Home range size and habitat use by the Eastern Indigo Snake (*Drymarchon couperi*) in South Florida: C- 44 Reservoir Site, Allapattah Flats, and Babcock Ranch

J.E. Herman[1], D.W. Ceilley[2], S.B. Jackson[1], S. Mortellaro[3], L. Nester[4], D. Dickinson[1], C.F. Houston[1], J. Webb[1], and E. Everham III[1]

[1]Florida Gulf Coast University, Fort Myers, FL
[2]Johnson Engineering, Inc., Fort Myers, FL
[3] US Fish and Wildlife Service
[4] Florida Fish and Wildlife Conservation Commission

Introduction:

The Eastern Indigo Snake (*Drymarchon couperi*) is listed as threatened under the U.S. Endangered Species Act of 1978. It is found from Southern Georgia throughout Florida but the preferred habitat for the species is now less than two percent of its original extent. Low population numbers and large territory sizes make it difficult to conduct standard field studies, such as mark-recapture. Because of this, there is a paucity of data on the basic life history of these snakes.

Most of our knowledge of Indigos is based on telemetry studies. These studies have been limited to populations in Georgia and North Florida and have shown that individual snakes require large home ranges with little overlap among individuals of the same sex. Recorded home range sizes were as large as 1,530 ha.

There has been no telemetry research conducted on South Florida populations. Due to climate and habitat differences between Georgia and South Florida the basic life history of South Florida Indigos is of interest to the overall conservation of this species. It has been suggested that Indigos in South Florida are more habitat generalists and may exhibit movement patterns different from snakes found farther north. A basic understanding of habitat use and behavior is vital to our understanding of the species and to the development of effective conservation plans tailored to Indigos in South Florida.

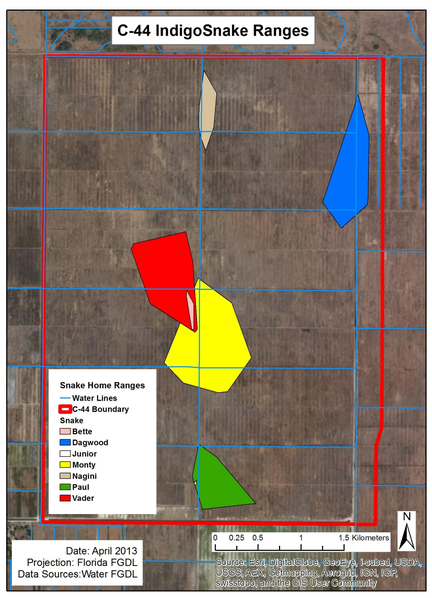
Research Objectives:

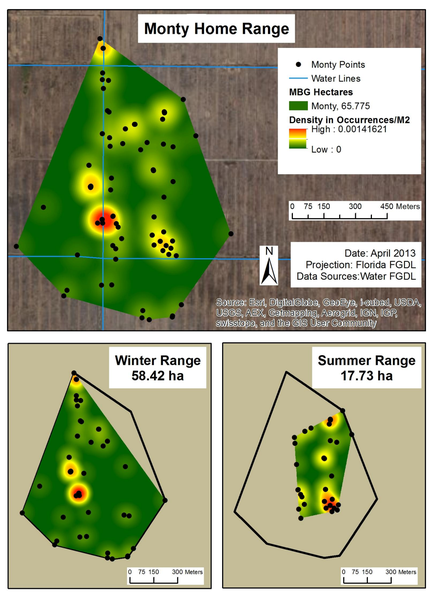
- **Determine home range size, habitat preferences, and seasonal activity patterns.**
- **Compare use of artificial and natural refugia.**

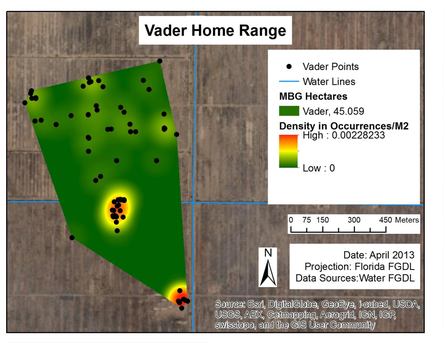
Methods:

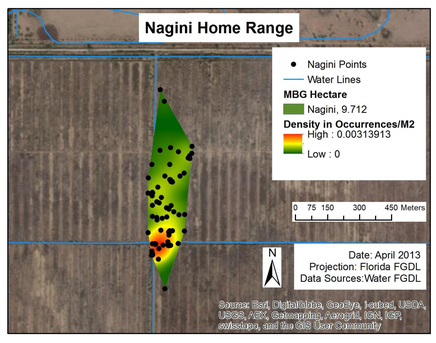
- **Snakes were located and captured at the C-44 reservoir site in Martin County, FL and the adjoining Allapattah Flats WMA as well as Babcock Ranch Preserve in Lee County, FL.**
- **Snakes were located using walking surveys along canal banks, also artificial refugia.**
- **Snakes were hand captured and taken to the Small Animal Hospital at the University of Florida in Gainesville; where Dr. Daryl Heard and his team surgically implanted Holohil Systems© SI-2T, 13-gram internal transmitters.**
- **After surgery snakes were taken to Florida Gulf Coast University in Fort Myers for recovery before being released back at site of capture.**
- **Telemetered snakes were tracked twice a week using a Communication Specialists© handheld 3-element yagi antenna coupled with a R-1000 Handheld Receiver.**
- **Data collected was imported into ArcGIS to create Minimum Bounding Geometry Polygons as well as Kernel Density Estimations.**
- **Once transmitter batteries started to get low snakes were recaptured and taken back to UF's Small Animal Hospital for transmitter removal.**
- **After transmitter removal and recovery, snakes were released back at last site of capture.**

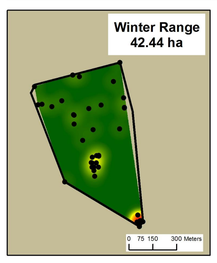
Results:

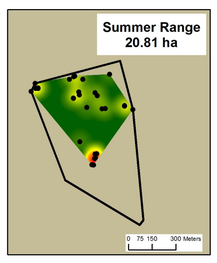


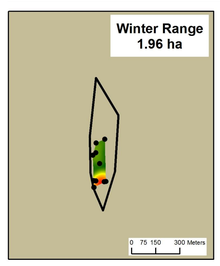


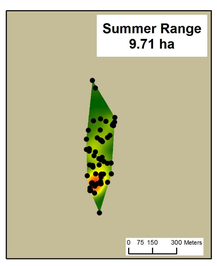


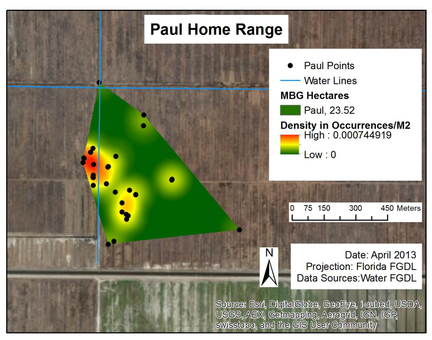


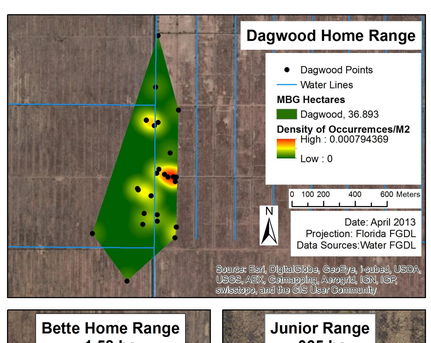


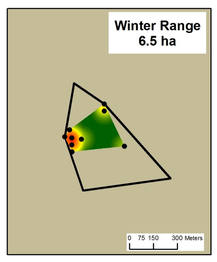


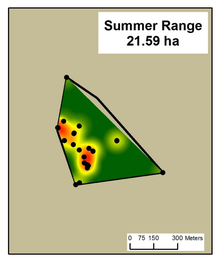


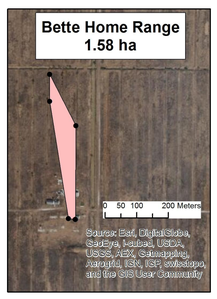


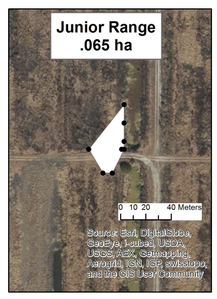


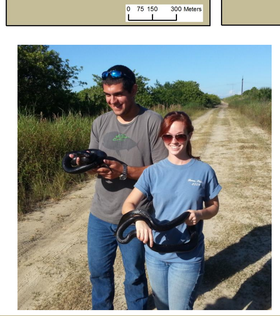


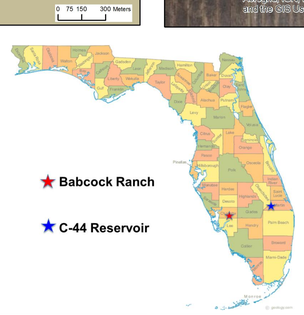












Discussion:

A total of seven snakes comprised of four males, two females, and one juvenile were tracked over the course of one year at C-44. Two additional females were also tracked, one each at Allapattah Flats WMA and Babcock Ranch Preserve.

Using ArcGIS, minimum bounding geometry polygons were created denoting home ranges. The largest home range size was our largest male at 65.78 ha. The smallest home range, minimum of 1-year tracking, was a female at 9.71 ha.

Creating seasonal polygons showed a preference for canal bank habitats during the winter and more open field and minor ditch habitats in the summer. Seasonal polygons also showed much larger home range sizes during the winter months compared to summer months for the male snakes tracked over both seasons. Overlap between individuals of the same sex was limited to abutting home ranges.

C-44 is devoid of Gopher Tortoises whose burrows are heavily relied upon as refugia by Indigos in the north. Refugia availability was still very high with an abundance of small mammal burrows as well as abandoned structures and pipes. Additional analyses (not shown) demonstrated a preference for artificial refugia during the winter.

In conclusion, we collected evidence that southern populations of Indigos are behaving differently from their more well-studied northern brethren. Further work is needed but conservation plans that include region specific clauses are recommended for this species, and likely others.

Special Thanks to:

Connor Ceilley, Savanah Ceilley, Colleen Clark, Dr. Marguerite Forest, Dana Dettmar, US Fish and Wildlife Service, Florida Fish and Wildlife Conservation Commission, Orianne Society, Dr. Jerome Jackson, UF Small Animal Hospital