

Robert WRZESIEN<sup>1</sup>, Joanna JARMUŁ<sup>2</sup>,  
Elżbieta BUDZYŃSKA-WRZESIEN<sup>3</sup>  
and Monika ŚCIESZKO<sup>3a</sup>

## ECOLOGICAL METHODS OF BIRD CONTROL IN URBAN AGROCOENOSES IN WARSAW

### PROEKOLOGICZNE METODY ZWALCZANIA PTAKÓW W AGROCENOZACH MIEJSKICH NA PRZYKŁADZIE WARSZAWY

**Abstract:** The development of city agglomeration and suburban areas largely affect animal, mainly bird, behaviour. Warsaw as an example of devastated landscape with developing industry and housing and degraded natural ecosystems creates excellent conditions for the invasion and settlement of bird populations. Increasing problem of overpopulated avifauna results in the dispersion of animal-borne diseases. This paper is focussed on the importance of avifauna for a city, on diseases birds might disperse and on ecological methods of bird control in public places like supermarkets and facades of historical buildings.

**Keywords:** city agglomeration, avifauna, animal-borne diseases

Migration of wild animals to city agglomerations has become a problem of increasing importance recently. One of the reasons is the rapid development of towns and their suburbia. Another problem lies in the development of monocultures and decline of natural forests or mid-field woodlands [1, 2]. All these factors combined result in changes of animal behaviour which demonstrate themselves in distinct

---

<sup>1</sup> Department of General and Experimental Pathology, Medical University of Warsaw, ul. Krakowskie Przedmieście 26/27, 00–927 Warszawa, Poland, phone: +48 602 663 453, email: wrzesienddd@poczta.onet.pl

<sup>2</sup> Unit of Zoology, Department of Animal and Environmental Biology, Warsaw University of Life Science – SGGW, ul. Ciszewskiego 8, 02–786 Warszawa, Poland, phone: +48 22 593 66 23, email: joanna\_jarmul@sggw.pl

<sup>3</sup> Unit of Animal and Environmental Hygiene, Department of Animal and Environmental Biology, Warsaw University of Life Science – SGGW, ul. Ciszewskiego 8, 02–786 Warszawa, Poland, phone: +48 22 493 66 11, email: elzbieta\_budzinska\_wrzesien@sggw.pl

<sup>3a</sup> Student of Unit of Animal and Environmental Hygiene.

ethopathologies like changes in food preferences. Birds living in towns willingly select boiled or baked food products. Another problem is in that animals have developed a taste for unique city welfare. This, however, is not good for animals since they have to compete for space with people and with other animals from neighbouring regions [3, 4]. This competition changed their behaviour compared with that typical for birds living wild. Ways of competition are being changed, hierarchy is being disturbed and birds become more aggressive towards representatives of their own species. During the last several years 247 species were noted in Warsaw. Out of this number 187 species occurred regularly and 60 were present occasionally or rarely. 131 species were regular breeders in the city area and 20 species were wintering there. Mean bird density in Warsaw during the breeding period is estimated at 300–700 pairs/km<sup>2</sup> [5–7]. The highest concentration of avifauna is observed in Warsaw city centre of an area of 52 km<sup>2</sup> where the density ranges from 830 to 1590 pairs/km<sup>2</sup>. In winter the density reaches 2500–4500 ind./km<sup>2</sup> [6, 7].

Pigeons and house sparrows are the dominants which together constitute 2/3 of the whole breeding avifauna (3/4 in winter together with the rook). Subdominants of a lesser density are swifts, jackdaws, starlings, collared daws, magpies and tits (the blue tit and the great tit). In the autumn water bodies of the city are visited by mallards and black-headed gulls.

### **Threats to and protection of birds in the city centre**

Central area of Warsaw provides some advantages to birds (food abundance, favourable breeding places in buildings, warm water in winter) but also poses some serious threats. Sky-scrapers, particularly glazed office blocks, or load-bearing steel cables of the Swietokrzyski Bridge are a problem to flying birds which may smash against such obstacles and eventually die. Development and new investments cause shrinking of the city green. Intensive care of the latter impoverishes food base, breeding places and refuges for birds. Collisions with running cars increase mortality in young birds. Drying water holes and ponds in parks hampers the access to water for mallards and their young. Steep concrete slopes of water bodies become an „ecological trap” which makes drinking or bathing impossible. Nests are being destroyed in the breeding period when it coincides with renovation of house elevations. This problem is responsible for the declining density of nesting falcons, kestrels, sparrows, swifts, starlings and pigeons.

A serious ecological problem of the town is also an excessive multiplication of domestic and stray cats hunting for young birds and destroying their nests when let free on the green around houses.

Nature Protection Act of 1991 [8] helped city avifauna by protecting birds in the central area of Warsaw. It is not allowed to kill, catch, scare and keep birds in captivity. It is possible to install nesting boxes in town greenery to help moving birds from house elevations. Another problem is associated with feeding birds in special places. Fodder should be similar to the natural bird's food like eg sunflower or cereal seeds.

## Birds as a source of infection

Warsaw is „besieged” by birds which means favourable conditions for spreading animal-borne diseases. These diseases are dangerous for human health and life. The harmfulness of birds is always associated with their passages, feeding grounds, nesting and lodging places. Its size depends largely on bird density in a given area. Dominating species (pigeon in Warsaw) are the main sources of threats and damages [9].

Birds soil and pollute surfaces they sit on. The amount of excreted faeces depends on the structure of alimentary tract. Consumption of processed food shortens the digestion period and increases the amount of excreta. After drying bird faeces may be ground and spread in a form of fine dust particles. Moreover, birds leave feathers and down. Population of species dominating in Warsaw are the source of endo- and egzoparasites, they also transmit rickettsias, viruses, fungi and bacteria. Bird faeces contain condensed allergens, eggs of parasites or fungal spores [10–12].

Birds entering buildings, shops, supermarkets and storehouses (particularly with food products) have recently become a problem. The main representative of such birds is the house sparrow which adjusted its behaviour to the functioning of these objects.

## Methods of bird frightening

Control of sanitary pests posing a risk in food production and storage is legally regulated by the Directive 93/43/ECC of 10.06.93 which requires having the HACCP system [13, 14]. The system consists in limiting to a necessary minimum chemical measures in favour of preventive actions. Applied methods of inspection should enable detection and liquidation of plagues (including bird's ones) in the time the risk arises [15].

To limit bird populations one has to prevent them from nesting and lodging. Environmental friendly methods include various scaring methods: physical (nets,



Photo 1. Protecting nets on cornices of the SGGW building

spikes), chemical (liquid, gel taste applicators), acoustic (sounds) and visual (silhouettes of natural enemies, lamps) signals and natural enemies (falconry).

Specially designed barriers and physical obstacles are often used to hamper the access of birds to a given space. Polyethylene nets protecting large surfaces are most often used for this purpose. Another method is to install spikes on window sills or fences. The spikes are efficient in preventing birds from sitting and nesting (Photo 1).

Large shops and supermarkets often use acoustic frighteners which affect the sense of hearing by emitting ultrasounds heard by birds but not by humans. These devices are imported since they are not produced in Poland. They are very efficient in controlling bird density in apartments, shops and warehouses.

Silhouettes of attacking birds of prey that resemble predator's shadow are being glued on special screens along fast roads. Such figures frighten crows (*Corvus corone*), pigeons (*Columba sp.*) and other birds and prevent from accidental road collisions.

## Conclusions

Birds in a common conviction are not harmful to man but under specific conditions of town agrocoenoses the situation is quite opposite. Possibilities of controlling undesired bird presence in towns are limited in our country due to a lack of specific environmental friendly repellents which might be helpful in the case of risk. Most products are available abroad but in Poland local production is missing. Due to increasing demand, professional repellents are imported, sold or lent by special firms.

## References

- [1] Fernández-Juricic E, Jokimäk J. *Biodivers Conserv.* 2001;10:2023-2043.
- [2] Andrén H. *Oikos.* 1994;71:355-366.
- [3] Fernández-Juricic E. *Condor.* 2000;102:247-255.
- [4] Emlen JT. *Condor.* 1974;76:184-197.
- [5] Dröscher VB, Vitis B. *Reguła przetrwania.* Warszawa: PWN; 1982:13-46.
- [6] Luniak M, Kozłowski P, Nowicki W, Plit J. *Ptaki Warszawy.* Warszawa: Instytut Geografii Przestrzennego Zagospodarowania PAN; 2001:26-38.
- [7] Nowicki W. *Ptaki Śródmieścia Warszawy.* Warszawa: Muzeum i Instytut Zoologii PAN; 2001:2-34.
- [8] Ustawa o ochronie przyrody 1991 ze zmianami. DzU 2004, nr 92, poz 880; DzU 2005, nr 113, poz 954; nr 130, poz 1087.
- [9] Donnelly R, Marzluff JM. *Conservat Biol.* 2004;18:733-745.
- [10] Alberti M, Marzluff JM. *Environ Plan B: Plan Design.* 2006;26:605-630.
- [11] Rokicki E, Kolbuszewski T. *Wybrane zagadnienia z medycyny weterynaryjnej.* Warszawa: Wyd SGGW; 1997:25-39.
- [12] Humphrey T, O'Brien S, Madsen M. *Int J Food Microbiol.* 2007;117:237-257. DOI: 10.1016/j.ijfoodmicro.2007.01.006.
- [13] European Union. Council Directive 43/93 of 14 June 1993 on the hygiene of foodstuffs. *Official Journal of the European Communities*, L 175, Brussels; 1993.
- [14] European Union. Council Regulation 852/2004 of 29 April 2004 on the hygiene of foodstuffs. *Official Journal of the European Communities*, L 139, Brussels; 2004.
- [15] Ignatowicz S, Wojciechowski T. *Gosp Mięsna.* 1999;1:54-57.

**PROEKOLOGICZNE METODY ZWALCZANIA PTAKÓW  
W AGROCENOZACH MIEJSKICH NA PRZYKŁADZIE WARSZAWY**

<sup>1</sup> Katedra i Zakład Patologii Ogólnej i Doświadczalnej, Warszawski Uniwersytet Medyczny

<sup>2</sup> Katedra Biologii Środowiska Zwierząt, Zakład Zoologii,

<sup>3</sup> Katedra Biologii Środowiska Zwierząt, Zakład Higieny Zwierząt i Środowiska,

<sup>3a</sup> student, Katedra Biologii Środowiska Zwierząt, Zakład Higieny Zwierząt i Środowiska  
Szkoła Główna Gospodarstwa Wiejskiego w Warszawie

**Abstrakt:** Rozwój aglomeracji i urbanizacja terenów podmiejskich wpływa w znaczący sposób na zmianę zachowań zwierząt, przede wszystkim ptaków. Warszawa jako przykład krajobrazu zdewastowanego, gdzie rozwija się przemysł oraz zabudowa, a naturalne ekosystemy ulegają degradacji stwarza świetne warunki do wprowadzania się i zasiedlania przez ptaki. W konsekwencji wzrasta problem nadmiernego zagęszczenia awifauny, a konsekwencji wpływa to na rozprawianie i emisję źródeł chorób od zwierzęcych. W pracy tej skupiono się na przedstawieniu znaczenia awifauny dla miasta, chorób jakie mogą roznosić oraz metod ekologicznego usuwania nadmiaru ptaków z miejsc publicznych np.: supermarketów, fasad zabytkowych budynków.

**Słowa kluczowe:** aglomeracja miejska, awifauna, choroby od zwierzęce