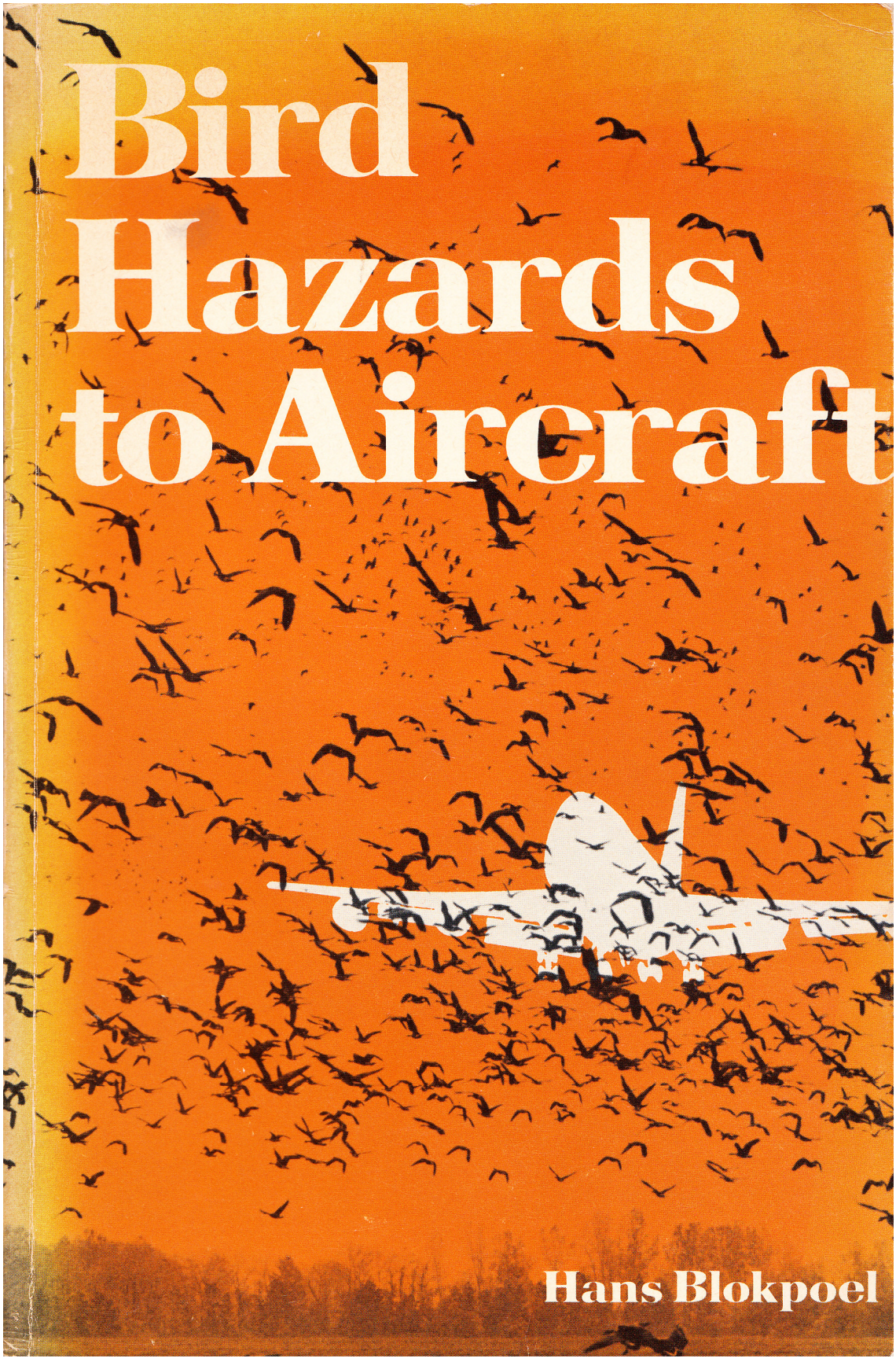
Bird Hazards to Aircraft



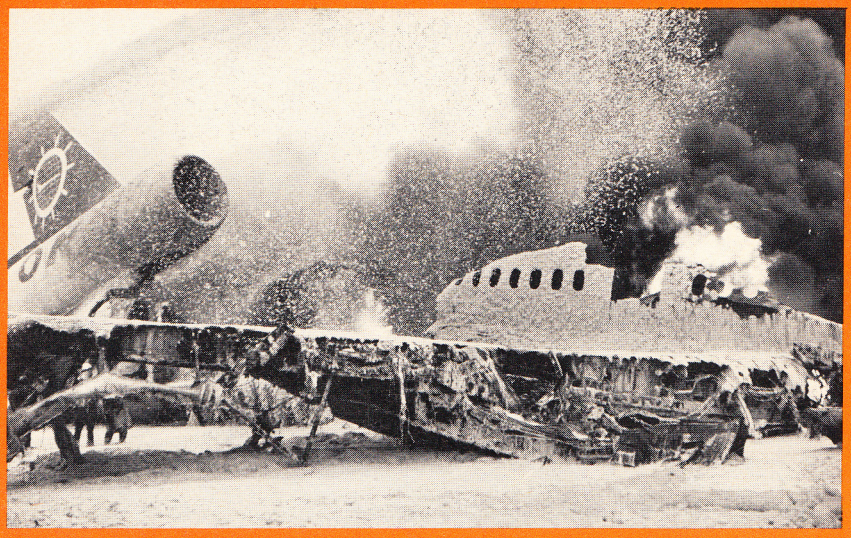
Hans Blokpoel

ABOUT THE BOOK

Here for the first time in one volume is a detailed review of the increasingly serious problem of bird/aircraft collisions. The result of years of research, *Bird Hazards to Aircraft* was written under the auspices of the Associate Committee on Bird Hazards to Aircraft, National Research Council of Canada. It is international in scope and discusses all aspects of this extremely complicated subject.

The text consists of seven chapters, which can be read in any order. Chapters 1 and 2 give pertinent information on birds and statistics on bird strikes on aircraft. The following chapters deal with methods for reducing the hazard: bird-proofing of aircraft, possible on-board devices to clear birds from an aircraft's flight path, reduction of bird numbers at airports, and warning techniques during the high-risk seasons of bird migration. The last chapter describes how bird strike reduction programs can be organized.

Although *Bird Hazards to Aircraft* will be widely used by those responsible for flight safety (pilots, air traffic controllers, airport managers, aircraft manufacturers), the wealth of information it offers should make the book a valued addition to the bookshelf of anyone interested in birds or aircraft.



Birds cause DC-10 crash. United Press International photo.

ABOUT THE AUTHOR

Hans Blokpoel is a member of the Associate Committee on Bird Hazards to Aircraft. While in the Royal Netherlands Air Force he worked on the bird strike problem in Dutch military operations. Since 1967, when he emigrated to Canada, he has carried out radar studies on bird migration in Alberta, Manitoba, Ontario and Quebec. He has published a series of reports and scientific papers on his work, which has been directed toward reduction of bird strikes to aircraft en route. Mr. Blokpoel is a Wildlife Biologist with the Canadian Wildlife Service in Ottawa.

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with the compliments of the author,

Hans Blokpoel.

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BIRD HAZARDS TO AIRCRAFT

BIRD HAZARDS TO AIRCRAFT

Problems and Prevention of Bird/Aircraft Collisions

H. BLOKPOEL

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flares, have a longer range, may require special launching equipment, and are considerably more costly. Tests in the USSR with a special signal rocket showed that it had an effective range of about 1,300 feet; however, most birds soon returned and settled again on the spot from which they had been scared (234). An additional effect was created when after the explosion, a number of coloured flames fell towards the ground, emitting a howling sound. The GAF manual on bird control at airbases mentions the "Spezial-Blitz-Knall-Rakete" (special flash-and-banger rocket), and recommends that different pyrotechnics be used in an alternating manner and from different sites, to avoid habituation of the birds (201).

(b) Birds of prey

The use of raptors to clear birds from airfields has attracted public interest. It is indeed unusual when a medieval sport is used to safeguard jet-age air travellers.

Falconry is the art of taking wild quarry with captive birds of prey. Members of the falcon family (Falconidae) and the true hawk family (Accipitridae) are commonly used. Buteos or buzzards, often called "hawks" in North America, are infrequently used in falconry. Falcons have long tails, long narrow wings and are birds of the open spaces (moors, marshes, prairies, deserts, etc.). Accipiter hawks have short tails, short rounded wings, and are birds of the woodland and scrub (354).

Falconry is a specialized form of hunting, and books have been written on its techniques and terminology (e.g., 49, 441).

Wild falcons quickly climb above their prey and swoop down on it, whereas wild hawks chase their quarry in a rapid pursuit, often between trees and through bushes. The methods that the falconer uses are adapted to the different raptor and prey species.

Experimental work at airports began in 1947-49 in Britain, with Peregrine Falcons. From these trials it was concluded that an airfield can be kept clear of birds by flying a Peregrine Falcon at least once a day, but the clearance does not last for more than two days once the falcon is taken away. Major drawbacks to the use of this method were: keeping and training the birds was time-consuming and costly; some airfields were unsuitable for falconry (birds got lost or were shot); and the falcons could not be flown in darkness or in bad weather such as fog, heavy rain, or high winds (443).

Nevertheless, a falconry program was started at Royal Naval

Air Station Lossiemouth in Scotland, because its serious problem of local breeding gulls could not be solved by other methods. The Peregrine Falcons scared the gulls away during the day and in good weather. Gulls that returned at dusk were harassed by firing shellcrackers at irregular intervals during the hours of darkness. Furthermore, Thunderbird exploders were used at the ends of all runways during aircraft operations. After two months, the gulls had left the airfield and found a roost elsewhere. The operation has been highly successful: no bird strikes have occurred since establishment of the falconry section and after two years there were few, if any, birds on the field (197).

In Canada, large numbers of Glaucous-winged, California, and Mew Gulls frequenting Victoria Airport on Vancouver Island provided ample opportunity to test the operational feasibility of falconry at airfields. A falconer and assistant flew Peregrine Falcons from 1962 to 1964, and Gyrfalcons from 1964 to 1965. The gulls were invariably dispersed from the area but frequently returned soon after the falcon was back in its cage. When winter rains brought many worms onto the tarmac, several falcon flights per day were necessary to offset this attraction.

At another airport, near Halifax, Nova Scotia, a falconer, also using peregrines, tested a different scaring technique: the falcons did not approach or attack the gulls but instead circled high above the falconer until recalled by him. These experiments on Herring and Great Black-backed Gulls, in the fall of 1964, showed that this method was effective, that the falconer had better control over the bird, and that the falcon would not be injured.

Despite these satisfactory results the Canadians decided not to use falcons because of the limitation to daylight hours (many strikes occurred at night); the need for trained and dedicated operators with a radio-equipped vehicle; the requirement of a dependable supply of falcons; and the availability of other, and less costly, scaring methods for use by untrained staff (365).

The Dutch military tested the effectiveness of Goshawks to control a serious gull problem at Leeuwarden Airbase. A falconry team (consisting of 1 falconer, 3 assistants, 6 hawks, and a radio-equipped jeep) worked on the airfield during most of 1968 (Fig. 5-4). Results were satisfactory (fewer bird strikes compared to previous years), but after a while the gulls tended to fly a short distance away on approach of the falconer's jeep before the hawk could be used. In such cases smoke puffs and shellcrackers were used (362). Although the hawking group proved its limited effectiveness, it is impossible to say how much was due to the

Fig. 5-4: Birds of prey, such as these Goshawks, have been trained successfully to frighten birds from airports.

presence of the patrol group and how much to the hawks (342). The hawking group was disbanded because of the high cost of staffing a permanent falconry unit.

In Spain, six Peregrine Falcons were used to get rid of thousands of Little Bustards that caused serious strikes at Torrejon Airbase near Madrid, a busy airbase used by USAF Europe. After three months of falconry operations all nuisance birds had left the airbase and no more strikes occurred (113); but the falcons still had to be flown every day to prevent the birds from returning (339).

Because of these good results, peregrines were introduced at the Barajas-Madrid civil airport to drive out Little Bustards, Stone Curlews, and Mallards. The success of clearing bustards from Torrejon had increased the bird problem at Barajas, less than five miles away (366). Again, the falcons proved to be effective: after six months both runways and the airfield were completely free from these three species (339).

Encouraged by the results in Spain, USAF Europe decided to employ falcons at its six bases in the UK, where a full-time year-round program was introduced in 1970. At the airfields mainly Saker, Laggar, and Lanner Falcons are used, all of which are imported. (Peregrine Falcons can no longer be obtained in Europe.) Other scaring techniques are also used, including dogs, shell-crackers and live ammunition. Although 80% of the bird-clearing work is done without falcons, the 20% with falcons is considered essential (118).

The USAF has begun a falconry program at an airbase in Turkey and also tested falcons at Whiteman AFB in Missouri, US (286).

When reviewing the various past and present falconry activities at airfields, a few facts become clearly evident: (1) properly trained birds of prey of the right species for the job at hand, used regularly and persistently by skilled and conscientious personnel, are effective in clearing nuisance birds from airfields during daylight and good weather; (2) for good results, daily operations on a year-round basis are required in most cases; (3) several falcons are required in order to have at least one falcon on standby at all times, ready for action; (4) to obtain, train, operate, and care for falcons a staff of at least two full-time well-trained personnel is required.

At present in most western countries a permit is required for the capture of wild raptors, and some species may not be captured at all. The use of raptor species that are threatened with extinction

is of great concern to environmentalists (304, 315) and it should not be encouraged as the standard method for all airfields with bird problems. The world population of these raptors would be unable to sustain the required supply without causing further decline of their numbers.

Recently this situation has changed a bit. When raptor numbers began to decline disastrously, attempts were begun to breed birds of prey in captivity. Based on a new technique that can be described as "co-operative, artificial insemination," propagation of captive birds has been successful for several species including the American Kestrel (326), Prairie Falcon (86), Peregrine Falcon (86), Goshawk (38), Red-tailed Hawk (395), and Golden Eagle (171).

So far, most of the successful experiments to breed raptors in captivity have been carried out in North America, particularly at Cornell University. If this know-how improves and if similar results are obtained in Europe and elsewhere, there might well be a limited but sustained supply of falcons for use at airports. At present, Canadians are considering use of falcons bred and reared at Cornell, for experiments at Vancouver Airport against huge flocks of wintering Dunlins (266).

(c) Radio-controlled model aircraft

As the use of real raptors has some shortcomings, an engineer may feel challenged to build something better. An attempt to do so was made in New Zealand, where a remote-control model aircraft was used against the nuisance birds at Auckland Airport. The model had a wingspan of 5¾ feet and a length of 3½ feet and was painted so as to resemble a bird of prey. The standard engine was radio-controlled within a quarter-mile radius of the operator. Preliminary results were promising (345).

In Canada, preliminary work was done with a model airplane to move Dunlins from the salt flats near Vancouver Airport. The tests were successful in causing the birds to move, and further experiments with a falcon-shaped model are in preparation (Fig. 5-5).

The Canadian Wildlife Service gained experience in the use of model aircraft when attempting to scare robins from low-bush blueberry fields in New Brunswick. Robins could be flushed and driven off by the noisy aircraft. But other species, such as sparrows, waxwings, and swallows, did not appear to be bothered. The robins came back to the blueberries as soon as the airplane had