



Invasive/Non-native Species Control Programs

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Conservation and Research
Department

Strengths

- Animal Behavior
- Animal Husbandry
- Natural History
- Species Identification
- Zoonotic disease
- Disease monitoring
- Biosecurity
- Outreach/Awareness/Education
 - Nearly 1,000,000 visitors a year

Sacred Ibis

- Partnered with USDA Wildlife Services
- First two captured allowed GPS satellite transmitter backpacks to be deployed
 - Discovered rookery site
- Captured a total of 33 through non-lethal means
 - Traps, pens, nets, sedation
- Surgically pinioned and placed in accredited institutions in North America with environmental impact agreements



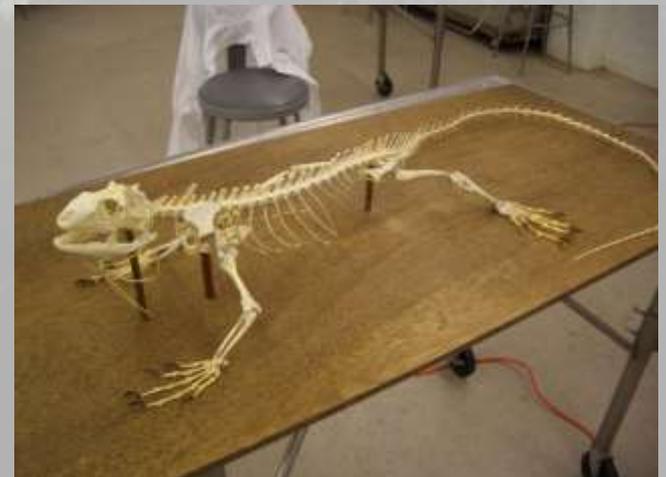
Green Iguanas

- Management decision to reduce population due to concerns of animal collection and public safety, food competition and consumption
- Utilized existing live traps
 - Used botanical collection blooms as bait in beginning but then developed effective non-bait techniques
 - Noose poles, hand grabbing, burrow funneling, chain-link fence snares
- Removed over 450
 - Less than a dozen resident now



Green Iguanas

- Endo and Ectoparasites
 - Discovery of Green Iguana Scale Mite (*Hirstiella stamii*)
- Gross necropsy on 100 individuals and full histopathology for disease screening on a sampling of 35 individuals
- Salmonella shedding and serotyping
- All carcasses given to veterinary school anatomy classes and researchers



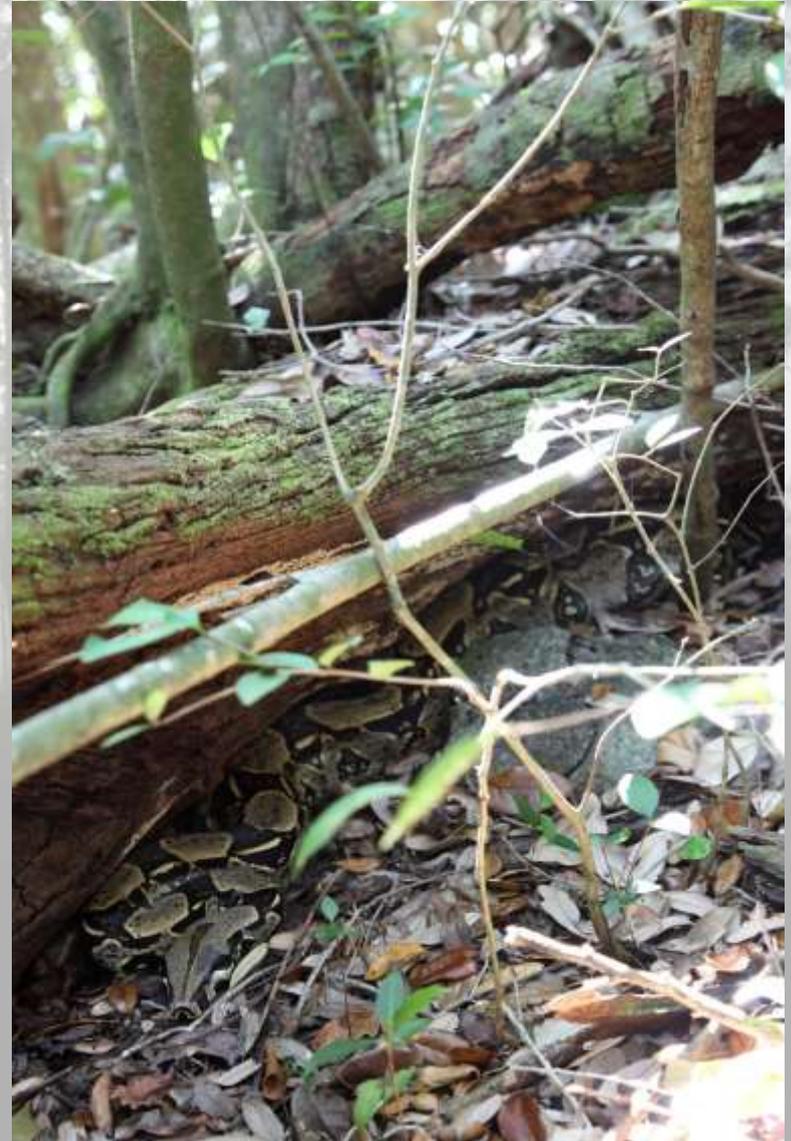
Boa Constrictors

- 169 removed from Deering Estate at Cutler since 1989 (some accounts back to 1970's)
- Lack of understanding of local environmental impact, population size, behavior in environment, origins, effective removal/survey techniques, respond to county resident concerns
- Radio-telemetry study began in fall of 2012
 - 2.2.2 sample of population



Boa Constrictors

- 12 removed since onset of program
 - Nov 1st, male with transmitter led us to breeding ball of 3.1 boas
 - Majority of time spent subterranean
 - Maintain territories
- Train staff on radiotelemetry techniques, snakes used on educational walks, FIU student workshops
- Genetic profiling of population with Florida Museum of Natural History
- Disease monitoring (gross pathology, histopathology, parasitology and virology)



Invasive Plant Control

- Zoo Miami funds \$60,000/year towards invasive plant management of globally imperiled pine rockland
 - Largest fragment outside ENP
 - 15 Federally endangered species
 - 110 State threatened/endangered
- Removed thousands of invasive plants in 2013 and replaced with over 30,000 native plants through FWC collaboration and grant
- Browse program for animal collection incorporates invasives on developed grounds and fundraising for suitable replacement species
- Multimillion dollar program with Honeywell to develop in-vessel composter to dispose of horticultural waste/invasive plants



Ongoing Control Programs

- Green Iguanas
- Cuban Knight Anoles
- Marine Toads
- Cuban Treefrogs
 - Eliminate risk to collection animals and reduce pressures on native species
- Australian pine, Brazilian pepper, Cane and elephant grass, Earleaf acacia, exotic ground orchids, cow-itch vine



Collaborative Programs

- Burmese and African Rock python surveys
- Argentine Black and White Tegu monitoring and removal efforts
- Oustalet's Chameleon surveys and telemetry
- EIRAMP routes – UF
- ECISMA workdays and steering committee
- Host annual FWC Amnesty Day and provide veterinary and support staff volunteers



Research Efforts

- Collaborative paper with Disney on Marine Toad and Cuban Treefrog being peer reviewed
- Upcoming paper on chameleons
- Grant given to FIU for invasive ant study effecting imperiled butterflies
- Grant and citizen science program developed with FIU on exotic ground orchid study
- Novel minimal herbicide application techniques for selective invasive plant control
- Several publications will come out of boa constrictor work



Services Provided

- Training on necropsy and surgical techniques to researchers
- Zoonotic disease and safe animal handling
- Outreach materials
- Permit review
- Veterinary services to multiple agencies, universities, and NGOs
- Invasive species educational exhibits and signage at Amazon and Beyond area and planned for new Florida: Mission Everglades exhibit (2015)



Future Plans

- Partnership with FIU to form a conservation and research center at Zoo Miami that will provide shared resources and collaborative initiatives for multiple agencies to address regional invasive species and conservation issues
- Desire to offer offices and shared space for government agencies, universities and NGOs to encourage cooperative programs

