

ZOO
MIAMI



Conservation and Research Report 2015



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Director's Update:



My return to Zoo Miami, now as the Zoo Director, is an exciting time in my career to be able to mentor and empower the next generation of zoo leaders and conservation stewards. We are

focused on continuous improvement and recruiting and retaining the best talent to help achieve our goals. Our strategic plan revolves around five foundational pillars: animal well-being, conservation and stewardship, guest experience, financial strength, and performance excellence.

Through this report, I hope you can see how we continue to make Zoo Miami a leader in regional wildlife conservation and environmental stewardship. Our dedicated team will continue to pursue this role and aspiration through innovative educational programs, meaningful and impactful research, supporting ex-situ field projects, and habitat conservation.

I ask you to join us in our efforts to continue to earn and retain our place as one of the best zoos in the United States.

- Carol Kruse, Zoo Director

Imperiled Butterfly Programs

Zoo Miami continues its efforts and partnerships in 2015 by helping several imperiled butterfly species populations stay secure and move towards recovery.

With volunteers from [HandsOn Miami](#), Zoo staff planted several hundred larval host plants in disturbed areas around an old Richmond Naval Air Base bunker on Zoo grounds surrounded by pine rocklands. These were planted in a strategy to get some natural recruitment from the surrounding woods and provide added resources for the imperiled species already found on Zoo Miami grounds. We are happy to report that the results were almost instant! Within five weeks of the planting, there was a federally endangered Bartram's Hairstreak caterpillar present on the pineland croton and Florida duskywing caterpillars making silk tents in the leaves of the locustberry.



As part of a partnership with the [Florida Museum of Natural History](#) and with funding from the [Disney Conservation Fund](#), This year, Zoo Miami's Conservation and Research staff was trained and assisted in the Schaus' Swallowtail surveys on Elliott Key in Biscayne National Park. The surveys were done in late summer, at the height of the mosquito season, to try and document them in a second flight for the year. A second flight for the year had always been attributed to tropical storms but is now being shown that it may occur naturally with no severe storms occurring this past year.

To give the public a glimpse of the butterfly programs going on behind the scenes here at Zoo Miami, a new exhibit with atala hairstreak butterflies opened in the Flooded Forest Building at Amazon and Beyond. You can see all the life stages of this imperiled local butterfly and how we are breeding them for release back into the local environment to bolster their numbers. In the coming new year, we will be partnering with [Fairchild Tropical Botanic Gardens](#)' "Connect to Protect" program with these atala. If a business, school, or homeowner plants enough host and nectar plants, we will deliver some atala butterflies to the property to try and establish a new colony. The hope is that these will help form a link between this butterfly's remaining fragmented habitat with your help!





Tigers in the Forest

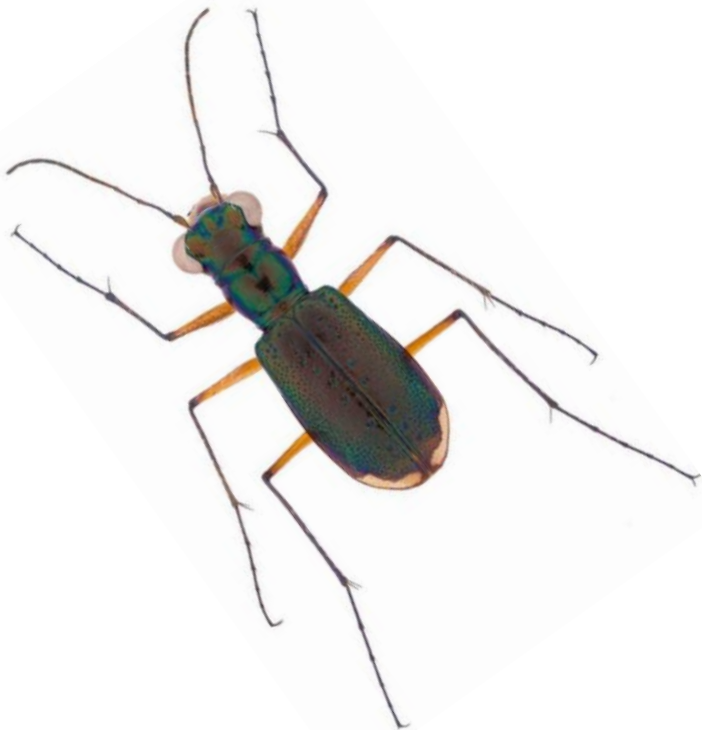
No, these are not the tigers with stripes and claws but they have a similar predatory appetite, amazing speed, and jaws that rival any animal in the forests of the world for their size. This is the Miami Tiger Beetle.

It had been thought to have been extinct since it hadn't been seen for more than half a century. But, a small population was rediscovered in 2007 in a pine rockland fragment. A search ensued across several counties but no additional populations were found and not all of the remaining pine rockland is even suitable for the beetle to sur-



vive. The remaining population size is presumed to be less than a hundred. These beetles only thrive in open sandy patches of pine rockland that is maintained by regular fire.

If you see one of these sandy patches and there are insects crawling around, there probably isn't a tiger beetle around. When a tiger

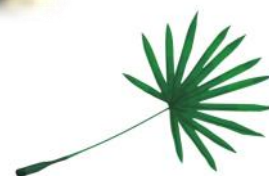


beetle is present, it perches at the edge with its large eyes waiting for something to wonder in. When tiger beetles see their prey, they charge at it so quickly that they go blind for an instant. Then they lock onto their prey with their giant mandibles. The hunt is over in an split second.

This year, 2015, the Florida Fish and Wildlife Conservation Commission (FWC) decided to consider listing the Miami Tiger Beetle as being a state threatened species. But, in December of 2015, the US Fish and Wildlife Service (USFWS) announced that it was proposing the beetle as a federally endangered species. This means that the State designation will go on hold while the species undergoes a year long review process of whether it satisfies the listing requirements and would be afforded more protections. 2016 is set to be a busy upcoming year for biologists studying this rare invertebrate.

Conservation and Research Department staff took FWC and USFWS out into the pine rocklands to train them on detection techniques, show them “hotspots” to find the beetles, and help provide feedback on survey protocols.

Even though this beetle is small in stature, it plays a role in the food web that supports the critically endangered pine rockland ecosystem that we are still learning about.



“Conchy” the American Flamingo

In early September of this year, a trio of American flamingos flew into the shallow water areas of the Naval Air Station Key West at Boca Chica Field. Within a few days, a strong storm came through the area and two of the flamingos flew off leaving a single individual flamingo behind.

This flamingo took up residence between two very busy airstrips where Naval jet squadrons take off and land throughout the day. USDA Wildlife Services agents are contracted to keep wildlife out of these areas to prevent possible life threatening collisions with aircraft. They have tried and true techniques to harass birds to get them to leave the area keep the area safe for the birds and pilots. But, this flamingo was not budging after a few weeks of trying and the reluctant pressure to use lethal removal was building since an accident from a collision could cost the Navy millions of dollars or a pilot's life.

The USDA agent at the base had heard about our Florida flamingo project and contacted one of our partners in the National Park Service to reach out for assistance on a possible capture and removal. This was a departure from our study which was focused on capture, attaching a transmitter and then immediately releasing since this bird would have to be relocated. But, we were all willing to give it a try and help out in this unique situation.



With help from the USDA, the Key West Wildlife Center, and the NAVY, we were successful in capturing the flamingo with a small net gun on the second day of attempts. This was an exciting moment for all of us to remove the danger to the bird and pilots but only the start of the story for the flamingo we affectionately named, “Conchy.”



“Conchy” was a little thin upon capture and needed some place to stay and fatten up while we worked through many regulations and permits to secure a suitable release location. The Key West Wildlife center stepped up again and housed and fed him for three weeks.

When that storm had passed through originally leaving “Conchy” alone in Boca Chica, the next day a pair of flamingos appeared in the area of Snake Bight in Everglades National Park. It is likely that this pair were the same ones that had been with “Conchy” and were also likely its parents. Flamingos pair bond and if you happen to see an isolated trio, it is



likely a pair with their immature offspring. This made Snake Bight the most likely successful site for release to give “Conchy” its best chance of returning to the wild and reuniting with a flock. After the permits were obtained, “Conchy” had a transmitter attached to a leg band to allow tracking, the bird was loaded into a crate and transported to the Flamingo campgrounds at Everglades National Park where a park employee gave us a boat ride out to release him in an area near the other flamingos. “Conchy” was released onto a mudflat with hundreds of others wading birds around.

All looked promising for him but like most fieldwork, things don’t always go as planned. A week after release, we got a call that “Conchy” had been found in Everglades National Park by their maintenance staff in very poor condition. He was picked up and found to be in very thin, in shock, and near death. He was rushed to Zoo Miami’s hospital for emergency treatment by our veterinarians and stabilized.

It turns out that while “Conchy” was at Boca Chica, he had been feeding in a very shallow man-made tidal pool with not much food except some snails and macroalgae on the bare rock. A common parasite, a liver fluke, goes through its life cycle in snails. He had apparently received a very large burden of these while staying those weeks in Boca Chica and eating many snails. The damage to his liver was severe but with treatment he recovered over several weeks and became strong and feisty. It was time to try and get him back in the wild again.

The pair of flamingos were still present in Snake Bight in Everglades National Park but our permits were no longer valid to release there again and couldn’t be renewed for several more weeks. Since birds don’t care about borders that we make up, it was decided to release him as close as we could near the border of the park and let him choose to fly where he wanted, hoping he may find other flamingos. The second release on the Gulf side of the upper keys went well.



We are now tracking “Conchy” with a solar powered GPS satellite transmitter and recording his adventures through the keys of Florida Bay. It is hoped that he will run into some more flamingos as they are passing through or seek out a mate when he reaches sexual maturity. But for now, we are just happy to have saved him, twice, and be able to learn more about places in Florida that are important for flamingos.

“Bruce” the Florida Bonneted Bat

One night in late November, a city of Miami Park Ranger heard some squeaking noises on the ground as he was locking up Shenandoah Park. When he tracked down the noises, he found a bat crawling on the ground under some large live oaks that had just been trimmed for an upcoming event in the park.. He carefully herded it into a box and got it up to the [South Florida Wildlife Center](#) to get checked out in case it was hurt. This conscientious ranger helped save one of our very endangered neighbors and started a many month long labor of love for Zoo Miami staff.

Dr. Frank Ridgley, a wildlife veterinarian in the Zoo’s Conservation and Research Department, had assisted the South Florida Wildlife Center with the rehabilitation and release of a Florida Bonneted Bat about a year prior to this discovery. That past experience was so gratifying when they called with another possible case, he readily agreed to help take over its care. But, from the first feeding, he knew this bat was much different.

This Bonneted Bat was very small and when presented with a waxworm for food, he let out very loud audible vocalizations, latched onto the waxworm, and began to suckle. This



bat was still a baby and nursing! This was not going to be like the previous case where a good couple weeks of care would get it strong enough to go back out into the wild. There were no books that you could look in or webpages to pull up that would give you guidance on how to raise a baby Florida Bonneted Bat. Likely, less than a dozen have ever been rehabilitated but never hand raised from a baby. The challenge and time commitment was going to be huge but with a total estimated population in the low hundreds for the species, every one of them is very important.

The ranger who found this bat named him “Bruce.” Bruce would become a fixture around the Zoo’s hospital for many months as staff had to feed him every few hours, drop by drop with formula. After many weeks, he slowly began to experiment with solid food. He grew bigger and stronger. He eventually moved to a large outdoor screen enclosure with his specially made bat box hung up in it. In there he learned to fly. Contact with people





was kept limited to quick feedings so that he would hopefully be able to return to the wild. Flying insect traps were placed near his enclosure so that captured bugs could be introduced inside every day.

Eventually, he was fully weaned, started showing adult male characteristics, and taking a variety of insects. It was decided by wildlife agencies that it was time to try and see if a reintroduction to the wild would work. Bruce had a tiny microchip placed under his skin for permanent identification and a tiny collar made from a suede string so that a transmitter could be attached. On the big night when the doors to his enclosure were to be left open, [US Fish and Wildlife Service](#) and [University of Florida](#) biologists came out to the zoo armed with tracking equipment to help see where he goes. The hope was that he would explore some and come back to his bat house that had been his home for over four months. Or, possibly find some other place close by to roost. We knew Florida Bonneted

Bats utilize the Zoo's grounds to forage at night and he could even take up with them. But, Bruce had other plans.

The tiny transmitter, about the size of a flat pencil eraser, was attached to his collar. The end wall of his enclosure was removed to give him free access to fly out. Everyone got into position spread out a few miles apart since Bonneted Bats can fly up to 30 miles a night. Then the wait began.

He began flying around in his enclosure as we would hear beeps from his transmitter through our equipment. A loud thump on the screen of his enclosure was heard and then silence. Did he return to his box? A quick check of his enclosure and box showed that he had flown out of it. A call went out to all the parties but he had already flown out of the mile range of the receivers. Bonneted Bats are very high altitude fast flyers and cover ground quickly.

A search for a signal from him went on for the next few weeks across Miami hoping to check on his status but not a single beep was heard. The collar was designed to fall off within a couple weeks. Bonneted Bats are believed to be able to live 20 years or more. So, as more roosts of these elusive endangered bats are discovered in South Florida, we hope one day we will be able to scan a group held up somewhere and a little code will pop up on the screen telling us it's Bruce and he has been tearing up the skies over Miami!





Gopher Tortoises in Miami-Dade

The pine rocklands surrounding Zoo Miami are home to a substantial population of threatened gopher tortoises. One of only two species of tortoises native to the United States, gopher tortoises play an important role in the ecosystems they inhabit - they create deep burrows that are used not only by the tortoises, but by dozens of other species (including insects and spiders, frogs and snakes, and various small mammals). Gopher tortoises are threatened throughout their range by urban development and by an emerging disease - upper respiratory tract disease (URTD)- that has devastated some tortoise populations.

This year, the Conservation and Research Department has begun a detailed study of the ecology and conservation of tortoises at Zoo Miami. Conservation and Research staff, working with a group of undergraduate interns from [Florida](#)

[International University](#), have been conducting surveys for

gopher tortoise burrows throughout the Zoo, and have been using



motion-sensor cameras at burrow entrances to record tortoise behaviors and monitor activity periods. We have individually marked tortoises by painting numbers on their shells so we can track the movement patterns and social interactions of individual tortoises.

Because URTD is a major threat to tortoises, the Conservation and Research Department has begun testing tortoises throughout Miami-Dade County for evidence of infection. Understanding how widespread the disease has become can help to design effective management strategies for tortoises in South Florida.



Saving Rainforest Amphibians from Extinction

In 2015, Zoo Miami's Conservation and Research Department began a project working with critically endangered rainforest amphibians in Costa Rica, funded by



the National Geographic Society's Conservation Trust. Many species of amphibians throughout Costa Rica have been driven nearly extinct by the appearance of the deadly amphibian chytrid fungus. Several species of frogs that were formerly widespread in Costa Rica now persist in single, highly vulnerable populations.

Zoo Miami, in collaboration with the Universidad de Costa Rica and the University of South Dakota, is working on efforts to protect these amphibians from extinction.

Dr. Steven Whitfield from the Conservation and Research Department at Zoo Miami visited Costa Rica in October 2015 to begin this new field research project. During this field project, researchers from Zoo Miami and the Universidad de Costa Rica used a skin swab test to examine amphibians for infection by the chytrid fungus. Further, researchers individually marked amphibians with permanent tags, so we can follow animals over time and estimate



the size of remaining populations. Zoo Miami's efforts with endangered rainforest frogs will continue in 2016, and aims to develop scientifically-informed management strategies for protecting these and other amphibians.



Partners Supported

Zoo Miami's Wildlife Conservation Fund contributed over \$36,000 in 2015 to support some of our partners doing exceptional conservation work in the field around the world. We are not only committed to providing exceptional care of the species that reside at the Zoo here in Miami but the entire connected global populations to help ensure their survival for future.



Zoo Miami made donations to the fundraising events "Christmas Crocfest" and "Summer Crocfest" to support crocodylian conservation efforts. These donations specifically went to support a community based reintroduction and monitoring program of the critically endangered Philippine crocodile and a management plan for the critically endangered Indian gharial.

The Sahara Conservation Fund and the AZA Ratite Taxon Advisory Group have partnered with the Republic of Niger to reintroduce the Red-necked Ostrich into Niger. The Red-necked Ostrich is gone from 95% of its former range and is currently extinct in the wild of Niger. Zoo Miami is proud to support this program comprised of local Nigerian breeders in an effort to captive raise this species and work towards the reintroduction of the species. Monies contributed will go towards the construction of pens and daily care of the birds until the goals can be met.



The International Iguana Foundation (IIF) educates the public and prioritizes conservation projects for the critically endangered iguana species of the world. Zoo Miami has been a proud supporter through financial and field expertise of the IIF for many years.





Rhinoceros populations throughout Africa and Asia are under tremendous pressures with a dramatic increase in poaching in the last few years. [The International Rhino Foundation \(IRF\)](#) prioritizes and funds field conservation programs in Africa and Asia while also enabling captive populations remain viable. Zoo Miami has been a long time financial supporter of the IRF in their efforts to aid these unique species.

Poaching of elephants has reached record levels in the last few years. Zoo Miami has been a long term supporter of the [International Elephant Foundation \(IEF\)](#) which supports scientific research, conservation programs and provide expertise on a global level. This year, our contributions specifically went to support Asian elephant field conservation efforts supported by the IEF.



Zoo Miami has long been involved in the captive breeding programs of both the East and West African Crowned and Blue cranes. Illegal trade in these species in Africa has significantly increased in the past 5 years. Zoo Miami is proud to support the [Endangered Wildlife Trust's African Crane Conservation Program](#) that helps provide financial support for the veterinary care, housing and feeding of confiscated cranes during efforts to rehabilitate and reintroduce them to the wild.

Partners Supported



The Thailand Hornbill Project has successfully changed local villager roles with these species by paying villagers to monitor and protect their nests instead of stealing and selling the chicks like in the past. The data obtained from the monitoring is helping secure long term populations in the area. Zoo Miami is proud to have provided funding to monitor and protect six nests this last year.

Zoo Miami maintains two different captive populations of the endangered golden frogs and participates in the Panamanian Golden Frog Species Survival Plan by breeding the species. To also help this species in its country of origin, Zoo Miami supports the efforts of the Conservation Breeding Specialist Group's work in El Valle, Panama. These measures together are working towards the long term viability of this frog with hopeful future reintroduction to the wild.



The critically endangered radiated tortoise in Madagascar has had an exponential increase in poaching over the last decade. Educating local populations and increased law enforcement has led to more successful confiscation of these tortoises. The Turtle Survival Alliance (TSA) has received land within the radiated tortoises native range and needs support to build a facility where these confiscated tortoises can be evaluated and housed prior to release into back the wild. Zoo Miami has been housing and breeding this species for more than 40 years and is proud to contribute to the TSA to help build this facility in Madagascar.

The Komodo Dragon Research and Monitoring Program in Komodo National Park on the island of Flores has been conducting research to better understand the ecology of this population under threat from human pressures on the island. Zoo Miami has been a leading institution globally in working with this unique species and continues to support efforts like this to ensure the survival of this vulnerable lizard.



The Okapi Conservation Project (OCP) is located in the Ituri Forest of the Democratic Republic of Congo which is one of the most biologically diverse areas in Africa. The OCP assisted in the establishment of the Okapi Wildlife Reserve which not only contains a large population of the endangered okapi but also protects an incredibly diverse ecosystem that is a United Nation's World Heritage Site. The OCP headquarters underwent an armed attack in 2012 that resulted in a loss of human life, infrastructure, and the entire captive population of okapi at the facility. Zoo Miami contributed this year to help rebuild what was lost and continue all of our efforts to help this fascinating species survive.





Throughout the year, the [South Florida Chapter of the American Association of Zoo Keepers \(SFAAZK\)](#) holds awareness events to educate the public and fundraisers to contribute monies towards conservation programs that they are passionate about. Below are just some of the actions they took in 2015.

Awareness Campaigns:

[Elephant Conservation Week](#)—This week long event engaged the public and discussed poaching and habitat loss issues. Ornament and t-shirt sales profits went to the International Elephant Foundation

[Tree Kangaroo Conservation Weekend](#)—While not only discussing habitat loss and hunting with the public, SFAAZK also sold baked goods, lemonade, and a behind-the-scenes raffle with proceeds going to the [Tree Kangaroo Conservation Program](#) working in New Guinea to protect the wild populations.

[Okaptoberfest](#)—This weekend long event helped raise awareness about one of the Congo's most endangered residents, the okapi. Proceeds from the sale of food items and buttons went to the Okapi Conservation Project operating out of Epu-lu in the DRC.

[Cheetah Awareness Weekend](#)—SFAAZK sold t-shirts during this awareness event to raise funds for the Zoo Miami Cheetah Fund and the [Anatolian Guard Dog Project at Cheetah Outreach](#) in South Africa that are working to protect wild populations of cheetah.



Fundraisers:

[Savage Art Show](#)—This animal made gallery show takes place in Miami's trendy Art District. Sales of the pieces support Zoo Miami's Conservation and Research Department's programs and contributions were made to [Niños y Criás](#) working with wild flamingos in the Yucatan, the [Ruaha Carnivore Project](#) in Tanzania working to conserve large carnivores in the region, and the [Orangutan Foundation International](#) working to preserve orang habitat and raise orphaned ones for release.

[Pies For Panthera](#)—This event gives staff a chance to bid on throwing a pie in the face of senior managers at the zoo to raise money in a fun way. Proceeds go to the [Tiger Conservation Campaign](#) working to preserve tigers throughout their range in Asia.

[Bowling for Rhinos](#)—This annual event gives the public a chance to challenge a few friends at the lanes and have some pizza while raising funds to support rhino conservation organizations across Africa and Asia.



BioTECH at Richmond Heights

BioTECH is a public magnet high school with advanced level science and math curriculum focused on conservation biology. The school has a research station based at Zoo Miami that allows them easy access to the zoo property to conduct field studies. Below are some of the projects that the students concentrated on this past year.

Cuban Tree Frogs

BioTECH students are contributing to Zoo Miami's efforts to mitigate the impact of invasive Cuban treefrogs in South Florida. The students are testing different designs and placement in order to improve trapping efficacy.

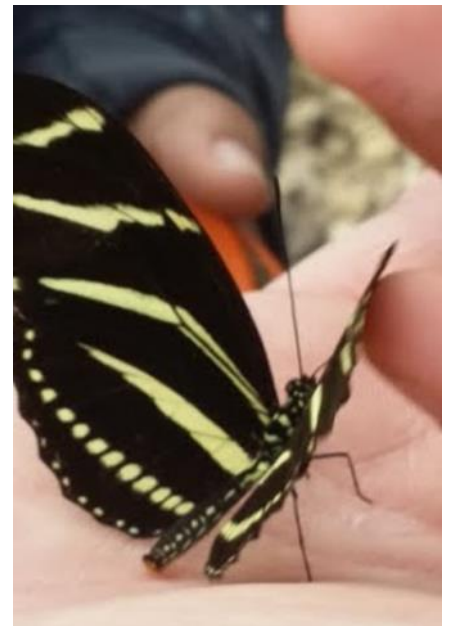


Aquatic Ecology

Zoo Miami is home to several lakes that provide refuge to native wildlife. In an effort to help us better understand how these lake ecosystems function, BioTECH students are examining spatio-temporal variability in lake water quality.

Butterfly Surveys

Our students are also hard at work examining the butterflies on Zoo Miami grounds – many of which are imperiled by loss of habitat and host plants.



Professional Contributions

Committees and Appointments:

Nicole Atteberry—Cyclura Steering Committee, Board Member of International Iguana Foundation

Jim Dunster - Blue Crane SSP Coordinator, Blue Crane Studbook Keeper, Turaco & Cuckoo TAG, Columbiformes TAG, Gruiformes TAG, Ciconiiformes TAG, Galliformes TAG

Dr. Gregory Koch—AZA Research and Technology Committee, Collaborator on Florida Coastal Everglades Long-Term Ecological Research program

Dr. Gwen Myers—Otter SSP Veterinary Advisor

Dr. Frank Ridgley—Everglades Cooperative Invasive Species Management Area Steering Committee, Florida Bonneted Bat Working Group, Imperiled Butterfly Working Group, FIU Courtesy Research Associate

Rachél Watkins Rogers - Biomaterials Banking Advisory Group, Institutional Data Management Advisory Group, Advisor to the Government Ownership Working Group, AZA Government Affairs Committee Member

Isabel Sanchez - Giant River Otter SSP Education Advisor

Dr. Steven Whitfield— Board of Governors for the American Society of Ichthyology and Herpetology, FIU Courtesy Research Associate

Scholarships:

Ron Magill presented the first annual Ron Magill Conservation Scholarship to Matt Hallett, a graduate student at the University of Florida Department of Wildlife, Ecology and Conservation.





Presentations:

Nicole Atteberry—“Captive *Cyclura* Reproduction: The Role of Zoos in Preserving the World’s Most Critically Endangered Lizards”; International Herpetological Symposium

Dr. Frank Ridgley—“Florida Bonneted Bat Acoustic Survey and History in the Richmond Tract”; Bat Conservation International Annual Meeting, “Zoo Miami Imperiled Butterfly Programs”; Imperiled Butterfly Working Group Annual Meeting

Dr. Steven Whitfield—“Enigmatic Survival Follows Enigmatic Decline: Conservation Ecology of Presumed Extinct Amphibians in Costa Rica”; American Society of Ichthyology and Herpetology Conference

Publications:

Dr. Yousuf Jafarey—“Medical Management of Leiomyomata and Suspected Endometriosis in an Allen’s Swamp Monkey (*Allenopithecus nigrovivividus*)”; Journal of Zoo and Wildlife Medicine: December 2015, “Presumptive Dysgerminoma in an Orange-Spot Freshwater Stringray (*Potamotrygon motoro*)”; Journal of Zoo and Wildlife Medicine: June 2015

Dr. Steven Whitfield—“Pesticides in Costa Rica: Can Agriculture and Ecotourism Safely Co-Exist?”; Save the Frogs Magazine: December 2015



Significant Births/Hatches

Births/Hatches

Harpy Eagle— Near Threatened

Arabian Oryx (4) - Vulnerable

Clouded Leopard—Vulnerable

Matschie's Tree Kangaroo—Endangered

Malayan Giant Pond Turtle—Endangered

Addax (3) - Critically Endangered

Grevy Zebra—Endangered

Addra Gazelle—Critically Endangered

Somali Wild Ass—Critically Endangered

Sumatran Tiger— Critically Endangered

Annam Leaf Turtles (7) - Critically Endangered



Acquisitions

Kagu—Endangered

Florida Panther - Endangered

Jamaican Iguana—Critically Endangered

In 2015, Zoo Miami contributed over \$440,000 towards field conservation and mission based research. The Conservation and Research Department was able to secure over \$135,000 through grants and fundraising for programs in 2015 with support from the Zoo Miami Foundation and SFAAZK. We greatly appreciate all of the support from the citizens of Miami-Dade County, our collaborators, and private donors who enable us to work towards our goals and accomplish our mission.



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CONSERVATION
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