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## Long-Term Study Updates Desert Tortoise Growth, Maturity and Survivorship Parameters

Data on the life history parameters of the Agassiz's desert tortoise (*Gopherus agassizii*) are necessary to develop accurate population viability analyses, which will allow land managers to make more informed decisions with regard to desert tortoise populations.

Long-term mark-release-recapture studies provide the best means of obtaining the most accurate information on life history characteristics such as growth, age at maturity, and survivorship.

A USGS study by Phil Medica, Ken Nussear, Todd Esque and Mary Saethre in the *Journal of Herpetology* reports on the growth, age at sexual maturity and survivorship of a cohort of 17 known-age, semi-wild desert tortoises over a 47 year period.

Growth of desert tortoises was positively correlated with the amount of winter rainfall and production of ephemeral plants. Winter rainfall and ephemeral plant production are highly correlated and served as equivalent predictors of annual growth of desert tortoises.

Desert tortoise growth was linear and not significantly different between sexes until tortoises reached the early to mid-20's in age. The inflection point of reduced growth in desert tortoises coincided with reaching sexual maturity. At this inflection point growth slowed for both sexes, but females grew significantly less than males.

Survivorship of this cohort averaged 43 years, notably less than the estimate of 50 to 100 years used in previous population viability analyses. Over the course of the study, mortality of adult desert tortoises was primarily caused by stochastic events, such as predation and drought.

### Management Implications

- Survivorship of the tortoise cohort studied averaged 43 years, notably less than the estimate of 50-100 years used in previous population viability analyses. This highlights the importance of long-term studies to obtain accurate information on life history parameters such as growth and survivorship.
- Growth and survivorship of desert tortoises are highly linked to stochastic rainfall events that may be altered by the effects of climate change. Drier climatic conditions would thus have a negative impact on both growth and survivorship of desert tortoises, putting further pressure on this declining species.

THIS BRIEF REFERS TO:

Medica, PA, KE Nussear, TC Esque, MB Saethre. 2012. Long-term growth of desert tortoises (*Gopherus agassizii*) in a southern Nevada population. *Journal of Herpetology* 46(2): 213-220. doi: 10.1670/11-327

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4776>

<http://www.werc.usgs.gov/nussear>



Ken Nussear/USGS

Long-term studies are crucial to obtain accurate information and clarify historic assumptions on tortoise life history parameters, such as growth and survivorship.