
ICAO
INTERNATIONAL CIVIL AVIATION ORGANIZATION
A UN SPECIALIZED AGENCY
RECONNECTING THE WORLD

Flight Plan

- ✓ Introduction to ICAO
- ✓ Wildlife strike history
- ✓ ICAO wildlife strikes analysis (IBIS)
- ✓ ICAO Documents
- ✓ Airport Services Manual, Part 3 – Wildlife Control and Reduction
- ✓ Ongoing work at ICAO
- ✓ Data Base Management

INTRODUCTION TO ICAO

- specialized agency of the UN, established by States in 1944 under the **Chicago Convention**.
- Global forum of 193 Member States for international civil aviation
- Develops policies and standards, undertakes compliance audits, and performs studies and analyses- **Annexes**
- provides assistance and builds aviation capacity through cooperation of Member States and stakeholders.

INTRODUCTION TO ICAO

Strategic Objectives

A. Safety

- Enhance global civil aviation safety.

B. Air Navigation Capacity and Efficiency

- Increase capacity and improve efficiency of the global civil aviation system.

C. Security and Facilitation

- Enhance global civil aviation security and facilitation.

D. Economic Development of Air Transport

- Foster the development of a sound and economically-viable civil aviation system.

E. Environmental Protection

- Minimize the adverse environmental effects of civil aviation activities.

Annex 14, Volume I

To reduce the risk to aviation safety, active assessments, reporting and management of wildlife are necessary through:

- the establishment of a national procedure for recording and reporting…
- the collection of information from aircraft operators, aerodrome personnel….on the presence of wildlife…constituting a potential hazard to aircraft operations; and
- an ongoing evaluation of the wildlife hazard by competent personnel.

Annex 14, Volume I (cont'd)

The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal… unless an appropriate wildlife assessment/Aeronautical Study indicates that they are unlikely…..

……13 km (or 7 NM) circle is considered a large enough area for an effective wildlife management plan.

However, as necessary, action should also be taken when the bird/wildlife attractants are outside the 13 km circle

Airport operator influence on planning and development issues necessary.

ICAO Wildlife Guidance Recently Updated

2022

ICAO

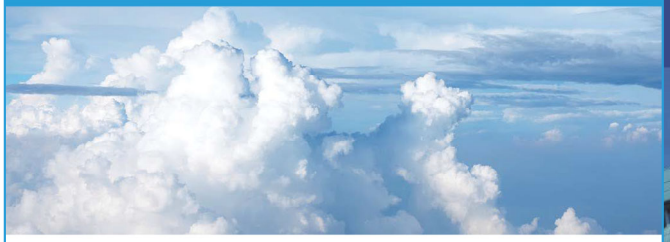
International Standards and Recommended Practices

Annex 14 to the Convention on International Civil Aviation

Aerodromes

Volume I
Aerodrome Design and Operations

Seventh Edition, July 2016



This edition supersedes, on 10 November 2016, all previous editions of Annex 14, Volume I.

For information regarding the applicability of the Standards and Recommended Practices, see Chapter 1, 1.2 and the Foreword.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

2020

ICAO

Doc 9981

PROCEDURES FOR AIR NAVIGATION SERVICES

Aerodromes

Third Edition, 2020

This edition supersedes, on 5 November 2020, all previous editions of Doc 9981.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

2020

ICAO

Doc 9137

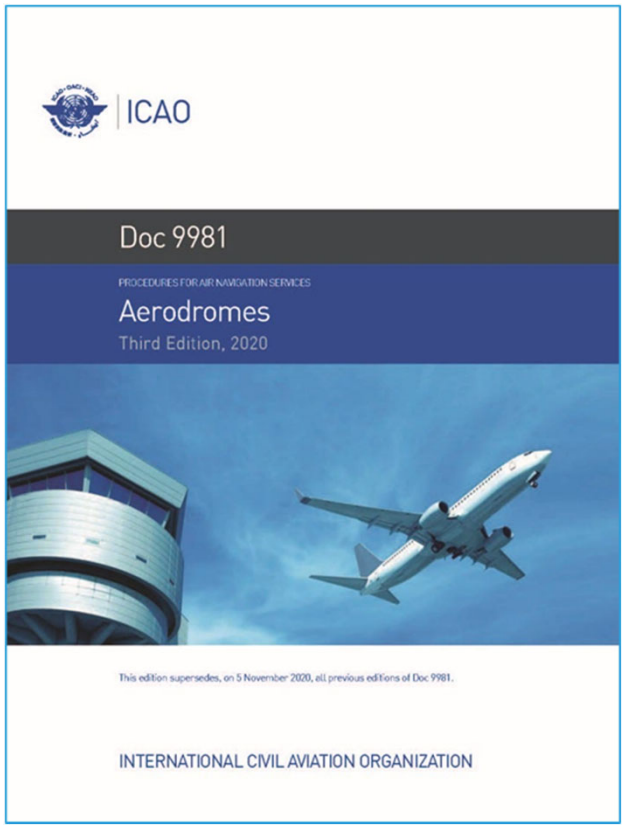
Airport Services Manual

Part 3 — Wildlife Hazard Management
Fifth Edition, 2020

Approved by and published under the authority of the Secretary General

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Doc 9981 Procedures for Air Navigation Services (PANs) Aerodromes 3rd ed. 2020

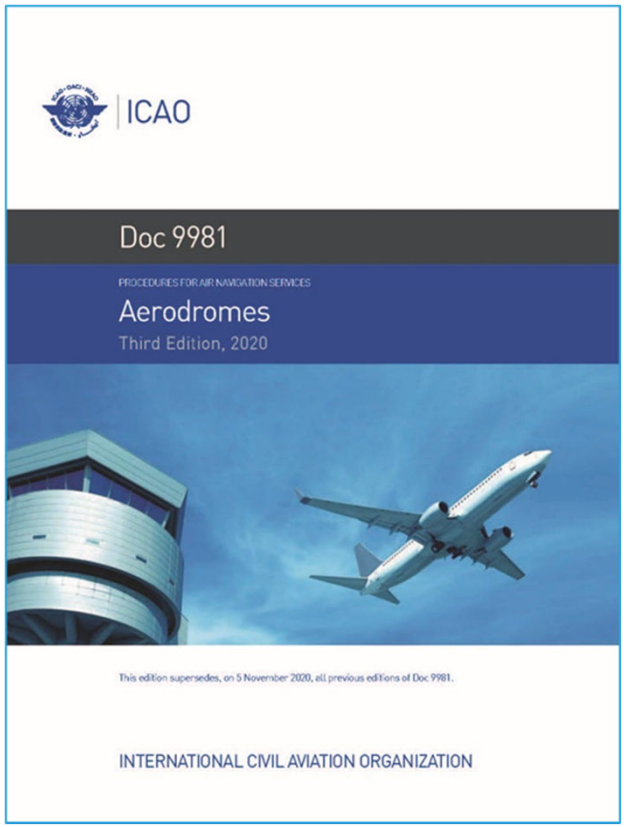


The PANs Aerodromes are complimentary to the SARPs in ANNEX 14, Vol. 1

Chapter 6. Wildlife Hazard Management (high-level guidance)
6.1 General
6.2 Objectives
6.3 Operational Practices

Appendix 1 Ch. 6 Wildlife Control Training
Appendix 2 Ch. 6 Wildlife Incident reporting Criteria
Appendix 3 Ch. 6 Land Use On and Around Aerodromes

Doc 9981 Procedures for Air Navigation Services (PANs) Aerodromes 3rd ed. 2020



6.1 GENERAL

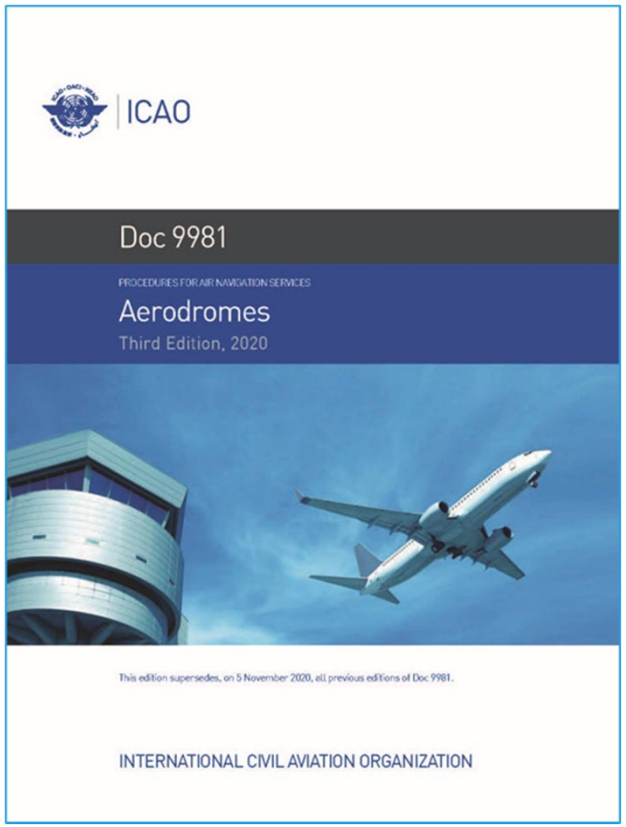
6.1.1 Wildlife **on and within the aerodrome vicinity** may pose a serious hazard to aircraft operational safety. **Therefore, to reduce the risk to aviation safety, active assessments, reporting and management of wildlife are necessary.**

6.1.2 Wildlife hazard management programmes work; **DO THEM**

6.1.3 PANs Aerodromes focuses on aerodrome responsibilities although other stakeholders (State and local authorities, aircraft operators and air navigation services providers) are equally important…

6.1.4 Land use around the aerodrome should, wherever possible, not be attractive habitats for wildlife.

Doc 9981 Procedures for Air Navigation Services (PANs) Aerodromes 3rd ed. 2020



6.2 OBJECTIVES

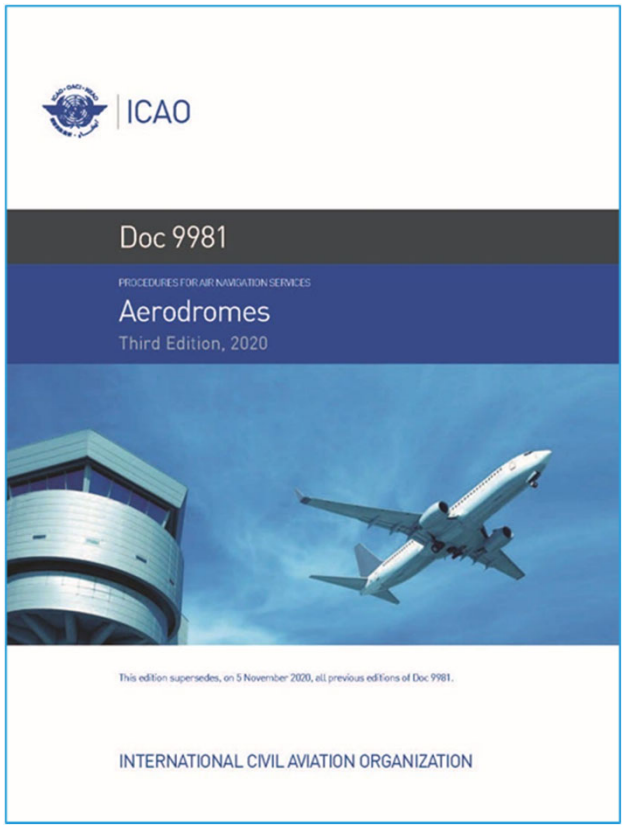
6.2.1 A wildlife safety risk assessment shall be conducted, covering the aerodrome and its vicinity.

6.2.2 A WHMProgramme shall be established and tailored to the local environment and be commensurate with the wildlife safety risk assessment.

6.2.3 The WHMProgramme shall include procedures and measures for reducing the wildlife risk at the aerodrome to an acceptable level. (aka: it must work)

6.2.4 Wildlife hazard reduction measures and procedures shall be integrated into the aerodrome operator's safety management system (SMS).

Doc 9981 Procedures for Air Navigation Services (PANs) Aerodromes 3rd ed. 2020



6.3 OPERATIONAL PRACTICES
6.3.1 Wildlife hazard management programme (WHMP)
6.3.2 Roles and tasks in the wildlife hazard management programme (WHMP)
6.3.3 Collecting, reporting and recording data on wildlife strikes and observed wildlife
6.3.4 Wildlife safety risk assessment
6.3.5 Habitat and land use management
6.3.6 Expelling and deterring wildlife
6.3.7 Coordination with stakeholders
6.3.8 Personnel training

Doc 9137 Airport Services Manual, Part 3 Wildlife Hazard Management 5th ed. 2020

Chapter 1. Introduction

Chapter 2. Stakeholders

Chapter 3. Aerodrome wildlife safety risk assessment

Chapter 4. Habitat management

Chapter 5. Management of hazardous wildlife

Chapter 6. Advancements in technology

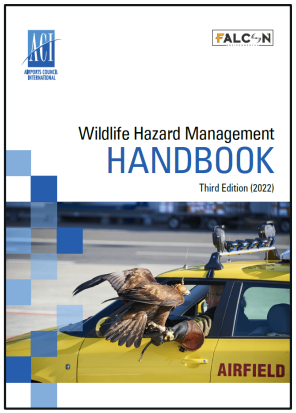
Chapter 7. Training

Chapter 8. Operational notifications

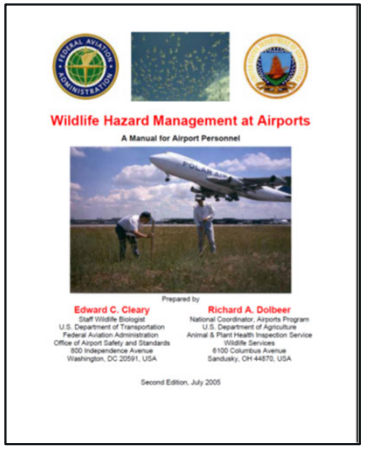
Chapter 9. Wildlife hazard management programme

Manuals and Handbooks

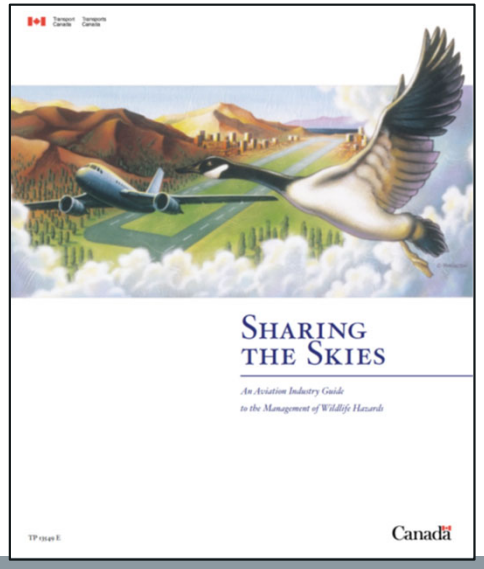
ICAO - Doc 9137 Airport Services Manual, Part 3 Wildlife Hazard Management 5th ed. 2020



ACI - Wildlife Hazard Management Handbook, Third Edition (2022)



FAA - Wildlife Hazard Management at Airports "A Manual for Airport Personnel" 2005



Transport Canada - Sharing the Skies "An Aviation Industry Guide to the Management of Wildlife Hazards" 2001

ICAO Annex 14 — Aerodromes

9.4 Wildlife strike hazard reduction

9.4.1 The wildlife strike hazard on, or in the vicinity of, an aerodrome **shall be assessed** through:

a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;

* * *

National Procedure may be mandatory or voluntary

History of Wildlife Strikes

Date/ Year Location	Aircraft or Pilot	Incident/Accident	Damage/Fatalities
7 Sept 1908	Capt. Orville Wright	Collision with bird	Not Known
3 April 1912 California	Capt. Calbraith Perry Rodgers	Collision with bird	Fatal
4 October 1960 Boston Logan International Airport	Lockheed Electra L188 plane	Ingestion in 3 of 4 engines of Starlings	62 fatalities out of 72 pax and crew
Baltimore in Maryland 26 November 1962	Vickers Viscount plane	Collision with whistling swans/Cowbirds	17 fatalities All crew and pax fatal

Wildlife Strikes are Increasing? Yes and No

- **Changes to Habitat – Onsite/offsite aerodromes (human population increase)**
- **Operations and peak flight hours expanded (human population increase)**
- **Wildlife are adaptable, tolerant, habituated**
- **Conservation = increased wildlife populations**
- **Climate change affects migratory patterns, duration, start time, end time**

IBIS STATISTICAL ANALYSIS FOR THE YEARS 2001-2021

Data	(7 Years) 2001-2007	(8 Years) 2008-2015	(6 Years) 2016-2021
States reporting	51	91	139
States/territories of occurrence	145	105	195
Strikes reported	42 508	97 751	273 362
Day time strikes	63%	68%	68%
Night time strikes	24%	25%	19%
Peak month activity	12% (August)	14% (August)	12% (July and August)
Strikes during takeoff	39%	31%	24%
Strikes during approach	37%	33%	23%
Strikes during landing	17%	25%	23%
Wildlife specie most frequent	Perching birds	Perching birds	Hawks, eagles and vultures
Part struck most frequent	Engines and Radome	Engines and Radome	Engines and Radome
Part damage most frequent	Engines and Wing/Rotor	Engines and Wing/Rotor	Engines and Wing/Rotor

IBIS STATISTICAL ANALYSIS FOR 2001-2021

Strike Data Missing Between States = Incomplete Data

Data	(7 Years) 2001-2007	(8 Years) 2008-2015	(6 Years) 2016-2021
States reporting	51	91	139
States/territories of occurrence	145	105	195
Strikes reported	42 508	97 751	273 362

	(7 Years) 2001-2007	(8 Years) 2008-2015	(6 Years) 2016-2021	(21 Years) 2001-2021
% Data Shared Between Location Reported and Location of Occurrence	35%	87%	71%	64%
# Strikes NOT SHARED	27,557	13,033	78,504	119,094

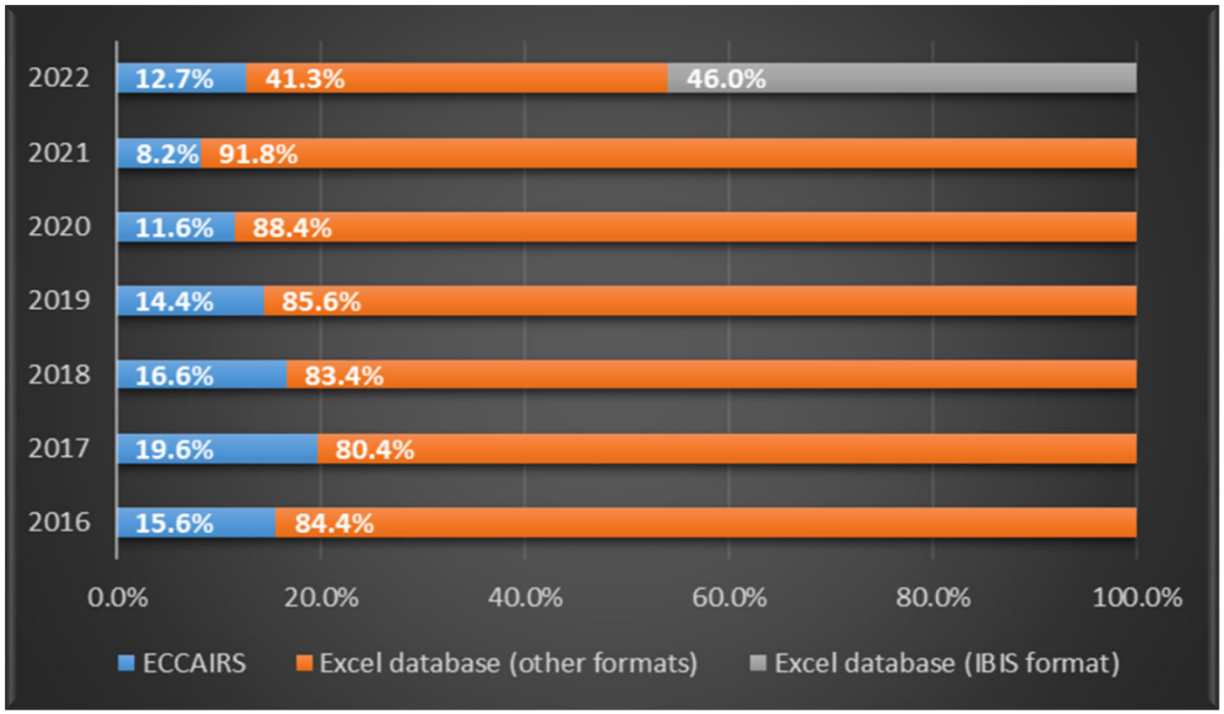
IBIS STATISTICAL ANALYSIS (2016-2021)

SUMMARY OF CHALLENGES

- **Not all States submit strike data into IBIS as required per Annex 14 (9.4)**
- **Lack of data quality (insufficient oversight and validation, differing priorities, language challenges, differing file format, etc.)**
- **Lack of contact point/responsible person = No dedicated wildlife strike data person**
- **COVID-19 pandemic period (2019-2021)**
- **Data from ECCAIRS provides only 14% of total data**
- **ECCAIRS's insufficient capabilities require ICAO to transfer ECCAIRS strike data into ICAO Excel files**
- **Majority of data is gathered by ICAO direct request from State's POC = Inefficient process and labor intensive**

IBIS DATABASE MANAGEMENT

Improvements on process for data collection



For data period covered by year 2022, ICAO has developed a new Excel Template to collect reports in a standardized format. That template **improves data quality and reduces processing time**.

ICAO has also changed the deadline to a single submission per year.

EXPECTATIONS OF STRIKE DATA

REGULATOR NEEDS ENOUGH QUALITY / QUANTITY DATA TO:

- determine high risk species
- track national trends
- provide scientific foundation for regulatory guidance

AIRPORTS NEED ENOUGH QUALITY / QUANTITY DATA TO:

- identify & mitigate hazardous species, strike dynamics and attractants and evaluate effectiveness of wildlife management program

INDUSTRY NEEDS ENOUGH QUALITY / QUANTITY DATA TO:

- evaluate effectiveness of aircraft components

We are Airports

FAA Office of Airports

INACCURATE / INCOMPLETE STRIKE DATA

INEFFECTIVE RISK MANAGEMENT

- Targeting wrong species
- Inadequate or incorrect habitat attractant management

FINANCIAL INEFFICIENCY / MISAPPROPRIATION

- Human resources or management resources inadequate / misused
- Funding prioritized incorrectly

PROGRAM EVALUATION IMPACTED

- Evaluation requires data quality / data quantity
- Inadequate / flawed evaluation equals guesswork and increased risk

OUT OF COMPLIANCE

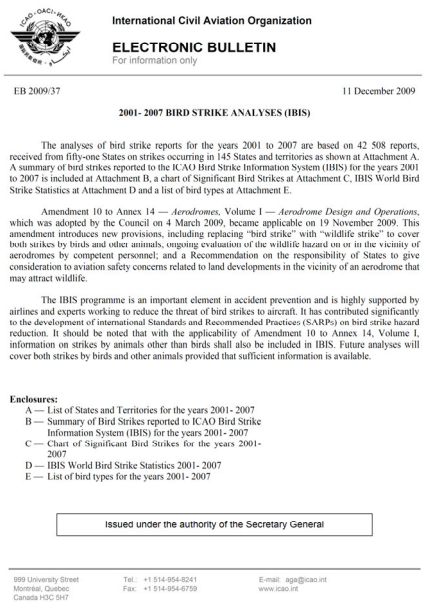
We are Airports

FAA Office of Airports

IBIS DELIVERABLES

Periodic Electronic Bulletins (EB) Since 2001

EB 2009/37
Reports for the years 2001 to 2007



International Civil Aviation Organization

ELECTRONIC BULLETIN

For information only

EB 2009/37 — 11 December 2009

2001- 2007 BIRD STRIKE ANALYSES (IBIS)

The analyses of bird strike reports for the years 2001 to 2007 are based on 42 508 reports, received from fifty-one States on strikes occurring in 145 States and territories as shown at Attachment A. A summary of bird strikes reported to the ICAO Bird Strike Information System (IBIS) for the years 2001 to 2007 is included at Attachment B, a chart of Significant Bird Strikes at Attachment C, IBIS World Bird Strike Statistics at Attachment D and a list of bird types at Attachment E.

Amendment 10 to Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*, which was adopted by the Council on 4 March 2009, became applicable on 19 November 2009. This amendment introduces new provisions, including replacing "bird strike" with "wildlife strike" to cover both strikes by birds and other animals, ongoing evaluation of the wildlife hazard on or in the vicinity of aerodromes by competent personnel; and a Recommendation on the responsibility of States to give consideration to aviation safety concerns related to land developments in the vicinity of an aerodrome that may attract wildlife.

The IBIS programme is an important element in accident prevention and is highly supported by airlines and experts working to reduce the threat of bird strikes to aircraft. It has contributed significantly to the development of international Standards and Recommended Practices (SARPs) on bird strike hazard reduction. It should be noted that with the applicability of Amendment 10 to Annex 14, Volume I, information on strikes by animals other than birds shall also be included in IBIS. Future analyses will cover both strikes by birds and other animals provided that sufficient information is available.

Enclosures:
A — List of States and Territories for the years 2001- 2007
B — Summary of Bird Strikes reported to ICAO Bird Strike Information System (IBIS) for the years 2001- 2007
C — Chart of Significant Bird Strikes for the years 2001- 2007
D — IBIS World Bird Strike Statistics 2001- 2007
E — List of bird types for the years 2001- 2007

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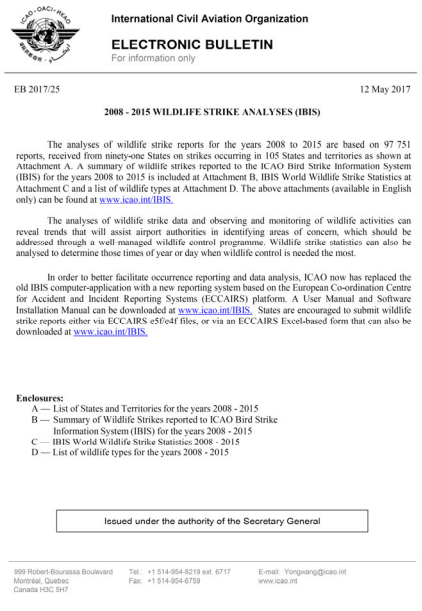
EB 2017/25
Reports for the years 2008 to 2015



International Civil Aviation Organization

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For information only

EB 2017/25 — 12 May 2017

2008 - 2015 WILDLIFE STRIKE ANALYSES (IBIS)

The analyses of wildlife strike reports for the years 2008 to 2015 are based on 97 751 reports, received from ninety-one States on strikes occurring in 105 States and territories as shown at Attachment A. A summary of wildlife strikes reported to the ICAO Bird Strike Information System (IBIS) for the years 2008 to 2015 is included at Attachment B, IBIS World Wildlife Strike Statistics at Attachment C and a list of wildlife types at Attachment D. The above attachments (available in English only) can be found at www.icao.int/IBIS.

The analyses of wildlife strike data and observing and monitoring of wildlife activities can reveal trends that will assist airport authorities in identifying areas of concern, which should be addressed through a well-managed wildlife control programme. Wildlife strike statistics can also be analysed to determine those times of year or day when wildlife control is needed the most.

In order to better facilitate occurrence reporting and data analysis, ICAO now has replaced the old IBIS computer-application with a new reporting system based on the European Co-ordination Centre for Accident and Incident Reporting Systems (ECCAIRS) platform. A User Manual and Software Installation Manual can be downloaded at www.icao.int/IBIS. States are encouraged to submit wildlife strike reports either via ECCAIRS e5f/e4f files, or via an ECCAIRS Excel-based form that can also be downloaded at www.icao.int/IBIS.

Enclosures:
A — List of States and Territories for the years 2008 - 2015
B — Summary of Wildlife Strikes reported to ICAO Bird Strike Information System (IBIS) for the years 2008 - 2015
C — IBIS World Wildlife Strike Statistics 2008 - 2015
D — List of wildlife types for the years 2008 - 2015

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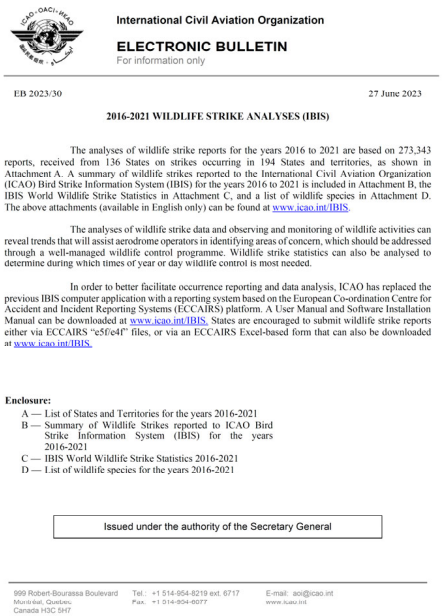
EB 2023/30
Reports for the years 2016 to 2021



International Civil Aviation Organization

ELECTRONIC BULLETIN

For information only

EB 2023/30 — 27 June 2023

2016-2021 WILDLIFE STRIKE ANALYSES (IBIS)

The analyses of wildlife strike reports for the years 2016 to 2021 are based on 273,343 reports, received from 136 States on strikes occurring in 194 States and territories, as shown in Attachment A. A summary of wildlife strikes reported to the International Civil Aviation Organization (ICAO) Bird Strike Information System (IBIS) for the years 2016 to 2021 is included in Attachment B, the IBIS World Wildlife Strike Statistics in Attachment C, and a list of wildlife species in Attachment D. The above attachments (available in English only) can be found at www.icao.int/IBIS.

The analyses of wildlife strike data and observing and monitoring of wildlife activities can reveal trends that will assist aerodrome operators in identifying areas of concern, which should be addressed through a well-managed wildlife control programme. Wildlife strike statistics can also be analysed to determine during which times of year or day wildlife control is most needed.

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Enclosure:
A — List of States and Territories for the years 2016-2021
B — Summary of Wildlife Strikes reported to ICAO Bird Strike Information System (IBIS) for the years 2016-2021
C — IBIS World Wildlife Strike Statistics 2016-2021
D — List of wildlife species for the years 2016-2021

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ICAO wildlife strikes analysis (IBIS)
…so what do we know?...

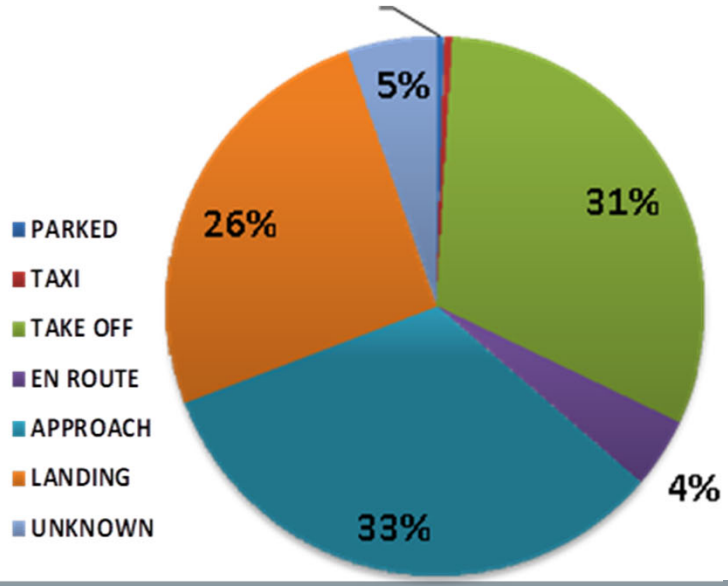
- Wildlife strike reports 2008 to 2015,
- Based on 97 751 reports, from 91 States
- Results 96% occurred on or near airports,

Of which

39% on take-off run or climb

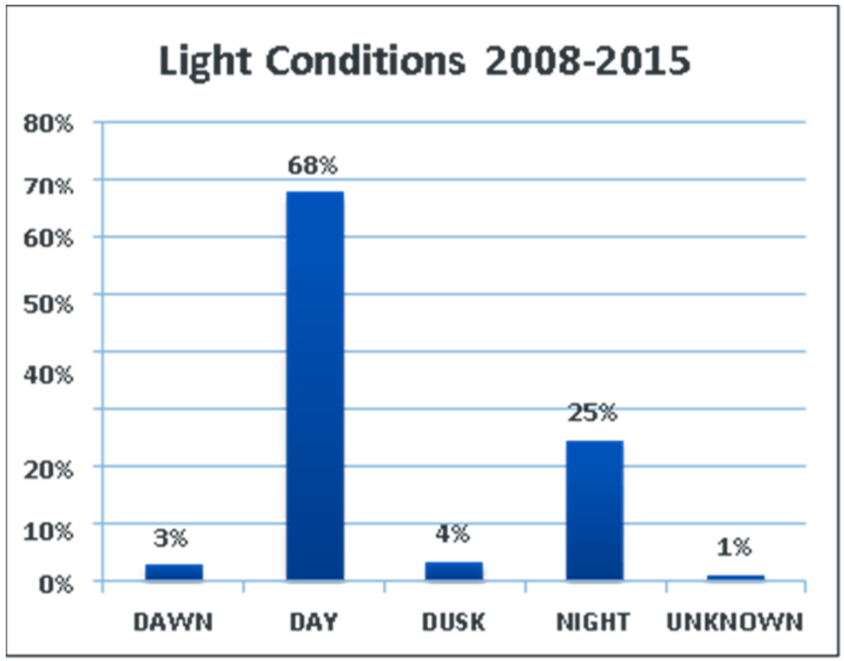
57% on decent, approach/ landing

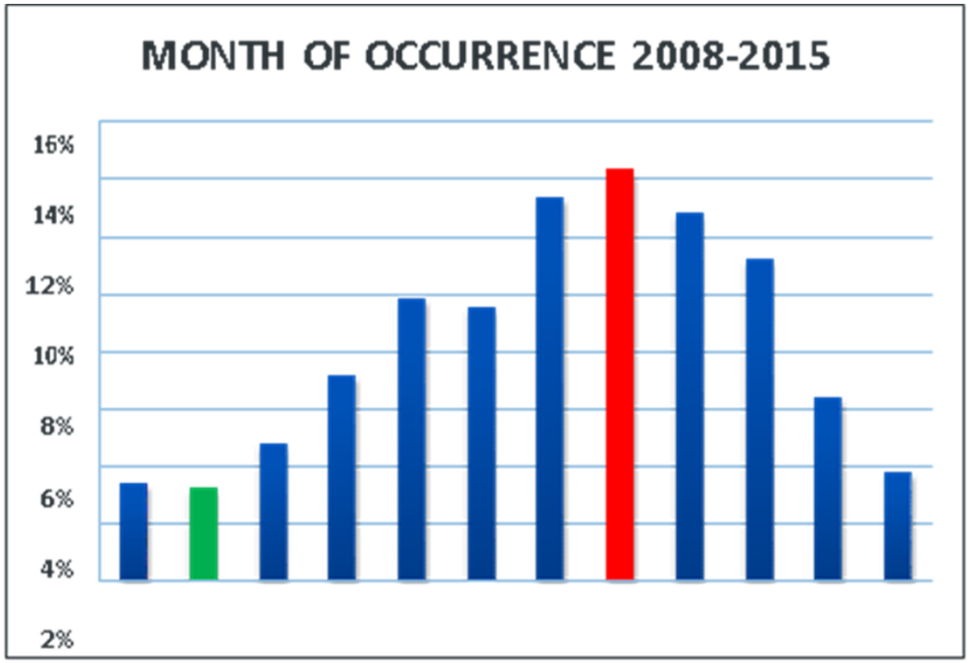
4% Enroute

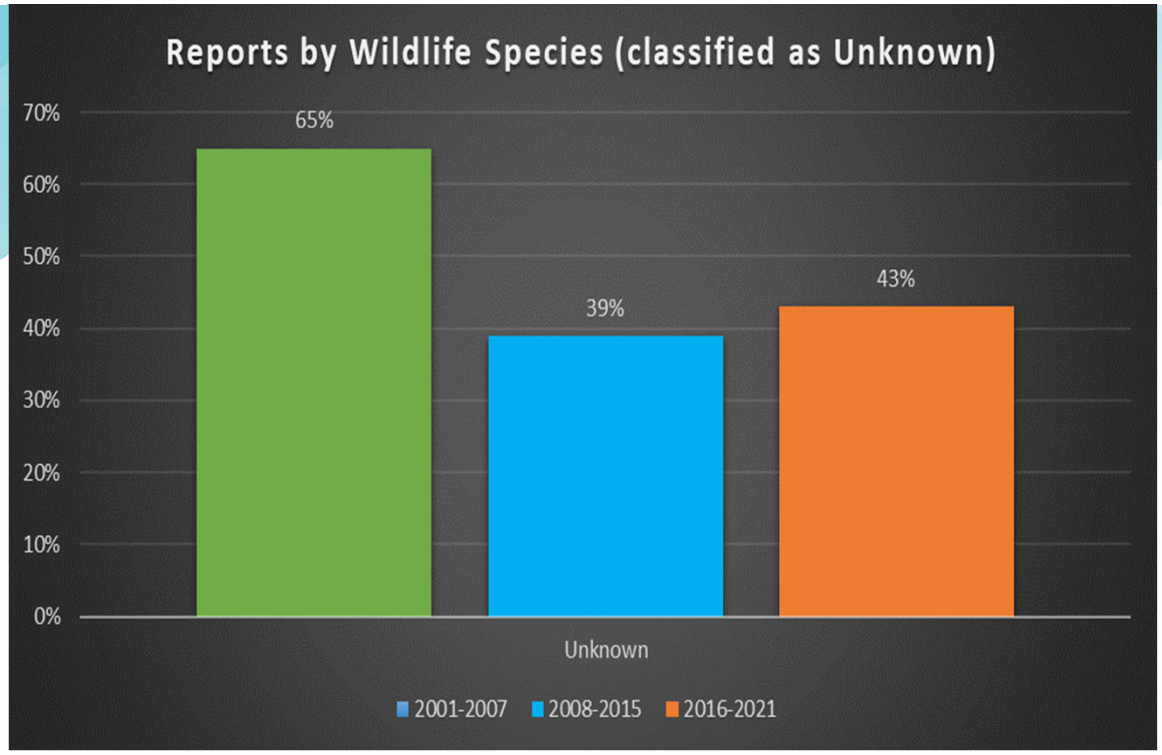


ICAO wildlife strikes analysis (IBIS)

- IBIS (ICAO Bird Strike Information System). http://www.icao.int/IBIS, wildlife@icao.int
- Bird Strike Reporting Form. Now all wildlife strikes



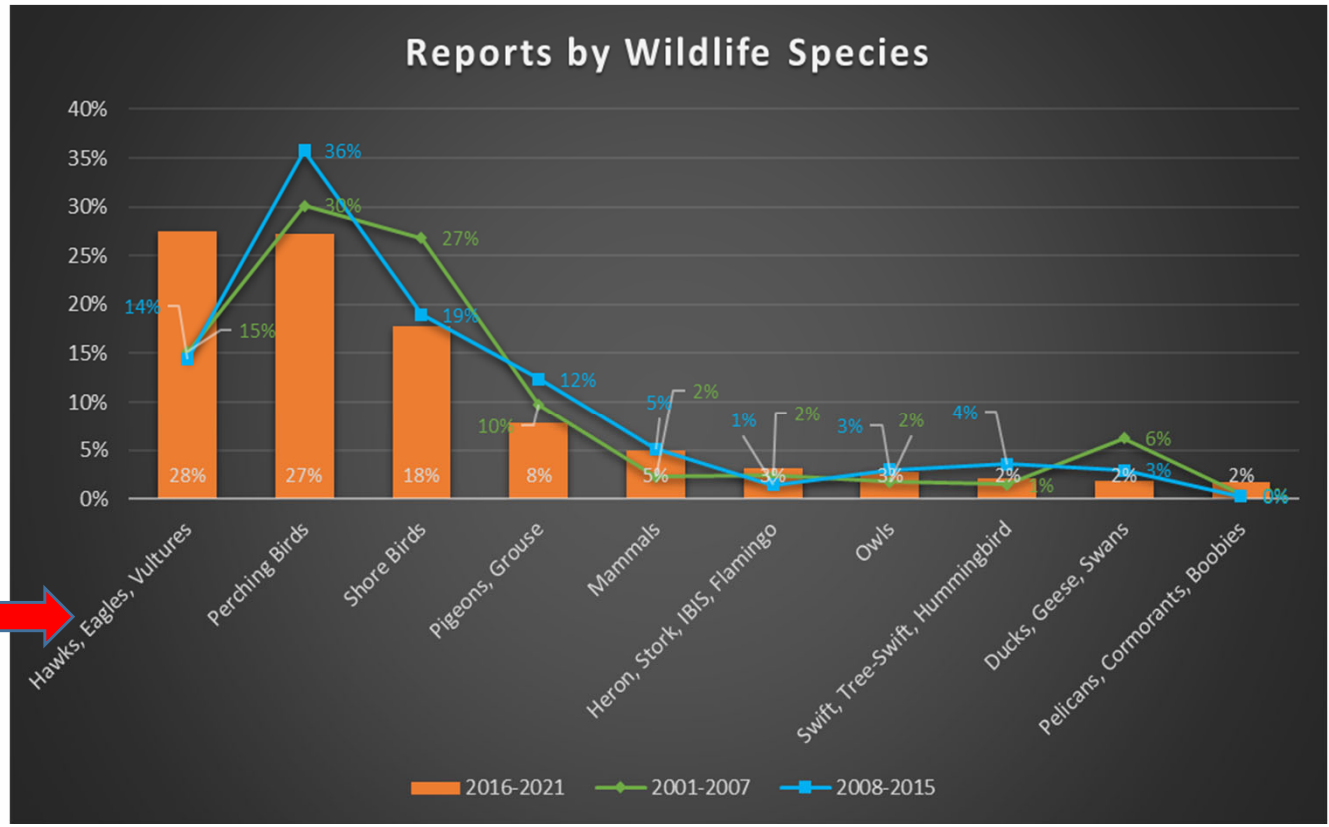




UNKNOWN IBIS WILDLIFE STRIKES 2016-2021

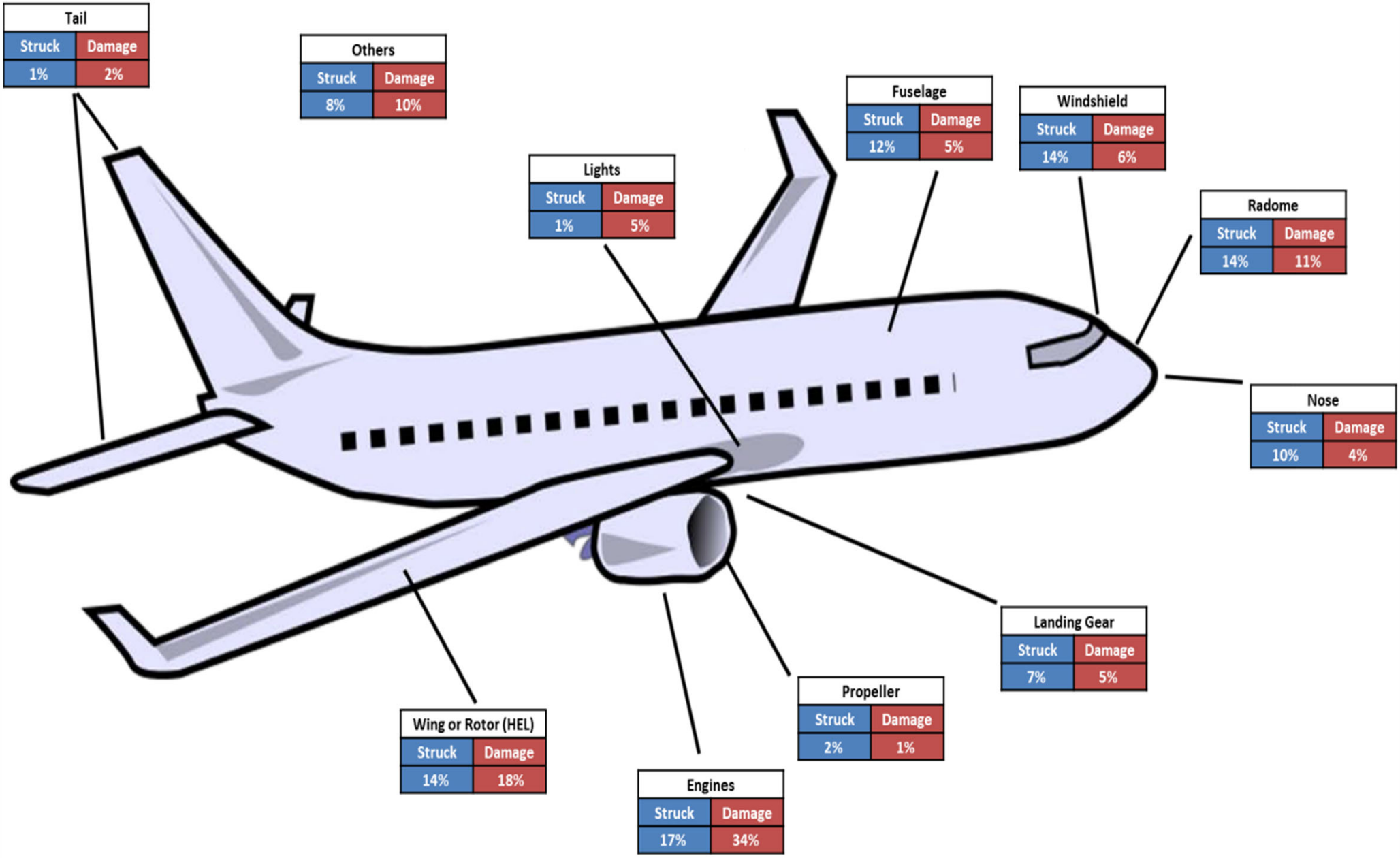
SPECIES GROUPS

WHAT IS GOING ON HERE?

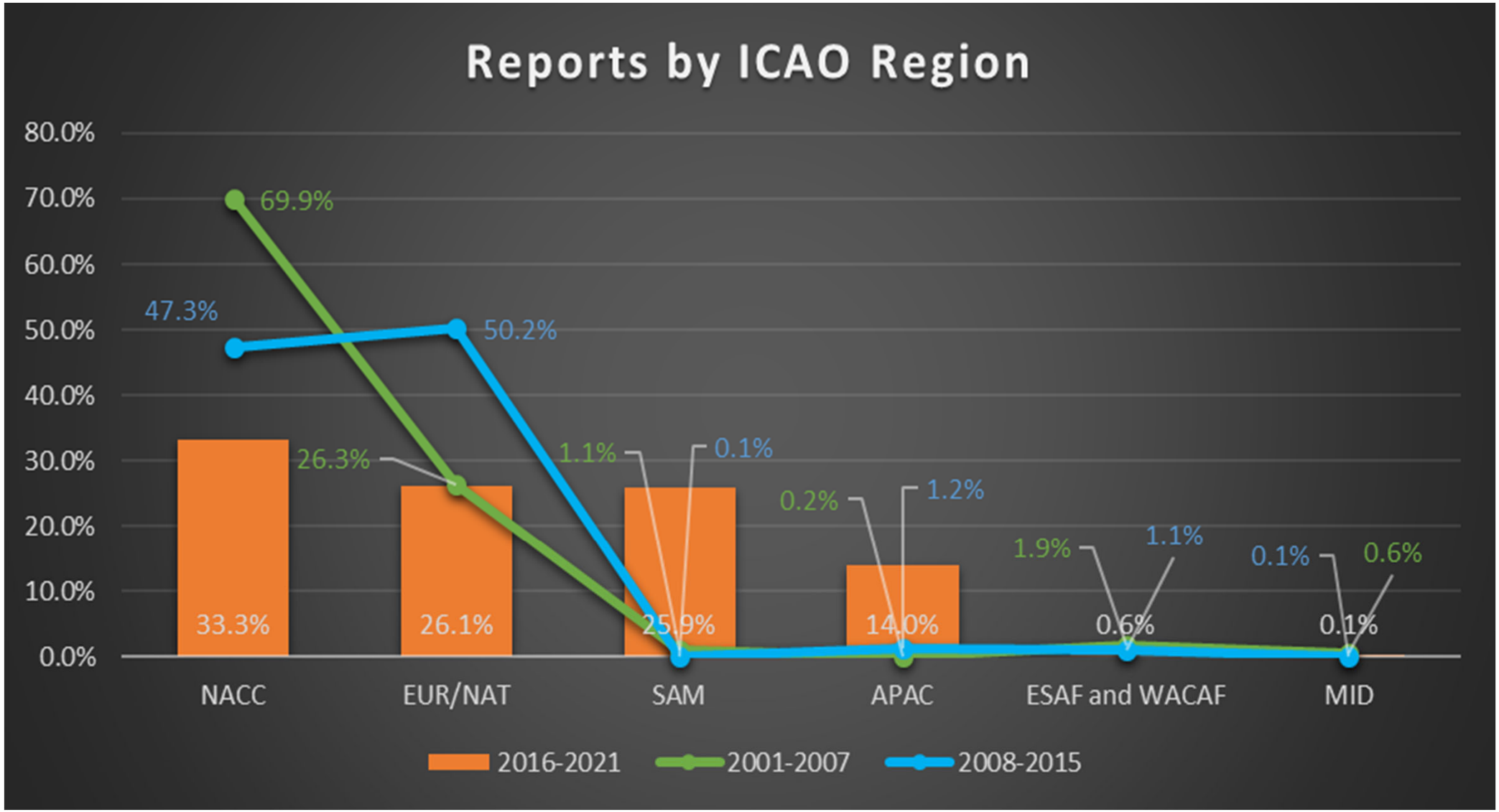


IBIS WILDLIFE STRIKES 2016-2021

Parts of Aircraft Struck and/or Damaged



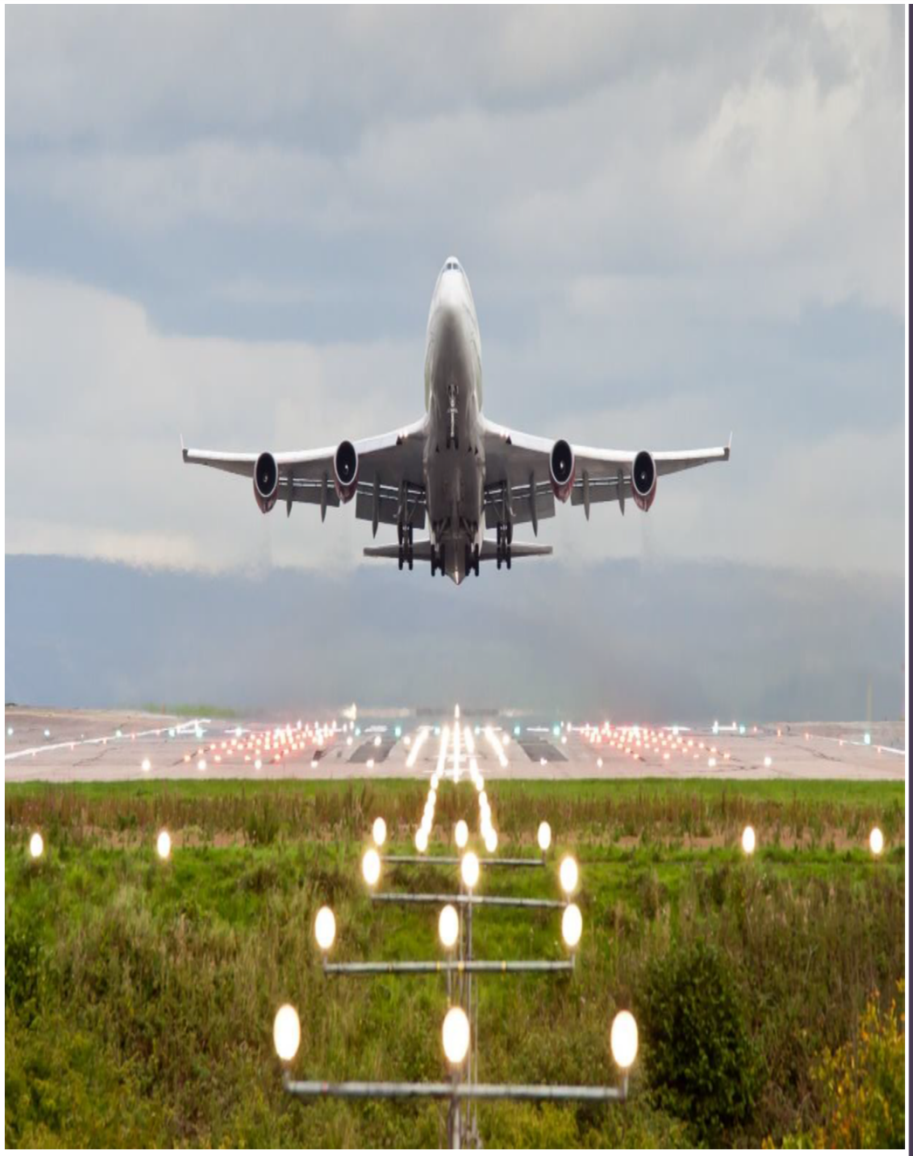
ICAO: REPORTING WILDLIFE STRIKES INTO IBIS 2016-2021 COMPARED TO PREVIOUS ANALYSES FROM 2001 - 2015



ICAO: REPORTING WILDLIFE STRIKES INTO IBIS 2016-2021

Wildlife strikes **reporting States** distributed by ICAO Region

(6 year totals and % of Strikes Submitted to IBIS)



Pilots
Airlines
Regulators
Wildlife-Managers
Airside-Operations
Air-Traffic-Controllers
Corporate-Operators
Manufacturers
Biologists
Airports

Thank You

ICAO