

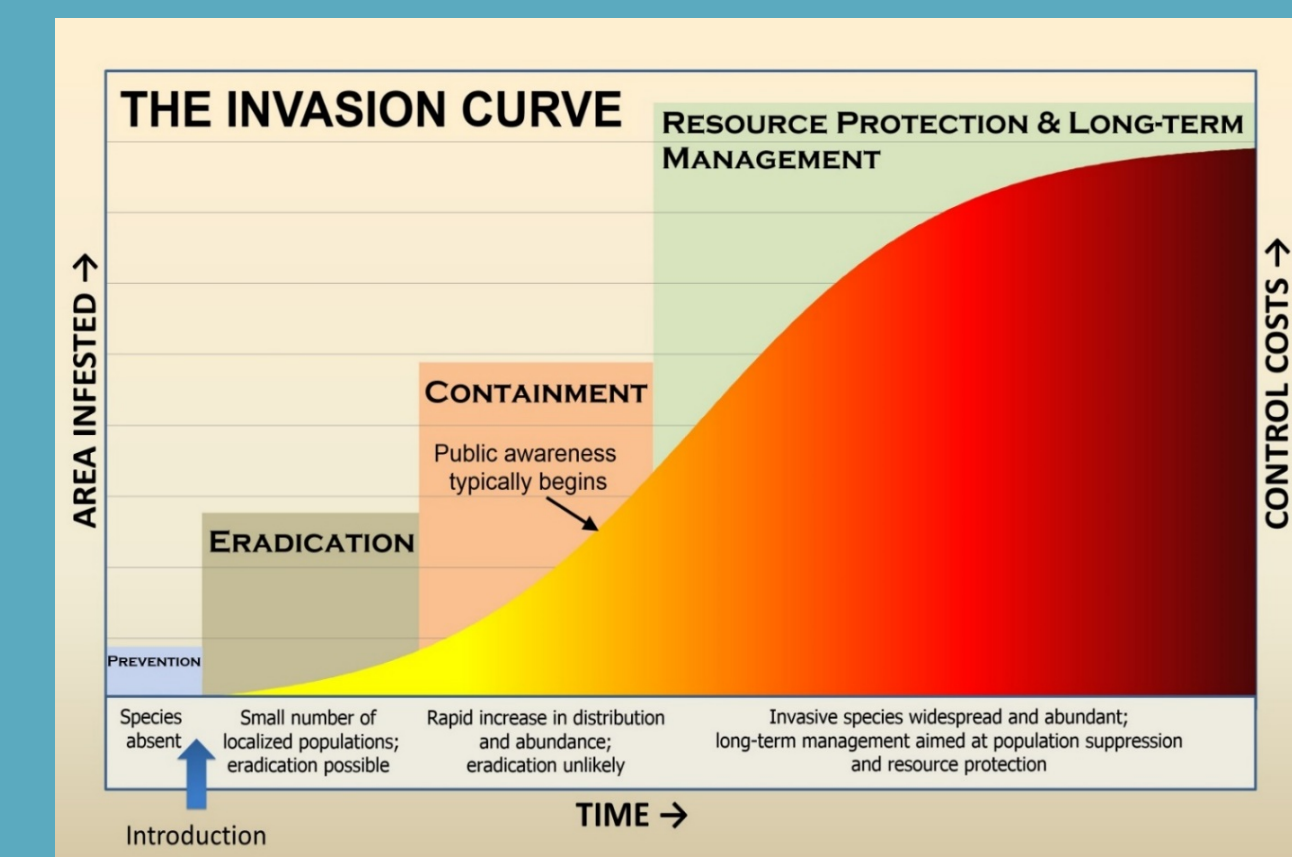
# Everglades Invasive Reptile & Amphibian Monitoring Program (EIRAMP)

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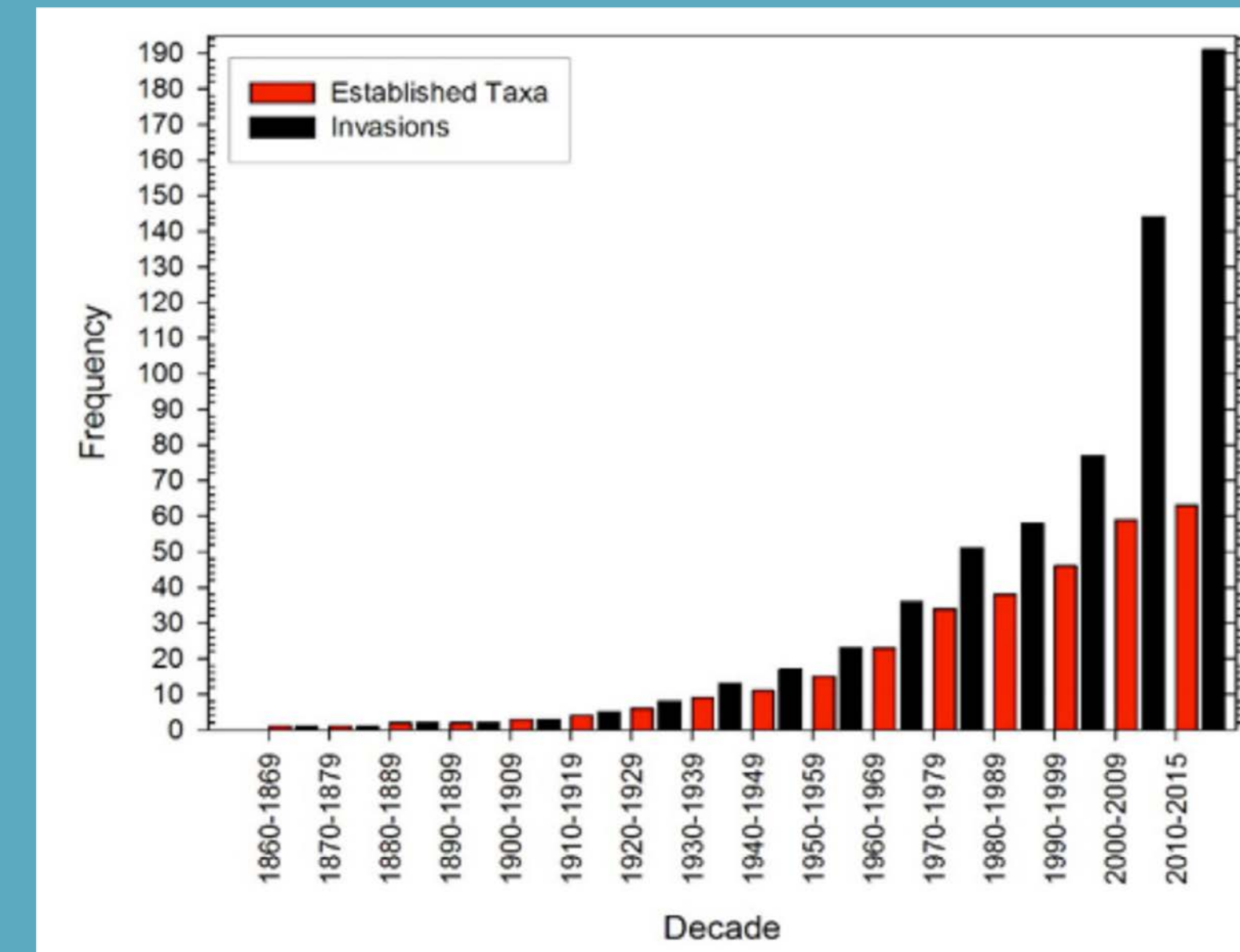
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## Introduction

South Florida has more nonnative species of reptiles and amphibians than anywhere else in the world. Based on addition of new species over the last 50 years, this trend shows no sign of slowing down.



Prevention and early detection and rapid response (EDRR) are the most cost-effective ways to limit impacts of invasive species. EIRAMP provides a scientific framework for integrated EDRR, outreach, and monitoring for invasive reptiles and amphibians in southern Florida.



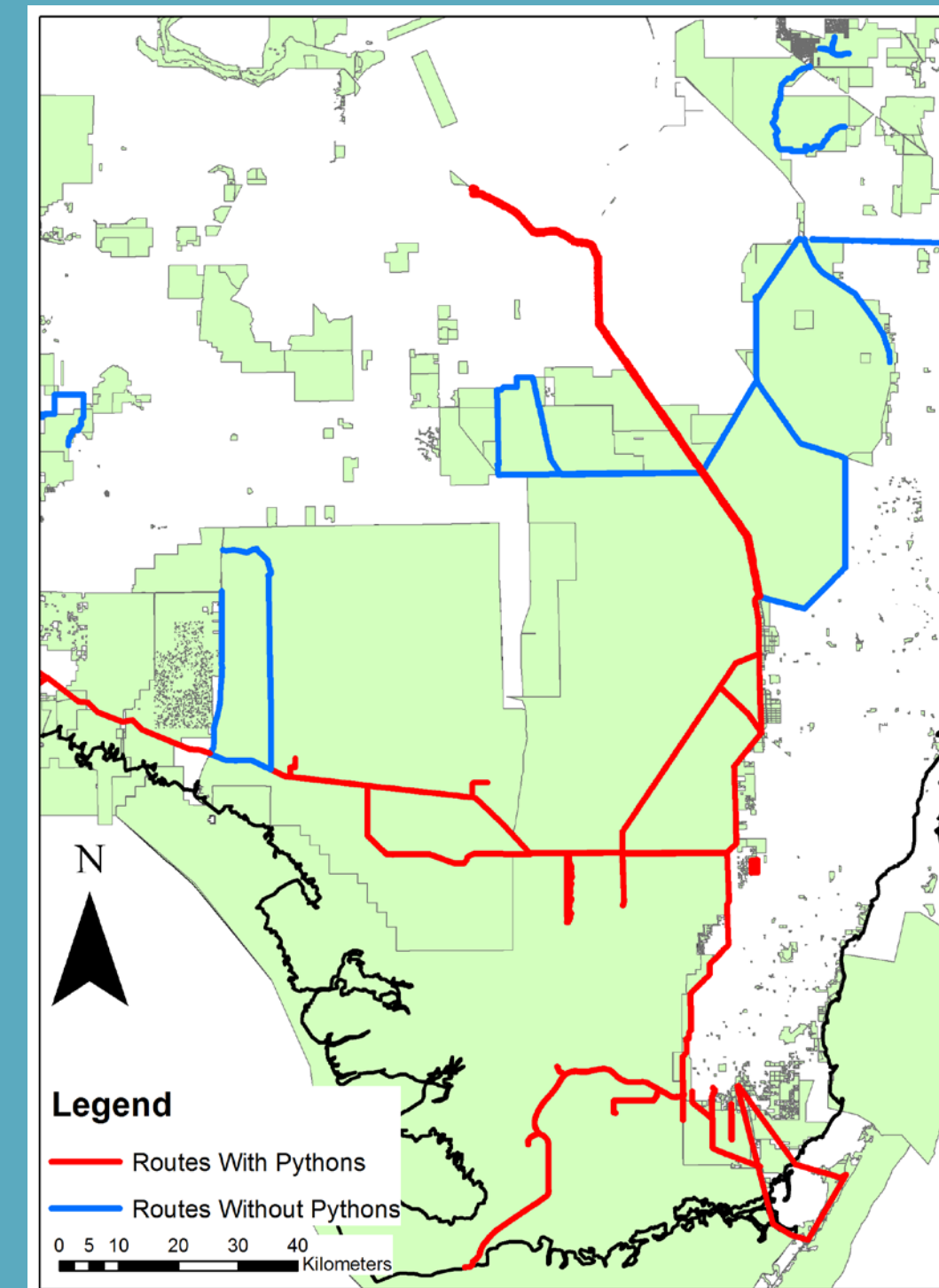
Accumulation curves for the total number of independent introductions of amphibian and reptile taxa and established taxa for each decade from 1860-2015 (Krysko et al. 2016)

## Objectives

- Determine occurrence, status, and spread of nonnative reptiles & amphibians
- Provide EDRR and containment capability for removal of nonnative reptiles & amphibians
- Evaluate native wildlife populations
- Synthesize results in an adaptive management framework



Interagency team removal of Nile crocodile led by UF biologists (EDRR)



Map of EIRAMP Survey routes

## Results

### Early Detection and Rapid Response:

Responded to reports of introductions and established species in new locations:

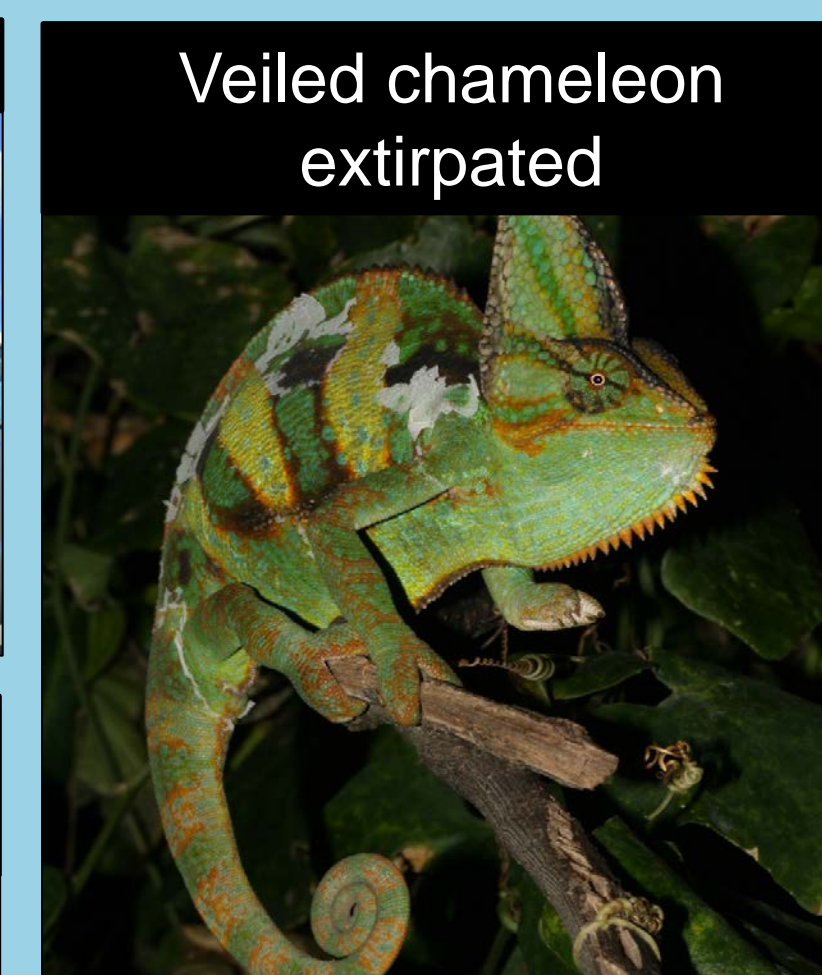
- Removed Nile crocodile from Miami-Dade County
- Found and extirpated panther chameleons from a natural area in Broward County and veiled chameleons near A.R.M. Loxahatchee N.W.R.



Python hidden in vegetation

### Improving Detection:

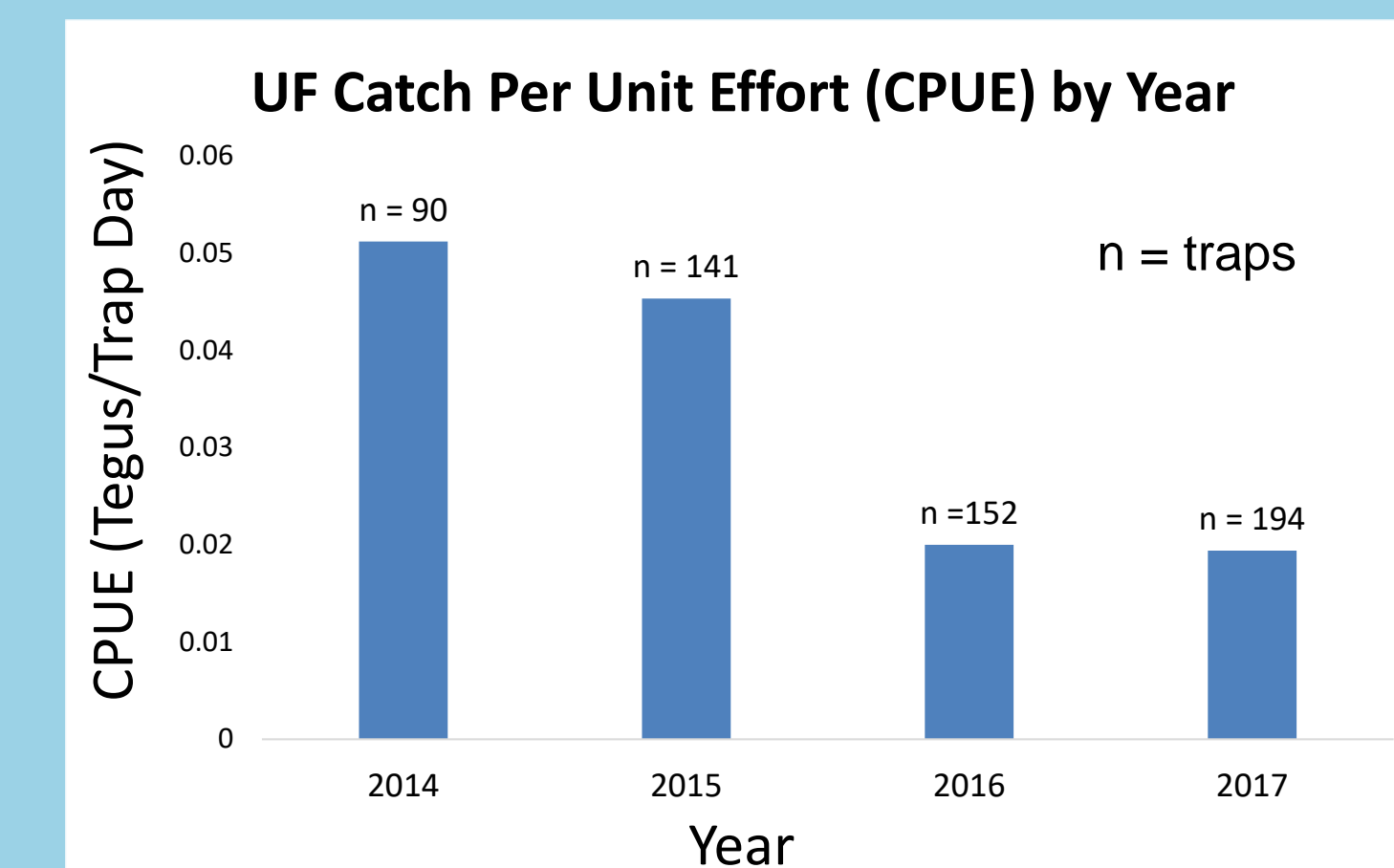
Finding Burmese pythons and northern African pythons is in itself the limiting factor for python removal. After 351 systematic and EDRR surveys, one northern African python was removed. With detection probabilities between 0.01 and 0.005, it would take between 300 and 600 surveys to know they are gone.



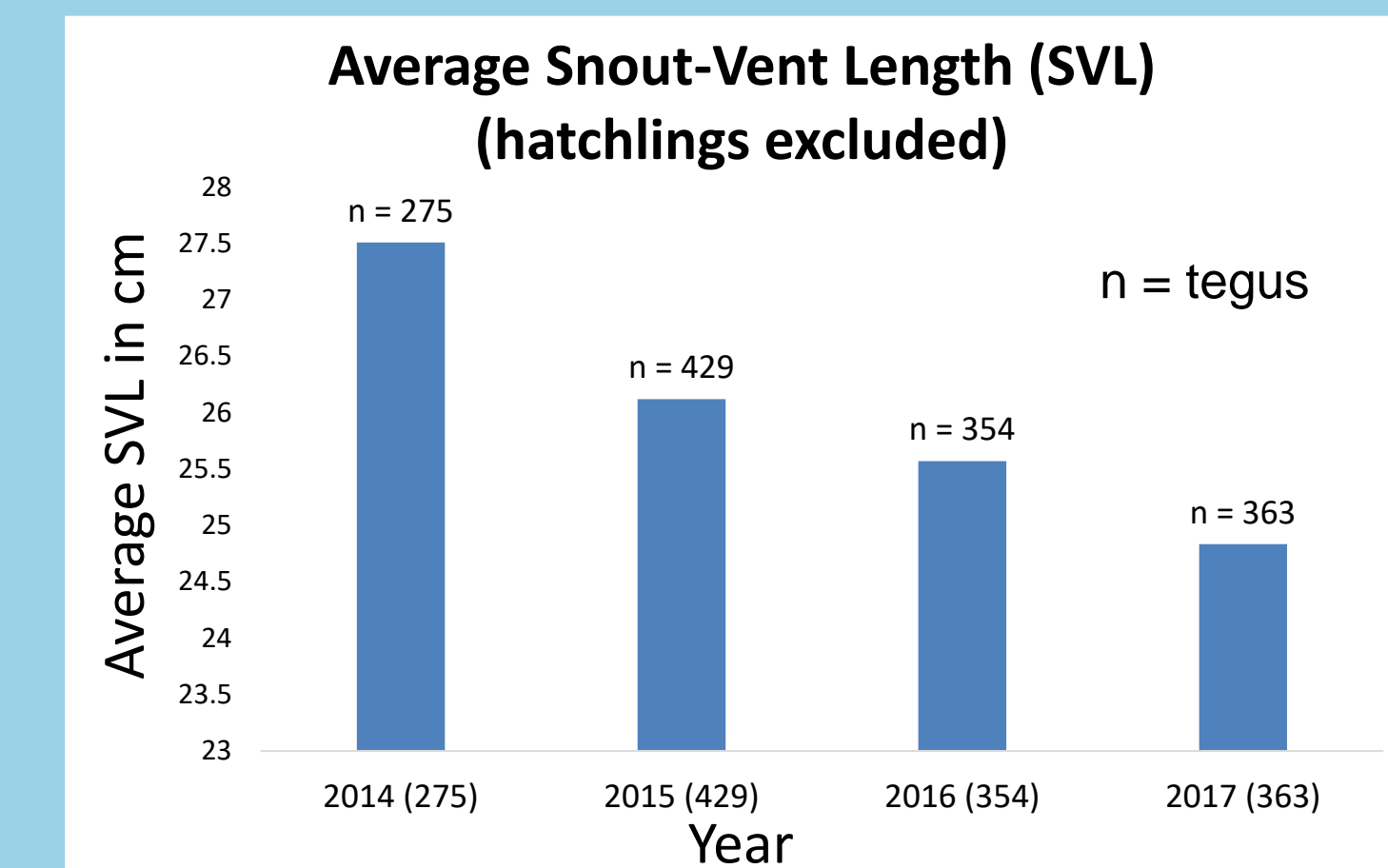
### Containment and Management

EIRAMP contributes to containment and long-term management stages of invasion curve by continually removing established species.

- More than 2,900 nonnative animals removed
- 1,781 necropsies of 14 species
- Sustained trapping efforts for Argentine black and white tegus resulted in a decrease in CPUE as well as SVL of non-hatchlings captured



CPUE for tegus decreased after sustained trapping efforts



Mean SVL of non-hatchling tegus decreased after sustained trapping efforts

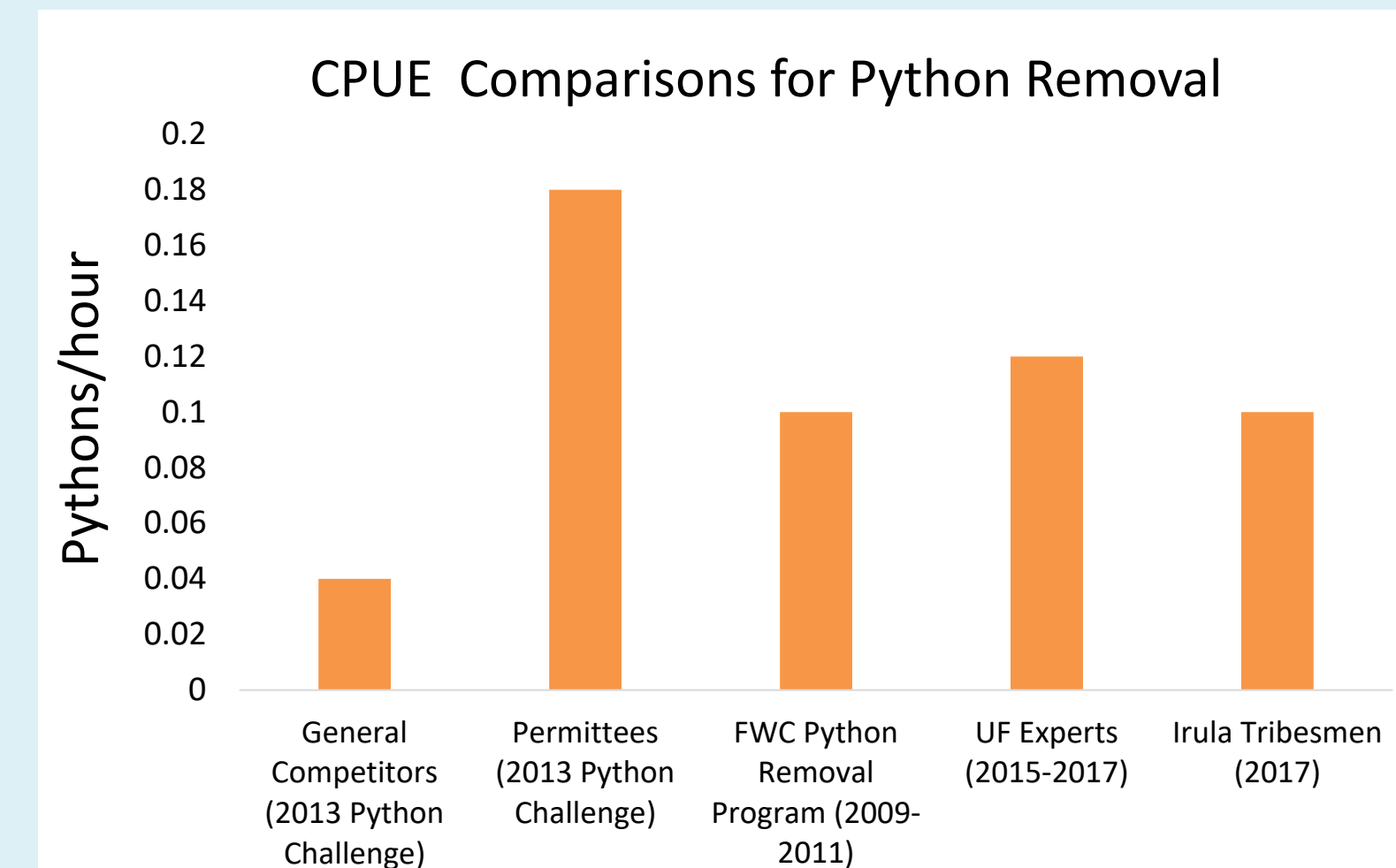
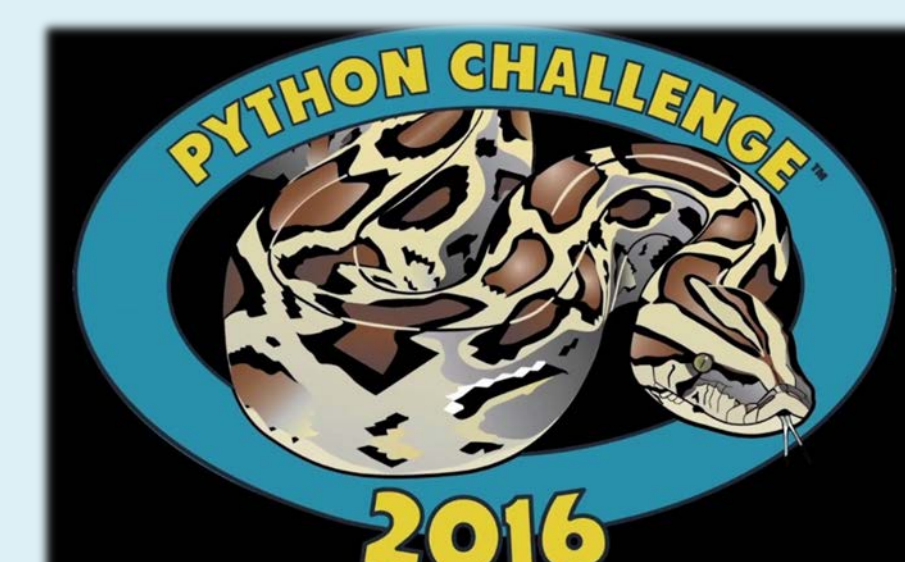
## Scientific Contributions and Management Lessons

### 2013 and 2016 Python Challenge™

- Demonstrated effectiveness of using expert reptile removers
- Demonstrated the value-added component of state, national, and international exposure to the problem with invasive species

### Impacts of Invasive Species

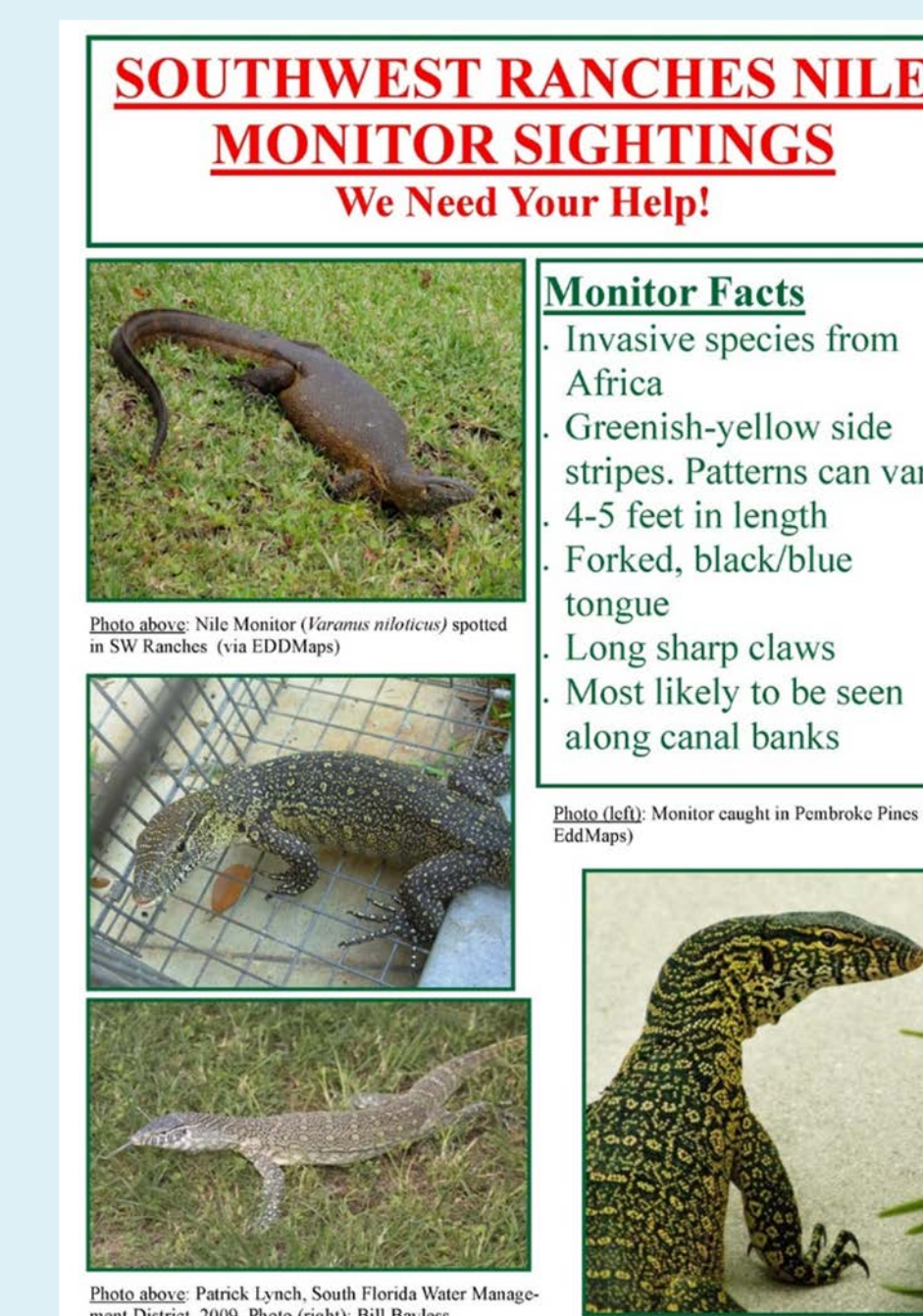
- Necropsies provided evidence of high fecundity (large number of eggs) of invasive reptile species
- Data on reproductive condition can be used to model population growth
- Tegus have been documented eating alligator and turtle eggs



Experienced permittees demonstrated their effectiveness at removing pythons during the 2013 Python Challenge.

**Professional Biologists:** Special skills are required to capture cryptic, elusive, and potentially dangerous wildlife, and to collect scientific data. Maintaining a core trained staff is essential to program success.

**Expert Reptile Removers:** Experts can be more effective at removing Burmese pythons at a lower cost than other python removal methods. This has a value-added component of invasive species education.



**Rapid and Persistent Response:** EDRR programs have to be persistent as well as rapid. Our success with a Nile crocodile and Nile monitors demonstrates the effectiveness of persistence.

**Targeted Outreach:** Engaging local residents and workers through targeted outreach can enhance EDRR programs in human-dominated landscapes.

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