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Publication Brief

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Translocation Does Not Elicit a Physiological Stress Response in Desert Tortoises

Wildlife translocation is increasingly used to mitigate disturbances to animals or habitat due to human activities, yet little is known about the extent to which translocating animals causes stress. To understand the relationship between physiological stress and translocation, researchers from the USGS and the University of Nevada, Reno, conducted a multiyear study using a population of Agassiz's desert tortoises (*Gopherus agassizii*) near Fort Irwin, California. The study is published in *Animal Conservation*.

Blood samples were collected from adult tortoises in three treatment groups (resident, translocated and control) for 1 year prior to and 2 years after translocation. Samples were analyzed for plasma total corticosterone (CORT), a glucocorticoid hormone commonly associated with both acute and chronic stress.

CORT values were analyzed in relation to potentially related factors (animal sex, date, behavior, treatment, handling time, air temperature, home-range size, precipitation and annual plant production) among seasons and years.

Among all tortoises, CORT values in males were higher than in females, and values for both varied monthly throughout the activity season and among years in association with differential rainfall, forage production, and corresponding activity levels. However, neither habitat variables (estimated annual forage and precipitation) nor behavior and home-range size significantly explained CORT levels at the level of the individual.

Furthermore, translocation did not explain differences in CORT levels between years. The comparison of resident, control and translocated tortoises yielded no significant differences in stress levels as measured by CORT. These results suggest that translocation does not elicit a physiological stress response in desert tortoises.

Management Implications

- There are many factors to be considered in relation to desert tortoise translocation. These include translocation effects on survivorship, site colonization, disease transmission, population genetics, population densities, and physiological stress. This research contributes to understanding of these influences.
- Translocation of desert tortoises did not result in elevated stress levels using CORT as an indication of stress in these animals.
- Environmental influences may dictate how tortoises respond to harsh conditions or disturbances. It is possible that an alternative measure is a more important and responsive indicator of stress in desert tortoises, or that chronic stress associated with translocation may alter the animal's ability to produce the appropriate hormonal responses.

THIS BRIEF REFERS TO:
Drake, KK, KE Nussear, TC Esque, AM Barber, KM Vittum, PA Medica, CR Tracy, KW Hunter Jr. 2012. Does translocation influence physiological stress in the desert tortoise? Animal Conservation.
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Recent USGS studies on stress and survivorship responses suggest that translocation may be an effective conservation measure for tortoises in the northeast Mojave.