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Bird strikes in Copenhagen Airport during a 10-year period, 1974-83.

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In Copenhagen airport bird scaring started in 1963, and a study on the occurrence and behaviour of birds in the airport was made in 1966-67. Since then a number of actions against the birds coming into the airport have been carried out. During the last ten years (1974-83) bird remains from bird strikes have been recorded and identified. This material, together with other statistics informing about developments in the bird strike situation in the airport, are presented below.

Recording of bird strikes in the airport.

There are three sources of information about the bird strikes which take place in the airport: 1) Pilots' reports on incidents. 2) Dead birds or remains found in the airport and sent in for identification together with data on the incident - may include some nearby strikes, the birds being thrown to the ground by the air turbulence. 3) Other reports, mainly due to the bird scaring personnel. The pilot reports include bird strikes inside as well as outside the airport. Information on height of the aircraft can be used in locating the incident. Strikes below 500' in the approach phase and below 1000' in the climb phase are defined as strikes within the airport. Using this definition all strikes within the border are certainly included, and probably only a few from outside. The definition used in the international statistics is not quite relevant to the work in the airport to prevent bird strikes.

Frequency of bird strikes.

The number of strikes may have declined since the end of the sixties and the beginning of the seventies, but during the ten-year period of regular reporting there has been no general change of frequency (Fig. 1). There are year-to-year variations irrespective of the reporting method.

Strikes with different bird species.

A total of 614 birds from 321 strikes have been identified during the ten-year period. The size of the material should allow for a reliable conclusion about the kinds of species causing strikes in the airport and their relative importance. Twenty-three bird strike species have been recorded (Fig. 2), and 8 of these caused 85% of the strikes. They are in order of frequency: Herring Gull, Black-headed Gull, Common Gull, Kestrel, Oystercatcher, Partridge, House Pigeon and Lapwing. The serious strikes in the airport during the ten-year period were due to six of these species: the three gull species, Oystercatcher, Partridge and House Pigeon (Table 1). A "serious strike" is defined as one causing repair costs of more than 10,000 \$ or, in a few cases, critical situations as judged by the pilots including returns for

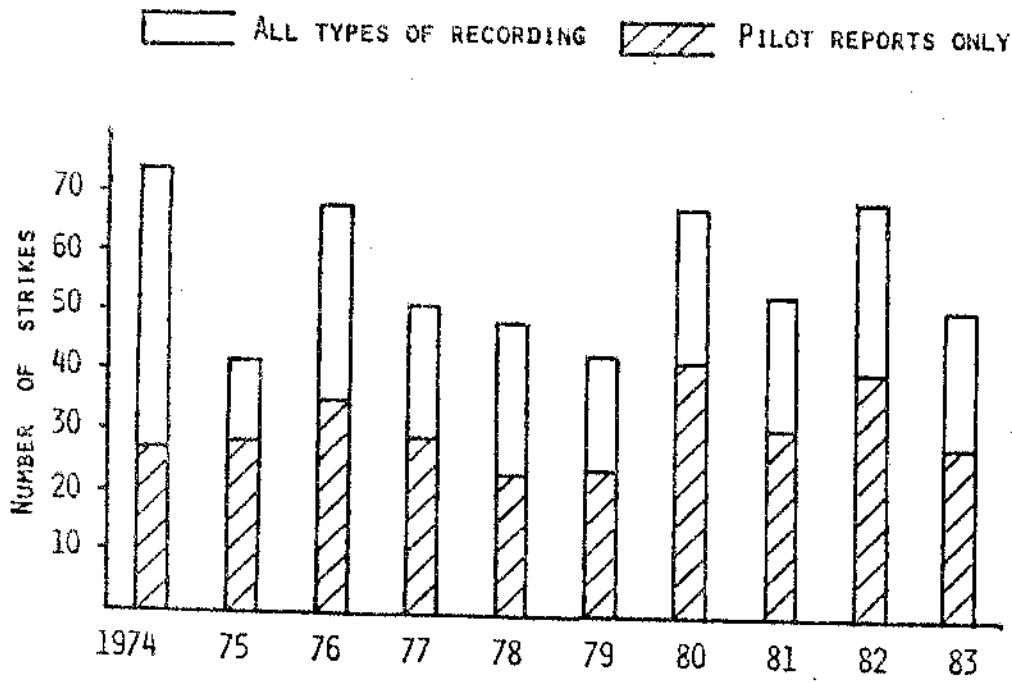


Fig. 1. The frequency of bird strikes per year 1974-83.



Fig. 2. The frequency of strikes per species 1974-83. Some strikes include two or more individuals and therefore in some species the number of identified birds exceed the number of strikes.

inspection. These dangerous species combine three characteristics: They are social birds forming flocks, they are heavier than about 200 gr., and they are of very common occurrence in the airport. In this way the main problems have been defined, but, of course, the significance of small species in large flocks (e.g. Starling) or heavy solitary birds (e.g. Buzzard) or relatively rare heavy birds (e.g. Mute Swan) should not be neglected.

Changes in strike frequencies of species.

As mentioned above there has been no general change of total strike frequency per year during the last ten years; however, there have been changes in some species (Fig. 3). A decrease in strike frequency is found in the Herring Gull and the Partridge, and an increase in the Kestrel. The differences between means of actual strike numbers in the two five-year periods are significant at the 1% level in the Kestrel, at the 5% level in the Herring Gull and close to the 5% level in the Partridge. The increase of strikes with Kestrels and the decrease in Partridges may be due to corresponding changes in the breeding population of these species in Denmark. As to the Partridge the cause may also be intensified shooting in the airport. The reduction in number of strikes with Herring Gulls certainly reflects the decreasing number of Herring Gulls occurring in the airport, and this in turn is probably due to a reduced breeding population on the island of Saltholm 5 km from the airport (Fig. 4): The negative development of the breeding population parallels the development of the gull numbers in the airport fairly well. There are two reasons for the reduction of the breeding population: Closing of garbage dumps in the Copenhagen area, and actions taken by the airport against the gulls on Saltholm since 1969, viz. spraying of eggs and killing of a number of adults by alpha-chloralosis. The latter actions probably have major significance for the results, the breeding colony having been reduced from about 40,000 pairs in 1970 till about 9000 pairs in 1984.

Regular patrolling and scaring of birds by specially trained personnel are considered to be very important for keeping the number of bird strikes down. Proper management of the grassland is also important, but sometimes difficult due to conflicting interests in the airport. Distress call scaring does not function very well, and research work is needed in order to improve the scaring effect of the call.

Bird strikes in areas outside the airport.

Sea and wetland areas at about 5 km distance east and west of the airport have rather great populations of birds all through the year. The question has been raised whether these birds are important for the air safety problems in the area. Fig. 5 shows the distribution of bird strikes reported by pilots on three categories of flight level in the approach-landing phase and the take-off-climb phase. Each of these categories may represent strikes taking place well within the airport borders, within or near the border and at distances of about 3-8 km from the

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Fig. (bro airp meas gull

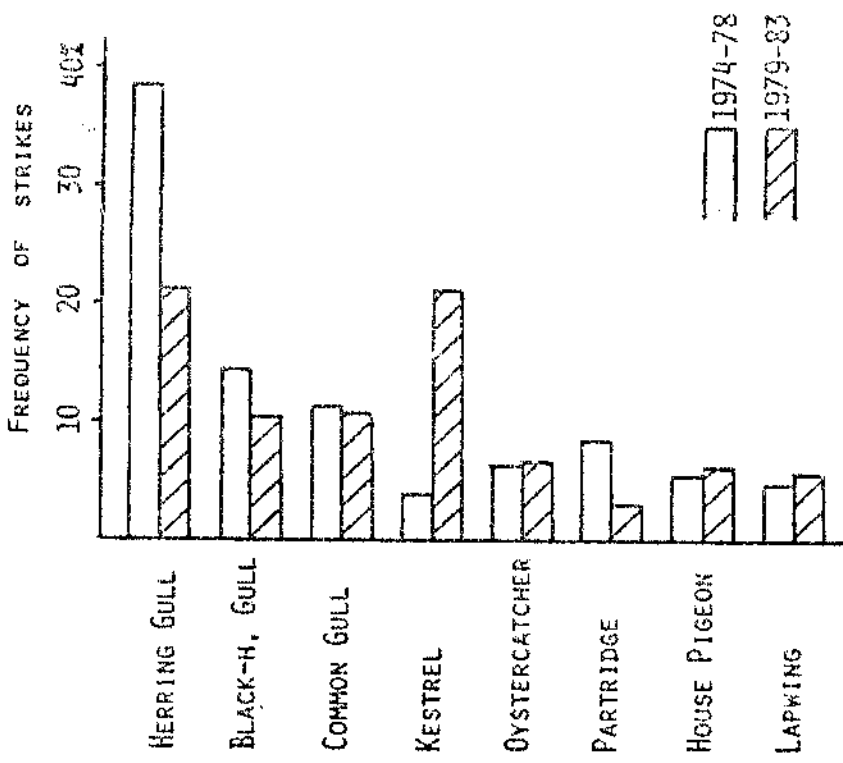


Fig. 3. Strike frequencies in two successive 5-year periods in 8 species causing the majority of bird strikes.

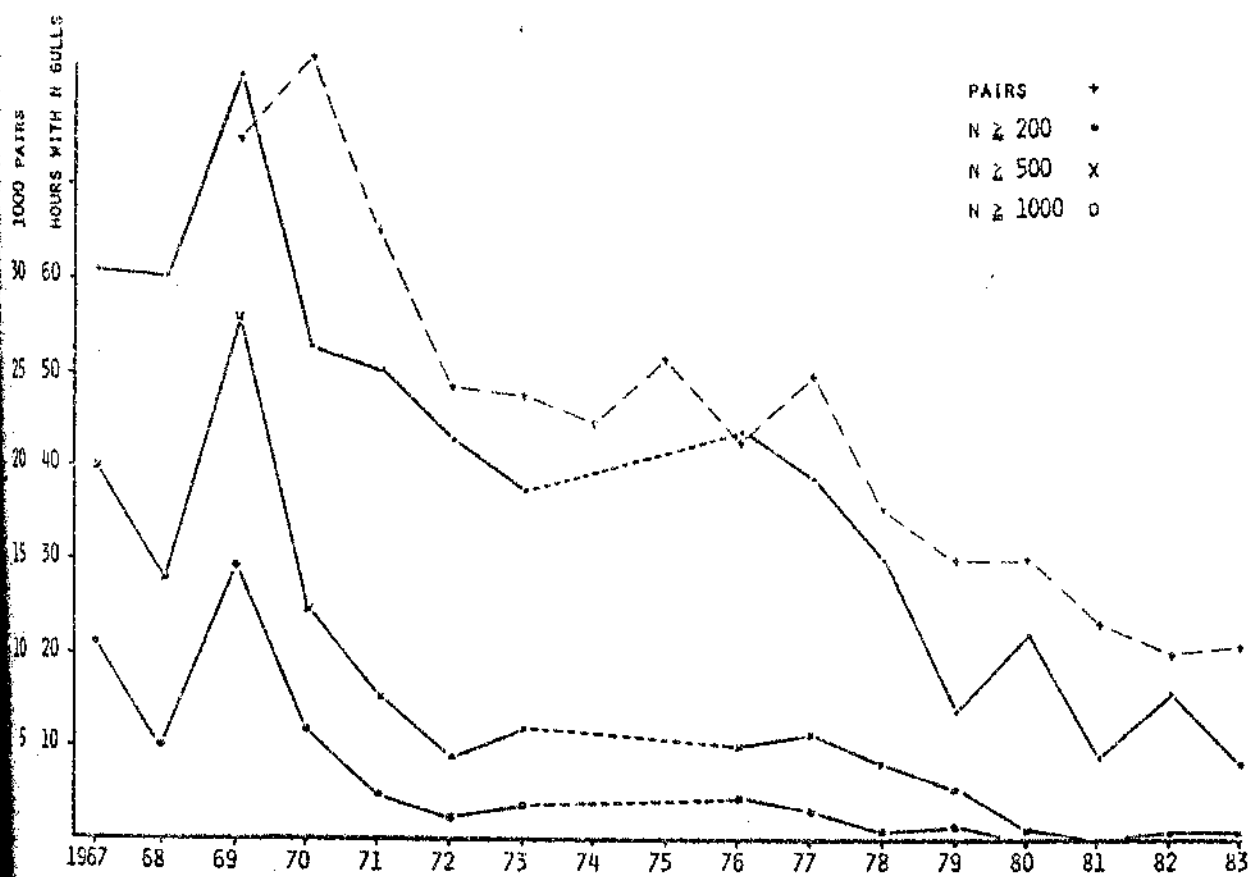


Fig. 4. Size of the breeding population of Herring Gulls on Saltholm 1969-83 (broken line) and size of the Herring Gull population feeding and resting in the airport 1967-83 (fully drawn lines). The size of the airport population is measured by number of hours per month, in which more than 200, 500 and 1000 gulls, respectively, have been observed. Mean numbers from June and July are shown.

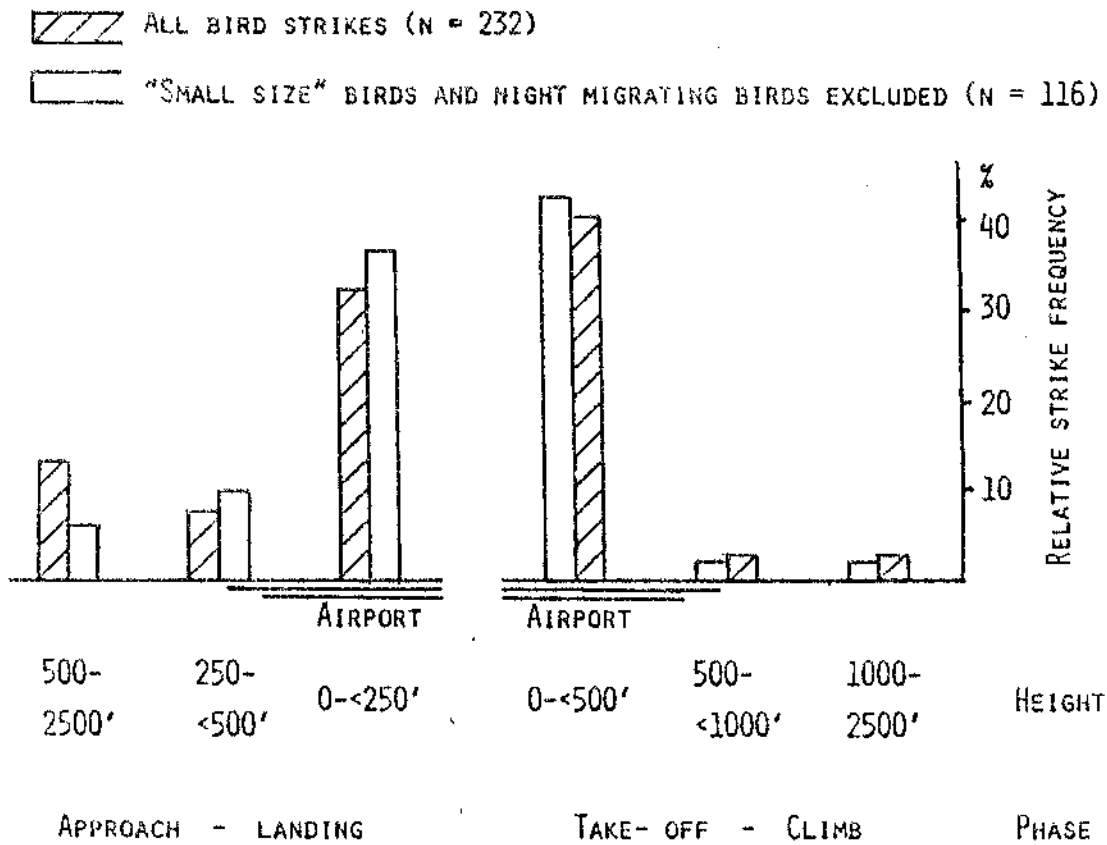


Fig. 5. The relative frequency of bird strikes in different heights corresponding to strikes within the airport, in the border area and in the nearby area of the airport, respectively. Based on pilot reports only.

SERIOUS BIRDSTRIKES 1974-1983

Table 1			
HERRING GULL	3	HERRING G. + COMMON G.	1
BLACK-HEADED GULL	2	OYSTERCATCHER	1
HERRING G. + BLACK-H. G. + COMMON GULL	1	PARTRIDGE	1
BLACK-H- G. + COMMON G.	1	HOUSE PIGEON	1

border, respectively. The most strikes happen in the airport, but between 16 and 25%, maybe approximately 20%, actually take place in the nearby area of the airport. The possibility of controlling the number of birds in this area is probably small. For instance birds passing on migration certainly are quite uncontrollable. Birds migrating at night can be taken out of the statistics and likewise the rather harmless small birds. Then the figures show that approximately 15% of the strikes with relatively large and mainly local birds (some day-migrating birds are included) take place in the nearby area of the airport (Fig. 5). It should be noted that most of them are in the rather unrisky approach phase. It would be of interest to know if the frequency of bird strikes in the "nearby area" of Copenhagen airport is large or small compared to other airports.

Summary

Ten year statistics on bird strikes including species identification are presented. 23 species have been involved in strikes, but only 6 are of major importance. The total number of strikes per year has not changed during the period, but it has changed in a few species. The causes are discussed. Actions directed against one species, the Herring Gull, have been successful. General scaring and grassland management are considered to be important. Further research on the method of distress call scaring is needed. About 20% of the bird strikes in and near the airport take place outside the border and comparable data from other airports is called for.

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