



Phone 863.465.2571
123 MAIN DRIVE ★ VENUS, FLORIDA 33960

To: Highlands News-Sun

From: Archbold Biological Station

Date Published: February 3, 2017

Author: Archbold Biological Station

Eastern Indigo Snakes on the Move

Meet the Eastern Indigo Snake (*Drymarchon couperi*). Reaching six to eight feet in length, this “blue” beauty is North America’s longest native snake. It is so quiet and elusive, few people may even be aware of its existence. Indigo snakes are nonvenomous, covered in shiny black scales and live only in the southeastern US, where they eat a diverse diet of small prey, primarily other snakes, frogs, mice and other small mammals. The indigo snakes are “top predators,” even though that term usually conjures images of animals like panthers and wolves.

From 2010 to 2013, researchers with The Orianne Society partnered with Archbold Biological Station to investigate the seasonal movement patterns and habitat selection of Eastern Indigo Snakes in the southern part of the species’ range, including Highlands County. Orianne is a nonprofit organization dedicated to conserving habitats for imperiled, ecologically important reptiles and amphibians (www.oriannesociety.org). For this project, Orianne captured and closely followed 30 individual snakes on Archbold Biological Station and several state conservation lands managed by the Fish and Wildlife Conservation Commission, all of which contained large patches of Florida scrub habitat.

Eastern Indigo Snakes regularly use such upland habitats, in part because of their close relationship with the Gopher Tortoise, a species that digs deep burrows used by indigos for

shelter. Research at Avon Park Air Force Range led by Archbold biologist Dr. Betsie Rothermel, has shown that Gopher Tortoise burrows tend to be much more abundant in scrub habitats than in wetter habitats, such as wet pinelands. The presence of tortoise burrows also boosts feeding opportunities for indigos, since many of their preferred prey are found in active and abandoned tortoise burrows.

The Eastern Indigo Snake is a federally threatened species, which means researchers had to abide by strict permitting requirements regarding handling of the animals. In particular, any tracking has to be safe and not affect the animals' survival. For this study, specially trained veterinarians at University of Florida implanted a small radio transmitter in each captured indigo. After a 2- to 14-day recovery period the snakes were released back at their capture locations. After 18-24 months each snake was recaptured for surgical removal of the transmitter, then released back to the wild. These methods allowed researchers to learn a tremendous amount about where indigos live and their movements that would never have been possible otherwise.

Perhaps the biggest challenge for the Orianne indigo trackers was keeping up with these highly mobile creatures. As the data ultimately showed, Eastern Indigo Snakes in southern Florida remain active year-round due to warmer temperatures. As a result their annual home range sizes sometimes exceed 1,100 acres for males and 370 acres for females. During the breeding season (October–March), male home ranges average 295 acres, more than four times larger than the average area used by females (63 acres).

By combining their Highlands County data with similar indigo tracking data collected in Brevard, Indian River, and Polk counties during 1998–2003, the research team led by Javan Bauder, a wildlife ecologist with Orianne (now a Ph.D. candidate at University of Massachusetts) has shed fascinating new light on the behavior, movements, and habitat use of this species. Their initial research results were published in two scientific journals *PLoS ONE* and *Herpetologica* in 2016, and one more article is currently in review.

According to Rothermel, a co-author of the studies, one of the interesting patterns to emerge was how “the home ranges of males and females overlapped significantly more than individuals of the same sex. The same type of pattern—low male-male overlap and high male-female overlap—is seen in other top predators, like mammalian carnivores.”

Like other snake species, the degree to which indigos move around varies seasonally due to variation in prey, locations of potential mates, and other resources. Male indigos tracked for this study greatly increased their movement frequency, the distance they moved every day, and their home-range size during the mating season. Presumably this serves to increase male reproductive success by increasing their encounter rates with potential female mates. Female indigo movements varied little throughout the year, with the exception of a few movements in late winter–early spring coinciding with the period of egg development and also lower prey abundance.

Tracking of Highlands County indigos clearly showed that, while indigos spend a great deal of time in scrub, they also move through and forage in a lots of other habitats, including pinelands,

wetland edges, and cattle pastures. This makes them somewhat more adaptable to some human uses of the landscape than other species that are scrub specialists, like the Florida Scrub-Jay. However, Rothermel said “We know from research in more-developed areas like Brevard County that increased urbanization—and especially increased road densities—poses a serious threat to long-term survival of the indigo snake. Their mobile lifestyle means they frequently encounter roads, and their attempted road crossings often end in death under the tires of speeding vehicles.”

So the next time you see a black snake crossing a road, give it a “brake” and look closely. Could it be this master hunter, on the trail of its next meal or mate?

Photo 1: Patrick Barnhart, an Orianne Society Indigo Tracker, using a radio tracking device to search for Eastern Indigo Snakes. Photo by Rebecca Tucker.



Photo 2: An Eastern Indigo Snake. Photo by Carlton Ward.

