



Minimizing Maximizing the Efficacy of Intra-Installation Translocations to Mitigate Human-Rattlesnake Conflicts

Project #16-822

Background:

The eastern diamondback rattlesnake (EDB; *Crotalus adamanteus*), a federal candidate species, occurs on various military installations in the southeastern United States. The imperilment of the EDB places importance on how installations manage human-EDB encounters in training areas. Concerns about recruit safety during training activities in habitats used by EDBs has prompted natural resource managers to use intra-installation translocation as a tool to reduce the probability of human-rattlesnake conflicts, ensuring safe, continued access to training areas. However, translocation distances may interact with EDB movement ecology, affecting the efficacy of translocations.

Objective:

Our objective was to examine the effect of intra and extra home-range translocations on EDB movement, survival, and habitat use on a Marine Corps installation tasked with managing human-rattlesnake conflicts.

Summary of Approach:

Two biologically-relevant scales of translocation distances were used and free-ranging, telemetry-equipped adult EDBs were monitored to assess snake-response to translocation at the Marine Corps Recruit Depot Parris Island (MCRDPI) in South Carolina. EDBs were translocated to locations that either occurred outside of the snake's home range (i.e., extra home-range translocation) or within the home range (i.e., intra home-range translocation). We compared post translocation movement, survival, home-range size, and within home range habitat use between treatments and controls (i.e., snakes that were not translocated) to quantify how translocation distances interacted with EDB movement ecology. We used digital imagery to classify the landscape based on the risk of negative human-rattlesnake interactions. Our landscape risk classification was used to generate the GIS-based models used in our movement analyses.

Benefit:

Management protocols that address human-rattlesnake encounters will lessen interruptions to training activities by helping to maintain continued access to training areas. The EDB occurs in up to 41 military installations in the southeastern United States, and identifying translocation scale for any venomous

species will enable military planners to work with natural resource managers to identify installation-specific scales of venomous snake translocation.

Translocation distance is an important consideration for efforts to manage human-rattlesnake conflicts. EDB management at military installations can use this study to justify incorporating intra home range translocations that are scaled to the movement ecology of installation EDB populations into management plans.

Translocation, regardless of scale, increases female movements, potentially stressing adult females. Management plans can use this information to justify monitoring EDB population demographics when translocations are used to manage rattlesnake-human conflicts.

Accomplishments:

Adult EDBs (n = 36) were monitored, including 11 snakes in the control group, 12 snakes in the intra home range translocation group, and 13 snakes in the extra home range translocation group. Home-range size was not affected by treatment; however, translocated females moved greater distances within their home ranges as compared to controls. The energetic costs associated with increased female movements could negatively affect their breeding frequency and impact population viability. Home-range size was positively associated with the proportion of high-risk habitats within home ranges, indicating that high-risk habitats were of low quality, forcing EDBs to use larger ranges for resource selection. EDBs were more likely to use low-risk habitats, regardless of translocation treatment; however, EDBs in the extra home-range translocation group were more likely to use high-risk habitats as compared to the intra home-range translocation group. More research is needed for insight into how extra-home range translocations lead to greater selection for high-risk habitat.

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