



CIVIL AVIATION GUIDANCE MATERIAL – 1400



WILDLIFE HAZARD MANAGEMENT PROGRAMME

CIVIL AVIATION AUTHORITY OF MALAYSIA

INTENTIONALLY LEFT BLANK

Introduction

This Civil Aviation Guidance Material 1400 (CAGM – 1400) is issued by the Civil Aviation Authority of Malaysia (CAAM) to provide guidance for the Wildlife Hazard Management at the aerodrome, pursuant to Civil Aviation Directives 14 Vol. I – Standards for Aerodrome (CAD 14 Vol. I – Standards for Aerodrome).

Organisations shall use these guidelines to ensure compliance with the respective provisions of the relevant CAD's issued. Notwithstanding the Regulation 65 of the Civil Aviation (Aerodrome Operations) Regulations 2016 (CA (AO) R 2016), when the CAGMs issue by the CAAM are complied with, the related requirements of the CAD's may be deemed as being satisfied and further demonstration of compliance may not be required.



(Dato' Captain Norazman Bin Mahmud)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Guidance Material components and Editorial practices

This Civil Aviation Guidance Material is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as “*shall*” or “*must*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as “*should*” or “*may*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Appendices: Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Tables and Figures: These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

Attachments: Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Guidance Material, the use of the male gender should be understood to include male and female persons.



INTENTIONALLY LEFT BLANK



Summary of Changes

ISS/REV no.	Item no.	Revision Details
ISS01/REV02	Paragraph 4.2 – 4.5	Amendment
	Appendix 1	Amendment



INTENTIONALLY LEFT BLANK



Table of Content

1	GENERAL	1-1
2	PROGRAMME	2-1
3	ROLES AND RESPONSIBILITIES	3-1
4	COLLECTING, REPORTING AND RECORDING DATA ON WILDLIFE STRIKES AND OBSERVED WILDLIFE....	4-1
5	WILDLIFE SAFETY RISK ASSESSMENT	5-1
6	HABITAT AND LAND USE MANAGEMENT	6-1
7	EXPELLING AND DETERRING WILDLIFE	7-1
8	COORDINATION WITH STAKEHOLDERS.....	8-1
9	PERSONNEL TRAINING.....	9-1
10	EVALUATING WILDLIFE CONTROL PROGRAMME	10-1
11	APPENDICES	11-3



INTENTIONALLY LEFT BLANK

1 General

- 1.1 Wildlife such as birds has been a potential hazard to aircraft since the beginning of air travel. Bird strikes were a minor risk in the early days as there were few aircraft in the sky traveling at relatively low speeds. Damage to aircraft was, therefore, limited to shattered windshields, dented leading edges, and some damage to the fuselage.
- 1.2 With time, the speed of aircraft increases and engine noise levels dropped with the development of newer generation turbine engines. Aircraft simply became too quick and too quiet for birds to sense and avoid. Birds inadvertently became a serious threat to aircraft safety as strikes became more frequent and more serious.
- 1.3 Birds however are not the only wildlife problem for aircraft. Animals such as dogs wandering onto runways can create serious problems for departing and landing aircraft. Other than economic cost of wildlife strikes, the cost in human lives lost when aircraft crashes as a result of strikes amplifies the need for effective management of the wildlife strike problem.
- 1.4 A good wildlife control programme depends on good reporting. Data may come from wildlife sightings, maintenance problems, wildlife strikes and wildlife control activities. Review of this data identifies problems at the site and may indicate the effectiveness of current wildlife controls.
- 1.5 A wildlife strike has occurred when:
- a) A pilot reports a wildlife strike; or
 - b) Maintenance personnel report that aircraft damage is due to a wildlife strike; or
 - c) Aerodrome personnel report seeing a wildlife strike; or
 - d) Aerodrome personnel find wildlife remains on airside areas on or in the vicinity of a runway and no other cause of death is identified; or
 - e) An animal's presence on the aerodrome had a significant negative effect on a flight (i.e., aborted take-off, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal).

1.6 Applicability

- 1.6.1 This guidance applies to all aerodrome operators certified under Civil Aviation Regulations (Aerodrome Operations) 2016; Regulation 6. Aerodrome operators should examine each item carefully, by considering the size, complexity and scope of operations at the aerodrome to determine what applies.

1.7 Abbreviations

- 1.7.1 A wildlife safety risk assessment shall be conducted, covering the aerodrome and its vicinity.
- 1.7.2 A WHMP shall be established and tailored to the local environment and be commensurate with the wildlife safety risk assessment.
- 1.7.3 The WHMP shall include procedures and measures for reducing the wildlife risk at the aerodrome to an acceptable level.
- 1.7.4 Wildlife hazard reduction measures and procedures shall be integrated into the aerodrome operator's safety management system (SMS).

2 Programme

- 2.1 An WHMP is for aerodrome operators to assess the wildlife activity, the impact of wildlife strikes and reduce the number of wildlife strikes at the aerodrome. The following are the recommended elements for such programmes:
- a) assignment of personnel (roles and responsibilities of personnel in the programme);
 - b) a process to report, collect and record data on wildlife strikes and observed wildlife;
 - c) a wildlife safety risk assessment method and procedure, including annual reviews;
 - d) a process of habitat and land management both on the airport and in its vicinity in order to reduce the attractiveness of the area to birds/wildlife;
 - e) a process for the expelling, deterring and removing of wildlife, including lethal means where appropriate;
 - f) a process for liaison or coordinating with internal and external stakeholders to ensure the airport operator is aware of developments that may contribute to creating additional bird hazards in the infrastructure, vegetation, land use and activities in the airport vicinity; and
 - g) a Training Programme for the personnel involved in Wildlife Hazard Management; and
 - h) Evaluating of wildlife control programme.
- 2.2 Each WHMP will be unique to that aerodrome, tailored to and commensurate with the size and level of complexity of the airport, taking account of the identification of the bird hazard and the risk assessment of that hazard.
- 2.3 To ensure that the WHMP effective, a monitoring and evaluation strategy for the entire programme should be implemented.



INTENTIONALLY LEFT BLANK

3 Roles and Responsibilities

3.1 The WHMP should detail the roles and tasks of all personnel who:

- a) develop and implement the WHMP;
- b) oversee the daily activities, analyse the collected data and carry out safety risk assessments in order to develop and implement the WHMP;
- c) expel and/or deter hazardous wildlife; and
- d) reduce the attractiveness of identified areas, if relevant.

3.2 Some suggested roles and tasks of all personnel that should be included into an WHMP as listed below:

3.2.1 Senior Manager

- a) Senior manager, or their designate, should be responsible for the overall management of the WHMP on a long-term as well as a daily basis at the site-specific level.
- b) The role should involve tasks and responsibilities that include:
 - 1) Ensuring that the WHMP is developed and implemented;
 - 2) Ensuring the WHMP is referred to and becomes part of the aerodrome Safety Management System (SMS) and the operational safety culture of the aerodrome;
 - 3) Ensuring sufficient financial and human resources, including initial and on-going training are provided to enable implementation of the WHMP;
 - 4) Participating on the Airport Wildlife Committee;
 - 5) Working with external parties such as local, regional and national governments in order to avoid or mitigate regulation that might impinge on the safe operation of airports;
 - 6) Ensuring that the protected species register is included in the WHMP and that proper safeguards for these species are in place;
 - 7) Ensuring that the required reports are submitted (quarterly or at other agreed intervals) to the CAAM;
 - 8) Ensuring that, where appropriate, habitats and land uses identified in the WHMP, especially those that will require capital expenditure, are included in the Airport Master plan.

3.2.2 Wildlife Coordinator / Manager

- a) The Wildlife Coordinator/Manager is in charge of the day-to-day management and efficient implementation of the WHMP.
- b) The coordinator or their designate, should coordinate the activities of the WHMP with air traffic control (ATC) and other stakeholders.

- c) The coordinator should also review strike reports, monitor daily activity records and maintenance reports to determine the requirements for short- and long-term management programmes, and this information should be passed to managers accountable for safety on a regular basis.
- d) In more detail, this role will involve key duties such as the following:
 - 1) Advising the Airport/Senior Manager on all matters relating to wildlife hazard prevention;
 - 2) Develop and implement the WHMP;
 - 3) Planning and organizing wildlife control operations in accordance with the WHMP;
 - 4) Supervising and monitoring wildlife control operations to ensure that the WHMP is implemented correctly;
 - 5) Supervising wildlife control record keeping (log, bird counts, wildlife strike recording and reporting, bird dispersal, culling and habitat management diaries, etc.);
 - 6) Providing technical supervision of Wildlife Control Operators, intelligence gathering, and planning;
 - 7) Facilitating active surveillance, wildlife dispersal, culling and other field tasks;
 - 8) Ensuring that all necessary passes and permits are current;
 - 9) Ensuring the supply, safe keeping and correct maintenance of wildlife control equipment and consumables;
 - 10) Coordinating with operation and/or grounds maintenance to ensure that habitat is managed according to the WHMP; and
 - 11) Providing a communications channel between the aerodrome policy makers/providers, wildlife control operators and other interested parties, such as airline operators and air traffic control.

3.2.3 Aerodrome Wildlife Control Personnel / Officer

- a) Aerodrome Wildlife Control Personnel / Officer are responsible for the direct delivery of control duties on the aerodrome and enacting the management programme to counter any wildlife presence on the airside that presents a potential risk to aircraft flight safety. As such, the wildlife control personnel's duties should include:
 - 1) Maintaining surveillance of wildlife activity on the aerodrome and around the aerodrome boundary;
 - 2) Implementing wildlife control measures in accordance with the WHMP to counter any detected wildlife strike risk;
 - 3) Providing information to air traffic control with details of potential wildlife strike risks and management activities as they occur;
 - 4) Recording and reporting all confirmed, unconfirmed, near-miss or suspected wildlife strikes;
 - 5) Recording wildlife control activity;



- 6) Advising the senior personnel of habitat control issues on the airside and identifying improvements to the wildlife control process; and
- 7) Assisting with wildlife/bird surveys, etc.



INTENTIONALLY LEFT BLANK

4 Collecting, Reporting and Recording Data on Wildlife Strikes and Observed Wildlife

- 4.1 An effective WHMP depends on accurate and reliable data. Reviewing and analysing wildlife strikes and wildlife observations will help identify hazards at the aerodrome and its vicinity and indicate the effectiveness of current wildlife strike prevention methods.
- 4.2 The aerodrome operator should establish procedures for recording reports of wildlife strikes that have occurred at the aerodrome and its vicinity, in close cooperation with all relevant organizations operating at the aerodrome.
- 4.3 Reporting of wildlife strikes in the vicinity of an aerodrome may be made through CAAM Aviation Reporting System (CAREs). Aerodrome operator or others user may access CAREs via CAAM website address at <https://safetyreporting.caam.gov.my/>.
- 4.4 The aerodrome operator's reporting system shall contain a requirement for all relevant third parties and all aerodrome personnel to report wildlife hazards, wildlife remains, including findings thereof during aerodrome inspections, and any other relevant identified hazards, to the aerodrome operator.
- 4.5 Appendix A shows a sample of the flowchart of the reporting procedures for reporting of wildlife strikes by personnel.
- 4.6 Wildlife activities, including incident reports, should be recorded in a wildlife log. This log should include, as a minimum, the following information:
 - a) the name of the person logging the data;
 - b) date and time of the observation;
 - c) numbers, species and location of the wildlife observations;
 - d) proactive and reactive actions taken to decrease the number of present wildlife and the results thereof; and
 - e) weather and lighting conditions.
- 4.7 The log should be completed by competent wildlife control personnel, at intervals commensurate with the number of aircraft movements and runways in use, and taking into account wildlife behaviour and other relevant local circumstances. Data should be analysed to identify which species represent a hazard at specific times of day and/or year, and during different types of meteorological conditions.
- 4.8 Aerodrome operators should ensure that the identification of the species involved in any reported wildlife strikes is as accurate as possible, since these reports represent data that will help in the assessment of the level of safety risk that each species of wildlife presents to aircraft operations at the aerodrome. The compilation of precise



wildlife observations and strike statistics should facilitate the analysis of data so as to improve wildlife hazard management.

5 Wildlife Safety Risk Assessment

- 5.1 Aerodrome operators shall conduct a specific safety risk assessment of the wildlife situation and use the results to help target wildlife management measures and monitor their effectiveness. Safety risk assessments should be updated and repeated at regular intervals, commensurate with assessed risks.
- 5.2 The aerodrome operator's wildlife safety risk assessment should, as a minimum:
- a) define the area for the safety risk assessment, which would, in most cases, be the entire aerodrome but may also include the vicinity of the aerodrome;
 - b) rate the strike probability using strike data from reports for each species, information on the presence of species, and the number of individuals and their biology, and update the data and probabilities regularly;
 - c) rate the severity of damage arising from those strikes for each species;
 - d) determine the risk for each species; and
 - e) identify the causes (attractants, migration routes) of each wildlife hazard.
- 5.3 The total number of wildlife strikes is not necessarily a comprehensive measure of safety risk, or indication of the performance of the wildlife control measures, at an aerodrome.
- 5.4 The aerodrome operator should prioritize its wildlife management measures on those species with the highest frequency (probability) and which may create the greatest damage (severity).
- 5.5 Further guidance on aerodrome wildlife safety risk assessment can be found in the Airport Services Manual (Doc 9137), Part 3 — Wildlife Hazard Management. Aerodrome operators are strongly encouraged to have their own risk assessment put in place. They should, at the same time, exercise due care to see what applies to their aerodrome, especially the different species of wildlife found on or in the vicinity of the aerodrome.



INTENTIONALLY LEFT BLANK

6 Habitat and Land Use Management

- 6.1 Habitat and land use management, including preventive and proactive actions, is intended to reduce the presence of wildlife on the aerodrome by taking appropriate actions.
- 6.2 Aerodrome operators together with appropriate agency should conduct an inventory of sites that attract wildlife within a defined radius around the aerodrome, paying particular attention to sites close to the airside and the approach and departure corridors. The appropriate radius (i.e. aerodrome vicinity) in this context should be 13 km around the aerodrome reference point. However, the radius may be extended or reduced, based on a wildlife evaluation of the aerodrome vicinity.
- 6.3 Aerodrome operators should regularly review features on, and within the vicinity of, the aerodrome that attract wildlife. A management plan should be developed to reduce the attractiveness of these features and to decrease the number of hazardous wildlife present or to deny them physical access to these areas.
- 6.4 Aerodrome development should be designed such that it will not be attractive to hazardous wildlife and no attraction will be created during construction. This may include denying resting, roosting and feeding opportunities for hazardous wildlife. In some cases, specific wildlife hazard control may need to be employed during the construction and reinstatement phases, and wildlife hazard management controls implemented as part of any approval process.
- 6.5 A complete perimeter fence of adequate height, strength and structure, is the prime method of preventing hazardous wildlife, other than birds, from gaining access to the aerodrome areas. Fences and gates should remain closed and be regularly inspected. Fencing should also be trenched in order to preclude burrowing animals from gaining access to the aerodrome.
- 6.6 No food sources should be available to hazardous wildlife on the aerodrome. The aim should be to prevent food sources from being available through management of the aerodrome environment.
- 6.7 Where applicable, vegetation should be kept at a height that is considered unattractive to hazardous wildlife. Where applicable, the vegetation composition on the aerodrome should not encourage wildlife. Agricultural crops should be discouraged from the aerodrome environment since agricultural crops and related activities (ploughing, seeding) may provide food for hazardous wildlife.
- 6.8 Water bodies such as depressions, open drainage ditches, ponds and lakes may be a particular hazard as they may attract hazardous wildlife. These hazards should be made less attractive by mitigation measures such as drainage, replacement by buried drain pipes, netting and fencing to deny access to wildlife that walk in or by steepening the sides.

- 6.9 The following is a non-exhaustive list of the types of land uses which have proven to attract hazardous wildlife and which should, in particular, be prevented, eliminated or mitigated on and in the vicinity of aerodromes:
- a) fish processing;
 - b) agriculture;
 - c) cattle feed lots;
 - d) garbage dumps and landfill sites;
 - e) factory roofs and parking lots, or other infrastructure;
 - f) theatres and food outlets;
 - g) wildlife refuges;
 - h) artificial and natural lakes;
 - i) golf or polo courses, etc.;
 - j) animal farms; and
 - k) slaughterhouses.
- 6.10 More details on habitat and land use management have been set out in Appendix 2 of this document.

7 Expelling and Deterring Wildlife

- 7.1 Wildlife deterring and expelling techniques should be appropriate to the wildlife situation on the aerodrome and its vicinity and should be based on:
- a) wildlife patrols;
 - b) acoustics, such as distress and alarm call simulators, specific signals, natural and synthetic cries;
 - c) pyrotechnics, such as medium- and long-range cartridges and shell crackers;
 - d) optical and visual deterrents, such as laser devices, flags and streamers, lights, predator models, gull models, hawk kites, balloons; and
 - e) other techniques such as firearms, chemical repellents, lethal chemicals, trained predators (dogs and falcons), gas cannons, traps and relocation methods.
- 7.2 The effectiveness of the techniques and measures listed in 7.1 may vary based on the species, location and their application.
- 7.3 Wildlife control personnel should be equipped with devices for deterring, dispersing or removing wildlife appropriate to the species encountered, the numbers of wildlife present, and to the area that they need to control, or obtain the means of calling on expert support at short notice.
- 7.4 In case hazardous wildlife are still attracted to the aerodrome after proactive measures have been implemented, it may be necessary to remove them by trapping or using lethal methods.
- 7.5 The challenge for wildlife hazard management is that some wildlife may become accustomed to certain dispersal techniques. Therefore, best results may be obtained if aerodrome operators routinely adjust and vary the control and dispersal measures being used. An aerodrome operator should proactively seek different or new effective ways to reduce the wildlife hazard, where or if existing methods prove ineffective.
- 7.6 Actions to manage wildlife should be prioritized on the movement area with particular attention given to the runways and approach/departure routes within the aerodrome vicinity.
- 7.7 All devices and methods should be used in compliance with national regulations or practices (e.g. in compliance with regulations on the use of firearms, environment and animal protection).



INTENTIONALLY LEFT BLANK

8 Coordination with Stakeholders

- 8.1 Effective wildlife hazard management requires communication, cooperation and coordination with all relevant stakeholders. Aerodrome operators should identify which stakeholders on and off the aerodrome should be involved and consulted. Such stakeholders may include transportation officials (including government), aerodrome staff, the ATS unit, aircraft operator representatives (including pilots), nature conservation organizations (government and non-government), local municipalities/cities, and organizations responsible for land management and local planning and development approvals in the vicinity of the aerodrome.
- 8.2 The WHMP should include a process to hold regular meetings with the stakeholders present at the aerodrome (including aircraft operators, ATS, ground handlers, as appropriate). The aerodrome operator should encourage stakeholders to share data that was collected, reported and recorded on wildlife observations and strikes, in order to improve the WHMP. Example of formation the committee has been set out in Appendix 3.
- 8.3 The aerodrome operator should ensure that there is a process for rapid communication among those involved in wildlife control as well as with ATS. This is necessary when a specific wildlife hazard is present to allow the issuance of appropriate warnings to aircraft operating on, and within the vicinity, of the aerodrome, by the air navigation services provider (ANSP).
- 8.4 The aerodrome's WHMP should include a process for liaising with non-aerodrome agencies, local landowners and other relevant stakeholders, to ensure that the aerodrome operator is aware of developments that may contribute to creating additional wildlife hazards in the infrastructure, vegetation, land use and activities within the aerodrome's vicinity (e.g. crop harvesting, seed planting, ploughing, establishment of land or water features, hunting). The aerodrome operators should consider options to influence the land-use within the vicinity of the aerodrome, in order to reduce the hazard from wildlife.
- 8.5 The aerodrome operator should participate in wildlife related meetings with other aerodromes to share experience and discuss common problems.



INTENTIONALLY LEFT BLANK

9 Personnel Training

- 9.1 The WHMP should include procedures for the initial and recurrent training of personnel involved in wildlife control. The minimum initial and recurrent training requirements for wildlife control personnel, and a typical training syllabus, are included in Appendix 4.
- 9.2 The training of wildlife control personnel should be conducted by competent wildlife control personnel, or specialists with proven experience in this field.
- 9.3 Wildlife control personnel should be fully aware of the details pertaining to aerodrome operations, the aerodrome environment and should have received appropriate training, including:
- a) airside driver training, aerodrome familiarization, air traffic control communications (radiotelephony (RTF)), signs and markings, navigational aids, aerodrome operations and safety, and other matters that the aerodrome operator deems appropriate; and
 - b) aircraft familiarization, including aircraft identification and effect of wildlife strikes on aircraft systems.



INTENTIONALLY LEFT BLANK

10 Evaluating Wildlife Control Programme

- 10.1 Procedures to monitor and evaluate the performance and effectiveness of wildlife control strategies might include:
- 10.2 An analysis of bird and wildlife strikes and observations should be undertaken periodically (at least annually) and after any significant strike event has occurred as part of the risk assessment process. Recording information is essential to provide evidence that active bird control is in place in the event that an incident occurs, and equally provides an opportunity to assess and evaluate fluctuations in wildlife occurrences in different areas of the airside.
- 10.3 Aerodromes should have a process to review and evaluate the wildlife habitat and wildlife management plan/programme to provide safety assurance that the plan/programme is fully effective and correctly implemented. The review should be completed on an annual basis but also must include an on-going review process to ensure that the plans/programmes are always current and fully functional at all times.
- 10.4 The following questions are designed to assist in determining if there is an effective wildlife control programme in place at an aerodrome:
- a) Are roles clearly defined and understood by all?
 - b) Do aerodrome personnel understand their roles and responsibilities?
 - c) Do programs meet required standards in ALL respects?
 - d) Is the programme effectively resourced & managed?
 - e) Are procedures efficient and effective?
 - f) Are programs current with all regulations and best practices?
 - g) Is there an effective review process in place?



INTENTIONALLY LEFT BLANK

11 Appendices

11.1 Appendix 1 – sample of flowchart for reporting of wildlife strike

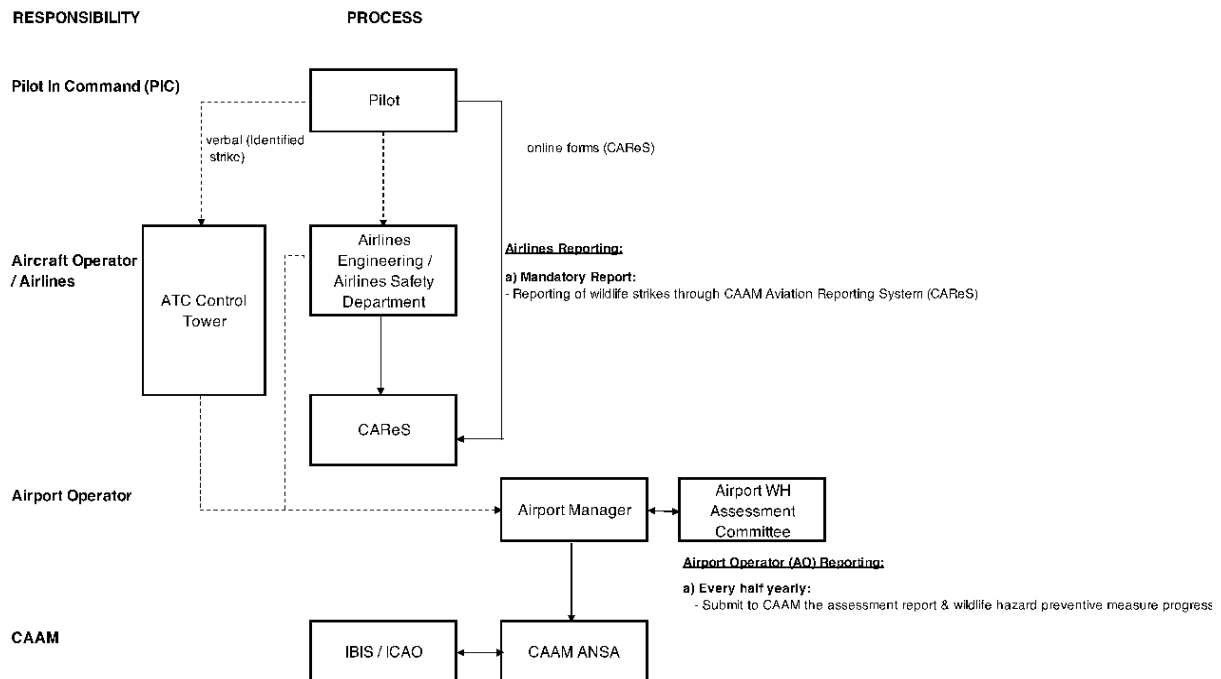


Figure 3. Sample of Flowchart for Reporting of Wildlife Strike

Note 1.— Wildlife strikes that occurred at, or in the vicinity of an aerodrome shall be reported to the Aerodrome Operator. Responsibilities of the following persons or department shall be described in the WHMP:

- h) *Pilots;*
- i) *Airlines Engineering Department;*
- j) *Air Traffic Controllers;*
- k) *Airlines Safety Department;*
- l) *Aerodrome operator.*

Note 2.— For Bird/Other Wildlife Strike Reporting Form, refer to CAAM website.



INTENTIONALLY LEFT BLANK

11.2 Appendix 2 – Habitat Management

- 1 Habitat management can be the most effective method to reduce wildlife hazard at an airport. This section outlines some general concepts and considerations, more details on this have been set out in Airport Services Manual (Doc 9137), Part 3 — Wildlife Hazard Management.
- 2 The management of habitats on the airport will be quite different from that on land adjacent and near to the airport. Some considerations are part of the long-term development of the airport and should be included in the Airport Master plan. Others issues are more related to regular maintenance and upkeep of airport lands.
- 3 The key to habitat management is avoiding conditions that attract wildlife such as food, water, shelter, and resting and breeding areas.
- 4 On Airport Habitats
 - a) Major earthwork considerations on airports are usually required to manage storm-water runoff, and drainage channels and settling ponds can become water bodies that attract wildlife. Such work is usually done at the time of runway and taxiway development and future developments would be included in an Airport Master plan. Wildlife hazard issues must be taken into account at the airport infrastructure planning stages.
 - b) Landscaping then usually involves seeding open areas for grass or other appropriate plant coverage to avoid soil erosion. Grass and plant species must be selected taking into account maintenance and watering needs, seeds and fruit, and shelter and nesting for wildlife.
 - c) A perimeter fence around the airport airside areas is often required for safety and security reasons. The ability to exclude local wildlife will be a key consideration with designing and constructing a boundary fence.
 - d) The need to protect the habitat of certain native animal and plant species might be a part of the airport's land management and biodiversity plans or obligations. This might in fact conflict with the need to reduce wildlife hazard and airport senior management may need to work closely with government wildlife or conservation department to develop appropriate local regulation. Careful consideration of wildlife hazards will be required when planning such conservation habitats.
- 5 Off-Airport Habitats
 - a) The land use and habitat management on areas near an airport are also an important consideration, although an airport operator may have limited ability to control off-site land use and will need to work in partnership with local landowners and stakeholders.
 - b) In principle, the habitats off-site should be more attractive to wildlife than the airport site itself. However extreme cases such as a land fill or garbage dump might attract so much wildlife that it may pose an increased hazard on airport land.



- c) Off site land uses and activities that can affect wildlife and might need careful consideration might include the following:
 - 1) Nature conservation and recreational areas;
 - 2) Local agricultural practices;
 - 3) Land fill and solid waste management;
 - 4) Storm water and waste water treatment plans
 - 5) Water bodies including reservoirs, lakes, rivers and the sea;
 - 6) Wetlands including marshes; and
 - 7) Gravel pits and quarries.

11.3 Appendix 3 – Formation of the WHMP Committee

1 Aerodrome Wildlife Hazard Assessment Committee

- a) The Aerodrome Wildlife Hazard Assessment Committee is required to facilitate the communication, cooperation and coordination of hazardous wildlife management at and around the aerodrome. This committee might be included within the safety management committee. In place of a dedicated local wildlife committee, the topic may be discussed in an airside or runway safety committee.
- b) Members of the committee may include, but are not limited to:
 - 1) Airport Manager;
 - 2) CAAM Airport Manager / RMAF (LBU & KUA);
 - 3) Airlines Manager;
 - 4) Local Authority;
 - 5) Royal Malaysian Police;
 - 6) Wildlife Department;
 - 7) Forestry Department;
 - 8) Environmental Department;
 - 9) Agriculture Department;
 - 10) Airport Ground handlers; and
 - 11) Airport Tenants.
- c) Responsibilities of the Aerodrome Wildlife Hazard Assessment Committee are as follows:
 - 1) to evaluate the wildlife hazard monitoring and assessment program reports;
 - 2) to evaluate the application of land use activities assessment reports;
 - 3) to determine the most suitable wildlife hazard control and reduction methods to be implemented at the aerodrome;
 - 4) to review the need of improving the wildlife hazard control and reduction methods; and
 - 5) to coordinate for expertise, when required to assist the Aerodrome Wildlife Hazard Monitoring and Assessment Team.



INTENTIONALLY LEFT BLANK

11.4 Appendix 4 – Wildlife Control Training

1 Initial Training

The initial training for wildlife control personnel should, as a minimum, address the following areas:

- a) an understanding of the nature and extent of the aviation wildlife hazard, and local hazard identification;
- b) an understanding of national and local regulations, standards and guidance material related to the aerodrome wildlife hazards management programme (use of best-practices models);
- c) a broad appreciation of local wildlife ecology and biology;
- d) the importance of accurate wildlife identification and observations, including the use of field guides;
- e) local and national laws and regulations relating to protected species, and species of special concern, and the aerodrome operators' policies relating to them;
- f) high-risk species identified in the wildlife risk assessment;
- g) wildlife strike remains collection procedures, identification and reporting;
- h) active/tactical measures, using well-established effective wildlife removal, dispersal, detection and control techniques;
- i) documentation of wildlife activities, control measures and reporting procedures (the aerodrome wildlife management programme); and
- j) firearms, drones and any other equipment and their use on the aerodrome, including the use of personal protective equipment.

2 Recurrent Training

In order to maintain the competence of wildlife management personnel, recurrent training should be carried out, including a selection of general topics covered in the wildlife control initial training. This should include:

- a) changes in the local environment;
- b) recent wildlife events at the aerodrome;
- c) changes in active and passive measures; and
- d) any other matters that the aerodrome operator deems appropriate.

3 Wildlife Control Training Syllabus.

A typical training syllabus may contain the topics listed below:

<p style="text-align: center;">Overview</p> <p style="text-align: center;"><i>Theoretical training</i></p>	<p style="text-align: center;">Familiarization</p> <p style="text-align: center;"><i>Practical training</i></p>	<p style="text-align: center;">Specification</p> <p style="text-align: center;"><i>Specific wildlife training</i></p>
<ul style="list-style-type: none"> • Aerodrome overview • Aerodrome certification • Aerodrome procedures • International regulations • National regulations • Environmental regulations • Aerodrome safety management system • Promulgation of information • Health and safety overview • Accident and incident reporting/investigation 	<ul style="list-style-type: none"> • All aerodrome operational procedures and standards • Landside overview • Airside safety • Airside security • Apron driving • Radiotelephony • Runway incursion training • Protection of NAVAIDs • Low/reduced visibility programme • On-the-job training • Recurrent refresher training • Familiarization programme 	<ul style="list-style-type: none"> • Detailed theoretical aspects of wildlife programmes • Integrated approach to all elements of habitat/wildlife programmes • All practical elements required to support programmes • Familiarization programme • Equipment training and procedural use of all equipment • Defined on-the-job training • Recurrent refresher training • Administration programme in respect of specific record-keeping • On/off field programme