Working group on bird hazards to aircraft

(c/o R.N.A.F., The Hague, Holland)

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Bird problems at Schiphol Airport

by C.J.Stortenbeker

1. Introduction

In the western and north-western part of Holland birds are abundant. There are several reasons for this: the coast is near, the fall-migration routes of many species follow the coast, and the type of country is attractive to birds. All airfields in these parts of the country, therefore, have serious bird problems, which have been met with short-term repelling measures such as pyro-acoustics and use of the distress call (by means of either stationary or mobile equipment). Also trials have been carried out with ecological changes, like increasing the length at which the grass is mown, or changing the vegetation by planting shrubs or growing lupine). Some of these measures improved the situation, but they did not solve the problem. It was felt that we know too little about the birds involved in relation to their habitat, and for further improvements this kind of basic information seemed essential.

In 1965, at the request of the Schiphol Airport Authority, the Institute for Biological Field Research ITBON started a research project, which is carried out in close cooperation with Mr.J.C.M.van der Heyde, senior Airport Inspector, and the flight safety section of the Royal Netherlands Air Force. This communication is an interim report which covers the first year of research (April 1965 - April 1966).

2. Schiphol Airport

At present the area under authority of the Airport is about 6 sq. km, but in the near future extensions will add about another 6 sq. km, much of which will be occupied by buildings, platforms, taxitracks and runways. Schiphol occupies the north-eastern corner of the Haarlemmermeer-polder, an agricultural area on a heavy clay soil 4 meters below sealevel,

to the south-west of Amsterdam. Of the present airfield area about 18% is covered by platforms, runways and taxiways, about 26% is grassland, 51% is arable land, on which sugarbeet, grain, potatoes and some other crops are grown, and about 3% is taken up by bare ground, rough and ditches. To the west and south the airport borders arable land, to the north the suburbs of Amsterdam are closing in, and to the east there is the Amsterdamse bos (a woodland and parkland area of about 7 sq. km), a polder of 2 sq. km and a small nature reserve, beyond which there is a large area of floriculture under glass.

3. The research programme

We set out to collect information on the following points:

a. which bird species inhabit or visit or pass the airport and in what numbers, and how do these numbers vary through the year;

b. which of these bird species are particularly dangerous to aircraft in the landing and take-off;

c. which are the relations between the different species and the airport habitat; do birds show a preference for certain terrain-features, and

d. which is the influence of the surrounding areas on bird densities at Schiphol?

Naturally a lot was known from experience, but exact data were not available. Our basic set-up had to be simple as we could spent only a limited part of our time on this project. At three-weekly intervals on the airfield bird numbers were assessed along a standard route of 21 km so that the entire area could be covered. These assessments were supplemented by observations on bird migrations and movements on and around the airport and by bird counts in two polders on either side of Schiphol. The results of the first year are summerised below.

4. Birds on Schiphol airport

4.1. Species involved in bird strikes

It is difficult to obtain exact data on the species and numbers of birds involved in collisions with aircraft. It was thought, however, that birds found dead on or near the runways (either being hit by an aircraft or being killed by the slipstream) would give reliable indications. Of

the 53 birds collected over a 4 months period 21 were gulls (mostly black-headed gull), 13 partridges and 10 lapwings. Dead starlings or wood-pigeons or sparrows were not found. These observations will be repeated over a longer period.

4.2. Species which are abundant

The periodic assessments showed that in 1965/66 the bird density was not excessive, in average being 0.3 to 1 bird being seen per ha (about 2.5 acres). At the time of fall-migration in September and October, however, there were peak densities of up to 4 birds per ha. There also were occasional concentrations of gulls in winter. Lapwing (43%), gulls (17%), starling (16%), wood pigeon (9%) and partridge (6%) were the species which were most abundant.

The breeding population of lapwing was not very high, probably less than 50 pairs, but large numbers were seen collecting and loafing around in September and October before the fall-migration. Gulls were present in numbers of 30 to 165, except during their breeding season when there were few, and in winter when occasionally hundreds roosted on the runways. Starlings were attracted mainly to grassland after mowing, and wood pigeons to arable land after harvesting. The real number of partridges on Schiphol was certainly higher than the 6% of the total number of birds seen suggests. Recently (1966/67) the population density has gone up to between 0.5 and 1 bird per ha.

4.3. Preferences for terrain features

Our researches showed that Schiphol has no terrain features which make it more than normally attractive to birds in respect of breeding, roosting, feeding or getting cover. The one exception may be that the high partridge density could be associated with the excellent cover provided by tall grass. This point is being investigated.

From the table it is seen that in general birds prefer grassland to arable land. If the birds had no preference their distribution would be random (as in column 1). All through the year, however, high percentages of the population were seen on grassland, while on arable land a high

proportion was found only after harvesting, or any form of soil cultivation or sowing; on average the distribution was certainly not random (column 2). Of the most abundant species in particular gulls, starlings and partridges clearly preferred grassland, though for partridges the figures probably are biased, as on arable land these birds will on average be less visible. At the airfield wood-pigeons had a strong preference for arable land, but in the Schinkelpolder to the east this was not so. This suggests that at Schiphol the repelling measures and/or the noise level is such that they only come there when there is a strong attraction, like for instance stubbles. During the period described here often the grass was mown shorter than 10 cm. It may be that the bird density on grassland will decrease considerably, now that the 10 cm regulation is strictly observed. This is being studied.

Distribution of terrain types and birds in % of the total

	terrain types	distribution of birds					
		all species	lapwing	gulls	starling	wood-pigeon	partridge
grassland	24	48	47	59	97	10	75
arable land	51	42	46	18	35	90	16
runways, taxiways, platforms	18	5	2	16			
bare ground, roads, ditches	3	5	5	7	8		4

4.4 Influence of surrounding areas

Parallel with assessments on Schiphol, birds were counted and their displacements observed in the Schinkelpolder, which directly borders the "Amsterdamse bos" to the south, and which for about 1/3 is occupied by grassland. Very little movement was seen between the woodland and Schiphol. Most birds from the woodland (wood-pigeons, corvids) feed in the Schinkelpolder, their average density there being 3 to 10 times as high as at Schiphol, but numbers of open-country birds like gulls and lapwing were also higher (from 1.5 to 2.5 times). On average bird numbers in the Schinkelpolder were at least 2.5 times as high as at the airport and it

is believed that this is due to lesser disturbance.

On the other side of Schiphol bird densities were assessed in the Haarlemmermeerpolder, which has virtually no grassland. Here densities were very much lower, on average only half or one third of those at Schiphol. High densities were seen only near the large garbage dump (at a distance of 4 km to the nearest runway; when the planned western runway is completed, this will be less than 2 km), and at the time of sugar-beet harvesting. It is not clear yet whether the garbage dump influences the numbers of gulls at Schiphol.

5. Conclusions

The conclusions so far are, that

a. Schiphol airport does not have excessively high bird densities considering the type of country (except for partridges), yet numbers are much too high for flight safety;

b. the airport is not a preferred feeding ground for birds from the woodland of the "Amsterdamse bos";

c. at the airport bird numbers are considerably lower than in a polder, which also has both grass and arable land and where there is little disturbance, but they are considerably higher than in the polder to the west, where there is virtually no grassland;

d. grassland is more attractive to birds than arable land;

e. all crops grown at the airfield are attractive to birds at some time, but potatoes and sugarbeet very much less so than grain. In general any form of soil cultivation attracts birds, whether using a plough, harrow or cultivator.

6. Future research

We will now concentrate on two problems. Firstly, how do we make the shoulders along the runways, which have to remain grassland, less attractive to birds? Both the effect of the increase in minimum grass length and possible ways of decreasing numbers of soil organisms will be studied.

Secondly we will investigate whether the crop alternation scheme cannot be modified to give less soil cultivation; perhaps the technique of agriculture without soil cultivation, now being developed at an agricultural research institute at Wageningen, might be a partial solution to the bird problem.

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Institute for Biological Field Research.
(ITBON)