

Annual Wildlife Hazard
Management Review
2021



Issued in June 2022

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Preface



The impact of the pandemic Covid-19 on the aviation industry has been of an unprecedented order, whilst the airport operations have become more demanding than ever, due to the uncertainty created from the constantly changing travel protocols. In this new normality, airport safety continues to be the first priority for Fraport Greece. Regarding wildlife strike prevention, we are proud to have a team of highly qualified airport professionals, who ensure that safety comes first.

At the same time, climate change is a reality and the aviation industry is adapting to this new reality by incorporating green and sustainable solutions at the core of its business. We acknowledge and embrace our responsibility to conserve non-hazardous wildlife and to protect our natural ecosystems. A five years action plan for the period 2021-2025 is in place at the Fraport Greece airports for biodiversity conservation. In addition to this, we are committed to preventing wildlife trafficking at all airports operated by Fraport Greece and to put an end to the illegal trade of animal and plant resources.

In this annual review we provide insights and detailed information in our best practice wildlife strike prevention techniques and the indicators we use to evaluate performance both for wildlife strike prevention and for conservation of non-hazardous species. I would like to thank our Wildlife Hazard Management Team as well as our airport operations personnel for their invaluable support and their continued contribution to the development of an open safety culture that encourages reporting and continually improves our safety standards.

Panagiotis Spyrtos
Acting Chief Operations Officer

Introduction

Background information

Fraport Greece is responsible for maintaining, operating, managing, upgrading and developing 14 regional airports in Greece over a period of 40 years. The operational transfer of the 14 airports to Fraport Greece took place on April 11th, 2017. The modernization and upgrade of the airports' infrastructure has been completed ahead of schedule. This emblematic €440 mil. investment programme brought in 2021 a clear vote of confidence and optimism about Greece's aviation future. The network of airports operated by Fraport Greece is highly seasonal and serves mostly unique travel destinations. Thessaloniki airport "Makedonia" serves the second largest city in Greece as well as the broader city area and has aircraft traffic throughout the year.

Covid-19 Pandemic

Since the outbreak of Covid-19 pandemic, Fraport Greece has strictly followed every protocol and guideline issued by the Authorities and implemented all the measures that protect the airport community from the virus and its further spread. The ACI World Airport Health Accreditation is a further testament that this commitment towards the safety of both passengers and local communities has turned into effective actions.



Photo: *Pheasant, Kerkira Airport "Ioannis Kapodistrias"*

Wildlife Hazard Management

Any collision between wildlife (including birds) with an aircraft is known as wildlife strike. Most of the times such a strike has no operational impact but few times it could result to delays for a technical check or even could cause damage to an aircraft. The number of dead birds is relatively small to affect the conservation status of a species. However, the cost to the aviation industry from delays and aircraft damages has a significantly higher impact.

From the outbreak of the pandemic and during the last 2 years, there were no reductions in wildlife hazard management at the airports operated by Fraport Greece. In contrary, the Wildlife Hazard Management Team has grown with additional expert personnel. Furthermore, the procurement of tractors and lawn mower riders was completed. Efficiencies are built therefore, both in active wildlife control and habitat management so as to make the airport environment less attractive to wildlife and further reduce wildlife strikes.

For active bird control, the Airside Supervisors (Follow-me car) and the Wildlife Control team are equipped with Bioacoustics, Digital sounds and Pyrotechnics. In 2021, an anti-bird laser was pilot tested at Thessaloniki Airport “Makedonia” with exceptionally good results for the dispersal of Ducks, Gulls, Herons and Pigeons. In the framework of continuous improvement, the Wildlife Control team will keep applying new methods for habitat management and active dispersal of hazardous bird species.



Photo: Peregrine falcon, Santorini Airport

2018-2021 Wildlife Strike Analysis



Collection and analysis of data from confirmed wildlife strikes is an essential step towards understanding wildlife collisions with aircraft. Systematic study of the confirmed wildlife strikes leads to the design and implementation of effective corrective actions to mitigate the wildlife strike risks and their impact to the aviation industry. The wildlife strike database is used to identify the most frequently struck wildlife species, the monthly distribution of strikes, the flight phase that strikes occur and the aircraft parts that may be more vulnerable. It also illustrates the contribution of the aircraft operators or other airport users as well as the Fraport Greece operations personnel to the wildlife strike reporting. Moreover, this archive is used in parallel with the air traffic data to calculate the wildlife strike rate, thus, the confirmed wildlife strikes per 10,000 aircraft movements. This indicator measures strikes per 10,000 movements and is used to evaluate performance at a specific airport over the years.

Fraport Greece operates since 11th April 2017. The below charts illustrate a statistical summary of the aforementioned data for 4 years (2018-2021).

Photo: A Sparrowhawk attacks a Pigeon, Rodos Airport "Diagoras"



Most wildlife strikes occurred between July and October (Chart 2). Birds were involved in 92.32% of the reported strikes and other wildlife species in 7.68%. Fraport Greece operations personnel reported 37% of the confirmed wildlife strikes (Chart 4). This indicator, is named as “% airport reporting” and represents the percentage of confirmed wildlife strikes a Fraport Greece operations personnel reports without any prior notice from a pilot or air traffic control. These dead animals, with evidence of strike, found on the runway by the Fraport Greece airside operations personnel are reported as confirmed wildlife strikes, attributed though to no airline. This is considered best practice at a European level and emphasizes the reporting culture developed at Fraport Greece.

The wildlife species that most frequently suffer a strike is the migratory bird Barn swallow, followed by Yellow-legged gull, Common kestrel, Pigeon, Eurasian stone-curlew (migratory bird) and Mallard (Chart 5).

61% of the wildlife strikes occurred during landing (including descent, approach, landing-roll, park) (Chart 6) and 71% occurred during the time segment 06:00-18:00 Greek local time (Chart 7). The aircraft parts most frequently struck by wildlife are the engines, radar radome, nose and windshield (Chart 8).

Photo: Spur-winged lapwing, Kavala Airport "Megas Alexandros"

All airports*

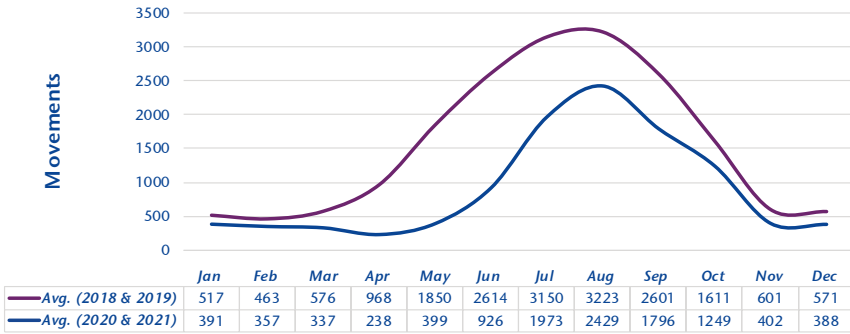


Chart 1 Average monthly air traffic between pre-pandemic years (2018 & 2019) and Covid-19 pandemic years (2020 & 2021). Since Fraport Greece operates seasonal airports, the busiest period is between May and October. Covid-19 outbreak caused a decline to the air traffic and shifted the busiest period to be between July and October

All airports*

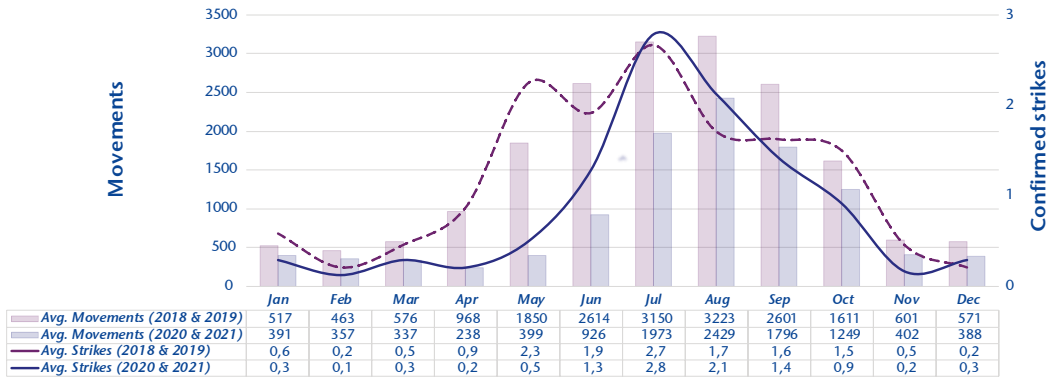
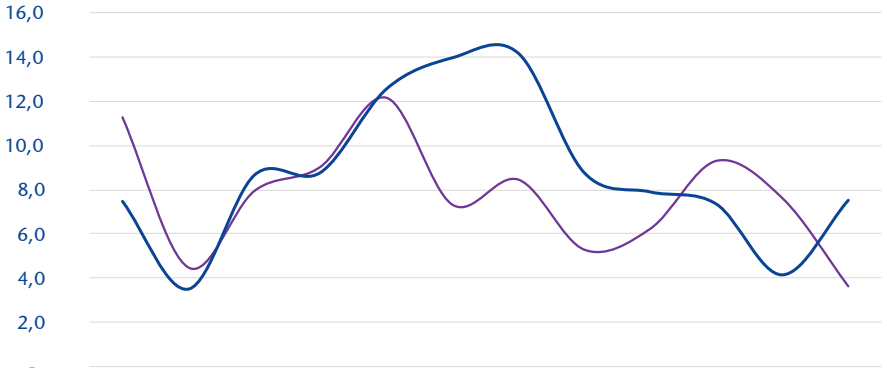


Chart 2 Average monthly confirmed wildlife strikes (bird species with mass over 100g) between pre-pandemic years (2018 & 2019) and Covid-19 pandemic years (2020 & 2021). During Covid-19 outbreak, most wildlife strikes recorded between July and October, when air traffic occurred

*Chania Airport "Ioannis Daskalogiannis" & Aktion Airport are excluded as per the provisions of the Concession Agreement

All airports*

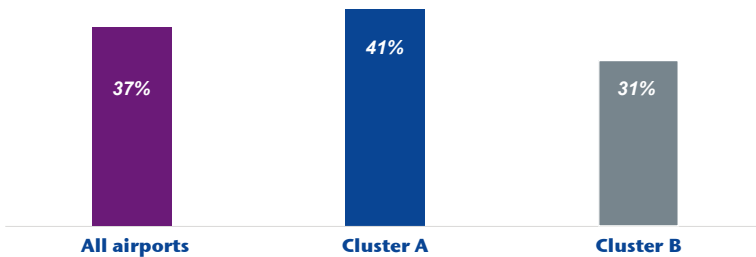
Average confirmed strike rate**



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. (2018 & 2019)	11,3	4,5	8,0	9,0	12,2	7,3	8,5	5,3	6,2	9,3	7,6	3,6
Avg. (2020 & 2021)	7,5	3,5	8,6	8,8	12,5	13,9	14,1	8,7	7,9	7,3	4,1	7,5

Chart 3 Monthly confirmed wildlife strikes (bird species with mass over 100g) per 10,000 aircraft movements between pre-pandemic years (2018 & 2019) and Covid-19 pandemic years (2020 & 2021). Possible impact of low traffic on the slightly increased rates in 2020 & 2021 is under evaluation

% Airport reporting for 4 years (2018 - 2021)



Cluster A consists of: Kavala Airport "Megas Alexandros", Kefallinia Airport "Anna Pollatou", Kerkira Airport "Ioannis Kapodistrias", Thessaloniki Airport "Makedonia", Zakynthos Airport "Dionisios Solomos"

Cluster B consists of: Kos Airport "Ippokratis", Mikonos Airport, Mitilini Airport "Odysseas Elytis", Rodos Airport "Diagoras", Samos Airport "Aristarchos of Samos", Santorini Airport, Skiathos Airport "Alexandros Papadiamandis"

Chart 4 Confirmed wildlife strikes reported exclusively by Fraport Greece airside operations personnel

*Chania Airport "Ioannis Daskalogiannis" & Aktion Airport are excluded as per the provisions of the Concession Agreement
 **Wildlife strike rate = Confirmed wildlife strikes (bird species with mass over 100g) per 10,000 aircraft movements

Most common species' strikes/10,000 movements for 4 years (2018-2021)

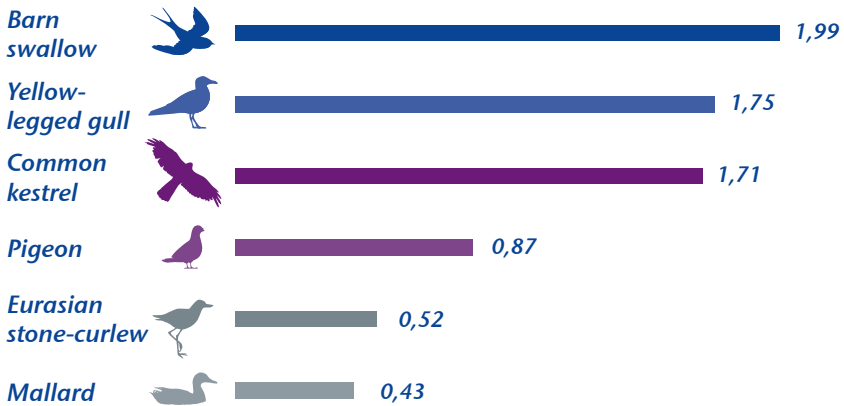


Chart 5 Most commonly struck bird species per 10,000 aircraft movements

Confirmed wildlife strikes per flight phase for 4 years (2018-2021)

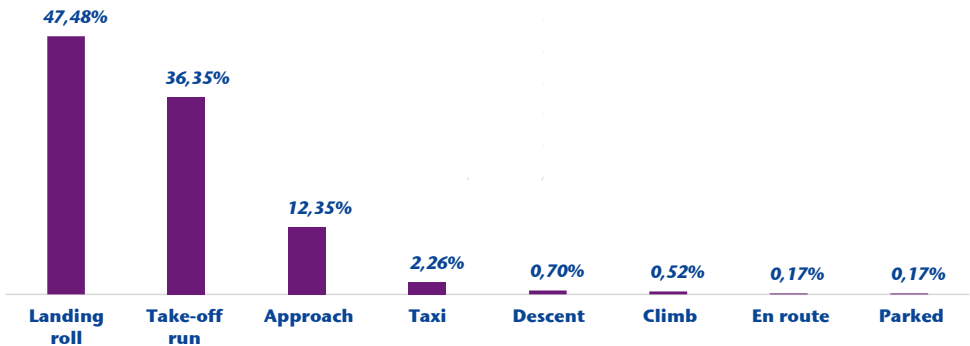


Chart 6 Reporting of confirmed wildlife strikes per flight phase

Confirmed wildlife strikes per time segment for 4 years (2018-2021)

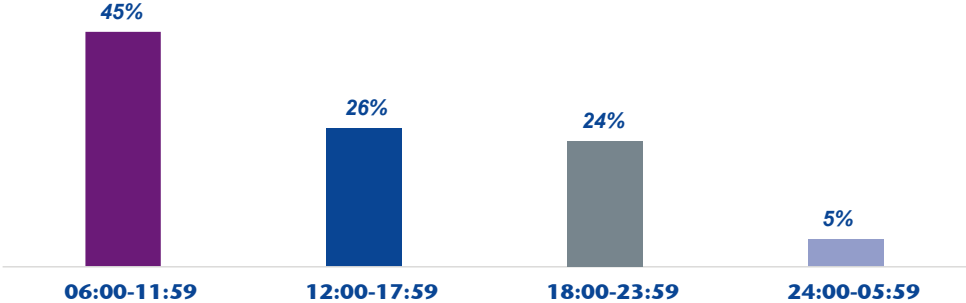


Chart 7 Reporting of confirmed wildlife strikes per time segment

Aircraft parts mostly struck for 4 years (2018-2021)

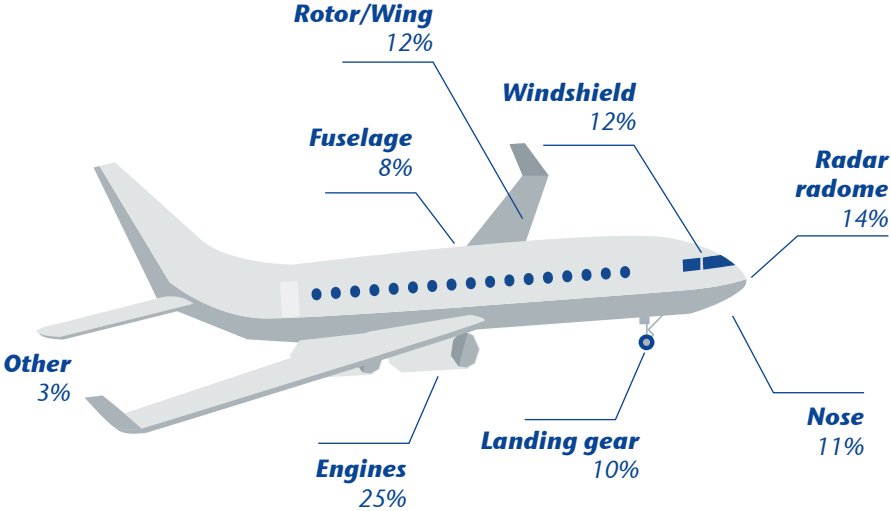


Chart 8 Aircraft parts mostly struck

Impact of Covid-19 pandemic on Wildlife Strikes across Europe



Fraport Greece has participated in a research study about the impact of Covid-19 on wildlife strikes at several European airports of various air traffic volume. Wildlife strike records for the period between March 2017 and February 2021 were analyzed to compare the data prior and during the Covid-19 outbreak. In particular, the number of wildlife strikes per 10,000 aircraft movements, the most commonly struck wildlife species and the daylight conditions that strikes occurred were studied. The factors that affect the wildlife strikes to aircraft were discussed by taking into consideration the different wildlife strike reporting procedures per airport operator. The results of the analysis indicate the necessity for increased awareness of the wildlife strike issue and for the implementation of effective wildlife hazard management, despite the air traffic volume decrease.

Biodiversity Conservation Programme

The Fraport Greece "Biodiversity Conservation Programme" provides a framework within which Fraport Greece opts to manage biodiversity at the airport areas as part of its Environmental & Social (E&S) Management System (ESMS).

The Biodiversity Conservation Action Plan 2021-2025 covers a significant habitat area of around 17km² in total for the 14 regional airports. The aforementioned surface areas refer to areas covered with vegetation at the airside. Over a period of five (5) years starting in 2021 and until the end of 2025, a comprehensive database will be created for a variety of wildlife species and their populations. Various measures are planned to support locally the protection of flora and fauna species that are not hazardous to aircraft flights.

The variety of the Biodiversity Conservation Programme objectives include grassland preservation, water surface monitoring, conservation of non-hazardous wildlife (insects, amphibians, reptiles) as well as marine conservation initiatives.



Hypericum perforatum,
Thessaloniki Airport "Makedonia"



Anacamptis pyramidalis,
Thessaloniki Airport "Makedonia"

Biodiversity Records

A significant number of bird species has been observed by Fraport Greece operations personnel, in 2021. This attempt has been initiated with a series of webinars and the procurement of the necessary birdwatching equipment. The photos below have been provided by motivated Airside Supervisors and have significantly enriched the biodiversity database.



Spotted flycatcher
is recorded for the first time
at Rodos Airport "Diagoras"



Eurasian wren
is observed at Skiathos Airport "Alexandros
Papadiamandis" and Thessaloniki Airport
"Makedonia"



Little-ringed plover
lands on our world destinations Mikonos
and Santorini Airports during the spring
migration to the north



Golden plover
makes a stop at Skiathos Airport
"Alexandros Papadiamandis"



Cattle egret
observed at the vicinity
of Zakynthos Airport
"Dionisios Solomos"



Rüppell's warbler
is found on the airside of Kos Airport
"Ippokratis" at night



Black tern
first record in the network of airports operated
by Fraport Greece was made at Kavala Airport
"Megas Alexandros"



Red-footed falcon
is seen at Mitilini Airport
"Odysseas Elytis"



*First sight of **White stork** at Kos Airport "Ippokratis", Rodos Airport "Diagoras" and Zakynthos Airport "Dionisios Solomos"*



***Osprey** is hunting at the Halikiopoulos lake, next to Kerkira Airport "Ioannis Kapodistrias"*



***Ruddy shelduck** observed close to the Samos Airport "Aristarchos of Samos"*



*First record of a **Shelduck** at Kefallinia Airport "Anna Pollatou"*

Reptiles are protected species. Snakes that may be occasionally found inside the airport buildings are safely handled and relocated in their natural habitat by the Aircraft Rescue and Firefighting with the assistance of Fraport Greece airport personnel. In 2021, the below Reptiles were recorded at the network of airports operated by Fraport Greece.

List of reptiles recorded at the airports operated by Fraport Greece

Balkan green lizard (*Lacerta trilineata*) at Skiathos Airport "Alexandros Papadiamandis"

Balkan whip snake (*Hierophis gemonensis*) at Zakynthos Airport "Dionisios Solomos"

Black whipsnake (*Dolichophis jugularis*) at Rodos Airport "Diagoras"

Caspian whipsnake (*Dolichophis caspius*) at Kos Airport "Ippokratis", Mitilini Airport "Odysseas Elytis" and Thessaloniki Airport "Makedonia"

Eastern Montpellier snake (*Malpolon insignitus*) at Kerkira Airport "Ioannis Kapodistrias" and Skiathos Airport "Alexandros Papadiamandis"

European cat snake (*Telescopus fallax*) at Kos Airport "Ippokratis", Santorini Airport and Thessaloniki Airport "Makedonia"

European ratsnake (*Zamenis situla*) at Thessaloniki Airport "Makedonia"

Four-lined snake (*Elaphe quatuorlineata*) at Kerkira Airport "Ioannis Kapodistrias", Mikonos Airport, Skiathos Airport "Alexandros Papadiamandis" and Thessaloniki Airport "Makedonia"

Grass snake (*Natrix natrix*) at Kavala Airport "Megas Alexandros", Mitilini Airport "Odysseas Elytis", Rodos Airport "Diagoras" and Samos Airport "Aristarchos of Samos"

Nose-horned viper (*Vipera ammodytes*) at Thessaloniki Airport "Makedonia"

Sheltopusik (*Pseudopus apodus*) at Thessaloniki Airport "Makedonia"



Eastern Montpellier snake,
Skiathos Airport "Alexandros Papadiamandis"



Grass snake,
Kavala Airport "Megas Alexandros"

White storks at Kavala Airport “Megas Alexandros”

The White stork is a long-distance migrant. It winters in Africa or the Indian subcontinent. In spring, it migrates to Europe for breeding.

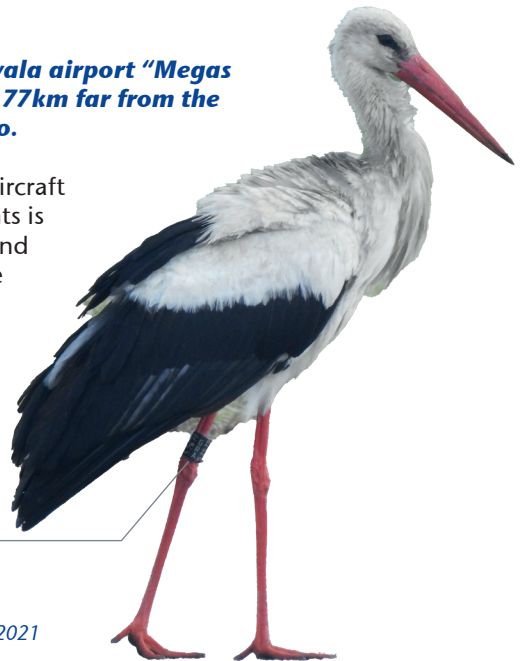
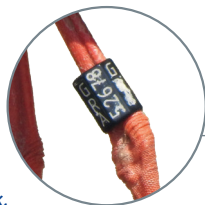
Migration and breeding of the White stork is recorded in Greece. According to the Red Book of the Threatened Animals of Greece it is evaluated as Vulnerable in Greece and breeds mainly in the central and north Greece as well as on Lesvos island. White storks are observed mainly at Kavala airport “Megas Alexandros” from March to August.

Bird ringing (placement of a numbered metal ring to the bird leg) brings valuable data to study the movements and life history of bird species. In 1906, the ornithologist Johannes Thienemann applied for the first time the ringing methodology on the White stork. At the airports operated by Fraport Greece, two ringed White storks have been recorded at Kavala airport “Megas Alexandros”. The recovery details, provided by the Hellenic Bird Ringing Center are presented below.

The White stork that was observed at Kavala airport “Megas Alexandros” in August 2019, was ringed 6,89km far from the airport, 3 years, 1 month and 25days ago.

The White stork that was observed at Kavala airport “Megas Alexandros” in May 2021, was ringed 20,77km far from the airport, 1 year, 11 months and 7 days ago.

The White stork poses a serious hazard to aircraft operations. The study of the bird movements is considered of high importance to understand its behavior and proactively prevent a strike with an aircraft. The use of Pyrotechnics is a very effective and environmental friendly way to disperse the White stork away from the airport.



Ringed White stork,

Kavala Airport “Megas Alexandros”, May 2021

“Dot-to Dot” Rare Observations

Records of bird species that occur rarely in Greece

November 2019

Two Eurasian dotterels are recorded at Zakynthos airport “Dionisios Solomos”, placing the first dots on Fraport Greece map of bird species that occur rarely in Greece.



Eurasian dotterel, Zakynthos Airport “Dionisios Solomos”

April 2020

A Eurasian dotterel comes again, but this time at Thessaloniki Airport “Makedonia”.

A Cream-colored courser is observed at Rodos airport “Diagoras”, giving the impression that it would prefer to run rather than fly, in case of danger.



Cream-colored courser, Rodos Airport “Diagoras”

April 2021

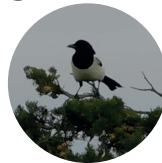
During a night inspection, a Short-eared owl lands on the runway of Rodos airport “Diagoras”. According to the Red Book of the Threatened Animals of Greece, the Short-eared owl is mainly observed as a rare winter visitor or in migration. Its nesting in two wetlands in Greece has also been reported.



Short-eared owl, Kos Airport “Ippokratis”

September 2021

Magpie may be regularly observed at the mainland Greece and on Kerkira, Kos and Lesvos island. It was impressive, thus, to discover for the first time five Magpies at Skiathos airport “Alexandros Papadiamandis”.



Magpie, Skiathos Airport “Alexandros Papadiamandis”

January 2022

A night inspection reveals the second record of a Short-eared owl, this time at Kos airport “Ippokratis”.

Wildlife Trafficking Prevention

Fraport Greece has signed the ***United for Wildlife Taskforce Buckingham Palace Declaration*** against wildlife trafficking, extending its biodiversity protection policy to the 14 regional airports and in close collaboration with ACI World. Recognizing the devastating impact of the illegal wildlife trade on the environment and the ecosystems, the company has pledged to actively participate in tackling the issue.

By taking an active role alongside leading companies in the international transport industry, Fraport Greece will establish protocols to notify and alert the relevant law enforcement authorities in order to combat the illegal animal trade at the 14 regional airports. The action plan for the implementation of the company's commitments is part of Fraport Greece's Biodiversity Conservation Programme and sits under a holistic strategy aiming at a sustainable development.

With wildlife protection at the top of its priorities, Fraport Greece aims to raise awareness to Greek and European stakeholders in order to mitigate wildlife trafficking in the most coordinated way possible.



Common chameleon (*Chamaeleo chamaeleon*)

In Greece, only a subspecies population is found on Samos Island. This population is threatened by the illegal trade. Photo by: Ilias Strachinis, Herpetologist

Trapping and Relocation of Common kestrel at Thessaloniki Airport “Makedonia”



The Common kestrel (*Falco tinnunculus*) has been identified as one of the species with the higher number of bird strikes during the last years at Thessaloniki airport “Makedonia”. In order to lower their abundance at the airside and as a consequence the number of Common kestrel strikes, a specific programme was designed to trap, ring and relocate Common kestrels, following a permission by the Ministry of Energy and Environment.

Trapping would be undertaken by the Wildlife Hazard Management Team using specially designed traps. Ringing will be performed by an external expert holding a current permit. Following ringing, the trapped Common kestrels will be relocated to suitable habitat away from the airport, to minimize the chances that the relocated birds return to the airport. During the first implementation of the project it will be interesting to see the return rate to the airport of the relocated birds based on the observations of the recaptured ringed birds.

Complimentary to the above mentioned strike prevention method, habitat management with superficial soil tilling makes the airport less attractive to the Common kestrels. Tilling reduces the amount of vegetation and consequently the available prey to Common kestrels.

Special thanks to the Fraport Greece operations personnel for providing photos for the creation of this review:

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*Photo: Golden jackal, Kavala Airport "Megas Alexandros"
Back Cover Photo: Kavala Airport "Megas Alexandros"*

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