

# **A14 Cambridge to Huntingdon improvement scheme**

## **Environmental Statement**

### **Appendices**

#### **Appendix 16.1: Preliminary bird hazard assessment**

**Date: December 2014**

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## Executive summary

Changes to the environment around an airport can result in changes in bird populations and bird movements with consequent changes in the risk of collisions between aircraft and birds ('birdstrike'). Any developments with the potential to affect air safety within a 13km safeguarding zone of an airport need to be assessed to identify any unacceptable risks that may arise. The A14 Cambridge to Huntingdon improvement scheme (the scheme) lies partly within 13km of Cambridge Airport, therefore that part has been assessed to identify any potential increases in hazardous species or movements of those species likely to affect air safety. The outline environmental design for the relevant section of the scheme was assessed using guidelines issued by the Civil Aviation Authority and the Airport Operators Association and using experience of birdstrike issues at a number of other UK airports.

The development of a borrow pit within the safeguarding zone has the potential to attract hazardous species although these may not cross the airspaces around Cambridge Airport.

In view of the wide range of habitats starlings will use for roosts, many of the areas of the scheme would have the potential to attract roosting starlings. It would be unreasonable to remove all areas potentially suitable for this species.

If necessary an appropriate bird control management plan would be developed with the aim of managing residual risk to a level acceptable to Cambridge Airport. Future stages in the design process would provide more detail and allow a definitive assessment to be made on which species may use the borrow pit.

While the planting for the scheme may include species that can increase birdstrike risk by attracting birds to feed on their fruit, the planting is sufficiently distant from the airport for this risk to be negligible.

# 1 Introduction

## 1.1 Background

- 1.1.1. In spite of technological advances making aircraft far less susceptible to damage from collisions with birds ('birdstrikes'), damage caused from such collisions can prove very costly and has the potential to endanger life. For this reason, all airports are obliged to monitor local bird populations and assess potential risk associated with each species. This risk is assessed by analysing the likelihood of any species being involved in a birdstrike in combination with the severity of such an impact. Where this risk is considered unacceptable or marginal, airports are duty-bound to seek a reduction in the risk (Civil Aviation Authority (CAA), 2008).
- 1.1.2. On the airfield, rigorous control measures, including habitat management and bird dispersal, are required and the efficacy of these measures is regularly audited by the CAA. However, populations of birds using land that is not controlled by the airport may also cross the airspace used by aircraft and present a hazard to air safety. Airports in the United Kingdom are therefore required by the CAA to operate a safeguarding policy within 13 km of the airfield. The 13km range is stipulated as this is the distance within which most approaching aircraft would be expected to descend to less than 2,000ft (the altitude below which 99% of birdstrikes occur).
- 1.1.3. The safeguarding process can include reactive measures such as removal of bird attractants or through land management to discourage birds. It also can include pre-emptive use of the planning process to object to any developments that have the potential to compromise air safety. This could include development likely to attract species considered to present a hazard to aircraft or through the creation of suitable conditions for large concentrations of birds.
- 1.1.4. In the absence of a suitable bird hazard assessment that identifies any risk as being acceptably low, or suitable control measures being agreed in a bird control management plan (BCMP), CAA guidance recommends that the airport consider any developments that might present an unacceptable or marginal risk to air safety.
- 1.1.5. Advice on the assessment of developments on air safety is presented in the CAA's *CAP772 Birdstrike Risk Management for Aerodromes (CAP772)* (CAA, 2008) and its predecessor *CAP680 Aerodrome Bird Control (CAP680)* (CAA, 2002). More specific advice is presented in technical notes published by the Airport Operators Association (AOA) and the General Aviation Awareness Council (GAAC). Of relevance to the development are *Safeguarding of Aerodromes, Advice Note 1: Safeguarding – An Overview (AOA Advice Note 1)* (CAA et al., 2003a), *Advice Note 3: Potential Hazards from Amenity Landscaping and Building Design (AOA Advice Note 3)* (CAA et al., 2003b) and *Advice Note 6: (Potential Bird Hazards from Sustainable Urban Drainage Schemes)*. As experts in this area, Armstrong McCaul Biological Consultants were commissioned to produce a bird hazard assessment (BHA) in relation to the likelihood of an increase in birdstrike risk as a result of the scheme.

- 1.1.6. Two main areas of concern are identified relating to planting schemes for landscaping. These two potential hazards are specifically identified in the *AOA Advice Note 3* (CAA et al., 2003b) which states:

*“Significant hazards associated with landscaping schemes are their potential to:*

- Create dense vegetation that may become a starling (*Sturnus vulgaris*) roost or provide roosting and nesting habitats for rooks (*Corvus frugilegus*), woodpigeon (*Columba palumbus*) and other aviation-hazard species.*
- Provide an abundant winter supply in the form of fruits and berries for large flocks of starlings, fieldfares (*Turdus pilarus*) and redwings (*Turdus iliacus*), which may also move onto an adjacent aerodrome to feed on soil invertebrates.”*

- 1.1.7. Landscaping issues are also discussed in the CAA’s *CAP 772* (CAA, 2008) as outlined below. While they are recognised as potential sources of risk, the area over which these should be considered may not include the entire 13km safeguarding zone:

*“Generally, in terms of bird attraction, landscaping schemes attract smaller concentrations of birds from a smaller area, have less potential for increasing birdstrike risk than developments such as landfills, sewage treatment plants and wetlands, and have much in common with many natural and semi-natural features commonly found around aerodromes. Therefore, the bird attraction and potential birdstrike risk of most landscaping developments, except for wetlands and starling roosts, is comparatively local in effect, i.e. usually limited to within about 6.5km (4 miles) of the aerodrome, or less”* (Risk Identification Chapter of CAP772 (CAA, 2008)).

- 1.1.8. CAP 680 notes that problems are unlikely with plantings of fruit bearing species greater than approximately 2km beyond the airfield perimeter.

- 1.1.9. *AOA Advice Note 3* (CAA, 2003b) considers the risk presented by the development of nesting colonies of rooks (‘rookeries’) in the vicinity of airports. It recommends that trees with the potential to grow in excess of 20m should not be included in planting schemes within 3km of an aerodrome. It also notes that rooks may use smaller trees; this suggests that remedial actions may be required in the event of the formation of a rookery.

- 1.1.10. The creation of waterbodies has the potential to attract hazardous species such as wildfowl and gulls or to change the behaviour of existing populations. Both of these can have serious impacts on bird strike risks. Wildfowl and geese are not only relatively large species (including the heaviest species in the UK) but they also present the risk of multiple collisions as they often fly in groups. This risk is further exacerbated by the habit of several species of developing regular flight-lines between foraging areas and waterbodies. Any assessment of the introduction of a new waterbody in the vicinity of an airport needs to take into account how numbers of wildfowl and gulls could be affected and whether changes in behaviour would result in more frequent crossing of airspace used by aircraft.
- 1.1.11. Guidance on the assessment of waterbodies is presented in *CAP772* (CAA, 2008), *CAP680* (CAA, 2002) and *AOA Advice Note 6: Potential Bird Hazards from Sustainable Urban Drainage Schemes (AOA Advice Note 6)* (CAA, 2003c). When considering whether an application for a wetland should be objected to; a:

*“variety of factors”* should be considered including *“Size of the proposed wetland, its detailed design in terms of bank profiles, water depth, proposed vegetative cover, any future management plans, its location in relation to aircraft flight paths and similar habitats nearby, and any proposed mitigation measures to control the birdstrike risk that are proposed”* (AOA Advice Note 6 (CAA, 2003c)).

## 1.2 Location

- 1.2.1. The scheme lies to the west and north-west of the airport and at its closest point is just over 4km from the airfield. The scheme location is partly buffered in terms of bird movements by Cambridge so there is no continuous suitable bird habitat between the airfield and the scheme. The area to the east and south-east of the airport is mostly intensively farmed. At the southern end of the airfield lies a group of three waterbodies known locally as ‘The Lakes’. These are former chalk extraction sites and appear to be of limited value to birds and would be unlikely to attract hazardous species from further afield (including the scheme).
- 1.2.2. The orientation of the runway (lying along a south-west to north-east axis), indicates that arriving and departing aircraft move perpendicular to the direction of the scheme and do not overfly the areas around the scheme in either direction.
- 1.2.3. There are many small to large waterbodies to the south and east of Huntingdon. To the west is Grafham Water, the third largest inland water in England and also a well-known major gull roost (with 50,000+ in mid-winter).

## 2 Methods

### 2.1 Examination of plans

- 2.1.1. The likelihood of any part of the scheme affecting air safety at Cambridge Airport depends on the type of risk presented. Waterbodies within the 13km safeguarding zone (and sometimes further afield) have the potential to produce regular flightlines involving the most hazardous large, flocking birds e.g. gulls and wildfowl. In contrast, the planting of fruiting species is only likely to lead to movements of less hazardous species in the immediate vicinity of an airport. The extent of the 13km safeguarding zone and the 6.5km radius required for assessment of landscaping issues are presented in *Figure 16.5*.
- 2.1.2. The current outline environmental design plans for the scheme were examined to identify any features that could affect air safety at Cambridge Airport. No part of the scheme falls within 3km of the perimeter of the airfield so it was not necessary to check for possible rookery sites. There is no clear guidance on the maximum distance from an airport that planting of fruiting plants could have an impact on birdstrike. *CAP680* (CAA, 2002) advises against planting within 2km, however *CAP772* (CAA, 2008) is not specific and includes these species under general landscaping. The advice for landscaping projects is that they are unlikely to have an impact at >6.5km from an airfield. All planting plans for areas <6.5km were therefore examined to identify species which could increase birdstrike risk.
- 2.1.3. As the hazard presented by the formation of a starling roost can be unacceptable at >6km from an airfield (*CAP772* (CAA, 2008)); all areas of the scheme within the 13km safeguarding zone were examined for this risk (*Figure 16.5*).

## 3 Results

### 3.1 Planting

- 3.1.1. None of the scheme is within 3km of the airport boundary so there is no unacceptable risk associated with the development of rookeries (as recommended in *AOA Advice Note 3* (CAA, 2003b)).
- 3.1.2. The extent of new planting within 6.5km (see *Figure 16.5*) of the airfield (the area within which landscaping might be expected to influence birdstrike risk) is relatively limited (*Risk Identification Chapter of CAP 772*). However, some of the species included in the indicative planting mixes are known to be attractive to birds (as listed in *CAP772* (CAA, 2008)) and need to be considered. *Table 3.1* shows indicative planting mixes for each general habitat type within the 6.5km zone and lists whether they are mentioned as attractant species in *CAP772* (CAA, 2008).

**Table 3.1: Indicative species mixes for planting and whether they are mentioned in CAP772 as bird attractant species**

	Species	% mix	CAP772 listed?
Woodland	Field maple ( <i>Acer campestre</i> )	10%	
	Sycamore ( <i>Acer pseudoplatanus</i> )	10%	
	Sweet chestnut (variant option) <i>Castanea sativa</i>	5%	
	Hazel ( <i>Corylus avellana</i> )	10%	
	Hawthorn ( <i>Crataegus monogyna</i> )	10%	Yes
	Silver birch ( <i>Betula pendula</i> )	10%	
	Holly ( <i>Ilex aquifolium</i> )	5%	Yes
	Black poplar ( <i>Populus nigra</i> )	5%	
	Wild cherry ( <i>Prunus avium</i> )	5%	Yes
	English oak ( <i>Quercus robur</i> )	30%	Yes
Common lime (variant option) ( <i>Tilia x europaea</i> )	5%		
Woodland edge	Field maple ( <i>Acer campestre</i> )	10%	
	Hazel ( <i>Corylus avellana</i> )	5%	
	Hawthorn ( <i>Crataegus monogyna</i> )	50%	Yes
	Common privet ( <i>Ligustrum vulgare</i> )	5%	
	Honeysuckle ( <i>Lonicera periclymenum</i> )	5%	Yes
	Wild crab apple ( <i>Malus sylvestris</i> )	2.5%	Yes
	Blackthorn ( <i>Prunus spinosa</i> )	5%	
	Dog rose ( <i>Rosa canina</i> )	5%	Yes
	Elder ( <i>Sambucus nigra</i> )	5%	Yes
	Common elm ( <i>Ulmus procera</i> )	5%	
Wayfaring tree ( <i>Viburnum lantana</i> )	2.5%	Yes	

	Species	% mix	CAP772 listed?
Hedges*	Hawthorn ( <i>Crataegus monogyna</i> )	70%	Yes
	Blackthorn ( <i>Prunus spinosa</i> )	10%	
	Hazel ( <i>Corylus avellana</i> )	5%	
	Honeysuckle ( <i>Lonicera periclymenum</i> )	5%	Yes
	Dog rose ( <i>Rosa canina</i> )	2.5%	Yes
	English elm ( <i>Ulmus procera</i> )	5%	
	Wayfaring tree ( <i>Viburnum lantana</i> )	2.5%	Yes

- 3.1.3. 30% of the 'woodland' mix is oak, a species that is not listed in the berry-bearing species section but is mentioned as it attracts feeding woodpigeons and rooks (Risk Identification Chapter of CAP772 (CAA, 2008)). It also includes hawthorn, holly and cherry, all of which produce large quantities of fruit. A variant of this mix is listed, with 5% common lime, a species that is not recognised as a bird attractant.
- 3.1.4. The 'woodland edge' mix is attractive to birds and 70% of the mix is made up of species listed in CAP772 (CAA, 2008), including 50% hawthorn.
- 3.1.5. The 'hedge' mix is mostly made up of potentially bird attractant species (80%) especially hawthorn (70%).
- 3.1.6. Within the 13km safeguarding zone the scheme includes several small attenuation ponds next to the A14. These ponds are not large enough to support concentrations of wildfowl, gulls or waders, however the detailed plans, when available should be assessed for the potential to support these birds. Three large pits forming borrow pit 6 approximately 8.5km from the runway (north-west of Girton interchange) could potentially attract several bird species of concern to air safety. The pits are large enough to attract wildfowl, gulls and wading birds. The current plans show that the pits are to be relatively steep sided and have no islands, both design features recommended to limit the attractiveness of a site to waterfowl. However, some areas around and within the pits may be extensive grassland with the potential to attract geese and waders. Until the detailed design of the borrow pits is more advanced it is not possible to predict the suite of species that could be attracted.
- 3.1.7. The exact requirements for the formation of a starling roost are poorly understood. There appear to be many areas within the proposed landscape planting design and existing areas in the broader countryside within the safeguarding zone that could support starling roosts.

## 4. Discussion

- 4.1.1. Although the indicative planting mixes for woodland, woodland edge, and hedgerows contain fruit-bearing species at levels above those recommended in guidance, the presence of a physical barrier in the form of Cambridge (urban area) partly mitigates for this. Species such as fieldfares and redwings are unlikely to 'commute' between planted areas and the airfield. Although in autumn/winter fieldfares, redwings and starlings gain most of their energy from berries, they need to supplement this with protein. They usually achieve this by foraging for invertebrates on grasslands, including airfields (although an effective long grass policy should reduce this to a minimum). The scheme is in an area dominated by agricultural land suitable for foraging for invertebrates. It is unlikely that redwings and fieldfares would seek to supplement berries from the scheme plantings by commuting across an urban area (which they usually avoid) to the airfield when there are suitable feeding conditions close by.
- 4.1.2. *CAP680* (CAA, 2002) advises that planting of fruiting species should not occur within 2km of an airfield. In view of the proximity of areas suitable for feeding on invertebrates, this is probably reasonable for the development. No areas of planting are within 4km of the airfield. In view of the absence of more detailed advice in *CAP772* (CAA, 2008) and the AOA's advice notes (*AOA Advice Note 3* (CAA, 2003b) only stipulates "the immediate vicinity"), it should be assumed that the planting is unlikely to affect birdstrike risk and should therefore be considered acceptable.
- 4.1.3. The borrow pit could potentially attract several species of great concern to air safety. However, there is little to the east of the airport to encourage wildfowl to commute across airspace around Cambridge Airport and affect air safety. The waterbodies to the south of the airport appear to be of limited value to birds and there are no significant areas of water further east. The borrow pit water bodies as currently shown are large enough to attract roosting gulls, however this seems unlikely in the view of the large gull roost at nearby Grafham Water (>50,000 gulls). It is likely that almost all of the gulls in the Cambridge and Huntingdon area would use this roost. Gulls feeding to the east of the airport would be unlikely to 'commute' across the airfield to the borrow pit in view of the presence of other established roosts closer by (e.g. Lackford Lakes which attracts up to 28,000 gulls). In view of the outline nature of the environmental design at this stage, detailed design would be aimed at reducing the attractiveness of the area to risk species, especially large wildfowl. This would take the form of minimising the areas of open water. If necessary a suitable bird control management plan would be prepared to deal with all possible sources of increased birdstrike risk associated with species likely to use the restored borrow pit area.

- 4.1.4. Starlings can roost in a wide range of habitats including natural woodlands, plantations, single trees, reedbeds and under bridges. In view of this behavioural plasticity, almost any area of planting has the potential to attract roosting starlings. It would be unreasonable to remove potential roosting habitat from developments in all but the immediate vicinity of an airport. As the scheme is <4km from the airport and the majority of the proposed planting is considerably further away it is more appropriate to react to a roost forming than to try to design any possibility of this happening out of the scheme. A suitable bird control management plan would be prepared for the possibility of the formation of a significant starling roost (in accordance with CAA advice).
- 4.1.5. Preliminary discussions with the management team at Cambridge Airport have considered the findings of this preliminary bird hazard assessment.
- 4.1.6. The airport welcomed the engagement by the A14 team. They were reassured by the fact that the Highways Agency has acknowledged birdstrike as a potential risk and has engaged competent consultants to consider these issues. The alignment of the runway and relative location of the A14 scheme away from take-off and landing flight paths was a material factor in reducing the underlying risks.

## 5. Conclusion

- 5.1.1. Detailed environmental design of the scheme would aim to reduce the attractiveness of risk features such as borrow pit 6 by limiting the amount of open water and breaking up any water bodies with berms and planting. Island features would not be included.
- 5.1.2. At the detail design stage the bird hazard risk assessment would be reviewed in consultation with Cambridge Airport and updated if necessary to identify any further measures that may be required to safeguard airport operations.
- 5.1.3. Any residual risk of increased birdstrike as a result of the scheme within the 13km safeguarding zone would be managed through the preparation and implementation of a bird control management plan based on appropriate management of vegetation within the Highways Agency's estate.
- 5.1.4. The scheme outline environmental design includes several areas that have the potential to attract roosting starlings. In view of the potential hazard presented by this species, the formation of roosts would also be covered in the bird control management plan.
- 5.1.5. Close liaison will be maintained with the airport during the development of the scheme design to ensure any potential increases in bird hazard risk are avoided where practicable. Based on this approach the Airport has indicated in consultation discussions that it has no concerns at this stage. Due to the distance of the A14 Scheme and Borrow Pit 6 from the airport and its location close to the edge of the 13km area the airport representatives did not have major concerns regarding the potential increase in bird populations and movement interfering with aircraft.

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