Estimating Food Habits of a Coastal Population of Gopher Tortoises in the GTMNERR

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Abstract

The coastal strand ecosystem in Northeast Florida is home to a variety of species, including the gopher tortoise, *Gopherus polyphemus*. There is little available information on gopher tortoise dietary preferences for inland populations, while there is even less for coastal populations. Fecal samples were collected from the coastal strand foredune in the northern segment of the Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR). The samples were analyzed to determine the diet of *G. polyphemus,* and analyses of fecal matter were conducted with the help of plant experts and identification guides. Once identified, the mass of each vegetative family was used to determine the relative importance of specific vegetative groups in an individual's diets. The significance of understanding the diet of *G. polyphemus* can aid in future conservation efforts because they are a threatened keystone species.

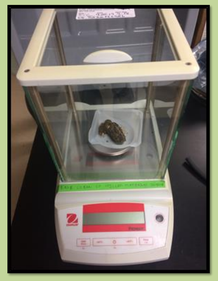
Hypothesis

We predict that coastal strand gopher tortoise populations have different food habits than inland populations.

Field Methods

Scat was collected opportunistically at North and South Beach at the GTMNERR. The areas focused on in the field were near gopher tortoise burrows. Once a burrow was located, the area above and below the burrow was searched. If a scat sample was found, the GPS location and date. Each sample was placed in an small plastic bag and stored in a cool, dry place. While collecting scat samples, plant samples were also taken from nearby plants, especially close to burrows, to aid in identification and analysis of the scat

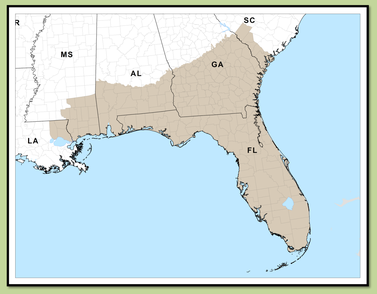
Lab Methods



In the lab, each sample was weighed to find initial total mass. Then, each scat sample was placed in a petri dish and gently picked apart with forceps, taking extra care to preserve specimens that were still intact, such as leaf remains. Each sample was sieved through three size classes to make sorting easier: 4 mm, 2 mm, and 0.5 mm. The two larger size classes, 4mm and 2mm, were sorted through by grouping material with similar patterns and textures until they could be identified. Due to time constraints and complexity, identified scat vegetation were classified by family instead of genus or species. Once each fecal sample was analyzed, the collective mass for each vegetative family was recorded in order to find percent composition of family type in each sample. In order to understand the data collected, the scat was analyzed using a chi-squared goodness of fit test. This test was used to determine the relative abundance of plant families in inland tortoise diets compared to those in coastal tortoise diets.

Past Research on Gopher Tortoises

Much research has been done with regard to habitat preferences of gopher tortoises: they like soil that they can burrow in, low-lying vegetation, open areas, and warm climates. Currently, they are distributed throughout the southeastern United States. However, they are threatened by rapid rates of habitat loss due to urbanization, especially in Florida along the coast. Past conservation efforts have been tailored according to their habitat preferences, but not much is known about their diet. The significance of this study is that it is the first characterization of food habits of coastal gopher tortoise population in Northeast Florida.



Photos courtesy of Florida Wildlife Magazine & USDA

Conclusions

We found that the three most abundant plant families in our samples were Poaceae, Smilacaceae, and Euphorbiaceae. Additionally, the fourth most abundant substance found in the scat samples is trash. This plastic appeared to be a plastic foam material that was part of a surfboard. Additionally, *Graph 3* shows the distribution of plant families between species. Specimens 1, 3, and 4 have a majority of Poaceae, whereas specimens 2 and 5 have more Smilaceae. This variation may be a result of the small sample size. We will improve this by continuing this study to have a larger sample size.

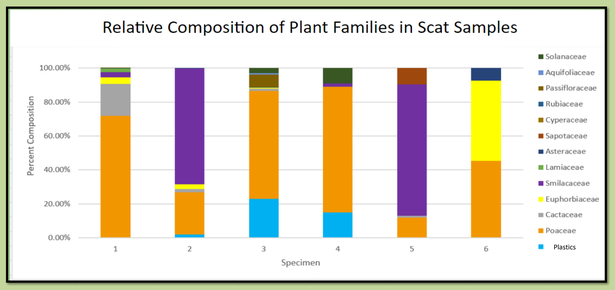
A study by L. Lohmeier and R. Lohoefener (1981) compared gopher tortoise habitats in young slash pine and longleaf pine forests and discussed observations of food habits in Florida, Mississippi and Alabama. Gopher tortoise scat was collected in Mississippi during the spring and summer and further analysis found that gopher tortoises diets in this area consisted largely of Poaceae, especially Panicum stems and seeds.

Future investigations would include looking into how gopher tortoise diet along the coastal strand might change throughout the year because of seasonal plant availability; as well as if the gopher tortoises exhibit a particular preference based on plant species type or location to the burrow. Future investigations will go beyond studying families, and will identify species where possible.

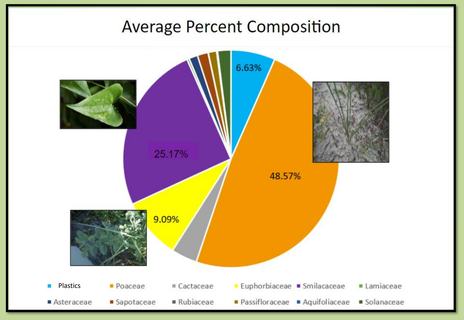
In order to best conserve this species, we need to know what they eat. If we know what they eat, we know what habitat best fits them. Knowing this information will allow us to relocate and rehabilitate in the event of a major disturbance.

Graph 1 shows the abundance of the two plant families that overlapped for inland tortoises and coastal tortoises.

Results



Graph 3 shows the composition of the plant families in each sample.



Graph 2 shows the average percent composition found in all of the plant samples. The top four have the percents labeled.

Family Name	Species	Common Name
Poaceae	Panicoideae (Sub-Family); *Cenchrus spinifex*; *Uniola paniculata*	Sticker bush; Sea Oats
Cactaceae	*Optunia* sp.	Pricklypear Cactus
Euphorbiaceae	*Croton punctatus; Chamaesyce* sp.	Beach tea; Beach seaside sandmat
Smilacaceae	*Smilax bona-nox* ; *Smilax pumila; Smilax auiculata*	Saw Greenbriar; Sarsaparilla vine
Lamiaceae	*Monarda punctata*	Bee Balm
Asteraceae	*Helianthus debilis*; *Heterotheca subaxillaris*	Dune sunflower; Camphorweed
Sapotaceae	*Sideroxylon tenax*	Buckthorn
Cyperaceae	*Cyperus compressus*	Flat sedge
Rubiaceae	*Diodia* cf. *teres*	Rough Buttonweed
Passifloraceae	*Passiflora incarnata*	Passionflower
Aquifoliaceae	cf. *Ilex vomitoria*	Yaupon, leaf tissue
Solanaceae	*Physalis* sp.	Fruit

Table 1 shows the species that could be identified within plant families.

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Additional Information Provided By:

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