

United States  
Department of  
Agriculture

Animal and  
Plant Health  
Inspection  
Service

**Wildlife  
Services**

FY 2004

## **New Technologies to Deter Wildlife from Airports and Aircraft**

*Contact Information:*

*Dr. Robert Beason, Wildlife Services Research Wildlife Biologist*

*Ohio Field Station*

*6100 Columbus Avenue*

*Sandusky, OH 44870*

*Phone: (419) 625-0242 FAX: (419) 625-8465*

*E-mail: robert.c.beason@aphis.usda.gov*

*Web site: www.aphis.usda.gov/ws/nwrc*

### **National Wildlife Research Center Scientists Modify Airport Habitats and Study Adjacent Land Uses**

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques. NWRC's field station in Sandusky, OH, is dedicated to providing a scientific foundation for WS programs that reduce wildlife hazards at airports throughout the United States.

In order to be certified for commercial passenger traffic by the Federal Aviation Administration (FAA), many U.S. airports are required to develop and implement a wildlife hazard management plan. The FAA strongly discourages the placement of wildlife attractants, such as waste management facilities near airports. The FAA also requires that aircraft engines be designed to safely withstand impacts from large birds. NWRC's research is focused on understanding the nature of wildlife hazards at airports, developing management tools to reduce those hazards, and providing airport personnel with information on the latest strategies for controlling wildlife hazards.



### **Applying Science and Expertise to Wildlife Challenges**

**Wildlife Habitat Management and Other Land-Use Studies at Airports**—Habitat management is fundamental to reducing wildlife

use of airfields. NWRC scientists have been studying vegetation types and vegetation management practices for airports to determine if there are management schemes and vegetation varieties that are undesirable for food and loafing by birds and other wildlife. Birds showed a species-specific response to vegetation height with some birds preferring taller and some shorter grass. Small mammal use was reduced in all areas mowed for vegetation height management. Canada geese avoided feeding on an endophyte-infected fescue variety. Fescue cannot be grown everywhere; therefore, further research is necessary to determine additional species of plants that do not provide desired food and if grown at the correct density and height might also inhibit birds from using the area for any reason. Water detention/retention and waste management facilities are being investigated to determine which features cause those facilities to attract wildlife. Water and waste management facilities are fre-

• • • • •  
**Major Research Accomplishments:**

- WS developed a National Wildlife Strike Database of more than 60,000 reports.
- WS completed an FAA manual entitled "Wildlife Hazards Management at Airports", which was distributed by the FAA to certified airports in the United States and translated into French and Spanish for worldwide distribution.
- WS partnered with private industry to develop a non-lethal laser gun to disperse geese and other wildlife from airports and other problem sites.
- WS partnered with private industry to test the effectiveness of electric fencing as a wildlife deterrent.
- WS established the efficacy of an endophyte-infected fescue variety in reducing foraging by Canada geese.

quently located near airports and the wildlife they attract often cross the airfield creating a strike hazard.

**National Wildlife Strike Database**—NWRC, in cooperation with the FAA, developed a 15-year database that contains information on more than 60,000 wildlife collisions with commercial aircraft in the United States between 1990 and 2004. This database provides an objective assessment of the nature and magnitude of wildlife strikes and a foundation for studies and operational programs dealing with wildlife hazards to aviation. In addition, the database can be used by the aviation industry to develop standards for wildlife impact resistance in engines, windshields, and other airframe components. Oversight and maintenance of the database have been transferred to the WS National Coordinator for Airport Safety and Assistance.

**Wildlife Deterrents and Repellents**—NWRC scientists investigated a new type of electric fence on the market that incorporates polyester rope braided with copper wire to keep deer from entering selected areas. The fence was tested to determine if it could be used at airports that cannot afford chain-link fence or in locations where chain-link is unsuitable. The new electric fencing reduced

white-tailed deer intrusions by 88-99% during 3 winters. Based on the results of the test the fence should provide a suitable alternative for locations on airfields where chain-link fencing cannot be used or is undesirable. We are investigating the efficacy of other non-lethal control devices such as electric mats and effigies of large flocking birds that can be used to keep wildlife away from the vicinity of airports.

**Avian Visual Deterrents**—Lasers, pulsed landing lights, and warning patterns have been tested for their effectiveness in deterring birds. In collaboration with private industry, NWRC scientists developed a hand-held laser that is used worldwide by WS and animal damage management agencies to control wildlife use of selected locations. Other collaborative research with private industry evaluating pulsed aircraft lighting to alert birds to the presence of aircraft resulted in a jointly held patent (U.S. Patent Serial Number 10/286,570). Our research continues to investigate the capabilities of avian vision, seeking avenues to develop more effective visual deterrents and make aircraft more noticeable to birds.

#### Groups Affected by This Problem:

- Airline passengers
- Airline pilots
- Airline administrators
- Airport operators
- Aircraft and engine manufacturers
- Insurance underwriters
- Residents near airports

#### Major Cooperators:

- Airline Pilots Association
- Port Authority of New York and New Jersey
- National Park Service
- Federal Aviation Administration
- Western Washington Airports
- U.S. Air Force Bird Air Strike Hazard (BASH) Team at Kirtland Air Force Base
- U.S. Marine Corp

#### Selected Publications:

- Blackwell, B. F.; Bernhardt, G. E. 2004. Efficacy of aircraft landing lights in stimulating avoidance behavior in birds. *Journal of Wildlife Management* 68:725–732.
- Seamans, T. W.; Bernhardt, G. E. 2004. Response of Canada geese to a dead goose effigy. *Proceedings of the Vertebrate Pest Conference* 21:104-106.
- Washburn, B. E.; Seamans, T. W. 2004. Management of vegetation to reduce wildlife hazards at airports. *Proceedings of the FAA Airport Technology Transfer Conference*. Paper S-111 <http://www.airporttech.tc.faa.gov/att04/ATT04%20INDEX.htm>.
- Blackwell, B. F.; Huszar, E.; Linz, G.; Dolbeer, R. A. 2003. Lethal control of red-winged blackbirds to manage damage to sunflower: an economic evaluation. *Journal of Wildlife Management* 67:818-828.
- VerCauteren, K. C.; Hygnstrom, S. E.; Pipas, M. J.; Fioranelli, P. B.; Werner, S. J.; Blackwell, B. F. 2003. Red lasers are ineffective for dispersing deer at night. *Wildlife Society Bulletin* 31(1):247-252.
- Barras, S. C.; Wright, S. E. 2002. Civil aircraft collisions with birds and other wildlife in Ohio, 1990-1999. *Ohio Journal of Science* 102(2):2-7.
- Blackwell, B. F.; Bernhardt, G. E.; Dolbeer, R. A. 2002. Lasers as non-lethal avian repellents. *Journal of Wildlife Management* 66(1):250-258.
- Gorenzel, P. W.; Blackwell, B. F.; Simmons, G. D.; Salmon, T. P.; Dolbeer, R. A. 2002. Evaluation of lasers to disperse American crows from night roosts. *International Journal of Pest Management* 48:327–331.
- Seamans, T. W.; Blackwell, B. F.; Cepek, J. D. 2002. Coyote hair as an area repellent for white-tailed deer. *International Journal of Pest Management* 48:301–306.