

DAILY ACTIVITY AND BODY TEMPERATURE OF THE SOUTHERN
WOODCHUCK, *MARMOTA MONAX MONAX*, IN
NORTHWESTERN ARKANSAS

STEVEN R. HAYES

ABSTRACT.—Daily activity and body temperature cycles of *Marmota monax monax* were studied in northwestern Arkansas during the summer and autumn of 1973. Above ground activity was observed 35.4 percent of the time. A unimodal cycle was characteristic of activity from 1 May through 14 June and 1 October through 19 November, whereas a bimodal cycle described activity from 15 June through 30 September. During the unimodal activity pattern, below ground activity accounted for 51.6 percent of the total activity as compared to 37.9 percent in the bimodal condition. Early morning and afternoon activity was greatest during the midsummer period, with depressed activity between 1300 and 1600 hours. Although body temperature cycles were slight during all periods, the cycle amplitude was largest early and late in the year. Maximum daily body temperatures were recorded during the day, whereas minimum body temperatures occurred at night. The mean body temperature was $37.8^{\circ} \pm 0.57^{\circ}\text{C}$. Body temperatures averaged 0.5°C lower during early summer and autumn than during midsummer. Effects of environmental variables on animal activity, position, and body temperature were slight.

Six species of the ground squirrel genus *Marmota* (family Sciuridae) occur in North America. *Marmota monax* is the most widespread of the North American species, ranging from the lower Mississippi River valley and southern Appalachia eastward to the Atlantic Ocean and northward to the tundra. Westward the range of *M. monax* borders the open plains of Oklahoma and Kansas northwestward through central Canada. Reaching northward into the lowlands of Alaska and southward to Montana, the range of this species terminates at the Pacific Ocean. Although the species is quite widespread, relatively little data have been published on populations in central and southern states. Most of the studies have been concentrated on populations in the extreme northeastern United States and Ontario, Canada (above 41° latitude). Classical studies of woodchuck natural history by Howell (1915), Hamilton (1934), and Grizzell (1955) were completed in the New York-Pennsylvania-Maryland area. More recent studies have dealt with special aspects of woodchuck natural history. Bronson (1962) observed seasonal and daily activity and agonistic behavior of the southern woodchuck in Pennsylvania. Merriam (1963, 1966) studied seasonal and daily movements and population ecology of *M. monax rufescens* near Ithaca, New York. Davis (1967, 1971) studied fat deposition and activity cycles in *M. monax monax* from Pennsylvania and Virginia.

Considerable research has been conducted on *M. monax* in northeastern North America. The present study was designed to measure activity patterns and body temperatures of *M. monax monax* near the southern limit of its