BIRD DETERRENCE AT AIRPORTS BY MEANS OF LONG GRASS MANAGEMENT – A STRATEGIC MISTAKE?

Christoph Morgenroth, Dr. forest.
German Bird Strike Committee (DAVVL e. V.)
Postfach 11 62, D-56831 Traben-Trarbach, Germany
Tel: +49 6541 812300, Fax: +49 6541 812301, Email: c.morgenroth@davvl.de
Web pages: www.davvl.de

Abstract

Since the middle of the 1990s, long-grass management is applied to the grassland areas of Dresden Airport according to the recommendations by HILD & HAHN (1997) for sustainable deterrence of bird species posing a flight-safety risk. Additionally, regular bird counts are conducted on the airport grounds in the framework the airport's bird-control activities, in which not only species and their densities, but also the vegetation heights on the respective observation areas are determined. The current presentation shows the findings of these surveys on the bird-deterring qualities of grassland vegetation of different heights

Keywords: long-grass policy, vegetation heights, deterrence of birds, bird strike avoidance, biotope management.

1. Introduction

Due to the specific safety requirements associated with air traffic (absence of obstacles), safety areas of airports inevitably form open-land habitats almost completely devoid of vertical structures. Accordingly, they form suitable habitats for open-land species like crows, gulls and wading birds, but also, in many cases, for bird species that rely to a great extent on small mammals, esp. mice, for food.

Considering the aspect of biological flight safety, this entails a significant risk from bird strikes as these species are relatively heavy and moreover can appear in rather big flocks. Thus, in case of a collision between an aircraft taking off or landing and the birds populating the airport grounds, damage to the aircraft is more likely than it would be the case with smaller birds. Furthermore, bird strikes involving flocks of birds hold the special risk of multiple hits which in combination can produce a considerable hazard for the people and the aircraft. Example cases can be found on the GBSC's website (www.davvl.de).

One strategy to permanently reduce this potential risk to air traffic is to apply a habitat management which exploits all possibilities that exist within the framework of the airport operations. The so-called long-grass management, implying the maintenance of a minimum grass height all through the year, has, since the research done by BROUGH (1982), been considered an efficient means to limit or reduce airport grounds' suitability for and attractiveness to open-land species and birds feeding on mice. The long grass has mainly two effects: Firstly, depending on their length and density, the stems more or less reduce the birds' visual contact with the surroundings. This impedes their social relations and inhibits their ability to detect predators, leading them to avoid such grassland areas. Secondly, as the lower visibility makes it harder to detect small mammals, the chance of birds feeding on mice to succeed in catching prey is reduced. Therefore, birds of prey revert to more promising hunting grounds outside the airport.

2. Material and method

In order to properly examine the effects of the long-grass regime employed at Dresden Airport, the operator regularly carries out bird counts in which the height of the grass and herb vegetation on the respective observation areas is recorded as well. The heights are divided into three categories - category 1 for short grass with a height of up to 10cm, category 2 for long grass with a height between 11 and 30cm, and category 3, the "XXL-"version of long grass, with a height of more than 30cm. The survey was carried out using the computer programme "Bird Control" (MORGENROTH 2001) which is based on the Point Stop Method (WEITZ 1999).

The data set comprises the observations of two whole years (2000 and 2001) in which two counts were carried out per month – the first in the first half of the month, the second in the second half.

The grass heights recorded during these counts represent the predominant heights of the respective grassland areas. The reason for this is not only that the growth of the grass and herb vegetation varies depending on the type and humidity of the soil, but also that the observation area of a bird count can include special areas on which no habitat management programme geared to preventing bird-strikes can be carried out as this would conflict with flight operations. A typical example is the extensive glide slope and localizer area within which the vegetation has to be kept short. Other examples are surfaced areas like snow dumps or access roads to airport infrastructure facilities. A certain degree of imprecision is therefore inevitable and needs to be corrected later.

3. Results

During the two-year observation period, 9994 birds were recorded at 46 counts. Their distribution over the three vegetation height categories is displayed in table 1. In category 1 (≤10cm) 3614 birds were counted, in category 2 (11-30cm) 5853, and in category 3 (>30cm)

527 birds. However, it would be premature to conclude from these results that vegetation heights between 11 and 30cm are the most unsuitable ones with respect to bird-strike prevention at airports as there are two more aspects which need to be considered:

What is the percentage of birds posing a risk to flight operations among the total number of birds counted in one category?

What is each of the categories' share of the total area on which bird counts were carried out during the observation period?

Table 1: Distribution of the birds observed at Dresden Airport over vegetation height categories

Category	**1**	**2**	**3**	
Vegetation height (cm)	**≤ 10**	**11 - 30**	**> 30**	**Total**
Total number of birds	3614	5853	527	9994

With respect to flight operations, 19 bird species were classified as hazardous. Table 2 lists these species and displays the frequency of their occurrence in each of the three vegetation height categories. This shows that the highest number of hazardous bird species at the airport also falls into category 2. In the short-grass areas, their share was reduced by about a quarter. In areas with long grass of more than 30cm height, hardly more than a tenth of the hazardous species of category 2 were recorded.

Table 2: Distribution of hazardous birds over vegetation height categories

Species \ Vegetation height (cm)	≤ 10	11 - 30	> 30
Jay	0	13	2
Magpie	0	24	0
Osprey and other	0	1	0
Rock Dove	0	46	41
Lapwing	0	6	0
Black-headed Gull	152	0	0
Common Buzzard	72	67	4
Hooded Crow	147	259	16
Carrion-Crow	28	55	1
Partridge	6	18	0
Wood-Pigeon	2	17	2
Marsh Harrier	2	4	0
Red Kite	1	2	0
Rook	142	28	0
Kite	3	4	1
Starling	1133	1581	165
Kestrel	69	112	19
Fieldfare	40	182	0
White Stork	0	0	3
Total number of birds	1797	2419	254

But even this is not a definite and generally valid result as long as the numbers have not been adjusted to reflect the frequency with which the respective heights occur. It would, e.g., be plausible to argue that fewer birds are counted in category 3 because the high stem length predominates only in a relatively short period of time, so that it is only rarely included in bird observations. It is therefore no wonder if fewer birds are counted in this category than in the categories that are predominant over the whole year.

As 10 observation points had been established at the airport for the Point Stop Method, 46 counts resulted in 460 area observations in the period mentioned. At 200 counts (“stops”), category 1 was predominant. Category 2 predominated at 219 counts. Only 41 counts were assigned to category 3.

But even when the number of birds in each of the three categories is divided by the frequency with which the respective category predominated, the order of the categories does not change. The shorter long-grass with its medium stem length of 11-30cm remains the one in which hazardous birds are most frequently observed.

Therefore, the question has to be asked whether the recommendation by BROUGH, published years ago, to use long grass to reduce the numbers of hazardous bird species and thus minimise the bird-strike risk at airports, does indeed have the desired effect, or if this is only the case when the XXL-version with stem lengths of more than 30cm is used.

In order to be able to answer this question, the focus was put on the bird counts before and after mowing. If the theory was right, then more birds had to be expected on count dates after mowing than during the preceding long-grass period. However, the bird counts at Dresden Airport did not produce a clear result. Sometimes bird number increased as expected, but at other times, they decreased. Furthermore, the difference in numbers between the counts before and after mowing was, in most cases, not bigger than when no mowing had taken place. They virtually disappeared within the normal fluctuations. How could this be?

In fact, the answer to this question is easy. In our latitudes, the number of birds is subject to considerable seasonal fluctuations. Additionally, it is strongly influenced by migration, with large numbers of birds coming and going.

The frequency with which birds appear is not only hormonally triggered, but also depends on the regional weather. On the local level, the weather determines which and how many of the potentially present birds an observer gets to see. As the weather conditions and the phenological phases of birds can vary considerably between the two counts per month, this might be reflected in the numbers. Thus, other factors as, e.g., differences in grass lengths might become obscured.

In order to be able to assess the effects of these other factors, the undesirable influences had to be excluded to the greatest possible extent. Therefore, only the data from observation dates on which all parameters apart from vegetation height were irrelevant had to be compared. Consequentially, the data had to be checked for counts which had taken place on the same date but for which the predominant vegetation heights at the airport were different, which was possible if some stands had already grown into the next category or had already been mown. The areas of different growth heights were then compared with respect to the numbers of birds observed.

This comparison showed clearly that the long-grass areas outmatched the short-grass areas when their biological flight-safety function was concerned: Whereas the average was 7.3 birds per observation point on these dates in short grass (≤ 10 cm), the figure was reduced by about two thirds to 2.49 for long grass with a height of 10-30cm.

Even though at first glance the synopsis of the bird counts at Dresden Airport seems to suggest the opposite, a careful examination of the numbers and critical consideration of the survey method confirms the general recommendation that in Central Europe, long-grass management should be applied at airports to reduce the number of hazardous birds and thus make the airspace safer for aircraft taking off and landing.

4. References

Brough, Trevor: Die Wirksamkeit von langem Gras als „Vogelvergrämungsmittel“ auf Flugplätzen. In: *Vogel und Luftverkehr* 2 (1982), Nr. 2, p. 78-84

Hild, Jochen ; Hahn, Edmund ; DAVVL e.V. (Hrsg.): *Biotopgutachten Flughafen Dresden - Verhütung von Vogelschlägen* -. Traben-Trarbach, 1997. – 127 p. and annex

Morgenroth, Christoph: Das avifaunistische Erhebungs- und Auswerteprogramm „Bird-Control“. In: *Vogel und Luftverkehr* 21 (2001), Nr. 1, p. 32-37

Weitz, Heinrich: Vogelbeobachtungsmethoden auf Flughäfen. In: *Vogel und Luftverkehr* 19 (1999), Nr. 1, p. 72-78