

Program Name: USGS SESC PYTHON SCIENCE

Project Name: Environmental DNA (eDNA) detection of five invasive giant constrictor snakes in Florida, USA

Project ID: USGS PYTHON SCIENCE (Gen.Pmb.003)

Lead Agency: U.S. Geological Survey

Strategic Plan Goal(s) Addressed:

2. Eradicate Invasive Exotic Species by Implementing Early Detection and Rapid Response
3. Contain the spread of invasive exotic species
4. Reduce the populations of widely established invasive exotic species and maintain at lowest feasible levels.

Measurable Output(s):

Published paper (still in preparation)

Project Synopsis:

Due to their cryptic coloration, secretive habits, and tendency to occupy largely inaccessible environments, invasive large constrictors in south Florida are almost impossible to detect using traditional tools (such as trapping or visual searching). A potentially informative method, environmental DNA (eDNA), uses water or soil samples to detect DNA that is shed into the environment via skin, excrement or other sources. To assist with detection efforts we developed species-specific quantitative PCR primers for the Burmese python, Northern African python, boa constrictor, and the yellow and green anaconda, and validated them using laboratory trials and field samples. In 21 locations, we detected Burmese python DNA in 20 of the 63 sampling events. These methods could assist with the detection of recently established, low density snakes species as well as determine the range limits of already established species. Environmental DNA could also assess and monitor the efficacy of control and eradication efforts.

Current Status:

Journal article in preparation/in revision

Project Schedule:

Start Date: Nov 2013 (laboratory and field trials began)

Finish Date: Ongoing (paper in preparation)

Detailed Project Budget Information

	2013	2014	2015	2016	2017	Balance to Complete	Total
Federal	\$25,000	\$120,000	\$100,000	\$100,000			\$345,000
SFWMD**							
Local							
Total	\$25,000	\$120,000		\$100,000			\$345,000

Contact:

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Hyperlink:

Link to the USGS website describing eDNA:

http://www.usgs.gov/ecosystems/genetics_genomics/edna.html

Pictures:

N/A

Map of area:

Map of study area with sample collection locations. Positive (black dots) and negative (white dots) sampled locations (N=21) are indicated. Some sample locations overlap due to the scale. BDB, Bird Drive Basin; DE, Deering Estates; ENP, Everglades National Park; HLWM, Holey Lands Wildlife Management Area; STA, Stormwater treatment area 5. Southwest Florida samples (SWFL) include three radiotagged Burmese pythons; SWP, Sweet Pea; NOS, Noosa; ELV, Elvis

