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# Record of a Sixteen-Year-Old White-tailed Deer (*Odocoileus virginianus*) in Carbondale, Illinois: A Brief Note

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## ABSTRACT

In May 2004, a dead white-tailed deer (*Odocoileus virginianus*) radiocollared in 1991 was found in Carbondale, Illinois, and was aged at 16 years old via cementum annuli analysis. She was a member of an unharvested, free-ranging population and likely died of natural causes. Given the average longevity of deer in unharvested populations at about 8 years of age, our finding is quite rare. Increased longevity of deer can heighten lifetime reproductive output, which may contribute to elevated deer abundance and concentrated herbivory in urban settings.

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White-tailed deer are the most widespread and abundant cervid in North America (Demarais et al., 2000). When protected from human harvest, deer populations are capable of irruptive population growth given their relative longevity and high reproductive capacity (McCullough, 1979, 1997). Flower (1931) stated that deer of the genus *Odocoileus* have a mean life span of 8 years, 10 months and 6 days. Masters and Mathews (1990) recorded female whitetails surviving beyond 9 years and remaining reproductively active in an unharvested population. Relatively few records exist of free ranging white-tailed deer living >10 years (Ozoga, 1969). The oldest free-ranging deer with age determined from counts of cementum annuli was a 20-year-old female in New York state (Sauer, 1984). Thomas and Bandy (1973) analyzed teeth from 859 black-tailed deer (*O. hemionus*); their oldest animal was a 19.5-year-old female. Records of extreme longevity include accounts of captive females living to ages of 17-19 years (Rue, 1978). We are unaware of more recent reports of long-lived deer, especially in Midwestern North America.

Herein, we report finding the remains of an old-aged female white-tailed deer from an unharvested population within the city limits of Carbondale, Illinois, <1 km north of Southern Illinois University Carbondale (SIUC) property. This deer was found by researchers during May 2004 while searching for fawns as part of another study (Rohm et al., 2007, 2008). Mortality of this individual had likely occurred during the winter months (but not earlier) given the stage of decomposition. No broken long bones indicative of trauma were noted, nor was hunting legal within city limits, thus, we concluded the animal likely died of natural causes (i.e., senescence). This deer was wearing a radiocollar

(frequency 151.744 MHz) from a previous study (Cornicelli, 1992; Cornicelli et al., 1996), thus we knew the animal was captured as an adult in 1991. Remarkably, the mortality location of this individual was still within its home range as calculated by Cornicelli (1992). We collected the lower jaw from this animal and excised an incisor for analysis of cementum annuli (Gilbert, 1966). We counted cementum annuli using a microscope and concluded this animal was 16 years old, making its birth year 1988.

Old-aged deer such as this individual have important implications to population dynamics and vegetation use of deer in developed landscapes, especially if several individuals in the population are able to achieve this age. Older females will contribute fawns to the population over a longer temporal period. Although we did not study fawn recruitment rates during the entire interval this animal was alive, recruitment was estimated at 0.57 fawns/adult doe on SIUC campus during 2007 (Hubbard and Nielsen, 2011). Therefore, this animal may have produced up to 9 recruits during her lifetime, depending on how many years she was reproductively active and given that recruitment rates were similar to the 2007 estimate during 1988-2004. These simple speculations outline the importance of knowing the age-structure of deer populations, as well as adult survival and fawn recruitment rates (Woolf and Harder, 1979).

This individual apparently used a similar home range for the 15 years between her home range calculation by Cornicelli (1992) and when the deer was found dead. Lesage et al. (2000) found that deer in high-density populations coincident with suburban areas were more philopatric than those in low-density populations. Kilpatrick et al. (2001) and McNulty et al. (1997) also reported that female deer demonstrated high philopatry to home ranges even as population abundance in both areas was reduced considerably. The implications of philopatry for long-lived deer include potentially severe herbivory impacts to forage resources in a relatively small area given the long-term presence of individual deer.

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