

Final Report
ACS Faculty Renewal Grant

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**Unique Opportunities for Undergraduate Research: Collaborative Research on Invasive
Burmese Pythons in Everglades National Park**

Date(s) of Project: 2008 and early 2009

Amount Awarded: \$4800

The goal of the proposed project is to provide unique opportunities for undergraduate students to become involved in original research examining the impacts of invasive Burmese pythons in Everglades National Park (ENP). The goal was met by involving 7 students in original research on the problem of invasive pythons in Florida. I took 5 students to Everglades National Park during 2008 and early 2009 to participate in various aspects of python research. Students assisted with radiotracking pythons within the park, surgeries to implant radiotransmitters, searching for pythons in the field and using road cruising, and in discussions of research plans. Students assisted with organizing and compiling data on the thermal biology of pythons that will be critical in evaluating their ability to spread northward. Two other students were able to participate in the research by conducting their own studies. David Millican conducted a study at Davidson College measuring characteristics of over 150 heads of captured pythons. Head measurements will be critical in determining how python size affects what prey the invasive can consume and thus, what impact the pythons will have on naturally occurring wildlife. David's research will likely be published in a herpetology journal such as *Copeia* or *Herpetologica*. Another student (Richard Bauer) spent 2.5 weeks at the Savannah River Ecology lab assisting with a project in which the goal is to evaluate the ability of invasive pythons to persist in areas north of South Florida. Richard conducted his own study while at SREL in which he evaluated the ability of volunteers to detect 10 pythons housed in a large, semi-natural enclosure outside. He will continue this research in the fall of 2009 and will write a paper describing factors affecting detectability in pythons. This paper will likely be published in either *Applied Herpetology* or the *Journal of Wildlife Management*. Richard's research is vital for evaluating

the effectiveness of the proposed “hunts” in Florida which some claim will rid Florida of invasive pythons.

I evaluated participating by students by discussing their experiences before they participated and afterwards. I surveyed students to determine what were the most beneficial aspects of their involvement in the research and modified subsequent experiences accordingly. This resulted in the opportunity of David and Richard to conduct their own research which provided them a vital connection to the overall issue and provided them motivation to get involved in a much greater degree than just serving as assistants. The biggest lesson learned was not to underestimate the ability of even first year undergraduate students to conduct meaningful research. You must be careful in the responsibilities that you give them, but often, the rewards far outweigh the risks.

This project provided a high-profile example of how to involve undergraduate students at Davidson in significant research that is not restricted to the Davidson campus and has major implications for conservation. Additionally, because of the high-profile nature of the issue, it generated considerable good public relations for the college. Because of the issues high-profile nature, I have had the opportunity to give talks at various other institutions and meetings that included discussions of undergraduate involvement in this project. These include:

Ecology of Invasive Burmese Pythons in Florida. Fifth Meeting of the Snake Ecologists Group, Donnelly, ID, July 2009.

The Problem of Invasive Pythons in the United States: What can be done? Annual Meeting of the Southeast Partners in Amphibian and Reptile Conservation, Montreat, NC, February 2009.

Anthropogenic impacts on amphibians and reptiles: the effects of urbanization, harvest and invasive species. Drexel University, January 2009.

Herps and humans: Detrimental impacts of humans on amphibians and reptiles. University of South Carolina Upstate, November 2008.

Anthropogenic impacts on reptile and amphibian populations. University of Georgia, October 2008

Effects of humans on amphibians and reptiles: urbanization, harvest, and invasive species. University of North Carolina Wilmington, September 2008

Dissemination also includes a website (www.bio.davidson.edu/dorcas) and eventual publications in peer-reviewed journals. Students that are currently involved (Richard and David) will continue to participate in the project over the next year or more. I will be seeking funding to further involve students in the various research projects related to this issue.

Please include a summary of your work that may be included on the ACS Faculty Renewal website.

The goal of this project was to provide unique opportunities for undergraduate students to become involved in original research examining the impacts of invasive Burmese pythons in Everglades National Park (ENP). Outcomes are expected to be student-directed projects and eventual publications examining aspects of the ecology of pythons in Everglades National Park and how that knowledge can contribute to mitigating their ecological impacts. Burmese pythons (*Python molurus bivittatus*), snakes that can reach over 6 m (20 ft), have been released as unwanted pets and have established a reproducing population in ENP and other parts of south Florida. Current estimates indicate a population size of more than 30,000 individuals and recent information indicates that this species could spread to cover much of the southern United States (Fig. 1).

Research is underway that will 1) determine the impact these snakes will have on the fragile Everglades ecosystems, 2) predict how far pythons will spread northward and through the Keys, and 3) develop methods for python control. I provided the unique opportunity for undergraduates to participate in and develop their own research projects as part of this overall issue. Involvement included interactions with colleagues from the University of Florida, the US Geological Survey, and the National Park Service. Numerous students participated in project and two students began studies of their own that will result in peer-reviewed publications. David Millican is investigating the effects of gape size on the ability of invasive pythons to eat various prey types to allow for better assessment of the impact the invasive snakes. Richard Bauer is investigating factors that affect humans' ability to detect pythons in the wild when searching for them and his research will provide information critical to determining the effectiveness of eradication efforts.

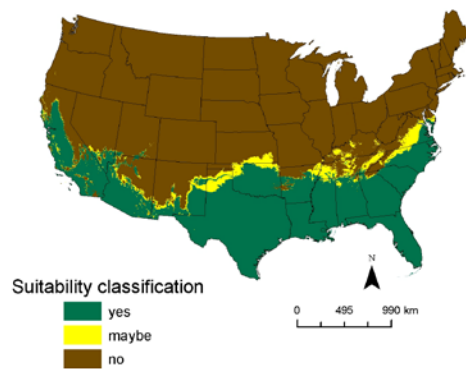


Figure 1. Potential range of Burmese pythons in the United States (Rodda and Reed, unpublished. data)