A Pilot Study: Gopher tortoise (Gopherus polyphemus) foraging preferences at Barefoot Beach Preserve in Collier County, FL

Monica Hendrick and Nora Demers
Florida Gulf Coast University, Fort Myers, FL

Introduction

Gopher tortoise populations have recently been on the decline, partly due to the disturbance of wildfires (Ashton et al. 2008). It has been observed that gopher tortoises are significantly more common in areas of recent burning than in areas that are undergoing fire suppression, possibly because burning promotes the development of plants species on which gopher tortoises depend (Ashton et al. 2008; McCoy et al. 2006).

Since some preserves do not mandate burning as an appropriate habitat management practice due to safety considerations, we propose a solution that does not involve the use of fire.

Objectives

1. To explore foraging preferences of gopher tortoises at Barefoot Beach Preserve.
2. To find out where gopher tortoises are foraging within the Preserve, and deduce possible explanations for their foraging location preference.
3. To determine if understory cutting promotes gopher tortoise foraging behavior within the treated site.
4. To discover if tortoises forage close to their burrows, or travel over large distances.

Methods

Understory cutting was recently conducted on an area between the parking lot and the beach within Barefoot Beach County Preserve, referred to as the “treatment site”.

Prior to understory cutting

The behavior of gopher tortoises was observed June - August 2017 at four research sites: the mound, treatment, control, and parking lot. Continuous focal animal samples were conducted by a single observer. If the animal was foraging, the plant species the tortoise was utilizing was also recorded.

Behavioral and foraging data were collected in the field using paper data sheets, and then transferred into Google Sheets for long-term records and data analysis.

Discussion

Five plant groupings were utilized in this study: grasses and clover, the genus Opuntia (prickly pear); the flowers of several species (flowers); the genus Ambrosia (ragweed); and other species that did not fit into any of the other groupings.

Results

Grasses and clover are plants that are easily accessible to gopher tortoises due to their small stature and lack of rigid structural support, characteristics that may contribute to gopher tortoises displaying a high propensity to forage on such species.

Gopher tortoises foraged the most at the parking lot, regardless of burrow location. None of the individuals already located in the parking lot were observed foraging at any other site. It has been observed by other researchers that gopher tortoises prefer open habitats (Ashton et al. 2008; Breininger et al. 1991; Diemer 1986) like that found in the parking lot. Furthermore, since grasses and clover may be the sought-out group, it could be deduced that the area possessing the highest concentration of grasses and clover would possess the greatest amount of foraging behavior instances observed.

There was an insignificant difference of instances of foraging between the treatment and control sites (Fig 2), with only two more observations from the treatment site than the control.

Possible explanations for this phenomenon:

1. The majority of observations collected at the control site was collected within the first two weeks of observation when the protocol was still being perfected.
2. Two foraging behaviors were included into the summation of foraging behavior: tactile investigation and consumption. Tactile investigation was recorded for eight out of the nineteen foraging behaviors at the control site, and was never observed at the treatment site. When removing tactile investigation from the calculation, the disparity between foraging behavior at the treatment and control sites increases significantly, with 10 more foraging observations now for the treatment site than the control site.
3. Finally, all eight tactile investigation behaviors observed were of gopher tortoises foraging on ragweed. Even though ragweed was consumed at the mound and control sites, both of these areas have considerably higher ragweed cover than the parking lot and treatment sites. Therefore, it may be that gopher tortoises are only foraging on ragweed in these areas because of the lack of other, more preferable species available.

Conclusion

Gopher tortoises prefer grasses and clover for foraging needs.

Gopher tortoises prefer foraging in the parking lot’s grass areas.

There was more foraging at the treatment site than at control site, especially when only considering consumption and removing tactile investigation.

Several gopher tortoises will travel from their burrow site to other locations to forage.

For the Future

It is advised that a local botanist is contacted to identify the floral composition of each research site and of consumed species.

To provide more insight into location preference, a protocol should be produced that controls for observation time per site.

Size of research sites should be controlled; some areas may be more foraged because of size rather than preference.

It may prove wise to take measures to restore areas away from human and vehicle traffic to limit anthropogenic interference and human-related mortalities.

If it is determined that understory cutting is a useful method for optimal habitat management, then cutting should be conducted regularly within Barefoot Beach Preserve.

References


Acknowledgements

I would like to express extreme gratitude to the Friends of Barefoot Beach for their continual assistance with gopher tortoise conservation at the Preserve, and for financing all travel and housing expenses for the Gopher Tortoise Council Annual Meeting of 2017. I also give thanks to Dr. Nora Demers for providing the opportunity to conduct this research and for her assistance throughout the research and presentation process, and the staff at Barefoot Beach County Preserve for allowing us to use their land as a research site for this project.