

## BREEDING SEASON OF WHITE-TAILED DEER IN EASTERN OKLAHOMA

M. R. Dunbar<sup>1</sup>

Department of Zoology, Oklahoma State University, Stillwater, Oklahoma

Peak breeding season of a population occurs when the majority of that population is actively engaged in breeding. Peak breeding season dates of white-tailed deer (*Odocoileus virginianus*) vary throughout the central United States. Robinson, *et al.* (1) reported sperm production of deer peaked during late December and early January in central Texas. The peak breeding season date for deer in northern Arkansas is 13 November, while in southern Arkansas it is 5 December (2).

Owing to buck-only hunting, up to 86% of antlered deer are removed from some areas in eastern Oklahoma. The 1972 pre-hunting season antlered:antlerless ratio in the Gruber Public Hunting Area, located in Cherokee County near Muskogee, Oklahoma, was estimated to be 1:12 (3). Following buck-only hunting this ratio was reduced to 1:52. This post-season sex ratio may be inadequate for maximum breeding success. Consequently, a large percentage of unbred does might result if this season were held prior to the peak of the rut. This study was conducted to determine breeding dates of white-tailed deer and to test the effectiveness of existing deer hunting dates in eastern Oklahoma.

Reproductive organs were collected 18 and 19 November, 1972 from deer on the Cookson Hills Game Refuge, located in Cherokee County near Tahlequah, Oklahoma, and 24-26 November, 1972 from McAlester Naval Ammunition Depot (NAD), located in Pittsburg County near McAlester, Oklahoma. Twenty-four pairs of testes and epididymides (thirteen from Cookson and eleven from NAD) were removed from freshly killed deer and stored on ice for 12-24 hours, then preserved in ten percent neutral buffered formalin. Since spermatogenic activity was similar among the first fifteen testes randomly selected, the remaining nine were not examined.

Testes were embedded in paraplast, sectioned at ten microns, and stained with hematoxylin and eosin. Sections were examined microscopically for the presence of spermatozoa using the technique described by Christian (4). An index to relative sperm density described by Tiemeier (5) was used in the examination of epididymides (0 = no sperm, 1 = occasional sperm, 2 = frequent sperm, 3 = many sperm, 4 = masses of sperm).

Female reproductive tracts from twelve adult does ranging in ages from yearling to seven and one-half years from the Gruber and NAD areas were collected during a special antlerless hunt on 16 and 17 December, 1972. Uteri were examined for embryos and ages were determined using crown-rump measurements. (6) These uteri contained eight embryos with mean crown-rump length of  $8 \pm 2$  mm S.D., indicating a mean embryo age of 32 days. (7) These indicate the mean date of conception was 13 November, the same as reported by Wilson and Sealander (2) in northern Arkansas.

Testes of ten deer from Cookson Hills Game Refuge were examined. Nine showed signs of germ cell degeneration and cessation of spermatogenesis. Only one was still fully producing sperm. Five testes from NAD were examined, and all showed gross signs of germ cell degeneration and disarrangement of germ cell types. Germ cell degeneration and disarrangement of germ cell types within the seminiferous tubule lumen of those testes collected from Cookson indicate peak breeding season had passed and occurred just prior to 18 November. All twenty-four pairs of epididymides collected contained numbers of spermatozoa with indices between 3 and 4.

These data suggest that the most effective buck-only deer season in eastern Oklahoma should occur between mid-November and early December. Deer hunting prior to about 11-15 November could result in bar-

<sup>1</sup>Present address: Dept. of Fish and Game, Box 1336, Salmon, Idaho 83467  
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ren does in areas where bucks are heavily harvested. To prevent deer hunting in a period when bucks are shedding antlers, buck hunting should be before early December. This is the current policy in eastern Oklahoma, with hunting dates usually occurring in the latter part of November.

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