

Unit 28: Bird and Wildlife Control on Airports and Airfields

Unit code:	D/602/5680
QCF Level 3:	BTEC National
Credit value:	4
Guided learning hours:	32

● Aim and purpose

The aim of this unit is for learners to gain understanding of the potential dangers caused by birds and other wildlife on or around airfields and how these may be minimised.

● Unit introduction

A bird strike is defined as a collision between a bird and an aircraft. Bird strike is also used to refer to other wildlife strikes – such as bats or ground animals. Bird strikes may happen at any phase of a flight but are most common during the take-off, initial climb, approach and landing phases because of the greater number of birds flying at lower levels. Bird strikes are becoming more frequent and can be a major threat to aircraft safety. For smaller aircraft, significant damage may be caused to the aircraft structure, especially jet-engine aircrafts, as they are vulnerable to the loss of thrust resulting from the ingestion of birds into the engines, which has caused a number of fatal accidents.

The majority of birds and wildlife are diurnal, therefore occurrences of bird and wildlife strikes are more common during daylight hours. Bird strikes pose many dangers to aircraft in terms of aircraft loss of control, complete engine failure, serious power loss etc. Many systems and procedures have been put in place to minimise hazards, control, disperse and remove birds and other wildlife. The best long-term control in place for managing bird and wildlife activity is achieved through habitat management; however it is impossible to completely control wildlife in this way. Birds are particularly difficult to manage because they are mobile and readily adapt to changing environments. In most situations, active removal or dispersal of wildlife is necessary, in conjunction with habitat management techniques. Habitat management involves the reduction or elimination of trees, shrubs and other plants which provide food, shelter or roosting sites for birds and wildlife. Airport authorities seek to achieve this through liaison, for example with local authorities regarding landfills and with local farmers to reduce the attractiveness to birds of fields surrounding airfields.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand the regulatory framework relating to the potential impact of birds and other wildlife on aircraft safety
- 2 Understand how to manage potential dangers created by birds and other wildlife on and around airports and airfields.

Unit content

1 Understand the regulatory framework relating to the potential impact of birds and other wildlife on aircraft safety

Impact of birds and other wildlife on aircraft safety:

- birds and other wildlife, e.g. flocks of birds, individual birds, rabbits and hares, deer
- different types of airport and airfield, e.g. major airports, regional airports, feeder airports, airfields
- potential dangers and risks of bird and wildlife strike to small propeller-driven aircraft, e.g. aircraft loss of control, complete engine failure or serious power loss
- potential dangers and risks of bird and wildlife strike to larger jet-engine aircraft, e.g. engine ingestion, loss of flight instrument function, injury to pilots, rapid depressurisation, landing gear system
- results of bird and wildlife strikes, e.g. rejected take-off, forced landing, emergency landing, ditching, commercial costs in terms of aircraft damage, aircraft diversion, delays

Regulatory framework associated with bird and wildlife dangers:

- bird strike regulations, e.g. airport bird hazard management, aircraft certification for bird strike risk, operator's checklist for bird strike hazard management
- airport regulations for prevention of bird strikes, e.g. airport services manual, airworthiness requirements of the Aircraft Type and Aircraft Engine Type Certification processes, CAP 393 – Air Navigation Order (ANO) 2005, establishment of a safeguarding process

2 Understand how to manage potential dangers created by birds and other wildlife on and around airports and airfields

Systems and procedures for observing birds and other wildlife:

- bird history, e.g. identification of bird and wildlife remains, migratory patterns, bird and wildlife populations, concentrations and movement patterns

Systems and procedures for documenting and reporting birds and other wildlife:

- bird strike and wildlife support, e.g. bird ID campaign, Civil Aviation Authority (CAA) bird strike database, in-house bird and wildlife hazard training programmes, guidance and advice from CAA, logging of bird and wildlife species
- initial recording of bird and wildlife strike information, e.g. phase of flight information, record of aircraft engine type involved, extent of damage
- Bird Control Management Plan (BCMP), e.g. policies and procedures, risk identification and assessment, reporting bird control issues

Systems and procedures used to minimise hazards caused by birds and other wildlife:

- minimising hazards, e.g. flight crew awareness of bird and wildlife hazards through Aeronautical Information Publications (AIPs) or Notices To Airmen (NOTAMs), appropriate guidance on response to the hazard

Systems and procedures used to control, disperse and remove birds and other wildlife:

- control measures (bird scaring techniques), e.g. broadcast of bird and wildlife distress signals, firing of pyrotechnic bird scaring cartridges, specialised ground-based radar equipment, monitoring levels of bird activity
- habitat management, e.g. reduction or elimination of trees, shrubs and other plants which provide food, shelter or roosting sites for birds, habitat modification, controlling possible animal habitats
- aerodrome grass management, e.g. liaison with local authorities regarding landfills, liaison with local farmers regarding reduction of attractiveness to birds of fields surrounding airfields, appropriate grass management policies – grass heights

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<p>P1 Explain how birds and other wildlife on and around different types of airports and airfields endanger aircraft [IE]</p>	<p>M1 Discuss two bird strikes that resulted in aircraft accidents comparing the consequences to passengers, flight crew, airline and airport</p>	<p>D1 Produce a Bird Control Management Plan for your local airport</p>
<p>P2 Describe the regulatory framework associated with bird and wildlife dangers [IE]</p>		
<p>P3 Describe systems and procedures for observing, documenting and reporting birds and other wildlife</p>	<p>M2 Compare the roles and responsibilities of the staff responsible for the control of birds and wildlife at airports</p>	
<p>P4 Explain how systems and procedures are used to minimise hazards caused by birds and other wildlife [EP]</p>		
<p>P5 Explain how systems and procedures are used to control, disperse and remove birds and other wildlife [EP]</p>		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers CT – creative thinkers	RL – reflective learners TW – team workers	SM – self-managers EP – effective participators
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Essential guidance for tutors

Delivery

It would be useful for learners to listen to a presentation from an airline or airport operator, ideally at an airport, regarding bird and wildlife strikes, examining the procedures in place to control hazards and remove birds and other wildlife from the flight path. As there is multi-agency involvement, there is an opportunity to use guest speakers. Learners would benefit by a visit to or from the CAA. Discussions can take place on the bird strike regulatory framework relating to the potential impact of birds and other wildlife on aircraft safety and the legal framework embracing what is arguably the most highly-regulated industry in the world.

The development of communication skills is critical. Learners will be expected to produce a range of written materials and these should be presented to the standard required by the industry. Learners would benefit from a visit to an airport and from talks with guest speakers such as fire officers, security officers, safety officers and airline representatives. This will enable learners to get a 'feel' for the type of hazards that exist due to bird strikes. By carrying out detailed research, learners can use case studies to understand the relevance of the different legislation and regulations to the industry. For learning outcome 1, learners need to refer to the following publications: CAP393 – Air Navigation Order (ANO) 2005 and 2009, CAP168 – Licensing of Aerodromes, International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs) Annex 14 – Aerodromes, ICAO Airport Services Manual (Doc 9137) Part 3 – Bird Control and Reduction. Learners would benefit from downloading a CAA bird strike occurrence form – CA1282 – to examine the content and information required. The ICAO recommends a 13 km radius circle around the airport for the management of bird and wildlife. Learners should have access to library and research facilities which include current trade publications detailing and reviewing procedures for dealing with emergencies and other bird strike incidents.

It would be useful for the tutor to create scenarios where learners can work in groups to share ideas about how to deal with various situations and present their findings in their individual assignments. Useful comparisons and contrasts can be drawn from different bird strike case studies which would improve learner understanding and give them the opportunity to conduct more detailed individual research. Examples to be discussed and researched could be linked to recent bird strike incidents, these are usually comprehensively covered in the media and likely to be fairly accessible for research, such as the ThomsonFly flight or the Hudson River ditching (links provided under Websites).

It is essential for learners to examine the ICAO Airport Services Manual (Doc 9137) Part 3 – Bird Control and Reduction, where they will have access to a number of useful documents that demonstrate the importance of airport bird and wildlife hazard management. Learners need to understand the importance of establishing and monitoring levels of bird activity and the recording of bird strikes. Pilots need to be aware of bird activity in arrival and departure airports and this information needs to be shared with airports and airlines. It highlights the importance of pilots, airlines and airports reporting bird strikes or potential bird strikes.

Delivery will demonstrate the importance of teamwork due to the number of different organisations involved in the prevention of bird strikes. Learners need to think 'outside the box' with regard to other possible support such as communicating with local birdwatchers, ornithological societies, nature reserve wardens or gamekeepers and local authorities to ensure that landfill waste disposal sites are not operated in a way that will create an aircraft hazard.

Learners should be encouraged to undertake field activities in suitable locations well away from any airport operations (recreational parks, local countryside, etc). These field activities can include bird recognition, developing and undertaking simple bird scaring techniques. Learners can then judge for themselves the impact of bird distress calls, loud noises, scaring devices, etc. If one exists locally, a visit to a starling roost during the autumn or winter would be a powerful learning experience in how birds might bring down a large passenger

aircraft. Starlings can roost in numbers exceeding 100000 and turn the sky black as they gather in numbers and perform their curious turning and swooping in unison. This spectacle, known as a murmuration, can be viewed on many of our nature reserves and other sites.

Wildlife management and habitat control can involve a practical exercise on optimum grass length. Learners will need to observe the number and type of birds attracted to a field that has been newly mown, measure the grass length and monitor the changes as the grass grows. Some negotiations may need to take place with the institution's grounds staff.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit and the two learning outcomes.
A review of the unit assessment methods, along with timescales and hand-out and hand-in dates.
Discussion and research into how birds and other wildlife on and around different types of airport and airfield endanger aircraft.
Visit to an airport or airfield bird and wildlife control unit.
Tutor input and research on the regulations that are associated with bird and wildlife dangers at airfields and airports.
Guest speaker from the CAA.
Tutor input, discussion and investigation into bird strikes that have resulted in aircraft accidents and the consequences of these accidents for passengers, flight crew, airline and airport.
Preparation for assignment
Assignment 1: How Birds And Wildlife Can Endanger Aircraft and the Regulatory Framework (P1, P2, M1)
Feedback on assignment
Tutor input and research on the systems and procedures for observing, documenting and reporting birds and other wildlife.
Visit to a starling roost to view a murmuration.
Discussion and research on how systems and procedures are used to minimise hazards caused by birds and other wildlife.
Tutor input and research on the systems and procedures used to control, disperse and remove birds and other wildlife.
Practical experiments on bird recognition, developing and undertaking simple bird scaring techniques.
An experiment on optimum grass length (ongoing throughout the unit).
Tutor input and discussion on the roles and responsibilities of staff responsible for the control of birds and wildlife at airports.
Preparation for assignment
Assignment 2: Observing, Reporting, Minimising and Controlling Birds and Wildlife (P3, P4, P5, M2)
Feedback on assignment

Topic and suggested assignments/activities and/assessment

Discussion and research on the contents and format of a Bird Control Management Plan.

Preparation for assignment

Assignment 3: Bird Control Management Plan (D1)

Feedback on assignment

Review of the unit.

Assessment

Evidence can be generated in a variety of ways, through presentations and role play or in report and assignment format.

P1 – P2 – M1

To achieve P1, learners must explain how birds and other wildlife on and around different types of airport and airfield endanger aircraft. Learners must explain the effects of bird strikes on both small propeller-driven aircraft and larger jet-engine aircraft, including the nature of aircraft damage. Learners should cover at least three different types of bird strike and one other type of wildlife hazard such as rabbits.

To achieve P2, learners must list the regulations that are associated with bird and wildlife dangers and briefly describe the key points of the different types of regulation that have to be followed on airfields and airports.

M1 can be achieved by discussing two bird strikes that have resulted in aircraft accidents and comparing the consequences of these accidents for passengers, flight crew, airline and airport.

P3 – P4 – P5 – M2

To achieve P3, learners are required to describe systems and procedures for observing, documenting and reporting birds and other wildlife. Evidence should be supported with examples of documentation relating to, and reports of, birds in and around the flight path covering the items listed in the unit content.

To achieve P4, learners must explain how systems and procedures are used to minimise hazards caused by birds and other wildlife, learners may link P4 to P5 clearly stating systems and procedures for dispersing and removing birds and other wildlife. Learners must refer to the unit content.

To achieve P5, learners must explain how systems and procedures are used to control, disperse and remove birds and other wildlife. Learners may link P5 to P4 where they explain how systems and procedures are used to minimise hazards in addition to controlling, dispersing and removing birds and wildlife associated with bird strikes. Learners must refer to the unit content.

M2 can be achieved by comparing the roles and responsibilities of staff responsible for the control of birds and wildlife at airports. Learners do not have to explain the roles of those involved in great detail but they do need to compare and contrast the overarching responsibilities of each role and how these roles differ according to function or seniority.

D1

D1 is achieved by producing a Bird Control Management Plan (BCMP) for a local airport. The BCMP should contain all the elements listed in CAP772 Birdstrike Risk Management for Aerodromes – Chapter One, Section 2.3.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1	Assignment 1: How Birds and Wildlife Can Endanger Aircraft and the Regulatory Framework	Your role at the airport is to make staff, other stakeholders aware of the dangers to aircraft created by birds and wildlife. Provide a briefing to staff on dangers and the associated regulatory framework. To emphasise the dangers you have decided to conclude by contrasting two birdstrikes that resulted in aircraft accidents.	Presentation
P3, P4, P5, M2	Assignment 2: Observing, Reporting, Minimising and Controlling Birds and Wildlife	Your next task is to invite neighbouring businesses and local homeowners to a meeting to ask for their help in observing, reporting, minimising and controlling birds and wildlife.	Presentation
DI	Assignment 3: Bird Control Management Plan	The content and feedback from your meetings needs to be formulated into a Bird Control Management Plan that can be distributed to all concerned. You should write this plan for your airport using the format laid out in CAP772.	Bird Control Management Plan

Links to other BTEC units

This unit forms part of the BTEC aviation sector suite. This unit has particular links with the following unit titles in the aviation suite.

Level 2	Level 3	Level 4
n/a	Unit 24: The Principles of Flight Unit 27: Airfield Operations	n/a

Essential resources

Learners must have access to library and research facilities, and current trade publications.

Employer engagement and vocational contexts

Industry visits and guest speakers are recommended. Learners should have access to accurate and up-to-date industry case studies.

Indicative resource materials

Textbooks

Asford N, Coutu P and Beasley J – *Airport Operations, 3rd Edition* (McGraw-Hill Professional, 2012)
ISBN 978-0071775847

Kalafatas, M – *Bird Strike: The Crash of the Boston Electra* (Brandeis University Press, 2010)
ISBN 978-1584658979

LeMieux J – *One Bird Strike and You're Out* (Trafford Publishing, 2009) ISBN 978-1426920851

Journal

Flight International – Reed Business Publishing

Other publications

BCARs – *Airworthiness Information Leaflet*, available via the Civil Aviation Authority website or HMSO ISBN 1904862578

Civil Aviation Authority – *CAP772 – Birdstrike Risk Management for Aerodromes*

Civil Aviation Authority – *CAP168 – Licensing of Aerodromes*

European Aviation Safety Agency – *Bird population trends and their impact on aviation safety 1999-2008* (Report by Ilias Maragakis)

International Civil Aviation Organization – *Airport Services Manual*

International Civil Aviation Organization – *Annex 14 (Aerodromes)*

Websites

accidents-ll.faa.gov/

www.airbus.com/fileadmin/media_gallery/files/safety_library_items/AirbusSafetyLib_-FLT_OPS-OPS_ENV-SEQ05.pdf

www.caa.co.uk

www.easa.europa.eu

www.icao.int

www.youtube.com/watch?v=-mBSAIWGMsk&feature=fvst

www.youtube.com/watch?v=fwle-e7Apkc

www.youtube.com/watch?v=IICb8p9SwM

Federal Aviation Administration – Lessons Learned from Transport Airplane Accidents

Airbus Flight Operations Briefing Note – Bird Strike Threat Awareness

Civil Aviation Authority

European Aviation Safety Agency

International Civil Aviation Organization

Video footage of ThomsonFly bird strike incident

Video footage of Hudson River bird strike incident

Video footage of Swiss Airbus bird strike

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	independently planning and carrying out detailed research into the dangers of birds and other wildlife to aircraft and the regulatory framework
Effective participators	explaining how systems and procedures are used to provide solutions for minimising hazards caused by birds and other wildlife.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Team workers	working in groups to discuss how to manage potential dangers
Self-managers	managing the workload of the unit assessment.

● Functional Skills — Level 2

Skill	When learners are ...
ICT — Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using a variety of websites to research and present work on the dangers of birds and other wildlife to aircraft
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning and carrying out research using appropriate search criteria
Manage information storage to enable efficient retrieval	organising work into folders to enable retrieval and development
Follow and understand the need for safety and security practices	logging in to a variety of systems securely and visiting trusted websites
Troubleshoot	as required.
ICT — Find and select information	
Select and use a variety of sources of information independently for a complex task	investigating case studies to identify the dangers of bird strikes to aircraft
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	using appropriate search criteria in order to review news articles and published reports.
ICT — Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	entering and developing images, diagrams and text to describe the dangers of bird strikes and other wildlife to aircraft
Bring together information to suit content and purpose	collating notes and research findings to produce a written report
Present information in ways that are fit for purpose and audience	communicating information clearly and accurately for a variety of stakeholders
Evaluate the selection and use of ICT tools and facilities used to present information	selecting the most appropriate ICT tools to produce presentations and reports throughout the unit
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	sharing articles with colleagues and tutor, paying attention to confidentiality issues.

Skill	When learners are ...
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	discussing the dangers created by birds and wildlife to aircraft
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading case studies of past incidents involving bird strikes
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing presentation notes on how to observe, report, minimise and control birds and wildlife.