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Philip A. Tappe
University of Arkansas at Monticello, ptappe442@gmail.com

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PHILIP A. TAPPE

Arkansas Forest Resources Center, University of Arkansas, Monticello, AR 71656

Correspondent: tappe@uamont.edu

Between 1990 and 2000, the human population in Arkansas increased 13.7%. The northwest corner of the State had the greatest increase with the population in Fayetteville-Springdale-Rogers metropolitan area growing by 47.5% (Perry and Mackun, 2001). Arkansas also harbors an abundant white-tailed deer (*Odocoileus viginianus*) herd. No reliable statewide estimates of the size of Arkansas's deer population are available; however, legal statewide deer harvests have ranged from 90,910 in 1990 to 194,687 in 1999 (AGFC, 2004). As human populations continue to increase, encroachment into areas populated by deer is inevitable, thus increasing deer-human interactions and conflicts. Arkansas' first attempt to reduce the size of a nuisance urban deer herd via an archery hunt occurred in 2002 at Bull Shoals in Marion County.

In Arkansas, deer-vehicle collisions are a very visible negative consequence of an increasing human population combined with an abundant population of white-tailed deer. Farrell (2003) found that deer-vehicle accident occurrence in Arkansas counties was influenced more by roadway features, level of urbanization, and human population densities than by deer densities or landscape characteristics. However, landscape characteristics in Arkansas were useful in predicting site-specific probabilities of deer-vehicle collisions (Enderle, 2003).

There is no nationwide data clearinghouse for reporting deer-vehicle collision information. However, several studies have reported information, or estimated the effects, of deer-vehicle collisions. It is estimated that nationwide, at least 1.5 million deer-vehicle collisions occur annually (Conover et al., 1995). These accidents result in about $1.1 billion of damage to vehicles ($\bar{x}$ = $1,577/vehicle) and at least $200 million in loss of life or injury (Conover et al., 1995). Human injury rates have been reported at 4% (Conover et al., 1995; Hansen, 1983) and death rates at 0.03% (Conover et al., 1995). Peaks in deer-vehicle collisions typically occur late in the evening, at night, and in the early morning. Seasonally, they peak in the fall with a smaller peak in the spring (Allen and McCullough, 1976; Carbaugh et al., 1975).

In Arkansas, records on deer-vehicle collisions are not readily available or do not exist. Vehicle accident reports filed with the Arkansas State Police are the most extensive and reliable source of information on deer-vehicle collisions available in Arkansas, and thus, these reports were used to provide the following descriptive statistics on deer-vehicle collisions in the state.

Vehicle accident reports involving deer from 1998-2001 were obtained from the Arkansas State Police. These reports were of accidents that occurred on state and federal highways and were of a serious enough nature to require a response from the state police. Thus, these accidents were not representative of all deer-vehicle collisions in Arkansas. Information was not available on accidents that occurred on roads maintained by a county or municipality or on any accident that was not reported. While it is unknown what percentage of deer-vehicle collisions the vehicle accident reports represented, the information that was available likely represented deer-vehicle collisions that were the most serious and costly.

Accident reports were available only as hardcopy reproductions. Every report filed with the Arkansas State Police during 1998-2001 was inspected to identify accidents that involved a deer. Identified reports were photocopied at the Arkansas State Police headquarters in Little Rock, and

Table 1. Summary of deer-vehicle collision information obtained from Arkansas State Police vehicle accident reports.

Parameter	Year				Overall Total	Overall Mean
	1998	1999	2000	2001		
Number of collisions	1,420	1,618	1,248	1,572	5,858	1,465
Number of human injuries	15	7	6	12	40	10
Percent with human injuries	1.1	0.4	0.5	0.8	---	0.7
Number with deer deaths[1]	478	575	419	416	1,888	472
Percent with deer deaths	69.6	69.0	67.4	63.3	---	67.5
Mean damage estimate per vehicle	$1,868	$1,918	$1,975	$1,947	---	$1,926
Total damage estimates per year	$2,554,215	$2,938,773	$2,324,045	$2,945,245	$10,762,278	$2,690,570

[1] Fate of deer was determined in a total of 2,799 deer-vehicle collisions.

then pertinent information was entered into a database. This information included the year, date, time, location, gender of deer involved, fate of deer (death or ran away injured), fate of vehicle occupant(s), and a monetary estimate of vehicle damage.

Annual means were computed for vehicle-damage estimates. Numbers of human injuries and deer deaths were summarized by year and averaged across years. Numbers of collisions were averaged across years by time and month. Proportions of bucks and does involved in collisions were averaged across years by month.

A total of 5,858 vehicle accident reports, averaging 1,465 per year, indicated the occurrence of a deer-vehicle collision (Table 1).

Collisions were recorded in all months, but most (>50%) occurred during October – December with a peak in November (Fig. 1). This time period coincides with white-tailed deer breeding activity in Arkansas which also peaks in November (AGFC, 2004). The number of collisions was greatest between 5:30 p.m. and midnight with a smaller peak occurring between 5:00 – 7:00 a.m. (Fig. 2). These time periods are consistent with diel activity patterns documented for deer in Arkansas (Cartwright, 1975; Pledger, 1975). Most deer (67.5%) were killed as a result of the collisions; 32.5% were injured and fled the collision site. The ultimate fate of these animals is not known. Overall, 48.3% of the collisions were with bucks and 51.7% were with does. However, this proportion varied by month, ranging from 24.1% bucks and 75.9% does in June to 64.7% bucks and 35.3% does in November (Fig. 3). The larger proportion of bucks involved in collisions during October – December coincides with buck rutting activity in Arkansas (AGFC, 2004). Annually, the human injury rate averaged 0.7% with 6 – 12 vehicle occupants being injured per year (Table 1). Estimated damage to individual vehicles ranged from $0 - $20,000. Total estimated damage averaged almost $2.7 million/year with a mean of $1,926 per collision.

Decker et al. (1990) found that only 17-25% of deer-vehicle accidents are reported. If this is the case in Arkansas, then deer-vehicle collisions on state and federal highways may be as great as 9,000 annually. Including accidents that occur on roadways maintained by counties and municipalities could potentially double that number, resulting in an estimated 18,000 deer-vehicle collisions with

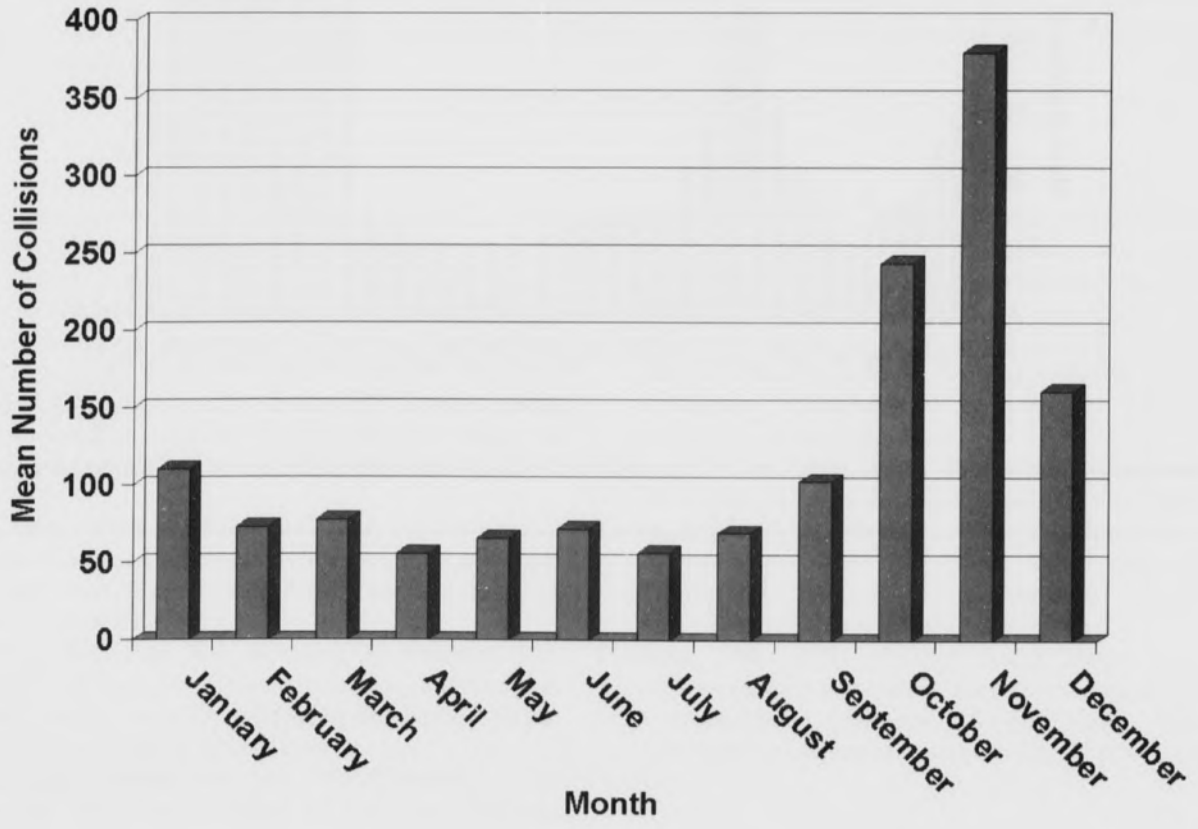

Fig 1. Mean monthly numbers of traffic accident reports filed with the Arkansas State Police during 1998 – 2001 that indicated the occurrence of a deer-vehicle collision.

an estimated loss of almost $35 million in vehicle damage annually. Given the potential economic impact, a statewide collaborative effort involving the Arkansas Game and Fish Commission, Arkansas State Police, Arkansas Department of Transportation, and county and local governments is needed to adequately address the issues surrounding deer-vehicle collisions. In addition to a unified, consistent effort to collect information and institute mitigation measures, educational efforts should be focused at both policy makers and the general public.

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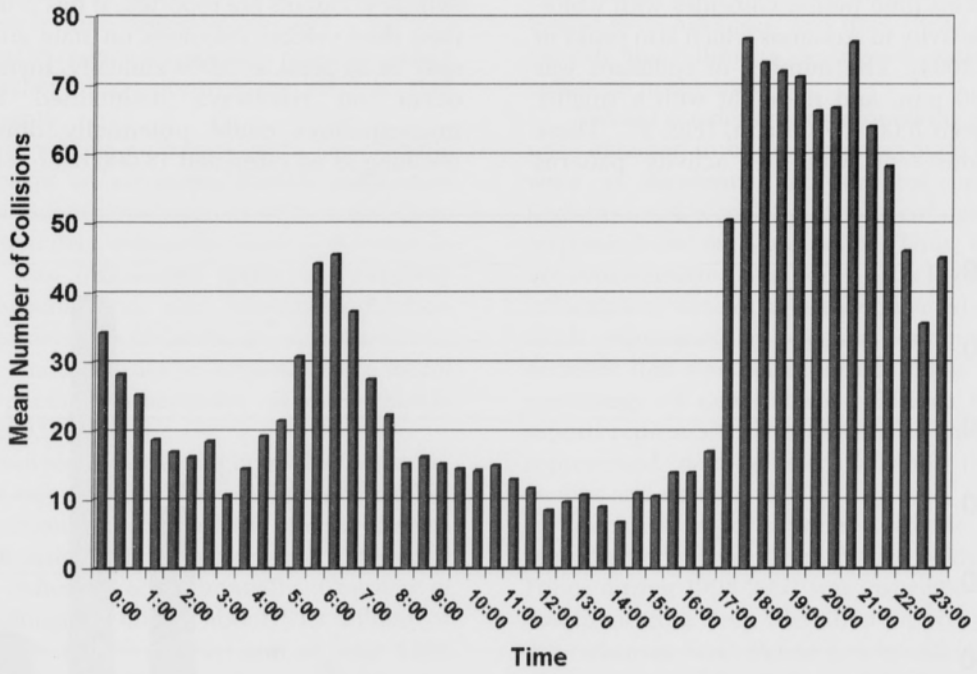

Fig 2. Numbers of deer-vehicle collisons by time of day reported to the Arkansas State Police in a traffic accident report during 1998-2001.

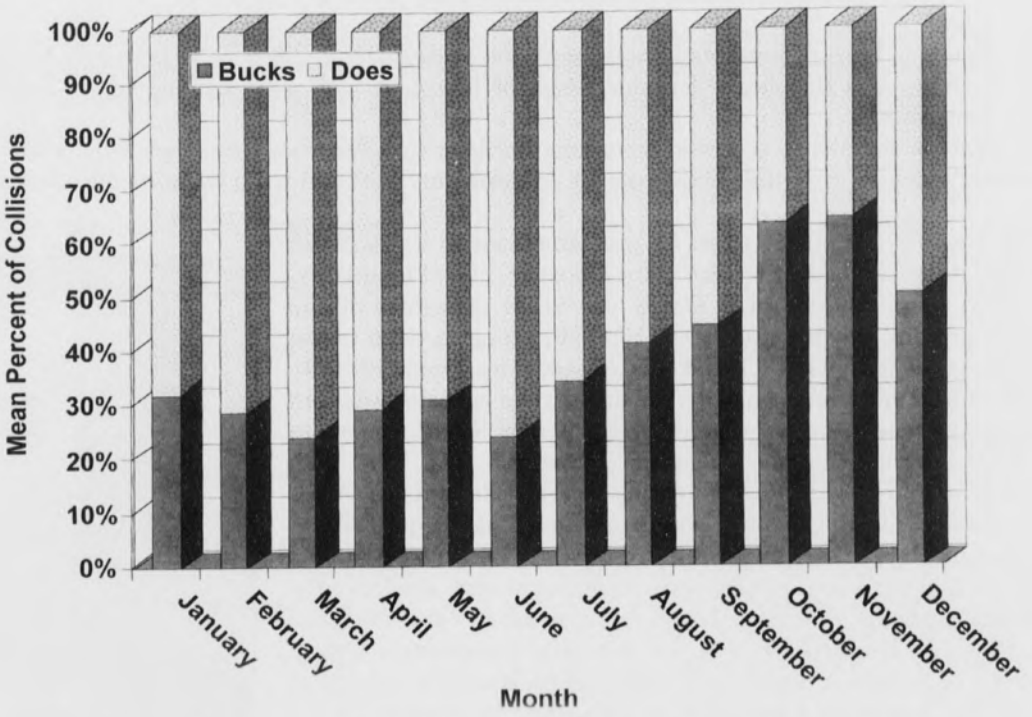

Fig 3. Sex ratios of deer involved in deer-vehicle collisions reported to the Arkansas State Police in a traffic accident report by month during 1998-2001.

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