СЕКЦІЯ 1
ЕКОЛОГІЧНА БЕЗПЕКА ТРАНСПОРТУ ТА ВІЙСЬКОВО-ПРОМИСЛОВОГО КОМПЛЕКСУ

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ON THE SIGNIFICANCE OF ADJUSTED ORNITHOLOGICAL IMPACT AREAS CONSIDERATION IN AVIATION (IGOR SIKORSKY KYIV INTERNATIONAL AIRPORT (ZHULIANY) CASE STUDY)

The mutual impacts of birds and aviation is a well-established fact. All international airports are obliged to have the systems of ornithological monitoring and control, with temporary or permanent teams of specialists and thoroughly developed management strategies, for the provision of the most efficient and safe functioning for both people and environment. Nonetheless, the specifics of ornithological issues in the aviation industry remain somewhat ambiguous, primarily due to the differences in standards, approaches and policies as well as a high degree of freedom for choice of best practices by individual airports (with prioritisation of economy over efficiency).

In Ukraine, main approaches to the definition of airport impact areas include: (1) definition of the zone directly adjacent to the airfield, (2) sanitary protection zone (SPZ), (3) definition of full airport impact area (at least 50 km from the geometric centre of airfield, with 15 km zone of restrictive building height surfaces). In the course of our investigation we decided to identify, if such approaches and scales are suitable for ornithological inquiries and management practices.

Within our study we have identified at least 11 bird species overlooked by official documents of Igor Sikorsky Kyiv International Airport (Zhuliany) (Table 1) due to the limitation of ornithological inquiries to the immediate airport area. Two of those species present significant hazard to the aircraft in case of collision due to body parameters, three species are expressing dangerous flocking behaviours, five species are synanthropes with high tolerance thresholds, adapted to living near and off human neighbours, and eight species are listed as protected in domestic or international documents.

Additionally, we listed and surveyed the locations around the airport, which may be attractive to the birds as forage, resting, mating or nesting spots. 90% of collisions happen at 900-1000 metres (and the rest – at up to 2-2,5 km), i.e., at take-off, climbing, approach and landing stages of runway cycle. Thus, we covered the area up to 10 kilometres in radius (as averaging) in all directions and identified 16 locations with different sizes and natural parameters (among which – plant coverage and height, fragmentation levels, presence of food base and water bodies, attractiveness designation etc.). The list includes the absolute majority of natural areas in Kyiv city as well as some

agricultural areas in close proximity to city borders, with such vast territories as Holosiivskyi National Nature Park, Sviatoshyn forest and lakes, Hryshko National Botanical Garden, Trukhaniv and Zhukiv isles etc. The total avifauna of the Ukrainian capital comprises more than 100 species. Birds can cover vast territories on a daily basis in search of food, water, mates or nesting spots, as well as in course of seasonal migrations, which implies that all those areas need to be included into monitoring programmes, risk assessment and management efforts. As a result, it is clear that all of the above-mentioned alternatives regarding impact zones are poorly applicable for the objectives of ornithological management. They are either insufficient for making some well-proven conclusions, or excessive with large neglected and overlooked areas.

Table 1

Bird species identified outside the immediate airport area at the international airport "Kyiv" (Zhuliany)

Species	Body parameters (BL – body length, WS – wingspan, BM – body mass)
Motacilla alba	BL – 17-19 cm; WS – 25-30 cm; BM – 20-32 g
Turdus merula	BL – 23-29 cm; WS – 34-45 cm; BM – 80-110 g
Turdus pilaris	BL – 23-26 cm; WS – 39-42 cm; BM – 75-140 g
Spinus spinus	BL – 11-13 cm; WS – 20-23 cm; BM – 10-20 g
Sitta europaea L.	BL – 12-15 cm; WS – 22-28 cm; BM – 19-25 g
Parus major	BL – 13-17 cm; WS – 20-26 cm; BM – 14-21 g
Columba palumbus	BL – 40-43 cm; WS – 68-80 cm; BM – 360-660 g
Streptopelia decaocto	BL – 31-33 cm; WS – 47-55 cm; BM – 140-240 g
Picus Viridis	BL – 31-33 cm; WS – 40-42 cm; BM – 140-200 g
Emberiza schoeniclus	BL – 15-21 cm; WS – 21-30 cm; BM – 15-25 g
Corvus Corax	BL – 56-78 cm; WS – 100-150 cm; BM – 0,7-2,0 kg

The calculation of the impact zone with ornithological risks for both people and birds in mind requires cooperation of different experts and consideration of many variables that differ for various types of aircraft, such as horizontal and vertical aircraft speeds, altitude angle, flight time required to reach a certain altitude mark, and so on. In addition, it is necessary to take into account the possible indirect impact of runway length and coverage, weather conditions, seasons and other factors, as well as the impact of airport infrastructure on the surrounding populations. Thus, the traditional approaches of information collection prove to be inadequate. Yet, considering the notorious difficulty of ornithological investigations, there is an obvious need for the establishment of a clear and optimised ornithological impact area arises. Therefore, it should become one of the focus points for the studies and actions in this field in the near future.

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