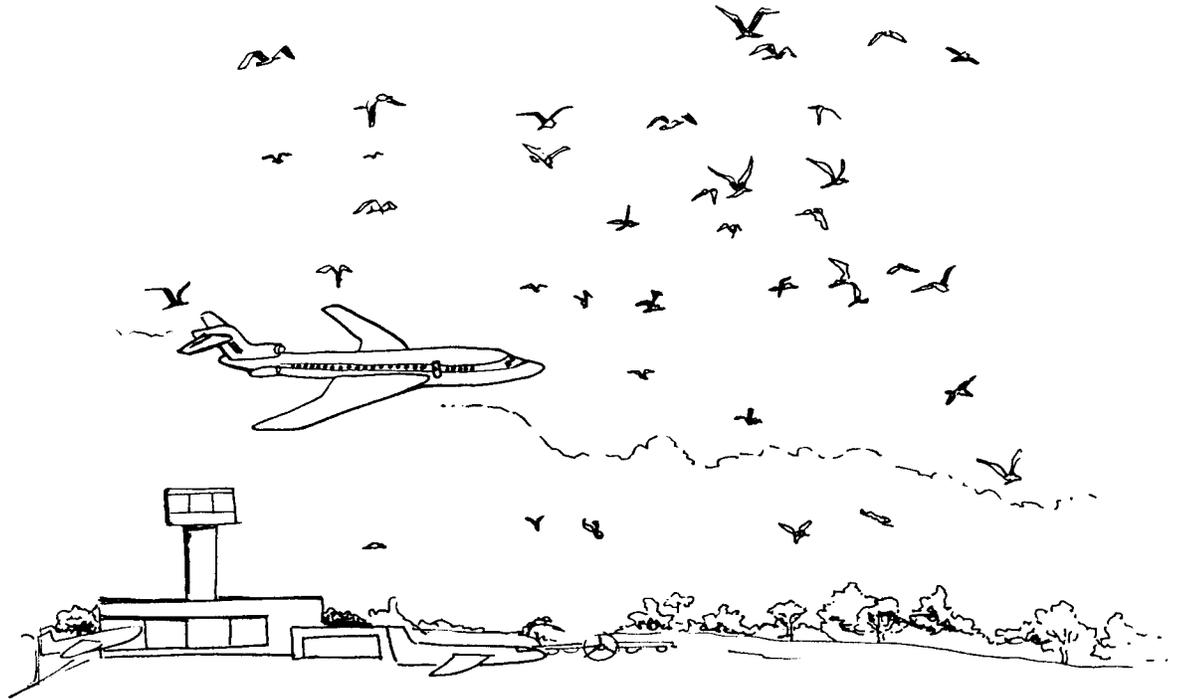


Alfred J. Godin
State Director (retired)
USDA-APHIS-
Animal Damage Control
Augusta, Maine 04330

BIRDS AT AIRPORTS



Birds are a serious hazard to aviation. A bird or a flock of birds that suddenly rises from a runway or surrounding area may collide with incoming or departing aircraft and cause the aircraft to crash, possibly resulting in the loss of human life. Bird collision with aircraft is commonly known as "bird strike."

Damage caused to aircraft usually results from collision of one or more birds with the engines and/or fuselage. Although most bird strikes do not result in crashes, they do involve expensive structural and mechanical damage to aircraft. The incidence of

this problem worldwide makes bird strike a serious economic problem.

Birds have been a hazard to aircraft from the first powered flight. During the early days of aviation, when aircraft flew at slow speeds, birds had little difficulty in getting out of the way. Bird strikes were infrequent and damage was mainly confined to cracked windshields. The likelihood of the loss of aircraft and/or human lives was remote. With the development and introduction of jet aircraft, bird strikes became a serious hazard and costly problem. Faster speeds mean birds have less time to react to approaching aircraft. The force gener-

ated by bird impact with a fast-moving aircraft is tremendous. The newer turbine engines use light-weight, high-speed mechanical parts which are vulnerable to bird strike damage.

The Federal Aviation Administration (FAA) prescribes rules governing wildlife hazard management at certified airports in the Federal Aviation Regulations: Part 139. The USDA-APHIS-ADC program recognizes the potential for aircraft accidents and loss of human life and considers bird hazards to aircraft a top priority. This program provides technical assistance to alleviate bird hazards to civilian airports and military airbases.



PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

**Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln**

**United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control**

**Great Plains Agricultural Council
Wildlife Committee**

Legal Status

Most bird species are protected by federal and state laws. The legal status of problem bird species at airports should be determined before control is attempted. Migratory birds are protected under the Migratory Bird Treaty Act of 1918 (16 USC 703-711), while nonmigratory species are protected under state laws. Some species are further protected by the Endangered Species Act of 1973 (Pub. Law 93-205). These laws state make it unlawful to pursue, capture, take, kill, or possess migratory birds or endangered and threatened species, except as permitted by regulations adopted by the secretary of the interior. Permits to take nonendangered migratory birds are issued only when the birds are causing, or have the potential to cause, a serious threat to public health and safety and when nonlethal methods have failed to solve the problem. A state permit also may be required to control migratory and nonmigratory birds protected by the state.

Airports

No two airports are exactly alike. Accordingly, bird hazards vary from airport to airport, even when the same species are involved. The occurrence of birds at airports varies according to habitat availability, weather, season of year, and time of day.

Bird Attractants at Airports

Airports provide a wide variety of natural and human-made habitats that offer food, water, and cover. Many airports are located along migratory routes used by birds. One of the first steps in reducing bird hazards is to recognize these attractants. Usually, several attractants acting in combination are responsible for the presence of birds and their behavior at an airport.

Food. Birds require relatively large amounts of food. Most airports support an abundance and variety of foods such as seeds, berries, grass, insects, grubs, earthworms, small

birds, and small mammals. Seeds and berries are sought by several migratory and resident birds such as sparrows, finches, starlings, blackbirds, mourning doves, common pigeons, and waterfowl. Geese are attracted to open expanses of grasses. Gulls, starlings, robins, and crows often feed on earthworms on the surface of the ground following a rain. Gulls are opportunistic feeders and frequently feed on grasshoppers and ground-nesting birds. Raptors are attracted to airports because of rodents, birds, and other small animals that harbored by tall, poorly maintained grass stands and borders.

Occasionally, food becomes available through careless waste disposal practices by restaurants and airline flight kitchens. Airport personnel have been known to feed birds during their lunch breaks. Many airports have inadequate garbage disposal systems that permit access to various food items. These are a favorite of several species of birds, especially gulls. Nearby landfills or sewage outlets may also provide food for birds and other wildlife.

Landfills are often located on or near airports because both are often built on publicly owned lands. In these circumstances, landfills contribute to bird strike hazards by providing food sources and loafing areas that attract and support thousands of gulls, starlings, pigeons, and other species. Generally, landfills are a major attraction for gulls, the most common bird involved in bird strikes. Waste paper, paper bags, and other litter blowing across the ground attract gulls, presumably because litter is mistaken for other gulls or for food. A gull that is attracted to litter decoys other gulls and encourages flocking.

Water. Birds of all types are drawn to open water for drinking, bathing, feeding, loafing, roosting, and protection. Rainy periods provide temporary water pools at many airports. Many airports have permanent bodies of water near or between runways for landscaping, flood control, or wastewater purposes. These permanent

sources of water provide a variety of bird foods, including small fish, tadpoles, frogs, insect larvae, other invertebrates, and edible aquatic plants. Temporary and permanent waters, including ponds, borrow pits, sumps, swamps, and lakes, attract gulls, waterfowl, shorebirds, and marsh birds. Fresh water is especially attractive in coastal areas.

Cover. Birds need cover for resting, loafing, roosting, and nesting. Trees, brushy areas, weed patches, shrubs, and airport structures often provide suitable habitat to meet these requirements. Almost any area that is free from human disturbance may provide a suitable roosting site for one or more species of birds. Starlings, pigeons, house sparrows, and swallows often roost or nest in large numbers in airport buildings or nearby trees, shrubs, or hedges. Large concentrations of blackbirds and starlings are attracted to woody thickets for winter roosting cover. Gulls often find safety on or near runways of coastal airports when storms prevent their roosting at sea, on islands, or on coastal bays.

Migration

Many airports are located along traditional annual bird migration routes. Birds may suddenly appear in large flocks on or over an airport on their annual migration, even when the airport itself offers no particular attraction. Dates of migration vary by species and area. Flock size of a given species may vary widely from year to year depending on time of year, weather conditions, and many other factors.

Local Movements

Shorebirds, waterfowl, gulls, and other birds often make daily flights across airports from their feeding, roosting, nesting, and loafing areas. Airports near cities may experience early morning and late afternoon roosting or feeding flights of thousands of starlings.

Damage Prevention and Control Methods

Bird strike hazards reoccur regularly at many airports and require constant attention. Before attempting to reduce bird hazards at an airport, it is important to assess the problem, identify contributing factors, and analyze the threat to aircraft and human safety. A wildlife hazard management plan should be implemented (and may be required by FAA) to make the airport unattractive to birds. Scaring or dispersing birds away from airports is usually difficult because birds are tenaciously attracted to available food, water, and cover. As long as these attractants exist, birds will be a problem.

In most situations, a wildlife biologist trained in bird hazard assessment should be selected to conduct a thorough ecological study of the airport and its vicinity. The study should determine what species of birds are involved, what attracts them, abundance and peak use periods and special hazard zones. It should also include control recommendations to reduce the frequency of bird occurrence at the airport.

Habitat Modification

Several habitat management practices can make an airport less attractive to birds. These include eliminating standing water, removing or thinning trees, removing brush and managing grass height. Buildings can be modified to reduce or eliminate roosting or nesting sites.

FAA Order 5200.5A provides guidelines for the establishment, elimination, or monitoring of landfills, open dumps, or waste disposal sites on or in the vicinity of airports.

Frightening

Frightening is a reliable and expeditious means of repelling birds. Frightening programs, however, provide only temporary relief and require constant monitoring.

An early priority in reducing bird hazards is to establish a bird dispersal patrol team to harass and scare birds and provide immediate protection for aircraft within the airport perimeter.

The patrol team must consist of highly motivated and knowledgeable personnel with adequate equipment, such as radio-equipped vehicles, shotguns, and frightening devices consisting of bird distress calls, live ammunition, and pyrotechnic devices (automatic gas exploders, shellcrackers, and racket bombs). Patrol personnel must be trained in bird identification and dispersal methods. Clear communication between the patrol team and the control tower is essential.

Birds react to unfamiliar sounds and objects. They learn, however, to ignore sounds and objects that have proven harmless, especially if they are used often and for long periods of time. Birds should not be allowed to acclimate to a scare device through repeated exposure without an associated adverse effect. The use of shooting to reinforce frightening techniques can be effective and should occur simultaneously with the scare devices often enough to maintain fear in the birds. In most cases, an integrated approach that incorporates several frightening devices will produce the best results.

The shellcracker fires a projectile from a 12-gauge shotgun. It travels up to 100 yards (90 m) and explodes with a loud noise and a flash. Noise bombs are similar and can supplement shellcrackers, but their range is much shorter. Racket bombs are propelled by a special pistol and travel approximately 100 yards (90 m); they do not explode.

Shellcrackers and racket bombs may lose their effectiveness when used frequently. It may be necessary to use live ammunition to kill an occasional bird. Remaining birds then become more responsive to the noise devices. Remember that a permit is required to take protected species.

Distress calls are sounds emitted by birds under conditions of stress. The

calls can be recorded on tape cassettes and played through a loudspeaker located on the patrol vehicle. Distress calls supplement shellcrackers and noise bombs.

Automatic exploders or gas cannons, operated by acetylene, propane, or LP gas, produce a noise louder than a shotgun blast. Exploders can be set up and left to operate continuously, but for best results, the exploders should be operated for limited periods of time only, unless birds are moving into the airport. Exploders should be moved periodically so that the birds do not become accustomed to the blasts.

Repellents

Research has been conducted on the efficacy of methyl anthranilate (ReJeX-iT, Peter Vogt, PMC Corp., pers. commun.) for repelling gulls and waterfowl from standing pools of water on airport runways. Results are promising and registration of ReJeX-iT by the Environmental Protection Agency is currently pending. Methyl anthranilate is a grape-flavored food additive.

Shooting

Shooting birds with shotguns or rifles can be a highly selective and useful form of hazard control under certain conditions. Federal, state, and possibly municipal permits are required. Shooting has been used to reduce hazards caused by birds that habitually fly over airport runways. Caution must be used so that shooting does not disturb nontarget species. Shooting is not practical or desirable as a method for reducing large numbers of birds.

Airport Assistance

USDA-APHIS-ADC provides technical and operational assistance to airports on all aspects of wildlife hazard management, including workshops on bird hazard management, conducting environmental assessments, and developing airport wildlife hazard management plans.

Acknowledgments

I thank James Forbes, USDA-APHIS-ADC, and Eugene LeBoeuf, Federal Aviation Administration, for reviewing the manuscript.

For Additional Information

Arnold, K. A. 1981. Environmental control of birds. Pages 499-505 *in* D. Pimentel, ed. CRC handbook of pest management in agriculture, vol. 1. CRC Press, Boca Raton, Florida. 597 pp.

Brough, T., and C. J. Bridgman. 1980. An evaluation of long grass as a bird deterrent on British airfields. *J. Appl. Ecol.* 17:243-253.

Pearson, Erwin W. 1967. Birds and airports. *Proc. Vertebr. Pest Conf.* 3:79-86.

Solman, Victor E. F. 1981. Birds and aviation. *Environ. Conserv.* 8:45-51.

Thompson, Richard L. 1983. Bird hazards at airports. *Proc. Eastern Wildl. Damage Control Conf.* 1:331.

Editors

Scott E. Hygnstrom
Robert M. Timm
Gary E. Larson