

DEER ON AIRPORTS: AN ACCIDENT WAITING TO HAPPEN

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ABSTRACT: The authors analyzed data on civil aircraft strikes with wild ungulates (deer [*Odocoileus* spp.], elk [*Cervus canadensis*] and moose [*Alces alces*]) in the U.S. from the Federal Aviation Administration (FAA) Wildlife Strike Database and the National Transportation Safety Board (NTSB) Aviation Accident Database for 1983 to 1997. Prior to 1991, the FAA Form 5200-7 for reporting strikes was designated solely for bird strike data, thus, strike reports for non-avian species prior to 1991 are underrepresented. A total of 343 ungulate strikes was reported, 48 from 1983 to 1990 and 295 from 1991 to 1997. Forty-four states reported ungulate strikes with 77% of the reports from states east of the Mississippi River. November had more ($P < 0.01$) strikes (23%) than any other month. The strike rate (number/hr) was four to nine times greater ($P < 0.01$) at dusk than at night or dawn. Almost two-thirds of strikes ($P < 0.01$) occurred during landing, making landing at dusk in November the most likely time for deer strikes. About 79% of strikes had an effect on flight. Aircraft were damaged in 83% of strikes. Only 14% of reports indicating damage provided estimates of cost of repairs. The mean cost for these reports was \$74,537. Reported human injuries have been few, but the potential exists for a major disaster. Aircraft with capacity of 101 to 380 passengers were involved in 45 (14%) of the reported strikes. Airports should adopt a "zero tolerance" for deer within the operations area. Deer removal by professional shooters, in conjunction with permanent exclusion with 3 m high fencing, is the preferred management action.

KEY WORDS: airplane, airport, collision, deer, *Odocoileus virginianus*, strike, vertebrate pest, wildlife damage

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INTRODUCTION

There has been a dramatic increase in the white-tailed deer (*Odocoileus virginianus*) population in the United States in recent years. In 1900, white-tailed deer had been hunted to near extinction with only about 100,000 remaining, but they now number over 26 million (Jacobson and Kroll 1994). In addition to white-tailed deer, other ungulates whose populations have recovered include mule deer (*O. hemionus*), elk, and moose. In this paper, all wild ungulates are referred to as deer unless specifically noted otherwise.

Deer-automobile collisions are becoming more common in the U.S., increasing from an estimated 200,000 incidents in 1980 to 538,000 in 1991 (Romin and Bissonette 1996). However, most people are unaware that deer collisions with aircraft are also a serious problem. Airports often are situated in outlying areas surrounded by woods, agricultural fields, and early successional habitats. Landing fields, planted with grasses and forbs, provide prime locations for grazing.

The authors' objectives were to document the extent and characteristics of deer/aircraft collisions in the U.S. and to discuss methods to reduce these collisions. Their goal is to make airport managers, pilots, and the public more aware of the seriousness of deer/aircraft collisions so that more effective management programs can be put in place at airports.

METHODS

The data for this study were taken from two sources, the FAA Wildlife Strike Database and the NTSB Aviation

Accident Database. The former relies on voluntary reporting of strikes to the FAA by pilots and other aviation personnel (primarily on FAA Form 5200-7). The latter comprises information collected by the NTSB during investigations of accidents or incidents involving civil aircraft. This study did not include incidents with military aircraft.

Form 5200-7 has been available since the 1960s; however, no quantitative analyses of strikes were done until 1995 (Dolbeer et al. 1995). In April 1995, the U.S. Department of Agriculture's National Wildlife Research Center, through an interagency agreement with the FAA, initiated a project to obtain more objective estimates of the magnitude and nature of the wildlife strike problem nationwide for civil aviation. This project included: 1) editing all strike reports (Form 5200-7) sent to the FAA to ensure consistent error-free data; 2) entering all edited strike reports into a wildlife strike database; and 3) supplementing FAA-reported strikes with additional non-duplicating strike reports from other sources (e.g., NTSB, Aviation Safety Reporting System, engine manufacturers and others [Cleary et al. 1997]). In addition, phone calls were sometimes made to obtain additional details about strikes where incomplete data were submitted. Using this approach, the authors have presently (February 1998) compiled data on all reported wildlife strikes for 1991 to 1997. In addition, data were obtained for some deer strikes going back to 1983 (Form 5200-7 did not request data on wildlife other than birds until 1991).

options such as complete fencing on smaller airports. The best approach will be to integrate several methods into a comprehensive wildlife management plan that is periodically evaluated and updated. The important point, as the strike statistics from 1983 to 1997 indicate, is that deer constitute a serious safety hazard on airports that must not be ignored.

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LITERATURE CITED

- ALDRICH, C. G., J. A. PATERSON, J. L. TATE, and M. S. KERLEY. 1993. The effects of endophyte-infected tall fescue on diet utilization and thermal regulation in cattle. *Journal of Animal Science* 71:164-170.
- BELANT, J. L., T. W. SEAMANS, and C. P. DWYER. 1996. Evaluation of propane exploders as white-tailed deer deterrents. *Crop Protection* 15:575-578.
- BELANT, J. L., T. W. SEAMANS, and C. P. DWYER. 1998a. Cattle guards reduce deer crossings through fence openings. *International Journal of Pest Management* 44 (In Press).
- BELANT, J. L., T. W. SEAMANS, and L. A. TYSON. 1998b. Predator urines as chemical barriers to white-tailed deer. *Proceedings of the 18th Vertebrate Pest Conference* (In Press).
- BELANT, J. L., T. W. SEAMANS, and L. A. TYSON. 1998c. Evaluation of three electronic frightening devices as white-tailed deer deterrents. *Proceedings of the 18th Vertebrate Pest Conference* (In Press).
- BELLIS, E. D., and H. B. GRAVES. 1971. Deer mortality on a Pennsylvania interstate highway. *Journal of Wildlife Management* 35:232-237.
- CARBAUGH, B., J. P. VAUGHAN, E. D. BELLIS, and H. B. GRAVES. 1975. Distribution and activity of white-tailed deer along an interstate highway. *Journal of Wildlife Management* 39:570-581.
- CLEARY, E. C., S. E. WRIGHT, and R. A. DOLBEER. 1997. Wildlife strikes to civil aircraft in the United States 1992-1996. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Serial Report No. 3.
- CONOVER, M. R. 1987. Comparison of two repellents for reducing deer damage to Japanese yews during winter. *Wildlife Society Bulletin* 15:265-268.
- CRAVEN, S. R., and S. E. HYGNESTROM. 1944. Deer. Pages D-25-40 in *Prevention and control of wildlife damage*, S. Hygnstrom, R. M. Timm, and G. E. Larson, eds. University of Nebraska Coop Extension Service, Lincoln.
- DOLBEER, R. A., S. E. WRIGHT, and E. C. CLEARY. 1995. Bird and other wildlife strikes to civilian aircraft in the United States, 1994. Interim report, DTFA01-91-Z02004. U.S. Department of Agriculture for Federal Aviation Administration, FAA Technical Center, Atlantic City, NJ.
- HAWKINS, R. E., W. D. KLIMSTRA, and D. C. AUTRY. 1971. Dispersal of deer from Crab Orchard National Wildlife Refuge. *Journal of Wildlife Management* 35:216-220.
- HOFF, J. S. 1995. Liability with animals. *Airport Business*. April 30.
- INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO). 1989. Manual on the ICAO bird strike information system (IBIS). Third edition. Montreal, Canada.
- ISHMAEL, W. E., and O. J. RONGSTAD. 1984. Economics of an urban deer-removal program. *Wildlife Society Bulletin* 12:394-398.
- JACOBSON, H. A., and J. C. KROLL. 1994. The white-tailed deer—the most managed and mismanaged species. Presented at Third International Congress on the Biology of Deer: Edinburgh, Scotland, August 28 to September 2, 1994.
- JONES, J. M., and J. H. WITHAM. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. *Wildlife Society Bulletin* 18:434-441.
- MONTONEY, A. J. 1994. White-tailed deer management program at O'Hare International Airport. *Proceedings of Bird Strike Committee USA* 4:18.
- ROMIN, L. A., and J. A. BISSONETTE. 1996. Deer-vehicle collisions: status of state monitoring activities and mitigation efforts. *Wildlife Society Bulletin* 24:276-283.
- SAUER, P. 1984. Physical characteristics. Pages 73-90 in *White-tailed deer ecology and management*, L. K. Halls, ed. Stackpole Books, Harrisburg, PA.