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Wildlife hazard management

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Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to:

- aerodrome operators
- air traffic control
- aircraft operators and pilots
- land use planning authorities
- wildlife subject matter experts.

Purpose

The purpose of this AC is to provide general information and guidance for the management of wildlife hazards at aerodromes.

Aerodrome operators should use the guidance in this circular to inform their decision-making process to meet the requirements of the Part 139 of the *Civil Aviation Safety Regulations 1998* (CASR) Part 139 Manual of Standards (MOS) and PANS-Aerodromes.

Operators should always consider the context of their own current and future operational environment, and the operational needs of pilots, aircraft operators and associated stakeholders, including but not limited to the size and complexity of the aerodrome operation.

This guidance does not create or permit departures from regulatory requirements.

For further information

For further information or to provide feedback on this AC, visit CASA's contact us page.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the National Manager, Flight Standards Branch.

> **Note:** Changes made in the current version are not annotated. The document should be read in full.

Table 1: Status

Version	Date	Details
v2.0	July 2026	• The information in all sections simplified. • Improved guidance on reporting wildlife strikes and hazards. • Improved cross referencing in all sections. • Amendments to Appendix B for wildlife monitoring. • Additional information regarding wildlife control training. • Addition of Appendix F Cross reference matrix. • New CASA style template applied.
v1.0	June 2023	This new revision includes a thorough review and refinement of the initial AC 139-26(0) Wildlife hazard management at aerodromes
(0)	July 2011	This is the first AC on the subject of wildlife hazard management at aerodromes.

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1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Table 2: Acronyms

Acronym	Description
AAWHG	Australian Aviation Wildlife Hazard Group
AC	advisory circular
ATSB	Australian Transport Safety Bureau
ATC	air traffic control
CAR	*Civil Aviation Regulations 1988*
CASA	Civil Aviation Safety Authority
CASR	*Civil Aviation Safety Regulations 1998*
ERSA	En-Route Supplement Australia
ICAO	International Civil Aviation Organization
MOS	Manual of Standards
RMP	risk management plan
RP	recommended practices
SMS	safety management system
TSIR	Transport Safety Investigation Regulations 2003
WHMP	wildlife hazard management plan

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Table 3: Definitions

Term	Definition
aerodrome	means an area of land or water (including any buildings, installations and equipment), the use of which as an aerodrome is authorised under the regulations, being such an area intended for use wholly or partly for the arrival, departure or movement of aircraft.
aerodrome operator	means: a. for a certified aerodrome—the person who holds the aerodrome

Term	Definition
	certificate for the aerodrome; or b. otherwise—the person who is responsible for the operation and maintenance of the aerodrome
aerodrome vicinity	for the purposes of wildlife hazards, may be considered as being: a. for sources of attractants and wildlife movements which present a hazard — within a radius of 3 km from all the runways of an aerodrome; and b. for significant sources of attractants or hazardous wildlife movements across the aerodrome site — within a radius of 8 km from the aerodrome reference point.
air traffic control	means air traffic services in its capacity as a provider of air traffic control services.
certified aerodrome	means an aerodrome in respect of which an aerodrome certificate is in force.
confirmed wildlife strike	A wildlife strike is confirmed in the following cases: a. When physical evidence of a wildlife strike is found on the runway or runway strip used by the aircraft involved (unless another reason for the death of the wildlife can be found). b. When physical evidence of the strike is found on the aircraft involved following an inspection; and c. In any other instance where it can be reasonably proved from evidence that wildlife was struck as a direct result of a moving aircraft. For example, when aircrew report they saw, heard, or smelt a wildlife strike.
hazard	A condition or an object with the potential to cause or contribute to an aircraft incident or accident.
likelihood	Used as a general description of probability or frequency. Note: Can be expressed qualitatively or quantitatively.
NOTAM	means a notice issued by the NOTAM Office containing information or instructions concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to persons concerned with flight operations.
risk	The predicted probability and severity of the consequences or outcomes of a hazard. **Notes:** 1. A risk is often specified in terms of an event or circumstance and the consequence that may flow from it. 2. Risk is measured in terms of a combination of the consequences of an event and its likelihood. 3. Risk may have a positive or negative impact.
risk treatment	Describes the measures taken to reduce the likelihood of a wildlife strike occurring and/or the resultant consequence.
safety	The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.
substantial damage	Means damage or structural failure incurred by an aircraft by a wildlife strike that adversely affects the structural strength, performance, or flight characteristics of

Term	Definition
	the aircraft and that would normally require major repair or replacement of the affected component.
suspected wildlife strike	An event where a wildlife strike has been suspected by aircrew or ground personnel but upon inspection: • no carcass from the wildlife is found; and • there is no physical evidence on the aircraft of the strike having occurred
UNICOM	(universal communications) means a non-air traffic control communication facility operated to provide an advisory service to enhance the value of information normally available at a non-controlled aerodrome.
wildlife	Includes all birds, bats, and terrestrial animals and includes insects as a practical definition.
Wildlife Hazard Management Plan	A method for aerodrome operators to adopt reasonable wildlife risk control measures, address features that may attract wildlife, control the presence of wildlife on, and in the vicinity of, the aerodrome. A WHMP should be developed based on the wildlife hazard risk assessment, according to the size and complexity of the aerodrome.
wildlife incident	An event where it is likely that a strike could have resulted from a wildlife hazard. A near miss event involving both wildlife and aircraft should be considered a form of wildlife incident.
wildlife strike	When wildlife and a moving aircraft collide.

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website https://www.legislation.gov.au/

Table 4: Legislation references

Document	Title
Part 139 of CASR 1998	Aerodromes
Part 139 (Aerodromes) Manual of Standards (MOS)	Aerodromes

Advisory material

CASA's advisory materials are available at https://www.casa.gov.au/publications-and-resources/guidance-materials

Table 5: Advisory material references

Document	Title
AC 139.C-01	Aerodrome manual
AC 139.C-02	Aerodrome personnel
AC 139.C-03	Serviceability inspections

Document	Title
AC 139.C-04	Aerodrome technical inspections and aerodrome manual validations
AC 139.C-05	Aeronautical information reporting validation
AC 139.C-26	Safety management systems for aerodromes
AC 139.C-27	Risk management plans for aerodromes

International Civil Aviation Organization documents

International Civil Aviation Organization (ICAO) documents are available for purchase from http://store1.icao.int/

Many ICAO documents are also available for reading, but not purchase or downloading, from the ICAO eLibrary (https://elibrary.icao.int/home).

Table 6: ICAO references

Document	Title
ICAO Doc 9137	Airport Services Manual: Part 3 - Wildlife Hazard Management Fifth Edition, 2020
ICAO Doc 9981	PANS-Aerodromes: Third Edition, 2020

Other reference material

Table 7: Other reference material

Document	Title
Australian Aviation Wildlife Hazard Group (AAWHG) Recommended Practices	Available from: https://aawhg.org/resources/recommended-practices/
EPBC No. 91, 1999	Environment Protection and Biodiversity Conservation Act 1999
National Airports Safeguarding Framework Guideline C	Available from: 3.1.4_Guideline_C.pdf 3. Wildlife -Attachment A -birdstrike risks.xlsx

2 Background

2.1 General

2.1.1 Wildlife activity at, and in the vicinity of, aerodromes present a hazard to aircraft operations[1]. Wildlife activity includes the presence and behaviours of birds and animals at an aerodrome. Seasonal changes, environment changes and geographical changes can impact the range, volume or behaviour of wildlife at the aerodrome.

2.1.2 Food sources and availability, breeding cycles and the presence of predators can influence the way wildlife behaves. Wildlife behaviour, especially with birds and other flying wildlife can be hazardous to the safe operation of aircraft, particularly when in the path of aircraft engaged in flight or manoeuvring on the surface.

2.1.3 Wildlife strikes can result in aircraft damage, operational disruption, and, in rare cases, catastrophic outcomes. Effective management of these hazards is necessary to ensure the safety of aircraft, passengers, and crew.

2.1.4 The nature and extent of wildlife hazards will vary depending on factors such as:

- the geographic location of the aerodrome
- local environmental conditions
- surrounding land use
- the types and behaviour of wildlife species present.

2.1.5 Aerodrome operators should consider these factors when establishing and implementing wildlife hazard management processes. Wildlife hazard management should also be undertaken in a manner that considers applicable environmental and regulatory requirements.

2.2 Introduction to wildlife hazard management

2.2.1 Wildlife hazard management should align with Australia's commitment to environmental stewardship and conservation. The protection of both people and the welfare of wildlife is essential.

2.2.2 National and state-level guidelines and regulations (such as the *Environment Protection and Biodiversity Conservation Act 1999*) should be considered when establishing wildlife hazard management procedures at aerodromes.

2.2.3 Aerodrome operators should understand the behaviour and characteristics of wildlife species relevant to their operating environment. Wildlife hazard management should be implemented through defined procedures that form part of the aerodrome's operational and safety systems. For certified aerodromes, these procedures must be included in, or referenced by, the aerodrome manual in accordance with section 11.08 of the Part 139 MOS.

2.2.4 Wildlife hazard management involves the identification, assessment, mitigation and reporting of wildlife hazards to reduce risks to aircraft operations. The objective is to minimise the presence of hazardous wildlife within areas used by aircraft, including movement areas and approach or departure paths.

[1] Refer to Australian Aviation Wildlife Hazards Group (AAWHG) for further information (https://aawhg.org/resources)

2.3 Wildlife hazard management programme

2.3.1 The wildlife hazard management programme is a strategic management system that establishes an aerodrome operator's approach to managing wildlife hazards.

2.3.2 Wildlife hazard management procedures should be developed as part of the wildlife hazard management programme. As a minimum, the procedures should address monitoring, assessment, mitigation, and reporting of wildlife hazards, and coordination with relevant stakeholders. Refer to Chapter 3 of this AC for detailed requirements

2.3.3 A wildlife hazard management programme is a structured set of processes used by an aerodrome operator to manage wildlife hazards on an ongoing basis. The programme should be based on:

- identified wildlife hazards
- the level of risk associated with those hazards
- the operational context of the aerodrome.

2.3.4 The programme should include processes for:

- monitoring wildlife activity
- collecting and analysing relevant data
- assessing risks
- implementing and reviewing mitigation measures
- reporting wildlife hazards and incidents.

2.3.5 Where appropriate, the wildlife hazard management programme should be integrated with the aerodrome operator's safety management system[2] (SMS) or risk management plan[3] (RMP). This ensures that wildlife hazards are managed in a consistent manner with other operational hazards.

2.3.6 Where the criteria specified in section 17 of the Part 139 MOS are met, the wildlife hazard management programme must be formalised in a Wildlife Hazard Management Plan (WHMP). Refer to Chapter 3 of this AC for detailed WHMP requirements. Wildlife hazard management must be integrated with the aerodrome's SMS or RMP, as applicable — refer to Chapter 5 of this AC.

2.3.7 Effective wildlife hazard management programmes (and any related WHMP) should be commensurate with the level of risk and complexity of the aerodrome operation. They may also benefit from engagement with relevant stakeholders, including local authorities and landowners, particularly where wildlife attractants exist outside the aerodrome boundary.

[2] Refer to AC 139.C-26 Safety management systems

[3] Refer to AC 139.C-27 Risk management plans for aerodromes

3 Wildlife Hazard Management Plan

3.1 General

3.1.1 The operators of certain aerodromes are required to prepare and implement a Wildlife Hazard Management Plan (WHMP) in accordance with section 17.03 of the MOS. The Plan is the operational document that describes how the programme will be implemented in practice.

3.1.2 Aerodrome operators should develop a WHMP that is appropriate to the identified wildlife hazards and operational context of the aerodrome. The WHMP forms part of the aerodrome operator's overall safety system and should be included in, or referenced by, the aerodrome manual.[4]

3.1.3 The WHMP is to be prepared in consultation with suitably qualified or experienced persons[5], including:

- an ornithologist, zoologist, biologist, ecologist

or

- a person with demonstrated expertise in the management of wildlife hazards to aviation.

3.1.4 A WHMP must be based on:

- identified wildlife hazards
- an assessment of associated risks
- the operational characteristics of the aerodrome.

3.1.5 The WHMP must include, as a minimum (see MOS 17.04):

- procedures for wildlife hazard monitoring and detection (see section 3.2)
- procedures for data collection, reporting and recording (see section 3.3)
- methods for wildlife risk assessment and periodic review (see section 3.4)
- procedures for implementation of mitigation measures (see section 3.5)
- training arrangements for personnel (see section 3.6)
- arrangements for liaison with relevant stakeholders.
- The WHMP should identify:
  - roles and responsibilities of personnel
  - resources required for implementation
  - processes for review and continuous improvement.

3.1.6 The WHMP must be reviewed:

- at least annually
- following significant wildlife events
- where changes in wildlife activity or aerodrome operations are identified.

3.1.7 The processes for habitat and land management may be included in the WHMP, along with appropriate resource requirements.

[4] Refer to AC 139.C-01 Aerodrome manual

[5] Refer to section 17.04 of Part 139 MOS

3.2 Wildlife hazard monitoring

3.2.1 Aerodrome operators must monitor wildlife activity at, and in the vicinity of, the aerodrome as part of routine serviceability inspections.[6]

3.2.2 Monitoring activities should:

- identify the presence, number and behaviour of wildlife
- consider both on-aerodrome and off-aerodrome sources.

3.2.3 Monitoring should:

- cover periods of relevant wildlife activity (e.g. day, night, seasonal variation)
- include areas used by aircraft and surrounding environments
- consider known wildlife attractants.

3.2.4 Monitoring should be conducted at a frequency relative to the severity of the wildlife hazard. The greater the wildlife hazard, the more frequently monitoring should be conducted.

3.2.5 Where necessary, aerodrome operators may implement additional or targeted wildlife monitoring activities.

- the results of monitoring must be recorded to support:
- trend analysis
- risk assessment (see section 3.4)
- evaluation of mitigation effectiveness (see section 3.5).

3.2.6 Monitoring activities in the vicinity of the aerodrome, including off-aerodrome sites and monitoring zone practices, are addressed in Appendix B.

3.3 Data collection, reporting and recording data on wildlife activities

3.3.1 Aerodrome operators should establish processes to record and report wildlife activity and wildlife strike events.

3.3.2 Data collected from monitoring activities (see section 3.2 of this AC) should be recorded in a consistent format and should include, as a minimum:

- name or position of the person logging the data
- date and time of observation
- location
- species and number of wildlife (where practicable)
- behaviour and movement patterns
- actions taken and outcomes
- weather and lighting conditions.

3.3.3 Recorded data should be used to:

- identify trends in wildlife activity
- support risk assessments

[6] Refer to AC 139.C-03 Serviceability inspections

- inform mitigation strategies.

3.3.4 Wildlife hazards must be reported using standard aeronautical information and communication channels.[7]

3.3.5 This may include:

- ongoing hazards reported via AIP (ERSA)
- short-term hazards reported via NOTAM
- immediate hazards communicated via ATC or UNICOM.

3.3.6 All wildlife strikes must be reported to the ATSB in accordance with the Transport Safety Investigation Regulations.

3.4 Wildlife risk assessment

3.4.1 Aerodrome operators must monitor and record the presence and behaviour of wildlife on the aerodrome and wildlife activity that is visible in the vicinity of the aerodrome. Any detected wildlife hazard must be assessed for its potential risk to aircraft operations[8].

3.4.2 Risk assessment should:

- use data from monitoring and recorded observations (see sections 3.2 and 3.3 of this AC) including:
  - wildlife observations
  - reported aircraft strike events
  - reported aircraft near miss events
  - where multiple species exist and threats can be ordered accordingly.
- consider likelihood and consequence of wildlife strikes
- identify high-risk species and activities.

3.4.3 Where an SMS[9] or RMP[10] is implemented, wildlife hazards must be managed in accordance with those processes.

3.4.4 The AAWHG has established a recommended practices (RP) document to help implement wildlife risk assessment and analysis procedures at aerodromes (Refer to AAWHG RP 1.3).[11]

3.4.5 The RP document has highlighted the following steps to be followed during the risk assessment process:

- establish the context
- identify risks
- analyse risks
- evaluate risks
- treat risks.

7 Refer to section 17.05 of Part 139 MOS and AC 139.C-04 Aerodrome technical inspections and aerodrome manual validation

8 Refer to section 17.02 of Part 139 MOS

9 Refer to AC 139.C-26 Safety management systems

10 Refer to AC 139.C-27 Risk management plans for aerodromes

11 The AAWHG encourages participants to implement wildlife risk assessment as per the ISO Standard 31000 - “Risk Management -Principles and Guidelines

3.4.6 The risk assessment process should support:

- prioritisation of hazards
- selection of mitigation measures
- review of existing controls.

3.4.7 Risk assessments must be:

- reviewed periodically
- updated following significant events
- used to inform WHMP updates.

3.4.8 Where it is identified that existing risk controls are not effective, the aerodrome operator should re-evaluate the risk, and ensure effective controls are implemented as soon as reasonably practicable.

3.5 Wildlife hazard mitigation

3.5.1 Aerodrome operators must implement mitigation measures to reduce the level of risk associated with identified wildlife hazards.[12]

3.5.2 Mitigation measures may include:

- habitat modification
- land-use management
- patrols and dispersal activities
- physical barriers and deterrents.

3.5.3 Mitigation strategies should:

- target identified high-risk wildlife species
- be proportionate to the level of risk
- consider effectiveness and potential unintended impacts.

3.5.4 Each mitigation measure should be:

- documented within the WHMP or programme
- assigned to responsible personnel
- monitored to assess effectiveness.

3.5.5 The effectiveness of mitigation measures should be verified through:

- ongoing monitoring (see section 3.2)
- inspection and assurance activities[13].

Habitat management

3.5.6 Guidance on on-aerodrome habitat management is provided in Appendix A of this AC. Guidance on off-aerodrome land use management is provided in Appendix C of this AC.

[12] Refer to section 17.06 of the Part 139 MOS.

[13] Refer to AC 139.C-03 Serviceability inspections

Wildlife dispersal techniques

3.5.7 Guidance on wildlife dispersal and deterrence techniques is provided in Appendix D of this advisory circular.

3.6 Training wildlife hazard management personnel

3.6.1 Aerodrome operators must ensure that personnel involved in wildlife hazard management are appropriately trained in accordance with section 17.07 of the Part 139 MOS.[14]

3.6.2 Training should ensure personnel are competent to:

- identify wildlife species and hazards
- conduct monitoring and inspections
- record and report wildlife activity
- implement mitigation measures safely
- collect remains of any wildlife strike on the aerodrome
- assess the effectiveness of any mitigation measures that are taken.

3.6.3 Detailed training requirements, including a training syllabus and stakeholder awareness requirements, are provided in Appendix E of this advisory circular.

3.6.4 Training records must be maintained for a period of at least 3 years[15].

[14] Also refer to CASA AC 139.C-02 Aerodrome personnel.

[15] Refer to section 17.07 of Part 139 MOS.

4 Reporting wildlife strike incidents

4.1 Routine reportable matters

4.1.1 Aerodrome operators must report wildlife strike incidents in accordance with the *Transport Safety Investigation Regulations* (2022 amendment).

4.1.2 The operators of a certified aerodrome are required to report to the ATSB within 72 hours of a wildlife strike occurring at an aerodrome[16]. For all aircraft operations, the TSIR defines a wildlife strike as being 'a collision with an animal, including a bird'.

4.1.3 Reports to the ATSB should include the following information as known by the person making the report:

- the name and contact details of the reporter
- the date and time (local) of the strike
- aircraft part(s) damaged (if any)
- the location of the strike (i.e., at aerodrome, greater than 5 kilometres away, etc).

4.1.4 Reports to the ATSB may also include the following details as known by the person making the report:

- For bird strikes, the:
  - runway number or taxiway designator used by the aircraft operation
  - number of birds sighted
  - number of birds struck
  - species involved (or bird type if the actual species is not known)
  - size (large, medium, small etc.) of the actual bird(s) involved (not the species average size)
  - details of any engine ingestion (including the number of engines experiencing ingestion).
- For animal strikes:
  - specific location (runway, taxiway, etc.)
  - the size (large, medium, small etc.) of the animals(s) involved (not the species average size)
  - the species involved (or type of animal if species is not known).

4.1.5 Wildlife strike events should be:

- recorded as part of the aerodrome's reporting processes
- investigated in accordance with the aerodrome's SMS or RMP.

4.1.6 Investigations should:

- identify contributing factors
- assess the effectiveness of existing mitigation measures
- inform updates to the WHMP or programme.

[16] Refer to Aviation reporting requirements at https://www.atsb.gov.au/aviation-reporting-requirements

4.1.7 Wildlife hazards identified through incidents must be:

- assessed (see section 3.4)
- addressed through mitigation measures (see section 3.5)
- communicated, where required, to pilots and stakeholders.

4.1.8 Where the aerodrome operator is unable to identify the wildlife species involved in the strike, forensic identification methods such as DNA sampling of the remains may assist. More information is available from the ATSB report titled 'Forensic Identification of Aviation Bird Strikes in Australia'.

4.2 Publishing information on wildlife hazards

4.2.1 Any significant increase in, or concentration of, wildlife hazards on or near the aerodrome which constitute a danger to aircraft, unless the wildlife causing the hazard is dispersed immediately need to be reported to the NOTAM Office.[17]

4.2.2 The reporting to pilots through the AIP, NOTAM and ATC (if applicable) should be set out in the WHMP (where applicable) or the aerodrome manual[18].

4.2.3 Airservices Australia published the NOTAM data quality requirements for aerodrome operators. This document sets out the requirements and format for NOTAM when they are initiated to report a significant increase of birds or animals.

4.2.4 NOTAM advising of the presence of significant increase of birds or animals should include specific information on species, period of concentration, likely location, flight path behaviours and information on the physical size of the bird or animal and estimated quantity of the bird or animal being reported.

4.2.5 Aerodrome operators may choose to include a standing caution is included in En Route Supplement Australia (ERSA) for a bird or animal hazard.

4.2.6 Standing cautions in ERSA should include sufficient information to provide the reader with nature of the wildlife hazard, including species, period of concentration, location and flight path.

4.2.7 Some Australian aerodrome operators use wildlife hazard notifications (WHNs) to communicate wildlife hazards to airlines and other industry stakeholders.[19]

4.2.8 When used, WHNs inform the recipient of:

- the aerodrome strike hazard level (low, moderate, high, or severe)
- the nature of the hazard including species, location, time, duration height
- what the aerodrome is doing to mitigate the risk
- recommendations for aircrew to minimise the chance of a strike.

4.2.9 NOTAM templates designed specifically to communicate bird strike risk levels to flight crew may be developed and implemented through the WHMP or aerodrome manual procedures. Known as BIRDTAM, these specific NOTAM are used in several countries and are used to communicate periods of elevated bird migration activity that may pose a hazard to low-level flight operations.

4.2.10 BIRDTAMs are not a formally established mechanism in Australian civil aviation, however they may form part of an aerodrome operator's risks management system. When incorporated, the BIRDTAM NOTAM template may communicate:

[17] Refer section 12.04 of Part 139 MOS

[18] Refer to AC 139.C-05 Aeronautical information reporting validation

[19] Refer to Australian Airports Association (AAA) Airport Practice Note 9 Wildlife hazard management at airports

- the geographic area affected
- the time period during which elevated bird activity is expected
- the intensity level of bird activity, usually expressed on a scale — commonly a five-level scale ranging from nil or low activity through to very severe migration activity
- the altitude band within which the hazard exists
- whether activity is expected during day, night, or both, which is particularly relevant given that many migratory species fly at night.

5 Integration with aerodrome safety management system or risk management plan

5.1 Where implemented, the wildlife hazard management programme or WHMP must be integrated into the aerodrome operator's SMS[20] or RMP[21].

5.2 Integration should ensure that:

- wildlife hazards are treated as part of the aerodrome hazard register
- risk assessments are consistent with established processes
- mitigation measures are subject to assurance and review
- incidents are investigated using SMS procedures.

5.3 The WHMP or programme should be subject to:

- audit and assurance processes
- periodic review
- continuous improvement activities.

5.4 Integration with the SMS or RMP supports:

- consistent hazard management
- effective monitoring of risk controls
- ongoing improvement in wildlife hazard management outcomes.

[20] Refer to AC 139.C-26 Safety management systems.

[21] Refer to AC 139.C-27 Risk management plans for aerodromes.

Appendix A
On aerodrome habitat management

A.1 Habitat management

A.1.1 Purpose

A.1.1.1 This appendix provides guidance on managing aerodrome environments to reduce conditions that attract hazardous wildlife. These measures support the mitigation strategies described in section 3.5.

A.1.2 General

A.1.2.1 Aerodrome operators should identify and manage features within the aerodrome that may attract wildlife. Habitat management measures should be:

- targeted at identified high-risk species
- proportionate to risk
- integrated with monitoring and mitigation processes (see sections 3.2 and 3.5 of this AC).

A.1.3 Buildings and structures

A.1.3.1 Aerodrome operators should:

- prevent wildlife access to buildings (e.g. screening, netting)
- remove or modify structures that provide nesting or roosting sites
- install deterrents (e.g. anti-perching devices) where required
- Where nests are present, removal must comply with applicable environmental requirements.

A.1.4 Fencing and perimeter control

A.1.4.1 Aerodrome operators should:

- install and maintain perimeter fencing to restrict access by terrestrial wildlife
- ensure fencing is effective against digging or breaching (e.g. buried edges)
- manage access points to prevent wildlife entry
- Fencing effectiveness should be monitored as part of routine inspections[22].

A.1.5 Vegetation management

A.1.5.1 Aerodrome operators should manage vegetation to reduce its attractiveness to wildlife by:

- maintaining grass height appropriate to local high-risk species
- removing or controlling vegetation that provides food or shelter
- limiting standing water within vegetated areas

[22] Refer to AC 139.C-03 Serviceability inspections

- vegetation management practices should be based on site-specific assessment.

A.1.6 Waste management

A.1.6.1 Aerodrome operators should:

- implement wildlife-proof waste storage
- remove food waste promptly
- prevent unauthorised feeding of wildlife
- Waste management practices should minimise access to food sources.

A.1.7 Water management

A.1.7.1 Aerodrome operators should:

- eliminate or reduce standing water, where practicable
- manage drainage systems to prevent wildlife use
- apply deterrents or barriers where water bodies cannot be removed
- Water features should be monitored as potential wildlife attractants.

Appendix B
Practices for monitoring wildlife

B.1 Purpose

B.1.1 This appendix provides guidance on practices for monitoring wildlife activity at, and in the vicinity of, aerodromes. These practices support the monitoring requirements described in section 3.2 of this AC.

B.2 Determining practices by location, environment or activity

B.2.1 Practices for monitoring wildlife may include dividing the aerodrome into separate monitoring zones based on:

- geographical size
- specific environmental factors within the zone such as terrain, soil type, flora, land use etc
- the operational use of the zone by aircraft such as take-off, approach etc.

B.2.2 The aerodrome operator, in consultation with the local planning authorities, should monitor sites within 13 km of the aerodrome that do or could attract wildlife.

B.2.3 Monitoring practices in the vicinity of an aerodrome may include (but not limited to):

- areas used for waste, recycling, offal, or sewage
- wetlands, marshes, areas of water discharge and open waterways; areas containing significant food sources for high-risk species
- national parks, wildlife reserves and other significant wildlife corridors.

B.2.4 The identification of these areas can be achieved by:

- the observation of wildlife transiting across the aerodrome between separate sources of attraction
- the physical observation of land uses in the aerodrome environment
- any wildlife hazard reports received from pilots, authorities and/or the public.

B.2.5 Offsite aerodrome attraction sources (such as animal sale centres, picnic areas, aeration facilities, waste disposal and landfill areas etc.).

B.2.6 Climatic or seasonal considerations, such as the presence of wildlife at certain times of the year.

B.3 Recording and documentation of monitoring activities

B.3.1 Aerodrome operators should ensure that the results of all monitoring activities are recorded in a consistent and timely manner to support trend analysis, risk assessment and evaluation of mitigation effectiveness.

B.3.2 Field recording practices should:

- use a standardised format or observation sheet

- capture, as a minimum, the data fields specified in section 3.3 of this AC
- be completed at the time of observation, or as soon as practicable after
- be retained and accessible for review and audit purposes.

B.3.3 Records should be stored within the aerodrome operator's established data management system and reviewed periodically to identify trends in wildlife activity.

B.4 Monitoring equipment and technology

B.4.1 Aerodrome operators should ensure that personnel conducting wildlife monitoring are appropriately equipped to carry out their duties effectively.

B.4.2 Equipment used to support monitoring activities may include:

- binoculars or spotting scopes for visual observation across movement areas
- night-vision or thermal imaging equipment for monitoring during low-light conditions
- unmanned aerial vehicles (drones) for surveillance of large or complex aerodrome environments
- remote-sensing or satellite detection systems for monitoring off-aerodrome land use and wildlife movement
- wildlife camera traps for perimeter monitoring and detection of terrestrial species.

B.4.3 The selection of equipment should be based on the identified wildlife hazards, the size and complexity of the aerodrome, and the operational context.

B.4.4 Automated monitoring systems should be used to supplement, not replace, trained personnel conducting ground-based monitoring.

B.5 Monitoring frequency — risk-based approach

B.5.1 Monitoring should be conducted at a frequency commensurate with the assessed level of wildlife hazard. The following table provides a general guide; aerodrome operators should adjust frequency based on site-specific conditions, seasonal factors, and operational context.

Table 8: Example Guide to monitoring frequency

Hazard level	Indicative monitoring frequency	Examples of triggers for escalation
Low	Weekly, or as part of routine serviceability inspections	Occasional wildlife sightings; no recent strike history
Medium	Daily, or prior to and following aircraft movements	Regular wildlife activity; proximity to attractants
High	Per aircraft movement, or continuously during operations	Frequent sightings of high-risk species; recent strike events; seasonal peaks

B.5.2 Aerodrome operators should escalate monitoring frequency in response to:

- a wildlife strike or near-miss event
- the identification of new or increased wildlife attractants on or near the aerodrome
- seasonal changes associated with breeding, roosting or migratory activity
- changes to aerodrome operations or surrounding land use.

B.6 Monitoring inputs from air traffic control and flight crew

B.6.1 Air traffic control (ATC) personnel and flight crew observe wildlife from vantage points that complement ground-based monitoring, particularly on approach paths, departure paths and runway strips.

- Aerodrome operators should establish processes to:
  - receive and record wildlife observations reported by ATC and flight crew
  - incorporate these reports into the aerodrome's wildlife monitoring records (see section 3.3 of this AC)
  - use reported observations to inform risk assessments and mitigation decisions.

B.6.2 ATC should be included in the aerodrome operator's wildlife hazard reporting arrangements, consistent with the stakeholder roles described in Appendix E.

B.7 Seasonal and migratory species planning

B.7.1 The presence and behaviour of wildlife at aerodromes can vary significantly across seasons. Aerodrome operators should develop a seasonal wildlife calendar to support planning and resource allocation for monitoring activities.

B.7.2 A seasonal wildlife calendar should identify:

- species known or likely to be present at the aerodrome during each period of the year
- peak activity periods associated with breeding, roosting, migration or food availability
- times of year when monitoring intensity should be increased.

B.7.3 The seasonal wildlife calendar should be:

- developed in consultation with a suitably qualified wildlife expert
- reviewed annually, or following significant changes in wildlife activity
- used to inform updates to the WHMP or programme.

B.7.4 Seasonal planning should also consider the influence of climatic conditions, such as drought or flooding, on wildlife movement patterns and the availability of alternative habitat or food sources in the aerodrome vicinity.

B.8 Monitoring in low-visibility and night conditions

B.8.1 Wildlife monitoring should be conducted across all periods of aircraft operations, including during low-visibility and night conditions where applicable.

B.8.2 Monitoring practices for low-visibility and night conditions may include:

- use of vehicle-mounted or portable lighting to assist observation of movement areas
- use of thermal imaging or night-vision equipment (see monitoring equipment section above)
- coordination with ATC to obtain real-time reports of wildlife activity during aircraft operations
- adjustment of patrol routes and schedules to align with periods of nocturnal wildlife activity relevant to identified high-risk species.

B.8.3 Where an aerodrome operates during periods of reduced visibility, monitoring procedures for those conditions should be documented within the WHMP or programme.

Appendix C
Land use habitat management around aerodromes

C.1 Purpose

C.1.1 This appendix provides guidance on managing off-aerodrome land uses that may attract hazardous wildlife, supporting the requirements in sections 3.2 and 3.5.

C.2 General

C.2.1 Aerodrome operators do not control land use outside the aerodrome boundary but should engage with relevant stakeholders to manage wildlife risks associated with surrounding land uses. Operators should establish:

- processes to identify external wildlife attractants
- arrangements for communication with planning authorities
- mechanisms for escalation where hazards are identified.

C.3 Identification of external attractants

C.3.1 Aerodrome operators should identify land uses within the aerodrome vicinity[23] including:

- waste disposal or landfill sites
- water bodies and wetlands
- agricultural activities
- wildlife reserves or corridors.

C.3.2 These areas should be included in monitoring activities (see section 3.2 of this AC).

C.4 Engagement with stakeholders

C.4.1 Aerodrome operators should:

- engage with local planning authorities regarding incompatible land use
- provide advice on wildlife hazard risks during planning processes
- collaborate with landowners to reduce wildlife attractants.

C.4.2 Stakeholder engagement processes should be documented within the WHMP.

C.5 Risk management

C.5.1 Where external land uses present a wildlife hazard, aerodrome operators should:

- assess the risk (see section 3.4)

[23] Refer to section 17.01 of the Part 139.MOS

- identify feasible mitigation options
- implement or advocate for risk controls
- where risk cannot be directly controlled, appropriate operational measures and reporting should be applied.

C.6 Land use habitat management around aerodromes

C.6.1 The following is a non-exhaustive list of the types of land uses which have proven to attract hazardous wildlife, and which should be prevented, eliminated or mitigated within the vicinity of aerodromes:

- fish processing
- agriculture
- cattle feed lots
- garbage dumps and landfill sites
- factory roofs and parking lots, or other infrastructure
- theatres and food outlets
- wildlife refuges
- artificial and natural lakes
- golf or polo courses etc.
- animal farms
- slaughterhouses.

Appendix D
Wildlife dispersal techniques

D.1 Purpose

D.1.1 This appendix provides guidance on selecting and implementing wildlife dispersal techniques as part of mitigation strategies (see section 3.5 of this AC).

D.2 General

D.2.1 Wildlife dispersal techniques should:

- be based on identified species and behaviours
- be proportionate to the level of risk
- be applied in a controlled and coordinated manner
- Aerodrome operators should ensure that dispersal actions do not create additional hazards to aircraft operations.

D.3 Selection of techniques

D.3.1 Aerodrome operators should select dispersal methods based on:

- species characteristics
- environmental conditions
- operational constraints

D.4 Implementation of dispersal techniques

D.4.1 Dispersal methods may include:

- visual deterrents (e.g. flags, models, lasers)
- audio deterrents (e.g. distress calls, pyrotechnics)
- active control measures (e.g. patrols, trained animals)
- Operators should:
- ensure personnel are trained (see section 3.6 of this AC)
- coordinate dispersal with ATC where required
- apply techniques only when necessary

D.5 Monitoring effectiveness

D.5.1 Aerodrome operators should:

- monitor the effectiveness of dispersal actions
- adjust techniques where wildlife becomes habituated
- document outcomes as part of mitigation records

- Effectiveness should be assessed through monitoring and inspection processes (see sections 3.2 and 3.5 of this AC).

D.6 Wildlife dispersal techniques

D.6.1 Deterring and expelling wildlife

D.6.1.1 Wildlife deterring and expelling techniques should be appropriate to the wildlife situation on the aerodrome and its vicinity and should be based on risk assessment procedures established as part of the WHMP or programme.

D.6.1.2 Multiple expelling techniques may be deployed; however, their effectiveness should be reviewed constantly and where necessary, a different strategy should be employed to achieve desired results.

D.6.2 Some wildlife dispersal techniques

D.6.2.1 Audio Repellents, such as stock-whips, distress and alarm call simulators, specific signals, natural and synthetic cries and pyrotechnics, such as medium- and long-range bird fright cartridges and shell crackers.

D.6.2.2 Optical and visual deterrents, such as laser devices, flags and streamers, lights, predator models, gull models, hawk kites, balloons.

D.6.2.3 Other techniques such as firearms, chemical repellents, lethal chemicals, trained predators (dogs and falcons), gas cannons, traps, and relocation methods.

D.6.2.4 The advancements in electronics, remote sensing, and computers have led to the development of systems capable of automatically dispensing repellents (such as noisemakers or chemical sprays) in specific areas when targeted wildlife enters. However, it is automated repellents cannot replace trained personnel on the ground who can appropriately respond to incursions by different wildlife species. They should only be considered when traditional methods of control and dispersal have been proven otherwise ineffective.

D.6.3 Audio repellents

Pyrotechnics

D.6.3.1 This includes non-lethal cartridges fired from shotguns, specialised pistols, and stationary cannons, that are commonly used at aerodromes to disperse wildlife. These devices can control the direction of wildlife movement to some extent, but they should be employed alongside trained personnel on the ground for optimal effectiveness.

D.6.3.2 Pyrotechnics combined with other harassment techniques can be useful in driving birds away, and their distribution by wildlife management personnel targeting specific species helps associate the pyrotechnics with a perceived threat.

D.6.3.3 Firing at a greater angle can extend the impact of cartridges beyond the aerodrome perimeter, particularly on approaching flocks, while detonations near flocks can disperse regrouping wildlife.

D.6.3.4 Coordination with ATC is necessary when using pyrotechnics, and proactive fire prevention measures should be taken in dry conditions. Propane cannons (exploders) that produce shotgun sound blasts should be used sparingly and strategically to avoid habituation and scaring birds into flight paths.

D.6.3.5 Distress calls, emitted manually and species-specific, can attract flocking species and stimulate group investigation. It is important to consider the potential attraction of predatory mammals to distress calls.

D.6.3.6 Electronic noise-generating systems, such as long-range acoustic devices, offer the ability to emit targeted sounds over long distances, but caution is needed to control wildlife reactions and avoid drawing birds in from a wider environment.

D.6.4 Optical and visual repellents

The presence of humans and vehicles

D.6.4.1 The presence of humans and vehicles is an effective tool for controlling hazardous wildlife at aerodromes. Consistently harassing wildlife within the aerodrome environment creates a learned behaviour where wildlife becomes aware of approaching wildlife controllers and leaves before any control method is implemented.

Visual objects

D.6.4.2 Visual repellents, such as scarecrows, hawk effigies, reflective tape, and flags, have short-term effectiveness but are not suitable as long-term solutions. Displaying dead birds in a "death pose" can scare birds away, but it may also attract scavenging species.

Lasers

D.6.4.3 Certain bird species perceive laser beams as a threat and will fly away, making lasers effective during specific times of the day. Caution should be exercised to protect pilots and drivers from the hazards of lasers.

Trained predators

D.6.4.4 Trained predators like dogs and falcons can introduce a predator presence and prompt hazardous wildlife to disperse.

D.6.5 Other techniques

Firearms

D.6.5.1 This includes the use of lethal cartridges fired from shotguns in cases where it is not otherwise possible to remove the hazard, or in cases where the animal is otherwise harmed and needs to be despatched in a humane manner.

Non-lethal projectiles

D.6.5.2 Non-lethal projectiles can also be used to elicit a flee response, but proper training and awareness of any restrictions are necessary for their safe handling.

Chemical repellents

D.6.5.3 Non-lethal chemical repellents function by influencing the animal's senses, creating aversion to smell or taste. These repellents can be applied through spraying on roosting sites, food sources, or other areas where hazardous wildlife congregates. However, it should be noted that some chemical repellents, such as predator urine, may inadvertently attract other hazardous wildlife.

D.6.5.4 Aerodrome operators must consider the potential impacts of using these repellents. Additionally, it is crucial to use chemical repellents that are registered and approved by the appropriate national, regional, and local authorities.

Trap and relocate

D.6.5.5 Hazardous wildlife can be captured and relocated away from the aerodrome. The aerodrome operator must adhere to local laws and regulations concerning the trapping and release of such wildlife. If live bait is employed, regular monitoring and feeding are required. When using bait or decoys, precautions should be taken to avoid attracting additional wildlife to the aerodrome.

Appendix E
Wildlife control training

E.1 Purpose

E.1.1 This appendix provides guidance on training requirements for personnel involved in wildlife hazard management (see section 3.6 of this AC).

E.2 General

E.2.1 Aerodrome operators must ensure that personnel involved in wildlife hazard management are competent to perform their assigned duties.

E.2.2 Training programmes should:

- align with operational requirements
- address identified risks
- support effective implementation of the WHMP or programme.

E.3 Initial training

E.3.1 Initial training should include:

- understanding wildlife hazards and associated risks
- identification of local wildlife species
- monitoring and reporting procedures (see sections 3.2 and 3.3 of this AC)
- use of mitigation and dispersal techniques (see section 3.5 of this AC)
- applicable regulatory and environmental requirements. (See Appendix E.2 of this AC for detailed information).

E.4 Recurrent training

E.4.1 Recurrent training should:

- maintain competency levels
- address changes in wildlife activity or environment
- incorporate lessons learned from incidents
- Training frequency should be appropriate to operational risk.

E.5 Competency and records

E.5.1 Aerodrome operators should:

- assess personnel competency regularly
- maintain records of training and qualifications
- ensure personnel remain current in required skills
- Training records should be retained in accordance with regulatory requirements.

E.6 Stakeholder awareness

E.6.1 Aerodrome operators should ensure that relevant stakeholders:

- understand wildlife hazard risks
- are aware of reporting requirements
- contribute to hazard identification where appropriate
- Stakeholder roles should be defined within the WHMP.

E.7 Initial training[24]

E.7.1 The minimum requirements for the initial training of wildlife control personnel should cover the following areas:

a. Comprehensive understanding of the aviation wildlife hazard, its nature, and extent, including local hazard identification.

a. Familiarity with national and local regulations, standards, and guidance pertaining to the management of wildlife hazards at aerodromes, emphasising the adoption of best-practice models.

b. Adequate knowledge about local wildlife ecology and biology, ensuring a broad appreciation of the subject.

c. Recognition of the significance of precise wildlife identification and observations, encompassing the use of field guides.

d. Understanding of local and national laws and regulations concerning protected species, as well as species of special concern, and the corresponding policies of the aerodrome operators in relation to them.

e. Awareness of high-risk species identified during the wildlife risk assessment.

f. Proficiency in procedures for collecting, identifying, and reporting wildlife strike remains.

g. Proficiency in employing established and effective techniques for wildlife removal, dispersal, detection, and control, focusing on active and tactical measures.

h. Competence in documenting wildlife activities, control measures, and reporting procedures, constituting the aerodrome's wildlife management programme.

i. Familiarity with the usage of firearms, drones, and any other equipment employed at the aerodrome, including the appropriate utilization of personal protective equipment.

E.8 Recurrent training

E.8.1 To ensure the ongoing proficiency of wildlife management personnel, regular training sessions should be conducted, incorporating various essential topics covered during the initial wildlife control training. These recurrent training sessions should encompass:

a. Updates on changes occurring in the local environment.

b. Reviewing recent wildlife events that have taken place at the aerodrome.

c. Familiarising personnel with any modifications made to active and passive measures employed for wildlife management.

[24] Also refer to AC 139.C-02 Aerodrome personnel

d. Addressing any additional subjects that the aerodrome operator considers relevant and necessary.

E.9 Wildlife control training syllabus

E.9.1 Different aerodromes may require different levels and types of initial and ongoing training due to the nature of the specific wildlife hazards in the local area and due to the size and complexity of aerodrome operations, including the type of aircraft and frequency of air traffic movements. At a minimum, the training syllabus for wildlife management personnel may include, but not limited to the following:

- an understanding of the nature and extent of the aviation wildlife management problem and local hazard identification
- an understanding of the regulations, standards and guidance material related to aerodrome wildlife management programmes
- an appreciation of the local wildlife ecology and biology, including (where applicable) the importance of good airfield grass management policies (also known as “tall” or “long grass”) and the benefits to wildlife control they can deliver;
- the importance of accurate wildlife observation and identification, including the use of field guides;
- local and national laws and regulations relating to rare and endangered species and species of special concern, and the aerodrome operator’s policies relating to them;
- policies and procedures concerning collection and identification of wildlife strike remains;
- long-term (passive) control measures, including on- and off-aerodrome habitat management, identification of wildlife attractions, vegetation policies, aeronautical NAVAID protection, and drainage system and water body management practicalities;
- short-term (active) tactical measures, using well-established, effective wildlife removal, dispersal and control techniques;
- documentation of wildlife activities, control measures and reporting procedures (the aerodrome wildlife management plan);
- firearms and field safety, including the use of personal protective equipment; and
- wildlife strike risk assessment and risk management principles and how they integrate with the aerodrome’s safety management system.

E.9.2 Wildlife control personnel should be fully aware of the aerodrome environment. Wildlife control personnel should receive appropriate training, including:

- aerodrome airside driver training including aerodrome familiarisation, air traffic control communications, signs and marking, navigation aids, aerodrome operations and safety, and other matters the local aerodrome authority deems appropriate
- aircraft familiarization, including aircraft identification, aircraft engine design and the impact of wildlife strikes on aircraft systems.

E.9.3 The development and maintenance of competence requirements should consider and include:

- review of firearms safety (as appropriate)
- changes in the local environment
- changes in the risk management policy (when required)
- recent wildlife events at the aerodrome
- improvements in active and passive measures (as appropriate)

- any other matters that the aerodrome operator deems appropriate[25].

E.10 Stakeholder participation

E.10.1 Effective wildlife hazard management requires communication, cooperation, and coordination with all relevant stakeholders.

E.10.2 Aerodrome operators should identify which stakeholders on and off the aerodrome should be involved and consulted in developing the WHMP or programme.

E.10.3 The WHMP or programme should identify and establish the extent of participation of such stakeholders.

E.11 Stakeholders within the aerodrome

Airside personnel

E.11.1 Airside personnel may come across the wildlife activities and wildlife strike incidents at an aerodrome. The aerodrome operator must ensure that all relevant third parties and aerodrome personnel report wildlife incidents, wildlife remains, and any other potential hazards to the aerodrome operator.

E.11.2 All aerodrome personnel who are not directly involved in wildlife control measures should be informed about hazardous wildlife attractants and the significance of avoiding foreign object debris (FOD) as well as reporting or picking up FOD that could attract wildlife. The aerodrome operator should include this information in their briefings and during airside induction.

Air traffic control

E.11.3 ATC must adhere to established procedures and report all wildlife incidents that occur at the aerodrome, as well as maintain constant communication with the aerodrome's wildlife hazard management team. In response to potential wildlife strike hazards, ATC may act or provide advice such as delaying take-off, utilising alternative runways for take-off and landing, or adjusting routes and altitudes.

Pilots

E.11.4 Pilots must report any wildlife strikes by following the aerodrome operator's established procedures. Additionally, they must report any wildlife activity or remains detected near or on the movement areas to ATC, enabling other stakeholders to be informed and the wildlife hazard management team to evaluate the situation and take necessary action.

E.11.5 Pilots that observe hazardous wildlife before take-off or landing, may choose to delay the departure or execute a missed approach.

E.11.6 Participation of pilots in local aerodrome wildlife committees is highly recommended, as their distinctive vantage point allows them to provide valuable information about wildlife movements and activity during approach, landing, and take-off operations.

Aircraft operators

E.11.7 The aircraft operator must report all wildlife strikes to the aerodrome operator. They must also report any wildlife hazards observed by the aircraft operator, whether in the air or on the ground.

[25] Refer Chapter 4 of Part 3 of the ICAO Airport Services Manual (Doc 9137) for further information

If a high frequency of strikes occurs at a specific aerodrome, the aircraft operator may collaborate with the aerodrome operator to investigate the matter.

E.11.8 The aircraft operator must provide training to pilots and ground personnel on wildlife hazards related to flight operations and the reporting requirements.

E.11.9 As part of the risk assessment or airfield audit of an aerodrome, the aircraft operator may request the assessment from the WHMP or programme and provide feedback to the aerodrome operator.

Other stakeholders

E.11.10 Other stakeholders may include aircraft manufacturers seeking to enhance the resistance of materials, airframes, and engines to withstand bird impact. Additionally, aviation authorities may be involved in developing protective legislation, exchanging information and knowledge, disseminating best practices, and maintaining a database on wildlife strikes, among other tasks.

E.12 External stakeholders

Landowners

E.12.1 Aerodrome operators do not have the authority to directly manage habitats that are outside of the aerodrome. It is recommended for operators to develop a good relationship with landowners within the vicinity. Landowners should be made aware by the aerodrome operators of any potential wildlife attractants of the land use activities and construction.

Local authorities

E.12.2 Local authorities and public entities responsible for territorial planning should collaborate to establish restrictive legal requirements or raise awareness about land uses and human activities within a 13 km radius of aerodromes. This collaboration can lead to the development of environmental legislation or regulations that control or eliminate wildlife attraction areas near aircraft flight paths. State authorities should also provide information to landowners near aerodromes about applicable laws and regulations that may impact building design, land use, and agricultural practices.

E.12.3 Local and regional authorities assess and form decisions on the types of land uses or activities to be developed near aerodromes, using tools such as easement regulations, safeguarding areas, and wildlife hazard risk assessments. These authorities have responsibility for managing facilities or activities known to attract wildlife and can work towards minimising wildlife presence and attraction in such areas.

Environmental authorities

E.12.4 Environmental authorities develop legislation that requires environmental impact assessments for projects near aerodromes, ensuring that wildlife hazards are adequately evaluated and monitored. Environmental impact statements should avoid promoting projects that attract wildlife near aerodromes. Effective coordination and collaboration between environmental authorities, aerodrome operators, and CASA involve sharing information on wildlife species, population trends, habitats, concentration areas, and management procedures for addressing human-wildlife conflicts.

Security and police force

E.12.5 The responsibilities and capabilities of security and police forces may differ depending on the State. Typically, they are responsible for detecting and potentially preventing certain human activities that pose wildlife hazards near aerodromes, particularly if those activities are illegal.

Local community groups and aerodrome neighbour organisations

E.12.6 Effective coordination between the aerodrome operator and local community groups is necessary to ensure aerodrome safety. By providing them with adequate information about the risks associated with wildlife presence, collaborative efforts can be enhanced.

E.12.7 Effective collaboration with local community groups may lead to various beneficial outcomes:

- Farmers can choose crops that are less attractive to wildlife, adjust growing and harvesting techniques to minimise wildlife attraction.
- Hunters can coordinate hunting activities with the aerodrome operator to prevent wildlife from being directed towards the aerodrome. They can also assist in reducing the population of hazardous wildlife.
- Agreements can be made with farmers to collaborate on vegetation management, animal care, and property maintenance.
- Fishing groups can adjust their fish handling practices avoiding attracting birds.

Industry

E.12.8 The aviation sector invests considerable resources into researching advancements in technologies and materials for aircraft structures and engines to enhance their resilience against hazardous wildlife incidents.

E.12.9 The wildlife control industry consistently explores and adjusts new technologies to develop innovative measures and equipment for managing wildlife.

Wildlife SMEs

E.12.10 SMEs in wildlife and government agencies, actively share their knowledge and collaborate on wildlife management strategies. They contribute to raising awareness among stakeholders and publishing information about the risks that wildlife poses to aviation.

E.12.11 Scientists and universities play a crucial role by conducting research on wildlife hazard management, wildlife attractants, and emerging technologies that enhance our understanding of wildlife behaviour. Their findings benefit other stakeholders and ultimately contribute to improving aviation safety.

Appendix F
Cross reference matrix

The AC cross reference matrix intends to provide readers with detail on the system function, the Part 139 MOS reference and the role the system function has in AC 139.C-16. The matrix identifies which AC the reader should refer to, and the output or the evidence expected out of cross referencing.

The purpose of this Appendix is to reduce content in this AC and provide advice on other guidance material that contains the same or similar information. Readers should consider cross application of ACs mentioned in Column 2 when using this AC.

Table 9: Advisory circular cross reference matrix

System function	Part 139 MOS reference	AC 139.C-16 role	Supporting CASA AC number	Evidence / output
Policy & Documentation	MOS 11.08 & 17.04	Defines WHMP content and structure	AC 139.C-01	Aerodrome Manual / WHMP
Hazard Identification (Wildlife)	MOS 17.01	Monitoring procedures, observation, data collection	AC 139.C-03	Inspection records / logs
Routine Monitoring	MOS 12.01 & 17.01	Monitoring zones, frequency scaling, off-site monitoring	AC 139.C-03	Inspection reports
Data Collection & Recording	MOS 17.05	Wildlife activity logs, strike data, trend collection	AC 139.C-04 AC 139.C-03	Wildlife database / logs
Risk Assessment	MOS 17.02	Risk assessment methodology (ISO style)	AC 139.C-26 AC 139.C-27	Risk register entries
WHMP Development	MOS 17.04	Detailed WHMP structure and triggers	AC 139.C-01	Approved WHMP
Mitigation (On-aerodrome)	MOS 17.06	Habitat control, dispersal, fencing, patrols	AC 139.C-03	Maintenance / action logs
Reporting (Routine)	MOS 17.05	AIP / ERSA updates, hazard notifications	AC 139.C-04 AC 139.C-05	AIP updates
Reporting (Immediate hazards)	MOS 17.05	NOTAM, ATC broadcast, UNICOM warning	AC 139.C-04 AC 139.C-05	NOTAM / ATC logs
Incident Reporting (Strikes)	MOS 17.05 & TSIR	Detailed ATSB reporting processes	AC 139.C-04	ATSB reports
Training & Competency	MOS 17.07	Detailed wildlife training requirements	AC 139.C-01 AC 139.C-02	Training records

System function	Part 139 MOS reference	AC 139.C-16 role	Supporting CASA AC number	Evidence / output
Inspection & Assurance	MOS 12.17	Monitoring outcomes feed assurance process	AC 139.C-03	Audit/inspection findings
SMS Integration	MOS 25	Referenced but not deeply structured	AC 139.C-26	SMS records
Performance Monitoring	MOS 17.04	Mentions effectiveness indicators	AC 139.C-26	Performance dashboards
Review & Continuous Improvement	MOS 17.04	Annual review and event-driven review	AC 139.C-03 AC 139.C-26	WHMP review reports