



Assessment, Management and Audit of Birdstrike Risks: A win-win-win situation?

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The Problem

- Birdstrikes have destroyed 104 aircraft and cost over 250 lives in civil aviation history
- License holders, managers and staff may be personally liable
- ‘Routine’ birdstrikes cost the industry \$1.5 billion per year (excluding hull losses)
- An average non-damaging strike costs \$22,000
- An average damaging strike costs \$226,000
- Airports report between 1 and 15 strikes per 10,000 movements
- Increasingly insurers are looking to recover costs of claims

Some Recent Major Losses



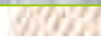
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Date	Location	Aircraft	Species	Result
Jan 1995	Le Bourget, France	Falcon 20	Lapwings	10 dead
Sept 1995	Elmendorf USA	E3A AWACS	Canada Geese	24 dead
July 1996	Eindhoven, Netherlands	C-130	Starlings	34 dead
July 1996	Aktion Greece	E3A AWACS	Starlings?	Aircraft Destroyed
April 2000	Pepa, Congo	Antonov AN8	Unknown	21 dead
June 2003	Milan, Italy	Lear 45	Pigeons	2 dead
March 2006	Payam Iran	Antonov 12	Unknown	Aircraft destroyed
July 2007	Moscow Russia	Antonov 12	Unknown	7 dead
Nov 2007	Khartoum Sudan	Antonov 12	Unknown	2 dead
Dec 2007	Moscow, Russia	Antonov 12	Unknown	Aircraft destroyed
Nov 2008	Rome Italy	B737 800	Starling	Aircraft written-off?
Jan 2009	New York USA	Airbus A320	Canada Goose	Aircraft Destroyed





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Cost of 'routine' strikes for one US airline

	Direct 'Damage' Cost \$ Million	Delays Cost \$ Million	Total Cost \$ Million	No. of strikes	Cost Per Strike \$
Damaging Strikes	23	37.43	60.4	267	226,329
Non Damaging Strikes	0.53	110.7	111.2	4938	22,417



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Bird management on airfields

- Airfield habitat management
- Active bird control



Habitat management

- Reduce resources = fewer birds
- Knowledge of ecology can help
- Works on limiting 3 main resources:
 - Food and water
 - Security
 - Breeding opportunities



Active control methods

- Primary:
 - Distress calls
 - Pyrotechnics/shell crackers
 - Lethal control
- Secondary:
 - Lures
 - Arm-waving
 - Falconry
 - Dogs



International Best Practice

- International birdstrike Committee best practice is now available
 - www.int-birdstrike.org
- Not a regulation but provides expert opinion
 - Airlines know what to expect from an airport
 - Regulators know what to require
 - Insurers know when best practice is, or more importantly is not followed.
 - Lawyers can seek expert opinion
 - Adopted/adapted by FAA, UKCAA, IFALPA, ACI, ICAO

Bird strike analysis

- Don't rely on total number of bird strikes
- Consider species and number being struck
 - Incidence of large birds
 - Incidence of flocking birds
- Not all bird strikes will be reported
 - But check there are no biases
- Be positive about reporting!



Reviewing bird management programmes

- Bird populations are not static in time
- Habitat around the airport will change
- Necessary to review bird management programme to ensure still fully effective
 - Bird strike analysis
 - Risk assessments
 - Auditing

The image shows the cover page of a report. The title is 'BIRD CONTROL STANDARDS CHECK AND BIRDSTRIKE RISK ASSESSMENT FOR STANSTED AIRPORT' with the year '2008' below it. The author is 'P. L. MOOREHEAD' with a blue email address 'p.l.moorehead@fera.gov.uk'. The affiliation is 'Bird Management Unit, Central Science Laboratory, Sand Herts, UK'. Below the text is a table with columns for 'Date', 'Location', 'Time', and 'Status'. There are two rows of data in the table, with handwritten entries in the 'Status' column. The table is partially obscured by a large, faint watermark of a bird's wing.

The risk assessment process

- Hazard description
 - The bird species, numbers and behaviour around the airport and the habitats that attract birds
- Risk estimation
 - The probability and severity of the risk
- Risk evaluation
 - Is the risk acceptable?
- Risk management
 - Option generation and evaluation for unacceptable risks

Risk estimation (frequency)

For each species:

No. Strikes per year	>10	3.1-10	1-3	0.3-0.9	0-0.2
Probability Category	Very High	High	Med	Low	Very Low

Risk estimation (severity)

For each species:

Percentage of strikes causing damage	>20%	10-20%	6-9%	2-6%	0-2%
Severity Category	Very High	High	Med.	Low	Very Low



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Risk evaluation matrix

Severity	Freq.				
	Very High	High	Med.	Low	Very Low
Very High	Level 3	Level 3	Level 3	Level 3	Level 2
High	Level 3	Level 3	Level 3	Level 2	Level 2
Med.	Level 3	Level 3	Level 2	Level 1	Level 1
Low	Level 3	Level 2	Level 1	Level 1	Level 1
Very Low	Level 2	Level 1	Level 1	Level 1	Level 1



Risk evaluation matrix

Severity	Freq.				
	Very High	High	Med.	Low	Very Low
Very High					Canada goose
High		Herring Gull			
Med.		Wood-pigeon	Black-headed Gull	Lapwing	
Low			Kestrel		
Very Low		Swallow			



Risk management – for all level 3 species

- List options without reference to cost
- Evaluate likely costs and potential benefits
- Select options and develop action plan
- Implement action plan and review at least annually
- Keep separate 'live risk' document to monitor and control short term problems



Audit of Bird Control Standards

- Even the best SMS process is only pieces of paper
- Audits check documentation, training, equipment, manpower levels, habitat management and active bird control against best practice
- Audits also look at the bird species, numbers and behaviour on and around the airport and recommend improvements if needed

Win-Win-Win

- Proper risk assessment and audit provides
- Win for airport managers – reducing possible liability
- Win for airlines – reducing costs
- Win for insurers – reducing losses