An Investigation of Gopher Tortoise Burrow Characteristic Preference at the GTMNERR

Thomas Hamilton, Mallory Hopkins, Cody Burns, and Professor Blonder: Natural Sciences Department, Flagler College, St. Augustine FL

Introduction

Gopher tortoises are native to the southeast coast of the United States. These tortoises dig into the sand and create burrows for their home. This is why they are called gopher tortoises.

In the coastal dune ecosystem, they are a keystone species meaning that other species rely on them. In this case other species rely in them for their burrows. Over 300 other species use the gopher tortoise burrows while they're still occupied and after they're abandoned.

Gopher tortoises are poikilothermic, meaning they rely on the environment around them to regulate their body temperature.

There has been studies on gopher tortoise burrow preference but none found on preference of physical characteristics.

Objective

- **To determine if there is burrow site preference of Gopher Tortoises at GTMNERR based on geographical characteristics**

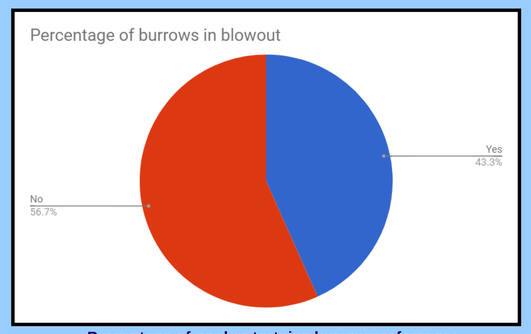
Methods

- **Surveyed fore-dune once a week from Oct. 3rd to Nov. 4th**
- **Burrow location recorded and identified via Trimble Geo 7x handheld GPS**
- **Height of burrow recorded with Nikon Forestry Pro Hypsometer**
- **Directional orientation taken Polaris compass**
- **Observational determination of blowout**

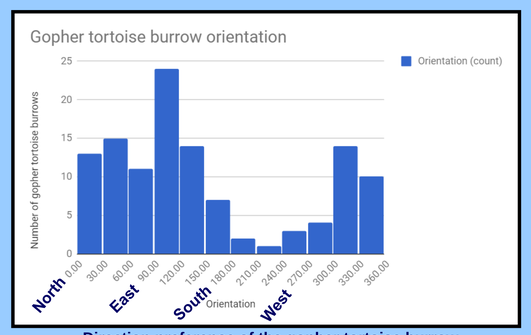
Abstract

The Guana Tolomato Matanzas National Estuarine Research Reserve coastal strand habitat has a high density of Gopher Tortoises. This project was focused on the Gopher tortoise (*Gopherus polyphemus)*, and its potential burrow preferences based on measurable physical parameters. The three characteristics measured were height of burrow, orientation of burrow, and whether the burrows were located in a blowout section of the dune. This project has multiple working hypotheses: the first is that *G. polyphemus* prefers burrows that are located at greater heights on the dunes. The second hypothesis is that *G. polyphemus* prefers burrows facing East due to exposure to sunlight. And the final hypothesis is that *G. polyphemus* prefers the burrows to be located in a blowout because there is less vegetation and more open sand for burrowing. There is very little literature pertaining to the question of burrow characteristic preferences of *G. polyphemus*.

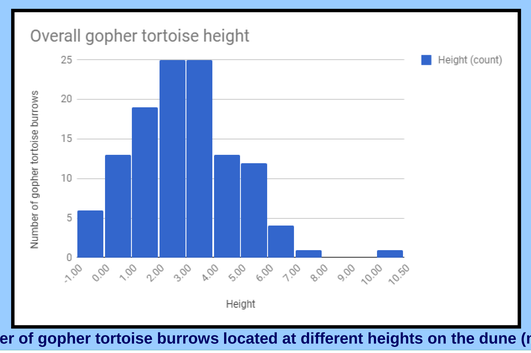
Results



Percentage of gopher tortoise burrow preference



Direction preference of the gopher tortoise burrow



Number of gopher tortoise burrows located at different heights on the dune (meters)

Conclusions

The gopher tortoise in our study site preferred to have their burrows located in non-blowout dunes. They also showed a preference in the direction the burrow opening was facing. They preferred to face in the Easterly direction. Finally the gopher tortoises preferred to have their burrows located at heights greater than 2 meters.

We ran 95% confidence intervals on each of the three hypotheses. The blowout hypothesis showed the gopher tortoises did prefer non-blowouts, but the complete certainty was very close to half and half which caused us to reject this working hypothesis. The orientation hypothesis showed that the gopher tortoises did like having their burrows open Easterly which allowed us to accept this hypothesis. Finally, the height hypothesis showed the preference was above the 2 meter thus allowing us to accept the hypothesis.

Acknowledgments

GTMNERR
Professor Blonder
Dr. Kurt Sebastian
Flagler College
Mr. John Wooldridge
Danielle Cayouette, Scott Rowan, John Cepeda

Literature Cited

Alexy, K., Brunjes, K., Gassett, J., & Miller, K. (2003). Continuous remote monitoring of gopher tortoise burrow use. Wildlife Society Bulletin (1973-2006), 31(4), 1240-1243.

Dodd, C. K., Lau, A. (2015) Multiscale burrow site selection of gopher tortoises (Gopherus polyphemus) in coastal sand dune habitat. Journal of Coastal Research, 31(2),305-314.

Garner, J.A., Landers, J.L., McRae, W.A., (1981) Movement patterns and home range of the gopher tortoise. The American Midland Naturalist, 106(1), 165-179.

Hansen, K. (1963). THE BURROW OF THE GOPHER TORTOISE. Quarterly Journal of the Florida Academy of Sciences, 26(4), 353-360.

Jeannine Ott Eubanks, Michener, W., & Guyer, C. (2003). Patterns of movement and burrow use in a population of gopher tortoises (Gopherus polyphemus). Herpetologica, 59(3), 311-321.

Landers, J., Garner, J., & McRae, W. (1980). Reproduction of gopher tortoises (Gopherus polyphemus) in southwestern georgia. Herpetologica, 36(4), 353-361.

McCoy, E., Mushinsky, H., & Wilson, D. (1993). Pattern in the compass orientation of gopher tortoise burrows at different spatial scales. Global Ecology and Biogeography Letters, 3(2), 33-40.

Means, D.B., (1982) Responses to winter burrow flooding of the gopher tortoise (Gopherus polyphemus daudin). Herpetologica, 38(4), 521-525.

Garner, J.A., Landers, J.L., McRae, W.A., (1981) Movement patterns and home range of the gopher tortoise. The American Midland Naturalist, 106(1), 165-179.