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Pils, Charles M.; Martin, Mark A.

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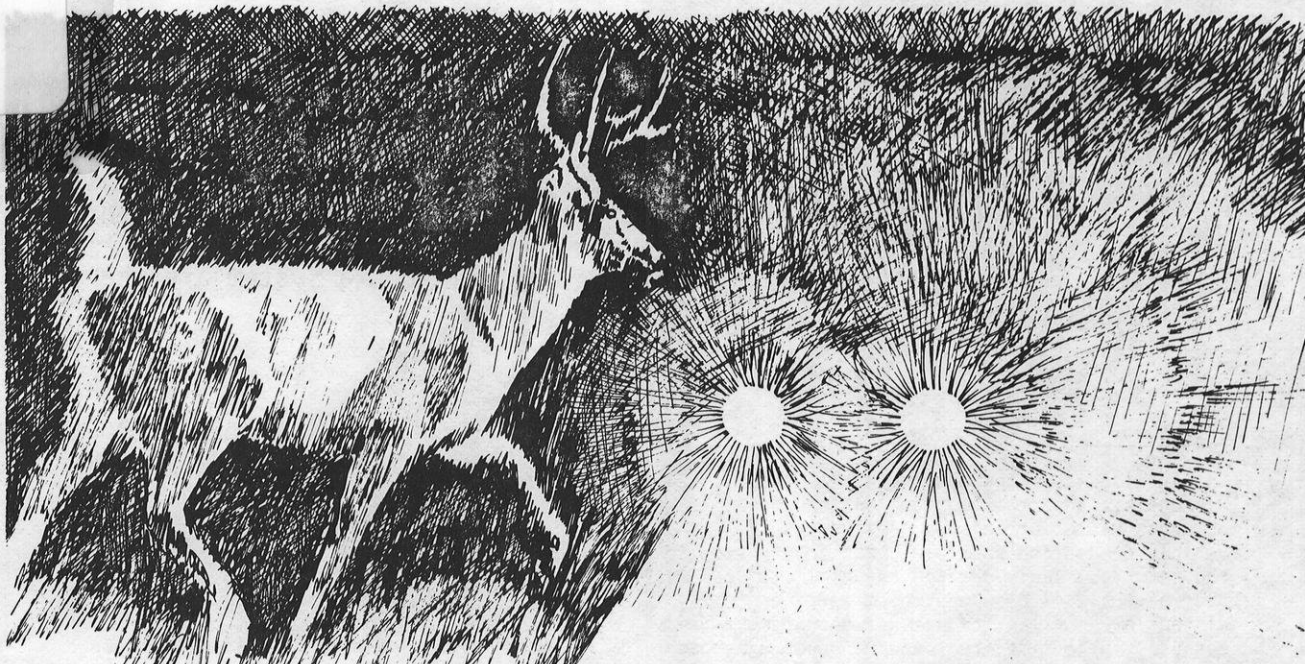
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# The Cost and Chronology of Wisconsin Deer-Vehicle Collisions

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DEPARTMENT OF NATURAL RESOURCES

**RESEARCH  
REPORT 103**  
NOV 1979

By

Charles M. Pils and  
Mark A. Martin  
Bureau of Research, Madison

## ABSTRACT

Individual and statewide motorist costs of hitting deer were determined by sending out 1,469 questionnaires to people involved in accidents in which deer were hit in three southern Wisconsin counties from 1976 through 1978.

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Returns from 949 accident victims indicated that mean insurance claims increased from \$407 in 1976 to \$503 in 1978, while average personal repair estimates escalated from \$189 to \$318 during the same period. Based on 18,200 deer killed annually from 1976 through 1978, the total loss borne by accident victims was \$22.1 million.

According to county accident reports, most deer-vehicle collisions occurred during early November, when the rut was in progress. Deer hunting activity caused an increase in collisions during late November. During all months, the highest rate of accidents occurred one to two hours after sunset. Defensive driving and continued use of the variable quota system are the best solutions to the problem of collision with deer.

### Introduction

White-tailed deer and motor vehicles abound in Wisconsin. When the two meet on the highway, numerous killed or injured deer, extensive vehicle damage and possible human injury are the results. Badly damaged or unsalable dead deer have always been a problem for the Wisconsin Department of Natural Resources because of the time, fuel and manpower expended to pick up and dispose of carcasses. The less damaged, salable deer killed by vehicles also require considerable attention by DNR personnel. Problems associated with their disposal were lessened in 1976, when Wisconsin motorists were given the option of salvaging deer that were hit and killed by vehicles. However, only 19% of the recorded 1974-78 highway kills were salable.

This report (1) shows the cost to individual motorists of hitting a deer; (2) estimates the total statewide dollar losses resulting from deer-vehicle collisions; (3) explores the chronology of deer-car accidents to determine in which months and at what time of day deer are most commonly struck by vehicles; and 4) offers some solutions to the collision problem.

### How Many Deer Are Being Hit by Vehicles?

Estimating the total numbers of deer hit on Wisconsin roads is a difficult task. DNR researchers have estimated that at least 30% of the deer struck by vehicles go unreported or unrecovered (D. R. Thompson, pers. comm.). Deer killed by vehicles and recovered were recorded on a calendar year basis through 1975. From that point on, all dead deer handled by the DNR, including illegal gun or bow kills, dog kills, vehicle kills and deaths from unknown causes were reported on a July 1 to June 30 basis as either seized deer (salable and unsalable) or vehicle-killed deer given free to driver or other persons at the scene of the accident. The total number of vehicle-killed deer reported after 1975 was thus virtually impossible to determine. The number of deer reported killed on the highways during 1974 and 1975 was about 14,000 and the total number of deer reported during 1976 and 1977 was 14,755. Therefore, we used a conservative estimate of 14,000 + 30% (animals hit but unreported), or 18,200 deer

killed on the highway to represent the average annual loss during our 1976 through 1978 study period.

### Accident Reports -- A Valuable Source of Information

County motor vehicle accident reports supplied us with the names and addresses of motorists involved in deer-vehicle collisions, as well as the appropriate dates, times and locations of the accidents. We chose accident victims in Dane, Dodge and Columbia counties as representative sources of information from southern Wisconsin. From 1976 through 1978, 1,469 questionnaires were sent out to deer-vehicle accident victims to determine the cost of the damage. Results of the questionnaires were segregated into personal and insurance damage estimates and average figures were determined for each category. Both averages were then multiplied by 18,200 (the estimated number of annual vehicle-deer collisions). The results were added together to determine how much money these accidents cost Wisconsin motorists.

### Cost to Wisconsin Motorists

Almost 65% (949 returns) of the 1,469 questionnaires sent out were returned with usable information. Average insurance claim estimates increased from \$407 in 1976 to \$503 in 1978, while average personal repair estimates rose from \$189 in 1976 to \$318 in 1978 (Fig. 1). These costs are somewhat lower than the 1976 National Safety Council estimates of \$670 in property damage for vehicle accidents of all types. Similarly, total damage cost estimates increased sharply to \$167,801 (insurance and personal) during 1978 (Fig. 1).

Inflation was probably the chief culprit in the steady rise of costs during the study. Personal estimates of damage were lower than insurance estimates because the former represented less serious accidents which could usually be repaired by the motorist involved. Cost estimates varied from \$0 to \$2,400 (personal and insurance) and included two motorcycle accidents. One motorcyclist and his passenger were both unharmed after hitting a deer on the highway. Other bizarre accidents included a motorist hitting two deer at once and a Dane County police car striking a deer

at 100 mph (\$2,300 damage) during a high-speed pursuit!

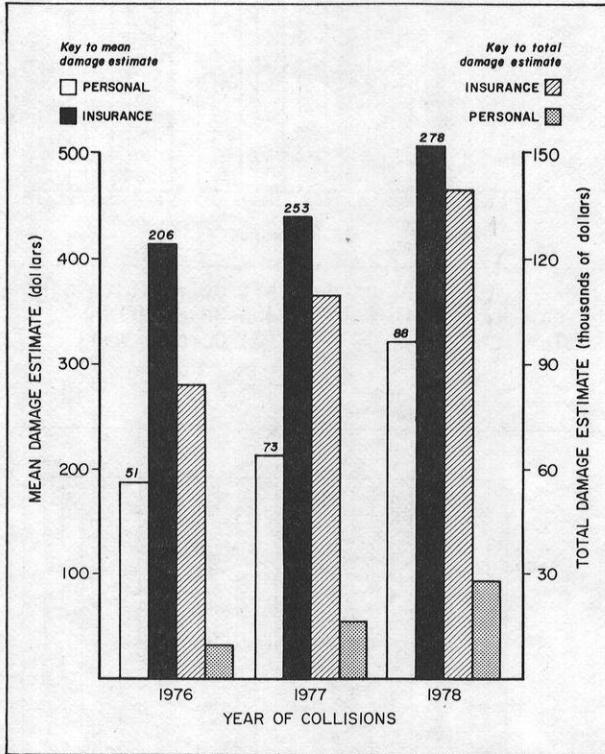


FIGURE 1. A comparison of mean and total damage estimates resulting from 949 deer-vehicle collisions in Dane, Dodge and Columbia Counties, 1976-78. (The number above each bar represents sample size.)

When personal and insurance average damage estimates were multiplied by 18,200 collisions to determine the total statewide monetary damages for individual years, the 3-year total loss suffered by motorists was \$22.1 million! Once again, inflation probably caused the gradual increase in costs from 1976 to 1978 as illustrated in Figure 2. Our total Wisconsin damage cost estimates are thought to be conservative because we used the same number of deer killed each year of the study period as a basis for our calculations, due to the difficulties in determining the reported annual car kill after 1975. Arnold (1978), who used National Safety Council data and the combined DNR-State Police deer-vehicle collision totals, concluded that these accidents cost Michigan residents over \$25 million in 1975 and 1976. Therefore, deer-vehicle crashes have resulted in a severe dollar drain, especially when figured on an annual basis.

Factors Causing Collisions

Many factors influence the frequency of deer-vehicle collisions, including the size of local deer populations, type of roadway (interstate, state highways or county trunks), traffic volume, road (wet or icy roads) and light conditions, time of day and month of the accident. Arnold (1978) found that: (1) 78% of the collisions occurred on dry roads; (2) the highest percentage (52%) of the accidents took place on local (county or town) roads; (3)

collisions were most frequent during the November deer rut and (4) there was a closer relationship between the number of deer-vehicle accidents and traffic volume than between the number of these accidents and deer densities. One additional point of interest in the Michigan study was the relationship between collisions and traffic speed. During early 1974, in the period following the "oil shortage" of late 1973 and the inauguration of the 55 mph speed limit, the upward trend of deer-vehicle accidents reversed itself in Michigan. This fact suggested that deer-vehicle crashes may be more preventable at slower speeds.

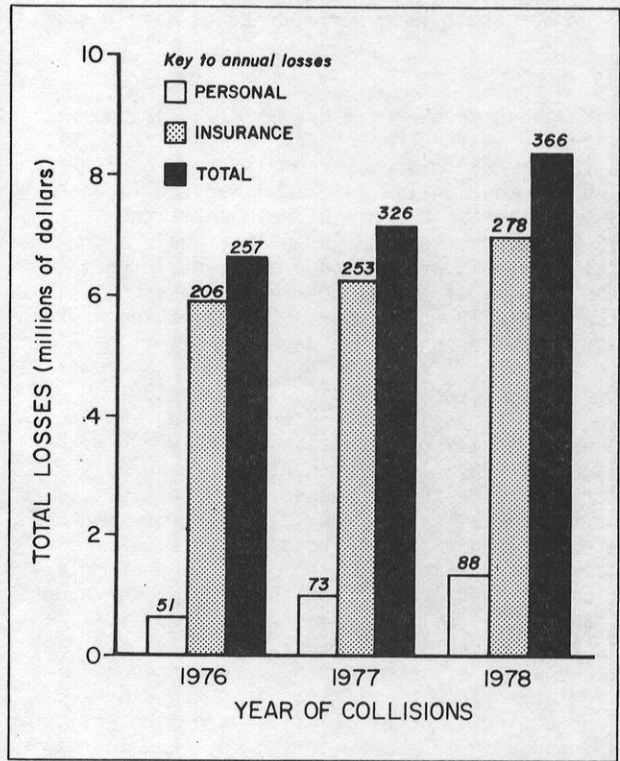


FIGURE 2. Projected statewide annual monetary losses from deer-vehicle collisions in Dane, Dodge and Columbia Counties, 1976-78. (The number above each bar represents sample size.)

The Chronology of Deer-Vehicle Accidents: November -- A High Risk Month

We selected Columbia County to look at the chronology of collisions because it had the greater amount of information as a result of its high number of deer-vehicle crashes. Columbia County recorded 1,151 such collisions during 1976-78. Looking at the monthly percentages of deer hit by vehicles in Columbia County (Fig. 3), the highest percentage of collisions (26) occurred in November. August, on the other hand, had the lowest percentage of collisions (3). Why does November rank so far above the other months? The primary reason, previously mentioned for Michigan, was the advent of the rut, the period of high male sexual activity. In southern Wisconsin, the rut begins about the last week of October. We graphically illustrated (Fig. 4) the increasing effect of the rut on deer mortality on Wisconsin highways by grouping numbers of deer hit by 5-day periods

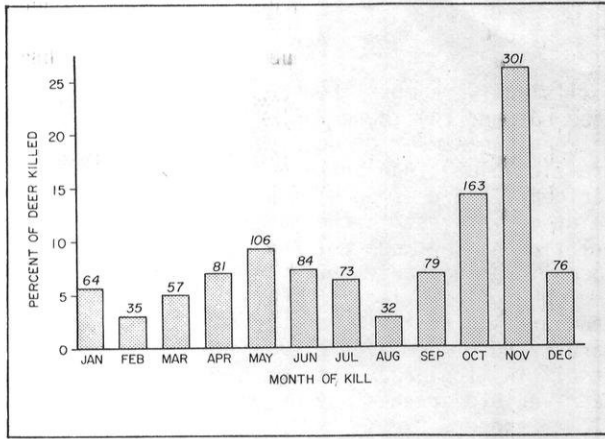


FIGURE 3. Monthly percentage of 1,151 deer hit by vehicles in Columbia County, 1976-78. (The number above each bar represents sample size.)

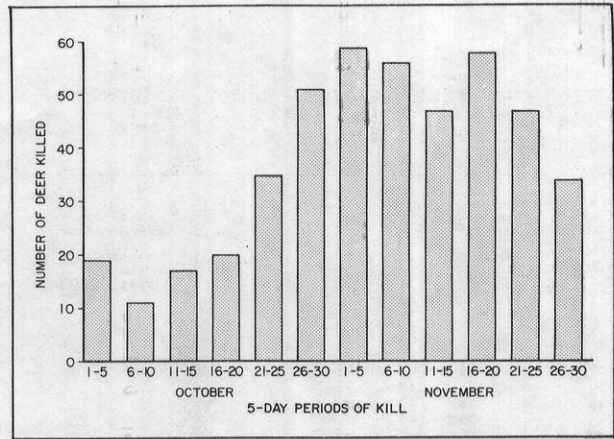


FIGURE 4. Numbers of deer hit by vehicles during 5-day periods in October and November in Columbia County, 1976-78 (31 October kill omitted).

throughout October and November. A gradual increase in the crashes can be noted from 6-10 October to a peak from 1-5 November. From 1-5 November until 11-15 November, collisions subside as the rut diminishes, until the 16-20 November period, when they again increase. This surge is probably due at least in part to the opening of the Wisconsin deer season, which traditionally occurs during Thanksgiving week in November and runs for 9 days.

During the deer gun season, between 650,000 and 700,000 Wisconsin hunters are afield, causing deer to move much more than normally and with less caution. The high hunting pressure, combined with the increased sexual activity of the bucks, causes many deer to cross and be struck along Wisconsin roads in November. Returning to Figure 3, the percentage of collisions is much lower from February through August than in the fall months. A small peak in accidents occurs during May, possibly as a consequence of the greening of herbaceous vegetation such as alfalfa after the winter. Deer coming through the winter are more active and probably move more during May than in the previous three to four months in an effort to graze on the new growing crops. These more frequent movements probably increase the chances of deer-vehicle collisions.

Watch out after Sunset

Sunset marks the time of day when most collisions on the highway occur. We use the times of 1,743 collisions from Dane, Dodge and Columbia counties and calculated monthly accidents per hour to determine daily patterns (Fig. 5). The highest rate of accidents occurring during the hours just after sunset was during the deer season. The rate of Columbia County daylight collisions was 12% greater during the deer season than during the rest of November, probably because hunting disturbance caused greater deer movements (Fig. 6).

The Future of Deer-Vehicle Collisions

Unless the current system used by the DNR to summarize deer road kills changes, it will be difficult to actually record, let alone

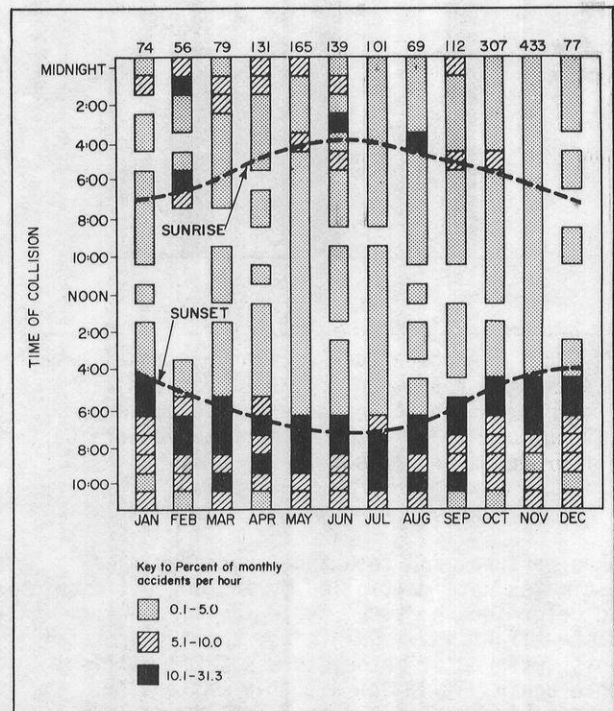


FIGURE 5. Percentage of monthly deer-vehicle collisions recorded per hour throughout the year in Columbia County, 1976-78. (The number above each bar represents sample size. All times are DST.)

estimate, future trends in the numbers of deer hit by vehicles. Due to the recent upsurge in gasoline prices and the likelihood of still higher prices, speed limits may be lowered or traffic volume may be reduced. The energy "crisis" may ultimately lessen the numbers of deer hit by vehicles, but whether it will is uncertain. On the other hand, tests of deterrents such as repellents, signs, fencing and reflectors have not shown a reduction in vehicle-deer collisions (Arnold 1978).

What can be done about the situation? While we found that only a very few severe human injuries resulted from collisions between vehicles and deer, the property damage remains high. Defensive driving is probably the most

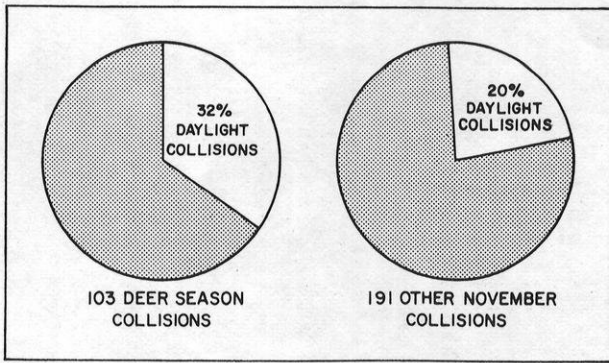


FIGURE 6. A comparison of the percentage of deer-vehicle collisions occurring during the deer gun season with those occurring during the rest of November in Columbia County, 1976-78.

immediate solution to the collision problem. High school driver education courses should stress the importance of properly scanning the landscape in areas frequented by deer. Proper defensive action when deer appear on the road should also be taught. The best long-range solution to the problem of waste of a valuable resource and chance of human injury is reduction of deer numbers through sport hunting. The continued wise use of the variable quota system is currently our best management tool for achieving this end. Public understanding and support of Wisconsin's current deer management system is crucial to controlling deer numbers and reducing the chances of deer-vehicle accidents.

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The authors are in the Farm Wildlife Research Group, Bureau of Research, Madison.

Ruth L. Hine, Editor  
 Anne G. Chacon, Copy Editor  
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