such as the green iguana continue to multiply unchecked due to a lapse in control operations as the result of staff reduction to only a handful of essential personnel conducting mission critical work.

Over the last three months, LOX has experienced its highest monthly visitation in its history. Early in the crisis, refuge management scrambled to secure approval to keep the Refuge open to provide the public with a host of outdoor recreational activities to help alleviate stress and 'cabin fever' in a natural setting. Management continues to monitor the status of the virus, and will continue to investigate various options to determine the best time and date as to when the Refuge will return to normal operations, but its first priority continues to be to ensure the safety of the public, its partners, its staff, and its volunteers.

Miami-Dade has faced their own challenges during these strange times. Dedicated field crews from Parks' Natural Areas Management (NAM) are still out there conducting invasive plant management. They have gone to working four ten-hour days per week, so that they are apart for a

# Partners Persevering Through a Pandemic (CONTINUED FROM PAGE 2)

longer time over the weekend. They also have their temperatures taken at the beginning of each work day, and are limited to riding only two to a vehicle, where they must wear masks at all times. All crew vehicles are disinfected at the end of each work day. While engaged in strenuous activities, they are allowed the option of not wearing a face mask, but only if social distancing can be maintained.

Procedural differences between departments meant that some biological staff were expected to still conduct field work, while others were not authorized to do so. Open communication and good relationships with colleagues came into play as NAM Preserve Managers were able to assist Environmentally Endangered Lands (EEL) Preserve Managers with activities such as conducting routine inspections, responding to complaints, and meeting with/accompanying researchers conducting work such as plant or wildlife surveying and monitoring at preserves. Holding meetings via Zoom or Teams has become a routine way of conducting business.

National Park Service (NPS) staff were able to oversee all planned invasive plant treatment in Everglades National Park (EVER), Big Cypress National Preserve (BICY) and Biscayne National Park (BISC) throughout the pandemic. While the volunteer python removal authorized agent program was suspended, staff worked with partners in FWC and SFWMD to expand access to NPS lands for increased numbers of python removal contractors resulting in record numbers of pythons being eliminated from NPS lands.

BICY also worked with USGS to continue to grow their scout snake project which has resulted in the significant removal of breeding females in 2020. UF interns working in EVER were actually able to increase the number of tegu traps by 50% and are also recording record numbers of tegu removals this year. BISC biologists were able to return to their marine-based work at the very end of May, and have removed 247 lionfish from park waters during the course of other underwater work.

Above: Clinton Cunningham, an FWC Biologist out of Fort Meyers, withd a large water monitor removed from Naples during COVID. FWC photo.

Left: Three biologists, Three masks, and three trucks; the USDA ARS IPRL team monitors Brazilian pepper thrips (biocontrol) in the ECISMA footprint while sporting COVID safety precautions. USGS photo.

# Florida Python Challenge™ 2020 Python Bowl

*by Sarah Funck, Florida Fish and Wildlife Conservation Commission*

The Florida Everglades is an extraordinary ecosystem unlike any other in the world. It is home to a variety of rare and unique wildlife including a diversity of native birds, mammals, fish and reptiles. However, an invasive apex predator poses significant threat to native wildlife – the Burmese python. To address this issue, Governor Ron DeSantis requested the Florida Fish and Wildlife Conservation Commission (FWC) and the South Florida Water Management District (SFWMD) bring back the Python ChallengeTM.

ECISMA partners with Governor Ron Desantis at the 2020 Python Bowl. FWC photo.

This invasive species awareness campaign highlights the importance of invasive species control efforts within the Everglades and catches the attention of conservation enthusiasts around the world. This year, the FWC and SFWMD teamed up with the Miami Super Bowl Host Committee, The University of Florida, Bass Pro Shops, The Bergeron Everglades Museum and Wildlife Foundation, Fish and Wildlife Foundation of Florida, and others to support the Committee's Ocean to Everglades initiative, which featured the Florida Python Challenge™ 2020 Python Bowl.

> "More than 750 people from 20 states registered to take part in the 10-day competition to remove Burmese pythons from public lands in south Florida."

Both "Rookies" and "Pros" competed in their respective categories for chances to win exciting prizes including the grand prize; a Tracker Off-road 570 ATV donated by Bass Pro Shops. The Python Bowl took place from January 10th – January 19th, 2020 on five FWC managed Wildlife Management Areas and two Public Small Game Hunting Areas in South Florida. During the 10-day competition, 80 pythons were removed, and prizes were awarded to individuals who removed the largest, heaviest, and most pythons.

Robert Edman demonstrates proper python capture technique at the kickoff of the 2020 Python Bowl. Photo Bowl. FWC photo.

In addition to the competition itself, the Florida Python Challenge™ 2020 Python Bowl provided an excellent opportunity to educate the public about the impact Burmese pythons have on Florida's ecosystems and how the public can get involved to help. All 750 registrants of the Python Challenge™ passed a mandatory online training on pythons. Over five hundred people also took part in the FWC's Python Patrol program; a hands-on, safe-capture training that instructs participants how to identify, locate, and safely and humanely capture Burmese pythons. "Having more than 550 people come out to take part in optional in-person trainings is a testament to the public's commitment to helping conserve Florida's precious natural resources," said FWC Executive Director Eric Sutton. In advance of the competition, FWC staff provided presentations at Bass Pro Shops to educate people about Burmese pythons in Florida

**CONTINUED ON PAGE 5**

# Florida Python Challenge™ 2020 Python Bowl (CONTINUED FROM PAGE 4)

Mike Kimmel received the Pro grand prize of a tracker 570 Off Road ATV for removing 8 pythons. FWC photo.

and promote the event. Several media events, one of which included Governor DeSantis, also promoted this exciting event.

In conjunction with the Miami Super Bowl Host Committee, FWC and SFWMD staff teamed up to run an educational booth at the Eco-Village of the Super Bowl Live! event held the week prior to Super Bowl LIV in Miami. At this event, staff had the opportunity to interact with people from across the country and around the world, educating them about the Everglades and the threats invasive species pose to this unique ecosystem. Live pythons and lionfish were displayed at this event, and FWC staff held multiple live python capture demonstrations for the public.

The Florida Python Challenge™ 2020 Python Bowl was a great success, engaging local experts and the public in control and removal of pythons while simultaneously helping to raise awareness about this important conservation issue. Winners of the 2020 Python Bowl were presented with their awards during Super Bowl Live! on January 25th at Bayfront Park in Miami.

**Florida Python Challenge™ 2020 Python Bowl Results:**

**Most Pythons:**

- Pro grand prize winner Mike Kimmel won a TRACKER 570 Off Road ATV for removing 8 pythons.
- Rookie grand prize winner Kristian Hernandez won a TRACKER 570 Off Road ATV for removing 6 pythons.
- Pro second prize winner Lindsey Floyd won $750 for removing 6 pythons.
- Rookie second prize winner Ethan O'Neil won $750 for removing 4 pythons.
- Active service member or veteran winner Barry Offenburger (U.S. Army) won $1,000 for removing 3 pythons.

**Longest Python:**

- Pro grand prize winner Tom Rahill won $2,000 for a 12-foot, 7.3-inch python.
- Rookie grand prize winner Kristian Hernandez won $2,000 for an 11-foot, 6.5-inch python.
- Pro second prize winner Amy Siewe won $750 for a 10-foot, 7-inch python.
- Rookie second prize winner Dave Mucci won $750 for an 11-foot, .08-inch python.
- Active service member or veteran winner Dave Mucci (U.S. Air Force) won $1,000 for an 11-foot, .08-inch python.

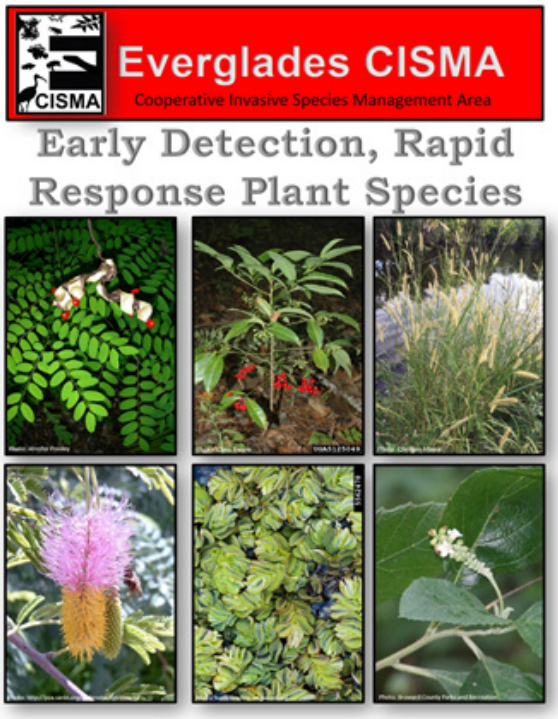
**Heaviest Python:**

- Pro grand prize winner Tom Rahill won $2,000 for a 62-pound python.
- Rookie grand prize winner Dave Mucci won $2,000 for a 49.4-pound python.
- Pro second prize winner Dustin Crum won $750 for a 35.9-pound python.
- Rookie second prize winner Kristian Hernandez won $750 for a 48.1-pound python.
- Active service member or veteran winner Dave Mucci (U.S. Air Force) won $1,000 for a 49.4-pound python.

Photo by: FWC.

# ECISMA Partners Publish Plant EDRR Booklet

*By Christen Mason, South Florida Water Management District (SFWMD)*




On the second day of the 2017 ECISMA summit, one of the breakout sessions included review and revision of the ECISMA Early Detection and Rapid Response (EDRR) plant list. Participants recognized that one challenge of successful EDRR is that obscure species are not recognizable by most people. The group recommended enlisting a team of volunteers to create a presentation that would teach members how to recognize these plants.

At the 2018 summit, a template for the ID sheets was presented, and many plant-minded members of ECISMA volunteered to compile information. Over the next few months, the team assembled a group of informational sheets for 29 priority EDRR species with excellent field identification tips and photos. To improve distribution of this content, we decided to apply for a grant from the Florida Invasive Species Council (FISC, formerly FLEPPC) to print a booklet. The grant was funded, and 400 copies of a 30-page color booklet were printed, with additional funding from the Friends of Everglades CISMA (FOE), just in time for the 2019 summit.

Approximately 200 copies were handed out to field staff at the summit, and since then, roughly 100 copies have been distributed to contractors, biologists, and other people working in the field who may encounter invasive plants. In the last year, there have been 12 EDDMapS reports in the ECISMA footprint of species contained in the booklet. We can't say that we're certain the guide was responsible for all these species getting noticed and reported, but we are confident that it put some of these plants on folks' radars. If you are interested in receiving a copy of the ECISMA EDRR Plant Identification booklet or if you have suggestions for appropriate groups to receive copies, please email Christen Mason at: cmason@sfwmd.gov.

Big thanks go to the following contributors: Courtney Angelo, Hillary Cooley, Dennis Giardina, Jimmy Lange, Deah Lieurance, Christen Mason, Jean McCollom, Alex Onisko, Jennifer Possley, LeRoy Rodgers, and Jessica Spencer. Many hands make light work!


**Figure 1.** Top & bottom of rose gum leaves


**Figure 2.** Pale bracts (leaf-like structures) subtend small flowers.

# U.S. Geological Survey and Partners Are Testing External Marks on Burmese Pythons

*by Austin Fitzgerald, U.S. Geological Survey (USGS)*

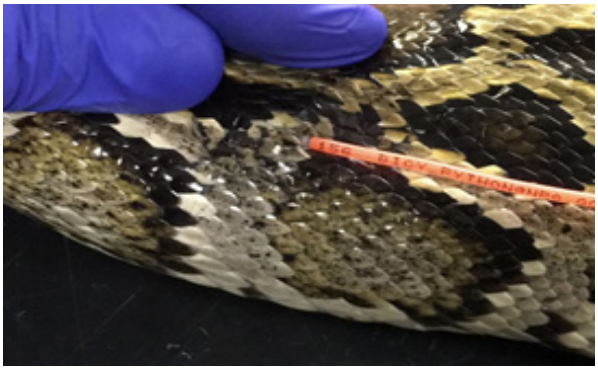
The USGS is assisting partners with an ongoing initiative to study "scout" Burmese pythons across southern Florida. This work is being conducted in collaboration with the National Park Service, U.S. Fish and Wildlife Service, and The Conservancy of Southwest Florida. Scout snakes are adult pythons with surgically implanted radio transmitters that are released back into the Greater Everglades ecosystem. The USGS receives assistance from staff at the veterinary hospital of Zoo Miami for python surgeries and the initial testing of external marks. After implantation of radio transmitters, the scouts can then be regularly located by researchers and managers with the hope that they will reveal the locations of other Burmese pythons during the breeding season.

Breeding Burmese pythons often come together in groups to engage in mating activities, and the scout programs can exploit this behavior to potentially increase the efficiency of removal efforts. Because the scout snakes are important resources for the various interagency partners involved, a need to quickly and easily distinguish them from other wild pythons encountered in breeding groups or elsewhere was identified as a priority. To meet that need, the USGS has been testing externally visible marks to assess readability and retention.

While conducting a literature review, it became obvious that very few previously used external marks met the desired criteria of being visibly obvious and easily read by untrained observers. However, some previous work used super-cooled metal numbers for marking snakes, and external Floy® tags (which are typically used with fish) for marking alligators. Seeing that this method met our criteria, we designed a field trial to test these methods on Burmese pythons. The images here illustrate the appearances of some scale markings and different styles of Floy® tags that have been tested to date.

The Floy® tags that are being implanted in Burmese pythons across southern Florida. Note that there are different email addresses assigned to them for reporting depending upon the location where the snake is being studied. USGS photo.


This past breeding season, these marks helped researchers and managers quickly distinguish scout snakes from unmarked pythons. Researchers saved valuable time that was otherwise used to collect time-sensitive biological samples



A Floy® tag that is applied to scout python #156. USGS photo.

**CONTINUED ON PAGE 8**

# U.S. Geological Survey and Partners Are Testing External Marks on Burmese Pythons (CONTINUED FROM PAGE 7)

by identifying their target scout in a group, while managers saved crucial moments focusing on the capture of unmarked wild pythons rather than their marked scouts. These marks will also be useful to the increasing number of authorized python removal agents and volunteers by helping them distinguish scout pythons from others that should be removed.

Many of us are concerned about the severe impacts these invasive snakes are having on the Greater Everglades ecosystem.

> "With the help of these external marks, members of the public can provide support for research and management efforts by reporting scout snake sightings and leaving them in the field to complete their purpose as research and removal tools."

This includes python removal contractors, volunteers, and the general public. Anyone can report scout snakes they find by following the instructions on the flyer that accompanies this article, "Have You Seen My Snakey Bling?", which the USGS and their partners released throughout the region to raise awareness of their efforts.

# Update on Arthur R. Marshall Loxahatchee National Wildlife Refuge Invasive Plant Management

*By Sergio Gonzalez, SFWMD*

The history of invasive plant infestation at Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) is familiar to most members of ECISMA. An internet search for images of Old World climbing fern (*Lygodium microphyllum*) will return photos of infested tree islands in the Refuge very near the top. Numerous presentations on the situation have been given at ECISMA meetings for years. Less frequently discussed is the severity of the melaleuca (*Melaleuca quinquenervia*) infestations within the Refuge. These two species have caused severe degradation of both marsh and tree island habitats in the Refuge for decades, but with a renewed interagency partnership, we hope we have begun a new chapter in the story of exotic vegetation management in the Refuge.

Contractors conduct their work treating invasive plants at Lox NWR. SFWMD photo.

Since 2018, the South Florida Water Management District (District) has taken the lead as coordinator in the efforts to tackle the invasive plant situation within the Refuge. A new license agreement with USFWS and ongoing MOU with FWC helped dedicate a $5-million annual budget to the project through at least fiscal year 2023. The District created a new biologist position dedicated to lead the project on the ground.

Since October 2018 (FY2019), invasive plant control efforts led by the District have totaled over $9,633,000. Most of these efforts have consisted of contracted ground crews, but some aerial chemical application

CONTINUED ON PAGE 9

# Update on Arthur R. Marshall Loxahatchee National Wildlife Refuge Invasive Plant Management (CONTINUED FROM PAGE 8)

has also been employed. Over 14,320 acres have been swept for Old World climbing fern, resulting in nearly 5000 treated acres of infestation, at the cost of $3,737,713. *Melaleuca* efforts have totaled $5,822,791, resulting in over 22,545 acres swept with an estimated 6,225 treatment acres.

Significant efforts have also been put towards other invasive species when encountered—the most common being Brazilian pepper (*Schinus terebinthifolia*). Additional contractors working for USFWS were deployed during a portion of 2019. This past spring, USFWS directed a large aerial chemical application on acreages of very heavy Old World climbing fern and melaleuca. Aerial targets were selected based on District aerial mapping and ground-truthing efforts.

A before and after comparison from the treatment of Lygodium microphyllum, or old world climbing fern, at Lox NWR. SFWMD photo.

For the purposes of interagency coordination and efficiency, work within the Refuge is tracked using a 1km grid system. This approach is being augmented with ongoing monitoring to maintain a cell-by-cell infestation condition inventory to help guide retreatment intervals. Retreatment efforts for both species are critical to getting to a maintenance in control level of infestation. This is especially true for melaleuca, where initial treatment results in the recruitment of more trees. Previous treatments had followed a perimeter containment strategy.

The current District-managed contractors continue maintenance treatments in those areas while initial treatments will move toward a broadening area of control, from perimeter to interior.

Concurrent with the systematic treatments, tree islands identified as high risk of collapse due to very high Old World climbing fern infestations have been identified for "triage" control efforts. Aerial digital sketch mapping was used to identify, map, and evaluate the canopy and infestation conditions of large strand islands at least 8 acres in size. These islands are located throughout the Refuge, and islands on the verge of canopy collapse may not enter a treatment rotation under the systematic grid-cell treatment schedule for some years. This assessment of large islands is being used to identify large islands of immediate priority.

Treatment of heavy Old World climbing fern infestations is very labor-intensive, and there are aspects of the species life history that affect management and are still not fully understood. The University of Florida has been working on herbicide trials in the Refuge and is working on experiments to better understand retreatment intervals and the effects of hydrology. USDA has also been conducting releases of Old World climbing fern biocontrol agents and examining establishment patterns within the Refuge. Both UF and USDA have been instrumental partners in developing integrated pest management strategies at the Refuge. The USFWS has an active prescribed fire program, and the District works closely with USFWS to coordinate prescribed burn intervals to support exotic treatment efforts. It is only through the continuation of these joint efforts that the invasive plant infestations can be brought under control across the Loxahatchee landscape.

# Big Cypress National Preserve's *Melaleuca quinquenervia* profile: then and now

*by Courtney Angelo, Billy Snyder, and Tony Pernas, National Park Service (NPS)*

The tree *Melaleuca quinquenervia* is fast-growing and is native to Australia. *Melaleuca* seeds are dispersed by wind and water, but many seed capsules are stored on mature trees and are explosively released after fires or other disturbance events.

Dense monoculture of *Melaleuca* saplings in a BICY pineland. NPS photo.

The species was first introduced into south Florida in the early 1900s as an ornamental plant. Subsequently, *Melaleuca* gained recognition as one of the most serious threats to the greater Everglades region, which led to the beginning of the invasive species movement in the U.S. The species is currently resurging in Big Cypress National Preserve (BICY) as one of the Preserve's most serious threats to intact native habitat.

Within the Big Cypress region, the introduction of *Melaleuca* occurred in the mid-1940's.[1] By the early 1980's, the species covered around 5% of the Preserve at varying densities. In 1992, systematic reconnaissance flights revealed an expansion to 12% coverage. In response, BICY created an exotic plant control program solely focused on *Melaleuca* treatments, and contractors were added to the treatment profile in the mid-90's.[2]

BICY first integrated biologic controls to target the development of *Melaleuca* as a complementary component of species treatment in 1997. From 1997-2008, three *Melaleuca* biocontrols developed by the USDA Invasive Plant Research Laboratory (USDA IPRL) have successfully established throughout the Preserve.[3]

The number of *Melaleuca* treatments have varied since 1984, with over 2500 treatment records between 1996-2017, due to treatment funding, reduction in density, the introduction of biocontrols, and fluctuating management perspectives over the years. Prior to 2018 and the Buzzard Fire, *Melaleuca* was deemed in maintenance condition in BICY.

The Buzzard Fire erupted in the spring of 2018 and burned more than 62,000 acres in the eastern portion of the Preserve north of highway 41. Within this footprint, remnant adult *Melaleuca* trees occurred sporadically, and previous treatments of the species had occurred in years prior to the fire.

1 Meskimen, G. F. (1962). A silivicultural study of the *Melaleuca quinquenervia* tree in south Florida. MS Thesis, University of Florida, Gainesville, Florida.

2 Pernas, A. J. & W. A. Snyder (1999). Melaleuca management efforts – Big Cypress. In Melaleuca Management Plan: Ten years of successful Melaleuca management in Florida 1988-98. F. B. Laroche (Ed), FLEPPC publication.

3 Melissa Smith, personal communication

Billy Snyder in front of a monoculture of *Melaleuca* saplings in the Buzzard Fire footprint (Winter 2020). NPS photo.

BICY pineland after treatment of *Melaleuca* (Winter 2020). NPS photo.

**CONTINUED ON PAGE 11**

# Big Cypress National Preserve's Melaleuca quinquenervia profile: then and now (CONTINUED FROM PAGE 10)

What emerged post-fire was the invasive behavior of a fire-adapted species with nothing holding it back. The spread of *Melaleuca* in the fire footprint spans from dense monocultures to sporadic individuals in pineland and marl prairie communities. In pineland uplands within the fire footprint, roughly 25-50% (5-10,000 acres) have some level of *Melaleuca* infestation. Infestations, where dense monocultures exist with no mature trees, suggest seedlings germinated from a dormant seed bank that may have persisted unknowingly until recently.

In response to the rapid emergence and spread of *Melaleuca* in the Preserve, agencies outside of NPS, such as the Florida Fish and Wildlife Conservation Commission and USDA ARS Invasive Plant Research Lab (IPRL), along with local sportsman's groups, have supported the Preserve's efforts to treat the species by providing funding for treatment, active research, and communication of the situation to Congress. Most recently, the USDA IPRL and BICY have initiated a research collaboration to evaluate *Melaleuca* seedbanks and seedling response to prescribed fire intervals.

Due to this resurgence, BICY would like to highlight to other resource managers that invasive species can always rebound quickly via dormant seedbanks after years of seemingly being more or less under control.

Additionally, as we all know from the wonderful partnerships bridged through ECISMA, the battle against invasive species is best approached through cross-agency collaborations. We thank all agencies that have provided funding, creative solutions, and support as we continue to treat and research *Melaleuca* throughout the Preserve.

# ECISMA partnerships lead to positive change at Fern Forest Nature Center: From invasive fern infestation to native fern restoration

*by Courtney Angelo (NPS), Jimmy Lange (Fairchild Tropical Botanic Garden), and Michel Therrien (Broward County)*

Fern Forest Nature Center (FFNC) was once described as a "fern grotto" in urban Broward County. Its limestone outcrops , carved out by the Cypress Creek Glade system, host habitat to many fern species, along with hammock canopy and cypress swamp communities. Today, there are 46 total fern species within the boundary of Fern Forest. Thirty-three of these ferns are native, 11 of which are state-listed, and 13 species are non-native, including six invasive ferns listed by the Florida Exotic Pest Plant Council (FLEPPC).

Along with diversity, FFNC also hosts important populations from a conservation perspective. For example, FFNC boasts the largest population of the Florida tree fern (*Ctenitis sloanei*) in the state, as well as the only Florida population of the rare *Goniopteris moranii* (Guadaloupe maiden fern), to name a few. Currently, the primary threat to these diverse and important terrestrial ferns in the natural area is the invasive *Tectaria incisa* (incised halberd fern).

Native to Mexico, South America, and the West Indies, *T. incisa* was first noted in Florida in the late 1970s in a few sites (Austin et al. 1979), including FFNC in Broward County before its formal establishment as a nature center. Its origin is uncertain and grows weedy in its native range. It is extremely aggressive in habitats of South Florida and is now listed by FLEPPC as a category one invasive species.

Abundant *Tectaria incisa* in the hammock understory at Fern Forest Nature Center prior to workday removal.

CONTINUED ON PAGE 12

# ECISMA partnerships lead to positive change at Fern Forest Nature Center: From invasive fern infestation to native fern restoration (CONTINUED FROM PAGE 11)

Understory of tropical hammock after *T. incisa* removal at FFNC.

The species grows faster and larger than most of our native ferns, producing far more spores in the process, and can grow both on soil and bare limestone. In fact, despite several control efforts, this species is the dominant species in much of the natural areas' understory, where it shades and outcompetes native species .

During previous workdays, the County's former botanist, Patricia Howell, partnered with Dr. Melissa Smith and other scientists at the USDA Invasive Plant Research Laboratory (IPRL) to remove the invasive incised halberd fern back in 2013 on Earth Day. With the success of that event, Broward County partnered with Dr. Smith and other scientists at IPRL again, along with Fairchild Tropical Botanic Garden (FTBG) through Broward's Rare Plant Program (RPP) to host another workday on 12/6/2019 to remove the pervasive *T. incisa* from sections of FFNC.

Due to the morphology similarity of *T. incisa* to its congener, the state-listed *T. heracleifolia*, Broward County staff were trained on identification prior to the workday. To avoid off-target damage to sensitive ferns as well as removing spores from the area, all *T. incisa* was removed by hand, bagged, and disposed of offsite. Workdays with ECISMA partners such as this are vital to the removal of the species and the restoration of the habitat. During the workday, ECISMA partners carefully and successfully removed 63 garbage bags full of *T. incisa* in several hours.

The next step in this process is to restore the area with native fern species through Broward's RPP with FTBG. FTBG is currently growing *Tectaria heracleifolia, Ctenitis sloanei*, and *Adiantum tenerum* (brittle maidenhair), all listed fern species in the state of Florida. FTBG plans to have the native ferns ready to outplant in a year. All fern spores were locally collected.

It's been over 40 years since Austin et al. (1979) described the fern species in what's now known as FFNC. We are happy to report that many of the native species on the first list are still present. Through partnerships described herein, there is hope that these native species will persevere for future generations.[1]

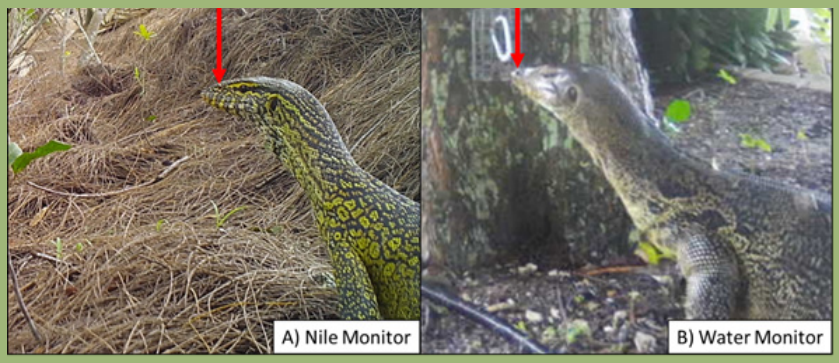
1 Austin, D.F., G. Blanchard Iverson, and C. E. Nauman (1979). A Tropical Fern Grotto in Broward County, Florida. American Fern Journal 69 (1): 14-16.

ECISMA partners with bags of pulled T. incisa at December's workday.

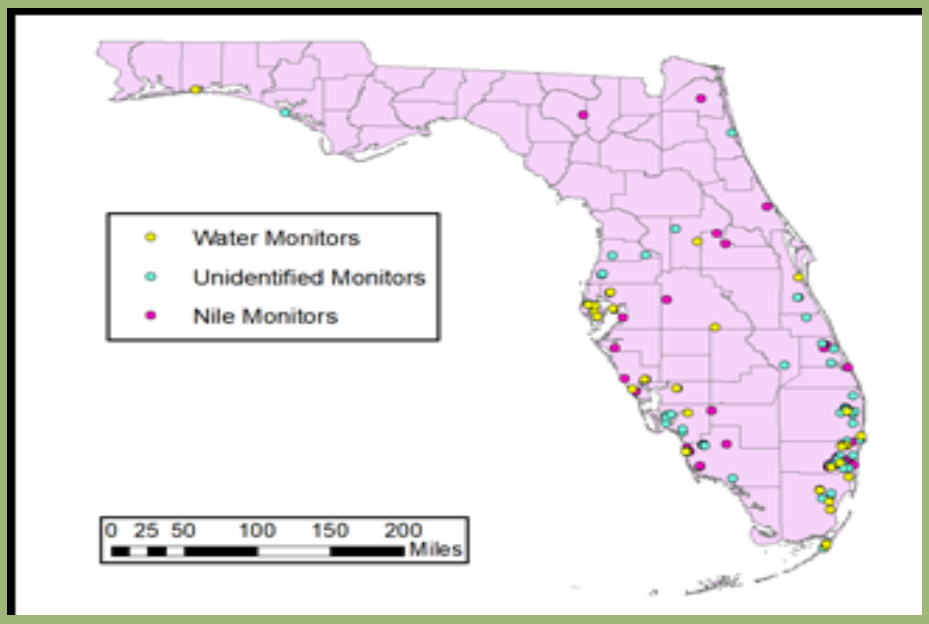
# Water Monitors in Florida Since 2015

*by Dan Quinn, Florida Fish and Wildlife Conservation Commission (FWC)*

Asian water monitors (*Varanus salvator*) are a large, carnivorous monitor lizard species native to a wide swath of Southeast Asia. The Asian water monitor is similar in size, morphology, and diet to the Nile monitor (*Varanus niloticus*). While Nile monitors are classified as a "conditional" species in Florida, meaning personal possession is not allowed, water monitors can still be acquired and kept as pets without a permit. Water monitors are common in the pet trade and can grow just as large as Nile monitors and may pose a similar risk to Florida's ecosystems.




Comparison between Nile monitor (*Varanus niloticus*) and water monitor (*Varanus salvator*) with red arrow indicating nostril location. 1) Nile monitor nostril placement is approximately halfway between tip of snout and eyes. 2) Water monitor nostril is located closer to the tip of the snout. FWC photo.




Credible and verified water monitor (*Varanus salvator*), unidentified monitor (*Varanus spp.*), and Nile monitor (*Varanus niloticus*) reports in Florida from January 1, 2015 through June 20, 2020. All Nile monitor reports were removed from counties in which established populations are known to occur (i.e., Lee, Palm Beach, and Miami-Dade) to prevent confusion of individuals within a recognized, established population. It is likely that the majority of "unidentified monitors" and even some reports of Nile monitors on this map are water monitors. FWC photo.

Since 2015, FWC has received 41 credible or verified water monitor reports, of which 17 were either found dead or were subsequently captured. It is possible that increased public awareness of Nile monitors and their physical similarities with water monitors may mean that many water monitors are misreported as Nile monitors. Even experienced biologists have difficulty distinguishing between these species, and photos lacking sufficient clarity make it entirely impossible to do so. Even credible and "verified" sightings of Nile monitors may in fact be misidentified water monitors.

Our experience suggests that Nile monitors (outside extant populations) or unidentifiable monitor lizards reported to FWC almost invariably end up positively identified later as water monitors. Since 2015 there were also 62 unidentified monitor reports and

**CONTINUED ON PAGE 14**

# Water Monitors in Florida Since 2015 (CONTINUED FROM PAGE 13)

68 Nile monitor reports outside of the three counties where established populations of Nile monitors are recognized (i.e., Lee, Palm Beach, and Miami-Dade counties). It is likely that a significant proportion of these additional reports are misidentified water monitors, and therefore, the true number of water monitors reported in the wild in Florida may be underestimated.

While no formal studies have yet determined the potential for water monitors to establish in Florida, the bio profile created by UF biologists, Briggs-Gonzalez et al. (2019), for FWC discusses their potential Florida distribution, including habitat similarity and ecological similarity to other known invasive wildlife (i.e., Nile monitors, black spiny-tailed iguanas (*Ctenosaura similis*), and Argentine black and white tegus (*Salvator merianae*).

Furthermore, at least two individuals evaded capture for several years in Monroe and Collier county respectively, demonstrating that water monitors can survive readily in South Florida. However, rapid response efforts by FWC and partners can and have decreased the number of water monitors in the wild. In addition to other removals, the two individuals mentioned above were both ultimately captured and removed by FWC and partners.

In summary, water monitors' anatomical, morphological, and dietary proximity to Nile monitors demonstrates that they may pose an equal threat to Florida's native ecosystem. The potential threat, along with the reported numbers of water monitors (and the likely higher number given their propensity for misidentification), indicate that more attention is warranted for this species to prevent future establishment.

[1]

1 Citations

Briggs-Gonzalez, V., Klovanish, C., and Mazzotti, F.J. 2019. Species bioprofile for water-dwelling monitors, the Southest Asian water monitor (*Varanus salvator*). Report Prepared for Florida Fish and Wildlife Conservation Commission: Contract Number 13416, TA-A3047.

Table 1. Credible and verified water monitor (*Varanus salvator*) reports in Florida from January 1, 2015 through June 20, 2020

| Date | County | Credibility | Report Type |
|---|---|---|---|
| 2/8/2016 | Brevard | Verified | Found Dead |
| 3/22/2016 | Broward | Verified | Observation |
| 4/21/2016 | Hillsborough | Credible | Observation |
| 4/26/2016 | Hillsborough | Verified | Observation |
| 6/12/2016 | Miami-Dade | Verified | Observation |
| 3/9/2017 | Charlotte | Credible | Observation |
| 5/25/2017 | Hillsborough | Verified | Capture |
| 6/20/2017 | Lee | Verified | Observation |
| 9/6/2017 | Pinellas | Credible | Observation |
| 9/25/2017 | Miami-Dade | Verified | Capture |
| 9/29/2017 | Marion | Verified | Observation |
| 10/7/2017 | Monroe | Verified | Observation |
| 10/7/2017 | Monroe | Verified | Observation |
| 10/13/2017 | Monroe | Verified | Capture |
| 11/2/2017 | Monroe | Credible | Observation |
| 12/18/2017 | Miami-Dade | Verified | Capture |
| 1/17/2018 | Miami-Dade | Verified | Found Dead |
| 1/23/2018 | Miami-Dade | Credible | Found Dead |
| 7/4/2018 | Broward | Verified | Observation |
| 8/17/2018 | Broward | Verified | Observation |
| 8/21/2018 | Broward | Verified | Observation |
| 9/6/2018 | Charlotte | Verified | Capture |
| 9/11/2018 | Broward | Verified | Observation |
| 12/4/2018 | Palm Beach | Verified | Observation |
| 12/23/2018 | Monroe | Verified | Observation |
| 5/30/2019 | Sarasota | Verified | Observation |
| 6/7/2019 | Broward | Credible | Found Dead |
| 6/7/2019 | Broward | Verified | Capture |
| 7/23/2019 | Sarasota | Verified | Capture |
| 8/19/2019 | Lake | Credible | Observation |
| 9/3/2019 | Okaloosa | Verified | Capture |
| 9/12/2019 | Pinellas | Credible | Observation |
| 9/17/2019 | Broward | Credible | Observation |
| 9/25/2019 | Charlotte | Verified | Capture |
| 10/14/2019 | Charlotte | Verified | Capture |
| 11/6/2019 | Pinellas | Credible | Observation |
| 1/12/2020 | Palm Beach | Verified | Observation |
| 4/13/2020 | Pinellas | Verified | Capture |
| 5/18/2020 | Pinellas | Credible | Observation |
| 6/7/2020 | Collier | Verified | Capture |
| 6/9/2020 | Lee | Verified | Capture |

# Navigating the "Y"-Maze: USDA research studies forge ahead

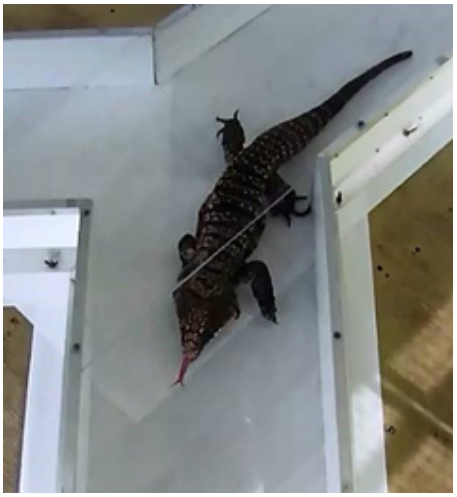
*by John Humphrey, USDA*

Squamate reptiles (snakes and lizards) rely on chemical cues to search for potential mates in their environment. How such cues are used by invasive species to facilitate reproduction, especially seasonally, is a key question that can inform management practices. The Argentine black and white tegu (*Salvator merianae*) is an invasive reptile species in south Florida threatening native fauna in biodiverse regions such as Everglades National Park. While some information exists on the reproductive ecology of this species in its native range in South America, the chemical ecology of *S. merianae* is unclear especially in its invasive range.

Through collaborative research at the USDA National Wildlife Research Center's Florida Field Station and James Madison University, several ongoing studies have begun making headway and will yield useful knowledge toward restoration of the Everglades. In controlled Y-maze studies at the field station, female tegus exhibited strong responses to scent trails of other tegus, following both male and female trails. Male tegus also showed increased rates of chemosensory sampling (tongue flicking) during the breeding season compared to fall. Findings such as these can be applied to enhance removals during breeding season through application of a conspecific chemical cue in traps.

To read this full study, visit: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236660.

Lipid extractions from tegu skin sheds will be tested with captive tegus in 2021 to determine if they elicit similar trailing behaviors. Lipid extractions from Burmese pythons are currently being analyzed for use in similar Y-maze based trials. The USDA is also initiating a captive tegu foraging behavior investigation aimed at determining tegu searching efficiency and susceptibility of bobwhite quail nests to tegu predation. This study was scheduled to take place in July and August of this year but has been postponed due to Covid-based delays.



An Argentine black and white tegu navigating the Y-maze. USDA photo.

# South Florida Ecosystem Restoration Task Force Update

*by Carrie Beeler-Kanderski, National Park Service (NPS)*

The South Florida Ecosystem Restoration Task Force (Task Force) was established by the Water Resources Development Act of 1996 to help coordinate the intergovernmental Everglades restoration effort. The Task Force consists of 14 members from four sovereign entities. There are seven federal, two tribal, and five state and local government representatives at the Secretary/Assistant Secretary level. The Task Force coordinates the development of consistent policies, strategies, plans, programs, projects, activities, and priorities addressing the restoration, preservation, and protection of the South Florida Ecosystem. It is supported by a Florida-based Working Group, the Science Coordination Group (SCG), and the U.S. Department of the Interior's Office of Everglades Restoration Initiatives (OERI).

Recognizing the importance of managing the growing threats invasive exotic species (IES) pose to the Everglades' health and restoration, the Task Force developed an Invasive Exotic Species Strategic Action Framework (Framework) in 2015. This effort brought together IES experts from federal, state, tribal, and local governments and established consensus goals, objectives, and priorities. The Framework is organized along the four phases of the Invasion Curve: Prevention, Eradication

**CONTINUED ON PAGE 16**

# Task Force Update (CONTINUED FROM PAGE 15)

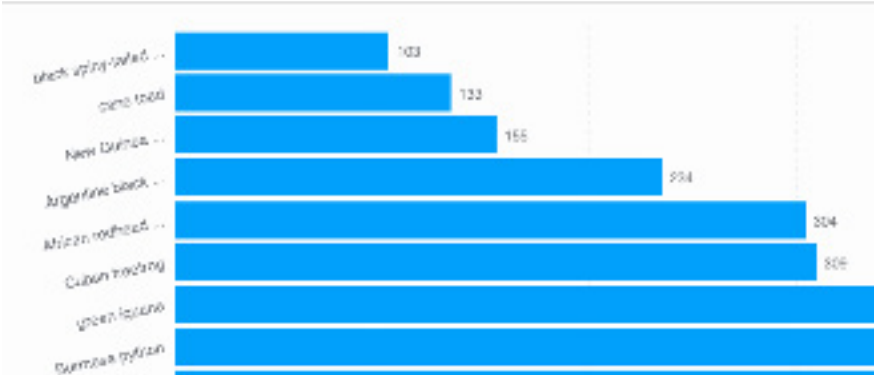
through Early Detection and Rapid Response (EDRR), Containment, and Resource Protection and Long-term Management. This structure reflects the spectrum of activities required to combat invasive exotic plant and animal species in the Everglades.

In 2019, the Task Force and its IES partners, through OERI, began updating the Framework and developing a set of complementary resources, including case studies, a 2015-2020 progress report, prioritization list, and an interagency snapshot budget for IES. More information will be available Fall 2020 at: EvergladesRestoration.gov.

# Online Impact: ECISMA and IVEGOT1

*by Sarah Jean Swain, Chuck Bargeron, University of Georgia (UGA)*

While many have been required by law to stay at home or have chosen to self-quarantine, reporting invasive species has allowed people to interact with nature while social distancing, during a global pandemic. The ECISMA website, along with IveGot1 and EDDMapS, have been resources for reporters old and new to learn about and report invasive species.




Top reported species from July 16, 2019 to July 15, 2020. Source: UGA.

On the IveGot1 app, reports reviewed and public records with observation dates made in 2020 on Android devices have increased from 88 to 164, while reports on iOS devices have decreased from 229 to 118. Although the total has decreased from 317 to 282, the overall numbers are still relatively close.

The first six months of 2020, from January 1st to May 31st have shown an increase in website reports via EDDMapS. Three hundred five reports with observation dates have been reviewed and are now public records. The same time frame of 2019 shows only two reports.

For the past year, there has been an average of 6 records per day added to EDDMapS in Florida.

The first day of this year's National Invasive Species Awareness Week (NISAW), February 24, saw 112 added. Overall, there have been 3,799 records added, covering 251 species by 1,085 reporters. 969 of those reports have been web reports, 554 iPhone reports, 767 Android reports, and 1,490 Bulk Data reports.

IveGot1 and IveGot1 Español, both of which are available for Android and iOS devices, were downloaded 7,493 times in the last year and 55,215 since first launched; there have been 6,186 updates in the last year and 137,722 total.

**Everglades CISMA Website and EDDMapS update July 2020:**

• IveGot1 iPhone App Downloads – 6,447 last year / 47,943 total'

• IveGot1 iPhone App Updates – 5,237 last year / 126,979 total

• IveGot1 Android Downloads – 1,006 last year / 7,146 total

• IveGot1 Android Updates – 949 last year / 10,743 total

• IveGot1 Español iPhone App Downloads – 36 last year / 118 total

• IveGot1 Español Android App Downloads – 4 last year / 8 total

A new version of the EDDMapS app was released for Android users in April of this year and for iOS users in June. Updates included a Field Guide Species List based on the state selected by the user, multiple ways to choose species on the report, the ability to search

CONTINUED ON PAGE 17

# Online Impact: ECISMA and IVEGOT1 (CONTINUED FROM PAGE 16)

and report any species, and having the My Species List synced with the server.

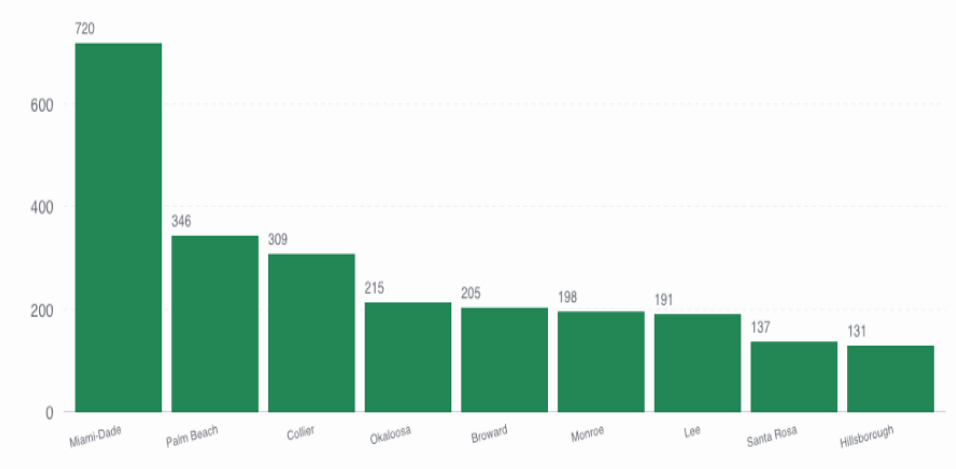
ECISMA website traffic from July 16, 2019 to July 15, 2020, has 106,926 pageviews from 62,666 users. The top ten pages include nine of the "Dirty Dozen" species featured on the ECISMA website and the ECISMA home page.

**Popular Pages (Page views from July 16, 2019 to July 15, 2020):**

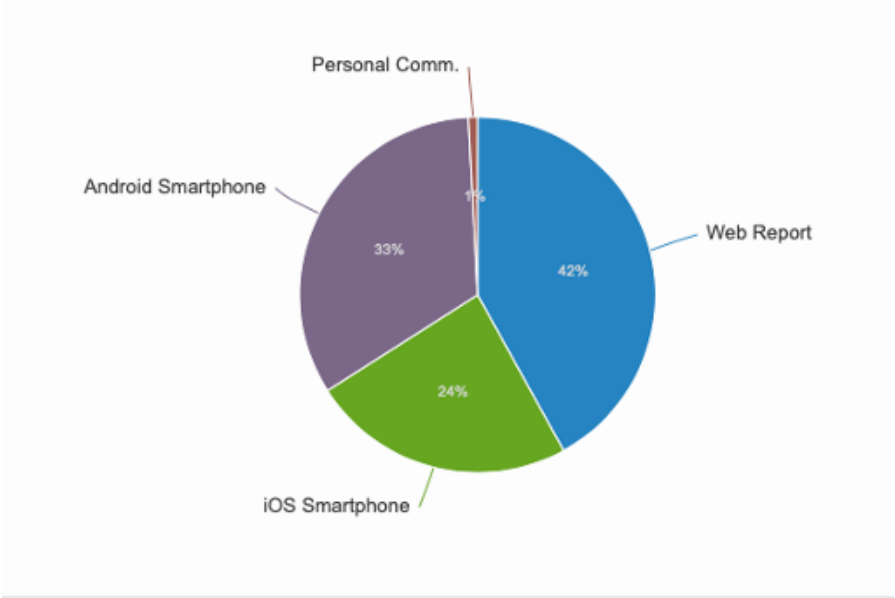
1. Dirty Dozen: Tegus – 22,169
2. Dirty Dozen: Pythons – 14,625
3. Dirty Dozen: Chameleons – 8,312
4. Dirty Dozen: Cuban Tree Frogs – 7,667
5. Home Page – 5,738
6. Dirty Dozen – 5,495
7. Dirty Dozen: Nile Monitor - 5,408
8. Dirty Dozen: Snakehead – 4,363
9. Dirty Dozen: Australian Pine – 4,269
10. Dirty Dozen: Air Potato – 3,838

During the two NISAW weeks, ECISMA's website visitors showed an increase in people visiting the site. From February 24th to February 28th, the site had and 987 new users and 1,788 pageviews, and from May 16th to May 23rd, ECISMA had 2,178 new users and 4,032 pageviews.

In the coming months, as temperatures lower and daily, afternoon downpours subside, reporting invasive species may increase on both IveGot1 and EDDMapS for Florida. With many outreach events postponed, canceled, or conducted online, numbers were still increasing in some instances, and remaining close to numbers accomplished in previous years in others. Therefore, educating about and reporting of invasive species using the ECISMA website, IveGot1 and EDDMapS in this pandemic has been successful.




Above: Public reports by Florida County from July 16, 2019 to July 15, 2020. Source: UGA.




Left: Percent of records by source from July 16, 2019 to July 15, 2020. Source: UGA

# Good News on Galaxy Scrub Workday

*by LeRoy Rogers, SFWMD*

ECISMA partner, LeRoy Rogers, and participants in Galaxy Scrub Workday.

In recognition of National Invasive Species Awareness Week, the Everglades CISMA (ECISMA) and Treasure Coast CISMA (TC-CISMA) partnered on February 27th, 2020 to organize an invasive plant workday at Galaxy Scrub in Boynton Beach. LeRoy Rodgers with South Florida Water Management District and Rebecca Harvey of the City of Boynton Beach co-led this project in collaboration with Palm Beach County Schools and the Sierra Club.

The City of Boynton Beach partnered with Palm Beach County Schools to preserve this 10-acre remnant coastal scrub and provide an outdoor environmental classroom for Galaxy Elementary. The site has a small gopher tortoise population. Local Sierra Club members put a lot of time into tortoise monitoring and habitat management. Numerous invasive plants occur on the site, and there are limited financial resources to keep them managed. FWC has provided land management support at this site in the past.

Workday participants bag and remove invasive plants at Galaxy Scrub in Boynton.

This workday aimed to assist with invasive plant control on the preserve and inform participating students about invasive species issues and wildlife conservation. Over fifty 5th graders were educated about invasive plants and wildlife impacts. A total of 24 volunteers attended, covering 6.5 acres, removing 45 bags of hand-pulled plants (approximately 700 lbs!, and 120 invasive shrubs were treated with herbicide (see list below).

Invasive plant species removed:

- Sword fern (*Nephrolepis cordifolia*)
- Umbrella tree (*Schefflera actinophylla*)
- Brazilian pepper (*Schinus terebinthifolia*)
- Shoebutton ardisia (*Ardisia elliptica*)
- Surinam cherry (*Eugenia uniflora*)
- Mother of millions (*Kalanchoe x houghtonii*)
- Asparagus fern (*Asparagus aethiopicus*)

A special congratulations to Galaxy Elementary for receiving the GOLD status award, which is the highest possible award for the Everglades Literacy Foundation! This would not have been possible without the hard work of volunteers and community partners over the years. Galaxy was also the only school honored with the FPL Environmental Stewardship Award for all they have done and will continue to do with the Galaxy Scrub, invasive species, and teaching students to be responsible stewards of the Earth..

# Friends of Everglades CISMA, Inc. Events and Everglades Invasive Species Summit

*by Justin Dalaba, University of Florida*

This past year, Friends of Everglades CISMA, Inc. (FOE) only held one event due to COVID-19 to raise funds to support Everglades CISMA. We are registered as a 501(c)(3), and donations to FOE, Inc. are tax-deductible. This status allows our funds to be used as a more immediate and flexible source of funding to support projects that may require a quick response time. This is sometimes necessary when responding to or managing invasive species.

**What's New?**

With the onset of COVID-19 , leading to a global pandemic, we were faced with the difficult decision to postpone the annual Everglades Invasive Species Summit, which is usually held in July. To ensure the safety of ECISMA partners and supporters, the first ever virtual Everglades Invasive Species Summit was organized in October 2020.

For a second year, FOE partnered with the Florida Panthers Hockey team to organize another invasive species fundraiser at the Florida Panthers vs Chicago Blackhawks game on 29 February, 2020. The game drew a crowd of over 13,000 people, providing ECISMA the opportunity to educate the masses. ECISMA partners shared their message at the game through an educational booth and awareness video that played on the JumboTron. A portion of ticket sales from a unique link set up for FOE, plus additional donations, raised around $300 in support of invasive species research and management throughout the ECISMA footprint. You can always stay up-to-date on upcoming events by following our Facebook page (https://www.facebook.com/evergladescisma/) and Twitter account (https://twitter.com/ecisma/).

**Make a Donation**

If you'd like to make a donation, head to our website (http://www.friendsofecisma.org/donate/). You can always support us on Amazon Smile (smile.amazon.com) (choose Friends of Everglades CISMA, Inc. under "Charities").


ECISMA partners at the Florida Panthers BB&T Center on 29 February 2020.

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

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

**Agency/Organization Abbreviations**

DOI - Department of Interior
ECISMA - Everglades Cooperative Invasive Species Management Area
EDDMapS - Early Detection and Distribution Mapping System
EDRR - Early Detection and Rapid Reponse
FTBG - Fairchild Tropical Botanic Garden
FFNC - Fern Forest Nature Center
FLEPPC - Florida Exotic Pest Plant Council
FOE - Friends of Everglades CISMA, Inc.
FWC - Florida Fish and Wildlife Conservation Commission
MDC - Miami Dade County
NPS - National Park Service
SFWMD - South Florida Water Management District
TC CISMA - Treasure Coast Cooperative Invasive Species Management Area
UF - University of Florida
USDA - U.S. Department of Agriculture

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
Big Cypress National Preserve
33100 Tamiami Trail East
Ochopee, FL 34141
(239) 695-1111
Tony_Pernas@nps.gov

Dennis J. Giardina
Florida Fish & Wildlife
Conservation Commission
298 Sabal Palm Road
Naples, FL 34114
(239) 229-5403
Dennis.Giardina@myfwc.com

www.evergladescisma.org

**2020 ECISMA Newsletter**

Editor:
Justin Dalaba, UF
Design and layout:
Rosemarie Moore, UF