Mammalian Diversity and Conservation Laboratory

Graduate Student

Gerrad Jones

Working thesis title:

Mammals of Padre Island National Seashore, Texas

Expected Graduation: May 2008

Abstract of Chapter 2 (Presented as a Wilks Award Finalist at the 2007 meeting of the Southwestern Association of Naturalists):

Title: An enigma of the species-area relationship: small island effect on coastal Texas islands

Several hundred, if not thousands of studies have documented the species-area relationship. However, embedded within this relationship lies a feature largely ignored: the small island effect (SIE) wherein species richness varies independently of area on small islands. It is generally thought that species richness on small islands is structured by stochastic events, island ecology, or habitat heterogeneity. The SIE has been understudied because larger islands have been disproportionately sampled as compared to smaller ones. Thus, the primary objectives of this study were to 1) determine if a SIE exists for small coastal islands in the Gulf of Mexico and 2) if a SIE is detected, test among the three hypotheses that explain the deviant pattern. Coastal islands in the Gulf of Mexico provide a unique opportunity to explore patterns of species richness across a wide range of island areas. Fourteen small islands and the largest barrier island (Padre Island) were sampled for mammals. Literature records of mammals were obtained for other barrier islands in the Gulf of Mexico. Species area relationships were assessed for both small mammal and total mammal richness across the entire island assemblage. Using a novel approach, we assessed the SIE by comparing linear and breakpoint regression models using both traditional log-log and semi-log variables. Breakpoint models, which supported the SIE, performed better than linear models in most situations. Within each breakpoint model, stair stepped species-area curves with 2-4 breakpoints were found. This stair stepped curve in addition to multiple breakpoints suggests that habitat heterogeneity is responsible for the observed SIE on islands in the Gulf of Mexico. Using this novel approach, biogeographers
can begin to unravel the enigmas of the species-area relationship and the small island paradox.

**Education:**

B.S. Truman State University.

**Professional presentations related to his thesis:**


**Publications resulting from thesis:**


Gerrad with his hands in a gopher tunnel on Padre Island.

Gerrad measuring least shrew habitat at Bitter Lake National Wildlife Refuge.