Landscape-Level Habitat Associations: Desert Tortoises (*Gopherus agassizii*)

Background:

Anthropogenic disturbances within the range of the desert tortoise (e.g., military training, recreational activity, grazing, etc.) have the potential to cause direct tortoise mortality and reduce habitat quality through impacts to vegetation structure and soil characteristics. While impacts to desert tortoise habitat on active military training areas can be substantial, these ranges often provide important refuges for tortoises and their habitat.

Given the possibility for ESA listing and the challenges that such a decision would impose upon the Department of Defense, it is prudent to understand the distribution and habitat associations of desert tortoises on military ranges in the Southwest. Combined with training area maps, these data will assist in identifying locations where overlaps exist and guide appropriate management decisions that reduce conflicts while maintaining the military readiness mission.

VHF and GPS tracking units deployed on a desert tortoise. Photo: Arizona Game and Fish Department.

Objective:

The objective of this study is to develop a landscape-level predictive habitat model for desert tortoises inhabiting the Yuma Proving Ground and Barry M. Goldwater Range - an area that represents the largest tracts of relatively undisturbed Sonoran Desert habitat in the southwestern United States. This model, validated with tortoise movement data, will be used to identify areas where desert tortoise occupancy is most likely and guide tortoise conservation planning on these ranges.

Summary of Approach:

We implemented a stratified random sampling design in which random samples were selected from soil strata defined by the National Cooperative Soil Survey division of the Natural Resources Conservation Service, a branch of the United States Department of Agriculture. This approach reflected our hypothesis that desert tortoise occupancy should vary among soil designations at the landscape-scale.

We conducted standardized surveys for tortoises and their sign (i.e., carcasses, scat, tracks, etc.) within 26 3-ha survey plots located within each of the 14 soil sub-groups found on the ranges using an area search methodology for complete coverage within the plot boundaries (i.e., 364 total survey plots). We also deployed VHF radio-transmitters and GPS tracking units to track adult desert tortoise movements within the study area as part of the habitat model validation process.

Benefit:

The results of this study will provide natural resource managers with the necessary data to make informed management decisions and engage in collaborative efforts across range boundaries to ensure the persistence of robust desert tortoise populations while maintaining the military readiness mission.

Accomplishments:

This project obtained its final year of funding through the Legacy Program in FY2010. Occupancy patterns observed in FY2009 indicate that desert tortoise locations are concentrated in soil sub-groups characterized by a distinct soil horizon cemented by calcium carbonate, which supports the creation of stable burrows for tortoise shelter sites.

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