



Invasive Burmese python in the Greater Everglades. Photograph credit: Brian Smith, USGS

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Grappling with Pythons in Florida

By Elizabeth Ashton

In 2003, wildlife scientists carrying out regular nighttime road surveys in Everglades National Park started to see fewer medium-sized mammals. Over the next few years, rabbits disappeared completely, and populations of foxes, raccoons, possums, bobcats, and white-tailed deer were either small or absent.

To discover what happened, electronic tracking devices were attached to a new population of rabbits. The rabbits were released into the park, and their movements were checked, at a minimum, every 2 days for 11 months.

After 11 months, 80 percent of the tracked rabbits were in the stomachs of Burmese pythons, and all the rabbits disappeared after 1 year.

The Everglades is an international treasure that attracts more than 1 million visitors each year from around the world, but it is under siege by damaging, nonnative plants and animals. Major environmental and economic consequences are likely to follow.



An American alligator and a Burmese python locked in a struggle to prevail in Everglades National Park. This python appears to be losing, but snakes in similar situations have apparently escaped unharmed, and in other situations pythons have eaten alligators. Photograph credit: Lori Oberhofer, National Park Service

Pythons Established in the Park

Burmese pythons were imported into the United States for decades, but until the 1990s, only a few were sighted in the Everglades. Wildlife scientists thought they were dumped by discouraged pet owners and didn't worry. The 20-inch hatchlings people bought in pet stores grew to 7 feet long after a year and grew to 15 feet in 4 or 5 years.

The total number of pythons in the Everglades is hard to estimate because they are difficult to find. Pythons possess excellent camouflage and are ambush predators, lying in wait to strike until prey cross their path. Scientists estimate that every snake sighted indicates 100 more in the wild. Additionally, pythons—like lions—are apex predators with few natural enemies to limit their numbers.

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established in the park. In 2006, U.S. Geological Survey (USGS) scientists joined a team of experts from universities, Federal agencies, State agencies, and others who were addressing the problem. By 2007, Burmese pythons had been sighted in the Florida Keys and were moving north—by 2012, road surveys showed that pythons had probably altered the food web of the Everglades.

Local, State, and Federal agencies in Florida asked volunteers and citizen scientists to help raise awareness about invasive species and remove pythons from the Everglades, but these efforts eliminated few snakes. Other short-term methods used included detector dogs, drift fences, camera traps, and sending electronically tagged female snakes (Judah snakes) into the wild and then killing them and their partners at breeding time. None of these significantly reduced the population.



A Burmese python slithering in the grass in the Everglades. Photograph credit: Emma Hanslowe, USGS

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Researchers implant a radio transmitter in a 16-foot, 155-pound female Burmese python at the South Florida Research Center, Everglades National Park. Photograph credit: Lori Oberhofer, National Park Service

Controlling the Species and Managing Resources

“Once USGS scientists were brought in, they showed us that eradication was impossible at that point,” said Rolf Olson, project leader at the Arthur R. Marshall Loxahatchee National Wildlife Refuge of the U.S. Fish and Wildlife Service. “The USGS helped us create several strategies to control the species and effectively manage our time and resources, with a specific focus on Early Detection and Rapid Response [EDRR].”

EDRR helps slow the expansion of damaging nonnative animals and makes eradication more likely when used early in the invasion. Response strategies are tailored to each species. Python presence or absence is determined using environmental DNA (eDNA) that detects DNA from shed skin cells in water samples. If the samples from an area are negative, control efforts and money move elsewhere, making the process very cost effective.

“Science-informed wildlife management is our primary goal, and USGS scientists have provided research to address this goal,” said Kristen Sommers, head of the

Wildlife Impact Management section of the Florida Fish and Wildlife Conservation Commission headquartered in Tallahassee, Florida. “The USGS helps develop science for all invasive species,” added Tylan Dean, Biological Resources Branch chief of Everglades National Park and Dry Tortugas National Park. “Their information is very useful and can help answer our questions. It’s a great partnership.”



USGS researchers handle a Burmese python in the Everglades. Credit: USGS