Bird and Animal Hazard Management Plan

National Template

November 2005

AUSTRALIAN AIRPORTS ASSOCIATION
THE ONE VOICE FOR ALL AUSTRALIAN AIRPORTS

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Part 1 - Administration

Disclaimer

This Bird and Wildlife Hazard Management Plan (the Plan) considers the strategies adopted by the Airport Operator to minimise the risk of bird and wildlife strike to aircraft and is provided for the purpose of information only. The contents of this Plan are for the information of the party to whom it is addressed (the Addressee) and for no other purpose.

No responsibility what so ever is accepted to any party what so ever who may use or rely on whole or any part of this Plan.

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the Airport Operator gives no warranty as to the information in this Plan, other than the Plan has been prepared and disclosed in good faith.

By way of accepting this Plan the Addressed acknowledges that the information contained in the Plan is particular to The Airport and may not be suitable for use at other airports.

Any inquires should be addressed to:

The Airport Operator
Insert name & address of AO

Acknowledgments

This Bird and Wildlife Hazard Management Plan is based on the National Framework Document prepared by the Australian Airports Association in conjunction with the Australian Aviation Bird and Animal Hazard Working Group.

The Association would like to acknowledge the work of Peter Pallot and Jill Holdsworth, Townsville Airport for their valuable assistance in the development of this Manual, along with the members of the Australian Aviation Bird and Animal Hazard Working Group. Thanks also to William Steel of Birds Australia and Phil Shaw for their contributions to the risk assessment section of the manual.

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Distribution

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Record of Amendments

No.	Date of Amendment	Section	Details	Signed	Date
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Record of Review

No.	Date of Review	Details	Signed	Date
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Authority

This Plan has been prepared as required by CASA and in accordance with Civil Aviation Safety Regulation (CASR) – Part 139 to provide particulars of the procedures to deal with danger to aircraft operations caused by the presence of birds or animals on or near the aerodrome and forms section K of the Aerodrome Manual for *Insert Aerodrome name*.

The organisation responsible for coordinating this Plan is *The Airport Operator* and is authorised by the Chairman of the Bird and Animal Hazard Management Committee (Committee) on behalf of the Committee. This Plan was agreed to by the members of the Bird and Animal Hazard Management Committee at its meeting on insert date

Recommended: ……..

Chairman Airport Bird and Animal Hazard Management Committee
On Behalf of the Bird and Animal Hazard Management Committee
Date

Approved: ……

(Airport General Manager)

Abbreviations

AEO	Airport Environment Officer
AHD	Australian Height Datum
ANR	Air Navigation Regulations
ASA	Air Services Australia
ASO	Airport Safety Officer
ATC	Australian Traffic Control
ATIS	Automated Terminal Information Service
ATSB	Australian Transport Safety Bureau
BAHMC	Bird and Animal Hazard Management Committee
BAHMP	Bird and Animal Hazard Management Plan (the Plan)
CASR	Civil Aviation Safety Regulations
CASA	Civil Aviation Safety Authority
DEH	Department of the Environment and Heritage
DoD	Department of Defence
DOTARS	Department of Transport and Regional Services
EPA	Environment Protection Agency
EPBC	Environment Protection and Biodiversity Conservation Act
GA	General Aviation
ICAO	International Civil Aviation Organisation
NOTAM	Notice to Airmen
RAAF	Royal Australian Air Force
RFFS	Rescue and Fire Fighting Service
RL	Reduced Level
RPT	Regular Public Transport
RWY	Runway
TWY	Taxiway

Glossary

Aerodrome/Airport	A defined area intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft at *insert airport name*
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Aircraft Operator	A person, organisation or enterprise engaged in, or offering to engage in, an aircraft operation.
Aircraft/Aeroplane	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.
Airline Operator	The operator of a Regular Public Transport air service.
Air Traffic Control	Air traffic control service provided by the RAAF or ASA
Tower Control	A unit established to provide air traffic control service to Airport traffic.
Airport Operator	The airport operator is *Insert the name of the entity that appears on the aerodrome certificate*
Authorised Shooter	A person with a relevant Firearms license, who is required by, and has written authorisation from the *Airport General Manager* of the Airport to use firearms for the purpose of controlling birds and animals at The Airport.
Apron	That part of an Airport to be used for the purpose of enabling passengers to board or disembark from an aircraft, loading of freight onto, or unloading freight from an aircraft, refuelling, parking or carrying out maintenance on aircraft.
Bird strike	Is the collision of an aircraft with an animal, including a bird. A "**reported bird or animal strike**" is deemed to have occurred whenever: • a pilot reports a strike to the ATSB • aircraft maintenance personnel find evidence of a bird or animal strike on an aircraft • personnel on the ground report seeing an aircraft strike one or more birds or animals • bird or animal remains are found on the airside pavement area, or within the runway strip, unless another reason for the bird or animals death can be found

	A "**suspected bird or animal strike**" is deemed to have occurred whenever a bird or animal strike has been reported by aircrew or ground personnel but upon inspection: • no bird or animal carcass is found, and • there is no physical evidence on the aircraft of the strike having occurred A "**confirmed bird or animal strike**" is deemed to have occurred whenever a bird or animal strike has been reported by aircrew or ground personnel and upon inspection • bird or animal remains are found on the airside pavement area or within the runway strip, unless another reason for the bird or animals death can be found • aircraft maintenance personnel find evidence of a bird or animal strike on an aircraft A "**bird or animal near miss**" is deemed to have occurred whenever a pilot takes evasive action to avoid birds or animals on, or in the vicinity of an aerodrome. An "on-aerodrome bird or animal strike" is deemed to be any strike that occurs within the boundary fence of the aerodrome. A "bird **strike in the vicinity of an aerodrome**" is deemed to have occurred whenever a birdstrike occurs outside the area defined as "on aerodrome" but within an area of 15 kilometres radius from the aerodrome reference point (ARP) or up to 1,ooo feet above the elevation of the aerodrome. A "**bird or animal strike remote from the aerodrome**" is deemed to have occurred whenever a birdstrike occurs more than 15 kilometres from an aerodrome or more than 1,ooo feet above the elevation of the aerodrome.
Director of Flying Safety	An appointment within the Royal Australian Air Force charged with all safety matters including the responsibility of investigating all military aircraft incidents.
Firearm	A shotgun, rifle or other weapon as defined under State and Commonwealth legislation.
Incident	An occurrence, other than an emergency/disaster, associated with the operation of an aircraft that affects or could affect the safety of operations.
Jointly Used Areas	Those areas including runways and taxiways that are used by both civil and military aircraft.
Joint User Airport	An Airport under the control of a part of the Defence Force in respect of which an arrangement under Section 20 of the Civil Aviation Act is in force.

Glossary

Landside	Those parts of an Airport not considered Airside, that is areas normally accessible to the general public.
Manoeuvring Area	Those parts of an Airport used for the take-off, landing and taxiing of aircraft, excluding Aprons.
Military Incident	Any incident involving military registered aircraft or facilities only.
Movement Area	That part of an airport used for the surface movement of aircraft, including manoeuvring areas and aprons.
Plan	The Airport Bird and Animal Hazard Management Plan
Runway	A defined rectangular area on a land aerodrome, prepared for the take-off and landing of aeroplanes along its length.
Runway Strip	An area provided both to reduce the risk of damage to aircraft running off a runway and also to provide an obstacle free airspace for aircraft flying over the area during landing and take off operations. The area is centrally located around the runway and includes any associated stopway.
Taxiway	A defined path on a land aerodrome established for the taxying of aircraft and intended to provide a link between one part of the aerodrome and another including: • Aircraft stand taxi lane. A portion of an apron designated as taxiway and intended to provide access to aircraft stands only. • Apron taxiway. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron. • Rapid exist taxiway. A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exist taxiways thereby minimising runway occupancy times.
Undershoot	The area within the take off and approach splays preceding the runway threshold.

Part 2 – Bird and Animal Hazard Management Plan

Section 1 - Management System

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Section 1 - Management System

The Bird and Animal Hazard Management Plan forms part of an integrated Airport Risk/Safety Management System.

It has been prepared to comply with the requirements of with Chapter 10, Section 10.14 Bird and Animal Hazard Management of the Manual of Standards Part 139 – Aerodromes and forms Section K of the Aerodrome Manual.

The plan also forms the Bird and Wildlife Management Plan within the Airport's Environment Management Strategy. (Where Applicable)

The Airport Bird and Animal Hazard Management Plan provides guidance for bird and animal strike hazard reduction at ***The Airport***. .

Section 2 - Planning

General

This section identifies the specific hazards or risks associated with bird and animal conflicts with aircraft at **the Airport**.

The risk assessment has been conducted in accordance with **the Airport's** Risk Management Plan (or refer to other risk management tool used).

Bird and animal species at the airport are ranked according to the risk posed to aircraft by the various factors including:

- The local and regional bird and animal population size (use Airport Bird Count Data, Safety Officer Log entries, Off Airport Counts)
- Size of the bird and flocking nature as a measure of its propensity to cause damage
- Location observed on or near the airport and movement patterns
- Strike History (Ability to avoid aircraft)

Risk Assessment

To quantify the risk presented by birds at the Airport it is necessary to undertake periodic risk assessment. These should be standardised to allow comparisons between years and also between airports using the same assessment protocol. The following procedure, is based upon that of Allen (2001).

Risk is defined as the consequence of a hazard, measured in terms of *likelihood* and *severity* (Mackinnon *et al*. 2001).

Likelihood is estimated for each animal species as the average number of strikes per year, over the past five years. In order to take into consideration any recent changes in bird populations at the airport, this value is then subjected to a 'population correction factor'; calculated as the average number of animals to be counted during surveys over the past year divided by the average number of animals over the past five years. However, this correction factor is not permitted to be less than one, and all values less than one were rounded up to one.

Likelihood Rating

No. strikes per annum	>10	3–10	1–2.9	0.2–0.9	0–0.1
Category	Very high	High	Moderate	Low	Very low

Severity is calculated for each animal species as the percentage of strikes that resulted in damage to the aircraft. The largest possible database was used in determining the proportion of strikes to have resulted in damage. For example, for some common bird species the published U.S. and Canadian records include very large sample sizes, and provided the best available data.

However, for most Australian native species the Melbourne Airport Wildlife Strike Database contained the greatest sample size, and data from this source were used.

Severity Rating

% strikes causing damage	>20	10–20	6–9.9	2–5.9	0–1.9
Category	Very high	High	Moderate	Low	Very low

Finally, the Likelihood Rating and the Severity Rating for each species were combined in Allen's (2001) matrix to determine whether specific management action is required for that species.

Overall Risk

	Likelihood				
	Very high	High	Moderate	Low	Very low
Severity					
Very high	Reject	Reject	Reject	Reject	Review
High	Reject	Reject	Reject	Review	Review
Moderate	Reject	Reject	Review	Accept	Accept
Low	Review	Review	Accept	Accept	Accept
Very low	Accept	Accept	Accept	Accept	Accept

All species 'rejected' must have targeted management action to reduce the risk. NB: All species of bird that flock are 'rejected' unless the species' fits within the 'very low' category for severity of strikes.

This process will identify species as being of concern:

The Bird Strike Committee USA (1999) recommends 'zero tolerance' for geese and other waterfowl on airport property because of their large size and flocking behaviour. It is considered prudent for Australian Airports to adopt a zero tolerance policy towards similar large and/or flocking bird species. Therefore, further species fitting these characteristics, which have been recorded at the airport, and have been involved in strikes should be listed as species of concern even though these species may have a 'low' or 'very low' Severity Rating.

Identification of Aspects

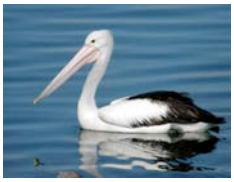
The following aspects should be considered in identifying the risk of bird and animal strike at the Airport:

- Species that frequent the airport in terms of
  - Numbers on and transiting the airport
    - Seasonal or Resident
  - Body mass of the species
  - Flocking behaviour of the bird
  - Historical strike numbers
  - Population growth
- The airport habitat
- The activities on the airport
- The airport's surrounding land use
- Off airport activities
- The weather and seasons
- Natural phenomena
- Bird and animal information

Bird and Animal Information

The following table represents one method of presenting a summary of risk ranking to an airport

Example

Rank	Species	Comments
1.	Magpie Goose 	Large body size. Flocking bird that is attracted to the grass species at the airport. Nests near the airport.
2.	Flying Fox 	Medium body size, large colonies overfly the airport and /or runway approaches.
3.	Australian White Ibis 	Large body size. Large flocks fly across the runway threshold at dusk and dawn. Australian White Ibis feed on the airport.
4.	Black Kite 	Large body size. Attracted to airport by the insects and small vertebrates exposed during mowing. Kites tend to congregate and fly at aircraft take off height.
5.	Australian Pelican 	Forms flocks around the airport and due to their very large size can cause serious damage to aircraft. Pelican are responsible for the only recorded deaths in Australia caused by bird strike.

The Airport Habitat

The airport habitat is a key factor that determines the species of birds and wildlife and the size of the populations attracted to the airport environment. Refer to Annex A: Airport Plan and Locality Plan.

Describe the habitat at the airport

Example - The vegetation of the airport environ is characterised by scattered remnants of salt marsh, mangrove and salt meadow communities, although the airport is predominantly grasslands (comprising grass, sedge and herbaceous species). The grasslands attract flocks of galahs.

The Activities on the Airport

The activities on airport also attract bird and animals.

Describe activities on airport that attract bird and animals.

Example - These include:

- Mowing and burning grasslands – insects and small vertebrate are exposed thus attracting birds
- Runway lights – insects are attracted to the lights, in turn attracting birds that feed on them
- Waste bins – birds and animals forage on waste bin contents

The Airport's surrounding land use

The habitat and the use of the land surrounding the airport is another key factor in determining bird and animal species and their population sizes.

Describe the habitat and surrounding land use at the airport. Information to include:

- Location of landfills from the airport (birds may transit over the airport to get to the landfill)
- Parks
- Waterways – wetlands, rivers, dams etc
- Cattle yards and/or abattoir
- Development (eg at Townsville a large development treats water on site using large filtration ponds)
- Grasslands
- Sewage treatment plants

Off Airport Activities

Activities off airport may also attract birds and animals to the airport.
Describe off airport activities and the types of birds and animals that are present due to these activities.

Example - Control burning – predator birds circle the area looking for prey

The Weather and Seasons

Bird and animal species and population sizes can reflect in weather and seasonal changes.

Describe the weather and seasons and what birds are attracted to the Airport because of this.

Example - In northern Australia the wet season brings abundant bird life to some airports.

Natural Phenomena

Natural phenomena such as thermals created by the heat of the runway attract birds to circle over the runway.

Describe any natural phenomena that occur at the airport and the birds and animals that are present at the airport because of this.

Example - Locus and grasshopper plaques attract birds to the airport.

Strike history

Strike history is an integral tool for assessing further strike risk. Collate strike data to identify most struck birds or animals.

Legislation

Annex B outlines the relevant legislation applicable to bird and wildlife management. Ensure to include any birds or animals that are protected as measures will be required to be implemented to continue the protection of this species as well as protecting the safety of aircraft.

Selection of Significant Aspects to be Addressed

The risk assessment identifies the risk ranking of the bird and animal species. This section addresses the treatments against the risks.

A table format is a good tool to summarise this information.

Example

Risk Rating	Species	Treatment Plan	Responsibility	Timing
1	Magpie Geese	1. Monitoring of airfield 2. Behaviour Research 3. 'Bird Checks' prior to arrival and departure of RPT 4. Drainage works 5. etc	Airport Responsible Person	Wet season or when geese numbers increase on airfield or adjacent wetland.
2	Flying Fox	1. Monitor Flight Path	Airport Responsible Person	November to December or when observed in monitoring

This Plan is based on hazards from resident, transient and seasonal bird and wildlife populations. Implementation of specific portions of this Plan is continuous, while other portions will be implemented as required by bird and wildlife activity.

Objectives and Targets

Setting objectives and targets is an important aspect of Planning. The objectives and targets must be measurable and consistent with the Policy. It is recommended to establish the objectives in a time frame (example for a five year time frame). The objectives and targets can than be used as management tool for budgeting, aligning with an Environment Management System and a Maintenance System.

The following table is an example of Objectives and Targets. It is important to set Performance Indicators so the Airport can objectively verify that a target is being met.

Example

Objective	Target	Performance Indicators	Responsibility	Time Frame
To become a benchmark for the management of bird and animal strike risk in Australia	Minimise the amount of bird strikes at the Airport	Number of bird strikes are continually reduced using 2003 as the base year	Manager, Airport Operations	Ongoing
	Continue to develop the Bird and Wildlife Management plan.	Reviewed and updated Plan available for verification.	Manager Airport Operations	Ongoing
	Minimise the amount of bat strikes at the Airport	Bat flight path system implemented at the airport	Manager Airport Operations	by 2008

Resources

Procurement and allocation/mobilisation of appropriate resources at appropriate times are critical to the successful implementation of this Plan. **The Airport** management is committed to assessing the resource needs, and allocating resources in time to ensure effective implementation of the Plan.

The Airport will utilise the services of skilled human resources in operational and environmental functional positions to ensure operationally and environmentally sound management. This will be achieved by enhancing the skills of existing employees through appropriate training and job rotation as well as through recruitment of new employees with appropriate skills.

Adequate financial resources and/or workforce will be allocated for:

- Identification of bird and animal hazards;
- Treatment plans to control bird and animal hazards;
- Equipment required to manage bird and animal hazards;
- Investigation of bird and animal strikes;
- Appropriate training and awareness of **the Airport's** employees;

- Conduct of studies and audits pertaining to the control of bird and animal hazards;
- Obtaining permits and licences;
- Other matters relevant to bird and animal hazard planning and management.

The (Responsible person) will identify resource requirements and seek budget allocation for identifying and managing environmental issues. The (Responsible person) will allocate budget as appropriate for the provision of resources.

Section 2 - Planning

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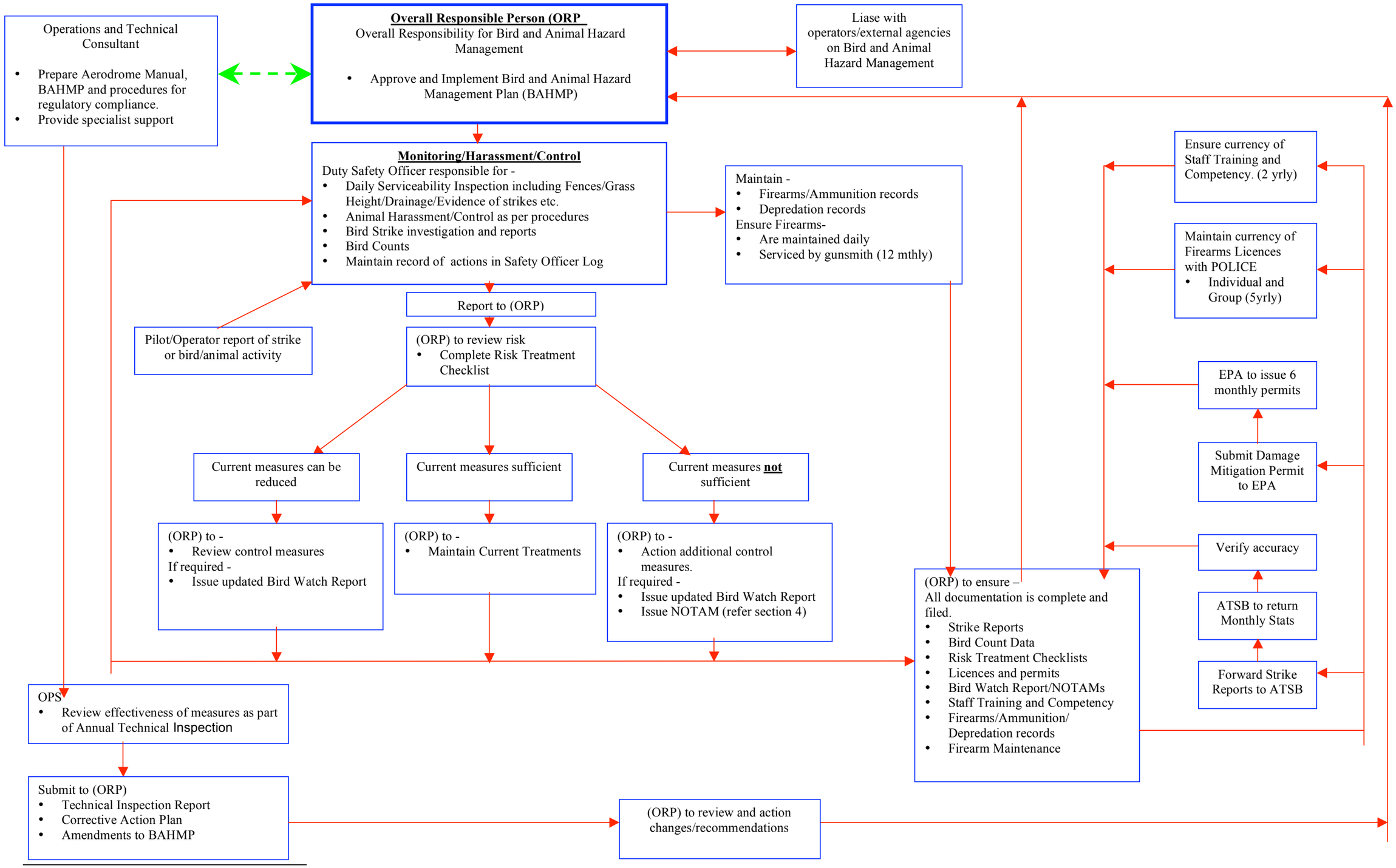
Section 3 - Operational Control

Flowchart Detailing Operational Control for Bird and Animal Hazard Management



Section 3 –Operational Control

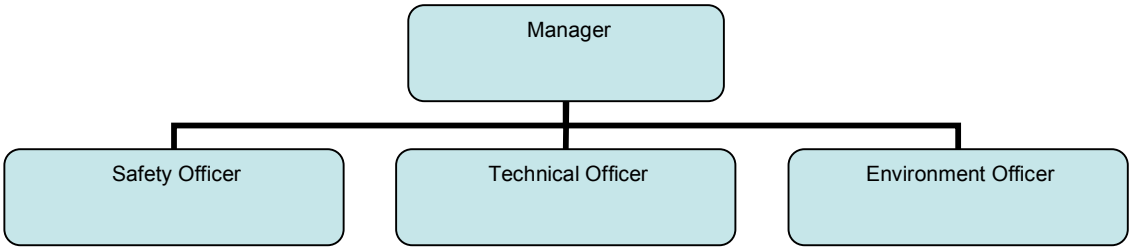
Identification of Organisational Structures, Roles Responsibilities and Authorities

On Airport Organisational Structure

A chart showing the organisational structure at **the Airport** has been included at Figure 1.1.

The primary responsibility for the implementation of the Bird and Animal Hazard Management Plan and maintenance of documentation and records rests with **the Airport (Operations) Responsible Person**.

Example



Bird and Animal Hazard Management Committee

Reducing the bird and wildlife strike hazard is not an airport responsibility alone. The task requires a cooperative effort between several organisations. To co-ordinate and assist developing and implementing this plan an Airport Bird and Animal Hazard Management Committee is recommended. Alternatively bird and animal hazard management is recommended to be an agenda item on an existing consultative group meeting.

Composition
The Committee consists of representatives from:

- The Airport
- Civil Aviation Safety Authority
- Air Traffic Control
- Environment Protection Agency or State Wildlife Service
- Airlines
- Local Governments
- The Airport City Council
- Ornithological clubs and organisations
- Ornithological Consultant
- Other stakeholders and affected parties

Section 3 –Operational Control

Terms of Reference
The terms of reference for the Bird and Animal Hazard Management Committee should be agreed at the first meeting. A sample "Terms of Reference is included below

The members of the Bird and Animal Hazard Management Committee will:

- Review Bird and wildlife strike data
- Develop and implement strategies to reduce the incidence of Bird and Wildlife Strike.
- Review operating procedures and policies
- Act as a forum for the discussion of recommendations from subject experts
- Review and recommend changes to the Bird and Wildlife Management Plan.

Meeting Schedule
The Bird and Animal Hazard Management Committee meets quarterly (or as requested by the chairperson of the Bird and Animal Hazard Management Committee).

Meeting Format
The Bird and Animal Hazard Management Committee Meeting is run in the general format of the Agenda outlined at Annex C. An outline of the Airport Report presented at each meeting is outlined in Annex C.

The following information outlines the tasks and responsibilities accepted and adopted by the stakeholders of the Airport who form the Bird and Animal Hazard Management Committee.

Position	Authority, Role/Responsibility
Bird and Animal Hazard Management Committee	▪ Develop and implement strategies to reduce the incidence of bird and wildlife strike ▪ Review bird and wildlife strike data ▪ Review operating procedures and policies ▪ Act as a forum to discuss recommendations from research and expert reports ▪ Review and recommend changes to the Bird and Wildlife Hazard Management Plan
Airport Operator	
Person responsible for oversight of the Plan	▪ Chair Bird and Animal Hazard Management Committee ▪ Approve recommendations of Bird and Animal Hazard Management Committee ▪ Declare, disseminate, and terminate Bird Watch conditions in consultation with RAAF SATCO ▪ Provide liaison with all airport operators ▪ Conduct periodic inspections of the airfield to identify potentially hazardous bird and wildlife conditions ▪ Issue specific guidance to airport management concerning actions required to implement this plan ▪ Promulgate NOTAM to advise of hazardous bird and wildlife activity ▪ Ensure all bird and wildlife strikes notified to the Airport are reported to ATSB ▪ Issue procedures for the preservation of bird and wildlife remains ▪ Ensure Airport Operations staff are trained in bird counts, bird and wildlife identification, bird harassment and survey techniques ▪ Consider bird and wildlife issues when developing land use strategies and approving land usages ▪ Annually review Bird and Wildlife Hazard Management Plan ▪ Review Bird and Animal Hazard Management Committee Meeting minutes ▪ Dissemination of bird and wildlife management information ▪ Provide information regarding bird and wildlife management to regulatory authorities as required ▪ Establish and maintain bird and wildlife management and firearm procedures ▪ Ensure land management procedures are implemented at the airport. ▪ Ensure Bird and Animal Hazard Management Plan complies with all relevant legislation ▪ Provides secretariat support to the Committee and provides Minutes within 14 days of each Meeting.
Airport Safety/Reporting Officer	▪ Serve as a member of the Bird and Animal Hazard Management Committee ▪ Monitor airport-wide compliance with the Plan and report all bird-aircraft strikes and hazards per ATSB requirement ▪ Prepare bird and wildlife strike and depredation data for Bird and Animal Hazard Management Committee ▪ Maintain a current bird count map for the Airport

	▪ Conduct bird counts and enters bird count data into the Bird/Animal Hazard database
Airport Safety/Reporting Officer Cont'd	▪ Enter the bird and animal depreciation counts on the shift Ammunitions Records Form ▪ Monitor bird and wildlife activity and strike statistics, and advise Management on Bird Watch conditions
	▪ Coordinate with aircrews and maintenance personnel for collection of all remains after strikes and organises identification of bird and wildlife species ▪ Provide photographic evidence to document bird and wildlife strikes and related activities as required ▪ Undertake bird harassment ▪ Undertake runway/bird inspections ▪ Undertake bird and wildlife dispersal and depredation ▪ Enter the bird and wildlife counts into the Bird and Animal Hazard database ▪ Inspect the perimeter fence daily so that access for other animals such as wallabies is restricted ▪ Store and maintain firearms and ammunition ▪ Coordinate training for personnel assigned to conduct bird harassment for appropriate weapons certification ▪ Annually review bird and wildlife management and firearm procedures, and forward any comments or updates to Airport Management ▪ Collect and store animal carcasses for identification ▪ Report all bird strikes to ATSB
Maintenance Staff	▪ Ensure garbage is disposed of appropriately and all bins are lidded on airport ▪ Provide a representative to the Bird and Animal Hazard Management Committee. ▪ Administer the mowing and drain maintenance contracts for the jointly used areas to minimise bird attractions. ▪ Report bird strikes
Airport appointed Biologist/Ornithologist or other approved Subject Specialist	▪ Serve as a member of the Bird and Animal Hazard Management Committee ▪ Provide expert advice on environmental aspects to the Bird and Animal Hazard Management Committee and advise the group of environmental issues ▪ Recommend environmental surveys and promulgate environmental impact assessments and statements as required ▪ Obtain and maintain Damage Mitigation Permits

	▪ Annually review and recommend changes to the Bird and Wildlife Hazard Management Plan as required
Airport appointed Biologist/Ornithologist or other approved Subject Specialist Cont'd	▪ Investigate recommend and report bird management trials ▪ Ensure Bird/Animal Hazard database is maintained and regularly updated with historical data ▪ Conduct periodic inspections of the airfield to identify bird and wildlife activity ▪ Assist in training Airport Operations staff bird counts, bird and wildlife identification, and bird harassment and survey techniques as required ▪ Assist in the control of birds and wildlife that present a health hazard in occupied buildings and hangars
Air Traffic Control Authority	
Air Traffic Control Authority	▪ Provide a member of the Bird and Animal Hazard Management Committee ▪ Consider the following during periods of increased bird and wildlife activity: i. Change circuit direction to avoid bird and wildlife concentrations. ii. Restrict use of RWY lights at nights ▪ Liaise with Airport Safety Officer when significant bird scare activities are necessary on the airfield ▪ Issue/cancel bird and wildlife hazard warnings via ATIS and Ground/Tower frequencies when hazardous birds and wildlife activities are observed ▪ Assist to annually review Bird and Wildlife Hazard Management Plan and forward any comments and/or updates to the Airport Operator
Airlines	
Airlines	▪ Provide a representative to the Bird and Animal Hazard Management Committee ▪ Issue specific guidance for aircrews on procedures to be followed under bird and wildlife hazard conditions ▪ Make operational changes to avoid areas and times of known hazardous bird concentrations ▪ Brief aircrews to promptly report all bird and wildlife strikes to ATSB and the Airport ▪ Brief aircrews to promptly report all bird watch conditions ▪ Annually review Bird and Wildlife Hazard Management Plan and forward any comments and/or updates to the Airport Operator ▪ Provide Committee with updated Strike data
Other Aircraft Operators	
Other Aircraft Operators	▪ Report hazardous bird activity observed at and near the airfield to ATC or the Airport Operator

	▪ Deliver all bird remains to the Airport Operator ▪ Report bird strikes to ATC and the respective company ▪ Submit a copy of all bird/wildlife strike reports to ATSB, Company Safety Department and to the Airport Operator ▪ Post current bird hazard activity on a status board and inform all aircrews of any change in status
Airport RFFS	
Airport RFFS	▪ Assist when possible Airport Operator with the removal of bird remains on the RWY ▪ Conduct runway/bird inspections when requested from ATC
CASA	
CASA	▪ Provide a representative to the Bird and Animal Hazard Management Committee ▪ Monitor the Bird and Animal Hazard Management Committee activities for compliance to CASA legislation
Environment Protection Agency (EPA) (Wildlife Agency)	
Environment Protection Agency (EPA) (Wildlife Agency)	▪ Provide a representative to the Bird and Animal Hazard Management Committee ▪ Issue permits to allow depredation of birds that cause a hazard to aircraft ▪ Consider bird issues when developing land use strategies and approving land usages ▪ Provide advice on environmental issues ▪ Annually review Bird and Wildlife Hazard Management Plan and forward any comments and/or updates to the Airport Operator
Ornithological / Wildlife Association/Clubs	
Ornithological / Wildlife Association/Clubs	▪ Provide a representative to the Bird and Animal Hazard Management Committee ▪ Provide additional information on migratory, local and seasonal bird and wildlife activities ▪ Conduct Bird Counts on the Town Common each fortnight and report findings to the Bird and Animal Hazard Management Committee ▪ Annually review Bird and Wildlife Hazard Management Plan and forward any comments and/or updates to the Airport Operator.
Local Government	
Local Government	▪ Provide a representative to the Bird and Animal Hazard Management Committee ▪ Manage waste disposal landfill sites to minimise their attractiveness to hazardous bird strike species ▪ Manage parks, gardens and other council lands to minimise their attractiveness to birds that are hazardous to aircraft

- Consider bird and wildlife issues when developing land use strategies and approving land usages
- Annually review Bird and Wildlife Hazard Management Plan and forward any comments and/or updates to the Airport Operator

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Section 4 - Implementation

Operation and Control

The Airport has developed a program that consists of a combination of the following three facets of bird and wildlife management to provide a safe operating environment for all aircraft utilising The Airport:

- **Exclusion**
- **Deterrence**
- **Detection**
- **Harassment**

The following sections outline the strategies implemented for each facet of the Management Plan.

Exclusion from Airport

Excluding birds and animals from the airport by way of adequate fencing of the perimeter, constructions that minimises perchs, nesting and breeding sites etc are ways of excluding birds and animal from the airport.

Deterrence on Airport

The most effective method used to reduce the bird numbers at the airport is the reduction of the attractiveness of the airfield to them. The following strategies are used to do this:

Land Management (Habitat Management)

Land management is a collective term for the numerous following measures taken to decrease the attractiveness of the airport to a variety of birds that frequent this region.

Airport Development Policy

All development at the airport goes through an approval process that considers the effect that the development will have on bird and wildlife management at the airport. Guidelines have been established that outlines the restrictions to ensure the development does not attract birds and wildlife. An example of the restrictions includes a list of flora species that can not be used for landscaping purposes.

Drainage and Grass Maintenance

Drainage and grass maintenance plays an integral role in bird and wildlife management at the airport. Some grass and sedge species found at the airport are known food sources for birds whilst wading birds are attracted to drains that contain emergent vegetation.

The elimination of standing water on pavements should be considered as a passive deterrence measure for some bird species.

Management of Grass Height

Grass at Airports is maintained at a height between 50 and 300 millimetres. The reasons for this include:

- To maintain the runway strip in a serviceable condition.
- To remove the food source (seed heads) and cover making the airfield less attractive to the birds.
- For ease of detection of birds within critical areas. Birds are more easily seen when the grass is short.

Other factors that are considered for grass management include:

- Cutting of grass before it goes to seed
- Herbicide selection for weed control
- Appropriate grass seed selection
- Fertilisation
- Erosion control vegetation.

Long Grass

Under certain circumstances the application of a long grass policy has led to the reduction in bird strikes relating to specific species and should be assessed in relation to each airport in consultation with the airport specialist.

Raptors and in particular Black Kites are known to be attracted by mowing activities. Harassment is conducted as and when required during the mowing operations. Mowing is ceased if the attracted birds create a hazard to aircraft safety.

Control of Undesirable Vegetation

Some species of grass are known to be an attractive food source for some birds. The species are controlled or if possible eliminated from the airfield through a process of selective herbicide applications.

The selection of trees and shrubs and flowers on and around the airfield should be carefully considered and advice saouht from suitably qualified persons on suitable plants for each particular region.

Maintenance of Drainage Ditches

Drains are regularly inspected and maintained to discourage wading birds and emergent vegetation. Vegetation is removed as often as necessary to maintain flow and discourage use by birds.

Removal of Dead Birds and Animals

Dead birds, animals and reptiles such as frogs, and other carrion are removed from the field to avoid attracting raptors. (Refer to Procedure on this activity)

Elimination of Roosting Sites

Roost sites are controlled where possible. Available perches are kept to a minimum on the airfield.

Prevention of Other Animal Hazards to Aircraft

Appropriate reduction and/or eradication methods for animals are implemented on an as needs basis. The Airport Operator inspects the perimeter fence daily.

Removal of Nests

Nests of birds breeding on site are removed or destroyed to discourage birds from inhabiting the airfield. This reduces the chance of birds such as plovers being struck whilst defending their territories.

Runway Lights

Where possible, runway lights are turned off between flights at night to reduce the number of insects that are attracted to them. Hence the potential food source for birds is reduced.

Bird Scaring Devices

In some circumstances bird scaring devices may be used to deter specific species of birds from nesting in aircraft and facilities.

Off Airport Hazard Management

By the facilitation of good communications with local planning authorities, off airport bird attracting sites can be managed or eliminated. Some potential sites of interest for Bird Hazard Management Committees are:

- Picnic areas
- Abattoirs
- Orchards
- Animal sale yards
- Plant nurseries
- Farms
- Rubbish tips
- Recycling centres
- Waste water treatment ponds
- Retention ponds/recreational lakes

Detection on Airport

The ability to see and avoid birds on airport is diminished due to size and natural camouflage, and the operational limitations of aircraft in near proximity to the ground.

The following outlines the detection measures undertaken by the Airport Operator.

Bird Identification

A Bird Identification Manual is held by the Airport Operator that identifies the bird species that frequent the airport. This manual is used by staff to correctly identify birds for detection and research purposes.

A training program for the persons responsible for bird and animal identification should be established using appropriately qualified persons. Ongoing training is essential to maintain consistency in approach.

Bird Patrols

The Airport Operator has established a system of bird patrols whereby the Safety Officer conducts regular inspections of the airfield including the movement areas during the course of their shift. The Safety Officer generally works from …… (Local) daily. The frequency of patrols is determined by the bird activity at the time.

Bird Count

The Airport Operator undertakes monitoring of the bird population at the Airport by undertaking regular bird counts. The Airport is divided into a number of areas to facilitate bird observation. The Bird Count Area Plan is enclosed in Annex A. The areas have been numbered. (Refer to Procedure on this activity)

In developing bird count areas consideration should be given to the following :

- Areas should be divided into enough areas that cover the airfield. These will vary according to the size and complexity of the airport and should be easily identified by natural delineations such as runways, taxiways, roads, tracks, drains and fences. Its important that these areas are accessible year round and that the observer can see the entire area. For a simple 1 runway airport at least 6 areas will be needed to cover both sides of the runway split in two and both approach areas as a minimum.
- Persons conducting the counts should use the same route each time a count is conducted.
- Counts should be conducted at the same diurnal time for each count. i.e. sunrise, midday and late afternoon is better than say, 0700 1200 and 1700.
- Three counts on the one day is preferable to one count on three days so that any peaks in bird patterns can be detected.
- Counts may need to be increased at times of high bird activity.
- Overflying birds should be included in the bird counts with species (if known) and a description and direction of flight given(i.e. flock of 20 Flying Foxes flying west to east over northern threshold).

Bird count information is critical to establishing a robust risk assessment for the airport, and regular analysis by a suitably qualified person is recommended.

The information obtained during bird counts include:

- Bird species and numbers for defined areas within the airport.
- Bird species overflying the airfield.
- Bird behaviour.
- Meteorological conditions.

This information is entered into the Airport Bird/Animal Management Database and used to identify trends in bird populations, locations and species mix. The meteorological conditions are also evaluated to determine seasonal fluctuation of bird species.

Statistical Analysis of Bird Count and strike data

The rigorous analysis of the statistical data gathered by the bird counts and bird strikes assist in risk analysis, selection of the appropriate management strategy and measuring the effectiveness of strategies.

Bird Safety Inspections

During times of severe bird activity the Airport Operator instigate additional bird safety inspections prior to each RPT jet operation. T*he Airport* Operator may make additional resources available on an as required basis.

Bird and Wildlife Strike

Bird and wildlife strike information is collated by the Airport Operator and entered into the Bird/Animal Management Database. The information recorded assists in

identifying trends in bird and wildlife strike species, locations of strikes, and times of day where strikes are more likely etc. The Airport Operator uses this information to develop and implement strategies to reduce bird and wildlife strike.

Bird and Wildlife Species

Bird and wildlife species considered to be most hazardous at the Airport are listed in Table 5. Hazard assessment is based on previous strike history (at the Airport), body size, flocking habit, flight speed, frequency and distribution.

Detection off Airport

- **External Bird Counts**
  Other bodies may conduct bird counts in the surrounding areas that may assist in the management of bird and animal hazards.

Harassment

Having detected the birds the focus is then shifted to limiting the birds' presence at the airfield. To do this *the Airport* conducts the following harassment techniques.

Harassment Techniques

Bird harassment and dispersal of birds from the runways and surrounding airfield, remains the most effective and immediate tool in bird management. Harassment activities are based on a priority rating with a concentric approach from the runway. The runway and associated undershoots are the main priority to be clear of birds. The runway strips being the second priority, the surrounding area the third priority and so forth. (Refer to a procedure on activity)

The Airport operator is primarily responsible to conduct bird harassment and dispersal. The RFFS may provide additional resources to *the Airport* Operator as and when required.

The Airport Operator undertakes harassment during operational hours. Experience has shown that a concerted harassment effort in the first two hours after sunrise results in a reduced number of birds for the rest of the day.

The Airport Operator has staff trained in bird identification. These staff also have the relevant firearm licences.

Bird harassment and dispersal procedures are implemented when the Airport Operator, ATC and/or aircrew observe and notify of the presence of birds at the airfield. The Airport Operator assesses the situation and decides on the safest and most effective method to use. The following harassment and dispersal methods are used at the airport:

- Vehicle lights, sirens and horns.
- Pyrotechnic charges (Bird Frite).
- Rubber Bullets.
- Live cartridge.

Vehicle lights, sirens and horns

The use of vehicle lights, sirens and horns are the preferred method of harassment to herd birds away from the movement areas and encourage them to leave the airfield. This method does no environmental harm and is the most cost effective method of harassment. Other untargeted flocks of birds tend not to disperse into the air giving greater control to the harassment officer. This method of harassment is limited by accessibility to the birds in the wet (because of water sheeting and pooling in certain areas of the airfield) and requires more time to move the birds in the desired direction. The birds will also learn that the vehicle, although an annoyance, is not a threat and may become more difficult to herd unless other methods are occasionally used.

Pyrotechnic Cartridges

Bird Frite is the brand name for the pyrotechnic charge used at the airport. Bird Frite is a non-lethal two stage pyrotechnic shell fired from a conventional shotgun. The charge produces one loud report. The report is generated when the cracker shell having travelled to the target area explodes with a flash bang and puff of smoke. The explosion presents a very marked visual and aural stimulus to which most species of birds immediately respond.

Birds, especially those resident or close to the airport soon become accustomed to a particular harassment technique if it is used to excess. For this reason the effectiveness of the Bird Frite is enhanced when live shot is used on occasions to reinforce the danger associated with the aural stimuli of the Bird Frite.

Rubber Shot

Rubber shot has been used effectively on large birds such as Jabirus and Brolgas where other methods tend not to work effectively. These birds, after a time, recognise the vehicle and Bird Frite as an annoyance rather than as a danger. The use of rubber shot is a non-lethal way of moving these more stubborn birds. The rubber bullets hit and sting the bird and are a very effective reinforcement method.

Live Shot

Live cartridges are used to reinforce the effect of bird Frite and remove hazardous birds that cannot be otherwise be dispersed, for example territorial birds. The shooting of birds with live cartridges has some effect on the behaviour of local bird populations. Live shot is used as the last resort.

Depredation Policy

At times of severe bird or wildlife activity, the Airport Operator may take (kill and live trap) specific bird and wildlife species that threaten the safety of aircraft operations. The use of live shot also increases the effectiveness of the non-lethal pyrotechnic charges. It has been observed that the birds associate the aural stimuli of the non-lethal pyrotechnic charges with either death or injury. The decision to take a bird or animal rests with the Airport Operator who must consider:

- The safety of aircraft.
- The use of non-lethal control methods to solve the problem.

Birds taken are handled in a humane manner and all carcasses recovered. The Airport Operator records birds and wildlife depredated.

An inventory of all birds taken is maintained and forwarded to the appropriate Authority on a quarterly basis.

(Refer to Firearm Procedures)

Permit
The Airport Operator operates under a Permit to take birds and wildlife that present a hazard to aircraft.

Commonwealth Environmental Protection
In order to consider the effects under the Environmental Protection and Biodiversity Conservation Act, the significance of all depredation on the airport (i.e. types and numbers of birds and species) will be reviewed on an annual basis.

Information, contacts, permits etc are available from DEH:
http://www.deh.gov.au/epbc/index.html

Training of Personnel

Training is conducted in accordance with the Airport's Training Manual (or refers to other tool used).

Training and awareness programs will be implemented at various levels to achieve the following objectives:

- Ensure all employees, airlines, aircraft operators are familiar with the Bird and Animal Hazard management Plan
- Ensure relevant employees are trained in Bird and Animal Hazard Management procedures
- Enhance the skills and abilities of relevant employees in specialised bird and animal hazard employees.

To ensure that the above objectives are satisfactorily achieved, the following categories of training programs will be developed and implemented at **the Airport**:

- General awareness training for Airport staff, airlines and aircraft operators. (Example Overview of Bird and Animal Hazard Management and specific training on Reporting Bird and Animal Strike on Aircraft)
- Job focused specialised training for employees dealing with bird and animal hazard management. (Example - Bird Identification, Basic Life history and behaviour of common species, Wildlife and environmental laws, Control techniques, Knowledge of procedures and firearm handling and safety requirements). (Also refer to Training Procedures).
-

Documentation and its Control

Documentation and Control of the Bird and Animal Hazards Management Plan is conducted in accordance with the Airports Documentation and Control Manual (or refer to other tool used).

Communication

The Airport Operator employs several means to communicate and record bird and animal hazard information.

Log Books
Information on wildlife activity is recorded daily in the Airport Safety Officer Log Book. Information from the Log Book is used to inform Airport Management of the status of the Bird and Animal hazard at the airport.

Section 4 Implementation

Bird Count Forms
Information from the Bird Count Forms is entered into a data base from where a detailed analysis of bird numbers may be made, deterrence activities assessed and risks reviewed.

Bird and Wildlife Strike Reporting

Reporting Strikes
An improved reporting culture allows a more thorough and comprehensive understanding of the bird and wildlife hazard situation, which in turn leads to the implementation of more effective control and management strategies.

Regulatory Requirements
All bird strikes and bird hazards, no matter how insignificant they might appear, must be reported to the Australian Transport Safety Bureau (ATSB).

The Procedure for Reporting for Bird Strikes is at Part 3 of this Plan.

Incidents, serious incidents and accidents reported to the ATSB are recorded on the Occurrence Analysis and Safety Investigation (OASIS) database.

Defence Requirements
All bird strikes and bird hazards, no matter how insignificant they might appear, must be reported to the Defence Directorate of Flying Safety.

Bird Watch
An effective means to communicate the risk of bird and wildlife strike is through the use of **Bird Watch** where implemented.

Bird Watch establishes procedures to use for the immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds that could pose a hazard to flight safety.

Bird Watch Conditions
The following terminology is used for rapid communications to disseminate bird activity information and implement unit operational procedures.

a. **Bird Watch condition SEVERE**. Heavy concentration of birds on or immediately above the active runway or other specific locations that represent an immediate hazard to safe flying operations.

b. **Bird Watch condition MODERATE**. Concentrations of birds observable in locations that represent a probable hazard to safe flying operations.

c. **Bird Watch condition LOW**. Low bird activity on and above the airfield with a low probability of hazard.

d. **Bird Watch ALERT**. Weather, time of day and seasonal conditions which make an influx of birds onto the airfield likely.

Authority
Airport operator is the authority to declare a Bird Watch condition.

Section 4 Implementation

Notifications

Bird Watch conditions are disseminated by the following means as applicable:

a. During periods of tower operations, ATC will include bird watch conditions other than LOW, on the ATIS.

b. When the Bird Watch condition is MODERATE or SEVERE, tower personnel will be notified and a NOTAM issued advising of bird watch conditions.

c. At airports where ATC is not present, recipients on the Bird Watch distribution list will be notified by email of all changes to the Bird Watch Conditions. **It is the responsibility of each recipient to ensure contact details in Appendix X are kept current at all times and the Airport Operator is notified of any changes.**

An example of Bird Watch used is attached at Annex D.

Aircrew Responsibilities and Procedures

If an aircrew observes or encounters any bird activity while in flight, which could constitute a hazard, the aircrew are to contact ATC and request that the observed bird activity be passed on to the relevant authority. The following information is necessary:

- Call sign
- Location
- Altitude
- Time of sighting
- Type of bird (if known)
- Approximate number of birds
- Behaviour of birds (soaring, flying to or from a location, etc)

Aircrew should be aware of the codes associated to Bird Watch conditions and in particular with Condition SEVERE or ALERT. During these conditions:

- ATC may consider changing runways, delaying take offs and landings, changing circuit altitude, etc.

Section 4 –Implementation

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Section 5 –Monitoring and Measurement

The following table outlines the Management System Review process.

Performance Indicators	Monitoring	Measurement	Triggers	Improving the system
Total Bird Strike	The total numbers of Bird strikes on and in the vicinity of the airport are recorded by the Airport Operator. Reports from other sources such as airlines are also forwarded to the Airport Operator. Periodically this data is checked against the ATSB data base for accuracy.	Bird strikes are represented as the number of strikes per 10,000 movements.	An increase in total bird strikes of 10% in any 12 month period will trigger a review of the management plan and its implementation	The Bird Management Committee will review and implement where necessary recommendations for changes to the Plan or the implementation of the Plan as a consequence of a trigger event.
Bird Strike causing damage	The number of Bird strikes causing damage on and in the vicinity of the airport is recorded by the Airport Operator. Reports from other sources such as airlines are also forwarded to the Airport Operator. Periodically this data is checked against the ATSB data base for accuracy.	The measure of bird strikes causing damage is important one in that it measures the severity of the strike in monetary terms. The cost includes :the cost of repair :lost revenue during repair :lost time for inspections	Any increase over a 12 month period will trigger a review of the management plan and its implementation	The Bird Management Committee will review and implement where necessary recommendations for changes to the Plan or the implementation of the Plan as a consequence of a trigger event.

Bird Counts	Bird counts undertaken regularly to monitor the activity of birds on the airfield.	Bird numbers and bird species are recorded in relation to defined areas on the airfield. Regular reviews of the bird count data will indicate increases and decreases in bird numbers over the short and long term.	Short term changes in bird numbers may indicate seasonal changes in the bird populations due to breeding and migratory cycles. This will trigger a review of operational response inline with the risk. Changes year on year may indicate changes due to climatic or environmental factors or may be an indication of the effectiveness of the Plan. Significant changes in this longer term pattern will trigger a review of the plan and its implementation.	The Aerodrome Operator will undertake a study of the change in bird numbers and where the effectiveness of the program is suspected for the increase in bird numbers the Bird Management Committee will review the plan. Where necessary recommendations for changes to the Plan or the implementation of the Plan will be considered by the Airport operator.

Section 6 - Management Review

General

The Bird and Animal Hazard Management Committee should review the Plan at planned intervals to ensure its continuing suitability, adequacy and effectiveness. The review should include opportunities for improvement and the need for changes to the Bird and Animal Hazard Management Plan, including the objectives and targets.

Management Review

At an operational level the following issues instigate a review of the Bird and Animal Hazard Management Plan

Issue	Review Input	Review Output
Legislation	Changes to legislation are reviewed to assess impact on implementation of the Plan.	Legislation Register updated Changes made to the Plan to reflect legislative changes Plan Amendments distributed to relevant companies.
Audits	Results of audits	Improvements related to stakeholder requirements
Management reviews	Follow up actions from previous management reviews	Improvement of the effectiveness of the management system and its processes Resource needs
Recommendations	Recommendations for improvements	Improvements to the Plan

Section 6 – Management Review

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Part 3 – Bird and Animal Hazard Management Procedures

Section 1 - Bird and Animal Hazard Management Procedures

To ensure consistent implementation of the bird and animal hazard management strategies *the Airport* have devised the following procedures.

An example of a format for a procedure is included in Annex E.

Table 3: *the Airport* Bird and Animal Hazard Management Procedures – the table outlines

Bird and Animal Hazard Management Procedures	
Procedure Number	**Title of the Procedure**
General	
1.	Runway/Bird and Animal Inspections
2.	Bird Harassment and Dispersal
3.	Reporting Bird and Animal Strike
4.	Identification of and Handling Bird and Wildlife Carcasses
5.	Bird and Animal Counts
6.	Bird and Animal Hazard Database
7.	Bird Watch
8.	Induction of staff Responsible for Bird and Animal Hazard Management
9.	Damage Mitigation Permit
Research	
1.	Research Guidelines
2.	Draft Magpie Geese Diet Research
3.	Goose Chase Trial
Firearms	
1.	Licensing and Authorisation
2.	Firearm Register
3.	Firearm Safety
4.	Use of Firearms
5.	Storage of Firearms and Ammunition
6.	Cleaning of Firearms
7.	Misfires
8.	Ammunition Records

Bird and Wildlife Hazard Management Procedures

Airport

Bird and Wildlife Hazard Management Procedures	
Procedure Number	**Title of the Procedure**
General	
1.	Runway/Bird Inspections (Bird Checks)
2.	Bird Harassment and Dispersal
3.	Reporting Bird and Wildlife Strikes
4.	Identification of and Handling Bird and Wildlife Carcasses
5.	Bird and Wildlife Counts
6.	Bird and Animal Hazard Database
7.	Bird Watch
8.	Induction of staff Responsible for Bird and Wildlife Management
Research	
1.	Research Guidelines
2.	Draft Magpie Geese Diet Research
3.	Goose Chase Trial
Firearms	
9.	Licensing and Authorisation
10.	Firearm Register
11.	Firearm Safety
12.	Use of Firearms
13.	Storage of Firearms and Ammunition
14.	Cleaning of Firearms
15.	Misfires
16.	Ammunition Records

Logo	**Bird and Wildlife Hazard Management** **General Procedure No. 01** **Runway/Bird Inspection (Bird Check)**	**Instructions:** Revision No.: 01 Review Date: 07/2005 Author: OO – E/S Approval: MAO

Objective:

- To ensure that no birds are located on the runway or within the runway strip or undershoots of Runways for the safe arrival and departure of RPT and military jets.
- To detail the correct actions and conduct of the Airport Safety Officer when carrying out these bird checks.

Responsibilities:

- The Manager Airport Operations (MAO) is responsible for initiating of Bird Checks.
- The Airport Safety Officer (ASO) is responsible for conducting Bird Checks.
- The ASO is responsible for positioning for a Bird Check for all civil aircraft arrivals/ departures.
- The Ground Air Traffic Controller (ATC) is responsible for informing the ASO in a timely manner of the arrival/ departure times for military aircraft requiring Bird Checks.

Procedure:

Bird Checks are done:
- Prior to the arrival and departure of each civil RPT and military jet operation, including any out of hour movements whether scheduled or delayed.
- Upon request.

Assistance
- ATC are to advise the ASO of estimates of RPT and military jet upon receipt.
- If for some reason the ASO cannot undertake a Bird Check, the ASO shall request the assistance of the RFFS or ATC if available.

How to conduct a Bird Check
- The ASO should be in the vicinity of the terminal and react when the aircraft starts up.
- Position yourself at either of the holding points depending on the duty runway.
- Advise the Ground Controller that you are waiting and ready for the bird check.
- Once permission is given to enter the runway, conduct the inspection.
- If any birds are found to be either on the runway or circling/flying over it then carry out the Bird Harassment and Dispersal Procedures.
- If you have to vacate prior to completing the Bird Check then, when advising the Tower that you have vacated, advise which part of the runway has not been inspected, e.g. “Vacating TWY G, north of G Bird Check incomplete.”
- If, after vacating, you notice birds flying towards the runway or moving into a potentially threatening position advise the Ground Controller immediately.

If a Bird Check is not completed or incomplete:

- Advise ATC of unchecked or incomplete areas of runway.
- Advise the Aircraft Captain In all instances where the bird inspection has not been carried out.

Note: ASO is to disperse birds (see Bird Dispersal Operating Procedure) by any approved means deemed necessary to remove birds from the runway, flight strip and runway undershoots for the safety of aircraft operations.

Annexes:

Nil

References:

Nil

LOGO	**Bird and Wildlife Hazard Management** **General Procedure No. 02** **Bird Harassment and Dispersal**	**Instructions:** Revision No.: 01 Review Date: 06/200$ Author: OO – E/S Approval: MAO

Objective:

- To detail the correct actions and conduct of the ASO for bird harassment and dispersal on the airfield.

Responsibilities:

- The Airport Safety Officer is responsible for the bird harassment and dispersal on the airfield.

Procedure:

1. Assess the safest and most effective method to be used. Bird harassment and dispersal techniques include:
- Lights and sirens
- Bird fright
- Rubber bullets
- Live cartridge

2. When bird control/harassment is necessary the following procedure is to be carried out by the ASO:
- Position yourself so that it is safe to conduct firing. Care must be taken so that there are no aircraft, vehicles, personnel, buildings, runway lights, etc in the direction of fire or within range of where you intend to fire
- Advise the Ground Controller on your intentions to fire, where you are positioned, direction of fire and get permission from them to fire if applicable
- If ATC are not available broadcast to all traffic on appropriate frequency your intention to undertake bird harassment using a firearm, intended duration of activity and advice that you will call again when activity is complete.
- Load the weapon ONLY once you are outside of the vehicle
- Visually check again that it is safe to fire
- Recover any FOD, wads, remains, etc
- If ATC available advise the Ground Controller that firing is complete
- If ATC not available broadcast to all traffic firing complete
- Record ammunition usage and birds destroyed in the Ammunitions Record Register

Notes

1. If a flock of birds or even a smaller number of larger birds is seen in the vicinity or on the airport, the Airport Safety Officer shall inform ATC or in the case where ATC is not present broadcast to All Traffic. This is especially important when an immediate hazard may exist to aircraft operations. With the appropriate information the pilot may take certain precautions either by delaying take-off or by aborting landing.

2. If birds are sighted on a runway the safety officer is to advise ATC/Pilot and request to disperse the hazard. If ATC refuse permission then ATC has the responsibility of any strike that may occur. In this situation ATC would normally put the onus onto the pilot.

3. When using bird frite ammunition in dry, hot conditions, care must be taken to ensure that the spent cartridge casing (which has a tendency to smoulder) does not set off a grass fire.

Annexes:

Nil

References:

1. Peter M Davidson Pty Ltd. June 1998, "**Bird Hazard Management Program Review**", PO Box 250 Norfolk Island 2899 Australia

Logo	**Bird and Wildlife Hazard Management** **General Procedure No. 03** **Reporting Bird and Wildlife Strikes**	**Instructions:** Revision No.: 02 Review Date: 06/2005 Author: OO – E/S Approval: MAO

Objective:

- To maintain a record of bird and wildlife strikes in the vicinity of the Airport
- To monitor the effectiveness of bird and wildlife management and control strategies implemented at the Airport.

Responsibilities:

The following persons are primarily responsible for reporting both suspect and confirmed bird and wildlife strikes on a military or civil aircraft:

- Aircrew
- Ground Engineering
- ATC
- Airport Safety Officers

Procedure:

What to Report

All strikes and bird hazards, no matter how insignificant they might appear, must be reported this includes:

Suspected bird strike:

- Carcass found on the operational area
- Aircrew suspecting they have hit a bird or animal

Confirmed bird strike

- Evidence found of the strike or witness reports confirming the strike

Airport and Civil Operators

1. Complete the Bird and Wildlife Strike Report Form

1 Submit **both** the Airline and Airport Bird and Wildlife Strike Report Form to:

- Airport Operations on Fax
- ATC on Fax
- ATSB on (02) 6274 6434

Note: The incident must be reported to ATSB within 72 hours of the incident occurring.

3. Airport to input data into the Bird/Animal hazard Database

4. File copy of Report

Example Procedures

At Joint User Bases
Defence Squadrons

1. Complete the Defence Bird Strike Form and submit to the DFS on (02) 6266 4754

2. Print a copy of the Strike Form and submit to Civil Airport Operations on Fax

3. Civil Airport Operator to input data into the Bird/Animal hazard Database

4. File copy of Report

Attachments:

1. FM715, Bird and Wildlife Strike Report Form
2. Defence Bird Strike Form

References:

1. Air Navigation Act Section 19BA, Section 19BC
2. Manual of Standards Part 139, Section 10.1.4

Attachment 1 Bird and Wildlife Strike Report Form

Australian Aviation Bird & Animal Strike Reporting Form

(Submit by Post: Reply Paid 50, PO Box 967, Civic Square ACT 2608. *No postage stamp required*)
or by Facsimile: (02) 6274 6434.

This report by: Airline ☐ Pilot ☐ ATC ☐ Aerodrome ☐ Aircraft Eng ☐ Other ☐

Aircraft Operator: _____

Aircraft Make/Model: _____ / _____

Engine Make/Model: _____ / _____

Aircraft Registration: _____

Date: Day_____ Month_____ Year_____

Local Time: _____

Dawn ☐ Day ☐ Dusk ☐ Night ☐

Aerodrome Name: _____

Departure Aerodrome: _____ **Arrival Aerodrome** _____

Runway Used: _____ **Position on Runway:**_____

Location if En Route: _____

Height AGL: _____ ft

Speed (IAS): _____ kts

Flight Details:

Pilot Warned of Birds/ Animals

Yes ☐ No ☐

Phase of Flight

Taxi	☐	Take-off Run	☐	Climb	☐	En Route	☐
Descent	☐	Approach	☐	Landing Roll	☐	Parked	☐

Effect on Flight

None	☐	Aborted Take-off	☐	Precautionary Landing	☐
Engines Shut Down	☐	Other	☐	(specify)_____	

Weather details:

Sky Condition

No Cloud ☐ Some Cloud ☐ Overcast ☐

Precipitation

None ☐ Fog ☐ Rain ☐ Snow ☐

Aircraft Details

Part(s) of Aircraft Hit

	Struck	Damaged			Struck	Damaged
Radome	☐	☐	Engine No.	1	☐	☐
Windshield	☐	☐	Engine No.	2	☐	☐
Nose (excluding above)	☐	☐	Engine No.	3	☐	☐
Propeller	☐	☐	Engine No.	4	☐	☐
Wing/ Rotor	☐	☐	Fuselage		☐	☐
Landing Gear	☐	☐	Tail		☐	☐
Lights	☐	☐				

Australian Bird & Animal Strike Reporting Form

Bird / Animal Details:

Bird / Animal Species (e.g. Seagull, Kangaroo) _____

Number of Birds/ Animals	Seen	Struck
1	☐	☐
2-10	☐	☐
11-100	☐	☐
more	☐	☐ (estimated number of birds: _____)

Size of Bird/ Animal Small ☐ Medium ☐ Large ☐

Bird Activity Low ☐ Normal ☐ High ☐

Environment Details:

Bird Control method used

_____

_____

Remarks:

(Describe aircraft damage, passenger injuries and other pertinent information)

_____

_____

_____

Direct Cost Information:

Aircraft time out of service _____hrs

Estimated cost of repairs or replacement AUD$ _____

Indirect Cost Information:

Estimated other costs AUD$ _____ (e.g. loss of revenue, fuel, hotels)

Special Information on Engine Damage Strikes

Engine Position Number Reason for failure/shutdown	1	2	3	4
Uncontained Failure	☐	☐	☐	☐
Fire	☐	☐	☐	☐
Shutdown – Vibration	☐	☐	☐	☐
Shutdown – Temperature	☐	☐	☐	☐
Shutdown – Fire Warning	☐	☐	☐	☐
Shutdown – Other _____	☐	☐	☐	☐
Shutdown – Unknown	☐	☐	☐	☐
Estimated percentage of thrust loss*	___%	___%	___%	___%
Estimated number of birds ingested	___	___	___	___

*These may be difficult to determine but even estimates are useful

Reported By **Position/ Company** **Date**

	Bird and Wildlife Hazard Management General Procedure No. 04 **Identification of and Handling Bird and Wildlife Carcasses**	**Instructions:** Revision No.: 01 Review Date: 07/2005 Author: OO – E/S Approval: MAO

Objective:

- To ensure the safe handling of bird and wildlife carcasses.
- To obtain positive identification of bird and wildlife carcasses for consistent and informed reporting.

Responsibilities:

- The Airport Safety Officer (ASO) is responsible to ensure appropriate measures are taken for identification of the bird/wildlife and the safe handling of the carcass.
- The Environment Manager (EM) is responsible in assisting the ASO in obtaining the identification of the bird/wildlife.

Procedure:

- Collect all bird (and bat) carcasses found on airport for identification and analysis.
- Wear heavy duty disposable rubber gloves (so that the remains can not penetrate through the glove) to collect carcass.
- Seal carcass in plastic bag (a heavy duty bag so that the remains can not penetrate through the glove) taking care not to contaminate the outside of the bag.
- Dispose of gloves in a trade waste bin.
- Fill out label, seal in small ziplock bag and staple to carcass bag.
- Freeze in designated bird carcass freezer (located locked storage area in the hallway of the administration building).
- Wash hands in disinfectant hand wash.
- Fill out Bird Strike Form if applicable (see Procedure No.3).
- Fill out Identification Form (attached)
- Send carcass to **Nominated facility** for identification.
- Handle carcasses that are depredated to reduce the birdstrike risk in the same manner and dispose of carcass in the designated pit at the Landfill.

Annexs:

1. Bird/Bat Identification/Chain of Custody Form
2. Bird/Wildlife Remains Identification Tag.

References:

Nil

Bird/Bat Identification/Chain of Custody Form			
Airport Safety Officer to Complete:			
Date/Time:			
Species:			
Cause of death:			
Bird Strike No.:			
Name:	Position:	Date:	Time:
Vet to Complete:			
Species:			
Sex:			
Age:			
Name:	Position:	Date:	Time:

DATE: **SPECIES: .....** **BIRD STRIKE NO: 200201** **Airport Name**	**DATE: .....** **SPECIES: .....** **BIRD STRIKE NO: 200202** **Airport Name**
DATE: **SPECIES:.....** **BIRD STRIKE NO: 200203** **Airport Name**	**DATE: .....** **SPECIES: .....** **BIRD STRIKE NO: 200204** **Airport Name**
DATE: **SPECIES:.....** **BIRD STRIKE NO: 200205** **Airport Name**	**DATE: .....** **SPECIES: .....** **BIRD STRIKE NO: 200206** **Airport Name**

	Bird and Wildlife Hazard Management **General Procedure No. 05** **Bird and Wildlife Counts**	**Instructions:** Revision No.: 01 Review Date: 07/2005 Author: OO – E/S Approval: MAO

Objective:

- To collate information on the species of birds that frequent the airport and to identify areas that birds are attracted to, to determine appropriate bird management strategies.

Responsibilities:

- The Airport Safety Officer (ASO) is responsible for conducting Bird/Animal Counts.

Procedure:

- Conduct Bird and Wildlife Counts twice a week at morning, midday and afternoon on every Wednesday and Saturday.
- Undertake Bird and Wildlife Counts regardless of bird activity levels, weather or any other factors.
- Visit each of the ten areas (see FM755) in sequence along the prescribed route outlined on the Bird and Wildlife Count Area Plan.
- Scan the entire area, using binoculars if necessary.
- Record all birds sighted within each area on the Bird and Wildlife Count Form (FM755).
- Enter data from the Count to be entered into the Bird Management database for analysis.

Completing the Bird and Wildlife Count Form

- Obtain information for the weather conditions from the ATIS on radio frequency 133.5.
- Obtain data for the Rain Last 24 hours from the Bureau Meteorology web site – www.bom.gov.au
- Enter the following information for the sections contained within the Weather Conditions:
  Wind Direction: calm; E; N; NE; NW; S;SE; SW; W or variable.
  Wind Speed: 0-5 knots
  5-10 knots
  10-15 knots
  15-20 knots
  >20 knots
  Temperature: measured in degrees Celsius (°C)
  Cloud: the amount of cloud is indicated by the following abbreviations:

SKC or, if appropriate, CAVOK	no cloud
FEW	1 to 2 OKTAS
SCT (scattered)	3 to 4 OKTAS
BKN (broken)	5 to 7 OKTAS
OVC (overcast)	8 OKTAS
CU Cumulus	
TCU Towering Cumulus	

Example Procedures

Note: Bird dispersal, if required during a Count, should not influence the number of birds entered onto the Bird/Animal Count Form. The number of birds on that area prior to dispersal is to be entered on to the form.

Annexes:

1. FM755 Aerodrome Bird and Wildlife Count
2. Bird and Wildlife Count Areas

References:

1. " Airport Bird Manual"

2. ECO-Sure Environmental Consultants, January 2000," Airport Bird Manual", 82 Companion Way, Tweed Heads NSW 2485, Australia

3. Simpson & Day, 1996,"Field Guide to the Birds of Australia, Fifth edition", Viking, Penguin Books Australia Ltd, 487 Maroondah Highway, Ringwood, Victoria 3134 Australia

4. Air Services Australia Oct 1998 "Aeronautical Information Publication Australia"

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Annex 1 Aerodrome Bird and Wildlife Count

DATE	TIME	OBSERVER

WEATHER CONDITIONS

WIND DIRECTION	WIND SPEED	TEMPERATURE	CLOUD	RAIN LAST 24 HRS

BIRD SPECIES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Black kite										
Brahminy kite										
Brolga										
Bustard turkey										
Cormorant										
Curlew										
Duck										
Egret										
Falcon										
Heron										
Ibis										
Magpie										
Magpie geese										
Magpie lark										
Martins										
Myna										
N/k kestrel										
Pelican										
Plover										
Spoonbill										
Swallows										
Others										
Overflying flocks of birds ▪ How many? ▪ What direction ▪ What portion of runway?										
Comments:										

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Annex 2

Bird and Wildlife Count Areas

	Bird and Wildlife Hazard Management **General Procedure No. 06** **Bird and Animal Hazard Database**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To store and analyse bird count, birdstrike and ammunition data.
- Analyse trends to assist in determining bird and wildlife management strategies.

Responsibilities:

At the end of each shift the Airport Safety Officer (ASO) is responsible for:

- Entering information derived from birdstrike, bird count and ammunition forms into the database.

Each quarter or as required the ASO or Manager Airport Operations (MAO) is responsible for:

- Analysing the trends in bird strikes and bird counts.

Annually the Quality Systems Manager (QSM) or a qualified consultant is responsible for:

- Providing a detailed analysis of the bird count and birdstrike data.

Procedure:

How to enter data into the Bird and Animal Hazard Database:

1. Open shortcut to Bird_Animal Hazard Management Database.
2. Choose either of the following:
   - Enter Daily Weather Report
     - Note: this database is in development
   - Enter Ammunition Record
     - Note: this database is in development
   - Enter Count Data
   - Enter Birdstrike Data
   - Edit Data
   - Parameters Maintenance
   - Reports
   - Exit
3. Use drop down boxes in each section to complete the forms.
4. Press Save to save the entered data.
5. If an error is made whilst entering data click on Edit Data.
6. Enter the date of the record to edit.
7. Edit data accordingly

8. Press Save
9. Exit

Annexes:

Nil

References:

Nil

	Bird and Wildlife Hazard Management General Procedure No. 07 **Bird Watch**	**Instructions:** Revision No.: 01 Review Date: 03/2004 Author: OO – E/S Approval: MAO

Objective:

- To identify actions required for Bird Watch conditions. Bird Watch establishes procedures to use for the immediate exchange of information between ground agencies and aircrews concerning the existence and location of birds that pose a hazard to flight safety.

Responsibilities:

- The Manager Airport Operations (MAO) is the authority to declare a Bird Watch condition and shall liaise with ATC in establishing or reviewing a Bird Watch condition.

Procedure:

1. Assess the category of Bird Watch by using the following terminology:

   e. **Bird Watch condition SEVERE**. Heavy concentration of birds on or immediately above the active runway or other specific locations that represent an immediate hazard to safe flying operations.

   f. **Bird Watch condition MODERATE**. Concentrations of birds observable in locations that represent a probable hazard to safe flying operations.

   g. **Bird Watch condition LOW**. Normal bird activity on and above the airfield with a low probability of hazard.

   h. **Bird Watch ALERT**. Weather, time of day and seasonal conditions which make an influx of birds onto the airfield likely.

Assessments are made using the following resources:

- Bird Count data
- Airport Safety Officer Log Book
- Ammunition Register
- Airfield inspection

2. Implement the procedures that are associated with each Category as outlined in the following table:

Bird Watch Condition	Procedures
Alert	Mowing
	Bird Counts
	Harassment as required
Low	Mowing
	Bird Counts
	Harassment as required
	Monitor activity and report to MAO
Moderate	Low +
	Bird Checks
	Intensive Harassment
	MAO and ATC to liaise and consider further actions
	ATC to include the Bird Watch condition on the ATIS
Severe	Moderate +
	Issue NOTAM
	Assessment of Flight Paths
	Additional Resources
	Advise Operators of Severe Bird Watch conditions

3. Write up a Bird Watch Report using the Bird Watch template.

4. Email (save as Word and in rich text format .rtf) or fax the Bird Watch report to the personnel on the Bird Watch Recipient List.

   It is the responsibility of each recipient to ensure contact details are kept current at all times and the MAO is notified of any changes.

Aircrew Responsibilities and Procedures

If an aircrew observes or encounters any bird activity while in flight, which could constitute a hazard, the aircrew are to contact ATC and request that the observed bird activity be passed on to the relevant authority. The following information is necessary:

- Call sign
- Location
- Altitude
- Time of sighting
- Type of bird (if known)
- Approximate number of birds
- Behaviour of birds (soaring, flying to or from a location, etc)

Aircrew should be aware of the codes associated to Bird Watch conditions and in particular with Condition SEVERE or ALERT. During these conditions:

- ATC may consider changing runways, delaying take offs and landings, changing circuit altitude, etc.

Example Procedures

Annexes:

1. Bird Watch Template
2. Bird Watch Recipient List

References:

1. Aerodrome Manual Part 2, Section 9.
2. Airport Bird and Wildlife Hazard Management Plan

Airport

Bird Watch Report | No.

Condition:

Legend

Bird Watch condition SEVERE. Heavy concentration of birds on or immediately above the active runway or other specific locations that represent an immediate hazard to safe flying operations.

Bird Watch condition MODERATE. Concentrations of birds observable in locations that represent a probable hazard to safe flying operations.

Bird Watch condition LOW. Normal bird activity on and above the airfield with a low probability of hazard.

Bird Watch ALERT. Weather, time of day and seasonal conditions which make an influx of birds onto the airfield likely.

Issue date:	Review date:
Prepared By: Name Position Company	Contact Details: Phone: Fax: Mobile:

Details

Location:
Time of Day:
Type and Number of Birds/wildlife:

Bird/wildlife management strategies implemented

Issue of NOTAM

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Example Procedures

Name	Title	Company	E-Mail	Phone	Fax

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	Bird and Wildlife Hazard Management General Procedure No. 08 **Induction of staff responsible for Bird Management**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure that staff that are responsible for bird and wildlife management have the knowledge and skills to implement the Bird and Wildlife Management Strategies.

Responsibilities:

- The Manager Airport Operations (MAO) is responsible to ensure that all operational staff are proficient in their bird and wildlife management duties.

Procedure:

Prior to employment the employee must have the completed the following:

1. Airport Safety Officer Course
2. Firearm Licence (Cat. A, B and C)
3. Airside Drivers Licence (Cat.4)
4. Radio Operators Certificate
5. Bird and Wildlife Management Employee Competency Form checked and approved by MAO

Prerequisite

- Firearm Licenses (Cat. B and C)
- Airside Drivers Licence Cat 4
- Gun Safety
- Shooting on airfield
- Characteristics of ammunition
- Bird Identification – see what is covered in course
- Bird Count Procedures - competency
- Bird Harassment Procedure
- Bird Strike Procedure
- Bird Inspections

Annexes:

1. Bird and Wildlife Management Employee Competency Form

References:

1. Bird and Wildlife Management Procedures
2. Bird Identification Book

Bird and Wildlife Management Employee Competency Form	
Employee:	
Activity	**Competent** (Y-Yes, N-Not Yet)
Firearm Licences Cat. A Cat. B Cat. C	
Airside Drivers Licence Category 4	
Radio Operators Certificate	

Knowledge and practical competency of Bird and Wildlife Management Procedures:

General	
1.	Runway/Bird Inspections (Bird Checks)
2.	Bird Harassment and Dispersal
3.	Reporting Bird and Wildlife Strikes
4.	Identification of and Handling Bird and Wildlife Carcasses
5.	Bird and Wildlife Counts
6.	Bird and Animal Hazard Database
7.	Bird Watch
8.	Induction of staff Responsible for Bird and Wildlife Management

Firearms	
17.	Licensing and Authorisation
18.	Firearm Register
19.	Firearm Safety
20.	Use of Firearms
21.	Storage of Firearms and Ammunition
22.	Cleaning of Firearms
23.	Misfires
24.	Ammunition Records

Bird Identification	
Knowledge of Airfield in wet and dry season	
Comments	

Sign Off

Name: Position: Sign: Date:

	Bird and Wildlife Hazard Management Research Procedure No. 1 **Research Guidelines**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To outline the criteria for research to be conducted.

Responsibilities:

- The Operations Manager is responsible for the use of the of the Research Guidelines.

Procedure:

- The attached proforma is to be completed for each research project undertaken by Bird and Animal Hazard Management Committee.

Annexs:

- Bird Management Research Proposal Paper

References:

BIRD MANAGEMENT RESEARCH PROPOSAL PAPER

1. **Project Title** (Brief, precise and informative to persons outside your field.)

Short Title (Short, descriptive title of 40 characters maximum)

2. **Project Summary** (Provide a summary of the project that is no more than 100 words. The summary should be intelligible to the lay reader, and outline the aims of the research, the expected outcomes and the overall significance of the project.)

3. **Summary of Chief Investigators**

Surname, title and initials	Company/Department

4. **Clearance Requirements**

	YES	NO
(a) Does the work require a Works Permit?		
(b) Does the work require an Environmental Compliance Certificate?		

5. **Budget Information**

Detailed budget items	Amount Requested
1. Personnel	
2. Equipment	

3. Maintenance	
4. Travel	
5. Other	

Financial Summary

Financial Year	Personnel $	Equipment $	Maintenance $	Travel $	Other $	Total $

6. Aims, significance and expected outcomes

Hypothesis:
Aims:
Significance:
Background:
Expected Outcomes:

7. Research Plan, methods and techniques

Aim 1:
Experiment 1:
Rationale:

Method:

Insert additional tables for additional Aims and/or Experiments

8. Proposed Timing (Mark time line)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Experiment 1
Experiment 2

Specific Dates:_____

9. Role of Chief Investigators

10. Justification of the Budget

11. Bibliography
(Use the following format to compile bibliography:
Author/s, (year of publication). Title of publication. Publisher, publishers address. Page number.

	Bird and Wildlife Hazard Management *Firearms Procedure No. 01* **Licensing And Authorisation**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure that staff are licensed and authorised to shoot at the airport.

Responsibilities:

- The Manager Airport Operations (MAO) is responsible to ensure that all staff are licensed.
- The Chief Executive Officer (CEO) is the authority for use of firearms at the airport.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Procedure:

Licensing of Personnel

Prior to any Airport Operations Officer discharging firearms at Airport, the MAO shall be satisfied that the person has successfully completed the following:

- Has an appreciation of the capabilities and effectiveness of firearms and ammunition.
- Has been deemed competent by an authorised Firearms Training Officer on the Firearms Legislation and Safety Course.
- Holds a valid and current State Class A, B and C Firearms License.
- Has been deemed competent on the relevant Operations Training Modules associated with firearms and bird control activities.
- Has written authorisation from the Chief Executive Officer to use firearms at Airport and is nominated to use firearms at the airport under the Company Licence (that is issued under MAO's name).

The licensed personnel are to be added to the Firearms Licence Register that is stored in File Number 6.1.12 Firearms.

Licensing of Firearms

- All firearms used at the airport must be licensed under the Weapons Act 1990 and added to the Company Licence that is issued under MAO's name.
- Firearms used at the airport must be added to the Airport Firearm Register (refer to Firearm Procedure No.2).
- Any modifications to the firearm must be done by a licensed gunsmith and noted on the Register.

Annexes:

Firearms Licence Register Form

References:

1. Weapons Act 1990

Firearms Register - Airport

Manufacturer/Type:		
Model/Calibre:		
Serial Number:		
Vendor:		
Permit Number:		
Date of Purchase:		
Date of Disposal:		
Method of Disposal:		
Servicing Record		
Date taken from service	**Name of servicing Agency**	**Date returned to service**

	Bird and Wildlife Hazard Management *Firearms Procedure No. 02* **Firearms Register**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To maintain and regularly audit an Airport Firearm Register.

Responsibilities:

- The Airport Safety Officer (ASO) is responsible for the record keeping of the Register.
- The Operations Officer – Environment/Security (OO – E/S) is responsible to conduct the annual audit on the Register.

Definitions:

Firearm – shotgun

Procedure:

- Maintain the Airport Firearm Register that outlines the type of firearms, the manufacturer, model serial number, vendor, and permit number, date of purchase, date and method of disposal.
- The servicing record of each firearm is to recorded on the individual Firearm Register.
- The OO – E/S is to audit the Register annually.

Annexs:

Airport Firearm Register Form

References:

1. Weapons Act 1990

Firearms Register - Airport

Manufacturer/Type:

Model/Calibre:

Serial Number:

Vendor:

Permit Number:

Date of Purchase:

Date of Disposal:

Method of Disposal:

Servicing Record

Date taken from service	Name of servicing Agency	Date returned to service

	Bird and Wildlife Hazard Management *Firearms Procedure No. 03* **Firearm Issue and Return Register**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To maintain a record of the use of ammunition issue and return of weapons that are used for operations and to validate that the firearms are secured at night.

Responsibilities:

- The Duty Airport Safety Officer (ASO) is responsible for the record keeping of the Register.
- The Manager Airport Operations (MAO) is responsible to conduct a six month audit on the Register.

Definitions:

Firearm – shotgun

Procedure:

- The Duty ASO is to sign the Register at the commencement of duty and at the end of the shift.
- At the end of the night shift the Duty ASO is to sign off that the weapons are secured in the locked firearms cabinet.

Annexs:

Firearm Issue and Return Register

References:

1. Weapons Act 1990

AIRPORT FIREARMS ISSUE / RETURN REGISTER

Weapon	*Issue to (Please Print)*	*Signature*	*Date/Time*	*Handed over to (Please Print)*	*Signature*	*Date/Time*	*Signature of Officer securing after pm shift*

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	Bird and Wildlife Hazard Management *Firearms Procedure No. 04* **Ammunitions Register**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To maintain a Register for the control of the quantity and quality of ammunition and to record of bird/wildlife destroyed.

Responsibilities:

- The Airport Safety Officer (ASO) is responsible for the record keeping of the Register.
- The Operations Officer – Environment/Security (OO – E/S) is responsible to conduct the annual audit on the Register.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearm – shotgun

Procedure:

- The Duty ASO is to sign the Register at the commencement of duty and at the end of the shift record the details of the ammunition used and the bird/wildlife destroyed during the shift.

Annexs:

Airport Ammunition Register

References:

1. Weapons Act 1990

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AIRPORT - AMMUNITION REGISTER

Ammo Type*	Quantity	Issued to	Signed	Date/Time	Quantity Used	Quantity Returned	Signed

*** Ammo Types - Birdfrite = BF 12 Gauge Shot = 12G**

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	Bird and Wildlife Hazard Management *Firearms Procedure No. 05* **Firearm Safety**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure the safe operations of firearms at Airport.

Responsibilities:

- All Airport Operational staff are responsible for the safe use and storage of firearms.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Live Rounds – cartridges that contain shot or a solid projectile

Cracker Shot – a cartridge specifically designed for the purpose of scaring, rather than killing, birds.

Procedure:

There are simple rules that all Operation staff should be aware of when handling firearms and ammunition, these rules are as follows:

- ALWAYS TREAT FIREARMS AS if they were LOADED – do NOT rely on the safety selector.
- ALWAYS ENSURE that a FIREARM IS UNLOADED and EMPTY with the action open BEFORE TAKING IT INTO ANY VEHICLE or building and BEFORE NEGOTIATING ANY OBSTACLE, gate or fence.

- ALWAYS ENSURE that gun BARRELS ARE CLEAR of any obstruction BEFORE LOADING. BLOCKED BARRELS CAN BURST and cause severe injury.
- ALWAYS CLEAN AND MAINTAIN a firearm in accordance with the owner's manual.
- ALWAYS maintain a FIRM SAFE GRIP on a firearm and carry it so that the direction of the barrel can be controlled in the event of a fall or stumble.
- ALWAYS BE ALERT to the danger of people, vehicle, aircraft, etc moving into line of fire both in front of and behind the target area.
- ALWAYS UNLOAD a firearm that is to be carried WHEN CLIMBING or when negotiating rough or uneven ground.
- NEVER POINT or aim a firearm AT A PERSON.
- NEVER POINT or aim a firearm at an object or at a target area UNLESS INTENDING TO SHOOT. Always ensure that the area between yourself and behind the target is clear of people, vehicles, aircraft etc moving into the line of fire
- NEVER SHOOT AT a flat, HARD SURFACE or at the surface of water.
- NEVER LEAVE a loaded FIREARM UNATTENDED.
- Always stow the firearm in the cradle.
- Always ensure that Cracker Shot is separated from Live Rounds.
- Never interfere with Live Shotgun Cartridges or Cracker Shot
- Never shoot from inside the vehicle
- Always store and use ammunition in accordance with the manufacturers instructions and recommendations
- Remove all FOD such as wadding, bird frite canisters etc from the runway
- Secure the weapons in the locker situated on the drivers' side of the vehicle when off base.
- Report all weapon faults or unserviceabilities to the OIC Firearms

- Personnel using shotguns are to use hearing and eye protection as provided.
- Either spend the round in the chamber OR do not have a loaded gun in the vehicle.
- A licensed gunsmith is to carry out a safety check annually on each firearm. The safety check is to be recorded on the Firearm Register's service record section.

Example Procedures

Annexs:

Airport Firearm Register

References:

1. Weapons Act 1990

Firearms Register - Airport

Manufacturer/Type:		
Model/Calibre:		
Serial Number:		
Vendor:		
Permit Number:		
Date of Purchase:		
Date of Disposal:		
Method of Disposal:		
Servicing Record		
Date taken from service	**Name of servicing Agency**	**Date returned to service**

	Bird and Wildlife Hazard Management *Firearms Procedure No. 06* **Use of Firearms**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure the proper use of firearms at the airport.

Responsibilities:

- All Airport Operational staff are responsible for the proper use of firearms on airport.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Live Rounds – cartridges that contain shot or a solid projectile

Cracker Shot – a cartridge specifically designed for the purpose of scaring, rather than killing, birds.

Procedure:

- Only weapons registered to the MAO or approved for use on the airport by the MAO are to be used on the airport
- Only authorized shooters or those given permission by the MAO are permitted to shoot on the airport

- Firearms are to be used only for the harassment and control of birds and animals and they are not to be removed from the airport for any other purpose other than maintenance inspection or licensing.
- Firearm safety, as outlined in Procedure No. 05 must be adhered to at all times.
- The sawn off single barrel shotgun is the ONLY weapon to be used for BIRDFRITE.
- The under/over and pump action shotguns are for 12 gauge (live rounds) use ONLY.
- The under/over shotgun CAN NOT be used for solid rounds.

Annexes:

Nil

References:

1. Firearm Procedure No. 05

	Bird and Wildlife Hazard Management *Firearms Procedure No. 07* **Storage of Firearms and Ammunition**	**Instructions :** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure safe storage of firearms and ammunition at Airport.

Responsibilities:

- All Airport Operational staff are responsible to ensure the safe storage of firearms and ammunition.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Live Rounds – cartridges that contain shot or a solid projectile

Cracker Shot – a cartridge specifically designed for the purpose of scaring, rather than killing, birds.

Procedure:

ALWAYS STORE and use AMMUNITION SAFELY and strictly in accordance with the manufactures instructions.

ALWAYS ENSURE that live-shot 12 gauge CARTRIDGES ARE SEPARATED from bird frite. Severe personal injury could occur if, through inadequate housekeeping, cartridges are mixed with a live-shot cartridge.

Cartridges are to be different colours:

- Bird Frite – Red
- 12 Gauge – Black and Yellow Or as approved by MAO

Storage of Firearms in Vehicle

The Airport Safety Officer vehicle is fitted with a gun rack and security cabinets to lock the firearm in the vehicle. All firearms are to be stored in the locked cabinets in the following situations:

- When firearms are not in use
- When in public areas or off the airport
- During Airport emergencies

At the commencement of each shift the person coming on should check the firearms to ensure that they are in a safe condition.

Storage of Ammunition in the Vehicle

The Airport Safety Officer vehicle is fitted with ammunition boxes and all ammunition should be stored in these boxes when not in use. The only ammunition in the passenger area should be that required for immediate use in the gun.

Storage of Ammunition in the Vehicle
The Airport Safety Officer vehicle is fitted with ammunition boxes and all ammunition should be stored in these boxes when not in use. The only ammunition in the passenger area should be that required for immediate use in the gun.

Annexs:

Nil

References:

1. Firearms Act 1990

	Bird and Wildlife Hazard Management *Firearms Procedure No. 08* **Cleaning of Firearms**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure that all firearms are well maintained.

Responsibilities:

- The Duty Airport Safety Officer is responsible for the cleanliness and safe operation of the firearm.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Live Rounds – cartridges that contain shot or a solid projectile

Cracker Shot – a cartridge specifically designed for the purpose of scaring, rather than killing, birds.

Procedure:

- All firearms are to be inspected for cleanliness daily. A dirty mechanism can result in a misfire.
- Firearms are to be cleaned at least weekly or after any period of heavy use.
- Firearms will also require cleaning in the event of a misfire.

Example Procedures

Annexs:

Nil

References:

Nil

	Bird and Wildlife Hazard Management *Firearms Procedure No. 09* **Misfires and Unexploded Ammunition**	**Instructions:** Revision No.: 01 Review Date: 06/2004 Author: OO – E/S Approval: MAO

Objective:

- To ensure appropriate procedures are implemented in the case of a misfire or unexploded ammunition to ensure the safety of personnel.

Responsibilities:

- All Airport Operational staff are responsible to ensure that this procedure is adhered to.

Definitions:

Authorised Shooter: - A person who is required by MAO to use firearms on the airport for the purpose of controlling birds and animals

Firearms Training Officer – a person appointed by the MAO to train, or arrange training of personnel who are required to use firearms to control birds or animals at the airport.

Firearm – shotgun

OIC Firearms – a person appointed by the MAO to be responsible for the safe custody of all firearms and ammunition on the airport

Live Rounds – cartridges that contain shot or a solid projectile

Cracker Shot – a cartridge specifically designed for the purpose of scaring, rather than killing, birds.

Procedure:

If a round does not go off the following actions are required:

- Keep the muzzle pointed in a safe direction
- Wait two minutes in case of delayed fire.
- Carefully open the action keeping the rear of the shell pointed away from yourself and anyone else.
- Look at the base of the shell to see if the primer has been struck. If it has been struck and there is a definite indentation then carefully remove the round and place in a safe confined

area. Advise the Firearm Officer. If soft struck or not struck at all remove the round and place the weapon in the safe. Advise the Firearms Officer.

- A licensed gunsmith is to be organized to inspect the weapon.
- Ensure that once safe the firearm is cleaned.
- Unexploded bird frite recovered are to be disposed of by immersion in water until disintegrated.

Annexes:

Nil

References:

Nil

Annex A: Airport Plans

Airport Habitat Plan

Airport Locality Plan (showing surrounding land use)

Bird Count Area Plan

Annex B: Legislation

Change in accordance with the Airport's situation

The Airport is situated on Commonwealth land and the following legislation applies to both civilians and the military operators:

- Airports Act 1996
- Airports (Environment Protection) Regulations 1997
- Environment Protection and Biodiversity Conservation Act 1999

  Information, contacts, permits etc regarding the EPBC are available from DEH: http://www.deh.gov.au/epbc/index.html

Aircraft safety regulations however differ between the civil and military operators. The following section outlines the legislation that applies to them.

Civil Aircraft Safety Legislation

Australia has international obligations as a contracting state to the International Civil Aviation Organisation. The Commonwealth has entrusted the enforcement of its obligations to the Civil Aviation Safety Authority (CASA). CASA enacts and enforces the Civil Aviation Regulations.

The following legislation applies to civil operators within Australia:

- Civil Aviation Safety Regulations 1998 (CASR), Part 139 - Aerodromes
- Manual of Standards – CASR Part 139
- Air Navigation Act Section 19BA, Section 19BC.
- International Civil Aviation Organisation ANNEX 14

Defence Aircraft Safety Legislation (If applicable)

The Director of Flying Safety (DFS) enacts and enforces the Defence Act for aircraft safety within the Australian Defence Force. At The Airport, the Senior Air Traffic Controller (SATCO) has the role of Base Flying Safety Officer (BFSO). The BFSO reports any incidents at The Airport to the DFS.

Annex C: Bird and Animal Hazard Management Committee

AGENDA		
Purpose:	**Bird and Animal Hazard Management Committee Meeting**	
Date:	**Time:**	**Venue:** ***the Airport***

1. Welcome and apologies
2. Confirmation of previous Minutes
3. Safety Officers Report - Bird Strike and Bird Count Statistics
4. Region Bird Observers Club – Report
5. Bird and Wildlife Hazard Management Plan
6. Land Management
7. Review of Plan Effectiveness
8. Other Business
9. Next Meeting

Annex C – Bird and Animal Hazard Management Committee

The following Report is an example of a Bird and Animal Hazard Management Update Report that is presented to the Bird and Animal Hazard Management Committee

Bird and Animal Hazard Management Update Report
15 July 2004 to 15 December 2004

Townsville Airport

Author: Warren Jones
Operations Officer Safety

Australian Airports (Townsville) Pty Limited

Annex C – Bird and Animal Hazard Management Committee

1. Introduction

Australian Airports (Townsville) Pty Ltd continue to maintain a policy to reduce the risk of bird strikes. The data contained in this report has been collated to provide information to the Bird Management Committee on bird control at Townsville Airport.

1.1 Aim

The aim of this report is to outline the bird strike details and other relevant information during the period 15 July 2004 to 15 December 2004

1.2 Sources of Information

The Operations Officer (Safety) maintains records of:

- bird strikes, both confirmed and suspected
- bird count register
- rainfall data from the Bureau of Meteorology
- collects data for the ATSB

2. Findings

2.1 Bird Strikes

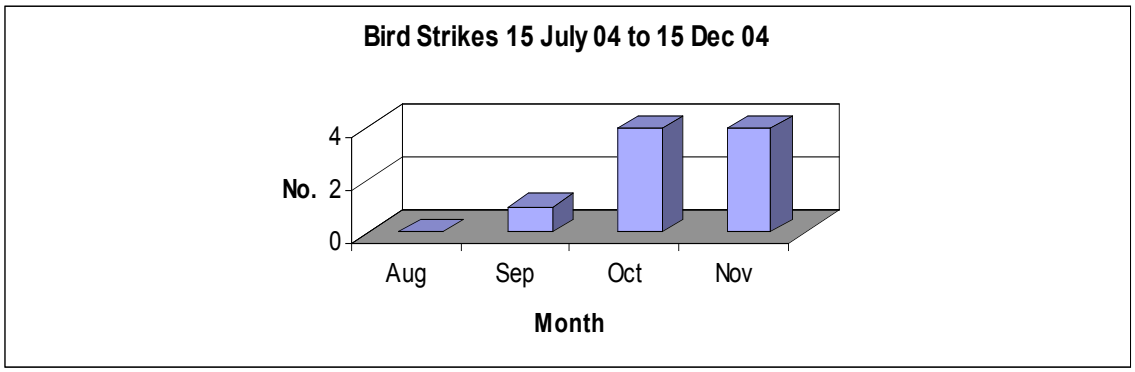
There have been a total of **9** confirmed bird strikes for this reporting period, compared with **11** bird strikes for this period last year.

There has been **nil** suspected bird strike during this reporting period.

Table 1: Comparison of Bird Strike Species – 2003 to 2004 for same reporting period

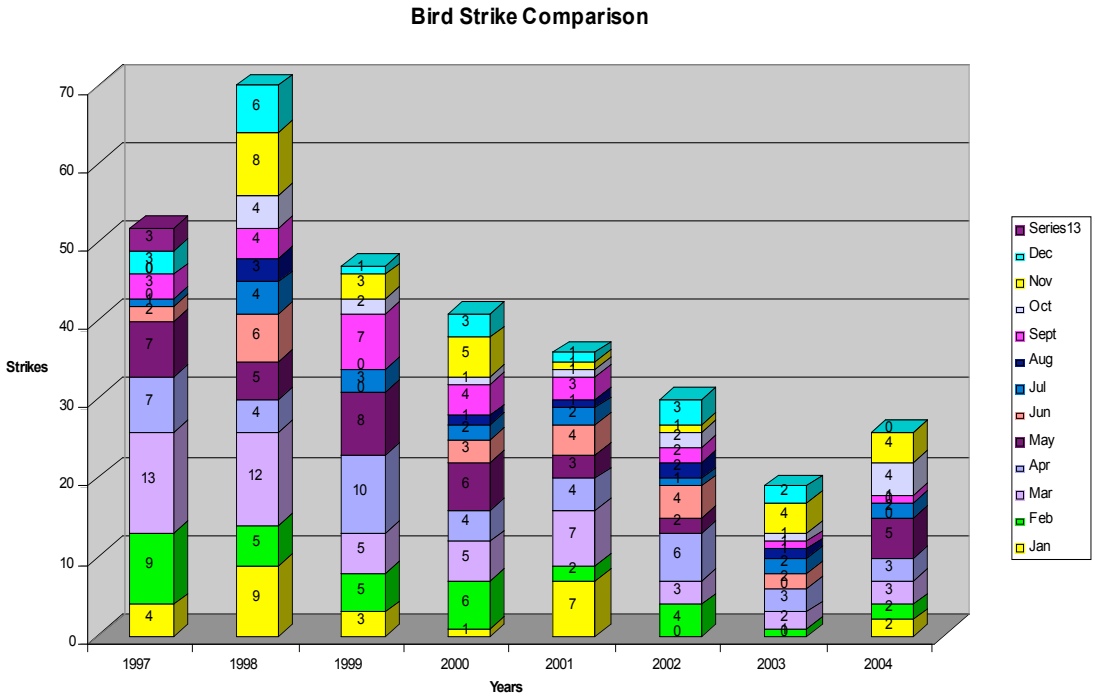
2003	2004
1 x Duck	3 x Flying Fox
1 x N/Kestrel	1 x White Ibis
4 x Flying Fox	1 x Magpie
1 x S/N Ibis	2 x Magpie Lark
1 x Finch	1 x N/Kestrel
3 x Unknown	1 x Unknown
Total: 11	**Total: 9**

2.2 Monthly Breakdown of Bird Strikes



2.3 Record of Bird Strikes

YEAR	NO. OF BIRDSTRIKES
1989	70
1990	41
1991	30
1992	27
1993	20
1994	19
1996	29
1997	49
1998	70
1999	47
2000	41
2001	36
2002	30
2003	19
2004	26 to Date



2.4 Mean Rainfall Record.

	1996	1997	1998	1999	2000	2001	2002	2003	2004
JAN	346.8	121.6	973.8	149.8	157.4	47.2	84.8	18.6	212.6
FEB	41.4	392.4	159.8	317.4	845.4	236	549	316	378
MAR	14.0	427.8	72.4	138.4	176.6	58.4	53	73.2	60.4
APR	25.0	8.4	52	100	546.2	10	5.6	20.8	54.8
MAY	9.8	48.2	92	9.8	32	0	19.8	8	2
JUN	2.8	21.2	17.4	0.4	4.8	9.4	18	5	0.4
JUL	2.8	21.2	8.8	14.4	0.4	8.0	0	0.4	2.8
AUG	2.8	21.2	258.2	6.2	0.2	0	11	7.6	0.4
SEP	2.8	16.6	31.2	0.2	0.4	1.2	1	0.8	6.4
OCT	63.6	8.4	108	2.2	45.4	25.8	0	32.2	8.4
NOV	59.6	3.2	104.8	186	345.2	71.2	1.4	9	23.8
DEC	51.2	400.6	122.4	151.6	219.2	0	25.4	88.8	35 to date
TOTAL	622.6	1490.8	2000.8	1076.4	2377.2	467.2	769	580.4	785 To Date

2.5 Bird Control

The following birds have been taken for this period.
Plovers- 14 Curlews- 4

Annex D: Bird Watch Example

Airport

Bird Watch Report	*No. 36*

Condition: Moderate / Alert current for Dawn and Dusk due Magpie Geese concentration at these times

Issue Date: 17 January 2005	**Review Date: 17 February 2005**
Prepared By: Warren Jones Operations Officer - Safety Australian Airports (Townsville) Pty Limited Authorised by Peter Pallot Manager - Airport Operations	**Contact:** Phone 07 47273211 (BH) Mobile 0418771999 (WH) Fax 07 47791843 **E-mail warren.jones@austairports.com.au**

Details:

Bird activity in the vicinity of the airport has increased after the recent rain.

Magpie Geese are currently breeding in the Town Common. Significant numbers of geese are being sighted feeding on the western side of the airfield during the early mornings from daybreak to 0800 and from 1730 to sunset. Additional staff resources have been allocated for bird harassment during these peak times as required.

The Airport Safety Officer in liaison with ATC will endeavour to apply bird avoiding strategies or bird position information to aircrew where possible.

The Safety Officer continues to conduct bird harassment and runway inspections prior to each jet operation to check for birds on and near the runway. Aircraft may experience short delays on take off whilst bird dispersal is underway.

As always if we can be of any further assistance please don't hesitate to call on 0747273211 (BH) or 0418771999 (0515hrs – 2130hrs) should you require any further information.

Regards
Warren Jones

Annex E: Procedure Format Example

AIRPORT LOGO	*Bird and Animal Hazard Management Procedure No.* **Title**	**Instructions:** Revision No.: 01 Review Date: Author: Approval:

Objective:

Responsibilities:

Definitions:

Procedure:

Attachments

References:

Annex F
Example Risk assessment data and calculations

Species Name	Likelihood Rating	Severity Rating	Conclusion
A	G	L	M
Nankeen Kestrel	moderate	Low	Unacceptable (multiple strikes)
Feral Pigeon	moderate	high	Unacceptable
Grey-headed Flying Fox	low	v. high	Unacceptable
Wedge-tailed Eagle	low	v. high	Unacceptable
Australian Pelican	v. low	v. high	Review
Red Fox	low	High	Review
Australian Hobby	low	v. low	Acceptable
Australian Magpie	high	v. low	Acceptable
Australian White Ibis	v. low	v. low	Acceptable
Australian Wood Duck	low	v. low	Acceptable
Banded Lapwing	v. low	v. low	Acceptable
Barking Owl	v. low	v. low	Acceptable
Barn Owl	low	v. low	Acceptable
Black Kite	low	v. low	Acceptable
Black-shouldered Kite	low	v. low	Acceptable
Brown Falcon	low	Moderate	Acceptable
Brown Hare	moderate	v. low	Acceptable
Chocolate Wattled Bat	low	v. low	Acceptable
Common Blackbird	v. low	Moderate	Acceptable
Common Starling	low	Moderate	Acceptable
European Greenfinch	low	v. low	Acceptable
European Rabbit	low	v. low	Acceptable
Feral Cat	v. low	v. low	Acceptable
Galah	v. low	v. low	Acceptable
Gould's Wattled Bat	moderate	v. low	Acceptable
House Sparrow	low	v. low	Acceptable
Latham's Snipe	v. low	v. low	Acceptable
Little Raven	moderate	v. low	Acceptable
Magpie-lark	low	v. low	Acceptable
Masked Lapwing	moderate	v. low	Acceptable
Pacific Black Duck	low	v. low	Acceptable
Pacific Golden Plover	v. low	v. low	Acceptable