# INVASI

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# ON!

Burmese python

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## FLORIDA IS NOW HOME TO MORE INVASIVE AMPHIBIANS AND REPTILES THAN ANY PLACE ON EARTH

**The invasion began innocently enough in the late 1800s. Greenhouse frogs stowed away on cargo ships headed from the West Indies to Florida around 1863. In 1887, a lizard called the brown anole used the same tactic to reach the state from Cuba, and has since become one of the most widespread and easily recognized reptiles in Florida.**

Over the years, more frogs, salamanders, newts and turtles followed, usually as stowaways on cargo ships. By the time anyone was paying attention, these immigrants to our shores were already well established.

In the 1970s, humans made the situation worse, importing exotic amphibians and reptiles to meet the demands of a booming pet trade. With iguanas making their way onto front porches and gigantic snakes stopping traffic, the problem started getting some attention, but it was too late.

Today, Florida has 137 non-native amphibian and reptile species, more than anywhere else in the world, according to a study by University of Florida researchers who have spent 20 years documenting the problem. The pet trade is accountable for 84 percent of the unwanted species' introductions.

"It's like some mad scientist has thrown these species together from all around the world," says Kenneth Krysko, herpetology collection manager at the Florida Museum of Natural History and lead author on the study, which was published in the journal *Zootaxa* in September. "It could take decades before we actually know the long-term effects these species will have."

With multiple, large ports of entry and a mobile population that includes tens of millions of international tourists annually, Florida is an invasive magnet. For years, non-native amphibians and reptiles garnered far less attention than crop-destroying insects and mammals. But with news reports of giant pythons threatening young children and swallowing alligators whole, government officials took note.

**"We don't know what's going to happen with the hundreds of species that don't belong here from different continents that we're just dumping into this new environment. It's not fair to the native species, for one thing, and we don't know what kind of long-term effect it's going to have on the environment and humans."**

**— Kenneth Krysko**

Florida outlawed ownership of seven large snakes as pets in 2010. Pet owners were allowed to keep large snakes obtained prior to July 1, 2010, provided they pay a $100 annual permit and implant a microchip in the animals.

In January 2012 the U.S. Fish and Wildlife Service banned importation of four species of pythons — the Burmese, Indian, Northern and Southern African — and the yellow anaconda, an action officials admit should have been taken sooner since thousands of snakes are already in the country, many of them in the Everglades.

"There is a large and growing understanding of the real and immediate threat that the Burmese python and other invasive snakes pose to the Everglades and other ecosystems in the United States," U.S. Secretary of the Interior Ken Salazar said in announcing the ban. "The Burmese python has already gained a foothold in the Florida Everglades, and we must do all we can to battle its spread and to prevent further human contributions of invasive snakes that cause economic and environmental damage."

Native to Southeast Asia and first sighted in the Everglades in 1979, Burmese pythons are some of the deadliest and most competitive predators in the area, with population estimates ranging from the thousands to hundreds of thousands. Known to consume birds, adult deer, alligators and other large prey, scientists fear the snakes' spread north into the peninsula and south into the Florida Keys.

"People might argue the ultimate boundaries, but there's no part of this state that you can point at and say that pythons couldn't live here," says Frank Mazzotti, an associate professor of wildlife ecology in UF's Institute of Food and Agricultural Sciences who has worked on python eradication since 2005. "We really need to be addressing the spread of these pythons. They're capable of surviving anywhere in Florida, they're capable of incredible movement — and in a relatively short period."

Mazzotti and colleague Michael R. Rochford of UF's Fort Lauderdale Research and Education Center contributed to a study published in the *Proceedings of the National Academy of Sciences* in January 2012 that found declines of more than 90 percent in the populations of a wide variety of small animals — including raccoons, opossum, bobcats and rabbits — in areas of the Everglades known to harbor Burmese pythons.

Because of their predation on protected species, scientists have researched Burmese pythons more extensively than other non-native species. But Krysko says he gives the same treatment to all non-native amphibians and reptiles he encounters in the wild: catch and remove them, and study them later.

"As ecologists, we simply just can't ignore the problem," he says. "Every non-native animal that we see out there, we have to remove."

Krysko is an expert on invasive or amphibian and reptile species, collectively known as "herps." While researchers say they are unsure of their future ecological impact, Krysko says he knows it can't be good.

"We don't know what's going to happen with the hundreds of species that don't belong here from different continents that we're just dumping into this new environment," he says. "It's not fair to the native species, for one thing, and we don't know what kind of long-term effect it's going to have on the environment and humans — we have no idea what we're getting ourselves into and to turn a blind eye to it is just unacceptable."

His study documented introduction pathways of non-native herps from 1863 through 2010, with 25 percent of the known species traced to a single animal importer. Other pathways include biological control, in which an animal was intentionally released to control a

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*Kenneth Krysko wrangles a Burmese python in the Everglades.*

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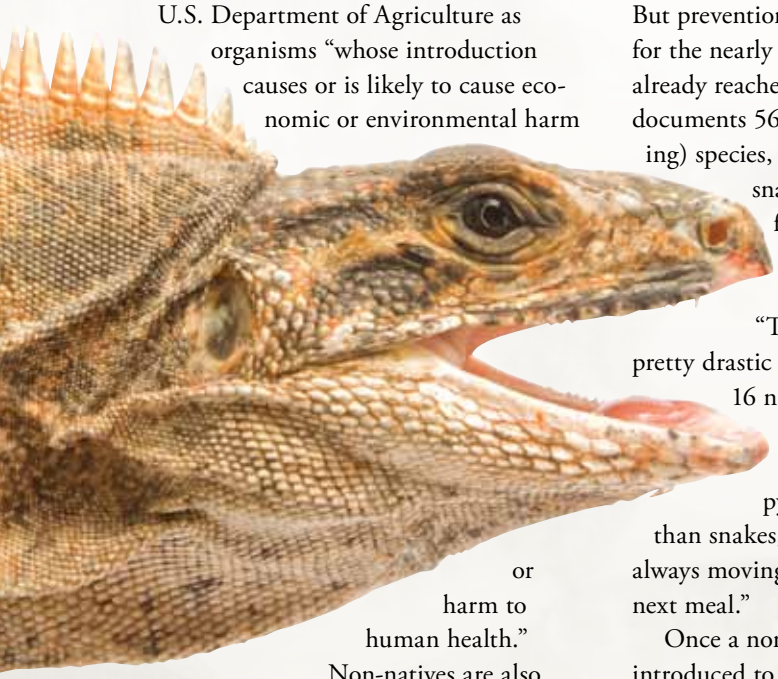
*Cuban tree frog*

pest species, and accidental introduction through the zoo or plant trade.

In 2011 alone, Krysko discovered at least seven additional newly introduced species. At this rate, there's no question that Florida's approach to the problem needs to be reevaluated.

"If the present trends continue, it's likely that we will have more non-native species in Florida than we do native species," Krysko says. "It's really difficult to comprehend, but it will happen if attitudes do not change."

Invasive species are defined by the U.S. Department of Agriculture as organisms "whose introduction causes or is likely to cause economic or environmental harm or harm to human health."



*Spiny tailed iguana*

Non-natives are also considered invasive if they become widespread.

"Most people in Florida don't realize when they see an animal if it's native or non-native and, unfortunately, quite a few of them don't belong here and can cause harm," Krysko says. "No other area in the world has a problem like we do, and today's laws simply cannot be enforced to stop current trends."

The Florida Fish and Wildlife Conservation Commission is responsible for regulating the state's non-native or exotic animals and while Florida law prohibits release of any non-native animal without a permit, an offender must be caught in the act of releasing an animal in order for disciplinary action to be taken. To date, no one in Florida has been prosecuted for the establishment of a non-native species.

"Obviously, since no one has been prosecuted … the law is more of a guidance document," says FWC exotic species coordinator Scott Hardin. "Regulations alone are never going to solve our problem."

The FWC takes a preventative approach to the state's invasive species problem by promoting educational outreach and responsible pet ownership. But prevention is no longer an option for the nearly 150 species that have already reached the state. Krysko's study documents 56 established (reproducing) species, including 43 lizards, five snakes, four turtles, three frogs and a caiman, a close relative of the American alligator.

"The invasion of lizards is pretty drastic considering we have only 16 native species," Krysko says. "Lizards can cause just as much damage as a python. They are quicker than snakes, can travel far, and are always moving around looking for the next meal."

Once a non-native species has been introduced to the state, the FWC will conduct a rapid assessment and attempt to eradicate it, Hardin says. But after the brief window for eradication has closed, officials revert to containment, hoping to prevent the animals from becoming widespread and established.

"The problem is that there are very few long-term studies that have looked at what the impacts [of non-native species] are, so from our perspective it's illegal, and it's illegal for a reason — because we would rather be cautious and not take chances," Hardin says.

While biologists may see every invasive species as having some effect on the environment, the FWC hopes to target animals that have the most negative impacts on native wildlife, habitat, the economy, and human health and safety.

*Jeff Gage*

*Brown Cuban anole*

"The statistics across the board suggest that it will be a minority of introduced species that are going to cause problems, and we have to determine what those are going to be and in what situations," Hardin says.

The Florida Museum of Natural History maintains a database with specimens and photographs of all known non-native amphibians and reptiles in Florida. Additionally, the FWC manages a separate database of all non-native species introductions, and citizens are encouraged to report any sightings by contacting the agency. The Nature Conservancy supports a call center with the FWC specifically for reporting sightings of Burmese pythons at 1-888-IVE-GOT-1.

"There are only so many of us that are professionally associated with this, so we really do have to rely on the public to get a head start on things," Hardin says.

While there are still many unanswered questions regarding how to gauge the impacts of different species, the FWC promotes its message of responsible pet ownership and holds an annual Pet Amnesty Day, in which pet owners may turn over their unwanted pets.

"The best thing to help the python problem is for pet owners to be

responsible," says Mazzotti, who credits Florida for creating a Pet Amnesty Day. "I'd love to see it be even more than once a year. Maybe someday it will be all year."

Given the present situation, citizens must be made aware of the invasive herp problem in Florida, Krysko says. And pet owners must educate themselves before buying a pet: know what the animal eats, its size as an adult, how to keep it in a proper enclosure and how long it lives.

Invasive species are recognized as one of the most significant environmental and ecological problems the world faces today, and ignoring the issue as more transplanted animals reproduce in foreign areas is a problem for scientists and residents alike, Krysko says.

"We have to stop this trend of pumping more and more non-native species in every year — laws need to be modified and enforced immediately," Krysko says. "You can only allow this to go on for so long before something really drastic happens. And maybe we already have that species here, maybe we don't – we just don't know."

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**Related websites:**
http://www.flmnh.ufl.edu/herpetology/kk/kkresearch.htm
http://crocdoc.ifas.ufl.edu/

Scan the QR code with your smartphone to see video about this research.

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