



Everglades Cooperative Invasive Species Management Area

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Newsletter

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Nypa stand at Montgomery Botanical Center (Photo: Dennis Giardina, FWC).

The Mighty Mangrove Palm, *Nypa fruticans*

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

In past issues, we have chronicled ECISMA's efforts to eradicate two woody mangrove species, *Lumnitzera racemosa* and *Bruguiera gymnorhiza*, from Miami-Dade County, as well as our subsequent efforts to curb the importation of exotic mangroves into the state of Florida (<https://bit.ly/2n4smvx>). While we were working with plant ecologists at USDA/APHIS's Plant Protection and Quarantine to officially prohibit the importation of species in the genera of *Lumnitzera* and *Bruguiera* through the "Not Authorized Pending Pest Risk Analysis (NAPPRA)," another species made the list: *Nypa fruticans*, the only true mangrove palm. *Nypa fruticans* is monotypic, or the only species in its genus. Its fronds grow from belowground rhizomaceous stems that can reach up to 30 feet in height, and it can form dense monocultures. The fronds have many indigenous uses for thatching and weaving, and *Nypa*'s sweet sap is processed into a form of sugar called jaggery. It is often made into vinegar and wine, and *Nypa*'s ripe seeds are widely consumed and contain a sweet, gelatinous center that can be eaten raw or added to other confections.

The native range of *Nypa fruticans* is extensive and includes tidal swamps, rivers

and estuaries of Southeast Asia, as well as parts of India, Australia and the Pacific. But, interestingly, its origins are in the West. The fossil record of the late Cretaceous Period in North and South America contains the oldest samples of *Nypa* pollen and fruit collected to date. Apparently *Nypa fruticans* arose in northern South America and then spread around the globe just before the Earth was hit by a large asteroid, which led to an extended period of global cooling and drying. *Nypa* died out everywhere except in the Coral Triangle of Malaysia and Indonesia (like many other mangrove species), from where it eventually expanded out to its current native range.

Unfortunately, *Nypa fruticans* was planted around the turn of the 20th century in Nigeria, West Africa. It rapidly spread up and down rivers and colonized estuaries, and it now occurs in Cameroon to the south. Expediting the proliferation of *Nypa fruticans* in West Africa has been the razing of native mangrove forests for petroleum extraction and pipeline construction, sand mining, and development.

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The Mighty Mangrove Palm, *Nypa fruticans* (CONTINUED FROM PAGE 1)



From left to right: ripe *Nypa* seed head; *Nypa* flowers at Fairchild Tropical Botanic Garden (Photos: Dennis Giardina, FWC).

At first, *Nypa* finds little niches where it can establish. Then, over time, it infiltrates native mangrove forests. If a West African mangrove forest containing *Nypa fruticans* is disturbed, it quickly colonizes and outcompetes native mangroves. After a while, *Nypa fruticans* leaf cast changes the soil composition to where the native mangroves cannot readily sprout and recruit.

For more than a hundred years, tons of *Nypa fruticans* seeds have washed down rivers and out of estuaries from West Africa into the conveying currents of the Atlantic Ocean. Many *Nypa* seeds were washed out to sea, culminating in the 1991 discovery of seedlings on Manzanilla Beach on the eastern coast of Trinidad. A spreading population of *Nypa fruticans* was also discovered in 1989 on the Caribbean coast of Panama, near the Colón airport in the Folk River and Manzanillo Bay area. These populations, especially those in Panama and northern Colombia, continued to grow and spread,

eventually winding up on the radar screen of the USDA/APHIS Plant Protection and Quarantine Unit and in the queue for NAPPRA status.

Unfortunately, *Nypa fruticans* has also been planted at two botanical gardens in Miami-Dade County. It was planted in five places at Fairchild Tropical Botanic Garden and two places at Montgomery Botanical Center. In November of 2017, ECISMA partners surveyed the five *Nypa fruticans* sites at Fairchild and found that three of them were still there. They were observed and photographed in flower and fruit but apparently were knocked back severely during the winter of 2009-10. That is not the case for the two sites at Montgomery Botanical Center. Where *Nypa fruticans* was planted on an island in a lake, a dense stand now covers it. Where it was planted on the shore of a small pond, it grew to occupy almost all of the open water. It showed no negative impact from the freezing temperatures of 2009-10, and though no seedlings were found at either

garden, its tendency to create dense monocultures is evident.

The thought of another potentially invasive, exotic mangrove species growing at botanical gardens within the boundary of ECISMA is concerning. So far, the *Nypa* plantings are not producing fertile seeds, and it is unclear why, but what if that changes? Both botanical gardens are very close to Biscayne Bay and only a few feet above a rising sea level.

Moving forward, ECISMA partners will keep the pressure on *Lumnitzera racemosa* until we eradicate it. We will continue making every effort to prevent the importation of the next *Lumnitzera*. Only a fraction of all shipments containing plant material can be physically inspected at Florida's ports, and the movement of plants through internet commerce presents an even greater challenge. However, ECISMA partners will continue to work with the USDA to prevent the importation and commercialization of exotic mangroves.

Fearsome Flatworm Threatens Native Snails

by Tim Collins, Florida International University, and Alície Warren, PhD, Miami-Dade County Parks

Flat, slippery, and one of the world's 100 worst invasive species, *Platydemus manokwari* has made its way to Florida.

Platydemus manokwari is a terrestrial flatworm first described at an agricultural research station in the town of Manokwari on the Pacific island of New Guinea (hence its common name: the New Guinea flatworm). The species was initially recorded in Miami-Dade County in 2015 (Justine et al. 2015, <https://peerj.com/articles/1037/>), although some records (unreported at the time) date to 2012. Since then, it has been widely reported around the state of Florida, as well as in Alabama and Georgia (<https://www.eddmaps.org/distribution/usstate.cfm?sub=78294>). In other parts of the world, it has been introduced accidentally (for example, in the soil of potted plants) and sometimes intentionally

(with the intent to control snail pests like the giant African land snail). From an environmental perspective,

under foundations after heavy rains or crawling up walls.



Platydemus manokwari in low light
(Photo: Tim Collins).

Platydemus is a concern because it is the suspected cause of rapid decline or extinction of native species. We have seen its effects on South Florida's tree snail populations. *Platydemus manokwari* is a threat to Florida's native snail species—in particular, iconic Florida tree snails like *Liguus* (see image to the left).

You might wonder, "Where would I see *Platydemus*?" and "How will I recognize it?" *Platydemus manokwari* is primarily nocturnal, so there is a good chance to see it one to four hours after sunset and especially during or immediately following rainfall. You may also see it on rainy or overcast mornings or early evenings. During the day, the flatworms seek refuge under rocks, boards, or leaf litter in moist areas. You may also see some emerge from



Florida tree snail, *Liguus fasciatus*, in Miami-Dade County (Photo: Tim Collins).

The mature flatworm at rest is typically 4-7 centimeters in length and 0.5–1 centimeter wide. In motion, specimens may be over 10 centimeters (4 inches) in length. The body is thickest in the middle and tapers at either end, giving it an appearance similar to some leeches. The angle of the taper is more acute at the front end, where bulging eyes are often visible. The body color is a light to dark tan to brown with a lighter cream-colored stripe often apparent down the middle of the dorsal (back) side (see image above). Note that in bright light, the body appears almost black, and the stripe on the back can be difficult to discern. The body of this flatworm is robust, has a D-shaped profile, and is rounded over the dorsal side and flat on the bottom. The mouth is located on the ventral side, where a feeding tube (pharynx) emerges that is pushed into the body of the prey by muscular and enzymatic action. The flatworm tracks its snail prey by following the mucus trail snails leave as they move. You may notice *Platydemus* swinging its head back and forth, touching the ground to sense the presence of mucus trails.

Although *Platydemus* has been widely reported, it is often misidentified. For example, blind snakes, slugs and snails have been reported as *Platydemus*.

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Fearsome Flatworm Threatens Native Snails (CONTINUED FROM PAGE 3)

There are also other flatworms that may appear superficially similar to *Platydemus* (see image below). The good news is that researchers have the tools to identify and document this species properly.

If you see something you think might be *Platydemus manokwari*, particularly in areas inhabited by native snails, report it to the FWC Exotic Species Reporting Hotline. Take a picture, note the location, and report it: 1-888-IVE-GOT1 (1-888-483-4681). If this is from a new location, genetic or other expert identification may be needed. Wear gloves when handling specimens, or handle with tweezers, Q-tips, or a small stick. If you have handled a specimen, wash your hands well and avoid touching your hands to your face, especially your mouth, nose, and eyes. In addition to other concerns, *Platydemus* has been shown to carry the disease-causing nematode *Angiostrongylus cantonensis* in other parts of the world.



Parakontikia ventrolineata, another flatworm in the same family as *Platydemus*, feeding on a slug in Bellevue, Washington (Photo: Eileen Rojas).

Hole-in-the-Donut Wetland Restoration

by Jonathan Taylor, National Park Service

Have you ever driven down Research Road and wondered what all those construction vehicles are doing in Everglades National Park? You may have been looking at the groundwork of Florida's first In-Lieu Fee Project and mitigation bank to return former agricultural lands to natural wetlands.

The Hole-in-the-Donut wetland mitigation project (HID) spans 6,600 acres within Everglades National Park (ENP). The HID was authorized as a mitigation bank in the mid-1990s because it provided a successful ecological lift through restoration, with the ultimate goal of restoring natural wetland functions.

Approximately 85% of the HID was composed of sawgrass (*Cladium jamaicense*) and muhly grass (*Muhlenbergia capillaris*) in marl prairie habitat, and 15% was pine rockland habitat. The goal is to restore wetland hydrology and soil formation processes. This will ultimately improve freshwater wetland plant communities as well as wildlife utilization.

From 1915 to 1970, a large portion of this area was privately-owned agricultural land. Farming changed the substrate, raised the elevation of the area, shortened the hydroperiod and added significant nutrients. These factors allowed the highly invasive Brazilian pepper tree (*Schinus terebinthifolius*) to colonize previously farmed land and develop into a nearly monotypic Brazilian pepper forest.

Successful restoration within HID occurs during dry conditions (December–May) and requires complete removal of unconsolidated substrate down to limestone bedrock. In more detail, the process looks like this: 1) cutting and grinding the Brazilian pepper to ground level; 2) pushing or scraping all that material into piles (windrowing); 3) loading and hauling material to spoil mounds; and 4) conducting a

final scrape (sweeping and grading) to remove any remaining loose substrate. The restoration work is done in phases (units), ranging in size from 40-1000 acres, with the optimal annual target of 350 acres. So far, 5,328 acres of the HID have been restored, and an additional 350 acres were completed this past May. The remaining 622 acres are likely to be restored within 3 years.



Aerial photo of the HID project (Photo courtesy of Everglades National Park).

Within the HID, there are eight spoil mounds, where farmed substrate and cut Brazilian pepper are indefinitely stockpiled. The mounds cover approximately 215 acres. At roughly 35 feet tall, each mound is allowed to revegetate naturally. This does, however, involve constant monitoring and treatment for new recruitment of exotic and nuisance vegetation.

After restoration, the HID is an “open freshwater system”; its hydrology is directly connected to the overall hydrology of the larger freshwater watershed. The hydrology of the HID is determined by the flows of freshwater on adjoining park lands.

As restored areas age, they typically become dominated by 18 to 25 native wetland plant species typical of sawgrass/muhly grass prairies, with sawgrass and muhly grass becoming increasingly more important. The restored areas also support a wide variety of indigenous wildlife and fish species.

The perpetual management of the HID, which is conducted by ENP resource management personnel and contractors, includes nuisance and invasive plant management, prescribed burning, and restoration monitoring.

Monitoring South Florida's Nile Monitor Lizards Through Targeted Outreach

by Olivia Loving, University of Florida

If you live in Palm Beach County, you might be within range of a Nile monitor (*Varanus niloticus*). Localized breeding populations exist within and around the C-51 canal in Palm Beach County and Cape Coral in Lee County. The Nile monitor is invasive (native to Africa), large (up to 7 feet long), carnivorous, and threatening to native wildlife. Fortunately, University of Florida researchers—in collaboration with the Florida Fish and Wildlife Conservation Commission and with funding from the U.S. Fish and Wildlife Service and the South Florida Water Management District—are on the case.

Researchers' efforts include targeted outreach, which involves fanning out and distributing flyers and door hangers to homeowners, businesses and citizens in areas where Nile monitors are known to breed. In other words, the researchers have a singular goal and an intended audience. The message is clear: Here is what these animals look like, and here is how to report them. Targeted outreach has worked in the past, with Argentine black and white tegus. After canvassing 128 homes in one Homestead neighborhood in 2018, UF received eight verified reports.

In South Florida, tegus occur regularly in agricultural/rural areas, while Nile monitors seem to be confined to urban/suburban environments. Despite these differences, both prefer habitats that may also include residences and businesses. Some of these residences are in gated communities, where researchers spread the message via social media. Because of the impossibility of reaching everyone who might come in contact with an invasive reptile, ECISMA partners depend on members of the public sharing information with friends, acquaintances, and—in this digital age—anyone they can reach.

Some homeowners have not heard of a Nile monitor, have mistaken it for an iguana, or have seen one and were not sure how to report it. UF and its partners want to shorten the path between points A and B: when a Nile monitor is spotted, and when, or if it is captured. One way to accomplish this is by sharing IveGot1.org, an invasive species reporting website, and its accompanying hotline telephone number. There is also a mobile app anyone can use (see later article: "IveGot1: Learn to Identify and Report Invasive Species in Florida," page 11). Once learning about the large, invasive, carnivorous lizard, nearly every resident pledged to report any sightings.

Between April 2018 and April 2019, UF researchers distributed over 2,000 door hangers and talked to 144 individuals in the process. Following these and other outreach efforts, researchers witnessed changes in the public's response. Some homeowners have shared information by word-of-mouth, social media, or via phone apps. One successful case involved a homeowner seeing the door hanger on the "Next Door" phone app, a social media sharing platform for specific communities. This demonstrates that even though researchers are reaching a certain number of people through direct efforts, word spreads from there.

NILE MONITORS:
REPORT SIGHTINGS IN SOUTH FLORIDA
We Need Your Help!



Photo above: Nile Monitor (*Varanus niloticus*) spotted in SW Ranches (via EddMaps)



Photo above: Monitor caught in Pembroke Pines (via EddMaps)



Photo credit: Patrick Lynch, South Florida Water Management District.



Photo credit: Bill Bayless



Photo credit: Nick Scobel, University of Florida

Monitor Facts

- Large (3-5 feet in length) invasive lizard from Africa
- Dark in color with greenish-yellow markings
- Forked black/blue tongue
- Most likely to be seen in wetlands or along canals banks
- Have long sharp claws, a powerful bite, and a long, muscular, whipping tail
- Opportunistic hunters and scavengers

IF SPOTTED IN YOUR AREA:

- Take a picture
- Note the location

PLEASE CONTACT:

1-888-IVE-GOT1

(Invasive species hotline)

- OR -

Report online at ivegot1.org



Thank you for your cooperation!



The flyer that University of Florida researchers have been handing out to South Florida residents (Photo courtesy of UF).

ECISMA and TC CISMA On A Mission To Tackle A New Invasive Grass

by Christen Mason, South Florida Water Management District



Participants from ECISMA and TC CISMA (Photo courtesy of SFWMD).

On November 7, 2018, members of Everglades CISMA and Treasure Coast CISMA held a joint workday focused on mission grass (*Cenchrus polystachios*), a federal noxious weed recently found in Palm Beach County. This grass has proven extremely difficult to control on the west coast of Florida and in other parts of the world that it has invaded. It spreads easily, through seeds dispersed by wind, animals and equipment. Once established, mission grass dramatically alters the ground cover vegetation and fire behavior of natural areas that it invades. Mission grass was first documented in Palm Beach County along the C-51 canal levee in June of 2017. Eight months later, it was found to the north on the C-18 levee and in a neighboring Palm Beach County natural area very close to the TC CISMA/ECISMA boundary.

The joint workday had three goals. The first was to give people an opportunity to learn what mission grass looks like (see image). This species has been documented in only four Florida counties, and it looks similar to other common grasses, making its identification tricky. Mission grass is on the TC CISMA EDRR list and has not been documented in their footprint, so there was much interest from its members in being able to recognize it. The second

goal was to assess the extent of the invasion by surveying levees and natural areas for undocumented populations of mission grass. Six routes were created in areas that either shared boundaries with known populations or were previously unsurveyed. The third goal was to treat small populations. All teams were given nitrile gloves, spray bottles with herbicide and heavy-duty garbage bags for seed heads.

Turnout for the workday was excellent, with 30 participants from eight different agencies/organizations. Altogether, we



Mission grass, *Cenchrus polystachios* (Photo: SFWMD).

surveyed over 256 miles. We were relieved that we did not find mission grass on three of the six routes. Unfortunately, we documented a considerable expansion of a known population inside a local 298 district, and mission grass was also discovered in two new locations. One of these locations is along a District ROW, so treatment is feasible, but the second population is in a Florida Power and Light right-of-way in Royal Palm Beach.

These new discoveries were, admittedly, discouraging.

Eradication of any grass species is challenging, and when the problem is compounded by infestations on privately-owned land, it becomes much less likely that all seed sources will be adequately controlled.

The good news is that, following aggressive monthly treatments, the District populations along the C-51 and C-18 canals have been greatly reduced. We recently skipped several treatment cycles because there was no grass to spray! This suggests that while seed viability seems high, the seed-bank life span may be fairly short. With increased partnership, eradication of mission grass in Palm Beach County may still be possible.

The CISMAs were created to work across boundaries, facilitate partnerships and enable monitoring and EDRR efforts. This joint workday was an effective demonstration of these priorities. It makes sense for neighboring CISMAs to collaborate; we all do our jobs better when we know who our neighbors are and understand their issues. After this successful workday, mission grass is on the radar of many of our partners to the north, and we're confident that it will have a difficult time evading detection in the TC CISMA region.

Nonnative Fish Roundup and Fish Slams

by Kelly Gestring, Florida Fish and Wildlife Conservation Commission



A nonnative carp removed from Broward County (Photo: Kaitlin Kovacs, USGS).

FWC and ECISMA partners held the 10th Annual Everglades Nonnative Fish Round Up on April 26 and 27, 2019. Twenty-five anglers brought in 1,195 fish weighing 679 pounds. Anglers brought a total of 18 different nonnative fish species to two weigh-in sites in Miami-Dade and Broward counties. There were no new species collected this year, but there were some uncommon ones, including the green severum, the yellowbelly cichlid, the pike killifish and the clown knifefish. Anglers are encouraged to keep and eat their fish each year, and some do. We donate the remaining fish to Flamingo Gardens to feed a variety of captive animals.

The weigh-in sites were run by staff from the Florida Fish and Wildlife Conservation Commission (FWC), the Miccosukee Tribe and Everglades National Park.

A big thanks to Haley Hanson, president of Friends of the Everglades, for all her

behind-the-scenes work. Thanks also to our sponsors, who were instrumental in making this a successful event. Despite a lower-than-expected turnout, we are happy with the number and weight of fish brought in. We have ideas on how to improve participation and look forward to an even bigger event next year!

The winners are posted on the website at www.ECISMA.org/roundup.

Fish Slams

ECISMA partners participated in two Fish Slams in November 2018 and March 2019, respectively. To document or monitor new introductions and to document range expansions of known species, Fish Slams target bodies of water that are infrequently sampled for nonnative fish. In November, 31 fishery biologists from 12 agencies participated in a two-day event, sampling 22 sites in Miami-

Dade, Broward and Palm Beach counties. Sampling gear includes electrofishing boats, backpack electrofishers, minnow traps, cast nets, seines, bowfishing equipment, dip nets and hook and line. Biologists from FWC select the sites and make equipment recommendations, while U.S. Geological Service (USGS) biologists coordinate the logistics of these events.

We did not collect any new nonnative species, but we electrofished a large common carp from the Middle River (C-13) Canal in Broward County. This carp was likely a contaminant in a bait-bucket release. Common carp are established in several Panhandle rivers but are rare in South Florida. As a follow-up to the bay snook (*Petenia splendida*) eradication conducted in November 2017, we sampled for bay snook in Pinecrest Gardens and detected none!

The March 2019 Fish Slam took place in the Vero Beach area, a region new to Fish Slams. This two-day event attracted 30 participants from 10 agencies. We sampled 18 sites, including natural areas like Blue Cypress Lake and the St. Lucie and Sebastian rivers, along with manmade lakes, canals and ditches. We collected at least 11 nonnative fish species, including several single specimens of two swordtail species and a Rio Grande cichlid from ditches in Vero Beach.

One of the benefits of Fish Slams is the ability to link research institutions, such as universities and

Nonnative Fish Roundup and Fish Slams (CONTINUED FROM PAGE 7)



Nonnative fish roundup participants with their catch (Photo courtesy of FWC).

museums, with biologists who have the expertise and field equipment to collect nonnative fishes, providing unique access to specimens. Representatives from the Florida Museum of Natural History, the Yale Peabody Museum of Natural History, and the Virginia Institute of Marine Science benefitted from these collections. Nonnative fish specimens are preserved after collecting DNA and sometimes frozen for later skeletal collection and processing. Data from these collections are available in publicly accessible databases, such as the VIMS Nunnally Ichthyology Collection (link: https://www.vims.edu/research/facilities/fishcollection/search_collection/index.php) and the Florida Museum Ichthyology Collection (link: <http://specifyportal.flmnh.ufl.edu/fishes/>). All field collections of nonnative fishes will be entered into the USGS Nonindigenous Aquatic Species Database and the FWC's Wildlife Impact Management section database. For general information on Fish Slam events, please visit <https://on.doi.gov/2R6DIL>.



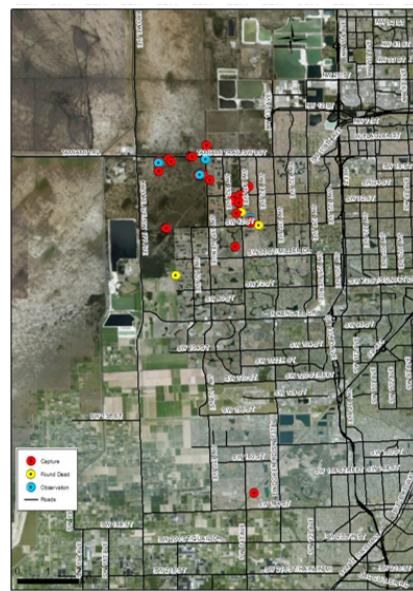
Fish slammers (Bottom four photos courtesy of Pam Schofield, USGS).

Northern African Python Removal Surveys

by Melissa Miller, Florida Fish and Wildlife Conservation Commission

The Northern African python (*Python sebae*) is a large constrictor snake native to sub-Saharan Africa, where it occupies regions that vary in climate—from semi-arid areas to mesic swamps. This species was first documented in southern Florida in 2001. Since then, approximately 40 Northern African pythons (NAP) have been observed, removed or found dead within a six-square-mile area within the Bird Drive Basin area of western Miami-Dade County.

After finding multiple Northern African pythons in 2009, ECISMA partners, including the Florida Fish and Wildlife Conservation Commission (FWC), worked



Map of Northern African pythons captured and observed from 2001-present (Map: Jacob Kline, FWC).

in tandem to organize large multiagency detection and removal search efforts. While captures and observations of Northern African pythons occur intermittently within this area, with the largest number of pythons removed around 2010, two pythons were recently removed in July and December of 2018, respectively. To our knowledge, very few NAPs remain in the wild in South Florida; however, these recent sightings raise concern that several locations within the Bird Drive Basin area may exist as holdouts for this species, warranting further search efforts.

Considering recent reports of Northern African pythons, FWC—along with the National Park Service, the South

Northern African Python Removal Surveys (CONTINUED FROM PAGE 8)



Female Northern African python captured and removed by Mike Kimmel (shown) from SW 30th Street, Miami, FL, in Dec. 2018 (Photo courtesy of Mike Kimmel).

Florida Water Management District, and the Miccosukee Tribe of Indians—organized a survey for Northern African Pythons. The survey took place on April 28th, 2019, with 39 participants representing partners and volunteers from federal, state and local agencies as well as non-governmental and academic organizations. Participants searched priority locations within the Bird Drive Basin area and West Miami-Dade County. Their focus was the known range of NAPs, including—but not limited to—Bird Canal, Tree Tops Park, Arches Canal, the Rock Pit and Lake Sebæ.

We did not encounter Northern African pythons during the survey. However, a group of participants from the University of Florida discovered python bones (see image) in a wooded lot in Miami-Dade County adjacent

to the most recent removal site of a Northern African python from December 2018. The group, led by UF doctoral students Natalie Claunch and Kodiak Hengstebeck, and post-doc Colin Goodman, collected a sample of the bones, including jaw bones, for comparison to known specimens of Northern African pythons and Burmese pythons available in the Florida Museum of Natural History. They found that the maxillary teeth from this specimen compare most closely to other Northern African python specimens rather than to a Burmese python. This indicates yet another Northern African python



A maxillary jaw bone (C) collected during the Northern African python survey on April 28, 2019 is shown, along with maxillaries of a Northern African python (B) and a Burmese python (A) from the Florida Museum of Natural History's collection.

(Photo: Natalie Claunch).



Participants searching for Northern African pythons in the Bird Drive Basin (Photo courtesy of FWC).

observation from the Bird Drive Basin area. While the Northern African python population in Florida appears to be small, consistent and continued search efforts are necessary to improve our understanding of this population. FWC plans to continue working with our

partners to survey areas within and adjacent to the known NAP distribution. We anticipate upcoming surveys will take place during the summer

months, beginning at dusk and continuing into the night. We will announce information for Northern African python surveys through ECISMA (www.evergladescisma.org), and we welcome participation by all. We look forward to continuing our work with partners, volunteers and stakeholders to intensify efforts to detect and remove Northern African pythons with the goal of eradication of this species from southern Florida.

FWC Large Lizard Removal Update

by Krissy Laurie, Florida Fish and Wildlife Conservation Commission



Trapped Argentine black and white tegu (Photo courtesy of UF).

The Argentine black and white tegu (*Salvator merianae*) is a large invasive lizard of priority in South Florida. Native to South America and now established in known areas of southern Florida, these omnivorous lizards eat a variety of native plants and wildlife, including eggs. Tegu diet is a primary concern for land managers since South Florida contains nesting sites of many imperiled species, including American crocodiles (*Crocodylus acutus*), least terns (*Sternula antillarum*), white-crowned pigeons (*Patagioenas leucocephala*), gopher tortoises (*Gopherus polyphemus*) and burrowing owls (*Athene cunicularia*).

Current numbers show that ECISMA partners along with private landowners have removed over 7,000 tegus from South Florida habitat in an effort to minimize adverse impacts on the Everglades ecosystem and risk of establishment of tegus into new areas. The Florida Fish and Wildlife Conservation Commission (FWC) is facilitating contracts with the University of Florida (UF) to continue trapping and removal efforts in the heart of their core introduced range in Miami-Dade County, as well as, utilizing a private contractor to maintain the trapping and removal of tegus along the eastern part of this range. Other ECISMA partners such as the United States Geological Survey, Everglades National Park, Florida Power and Light, and private landowners continue to trap and remove hundreds of tegus from southern Miami-Dade County. With the



Nile monitor, *Varanus niloticus* (Photo courtesy of Patrick Lynch).

help of these partners and participation of more private landowners taking advantage of the FWC's trap loan program, we will be able to enhance removals. Combined efforts in the 2018-2019 season have removed a total of 642 tegus from Miami-Dade County as of May 2019.

The Nile monitor (*Varanus niloticus*) is a large carnivorous lizard native to sub-Saharan Africa that is invasive to localized areas of Florida including Palm Beach County. Nile monitors are adept predators that prey on many native insects, mammals, birds, eggs, and other reptiles. Nile monitors are semi-aquatic and are likely to be seen basking along the banks of canals or other waterways in Florida. Like tegus, Nile monitors are effective nest predators, which is especially a concern for native wildlife and imperiled nesting species in Florida. Active management of this species through direct removal efforts and passive monitoring is paramount to conserving native wildlife. Additionally, targeted outreach is a valuable tool to enhance management efforts (see page 5). From 2011 through May 2019, ECISMA partners removed 140 Nile monitors from Palm Beach County. From July 2018 through May 2019, FWC removed 6 Nile monitors from Palm Beach County, for a total of 121 since management efforts began in 2011 (52% removal rate). FWC is experimenting with different live



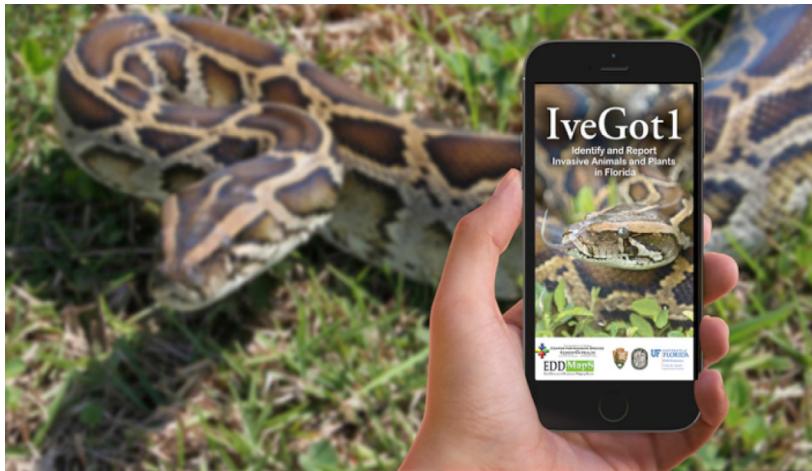
Spiny-tailed iguana (Photo courtesy of FWC).

trapping methodologies and targeted surveying to determine additional ways to remove monitors in this area. FWC is also closely monitoring a dwindling population of Nile monitors in Palm Beach County via camera trapping to determine abundance and target management efforts on the remnants of that population.

Spiny-tailed iguanas (*Ctenosaura similis* and *Ctenosaura pectinata*) are a large, invasive, omnivorous lizard native to Central and South America. The spiny-tailed iguana can be differentiated from the green iguana by its dark black banding and greyish coloring. These lizards are excellent burrowers, and when seen they are quick to run to their burrows. These lizards eat a wide variety of prey over the course of their lifespan, including birds, plants, and eggs. FWC's Nonnative Fish and Wildlife Program and FWC's South Region Volunteer Coordinator have been working with volunteers to help trap and remove spiny-tailed iguanas in Broward County, specifically in areas where imperiled gopher tortoises and burrowing owls occur. From the start of the program in 2017 through May 2019, volunteers removed 105 iguanas from one location in Broward County. Removal efforts will continue for the foreseeable future to ensure these imperiled species continue to thrive in this urban environment.

IveGot1: Learn to Identify and Report Invavive Species in Florida

by Rachel Carroll, Rebekah Wallace and Chuck Bargeron, University of Georgia



Report invasives on the IveGot1 smartphone app.

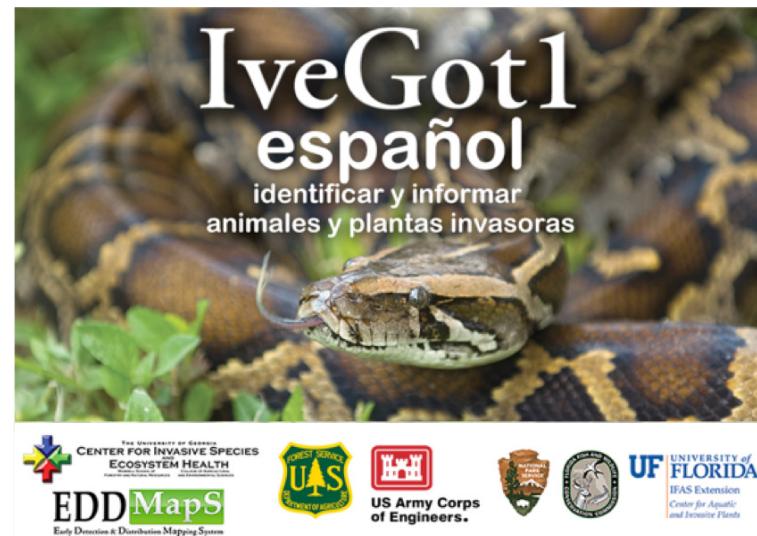
IveGot1 is an integrated invasive species reporting and outreach campaign for Florida that includes apps, websites with direct access to reporting and a hotline (1-888-IVEGOT1) for instant reports of live animals. IveGot1 is available in English and Spanish (new in 2018), and it was developed by the University of Georgia Center for Invasive Species and Ecosystem Health through a cooperative agreement with the National Park Service and in cooperation with the Florida Fish and Wildlife Conservation Commission and the University of Florida Center for Aquatic and Invasive Plants. EDDMapS powers and serves as the database to store and share collected data with reports uploaded and emailed directly to local and state verifiers for review.

With invasive species adversely impacting native wildlife, destroying agricultural crops and threatening our health and recreation, reporting sightings of invasive animals and plants can help experts better assess the extent of the infestations and hopefully eradicate new infestations before they become vast problems, as is the case with melaleuca or Burmese pythons.

The goal of the IveGot1 app is to make the identification and reporting process of invasive species as easy and efficient as possible for Floridians and visitors alike. Features of IveGot1 include:

- 1) Easy species reporting that captures your current location and allows you to submit an image of your sightings.
- 2) Images and information on Florida's worst invasive animals and plants.
- 3) Real-time point distribution maps centered on your current location.
- 4) Ability to get involved: Join the Florida Exotic Pest Plant Council or your local Cooperative Invasive Species Management Area (CISMA) through the Florida Invasive Species Partnership.
- 5) Real-time tracking of invasive species occurrences using local and national distribution maps and electronic early detection reporting tools. Statistics for reviewed records in Florida show that as of April 2019, there have been 6,166 website reports, 316,542 bulk reports (i.e., an existing agencies' database uploaded into the EDDMapS database), 2,496 iPhone reports, and 1,361 Android reports. Total reports of each taxa include 254,490 plant reports, 67,828 wildlife reports, 3,528 disease reports, and 1,397 insect reports. A breakdown of the reporters submitting records via smartphone shows that 3,063 reporters submitted one record each and that 805 reporters submitted two to five records, with fewer and fewer reporters submitting increasing numbers of records.

Report invasive species at www.ivegot1.org or download the smartphone apps by searching for "ivegot1" in the Apple App Store or Google Play Store.



Friends of Everglades CISMA, Inc.

Updates and Events

by Haley Hanson, President of Friends of ECISMA, Inc.
and Justin Dalaba, University of Florida

This past year, Friends of Everglades CISMA, Inc. (FOE) held several new events 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?

We held two fundraisers at Invasive Species Brewing in Fort Lauderdale. On November 18, 2018 and again on May 26, 2019, we were joined by many in the community for music, beer, food and discussions on invasive species. Joe Wasilewski brought a Burmese python and an Argentine black and white tegu, and FLEPPC displayed several non-native plants to engage and educate the public on the topic of invasive species. We had several generous donations to auction off, including an original photograph gifted by Clyde Butcher and merchandise from the brewery.

Overall, we raised over \$1,100 from both events! That money will be used for additional outreach materials and to support rapid-response efforts. We owe a big thank-you to Invasive Species Brewing, Joe Wasilewski, and everyone who came out to support us.

We are also excited to announce that FOE partnered with the Florida Panthers Hockey team to organize an invasive species fundraiser at the last hockey game of the season on April 6, 2019. 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 awareness video that played on the JumboTron

during the first intermission and at an educational booth throughout the game. A portion of ticket sales from a unique link set up for FOE, plus additional donations at the game, raised roughly \$300 in support of invasive species research and management throughout the ECISMA footprint. We are working to organize a second, full-day event at the BB&T Center to be held by early 2020.

If you missed out on either of these events, 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").



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:

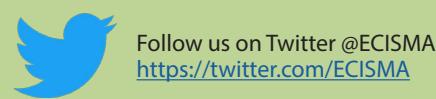
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2019 ECISMA Newsletter

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"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 Response
FIU - Florida International University
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
USGS - U.S. Geological Survey