



IATA Aviation Wildlife Management Toolbox

Guidance Material





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Acronyms

ACI	Airports Council International
ATCOs	Air Traffic Control Officers
CAA	Civil Aviation Authority
EASA	European Union Aviation Safety Agency
GADM	Global Aviation Data Management
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IDX	Incident Data Exchange
MOR	Mandatory Occurrence Reporting
ORA	Operational Risk Assessment
PSOE	Present, Suitable, Operating or Effective
SM ICG	Safety Management International Group
SMS	Safety Management Systems
SPIs	Safety Performance Indicators
SSP	State Safety Programme
SRA	Safety Risk Assessment
WHMP	Wildlife Hazard Management Programme

Introduction

Wildlife, whether birds or other animals, pose a significant safety risk to commercial aviation; wildlife management provides a critical function to maintain a safe airline operation.

Despite extensive international guidance material, significant damage still occurs on a daily basis. IATA presents this Aviation Wildlife Management Toolbox to support commercial airline operations to identify airports where the greatest hazards exist and address recognized safety risks. The provisions of this Toolkit do not supersede the organisational responsibilities established in ICAO Annex 14 and ICAO Doc 9137, Part 3 (Wildlife Hazard Management).

The IATA Aviation Wildlife Management is broken into four specific areas of activity:

- An IATA generic safety risk assessment, capturing all key elements that an airline would consider essential when assessing the viability of commencing operations, or of continued operations, into a specific airport.
- Intelligence sharing, utilising IATA Global Aviation Data Management (GADM) program, where high-risk airports are identified through the IATA generic safety risk assessment, and other source of qualitative and quantitative intelligence sources.
- Airport engagement, where identified safety risks are confirmed, to support Runway Safety Teams deliver wildlife management improvement programs, measured by safety performance indicators, to reduce the safety risk of wildlife-related incidents.
- A dedicated Wildlife Management heatmap to provide a global picture of wildlife hotspots (through GADM and other information sources).

Objective

This toolbox focuses on IATA activity to deliver actions, as detailed in extensive ICAO guidance material, to mitigate safety risks associated with wildlife management.

Understanding the Risks

Originally referred to as "bird strikes", due to the high frequency of incidents involving bird collisions, the term has broadened to "wildlife strikes" to include non-avian animal species. While less frequent than bird strikes, collisions with non-avian animals can be more severe due to larger body masses, especially during high-speed runway operations.

Smaller animals, including rodents, snakes and other vermin, present additional hazards as they can be ingested by engines, gnaw on cables and insulation, or attract larger predators to the airfield environment. Bats pose risks in-flight, with movement patterns distinct from birds, requiring tailored mitigation strategies. Reptiles and amphibians, such as snakes, turtles, and frogs, can also cause operational disruptions, particularly at airports located near wetlands or tropical areas.

Insects further contribute to wildlife hazards. Swarms of wasps, bees, or locusts can create operational hazards by obstructing sensors, clogging aircraft systems or interfering with ground activities. Even seemingly minor insect activity, such as wasps nesting inside aircraft components, has led to in-flight system malfunctions and serious safety events.

Wildlife, whether involving ingestion or strikes with birds, large or small animals, can damage critical aircraft components including engines, wings, windshields, and fuselage. Although catastrophic accidents from wildlife strikes are rare, many incidents result in minor damage. These events impose operational and financial burdens on airlines, including repair costs, delays, and flight disruptions.

Wildlife hazards remain one of aviation's enduring safety challenges. While birds continue to account for most strikes or near misses, the risks posed by mammals, reptiles, amphibians, insects, demonstrate that the problem extends well beyond avian species, encompassing any non-domesticated animal species capable of affecting flight safety or airport operations. The complexity of these hazards reinforces the need for airports to adopt comprehensive Wildlife Hazard Management Plans (WHMP) that address the full spectrum of threats.

Safety Risk Assessment

Airports are expected to perform a Wildlife Management Safety Risk Assessment (SRA) to understand the safety risks of wildlife strikes at their location. The detailed procedures and guidance for an airport wildlife SRA is described in [ICAO DOC 9137, Part 3 - Wildlife Hazard Management](#).

Airlines have established SRA procedures within their Safety Management Systems (SMS) to identify safety risks, based on latest intelligence, relating to all operational areas including wildlife strikes. These risks should be included within an airline's Risk Registry.

An airline needs to consider its network and operation, in addition to specific hazards at an airport, when developing a SRA. As there are common items to be considered by both stakeholders, intelligence sharing, through visibility to an airport's Wildlife Management SRA, is very useful for airlines to align common issues that need to be addressed within an individual airport's operating environment.

Airlines should have Safety Performance Indicators (SPIs) related to mitigating the risk of wildlife strikes. These are particularly useful to establish a baseline of normal / acceptable performance where SPI trigger additional actions if safety performance deviates away from the baseline.

To develop a realistic SRA validated information will be needed, e.g.:

- Species / types of wildlife most likely to be encountered at the location
- Migratory patterns
- Historical information on wildlife strikes
- Details of the Wildlife Hazard Management programme (WHMP) of the airport
- Airport Wildlife Management SRA for wildlife encounters

In this context, the hazard is the presence of certain wildlife on or near an airport. The safety risk is the probability of a wildlife strike by a particular species multiplied by the severity of damage to the aircraft that might reasonably occur.

Safety risk = (probability of a strike) × (severity of damage caused)¹

If an airline decides to develop an SRA for Wildlife Strikes, then it will use its own methodology.

The airlines may consider the potential operational consequences following exposure. For example:

¹ ICAO Doc 9137 Part 3 — Wildlife Hazard Management, Chapter 3

- engine damage or loss of thrust;
- windshield penetration;
- rejected take-off or runway excursion;
- loss of control;
- emergency return or diversion;
- injury to occupants or people on the ground;
- secondary operational disruption.

It may also be helpful to consider the credible operational consequences alongside the effectiveness of existing preventive, detective and recovery controls.

Use of Safety Performance Indicators by airlines

To be able to use SPIs, airlines need to gather safety data and information.

Accurate and consistent reporting of wildlife hazards is essential for generating reliable data, which forms the foundation of effective SPIs. These indicators help assess the effectiveness of WHMPs and identify areas for improvement.

When developing SPIs airlines need to consider how comparisons can be made across dissimilar operations. Airports with stronger reporting cultures may appear to perform less well, while under-reporting can create false reassurance. Reporting rates and data completeness could therefore be useful considerations when comparing locations.

Airlines use specific reporting forms for wildlife strikes mostly aimed at reporting by flight crews. If crews become aware of a wildlife strike, there is an obligation to report it. The airline SMS tracks these reports for the following purposes:

- Report to the States as part of Mandatory Occurrence Reporting (MOR) schemes.
- Report to the airport concerned to ensure collective knowledge sharing, and support airport wildlife management activities.
- Establish a statistical analysis of wildlife strikes which feed SPIs.

Airlines should consider the systematic collection and analysis of wildlife near miss occurrences that could help identify locations with significant wildlife exposure but relatively low reported collision rates.

SPIs should include a balanced mix of:

- Primary (Lagging) Indicators which reflect past performance, such as strike rates, severity, and damage incurred.
- Secondary (Leading) Indicators which highlight proactive efforts, including wildlife presence, report completeness, species identification rates, staff training coverage, and completion of mitigation actions.

Note: These indicators are consistent with ICAO's recommended practices outlined in Chapter 9 of ICAO Doc 9137-part 3-Wildlife Hazard Management, Fifth Edition, which emphasizes the evaluation of the WHMP.

Validating Safety Issues

Leveraging the IATA Safety Issue Hub

The IATA Safety Issue Hub captures the safety issue of Bird/Wildlife Strikes as indicated below:

Safety Issue Hub ²	S59-Bird/Wildlife Strikes
Bird/Wildlife Strikes Description Inadequate or insufficient control of bird and wildlife activity around the aerodrome can lead to critical situations due to impacts during takeoff, climb, and approach or landing. The most common consequences relate to damage to the airframe and engine bird ingestion, which can escalate into a loss of control in flight. Reducing the risk of birdstrike or wildlife strikes relies on the aerodrome's wildlife control program. However, air carriers/pilots' contribution is key to informing local and national mitigation programs. Issue ID 59 29 Jul 2022 Key Risk Area Loss of Control (LOC) Operational area Flight Operations IATA region ASPAC MENA AFI NAM LATAM EUR CIS NASIA ALL_REGIONS Guidance materials ICAO APAC Establishment of National Procedure For Recording And Reporting Wildl... ICAO APAC Evaluation of Aerodrome Wildlife Hazard Management Programme ICAO Wildlife Strike Analysis (Bird Strike Information System) Skybrary Operators Checklist for Bird Strike Hazard Management EASA Wildlife Hazard Management Guide ICAO - Doc 9137 Part 3 Wildlife Hazard Management ICAO - Doc 9981 PANS Aerodromes Chapter 6 Wildlife Hazard Management FAA - Wildlife Hazard Mitigation	

The referenced materials can be consulted to gain more knowledge about the safety issue.

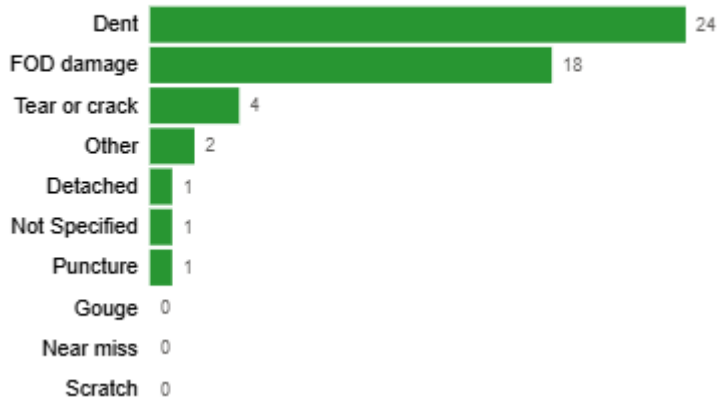
² The Hub is an internationally recognized repository of aviation hazards and safety risks to enable the prioritization and delivery of aviation safety improvement programs, for the benefit of reducing global accidents in aviation.

Utilising IATA Global Aviation Data Management program

The IATA Incident Data Exchange (IDX) program provides participants with comprehensive information and analysis regarding bird strikes where they are able to:

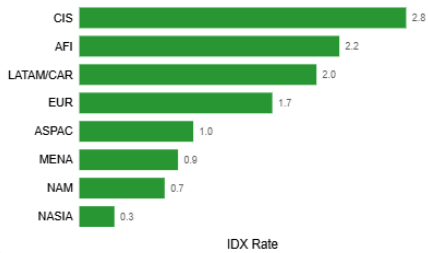
- Track the event rate of bird strikes over time, which is essential for measuring the effectiveness of wildlife control programs and identifying emerging trends. A high strike rate at a specific airport signals the need for immediate intervention and preventive measures.
- Capture information about where strikes occur. Airlines and airports can thus identify high-risk areas and implement targeted wildlife management strategies with the aim to reduce the likelihood of future incidents.
- Understand the phase of flight during which the event happened, whether during takeoff, climb, approach, or landing which provides valuable insight into when aircraft are most vulnerable. This knowledge allows for better planning of mitigation measures, such as deploying bird deterrent systems at critical times.
- Record which part of the aircraft was impacted during a strike, such as engines, windshields, and leading edges etc. This information helps pilots and maintenance teams identify key inspection areas pre and post flight.
- Record the damage level and severity of the strike. Knowing whether the impact caused minor damage, substantial damage, or resulted in an emergency landing helps assess the operational impact to airlines. This information supports maintenance planning, resource allocation, and risk management strategies. It also enables airlines to evaluate the effectiveness of current safety measures.
- Finally, incorporating the time of occurrence and seasonal trends into the analysis enables predictive risk modelling. Airports can anticipate periods of higher bird activity, such as migration seasons, and take proactive steps to minimize hazards.

Type of Aircraft Damage

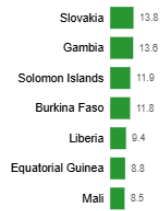


Note: Out of 29,841 reported Bird Strike IDX Events, 91.2% (27,225) had a Location of Occurrence reported. Only these have been considered in the visuals below.

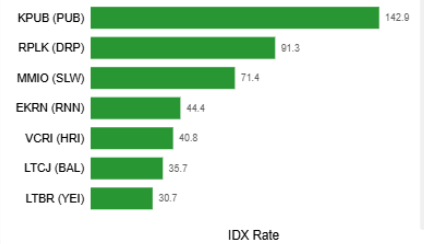
Occurrence Region



Occurrence Country



Occurrence Airport



Airlines Best Practices

Airlines implement a diverse array of risk management measures to mitigate the impact of wildlife strikes which can be used to develop an action plan to reduce risk exposure.

The airlines can systematically conduct risk assessments at specific locations, taking into account operational and environmental conditions to determine which mitigation measures are most appropriate and effective. Airlines should ensure all bird strike reports are sent to the airport and local ground handling agents, requesting feedback on implemented measures.

Whenever a high number of bird strikes is observed at a given location, airlines should:

- Conduct local investigations: Requesting detailed information from the airport, conduct field assessments, and, when necessary, request local teams for inspection;
- Contacts airport authorities: To share data, discuss measures, and follow up on corrective actions;
- Performs specific risk assessments: While there is no dedicated ORA (Operational Risk Assessment) exclusively for bird strikes, this hazard is systematically considered in safety studies for new destinations and special operations;
- Share information and best practices: With other operators and regulatory entities, promoting a collaborative approach (eg: GADM / IDX).

Airlines would need to reassess wildlife risk both before and after a significant change. Examples might include new destinations, construction activity, coordinating with airports and other stakeholders regarding changes in waste management arrangements, new land use near the airport, or changes to the WHMP elements.

Airlines should consider how WHMPs associated elements are managed internally within an operator, i.e. the crew reporting rate, are the reports being coded correctly, quality of information provided etc.

Airlines may wish to consider activities which can be delivered as individual actions, or combined together, such as:

a) Collaboration with airport Wildlife Management Committees and Runway Safety Teams:

Airlines should be active members of wildlife and safety committees at key network airports, including:

- Wildlife Committee at domestic airports: regular monitoring of occurrences, implementation of mitigation measures (e.g. falconry, food source management, daily monitoring); and information sharing with Authorities.
- Airport Committees: collaboration in action planning, reporting and analysis of events, and regular meetings to assess effectiveness.

b) Collaborative Safety Enhancements at Specific Locations

- Support airports to request local authorities' collaboration to relocate waste dumps, reducing bird attractants.
- Participation in joint initiatives with international operators and local authorities, including:
 - Audits and risk reports shared between airlines and the relevant CAA;
 - Support implementation of training and mentoring programmes for airport wildlife control and fire teams, with support from experts;
 - Support airport functions such as: vegetation cutting, waste removal, reinforced patrolling, acquisition of dispersal equipment, and specific training;
 - Advocacy for improvements in infrastructure and human resources.

- Monitoring of bird activity, report runway conditions, support the removal or relocation of wildlife attractants and collaborate with authorities for structural mitigation measures.

c) Operational Procedures

- Devise standard operating procedures, based on aircraft types operated, to minimize bird encounters and to reduce risk severity of impact. More information can be found on the IATA Safety Issue Hub – Safety issue 59.
- Maintain an Airport Risk Map, which incorporates, among other factors, the availability and identification of birds in the vicinity of airports ensuring that operational decisions are informed by up-to-date wildlife hazard data.

IATA Engagement of Stakeholders

The mission of IATA is to represent, lead, and serve the airline industry.

IATA will engage airports, where escalated safety risks are confirmed, to advocate and participate in wildlife management improvement programs that are measured by safety performance indicators to reduce wildlife-related incidents.

For this, approaches used include:

- Gathering, collating and analyzing airlines reports provided through GADM and other available intelligence sources.
- Having a comprehensive picture – as complete as possible – is very important in establishing a heat map of wildlife strikes
- Global and regional advocacy – IATA represents its members at various governance levels of ICAO including global WILDLIFE HAZARD MANAGEMENT WORKING GROUP
- Assessment of WHMP at airports on behalf of IATA Members through the “Evaluation of a Wildlife Hazard Management Plan” checklist attached to this document. ³
- This assessment can be performed independently or as a section of an airport safety assurance program that includes wildlife management.
- Targeted interventions at airports where the actions taken to mitigate wildlife / bird strike events do not seem to be effective.

³ The aim of the assessment is to gather evidence that controls are effective in the operating environment, rather than solely from documented compliance.



References

IATA Safety Issue Hub

ICAO Annex 14 - Aerodromes Volume 1 Aerodrome Design and Operations, Ninth Edition, July 2022

ICAO Document 9137 - Airport Services Manual Part 3 Wildlife Hazard Management, Fifth Edition, 2020

ICAO Doc 9981 – Aerodromes, Third Edition, 2020

Easy Access Rules for Aerodromes (Regulation (EU) No 139/2014)

EASA Wildlife Hazard Management Guide

ACI Wildlife Hazard Management handbook, Third Edition, 2022



Appendix A

Evaluation of a Wildlife Hazard Management Plan at an Airport

Airport Name:

Assessment performed by:

Note: The Assessment uses the SMICG PSOE model.

Present	There is evidence that the relevant item is documented within the organisation's Management System Documentation.
Suitable	The relevant item is suitable based on the size, nature, complexity of the organisation and the inherent risk in the activity.
Operating	There is evidence that the relevant item is in use and an output is being produced.
Effective	There is evidence that the relevant item is achieving the desired outcome and has a positive safety impact. The evaluation will review risk controls to confirm they are operating as intended, particularly following performance deterioration, organisational change, accidents or near misses.

	Program Elements	P	S	O	E	How it is achieved	Verification
1.1	The WHMP should define the roles, responsibilities, and procedures necessary for effective wildlife control and response.						
1.2	The WHMP should be included in the Airport Safety Management System.						
1.3	As part of a WHMP component: Is a formal wildlife risk assessment conducted to identify and prioritize species that pose the greatest threat to aircraft operations?						
1.4	As part of the Safety Risk Assessment, have all the areas where wildlife might pose a hazard been identified?						
1.5	The WHMP should Identify the wildlife species that are a priority for risk reduction, because not all wildlife poses equal risk. Consider the types of animals/wildlife a particular location may be susceptible to.						

1.6	The WHMP should highlight which species are most likely to cause dangerous encounters and focus on mitigation efforts; accordingly,						
1.7	The WHMP should prescribe targeted actions to reduce risks associated with each wildlife species.						
1.8	Are there procedures in place for detecting hazardous wildlife at and within the vicinity of an airport						
1.9	Are there procedures in place for removing hazardous wildlife at and within the vicinity of an airport						
1.10	The WHMP and the SMS documentation of the Airport Authority should specify the responsibilities for wildlife strike investigations after wildlife strikes have occurred. The investigations should contain recommendations to improve the WHMP implementation.						
1.11	Are wildlife bulletins and awareness campaigns used to support the detection and reporting of wildlife activity at the airport?						

2.1	The WHMP should describe the communication strategy to ensure relevant information for managing wildlife risk is shared effectively;						
2.2	The WHMP should present clear procedures for notifying key stakeholders, including Air Traffic Control Officers (ATCOs), pilots, and wildlife control teams of wildlife hazards and strikes, and how they should respond.						
2.3	Do you engage other stakeholders in the development and review of the WHMP to ensure it reflects operational realities and shared responsibilities?						
3.1	The WHMP should describe the training requirements for personnel involved in wildlife hazard management;						
3.2	Are personnel trained in wildlife identification, control techniques, and WHMP procedures?						
4.1	Are wildlife observations and incidents consistently recorded and reported						

4.2	Is strike data analyzed to guide mitigation priorities and assess effectiveness?						
4.3	Are SPIs related to wildlife hazards defined and monitored as part of the WHMP to evaluate the effectiveness of mitigation strategies?						
4.4	Are habitat modifications being used to reduce the attractiveness of airport environments to hazardous wildlife species?						
4.5	Are wildlife control measures (such as dispersal and removal) currently implemented at the airport effective in reducing wildlife strike risks?						
4.6	Has a land use plan been developed to ensure that on- and off-airport areas are managed in a way that supports effective wildlife hazard control?						
4.7	Is wildlife activity at the airport being detected using both manual and technological methods as part of the WHMP?						
4.8	Is wildlife activity regularly monitored and recorded using established methods as part of the WHMP?						

4.9	The WHMP should be based on appropriate ICAO and industry guidance. The Airport Authority should demonstrate access to the latest revisions of ICAO Doc 9137, Part 3 – Wildlife Hazard Management.						
5.1	The State should include Wildlife Strike Prevention in the SSP (in relation to the specific airport).						
5.2	The State should include oversight of the WHMP implementation in its airport safety oversight cycle (in relation to the specific airport).						
5.3	The State should investigate accidents and serious incidents related to wildlife strikes. (in relation to the specific airport).						
5.4	The airport should provide feedback to the reports received from airlines and other queries regarding the WHMP implementation.						
6.1	The WHMP should include procedures for regular review, data analysis, and program updates, allowing it to evolve with changing conditions and new information.						



6.2	Is the WHMP reviewed and updated regularly based on performance data and changing conditions?						
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