

Wildlife hazard management at aerodromes

CAP 772



Published by the Civil Aviation Authority, 2017

Civil Aviation Authority
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

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First published 2014
Second edition Oct 2017

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The latest version of this document is available in electronic format at: www.caa.co.uk

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Foreword

This document does not constitute a CAA 'requirement'. The content and status of the CAP is provided as information, specialist advice and supplementary guidance material in support of [EC Regulation 139/2014 and associated \(EASA\) Acceptable Means of Compliance and Guidance Material](#). The guidance expands upon the related material provided by EASA and reflects good practice and accepted standards currently supported and implemented by stakeholders, reflecting PANS Aerodromes (Doc 9981), ICAO Airport Services Manuals (Doc 9137), International Birdstrike Committee (IBSC) Standards and the ACI's WHM Handbook.

Aerodromes subject to UK CAA national aerodrome licencing requirements may use this guidance material to demonstrate a means of compliance to support the applicable wildlife hazard management requirements stated in CAP 168.

The term 'in the vicinity' (or aerodrome surroundings) is interpreted to mean land or water within 13 km of the aerodrome reference point and to landfill and waste disposal sites as defined under relevant UK legislation. It is important to note that 13km (as a distance to safeguard for *wildlife hazard* purposes) is not a specific requirement in this context.

An 'appropriate authority' is deemed to be an authority that has the power to take action in a particular situation.

Acknowledgments

The CAA previously contracted the Food & Environment Research Agency (now known as 'Animal and Plant Health Agency') to assist and provide specialist subject matter expert advice during the formulation of this revised guidance. The CAA further recognises the subject matter expert advice input provided by the following stakeholders:

- [The Airport Operators Association](#)
- [Birdstrike Management Ltd](#)
- AWM Ltd
- Aerodrome Habitat Engineering
- [Ecology & Habitat Management Ltd](#)
- [Mulholland Landscape Consultants](#)
- [STRI Aviation/Landsafe International](#)
- [Avian Safe](#)
- [DeTect](#)

- [Robin Radar](#)
- [Bird Control Group](#)

Document ID: CAP 772 2017

Background

Although ICAO and EASA now refer to the subject matter as 'wildlife' (defined as animals/mammals and birds), for simplicity and consistency and in order to avoid confusion throughout the majority of this document the term 'birdstrike' is used. Where direct quotes from ICAO or EASA references are quoted, 'wildlife' may be used.

This document focuses primarily on risks posed to aircraft by birds as they are the greatest risk from wildlife according to historical UK CAA occurrence data.

Where issues regarding wildlife hazards other than birds are presented the stakeholders should seek specialist advice from the relevant authorities and agencies.

Certification Standards for airframes and aircraft engines provide modern commercial aircraft with a measure of resistance to birdstrike damage. This is, however, proportionate to the size and type of aircraft, with light or general aviation type aircraft and helicopters currently having no birdstrike certification standards for windshields or airframes.

Aviation safety agencies, regulators and associated stakeholders worldwide have produced guidance, standards, manuals and policy documents to help aerodrome and aircraft operators in managing and mitigating bird and wildlife strike risks, these may all be referenced and adopted as applicable.

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Chapter 1

Standards, recommended practices and requirements

The UK, as a signatory to the Chicago Convention on International Civil Aviation, has adopted the standards and recommended practices (SARPs) specified in Annex 14 (Volume 1 Aerodrome Design and Operation), published by the International Civil Aviation Organization (ICAO).

The guidance in this document is also based on requirements and recommendations in the following documents:

- Article 10 of EC Regulation 139/2014¹
- EASA (ADR.OPS.B.020 Wildlife strike hazard reduction)
- Chapter 5 of CAP 168 Licensing of Aerodromes

Wildlife and conservation laws

When addressing the hazard posed by both birds *and* wildlife, stakeholders must ensure their actions are lawful. Specific licences are required for some wildlife control activities in order to preserve air safety which would otherwise be illegal under the 1981 Wildlife and Countryside Act. The agencies responsible for them are:

- [Natural England](#)
- [Scottish National Heritage](#)
- [Natural Resources Wales](#)
- [Northern Ireland Department of Agriculture, Environment and Rural Affairs](#)

All those involved in any wildlife control activities lethal or otherwise must ensure they are familiar with any restrictions that may apply to aviation related wildlife control and management activities issued by the relevant licensing authorities, as noted above.

Generally, a species specific licence may be issued by the relevant agency when:

- There is a genuine problem to resolve or need to satisfy for which a licensing purpose is applicable;
- There are no other satisfactory alternative options;
- The licensed action will contribute to resolving the problem or meeting the need;

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2014:044:0001:0034:EN:PDF>

- The action to be licensed is proportionate to the scale of the problem or need;

The aerodrome Accountable Manager must be satisfied that any aerodrome wildlife control personnel ('in-house' personnel or contracted third parties) act within the provisions of any relevant licence. Ultimately, it is the responsibility of individuals to ensure compliance with the law and to be aware that failure to comply with the relevant legislation could result in fines of up to £5,000 and/or a 6 month custodial sentence. In Scotland proceedings may be taken against the aerodrome in respect of an offence, whether or not proceedings are also taken against an individual.

Natural England and their equivalents may consider the impacts of 'on-aerodrome bird control' and related activities on adjacent areas that have been designated for protecting wildlife. [Sites of Special Scientific Interest \(SSSI\)](#) for example are protected by the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way Act 2000. Aerodromes whose land contains an SSSI or whose actions could impact on a nearby SSSI should therefore consult with the relevant agency before carrying out wildlife control activities.

Bird control and dispersal activities undertaken by the aerodrome that are not included within the existing provisions of an SSSI and which may damage an SSSI's natural features cannot be undertaken without consent from Natural England or equivalent. A significant number of SSSI's are also included in European or internationally protected designations such as Special Areas of Conservation, Special Protection Areas and Ramsar sites under the Habitat Regulations 2010 (as amended). Many of these are classified as 'Natura 2000' sites under European legislation. Aerodromes operating adjacent to or in close proximity to designated nature conservation sites should discuss their bird/wildlife control management plans with the relevant conservation agencies to ensure that any planned wildlife hazard control activities meet the requirements of the relevant legislation.

[Natural England](#) provides useful guidance concerning 'Sites of Special Scientific Interest' for land owners and occupiers.

Chapter 2

Wildlife hazard management plans

Principles and objectives

The reduction of birdstrike can be split into three areas:

- Identify hazards
- Evaluate management options
- Develop strategies to manage risk

Strategies should focus on deterring birds from flying in the same airspace as aircraft on and in the near vicinity of the aerodrome, and primary control options should include:

- Aerodrome habitat management
- Active control procedures
- Safeguarding

Each aerodrome location presents a unique habitat that influences the type and population of bird species present. It is therefore essential that the most appropriate and effective measures are identified and adapted to suit local conditions.

Wildlife hazard management plans

Wildlife hazard management plans (WHMP) should:

- Assess the wildlife hazard on, and in the vicinity of, the aerodrome;
- Establish a means and procedures to minimise the risk of collisions between wildlife and aircraft;
- Notify the appropriate authority if a wildlife assessment indicates conditions in the surroundings of the aerodrome are conducive to a wildlife hazard problem.²

As a minimum, a WHMP's should include details of:

- Persons who are accountable for developing and implementing the risk assessment programme, overseeing the control activities, analysing data and carrying out risk assessments;

² EASA (ADR-OPS B.020 Wildlife Strike Hazard Reduction)

- Risk assessment methodologies that are to be conducted and the risk mitigation measures that are in place;
- Policies and procedures for reducing wildlife strike risks on the aerodrome including:
 - Processes for effective on-aerodrome habitat management;
 - Flexible use of a range of deterrent, dispersal and control measures to prevent habituation from occurring;
- Details of any relevant permissions or licences for control measures;
- Recording of control activities;
- Reporting control issues to aerodrome management and airside or flight safety committees;
- Recording and analysis of strike reports;
- Logging species, observations, intelligence and subsequent data analysis;
- Policies for bird control during hours of darkness and low visibility operations.

The WHMP should be referenced or included in the aerodrome manual and made available to the CAA for audit and compliance monitoring purposes.

Measures detailed in the plan should relate to the threat posed by each identified risk, but should also include details on how measures may change due to changes in bird and wildlife activities; for example, dealing with seasonal change or following collection of wildlife data. The measures should include the wildlife control techniques described in this or other authoritative documents, at the aerodrome operator's discretion.³

Whichever technique or tools are used, priority should be given to reducing the presence of large and/or flocking birds and, where practicable, to managing other congregations of birds that present a threat to aircraft safety whether on or off-aerodrome.

Safeguarding systems

Safeguarding systems need to be put in place to guard against new or increased wildlife hazards caused by developments both on and in the vicinity of an aerodrome. They should

Other useful references include:

- International Birdstrike Committee, Recommended Practices No.1 Standards for Aerodrome Bird/Wildlife Control, Issue 1, October 2006;
- Airports Council International (ACI) – Aerodrome Bird Hazard Prevention and Wildlife Management Handbook;
- ICAO Doc 9137 (Airport Services Manual);
- PANS Aerodromes (Doc 9981)

include details of activities employed by the aerodrome operator to control or influence areas beyond the boundary of the airfield, in the vicinity of the aerodrome (up to 13 km and in some instances beyond, or less than 13 km, as determined by risk and effectiveness of interventions) and where practicable, could include:

- Establishment of a process with the local planning authorities for consultation on proposed developments that have the potential to be wildlife attractant within 13 km of the aerodrome;
- Means to influence land use and development surrounding the aerodrome such that the strike risk does not increase and, where practicable, is reduced;
- Means to help encourage landowners to adopt wildlife control measures and support landowners' efforts to reduce wildlife strike risks, via land use agreements; and
- Procedures to conduct and record the results of off-aerodrome site monitoring visits.

Record keeping

It is essential to record all wildlife control activities undertaken both tactically and strategically as determined locally, routinely, hourly, daily or per shift basis, details of which should form part of the WHMP. This intelligence and data can also be used in order to:

- Evaluate the effectiveness, performance and success of risk management programmes;
- Identify areas requiring attention;
- Highlight key risk periods;
- Provide a record of activities that were being undertaken in the event of an incident and assist with any follow-up investigation.

There is no standard or agreed list of details that must be collected, but the following may be a useful guide:

- Name of the personnel on duty;
- Shift start and finish time;
- Time for each activity or record;
- Location of activities;
- Species details of the bird or other wildlife observed and/or dispersed;
- Numbers of each species seen, including nil returns;

- Dispersal action taken;
- Reaction of wildlife to dispersal;
- Direction of dispersal.

For airports with an aircraft movement every 15 minutes or more, the [International Birdstrike Committee](#) recommends recording bird control actions as they are undertaken, but also that a record is added to the log at least every 30 minutes, even when no active control took place or where no bird or wildlife observations were made.

Review and evaluation

Procedures to monitor and evaluate the performance and effectiveness of wildlife control strategies might include:

- Wildlife control performance monitoring, measurement and improvement systems;
- Personnel training, competence assessment and appraisal;
- Trend analysis.

An analysis of bird and wildlife strikes and observations should be undertaken periodically (at least annually) and after any significant strike event has occurred as part of the risk assessment process. Recording information is essential to provide evidence that active bird control is in place in the event that an incident occurs, and equally provides an opportunity to assess and evaluate fluctuations in wildlife occurrences in different areas of the airfield.

Chapter 3

Roles and responsibilities

The roles and responsibilities of all personnel are important elements of the aerodrome operator's safety management system and contribute to the effectiveness of the wildlife/birdstrike management plan.

Where aerodrome bird or wildlife control is provided by third party service delivery companies there should be auditable oversight mechanisms in place, such as a service level agreement and formal arrangements that ensure trained, assessed and competent personnel are employed and that the overall performance of the activity is both compliant and is able to demonstrate measureable safety performance indicators and improvements.

In accordance with EASA ADR.OR.D.010 the aerodrome operator shall ensure that when contracting or purchasing any part of its activity, the contracted service, equipment or systems conform to the applicable requirements. The aerodrome operator is therefore obligated to ensure that the Competent Authority (CAA) is given access to the contracted organisation in order to determine continued compliance with the applicable requirements.

Contracted organisations should have a thorough understanding of their roles and responsibilities as set out in the formal arrangements and wildlife hazard management plan and be able to work effectively with other organisations as required, both on and off aerodrome, such as air traffic control and local landowners etc.

The roles and responsibilities may be adjusted to suit an aerodrome's specific hazard and control circumstances. The following subject headings describe the type of roles and responsibilities that may be typically included in a wildlife hazard management plan.

Bird control manager/co-ordinator

The aerodrome operator has overall accountability for wildlife hazard management at the aerodrome, but responsibility for wildlife control and the delivery and implementation of the management plan at the aerodrome is typically delegated to a coordinator, airside service delivery or compliance manager. Their primary objectives should be to:

1. Ensure that personnel understand how to assess and determine wildlife hazard and strike risks; understand the hazard management plan and have adequate resources to implement the plan;
2. Manage implementation of the plan via internal audit and periodic review;
3. Review statistical analysis of strike records;
4. Ensure the results of strike analysis are communicated to management and stakeholders as appropriate;

5. Monitor habitat changes on and in the vicinity of the aerodrome, and develop and implement appropriate management and control activities;
6. Ensure adherence to habitat management, airfield grass policies and associated maintenance programmes;
7. Understand the implications of not managing wildlife strike hazards effectively and not following the plan and initiating any necessary changes;
8. Analyse and interpret records (shift logs) of control activities, strike reports and on and off-airfield observations and intelligence;
9. Understand the need for periodic surveys of bird and wildlife concentrations and movements in the local area (up to or beyond 13 km as determined by aerodrome management policies);
10. Work with, for example, local landowners, farmers, gamekeepers, local nature reserve managers and racing pigeon organisations in order to influence and raise awareness of bird hazard matters;
11. Consult and engage with aerodrome planning development and engineering departments regarding safeguarding proposals, and engage with planning applicants where a proposed development has potential to change risk (e.g. restoration of mineral extraction sites);
12. Monitor the effectiveness of any bird and habitat management measures via quality audit or similar process;
13. Identify potential wildlife strike risks through collation of local ornithological reports and survey data;
14. Seek advice and assistance from outside specialists on matter requiring expertise not available at the aerodrome;
15. Produce reports on specific bird hazard issues, safety briefs and issue warnings to pilots via NOTAM, ATIS or AIP as necessary;
16. Ensure wildlife control record-keeping (recording observation counts, strike recording and reporting, dispersal, culling and habitat management diaries, etc.) are correctly recorded in a manner that can be easily interrogated and audited;
17. Ensure that all necessary training, passes, permits and licences are current;
18. Ensure the supply and safe keeping of equipment, including firearms and lasers.

Aerodrome bird/wildlife control personnel

Control personnel (or Bird Control Units, BCU) are responsible for the direct delivery of control duties on the aerodrome and enacting the management plan to counter any wildlife

presence on the airfield that presents a potential risk to aircraft flight safety. As such, the wildlife control personnel's duties should include:

1. Maintaining surveillance of wildlife activity on the aerodrome and around the aerodrome boundary;
2. Implementing wildlife control measures in accordance with the plan to counter any detected wildlife strike risk;
3. Providing information to air traffic control with details of potential wildlife strike risks and management activities as they occur;
4. Recording and reporting all confirmed, unconfirmed, near-miss or suspected wildlife strikes;
5. Advising the aerodrome certificate/licence holder and/or the accountable manager of habitat control issues on the airfield and identifying improvements to the wildlife control process; and
6. Assisting with wildlife/bird surveys and gathering and recording intelligence.

Chapter 4

Risk identification

Assessment of wildlife strike risk

The aerodrome operator should develop and maintain a systematic method of obtaining information regarding hazardous wildlife species and their habitats to manage them effectively. This should include:

- Assessing the hazards in the context of aircraft operations;
- Analysis of strike records to identify how many of each species have been struck over specific periods of time;
- Identification of species more likely to cause damage to aircraft, such as flocking birds and larger, heavier species, such as waterfowl;
- Development of a risk assessment methodology to inform the control programme in accordance with policies set out in the management plan.

Details of existing wildlife locations and wildlife movements both on and off the aerodrome should be recorded to provide a baseline and allow resources to be targeted effectively, and a risk assessment should then be carried out. The record and risk assessment should include:

- Detailed information of wildlife, identifying species, size, numbers and habitats that influence wildlife population and behaviour, and likely aircraft damage in the event of a wildlife strike;
- Risk information that can be quantified in the short and long term, dependent upon wildlife population and seasonal changes, including an assessment of the frequency of serious multiple wildlife strikes;
- The potential and continuing risks, so they can be assessed on a comparable basis control actions focused in a structured manner;
- The determination of the acceptability of the level of risk by summing the probability and severity, based on a probability/severity matrix, such as that illustrated in Figure 1 based on published birdstrike risk assessment methodology;⁴
- The identification of management options for, in this example, yellow/amber and red risks;

⁴ Allan, J (2006), [A Heuristic Risk Assessment Technique for Birdstrike Management at Airports](#)

- The development, implementation and monitoring of an action plan to eliminate, reduce or mitigate risks.

Figure 1: Example wildlife strike risk assessment matrix

		PROBABILITY				
		Very High	High	Moderate	Low	Very Low
SEVERITY	Very High					
	High					
	Moderate					
	Low					
	Very Low					

Red: high risk – additional management actions should be implemented for this species as soon as possible.

Yellow/amber: medium risk – current risk management strategies for this species should be reviewed and additional steps taken if appropriate.

Green: low risk – no additional action above that already being implemented for this species is currently necessary.

Probability of a strike

Probability of strike risk for different species can be calculated using, ideally, data recorded from the last 5 year period to provide an annual average number of strikes for inclusion in a matrix. Accurate up to date records are invaluable. Additional to observations by aerodrome personnel, liaison with local landowners and land users such as local bird watchers and ornithological societies, nature reserve wardens, water bailiffs, gamekeepers, farmers and pigeon racers, for example, may also be useful. Specialist wildlife and birdstrike organisations can also help apply wildlife strike knowledge in the context of the location of a potential bird attractant site and the type and numbers of species found there.

Using UK birdstrike data, the following ratings have been calculated:

Figure 2: Probability ratings

	Very High	High	Moderate	Low	Very Low
Number of strikes	>10	3.0 - 10	1.0 - 2.9	0.3 - 0.9	0 - 0.2

Severity

Using UK wildlife strike data submitted to the CAA, severity was calculated by species, based on the percentage of strikes that caused some form of damage to an aircraft. These proportions are provided in Figure 3. Examples of some severity percentages for different species are shown in Figure 4.

Figure 3: Severity (probability of damage to aircraft engines)

	Very High	High	Moderate	Low	Very Low
Number of strikes	>20%	10 - 20%	6.0 - 9.9	2.0 - 5.9	0 - 1.9

Figure 4: Example of species and their damage probability percentages

Species	Damage Percentage	Species	Damage Percentage
Mute swan	42.5%	Feral pigeon	6.5%
Canada goose	26.7%	Black-headed gull	4.6%
Herring gull	13.0%	Kestrel	2.6%
Buzzard	11.4%	Starling	2.6%
Lapwing	8.3%	Swift	1.2%
Woodpigeon	6.6%	Skylark	0.7%

Additional species severity ratings can be calculated using the mean weight of the species concerned. Strikes involving multiple birds have a far higher probability of causing damage to aircraft. Severity ratings should therefore be increased when strikes from multiple birds are being recorded. The severity rating should be upgraded to 'very high' when a 'high' severity species is recorded involving multiple birds, and 'moderate' or 'low' rated species should be upgraded after three or more strikes are recorded involving multiple birds, e.g. 'low' to 'moderate', 'moderate' to 'high' etc.