St. Catherines Island — Research, Conservation, Education Volume 7, Issue 11 November 2012

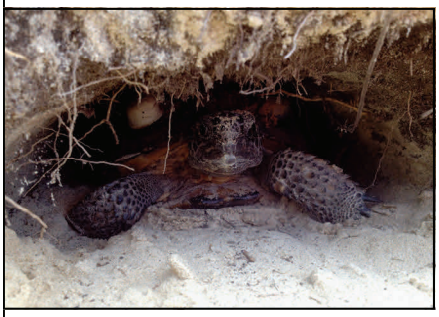
No Wake Zone

Gopher Tortoise By Bess Harris

Gopher tortoises are large tortoises native to the Southeastern United States. They feed on low-growing vegetation including many grasses and legumes. These are a long-lived species, thought to live over 60 years. Tortoises live in burrows that have been excavated using their shovel-like front feet. The tunnels of these burrows can be up to 40 feet in length and 10 feet in depth. Gopher tortoises have often been considered a keystone species in their habitat because their burrows offer refuge to over 360 different animal species and because of their natural role as a seed disperser.

The gopher tortoise has faced severe declines throughout its range, due largely to habitat loss and degradation. It is a federally listed species in the western portion of its range and is now a candidate for listing in its eastern range. There is an increasing need for information on the gopher tortoise regarding the movements, habitat use, and the overall requirements of the species for management and conservation purposes. Studies thus far have been focused primarily on adult tortoises because adult tortoises and burrows are relatively easy to locate.

The juvenile age class is an important life stage in understanding how to conserve gopher tortoises. However, there have been only a few studies to date that document juvenile gopher tortoise movements and habitat use. This is due to their low recruitment into the population and the subsequent difficulty in obtaining reliable sample sizes of juveniles. As a result, most of our current understanding of this age class is based on radio telemetry of a small number of individuals. This information gap has led both The U.S. Fish and Wildlife Service and The Gopher Tortoise Council to call for more information on juvenile ecology, including dispersal distances, movements, and survival rates.



St. Catherines Island has one of the few populations where juveniles can be effectively sampled due to their abundance and high survivorship, which makes it an ideal site for the study of juvenile ecology. The gopher tortoise population on St. Catherines is comprised of individuals brought here in 1997 and an entire population relocated onto the island from Statesboro, Georgia in 1994. The population has been monitored since the 1994 release providing information on survivorship, growth, health, and even mating success.

Our study aims to gain information on the movements and seasonal activity patterns of the juvenile gopher tortoises of St. Catherines Island comparing the tortoises before and after the introduction of a prescribed fire. This information will be used to better understand the needs of juvenile gopher tortoises and help manage for the juveniles in populations.

Twenty juveniles have been captured and are currently part of our study. They have all been marked and their measurements are all being maintained for the long-term study of the island population. This helps to evaluate survivorship and monitor the population's health. Movements are being documented through traditional telemetry methods; each juvenile has been fitted with a small radio and are tracked for their current location. Additionally a subset of these juveniles has been fitted with units that record GPS locations for the tortoise without the interference of a human tracker. We're collecting seasonal activity through temperature loggers attached to the tortoises comparing these loggers on the tortoises to loggers that have been placed in the environment.

This winter a prescribed fire will be implemented in designated areas of North Pasture. From this burn we can compare the movements and activity of the tortoises in the burned areas to that of those in the unburned areas as well as their previous year's findings. Implementation of this typical long-leaf management technique will provide information regarding how to best manage the habitat for gopher tortoises. In the future we would like to look at the plant composition of North Pasture and examine the nutrient intake of the tortoises for a nutritional health assessment in relation to the forage availability.

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Editor-in-Chief Jenifer Hillburn

"Female Lemur Power" By Tiffany Burgess

In Fall 2007, I was fortunate to have the opportunity to work as a primate intern on St. Catherines Island. While I was responsible for learning about animal husbandry broadly, I was also allowed to observe the large ring-tailed lemur group called 'Windmill troop' during my lunch breaks. Naturally, I fell in love. But I also became interested in their biology, especially the parts of their biology that regulate behavior. Fall is the breeding season for the ringtails, so hormone levels were elevated and there was frequent aggression between and within sexes. One lemur in particular caught my eye. This lemur seemed larger than others and highly aggressive, frequently chasing off the subordinate males. I assumed, wrongly, that it was a "juiced-up" male fighting for access to females. It turned out that the lemur I was watching was Holly, the second-in-command of the troop at the time, a dominant female. I gave her the nickname of "the enforcer". I learned that females dominate males in *Lemur catta* society; Holly, however, was more aggressive than any of the others on the island by far. I wondered, "what makes Holly so aggressive?" From my biology courses, I guessed that it must have something to do with hormones, possibly testosterone, so I started looking in the science literature and developing a project to examine hormones in ring-tailed lemurs.

After enrolling in graduate school, I returned to St. Catherines during the summer of 2012, to collect data for my project. My study focuses on the steroid hormone concentration differences between the females of each of the five free-ranging troops, with the goal of further understanding female dominance in ring-tailed lemurs. Similar studies on hormone concentration in spotted hyena, which show the most extreme case of recorded mammalian female dominance, support the hypothesis that dominant females have abnormally high levels of circulating masculinizing steroid hormones, called androgens.

I collected both blood serum and over 200 fecal samples from all juvenile and adult individuals of the population. I was able to collect blood samples during the annual lemur exams with the permission and help of Dr. Terry Norton. Collecting fecal samples was more of a challenge, as I had to follow lemurs in the woods and "scoop their poop". Fortunately lemurs, unlike some other primates, do not throw fecal samples at observers! After 12 weeks of 2 daily commutes to SCI, I completed the sample collection phase of my project. I will spend the fall and spring analyzing my samples and completing my thesis. My dream is to continue to do research with lemurs, which will hopefully involve return visits to my favorite Georgia barrier island.