Annual Wildlife Hazard Management Review 2019

Fraport Greece

Eurasian reed warbler
at RHO Airport

Introduction

Birds and other wildlife species can pose a direct threat to aviation safety. The bird movements, when interacting with the aircraft flight paths, on or in the vicinity of an airport, present a persistent and serious threat to flight safety. The term “in the vicinity” includes land or water areas up to a 13km radius from the airport reference point. Wildlife strikes with aircraft could result in billions of dollars in direct and indirect costs and cause injuries and fatalities. Wildlife Hazard Management (WHM) is therefore an important element of airport operations.

Greece is a small but mountainous country, which is characterized by a rich diversity of ecosystems and habitat types. It is one of the world’s hotspots for endemic plants and wildlife species. Four hundred and fifty four (454) bird species have been observed in Greece, either during the breeding, migrating or wintering season. However, not all wildlife species are equally hazardous. The fundamentals of wildlife management and airport ecology include understanding animal behaviour and working with it, not against it. Birds are not the only animals causing problems at Fraport Greece airports. Mammals such as jackals could interact with aircraft operations.

The Wildlife Hazard Management Team

The Operations Division of Fraport Greece has a responsibility to provide a safe operating environment to aircraft operators. The Wildlife Hazard Management Team reports to the Head of the Operations Standards and consists of:

- The **Wildlife Hazard Manager**, who is in charge of the development and implementation of the Wildlife Hazard Management System (WHMS). Each airport has its own specific Wildlife Hazard Management Programme (WHMP), tailor made according to the local airport and environmental conditions. This role involves responsibilities to work with external parties, regional and national government representatives on wildlife strike mitigation, to provide the Wildlife Hazard Management Training to airport operations employees and to comply with the regulatory requirements of the European Aviation Safety Agency (EASA) and the Hellenic Civil Aviation Authority (HCAA).
- The **Wildlife Hazard Management Officer** organizes the wildlife control operations according to the WHMP, supervises the wildlife control record keeping, provides technical support, conducts data entry, statistical analysis, wildlife surveys, and assists in the provision of the official WHM training.
- The **Wildlife Controller** is based at Thessaloniki Airport “Makedonia”. Main tasks of this role include habitat and wildlife monitoring, implementation of wildlife control and habitat management measures, liaison with local stakeholders and assistance in obtaining the necessary permits for wildlife control.

Grey heron *(Ardea cinerea)* flying over KVA Airport

Grey partridge *(Perdix perdix)* at SKG Airport

The five big challenges of managing wildlife hazards at Fraport Greece airports

1. The term “in the vicinity” of an airport, includes land or water areas up to a 13km radius from the airport reference point. From a network of 12 out of 14 Greek regional airports (CHQ & PVK are excluded due to Concession Agreement–Wildlife Hazard Management lies within Hellenic Air Force responsibilities at these two airports), this area includes 6.367 Km^2 to be surveyed in terms of habitat types, land uses, wildlife species and their populations. The environmental parameters fluctuate between seasons of the year and between years. It is therefore clear, that intensive monitoring is essential, during the first 5 years to create a database with credible data, the analysis of which will provide the basis for decision making in wildlife management. This data would be additionally used in negotiations with the HCAA and other stakeholders regarding land use and WHM at the areas outside the airport boundaries.

2. The expertise on Wildlife Hazard Management requires formal training plus extensive experience in field observations on environmental and aviation parameters. Fraport Greece operates the 14 regional airports since 11th of April 2017. The WHM training has been provided to Fraport Greece Airside Operations Personnel in that year. The wildlife strikes and the wildlife monitoring data, which will originate from observations from Fraport Greece employees, will be presented during the recurrent training. This type of data will enable a tailor-made training provision per airport, combined with the experience acquired from the airside personnel during the first years of operations.

3. According to the risk assessment methodology used to categorize the risk of each bird species struck with aircraft, a dataset of a minimum 5 years is required to apply the methodology. In 2018, the methodology has been applied with data obtained from the HCAA for the period 2013-2016 and from Fraport Greece for the year 2017. It is from 2022 and onwards, that the risk assessment methodology will be performed with a credible set of data obtained by trained Fraport Greece personnel.

4. A reporting system has been developed not only for the wildlife strikes when they occur, but also for the monitoring of wildlife activities at the airside. Any proactive measure, such as runway inspections for bird control is an important mitigation measure that reduces the wildlife strikes through effective wildlife control. The engineering of this reporting system at Fraport Greece airports is a major development. It improves continuously through a quality check of the documented information, to ensure bird species are identified correctly, the wildlife strikes are reported to the HCAA in time and all the necessary wildlife control measures are applied and documented to enhance flight safety standards.

5. Finally yet importantly, a surging population of stray animals in Greece causes problems at airport operations when animals enter the airside through fence gaps or vehicle gates. At the landside areas, passengers could be exposed to encounters with stray dogs, which can lead to dog attacks.

Ruddy shelducks *(Tadorna ferruginea)* at Psili Ammos, Samos Island

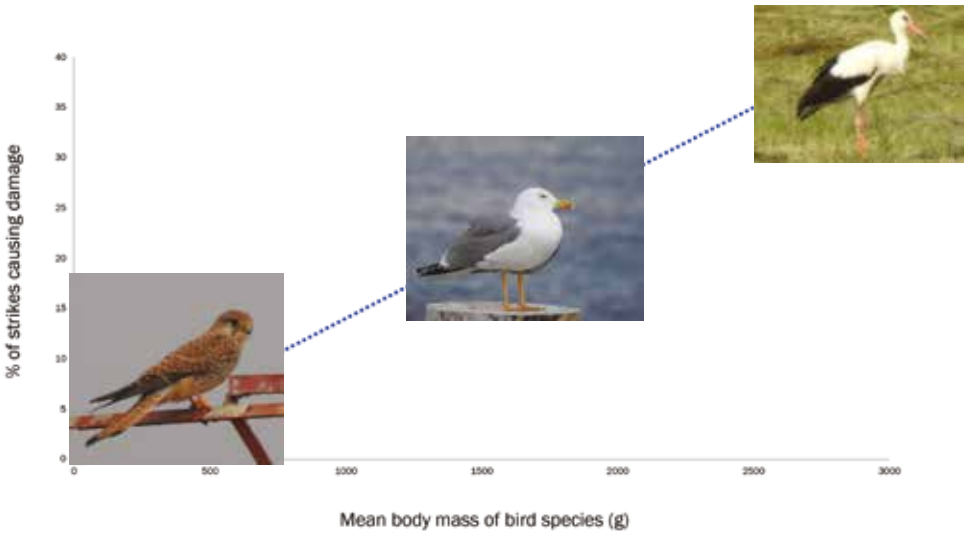
Yellow wagtail *(Motacilla flava)* at ZTH Airport

The Wildlife Hazard Management Programme (WHMP)

Each airport is unique in terms of landscape and wildlife. The WHMP describes the airport and its surroundings, includes a dataset, the risk assessment, procedures and measures applied to manage conflicts caused by the presence of animals. The effectiveness of the wildlife control measures is assessed through continuous monitoring. Therefore, wildlife management is flexible and adapts to changes. The WHMP is a document drawn up accordingly to the instructions issued by EASA and the HCAA. It contains additionally maps on habitat types, land uses around the airport, wildlife attractant sites up to 13km from the airport's reference point.

The wildlife strike risk is assessed by a combination of two parameters: probability and severity. The strike probability is calculated as the yearly frequency of reported strikes for different wildlife species or groups of species in a 5-year period. As a measure of risk severity, the proportion of damaging strikes in the 5-year period is estimated for any group of species according to their body mass. The identification of the species involved in strikes is crucial to perform any risk assessment. For this purpose, if macroscopic analysis of remains is not possible, DNA analysis reveals the species involved. The severity scale depends essentially on the size of the bird as the graph below shows.

Severity Index: Mean Mass of bird * 0,014



The habitat management is the cornerstone to successful wildlife hazard management. By reducing the resources that habitats offer to wildlife, the abundance of birds and other animals and the hazards they pose will also be reduced. Although such measures require greater effort in the beginning (in terms of expenditure and staff), in the long-term they are much more cost-effective than other measures, since the need for other control or dispersion actions is reduced. Extensive habitat modification has taken place at all Fraport Greece airports in 2018, with grass cutting, tree cutting and drainage ditch clearances.

To actively control wildlife, bioacoustics are used for wildlife species that communicate distress through sounds. For non-vocal species, digital sounds are emitted to disperse them out of the airport areas. In addition, trapping and relocation of stray animals and other mammals is applied, together with the appropriate fence maintenance repairs. For Corfu, Thessaloniki and Kavala airports, the permission process to import and use pyrotechnics for bird control has been initiated in cooperation with the local police departments.

Black-winged stilt *(Himantopus himantopus)* at SKG airport

Wildlife Strike Data

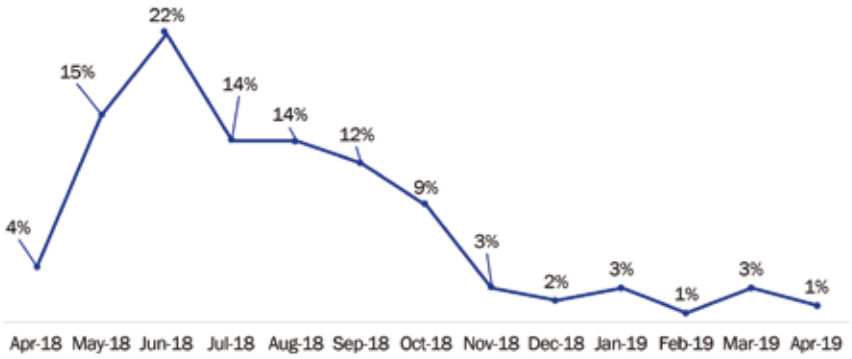
The following graphs provide information on the wildlife strike data obtained during the period 11 April 2018-11 April 2019.

The term **confirmed wildlife strike** includes any reported collision between a bird or other wildlife and an aircraft for which evidence on the form of carcass, remains, or damage to the aircraft is found. Any dead bird/wildlife found dead on the runway with an obvious cause of death from a strike is considered as confirmed wildlife strike, no matter if a pilot has reported a strike or not.

A **possible wildlife strike** (unconfirmed) is any reported bird collision between a bird or other wildlife and an aircraft for which no physical evidence is found on the aircraft or the airport.

A **wildlife strike with an effect on flight** is an incident that results in a delay, aborted take-off, precautionary landing or causes some form of damage to an aircraft.

% Confirmed Wildlife Strikes per Month (11th April 2018 - 11th April 2019)



The below table indicates the mostly struck wildlife species in descending order.

Yellow-legged gull
Barn swallow
Common kestrel
Pigeon
Mallard
Black-headed gull
Eurasian-stone curlew
Common swift
Grey partridge
Little owl

The fact that 35% of these strikes, were not reported by any aircraft crew, but by the Fraport Greece Airport Operations staff during runway inspections, emphasizes the quality of the newly built airport reporting system. In addition, Fraport Greece Airport Operations staff has submitted over 2400 reports referring to bird activity and related control measures applied.

A couple of the most interesting observations include the following:

1. On 17th April 2018, a ringed Osprey (Pandion haliaetus) struck on an aircraft at CFU having no effect on flight. Ring data has been provided to the Ringing Centre of Helsinki University. The recovery details revealed that the bird was ringed 2534km NNE of CFU, 1 year 9 months and 2 days prior to the date of birdstrike

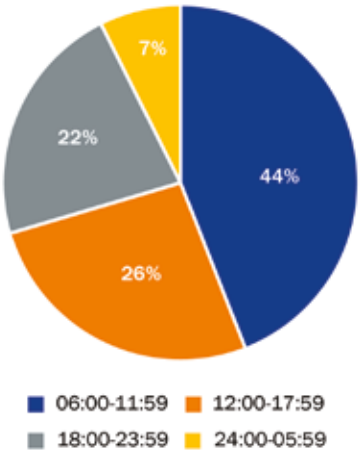
2. Eleonora's falcon (Falco eleonorae) winters mostly on Madagascar. A great proportion of its global population comes to Greece for breeding. On 22nd May 2018, over 20 Eleonora's falcons were observed flying over the RHO airport surroundings.

Wildlife Strike Data per Airport

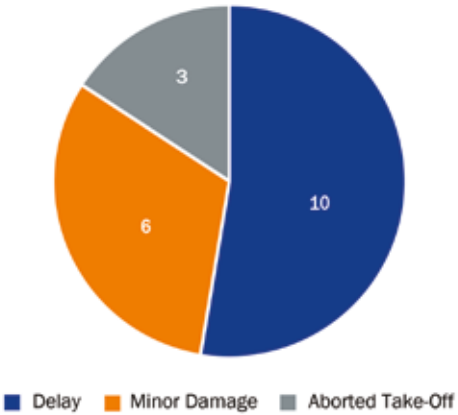
Airport	% Confirmed Wildlife Strikes	Wildlife Strikes with an Effect on Flight	% Possible Wildlife Strikes
CFU	10%	1	33%
EFL	2%	-	2%
JMK	3%	1	3%
JSI	1%	1	5%
JTR	6%	2	5%
KGS	5%	2	10%
KVA	7%	2	1%
MJT	2%	1	2%
RHO	12%	-	13%
SKG	34%	7	22%
SMI	3%	-	3%
ZTH	15%	2	2%
Total	**100%**	**19**	**100%**

On an annual basis, the risk assessment matrices that combine probability and severity parameters per airport are submitted to the HCAA. To assess the wildlife strike risk, only the confirmed strikes are taken into account. In 2018, these reports have been submitted to the HCAA for the period 11th of April 2017 – 31st of December 2017.

% Confirmed Wildlife Strikes per Period of Day (11th April 2018 - 11th April 2019)



Wildlife Strikes with an Effect on Flight (11th April 2018 - 11th April 2019)



The highlights of the year

Cooperation with the Hellenic Ornithological Society

A very dynamic team of expert ornithologists has been appointed from the Hellenic Ornithological Society, further to an agreement with Fraport Greece, for the conduction of wildlife surveys on and off-airport for the year 2018. The wildlife surveys included the recording of wildlife species and their habitats, the roosting, breeding and wintering population counts and the identification of main sites attracting wildlife within the 13 km radius of the airport.

Squacco heron (*Ardeola ralloides*) at RHO Airport

Common buzzard (*Buteo buteo*) at KGS Airport

Golden plover *(Pluvialis apricaria)* at KGS Airport

Sustainable management of Golden Jackal population at Samos airport

Samos Airport has been built on a wetland that is one of the natural habitats of the Golden Jackal. A possible collision between a Golden Jackal and an aircraft could result to the animal being killed as well as serious damage to the aircraft. To avert this, Fraport Greece is focused in the removal of the Golden Jackal from the airport area and has signed a cooperation agreement with the “Archipelagos” Institute of Marine Conservation over the sustainable management of the jackals and their exclusion from the airport area.

Since May 2017, zoology scientists at the Archipelagos Institute have been studying the jackal population in the airport area. To monitor Golden Jackals and to collect the necessary data, the team uses the latest technology available: new generation infrared cameras with motion detectors for night recordings, passive acoustic monitoring systems, etc. It is worth mentioning that the Samos Golden Jackal is a special population of this species, genetically unique compared to other Golden Jackal populations in the Balkans.

The project of gradual and mild relocation of the Golden Jackal population from Samos Airport is a world first and aims at becoming an international model for the management of large mammals in airport spaces, balancing the need for flight safety and the principles of environmental protection.

Golden Jackal at SMI Airport

Samos Airport "Aristarchos of Samos"

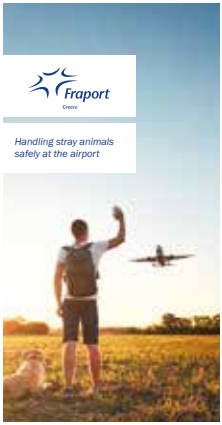
Seminar awareness on snakes identification and relocation

The Thessaloniki Airport “Makedonia” based firefighters, had the opportunity to attend an interactive training module on the management of snakes. Mr. Elias Strachines, biologist- herpetologist, talked about the numerous benefits that snakes offer to humans, the flora and the fauna. Contrary to popular belief, most of the snakes are not poisonous, thus, they are completely harmless to people. Even the Vipers, the only species with strong venom that we come across in Greece, are not aggressive and definitely not as dangerous as it is believed. Their biting can be treated in most cases without side effects. Within the scope of lifelong learning and development for Fraport Greece staff and 3rd parties operating at the airports, the awareness workshop was video recorded and distributed to all firefighting departments at the Fraport Greece operated airports.

Viper *(Vipera ammodytes)*

Safe Handling of Stray Animals

To raise awareness on the organization and other aviation stakeholders about the magnitude of animal neglect in Greece, a leaflet has been issued on safe handling of stray animals at Fraport Greece airports. This leaflet informs our employees and our customers about the threat is posed to the aviation safety from the presence of dogs and cats on the airport premises. An airport is not and should not be considered as suitable habitat for an animal. In collaboration with local authorities and animal welfare organizations, Fraport Greece ensures that stray animals are safely handled and relocated to designated areas, where they will be under appropriate veterinary care. The leaflet provides guidelines not to feed stray animals that may be found on the airport premises, and to keep the airport grounds clean, since any kind of garbage may attract them.



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