Collaboration of science and industry, exsample of efficient solution on WHR

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Program prepared for the WHR for all international airports within Slovenia and aimed for the period after the epidemic of COVID-19 has been prepared. Program is result of collaboration of the interdisciplinary research group presenting key academic institutions with Airport Ljubljana and with governmental support.

The ecological conditions in the immediate and wider surroundings affects the situation and the birdstrike safety policy of the airports. ***Understanding the ecology of the immediate and wider space gravitationally connected to the airports*** *allows for effective planning of WHM. This data are the basis for efficient WHM measures-safe airports and forecasting models in the light of medium and long-term changes in* ***global climate developments*** *and effect of the period with reduced air traffic* ***due to COVID-19****.*

The period of reduced air traffic due to COVID-19 is expected to result in a relatively ***increased number of collisions*****. We anticipate that the "disturbance-free time" of deterrent activities at the airports* ***will attract a larger number of Common Buzzards and Common Kestrel****, which will also have* ***no experience with aircraft****.*

Global climate change is reflected in ***changes in the species richness and composition of the bird community*****, *including at airports. According to the scenarios, and the experience of some airports, the* ***change in the species composition and dynamics of bird populations can be quite rapid, e.g. over a period of 2 to 5 years****. New species with* ***which the airports has no experience*** *so far bring new challenges and new methods of deterrence. It is necessary* ***to prepare a scenario of anticipated new species****, which are known from the literature to change the boundaries of their distribution or to inhabit new habitats. One of the potential species that will pose a challenge comparable to common buzzard is the Caspian Gull (Larus cachinnans), there are a few more candidates.*

Knowing the ecology of the wider space area gravitationally connected to the airport allows for better planning an effective WHM*.*

**The problem has been highlighted also by the World Birdstrike Association (WBA), https://www.worldbirdstrike.com/21-uncategorised/front-page-articles/155-message-from-the-board-covid-19-and-wildlife-hazard-management-at-airports*

****** Also ***ICAO has points out the problem:***
file:///E:/AERODROM%202020/Oliver/publikacije/Aviation%20and%20Changes%20to%20Biodiversity.pdf

The research will also continue with the some of the exsisting workplan. In addition to the Ecologycal study as base for efficient Wildlife hazard reduction at the Airport Ljubljana, we also wanted to gain additional ecological insights of the observed area together with a depper theoretical understanding of modelling methods used. With the insight gained we try, if possible, to generalize our findings over a broader area or use them in a broader way. As an example, assemble a bird species specific distribution model of the area observed, where we also take into account the temporal componenent of the data.

The research is focus on specific species distribution models (SDM), where we compare and evaluate different aproaches of modeling spratial distributions of specific species. The models we want to test can be divided into 3 categories: classical statistical regression models, Bayesian aproaches and machine learning methods.

We compare the model through time in how well they perform, which models are best after 1 year and which after 3-5 years.