

Overview of Introduced and Invasive Herpetofauna

*Heartland CISMA
Invasive Species Workshop*

Presentation Outline

- Defining invasive species
- Problems caused by invasive animals
- A framework for managing invasive animals
- Introduced and invasive vertebrates in FL
- Management priorities for herpetofauna
- Helpful resources

Invasive Species

Invasives are species, including their seeds, eggs, spores, or other biological material capable of propagating the species, that are not native to the ecosystem in which they are found (*human mediated movement implied*); and whose introduction *does or is likely to cause environmental or economic harm, or negatively impact human health or quality of life.*

National Invasive Species Council

<http://www.invasivespecies.gov/>

Problems Caused by Invasive Animals

- Ecological
 - Pathogens and disease
 - Predation
 - Competition
 - Major habitat modification
 - Hybridization
- Economical
 - Damage
 - Control
- Quality of life
 - Nuisance
 - Disease vectors



Managing Invasive Vertebrates in Natural Areas

- Set priorities and realistic objectives
 - Focal species to target, what to accomplish
- Include invasive verts in annual planning
 - Make a commitment to monitor and manage
- Use a variety of methods
 - Management strategies are species specific
- Be persistent
 - Long-term management is required
- Ask for help
 - Resources are available

Introduced Vertebrates in Florida

- Birds: ~200 species documented in the state
 - About 15 established and breeding species
- Mammals: ~30 species documented
 - About 15 established and breeding species
- Amphibians: ~10 species documented
 - Three established and breeding species
- Reptiles: ~120 species documented
 - About 60 established and breeding species
- Freshwater Fish: ~160 species documented
 - About 45 established and breeding species



Data from FWC website, FLMNH, pers. observations, colleagues



Invasive Reptiles in Florida

Common Name	Scientific Name	EnvD	EconD	HQL	INA
Burmese Python	<i>Python molurus</i>	Y	Y	Y	Y
African Rock Python	<i>Python sebae</i>	Y	Y	Y	Y
Common Boa	<i>Boa constrictor</i>	N	N	N	N*
African Spurred Tortoise	<i>Geochelone sulcata</i>	?	N	N	Y
Red-eared Slider	<i>Trachemys scripta</i>	Y	N	N	Y
Spectacled Caiman	<i>Caiman crocodilus</i>	Y	N	N	Y
Nile Monitor	<i>Varanus niloticus</i>	Y	Y	Y	Y
Tegu Lizards	<i>Tupinambis sp</i>	Y	Y	N	Y
Brown Anole	<i>Anolis sagrei</i>	Y	N	N	N*
Knight Anole	<i>Anolis equestris</i>	Y	N	N	Y
Green Iguana	<i>Iguana iguana</i>	Y	Y	Y	Y
Spiny Iguanas	<i>Ctenosaura sp.</i>	Y	Y	Y	Y
Ameraffrican Gecko	<i>Hemidactylus mabouia</i>	?	N	N	Y

N* = species that may penetrate natural areas to some degree at the urban/wildlife interface

Subset of established (breeding) species of reptiles—FWC

Invasive Reptiles in Florida

- Large Constrictors (Pythons, Anacondas)
 - South & Central Florida, predators of native verts including imperiled species
 - Hand capture, trap, Judas snakes, sniffer dogs
 - Resources (*P. molurus*): identification, biology, management
 - REDDy Program (more on this later)
 - TNC 'Python Patrol' training
 - <http://www.nps.gov/ever/naturescience/burmesepythonresearch.htm>
 - <http://nas.er.usgs.gov/queries/factsheet.aspx?SpeciesID=2552>
 - <http://edis.ifas.ufl.edu/uw286>



Invasive Reptiles in Florida

- African Spurred Tortoise

- Statewide, may compete with Gopher Tortoises?
- Hand capture, educate
- Resources: identification, biology, management

Google 'Spurred Tortoise' or 'Sulcata Tortoise'

Contact FWC for help placing a tortoise—Pet Amnesty Program

http://www.myfwc.com/WILDLIFEHABITATS/Nonnative_AmnestyDayEvents.htm



Invasive Reptiles in Florida

- Red-eared Slider

- Statewide (aquatic), hybridizes with native sliders, potentially compete with native turtles
- Hand capture, trap, shoot, educate
- Resources: identification, biology, management

http://myfwc.com/docs/WildlifeHabitats/Red_earedsliderbioprofile.pdf

<http://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=1261>



Invasive Reptiles in Florida

- Nile Monitor

- Homestead & Cape Coral, predators of native vertebrates including imperiled species, invade burrows
- Trap, shoot, get help
- Resources: identification, biology, management

REDDy Program (more on this later)

http://myfwc.com/wildlifehabitats/Nonnative_NileMonitor.htm

<http://myfwc.com/docs/WildlifeHabitats/Nilemonitorbioprofile.pdf>

<http://www.capecoral.net/Portals/0/docs/Public%20Works/Nile%20monitor%20Obrochure.pdf>



Invasive Reptiles in Florida

- Tegu Lizards

- South & Central Florida, predators of native verts, invade burrows (impacts on Gopher Tortoises?)
- Trap, shoot, get help
- Resources: identification, biology, management
REDDy Program (more on this later)

<http://www.evergladescisma.org/AnimalIDDeckLoRes.pdf>

<http://edis.ifas.ufl.edu/pdf/files/UW/UW33600.pdf>



Invasive Reptiles in Florida

- Iguanas

- Central and Southern Florida, predators of native verts including imperiled species, spread seeds of invasive plants, consume native plants, invade burrows
- Trap, noose, shoot, artificial nest boxes, get help
- Resources: identification, biology, management

REDDy Program (more on this later)

http://www.flmnh.ufl.edu/herpetology/kk/pdf/2007_Krysko_et_%20al-Iguana_iguana.pdf

<http://edis.ifas.ufl.edu/in528>



Introduced Amphibians in Florida

Common Name	Scientific Name	EnvD	EconD	HQL	INA
Cuban Treefrog	<i>Osteopilus septentrionalis</i>	Y	Y	Y	Y
Cane/Marine Toad	<i>Rhinella marina (Bufo)</i> <i>Eleutherodactylus</i>	Y	Y	Y	N*
Greenhouse Frog	<i>planirostris</i>	?	N	N	Y

N* = species that may penetrate natural areas to some degree at the urban/wildlife interface

Established (breeding) species of amphibians—FWC

Invasive Amphibians in Florida

- Cane Toad (aka Giant or Bufo Toad)
 - South and Central Florida, predators of native verts, poison glands
 - Hand capture, trap, remove eggs from breeding ponds
 - Resources: identification, biology, management

http://myfwc.com/wildlifehabitats/Nonnative_GiantToad.htm

http://www.wec.ufl.edu/extension/wildlife_info/frogstoads/bufo_marinus.php

<http://ufwildlife.ifas.ufl.edu/canetoad.shtml>



Invasive Amphibians in Florida

- Cuban Treefrog

- Peninsular Florida, predators of native verts (esp. treefrogs) and inverts, competitors with native frog larvae, noxious skin secretions
- Hand capture, trap in PVC, remove breeding opportunities
- Resources: identification, biology, management

http://ufwildlife.ifas.ufl.edu/cuban_treefrog_inFL.shtml

<http://edis.ifas.ufl.edu/uw259>

<http://edis.ifas.ufl.edu/uw308>



Resources—Get REDDy

- Join a growing statewide EDRR network
- More a bit later from Monica McGarrity



REDDy

**Introduced Reptile
Early Detection
& Documentation**



Additional Resources

- USDA Wildlife Services
www.aphis.usda.gov/wildlife_damage/
Gainesville: 352-375-2229
- FWC
http://myfwc.com/wildlifehabitats/Nonnative_index.htm
- University of Florida EDIS
<http://edis.ifas.ufl.edu/>
- National Invasive Species Information Center
www.invasivespeciesinfo.gov/
- Florida CISMAs
www.floridainvasives.org/cismas.html
- EDDMapS
<http://www.eddmaps.org/>

Additional Resources



- Berryman Institute www.berrymaninstitute.org
 - *Managing Wild Pigs*
 - www.berrymaninstitute.org/pdf/managing-feral-pigs.pdf
 - *Human-Wildlife Interactions (Conflicts)*
www.berrymaninstitute.org/journal/index.html
- More scientific journals, books
 - Biological Invasions, Biological Conservation*
 - Strangers in Paradise*, Simberloff et al. 1997
 - Encyclopedia of Biol. Invasions*, Simblerloff & Rejmanek 2011
 - Invasive Species Management*, Clout & Williams 2009
 - Invasion Ecology*, Lockwood et al. 2007