



Developing a survey protocol for landscapes with a low-density of Gopher Tortoises

Project # 14-762

Background:

The Gopher Tortoise (*Gopherus polyphemus*) has been declining throughout most of its geographic range. It was listed as federally threatened under the Endangered Species Act (ESA) in the western portion of its range in 1987 and is a candidate for listing under the ESA in the eastern portion of its range (USFWS 2011). We developed an occupancy survey approach to evaluate the distribution of Gopher Tortoises on Eglin Air Force Base (Eglin), a large military installation with the highest potential Gopher Tortoise habitat (155,600 ha) of all Department of Defense lands (USFWS 2011). Despite large expanses of suitable habitat and intensive habitat management on Eglin, tortoises appear to occur at low densities.



Figure 1. Adult Gopher Tortoise on apron of burrow on Eglin Air Force Base. (Photographed by S. Goodman)

Objective:

We had two main objectives: (1) determine if occupancy modeling is an effective technique for assessing Gopher Tortoise presence and distribution and (2) to describe the current distribution of tortoises on Eglin in relation to available habitat.

Summary of Approach:

We developed a survey protocol using prior information and randomization to sample a population of tortoises that appeared to be at low density. We used a two-observer, 10m-transect burrow survey method at more than 500 1-ha plots and conducted repeat surveys at >50% of these sites to develop a probability of detection. Additionally, we proportionally sampled sites within different habitat types to better inform managers about the probability of occupancy across the landscape.



Figure 2. High-quality sandhills habitat (left) and cleared vegetation/range (right) on Eglin Air Force Base, Florida. (Photographed by S. Goodman)

Benefit:

The benefit of this approach is that it allowed us to assess the distribution of tortoises in an unbiased manner and allowed for a comparison of occupancy among habitat types. This will allow managers to focus resources to habitats in greatest need of conservation and management. Additionally, managers can use this approach to gather site-specific information about the occurrence of gopher tortoises for a variety of purposes including project planning as well as population-level data for monitoring gopher tortoises and for development of INRMPS.

Accomplishments:

Our results suggest that tortoises are occupying only a small proportion of suitable habitat on Eglin and occupied areas are patchily distributed across the installation. Management should prioritize habitats near existing Gopher Tortoise populations and also focus on increasing connectivity among existing population centers. Our approach was successful at determining occupancy rates across a variety of habitat types/conditions in areas of both known and unknown Gopher Tortoise status, and detection rates were high despite the limited distribution and low-density of tortoises.

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