



**AIRPORT OPERATORS ASSOCIATION
IN ASSOCIATION WITH
CIVIL AVIATION AUTHORITY**



Safeguarding of Aerodromes

Advice Note 3

Wildlife Hazards around Aerodromes

1. Introduction

It is important to ensure that proposed developments that have the potential to attract wildlife into the vicinity of aerodromes are properly assessed. This Advice Note provides an understanding of how wildlife hazards can have serious impacts on flight safety and what sorts of developments influence these hazards. The following advice expands on the vulnerabilities described within Advice Note 1- Safeguarding of Aerodromes, Section 5.4 Wildlife Hazard Management

2. Background

Aircraft are vulnerable to wildlife strike risk, species such as deer, badgers and foxes can cause safety concerns. However birds are the most problematic in the UK. Advice Note 3 concentrates on birdstrike risk, as this has resulted in aircraft losses and fatalities. It is estimated that damage to aircraft and flight delays resulting from wildlife strikes around the world cost more than one billion Euros a year. The vast majority of birdstrikes occur on or close to aerodromes and Aerodrome Operators are bound by a number of regulations. Namely, those by the International Civil Aviation Organisation (ICAO), European Aviation Safety Agency (EASA) and UK Civil Aviation Authority (CAA) to take necessary steps to ensure that the hazard is assessed and the risk is reduced to the lowest practicable level.

Aerodromes work hard to apply control methods and manage the risks posed by birds on and near the airfield. They do this through the implementation of effective habitat management and active deterrence measures. Birds moving between sites located off the aerodrome can increase the birdstrike risk. Proactive prevention can often enable effective biodiversity and planning challenges to be met without compromising the very real risk to aircraft and flight safety.

Different species of birds will reside within habitats around aerodromes at different times of the year. Bird presence has the potential for uncontrolled risk to arise when they move through the aircraft take-off and approach paths or across the aerodrome. The precise mix of habitats and attractants around each individual aerodrome will affect safety considerations.



Figure 1. The result of a bird strike - US Airways Flight (2009). European Space Agency Image ©

3. Safeguarding Strategies

A general approach is for developments that have the potential to attract flocks of birds or large birds to the vicinity of an aerodrome to be assessed for their potential risk. The internationally accepted safeguarding area with reference to bird hazards is defined by ICAO as a 13km radius around the aerodrome. The majority of birds utilise the airspace close to the ground with most birdstrikes recorded below a height of 2000 feet. An aircraft on a standard approach to an airport enters this height at a distance approximately 13km from a runway.

This 13km zone should be seen as a planning guide, and “should an application that is likely to attract large numbers of hazardous (flocking or large) birds be presented outside this vicinity”, it is still possible that the movements of birds could impact significantly on flight safety. Scavenging Gulls, for example, are known to fly over 30 miles each way to exploit food waste. They can generate flight lines within the safeguarding zone that may increase the birdstrike risk. Where doubt arises, planning applications should always be forwarded to the aerodrome for comment.

An assessment will analyse whether the location of an application within (or close to) the 13km zone is an indicator of the level of risk it may create. The proposed development would need to either: increase the population of hazardous birds¹; or to generate flight lines that enter critical airspace, to increase the risk in order for it to be determined as unacceptable. Local conditions and existing attractants and bird populations will always influence the risk posed by a new development or construction site. In order to identify whether an application has the potential to increase the birdstrike risk at an aerodrome, the geographic location of the application site in relation to other key attractants, should be assessed

The successful outcome for this assessment process often requires a number of factors including: specialist knowledge; competence in the subject matter; an understanding of the risks posed by different species; the possible movement factors; any seasonal influences; along with construction, development and final plan considerations. This should be carried out by those specifically competent in the subject matter.

A precautionary approach should be taken by the Local Planning Authority (LPA) when deciding whether to consult an aerodrome with regard to any potential wildlife issues. The following paragraphs provide examples of the attractants that can be created as a result of development that has the potential to increase the birdstrike risk.

4. Species Risks

Where a proposed development has the potential to attract birds, the developer will be expected to have undertaken a comprehensive bird hazard assessment. Fundamental outline information is offered in the following paragraphs.

Listed below are some common hazardous birds providing an indication of the kinds that require consideration when assessing planning applications. Other species may also have the potential to increase the hazard equally. In general, large birds and flocking species present the greatest hazard. Developments that attract waterfowl or Gulls, for example, must be referred to the aerodrome operator.

¹ Large and / or flocking species capable of causing damage of aircraft

Some common hazardous birds (this list is not exhaustive):

- All wildfowl (Ducks, Geese and Swans)
- All large waterfowl (Hérons, Egrets, Cormorants)
- Gamebirds (Pheasants & Partridges)
- Birds of prey
- Large waders (Lapwing, Curlew and Golden Plover)
- All Gull species
- All Pigeon species
- All Corvid species (crow family)
- Starlings

Dependant on proximity or location in relation to other sites, the development may still be permissible or may require an appropriate Bird Hazard Management Plan (BHMP) to enable the development to gain planning permission. An assessment should include, but not limited to, species that are or could be problematic in and around the aerodrome.

With birdstrikes it is important to understand what constitutes a risk and what constitutes a hazard. In the context of birdstrike management, the hazard relates to the background population² of hazardous birds³ and the likelihood of causing a negative impact on air safety. This can be assessed by identifying; potential flight lines⁴ that may result from birds transiting between breeding, feeding and roosting sites; and the potential to increase the carrying capacity⁵ in the aerodrome vicinity.

The potential for a birdstrike risk to develop depends on several factors such as; the species of birds present; the types of aircraft operating; and the frequency of aircraft movements.

The safeguarding process should take a proactive, precautionary approach and as such, the potential attraction of a site to hazardous birds should be considered. Where a significant risk is identified, the developer will be expected to modify their proposals to mitigate the risk. Should the risk remain unacceptable they may find their application remains subject to a sustained objection from the aerodrome operator. In order to lift any objections, it is possible that as part of a mitigation plan, a results-based Bird Hazard Management Plan (BHMP) may be agreed with the aerodrome operator. The long-term efficacy of all mitigations proposed would need to be fully auditable by the aerodrome or their nominated specialist representatives.

² The level and type of bird activity that would occur in the absence of any bird control measures.

³ Large and / or flocking species capable of causing damage of aircraft.

⁴ Flight lines - interpreted as the routes taken by birds flying to and from breeding, feeding, & roosting sites

⁵ The maximum population size of the species that the environment can sustain indefinitely, given the food, habitat, water, and other necessities available in the environment.

To avoid delays in the planning process it is suggested that developers consult with relevant aerodromes at a preliminary stage and follow the design advice provided in guidance material, (e.g. UK Civil Aviation Authority CAP 772 Wildlife Hazard Management at Aerodromes) available from www.caa.co.uk). As there are many types of development, the following examples are given to help identify the potential to attract hazardous species.

5. Development Types

Development Type	Specific	Species concerns
Waste Management	Landfill Composting Recycling Treatment	Feeding opportunities for potentially large numbers of scavenging birds e.g. Gulls, Corvids, Starlings, Pigeons, Raptors.
Water	Nature Reserves Reservoirs Ponds River diversions Sewage/Water Treatment	Diversity of feeding, loafing, breeding and roosting opportunities for Waterfowl, waders and Gulls e.g. Swans, Geese, Gulls, Ducks, Herons and Egrets, Wading birds such as Lapwing, Oystercatcher etc.
Wetland	Nature Reserves Marshland Reedbeds Swales SUDS Schemes Drainage schemes Flood Alleviation Works Managed retreat	Feeding, roosting, breeding and loafing for Waterfowl, passerines, <i>hirundines</i> e.g. Swans, Geese, Ducks, Herons and Egrets, Gulls, Wading birds etc and potential for large Starling or Swallow roosts to form (e.g. Reedbeds).
Sports Facilities	e.g. Golf course open grassland, watercourses, fishing lakes, sailing clubs	Landscape developments risking feeding, loafing and breeding opportunities for different species such as Canada Geese, Gulls, Pigeons, Corvids, Starlings, Herons and Egrets etc.
Developments	Housing, Factories Industrial Estates / Units Mineral extraction Green roofs	Diverse human factors and built environment providing food and shelter for urban species such as Pigeons, Gulls, Corvids, Starlings etc.
Rural	Woodland plantations Pig rearing facilities Poultry facilities	Potential feeding, nesting and cover for species such as Pigeons, Gulls, Corvids, Starlings, Game birds etc.
Energy	Solar farms Tidal barrage Energy plantations	Potential perching opportunities and feeding for raptors. Changes to waterfowl and passerines distribution

Table 1. Examples of development types and potential to attract hazardous species

The final decision on whether a site may or may not result in a hazard to flight safety will be

dependent on location, proximity and relation to other existing wildlife sites and corridors.

The sorts of individual considerations and the potential attractions that can arise from just one of these types of developments are provided below. These provide a demonstration of the depth of concerns that may arise and the considerations that are necessary. Even if a building or development itself does not present apparent attractants, the construction phase might, for example due to standing water and the disturbance of soil. Many hazardous bird species are adept at exploiting these conditions, hence the construction phase will always need to be assessed and suitable mitigation put in place.

If a proposed development involves the removal, storage and redistribution of fertile topsoil, this can expose significant populations of invertebrates and small vertebrates. These can provide significant feeding attractants for Gulls, Corvids (the crow family) and Starlings. They have the potential to increase risk that may be significant to the aerodrome. If there is doubt about a development a second opinion in relation to birdstrike concerns should always be sought.

6. Development Example

Development	Type	Attraction
e.g. Industrial Estate Development	Development site - ground works	Corvids, Gulls & Scavenging birds feeding on soil invertebrates
	Development site - standing water	Loafing or bathing Gulls and dabbling ducks (Mallard). Potential for fish eating birds (e.g. Grey Heron)
	Development site - human factors	Workers cafeteria or mobile food outlet; waste food attracting Feral Pigeons, Starlings, Corvids or Gulls.
	Construction works	As above
	Construction works - buildings	Unfinished buildings providing nesting grounds for Feral Pigeons
	Completed works - rooftops	Open flat roofs – breeding grounds for roof nesting Gulls
	Completed works - landscaping	Tree planting or hedgerows presenting nesting opportunities for Woodpigeon / Rook and berry, fruit or nut provision providing food for Thrushes, Starlings, Pigeons etc.
Completed works - SUDS	Drainage swales resulting in streams, ponding / open grassland etc. suitable for waterfowl.	

Table 2. More detailed example of a development attractions for birds

Table 2 shows the depth of consideration needed to determine whether a development may result in risk. Similarly, assessments of sites attractive to birds, e.g. waste disposal facilities, would need reviews based on other factors.

7. Site Consideration Example

Development	Concern	Risk
e.g. Landfill	Waste disposal	Thousands of scavenging Gulls, Corvids, Starlings etc.
	Location	Proximity to aerodrome
		In relation to Gull roosts
		In relation to rookeries
		In relation to Starling roosts
		In relation to other feeding sites
Flight lines	Proximity / probability of crossing aerodrome or approaches	

Table 3. Example of concerns and risks

Sites that result in increased risk during construction are likely to be located in relatively close proximity to the aerodrome, or beneath the aerodrome approaches hence a responsible development should address all aspects of the works to ensure that both the construction and final outcome are appropriately managed.

8. Management Controls

National and international guidance material alongside experts in birdstrike management can help provide the necessary detail for reducing the potential risk from developments to levels acceptable to an aerodrome operator. In the event that a specific development cannot be suitably controlled, early consultation with the aerodrome should at least enable the developer to consider alternative locations. Where developments can be appropriately controlled, an example of potential actions is provided below;

Buildings may provide flat roofs for nesting gull colonies, ledges and gullies for Feral Pigeons, Jackdaws and Starlings to establish nest sites or perching areas. Opportunities to reduce the risk from rooftops could include;

- Netting to proof roofs and exclude hazardous species
- Roof overhangs kept to a minimum
- Ledges beneath overhangs and external protrusions avoided where possible
- Redesign roof to steeply pitched to deter Gulls from loafing, roosting and resting
- Lighting structures proofed to prevent perching
- Choice of roof material to reduce attractiveness (smooth surfaces with minimal protrusions or vents to reduce breeding opportunities)
- Roof spaces to be designed in such a way as to prevent access by birds
- Self-closing doors to prevent access to birds or openings fitted with netting or plastic strip enclosure materials
- Safe access by foot access to all areas of roof that cannot be proofed
- Outside dining areas enclosed or avoided in close proximity to an aerodrome

9. Monitoring & Inspections

Developments that have been carefully considered for wildlife hazards may have a combination of methods or standards attached to ensure the development does not increase risk to an aerodrome. As these planning requirements may be essential to the safe development and operation of a site, they may need to be independently reviewed to ensure they continue to be effective. Bird Hazard Management Plans (BHMP) should therefore be results based to enable the applicant to be flexible in their approach. Should circumstances change and species of concern no longer be present, less effort is therefore required to meet the needs of a plan. Equally, should control efforts fail to achieve the desired risk reductions additional effort may be required. In order to develop a results based BHMP all interested parties need to agree on achievable threshold figures that will result in no further increase in risk to the aerodrome, i.e. the number of each species that can be tolerated on site before control should be carried out.

An aerodrome will derive such a threshold figure from an estimation of the background population⁶ of that species in the local area in combination with potential risk to aircraft. An increase above the background population would be indicative of increased risk. A precautionary approach to the setting of the threshold figure will be adopted in the absence of robust ornithological data specific to the development. However, for BHMPs relating to breeding birds the threshold figure shall be set at zero (as measured by breeding success). In order for the efficacy of BHMPs to be audited, records of action taken and results must be kept and a programme of audit agreed.

During the breeding season for Gulls, for example, inspections to assure compliance with a 'no breeding' BHMPs should be carried out at least weekly during the breeding season, (e.g. Gulls typically April to June). To ensure that all hazardous birds found nesting are dispersed and any nests and/or eggs are removed. This process should be fully documented to provide an audit trail.

For roosting or loafing (resting) birds, regular inspections should be carried out and if the threshold level is exceeded then birds should be dispersed. The frequency of inspections should be dictated by the presence of hazardous birds and be sufficient as to ensure the efficacy of the plan. This process should be fully documented to provide an audit trail and compliance site visits from the aerodrome operator may be required, subject to the necessary Health and Safety considerations.

If a building is close to the aerodrome critical airspace then it may be necessary to have a communication plan. This would identify actions such as contacting Airfield Operations staff before any required bird dispersal takes place. It is important that if bird numbers at a

⁶ The maximum population size of the species that the environment can sustain indefinitely,

development increase and bird scaring methods are not proving effective, a plan to ensure the aerodrome operator is informed should be included in any BHMP.

Important measures that **may** be included in a BHMP are provided as general guidance only:

- Confirmation that access to all areas of the site is available and by what method, to ensure that inspections can be carried out (See Civil Aviation Publication CAP772 'Wildlife Hazard Management at Aerodromes', available at www.caa.co.uk)
- Confirmation that an appropriate inspection schedule is in place
- Confirmation that any control is to be carried out under appropriate licences
- Details of bird species and where applicable species behaviours that will be subject to control along with clearly designated thresholds to define when control actions should be instigated and what the control techniques should achieve
- Communications plan to contact Airfield Operations staff at the aerodrome concerned before bird dispersal takes place
- Details of any dispersal methods to be used
- An auditable record of all BHMP information to be maintained detailing: dates, times and description of monitoring carried out, species and number of birds recorded, control effort provided and the results of any control
- Provision for the aerodrome to inspect the records and undertake visits (without notice) to the site (where necessary)
- Duration of the BHMP linked to the site and not the site owner or operator
- Contact details for the aerodrome operator to contact the site principal

Early pre-application consultation with the aerodrome operator on the content of a BHMP is recommended. It is important that the aerodrome seeks to ensure that BHMPs are results-based, enabling the efficacy of the plan to be assessed in a fair and transparent way.

Results-based BHMPs also enable the applicant to develop the BHMP in the most cost-effective way, as they are less prescriptive than plans detailing the equipment to be used. Please contact the aerodrome operator to discuss requirements.

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- **Advice Note 1 'Aerodrome Safeguarding – An Overview'**
- **Advice Note 2 'Lighting Near Aerodromes'**
- **Advice Note 3 'Wildlife Hazards Around Aerodromes'**
- **Advice Note 4 'Cranes & Other Construction Issues'**
- **Advice Note 5 'Renewable Energy & the Impact on Aviation'**

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