

EVALUATION OF THE WILDLIFE MANAGEMENT PRACTICE OF LISZT FERENC INTERNATIONAL AIRPORT

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ABSTRACT

We investigated the wildlife strike data of years from 1997-2011 of Liszt Ferenc International Airport. The number of carcasses found on the airport increased till the year 2006, then, after a steep fall it became stabilized. Most of the strikes/found carcasses indicate presence of bird species, amongst these Common Kestrel (*Falco tinnunculus*) and Common Buzzard (*Buteo buteo*) have a remarkable occurrence. In the previous five years birds' trend suggests decreasing, whilst mammalian species' trend shows upward tendencies. Its reason is that the continuously growing tool-collection of the utilized management methods is mainly suitable against bird species.

Keywords: airport, wildlife strike, wildlife management

INTRODUCTION

Wildlife-aircraft collisions (wildlife strikes) cause gradually growing problems worldwide (MACKINNON, 2004; BREUER, 2005; DOLBEER & WRIGHT, 2008). Any of the airports can avoid the threats deriving of wildlife presence. For evaluation and effective management of these threats the following nine questions must be answered, according to CLEARY AND DOLBEER (2005).

1. What are the wildlife doing that make the control of their numbers or damage necessary?
2. Which species of wildlife are causing the problem?
3. Why are the wildlife species on the airport?
4. What are the daily and seasonal movement patterns of the wildlife among feeding, loafing, and roosting/nesting areas?
5. What is the legal status of the problem species?
6. What effective and legal management methods are available?
7. How selective are these control methods?
8. How much will it cost to apply the selected control methods?
9. What are public attitudes toward the problem wildlife species and the hazards that these species pose?

To mitigate the hazards at airports development and implementation of integrated wildlife hazard management plan is needed (MACKINNON, 2002; HESSE ET AL, 2010). The management plan has to include all the possible management/control strategies such as: aircraft flight schedule modification, habitat modification and exclusion, repellent and harassment techniques, and wildlife removal (CLEARY AND DOLBEER, 2005).

The relatively big body-size mammal and bird wildlife species that inhabit, move in, or temporarily occur at airports, and airfields pose increasing number of aviation safety matters at the Liszt Ferenc International Airport managed by Budapest Airport Ltd. and similarly at other important international aerodromes of other nations, and continents. Most of these species are on a particular protection level. Management of game species (such as common magpie (*Pica pica*), European (brown) hare (*Lepus europaeus*), red fox (*Vulpes vulpes*), European roe deer (*Capreolus capreolus*), or stray animals as well) may be realized under the control of the Hunting Act (Act No. LV of 1996 on the Protection of Game, Game Management, and Hunting), since management of protected species are regulated in the Nature Conservation Act (Act No. LIII of 1996 on Nature Conservation in Hungary). The Budapest Airport Ltd. has already utilized numerous different mitigation methods to date, but the effectiveness of these measurements have not been studied yet. Thus, our aim was to evaluate the efficiency of the methods used so far and to discover tools, technologies, and treatment forms, which, based on this investigation, could be further applied to practice.

MATERIAL AND METHOD

Data of 1997–2011, which were noticed by the wildlife management staff of the aerodrome, were provided to us by the Budapest Airport Ltd. Concerning this timeframe we have examined the followings:

- ✧ number of dead found animals on airport, number of mammal and bird species;
- ✧ type of the utilized methods, and time of application;
- ✧ monthly changes in wildlife strike frequencies.

RESULTS

First of all we investigated the number of dead found animals, having the presumption, that carcasses deriving from the surrounding area of runways may be considered as direct consequences of an aviation-related factor (mainly crash or collision). When looking at the whole 15 years (the last quarter of the year 2011 is missing), two periods can be distinguished. The first lasts 1997–2006, the second is the time passed since the end of the first section. These two sections may be characterized by different trend and numbers. Number of carcasses of the first period (1996–2006) is rather variable. Between 1997 and 2000 a steep rise, a fluctuating but more-less stable tendency till 2004, and a remarkably high value in 2005 were characteristic. Later comes a sharp fall till 2007, when a gradually increase starts and lasts till 2009. Within the last two years this trend broke and important to see that the numbers have not grown further. Anyway, data of the previous five years (second period) show different patterns, fairly lower values as it is in the first period. However, years between 2004 and 2006 must be highlighted as the most “dangerous” time (*Fig. 1*). Differences before and after 2007 can be very well explained with the fact that in 2007 a plenty of mitigation methods were implemented, and maintained, later on. This indicates a qualitative difference amongst the two distinguished periods (*Table 1*). Summarized numbers of wildlife strikes of every three years, in regard of belonging to birds or mammals, show clearly the definite majority of birds. Yet cannot we skip the importance of mammal species since those have become a permanent participant of the last decade’s airport wildlife hazard issues (*Fig. 2*).

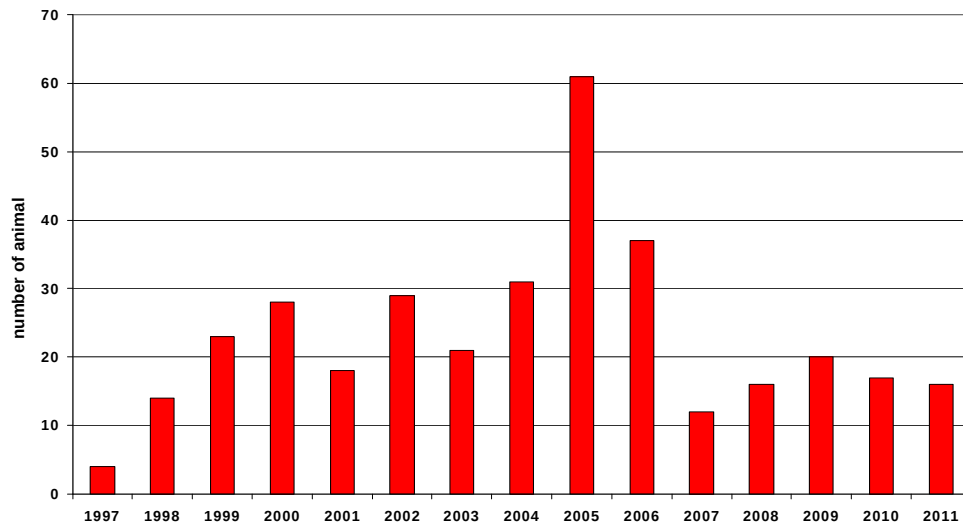
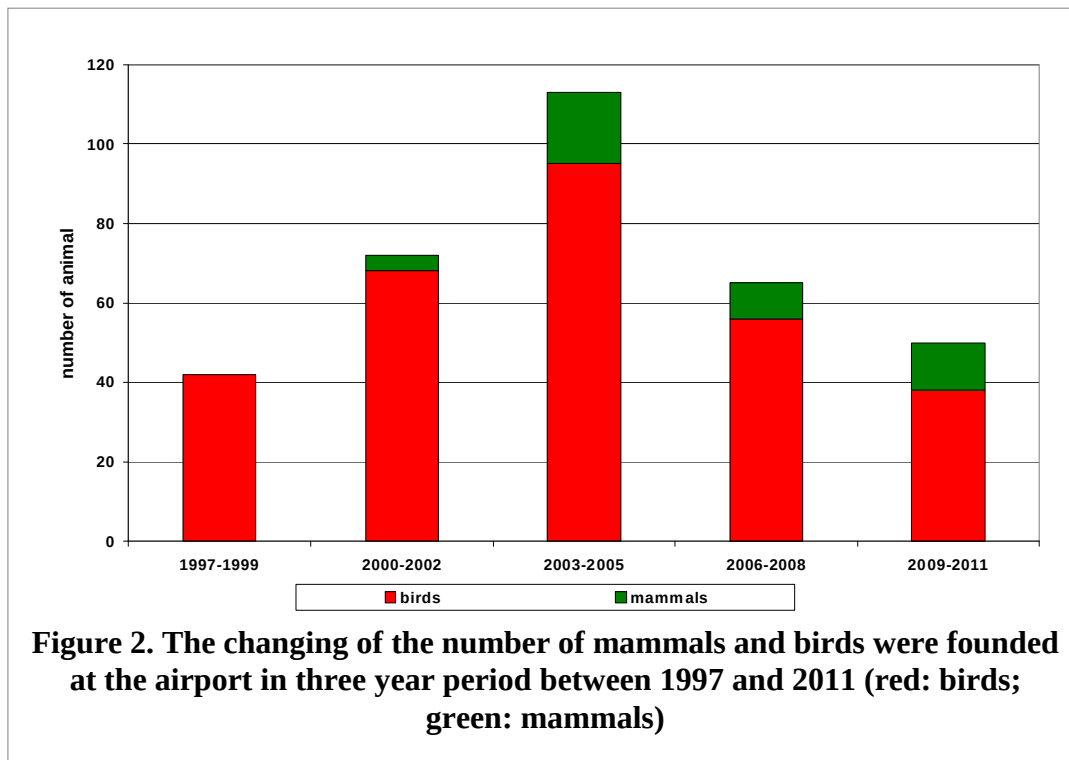


Figure 1. The number of animal carcasses were found at the airport between 1997 and 2011

Table 1. Particular management methods, and time of application.

Methods	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Moved sound canon															
Shot gun															
Fixes sound canon															
falconry															
wingaway															
scarecrow															
traping															
Nest removal															
dog															
spike															
BC bio sonic equipment															
pyrotechnics															
Alarm gun															
Dibble (T-tree)															
Code 3															
Stone marten trap															
Larsen trap															

Found and identified bird carcasses originated from 30 different species (this includes the error of the possible mistakes at the identification). Most of these were only occasional, not regular occurrences within the whole examination period (such as white stork (*Ciconia ciconia*), European nightjar (*Caprimulgus europaeus*), white wagtail (*Motacilla alba*), etc.), so we classified them as “other species” at the analyses. Taking a look on the more frequented species allows seeing a well drawn pattern; in most of the cases carcasses of two bird species, Common Kestrel (*Falco tinnunculus*) and Common Buzzard (*Buteo buteo*), were found, according to the three-year summaries.



Wildlife strike within-year distributions are not homogeneous in the whole year. The most problematic period starts in May and lasts till the end of October. Exceptionally high numbers are characteristic in July, August, and September. Monthly frequency of finding carcasses between July and September is 2-3 fold of the annual average. This general trend applies to the whole study period, from 1996 to 2011. This can be explained by two reasons. Firstly by the inexperience of young, and on the other hand, in case of bird species that are preparing to the migration, by their gathering into larger groups, and their increased space use (*Fig. 3*).

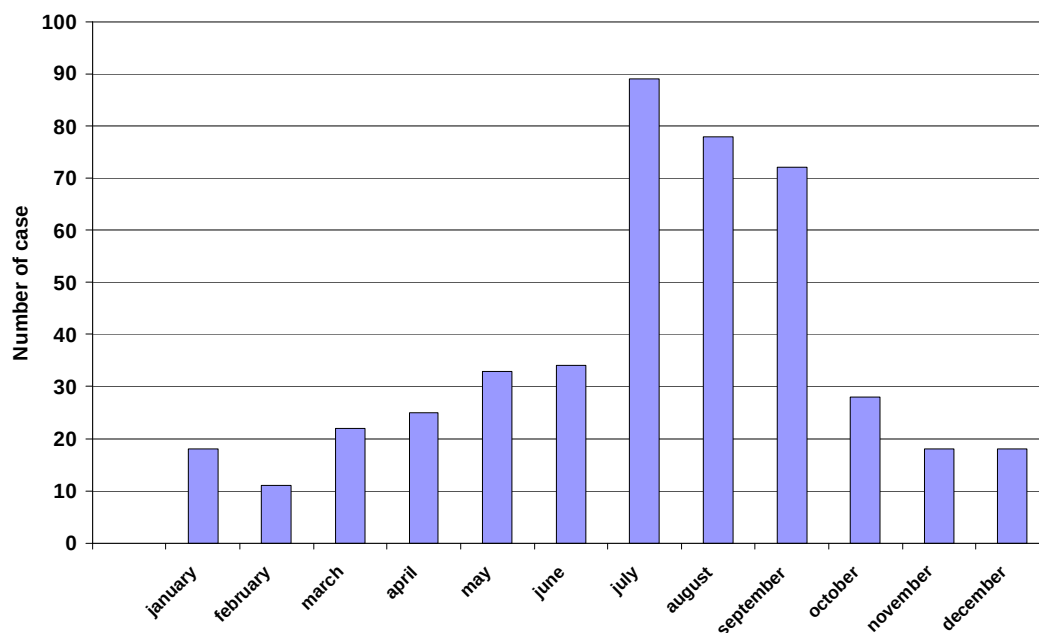


Figure 3. The summarized monthly number of collisions with birds and mammals at the airport between 1997-2011

CONCLUSIONS

The management of game and protected species at the Liszt Ferenc International Airport is strictly regulated (often limited) by the legal background. In case of protected species managers must initiate negotiation with the Inspectorate for Environmental Protection, Natural Protection and Water Management in order to ensure the unlimited removal of individuals both in time and number. In cases where the Hunting Act is relevant, managers must have exact proposals that clarify the obvious right and obligation for performing protection and mitigation measures with all the possible and suitable tools at non-hunting areas. After reviewing the scale and results of the airport wildlife hazard management measures were used to date, and the other possible measures that can be found in the international literature we have the following suggestions:

- ✧ The toolkit of the measurement techniques must be continuously widened. Based on our results it is unambiguous that the more diverse techniques are used the larger their impact is. This is in line with the international experiences.
- ✧ When widening the toolkit of the mitigation techniques and exceptional attention must be paid to the techniques against mammal species. Experiences so far indicate the need of improvement in this field, since, at slightly decreasing general tendencies, the number of mammal strikes are rising.
- ✧ According to the international experiences the utilization of lethal techniques cannot be avoided due to the appropriate effectiveness. Each repellent activity should be completed by occasionally lethal techniques, which will strongly increase the impact of the protective measures.

Protective measures against bird strikes to date can be considered successful, whilst against

mammals unsuccessful – based on the analysis of the wildlife manager’s notes. As it was seen in case of managing bird strike numbers, widening the toolkit of management techniques against mammal strikes is equal important (*Table 2*).

Table 2. Summary of applied and applicable management techniques against mammals

occurred mammal species	currently used techniques	possible techniques	advised techniques
European badger	live trapping	Live trapping, lethal trapping, shooting, fumigants	implementation of lethal trapping
bat species	-	ultrasonic device	-
dog	live trapping, capturing, driving out	live trapping, lethal trapping, shooting	implementation of lethal trapping, shooting
cat	live trapping, capturing, driving out	live trapping, lethal trapping, shooting.	live trapping
brown hare	-	live trapping, lethal trapping, shooting	capturing , shooting
stone marten	live trapping	live trapping, lethal trapping, shooting	implementation of lethal trapping
roe deer	capturing, driving out	propane cannons, pyrotechnics, shooting	shooting (with non-ricocheting bullets, night-vision, noise suppresser)
red fox	live trapping, driving out	Live trapping, lethal trapping, shooting, fumigants	implementation of lethal trapping

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