Table 1 Prehistoric astragali from central Texas

County	Number of astragali
Comal	9
Coryell	6
Hays	2
Hill	15
Travis	2
Uvalde	17
Val Verde	7

toric collections of vertebrate remains that are less accessible than those used here, which will require a substantial future research effort. The paleozoological samples are from a variety of contexts, but mainly they are from palimpsest rockshelter deposits that were accumulated via a variety of human and carnivore behaviors during the Holocene (e.g., Toomey 1994). There is no reason to assume that the prehistoric sample is age or sex biased, a conclusion that is partially supported by the similar level of variability in the prehistoric and modern samples (see below). Despite the coarse time-scale of the prehistoric samples used here, the prediction framed above can be evaluated in temporally coarse terms.

Modern white-tailed deer astragali are from two areas in central Texas. The first includes suburban areas west of Austin, Texas, where deer have not been subjected to structured management during the last few decades; these deer are relatively small and occur at high population densities. For purposes of this study these deer are labeled "unmanaged," and these populations appear to be at or near environmental carrying capacity, resulting in stunting (Cook 1984; Geist 1998; Teer and others 1965; Teer 1984). Astragali from unmanaged deer were collected by Orion Research and Management Services during unselective culling in 2005. The second modern sample is from Fort Hood near Killeen, Texas. This population has undergone structured and managed sport harvest for much of the last 50 years, and detailed records of population density and body size are available. The Fort Hood sample is labeled "managed," and it was collected during the 2005 hunting season; its population density is assumed to be restricted below environmental carrying capacity in contrast to the unmanaged sample.

Modern astragali were collected by clipping the distal tibia and proximal metatarsal; specimens were transported to the University of North Texas Center for Environmental Archaeology, defleshed, disarticulated, boiled gently for 45 minutes to remove grease, and measured following the specifications in Figure 2. Multiple regression of six measurements on dressed body weight using modern specimens produces a significant positive relationship (multiple R = 0.696, R^2 = 0.485, P < 0.0001, n = 72), indicating that astragalus size adequately reflects body size. Prehistoric and modern samples are compared using bivariate plots of selected astragali measurements (AST 1 and AST 3) and are treated statistically using Student's t test. Use of AST 1 as "thickness" and AST 3 as "length" also increases the size of the prehistoric sample in that these measurements are taken near the central, robust portions of the bone and are unlikely to be damaged via destructive processes through time. All six of the measurements correlate closely to one another, and simple bivariate analysis of thickness and length is the focus of the rest of the article.

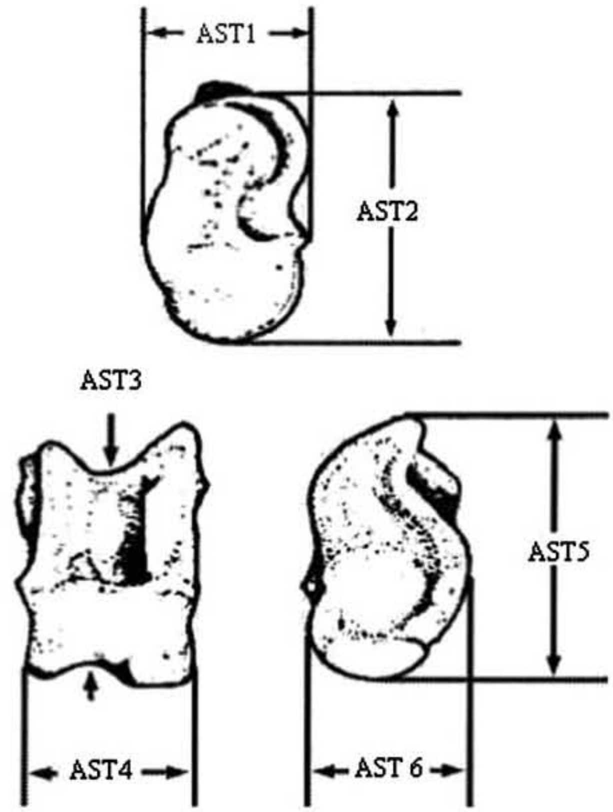

Fig. 2 Morphometric variables of the white-tailed deer astragalus used in this analysis. AST 1 is labeled "thickness" and AST 3 is labeled "length" in bivariate analyses (after Purdue 1989, p 309, Figure 1)

Results

Descriptive statistics related to each sample are provided in Table 2. Results of Student's t comparisons among samples are provided in Table 3. Figure 3 compares astragali from modern managed and unmanaged samples; there is some overlap, but on average