

Documentation of Missouri White-tailed Deer Chronoclines: Implications for Archaeology,
Paleoecology, and Conservation Biology

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Abstract

Multiple ecological factors (e.g., Bergmann's rule, competition, food quality and quantity) can be responsible for changes in animal body size over time. White-tailed deer (*Odocoileus virginianus*) serve as an ideal candidate for studying these variables due to their importance today (to hunters and to wildlife enthusiasts), their known phenotypic plasticity in response to ecological factors, and their high frequency in zooarchaeological collections. Using post-cranial, weight-bearing bone measurements as a proxy for body size, this study determines that stunting occurred from prehistoric to modern times in Missouri white-tailed deer. Forage availability and intraspecific competition were the major influences on body size. A diminution event occurred about ~1600-1300 radiocarbon years B.P. and is associated with fluctuating climatic conditions at the time. Modern deer in Missouri are smaller relative to an early prehistoric (ca. 3500 – 1300 B.P.) sample, but larger than a late prehistoric (ca. 1300 – 200 B.P.) sample. The historic diminution event seems to stem from modern management goals favoring large population sizes. Advantages of incorporating paleozoological data with modern conservation biology are exemplified by this study.