

**ETHIOPIAN CIVIL AVIATION AUTHORITY  
AERODROME SAFETY AND STANDARD  
DIRECTORET**



**PROTOCOL FOR THE CONDUCT AND REVIEW OF  
WILDLIFE HAZARD SITE VISITS, WILDLIFE  
HAZARD ASSESSMENTS, AND WILDLIFE HAZARD  
MANAGEMENT PLAN**

2014

**PROTOCOL FOR THE CONDUCT AND REVIEW OF WILDLIFE HAZARD  
SITE VISITS, WILDLIFE HAZARD ASSESSMENTS, AND WILDLIFE  
HAZARD MANAGEMENT PLANS**

## PREAMBLE

**WHERE AS**, it is desirable to consolidate and modernize the aviation Advisory Circular to bring them to international standards,

**WHERE AS**, it is important to set the Advisory Circular as to how the regulatory, administrative, technical and supervisory activities of the Authority shall be performed in the one hand and setting the duties, obligations and standards that shall be respected by operators and aviation personnel,

**WHERE AS**, it is necessary, to provide detailed Advisory Circular for the administration of license, certification, investigation and enforcement of aviation laws.

**NOW THERE BY**, The Authority under its power given by Article 92/2 of the Civil Aviation Proclamation No. 616/2008 issued the following Advisory Circular

### **1. SHORT TITLE**

This Inspector Handbook may be cited as “**Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments and Wildlife Hazard Management Plan** ” NO. ECAA-AC-AGA017

### **2. REPEAL AND INAPPLICABLE LAWS**

No order or practice shall, in so far as it is inconsistent with this Advisory Circular, be applicable with respect to matters provided for by this Advisory Circular.

### **3. EFFECTIVE DATE**

This Advisory Circular shall come into force as of August 2014.

  
**Wosanyetsh Hunegnaw (Col.)**  
**Director General**



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ECAA

## 1. Purpose

This Advisory Circular (AC) defines the minimum acceptable standards for the conduct and preparation of Wildlife Hazard Site Visits (Site Visit), Wildlife Hazard Assessments (Assessments) and Wildlife Hazard Management Plans (Plans). This AC provides guidelines that define when a Site Visit should be conducted and when an Assessment must be conducted. It also defines minimum standards for conducting Site Visits and Assessments, as well as developing Plans. The AC further defines and explains continual monitoring programs. This AC also provides checklists to help people evaluate Site Visits, Assessments and Plans.

## 2. Applicability

Airports that hold Airport Operating Certificates must use the standards, practices and recommendations contained in this AC to comply with the wildlife hazard management requirements in ECARAS PART 12.7. The ECAA also recommends the guidance in this AC for Airport Wildlife Biologists (Biologist), land-use planners and developers of projects, facilities, and activities on or near airports.

## 3. Background

Aerodrome manual of implementing standards for Wildlife Hazard Management, prescribes the specific reasons why an Assessment must be conducted and what subject matter is minimally required. Minimal standards have been unclear or absent for preferred methodologies that assess wildlife populations and wildlife hazard attractants. These disparities have resulted in non-standardized, wide ranging methodologies to obtain wildlife and habitat data. An Assessment, conducted by a Biologist, provides the scientific basis for the development, implementation, and refinement of a Plan. Though parts of the Assessment may be incorporated directly in the Plan, they are two separate documents. Part of the Plan can be prepared by the Biologist who conducts the Assessment. However, some parts can be prepared only by the airport. For example, airport management assigns airport personnel responsibilities, commits airport funds, and purchases equipment and supplies. Site Visits also must be conducted by a Qualified Airport Wildlife Biologist. The intent of a Site Visit is to provide an abbreviated analysis of an airport's wildlife hazards, determine if an Assessment is warranted, and if necessary, and provide actionable information that allows the airport to expedite the mitigation of these hazards.

Information about the risks posed to aircraft by certain wildlife species has increased in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous.

## SECTION 1

### PROTOCOL FOR THE CONDUCT OF A WILDLIFE HAZARD SITE VISIT (SITE VISIT)

Airports use a Site Visit to quickly evaluate and mitigate potential hazards on airports. An airport can also use a Site Visit to determine whether an Assessment is necessary. If an airport already has a Plan, airport management can use a Site Visit to investigate wildlife strikes to aircraft or to see if the Plan needs to be updated.

During the Site Visit, the Biologist collects and compiles information on the airport's wildlife hazard history, documented and suspected wildlife hazards, habitat attractants, control activities, airport operations procedures, communications of hazards through ATC and pilots, aircraft operations and scheduling. A Site Visit is typically conducted over a period of one to three days during which a Biologist evaluates the habitat on and surrounding the airport and records direct or indirect wildlife observations; and reviews the current Plan, current wildlife management activities and airport wildlife strike data.

A Qualified Airport Wildlife Biologist must conduct Site Visits.

#### 1.2. APPLICABLE AIRPORT INFORMATION

The airport operator shall provide the Biologist the following information, if available:

- a. Personnel and departments responsible for airport operations
  - b. Number of aircraft movements per year
  - c. Type of movements (i.e., % private, civil, and military)
  - d. Recent airport improvements or upgrades
  - e. Past and present land management practices
  - f. Records of strikes and damage, flight delays, injuries, and fatalities due to strikes.
- Wildlife strike data may help determine hazardous species on an airport. Data on reported wildlife strikes are available through the ECAA Bird/ Wildlife Strike Database.

Airports may maintain their own local database which can be compared with the ECAA Database. A Site Visit should include an analysis of wildlife strike records. If possible, include summaries of strike data by species, time of day, on and off-site airport locations, and weather conditions. A minimum wildlife strike analysis should include, if available:

- (1) Bird and mammal species involved
- (2) Frequency distribution by month and year

- (3) Number per 10,000 aircraft movements
- (4) Location on the airfield

- g. Previous wildlife hazard management efforts – Records of past management may be helpful during this initial consultation. Attempts to exclude, deter, or remove wildlife from the airport should be noted. If not already in place, a wildlife log should be created and maintained by airport operations to document all wildlife activity observed on the airport.
- h. Description of current wildlife hazard threats or concerns
- i. Any current Federal depredation/ wildlife control permits and annual permit reports
- j. Current Geological Survey topographic maps, airport maps, and/ or aerial photographs
- k. Other pertinent information present in airport records

Airport records may be incomplete or may not exist. Interviews with airport personnel often yield useful information that is missing from written records. The history of wildlife hazard problems at the airport should be discussed with the airport manager and staff. The control tower supervisor and chief of operations may also provide useful background information on the severity and frequency of the problem.

### 1.3. OBSERVATIONS.

Qualified Airport Wildlife Biologists should make observations from a variety of locations to ensure complete visual coverage of the airport. Minimum coverage shall include observations of the airport's Airport Operations Area (AOA). These observations should be brief and are not as rigorous as a full Assessment. At a minimum, the observations should include:

- a. *Birds* – Record bird species present and note abundance, activity, location, type of habitat used, time and date of observations. Note evidence of bird activity such as fecal material and regurgitated pellets (boluses) under structures used for perching.
- b. *Mammals* – Document mammals observed and evidence of mammal activity such as scats, tracks, runs, and burrows and include time and date of observations, activity, location, and type of habitat used. Estimate relative abundance, activity, and habitat use.
- c. *Habitat Attractants* – Assess habitats and man-made attractants on and around airport property. Note potential wildlife attractants. Review maps and aerial photographs, noting waste management facilities, wildlife refuges, water bodies, agriculture, stock yards, picnic areas, restaurants, and other features or habitats that may attract wildlife within a five mile radius around the airport.



- d. Wildlife/Habitat Relationship – Observe and record how the wildlife observed is using the habitat on the airport.
- e. *Wildlife Interactions with Aircraft Operations* – Assess the potential for wildlife interactions with aircraft operations in the AOA, traffic patterns, approach and departure airspace, and surrounding areas. Evaluate aircraft movements to see if these operations increase the risk of wildlife strikes. Review airport hazard advisories to see if they are specific to the hazards at the airport.

#### **1.4. SITE VISIT REPORT**

The Qualified Airport Wildlife Biologist must provide the airport manager with a letter report summarizing field data and any management recommendations following the Site Visit. The ECAA will review the site visit report and determine if a full Wildlife Hazard Assessment is required. Copies of the report should be filed and made a part of the historical record for the airport. The Site Visit report should contain:

- a. List of wildlife species (or wildlife sign- e.g., hyena tracks) observed during the visit, with a statement that the list is not a complete record of species using the airport )
- b. Federal conservation status of the species observed
- c. Habitat features that may encourage wildlife to use the airport
- d. Natural and man-made wildlife attractants on or near the airport
- e. Strike data analysis
- f. Recommendations to:
  - (1) Reduce wildlife hazards identified (if data is available to substantiate your conclusions)
  - (2) Conduct an Assessment, if warranted
  - (3) Modify an existing Plan, if warranted
  - (4) Improve communications and hazard advisories between Air Traffic Control, pilots, airlines, airport operations, and other airport users
  - (5) Provide for potential alteration of aircraft operations including locations and scheduling of flights to avoid identified hazardous wildlife concentrations
  - (6) No action required, if applicable

## SECTION 2

### PROTOCOL FOR THE CONDUCT OF A WILDLIFE HAZARD ASSESSMENT

#### 2.1. INTRODUCTION

The first step in preparing an airport Plan is to conduct an Assessment. The Assessment, conducted by a Qualified Wildlife Biologist, provides the scientific basis for the development, implementation, and refinement of a Plan. Though parts of the Assessment may be incorporated directly into the Plan, they are two separate documents.

The objective of an Assessment is to provide a baseline of data and understanding of wildlife species considered hazardous on or near an airport and of attractants that provide food, water, and shelter. The Assessment also identifies wildlife trends at the airport (location of wildlife hazards and seasonality of wildlife) and how these fluctuations in behavior and abundance may affect aviation safety, with particular emphasis to wildlife strikes to aircraft. It promotes the use of an integrated approach for wildlife mitigation to effectively modify the environment (e.g., mowing and drainage clearance), exclude wildlife (e.g., install fences and perch excluders), implement harassment procedures (e.g., pyrotechnics and propane cannons), remove wildlife (e.g., lethal and capture/relocate methodologies), communicate wildlife hazard advisories (e.g., through Air Traffic Control voice communications, NOTAMS), direct pilot responses to identified hazards, report strikes or hazardous situations, and potentially alter flight routes, traffic patterns, or schedules to avoid locations and times of identified wildlife hazards.

The Assessment provides baseline data for an airport to evaluate the efficacy of its wildlife hazard management program (e.g., determine redundancy of species-specific wildlife hazards, monitor reduction of onsite damaging strikes, monitor wildlife program communication and response efficiency, and improve the overall wildlife program through annual review). Better information regarding wildlife hazards and their attractants should result in better use of resources.

#### 2.2. REQUIREMENTS FOR WILDLIFE HAZARD ASSESSMENTS

Title *MOIS 13.2.4 Wildlife strike hazard reduction* requires that, airport should conduct wildlife hazard assessment. Each certificate holder must ensure that an Assessment is conducted when any of the following events occurs on or near the airport:

- a. An air carrier aircraft experiences multiple wildlife strikes
- b. An air carrier aircraft experiences substantial damage from striking wildlife
- c. An air carrier aircraft experiences an engine ingestion of wildlife
- d. Wildlife of a size, or in numbers, capable of causing an event described in a, b, c of this section is observed to have access to any airport flight pattern or aircraft movement area.

**Aerodrome manual of implementing standard 13.2.4 Wildlife strikes hazard reduction states that:**

*Note — the presence of wildlife on and in the airport vicinity poses a serious threat to aircraft operational safety.*

**13.2.4.1** *A named member of the senior management team at the airport shall be responsible for the implementation of the bird control programme, including both habitat management and active bird control.*

**13.2.4.2** *The wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:*

- a) *the establishment of a procedure by the aerodrome operator for recording and reporting wildlife strikes to aircraft;*
- b) *the collection of information from aircraft operators, airport personnel and other sources on the presence of birds on or around the aerodrome constituting a potential hazard to aircraft operations; and*
- c) *An ongoing evaluation of the wildlife hazard by competent personnel.*

**13.2.4.3 Recommendation:** *The precise nature of the resource that the wildlife are attracted to should be identified and a management plan should be developed to eliminate or reduce the quantity of that attractant, or to deny birds access to it as far as it is practicable.*

## **2.3. NECESSARY ELEMENTS OF A WILDLIFE HAZARD ASSESSMENT.**

This AC provides specific guidance as to what facts must be addressed in a Wildlife Hazard Assessment. The following is a point-by-point comment on each section of the regulations concerning the factors to be addressed in a Wildlife Hazard Assessment

- ❖ The Wildlife Hazard Assessment shall be conducted by Qualified Airport Wildlife Biologist having training or experience in wildlife hazard management at airports or working under the direct supervision.

**The Wildlife Hazard Assessment shall contain:**

- (1) Analysis of the event or circumstances that prompted the assessment (Who, what, when, where, why of the situation prompting the Assessment).
- (2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.( What wildlife species have access to the airport? What are their legal status, movement patterns, and seasonal patterns?).
- (3) Identification and location of features on and near the airport that attract wildlife (Wildlife are attracted to an airport because something exists on or near the airport that they desire. Wood lots near the AOA and large open areas provide relatively safe loafing, nesting and feeding locations. Food and water sources can be highly variable (dependent on hazardous species), seasonal or ephemeral. These attractants and others, such as easily accessible travel corridors, should be analyzed.)
- (4) A description of wildlife hazards to air carrier operations.( This is a judgment call best made by the Qualified Airport Wildlife Biologist trained in dealing with airport issues. Hitting 3-4 swallows is much less hazardous than hitting one 2-kg black kite.)
- (5) Recommended actions for reducing identified wildlife hazards to air carrier operations. (The Qualified Airport Wildlife Biologist preparing the Assessment must provide prioritized recommendations for mitigating the hazardous wildlife and their attractants as well as recommendations for Operations (e.g., ATC, air carriers,)).
- (6) Analysis of the event or circumstances that prompted the assessment.( Who, what, when, where, why of the situation prompting the Assessment).

## **2.4. NECESSARY ELEMENTS OF A WILDLIFE HAZARD ASSESSMENT REPORT**

Elements discussed within the above section must be discussed in the final Assessment report. If there was no event or circumstance that prompted the Assessment then number (1) of the above section may be omitted. Although there are many acceptable formats to present the findings of an Assessment, there are certain key components that must be provided. The required components include sections summarizing methodologies, results and recommendations (if there are any).

Assessment techniques such as point counts, trapping indices and vehicle routes should be conducted and locations described that allows future duplication for consistent, continued monitoring or comparison to previous findings. Maps, imagery and/or detailed descriptions should be incorporated whenever location information is necessary (e.g., Assessment techniques, wildlife hazard attractants, airport layout).

Wildlife strike data should be evaluated regardless of an event or circumstance that may have prompted the Assessment. Strike records may be available from other sources such as the airport, airlines and ECAA. When available, key strike data such as species, number struck, phase of flight, altitude, time of day, time of year, and damage (if any) should be summarized in the Assessment.

Recommended actions for reducing identified wildlife hazards may include detailed, task specific objectives or general measures. Attention should be given both to proactive mitigation such as habitat modification and exclusion techniques and reactive measures that involve harassment, dispersal and removal procedures. When applicable, airports should be strongly encouraged to maintain Federal depredation permits.

## **2.5. MINIMUM NUMBER OF WILDLIFE SURVEYS REQUIRED AND DURATION OF WILDLIFE HAZARD ASSESSMENT.**

In conducting a Wildlife Hazard Assessment ECAA requires the “*identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.*” In most cases, this requirement dictates that a 12-month Assessment be conducted so the seasonal patterns of birds and other wildlife using the airport and surrounding area during an annual cycle can be properly documented. Most regions of Ethiopia have dramatic seasonal differences in numbers and species of migratory birds. Even for non-migratory wildlife, such as hyena and resident speckled pigeon, behavior and movement patterns can change significantly throughout the seasons. Observations of wildlife at an airport and surrounding areas limited to a few days in a single season generally cannot adequately assess hazardous wildlife issues and associated habitat attractants.

In order to adequately identify wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences, the Biologist may choose from several objective procedures that will adequately assess avian and mammalian species. These standardized survey procedures will insure that quality, representative data can be constantly collected for hazardous wildlife species in the airport environment and that these procedures can be repeated in future years for comparative purpose.

Various wildlife species are active throughout all hours of the day and night. Inventory and monitoring techniques should account for these movement dynamics. Birds should be surveyed diurnally in the morning, midday, and evening hours while appropriate nocturnal surveys and/or tracking indices are incorporated to sample mammals.

**a. Avian Surveys**

- (1) Minimum of twelve months data collection
- (2) Minimum of two randomly selected sampling trips/month
- (3) Minimum of two survey samples/month for each of the survey points during the diurnal periods of morning, midday and evening.

**b. Mammalian Surveys**

- (1) Minimum of twelve months data collection
- (2) Minimum of one randomly selected sampling trip/month

**c. Data from Other Sources**

- (1) Published data
- (2) University studies
- (3) Federal and regional offices studies
- (4) FEPM (forest and environmental protection minister) documents
- (5) Radar studies (if available)
- (6) ATC and airport “event logs” or wildlife management, patrol, monitoring logs
- (7) Other acceptable data sources

**2.6. BASIC WILDLIFE SURVEY TECHNIQUES FOR WILDLIFE HAZARD ASSESSMENTS.**

Not all species are equally detectable but an Assessment should strive to assess the presence/absence of known or suspected hazardous species on or near the airport, especially those documented within the facility’s strike database. Hazardous avian species on or near airports are typically medium to large birds that exhibit either solitary or flocking behavior or small birds that congregate in large flocks.

**a. General Observations**

In addition to the standardized survey, it is important to make general wildlife observations in areas outside the survey points. These observations can provide important information on significant bird hazards and/or zero tolerance species (e.g., wattled ibis) and issues (e.g., endangered species) not fully covered by a standardized survey. Observations of wildlife use and movements around and within structures and other unique areas of the airport environment that are not covered in the standardized bird survey should still be recorded. In addition, observation points also should be established at selected areas of high wildlife use within 13 km

of the airport such as reservoirs, roosting sites, feedlots, landfills, and other potentially attractive sites. The ECAA has established a 13km radius around the airport as the major area of concern.

Additional analysis may also be performed. Each airport is different, and may require special analysis to document bird activity. For example, if a certain flocking species is present in large numbers, some analysis of mean flock size might be presented. If a large number of birds migrate through the airport area over a two-week period, a graphic presentation showing numbers at two week intervals instead of monthly or seasonal intervals might be appropriate. In addition, the general bird observations made outside of the standardized survey need to be incorporated. For example, tables might list the number of pigeon flocks recorded on the airport by month, the mean number of vulture seen per observation by month at a trash transfer facility approximately 3.2 km from the airport, or the mean number of doves seen in a hangar per observation by season. Descriptive summaries might be included of general observations about flight patterns of a certain species over the airport or the habitat use by another species on the airport.

#### **b. Data Recording**

An example of the form used for data recording is located in Appendix F and may be used to record survey data. This data form has standardized codes for weather and time. Encoding data will facilitate data analysis and entry into a database. The use of bird species codes is recommended. For example, in some situations you may not always be able to identify pigeons to species and need a code for unknown pigeons ("UNPGN").

#### **c. Data Analysis and Descriptive Statistics**

Appropriate data analysis and interpretation will provide much of the information necessary to accurately assess hazards and make management recommendations. Data will also serve as a baseline from which the effectiveness of management actions can be measured.

For each survey, the total birds observed per species and the number of observation points recording the species (frequency of sightings on the airport) should be calculated. The number of birds observed provides a measure of species density on the airport. The frequency of sightings at each location indicates the distribution of the species on the airport. Surveys can then be grouped to calculate mean number and frequency of birds (by species) seen per survey by time of day, month, and season.

#### **d. Seasonal Patterns**

Seasonal patterns or trends for species can be represented by graphing the mean number of birds and mean frequency of sightings per month or season as calculated above. The graph will

provide a visual representation of obvious seasonal trends or patterns for each bird species observed in all habitat types (i.e., the entire airport). In many cases it will be useful to simplify presentations by combining species into groups (e.g., birds of prey, dove, and pigeon) in these summary graphs, presenting the detailed data for individual species in a table or appendix.

#### **e. Mammal Surveys**

The collection of data pertaining to mammal populations is often time consuming and labor intensive. However, these data often are a necessary part of an Assessment and wildlife hazard analysis. Whether to collect data for all or for selected mammal species found on an airport depends on past and present wildlife hazards and the judgment of the Biologist. The Biologist should collect data related to identified and suspected hazardous mammal species, including ungulates, canids, and if necessary, rodents.

A number of survey designs developed for mammal species rely upon trapping and marking animals (e.g., mark-recapture studies). Mark-recapture studies are usually time consuming, labor intensive, and costly. Typically, the Biologist should consider a combination of data collection procedures that best identify a specific airport's hazardous species. Systematic vehicle surveys, tracking indices, catch-per-unit-effort survey, and spot mapping are commonly used techniques. Vehicle surveys should provide adequate data on large mammals such as ungulates, canids, and lagomorphs. Various tracking indices can be used to assess relative abundance or to aid in the identification of mammals beyond the scope of vehicle surveys which have varying degrees of success dependent on method (e.g. spotlight, night vision or Forward-Looking Infra-Red [FLIR]). Relative abundance data for small mammals are collected by catch-per-unit-effort sampling (snap traps). Data related to miscellaneous mammals (canids, ungulates,) can also be collected by spot mapping.

##### **(1) Vehicle Surveys**

Vehicle surveys at night using a spotlight, night vision equipment, or FLIR unit are performed along predetermined routes. The survey can be one continuous route around the airport or several routes covering different areas. Survey routes should include areas near runways and habitat types where ungulates, predators, or other target species are suspected or known to occur. Routes should sample a minimum of 10% of the total area. Aerial photographs, topographic maps, and maps that contain airport roadway systems can help in establishing survey routes. Preliminary examinations will be helpful to establish appropriate night time survey routes without excessive obstructions that limit viewing. Survey routes should be established carefully and remain constant throughout the study. Coordination with Air Traffic Control is essential during spotlight surveys to ensure no aircraft are in the AOA or traffic pattern in the line of spotlight beams. Additionally, spotlight surveys should ideally be



scheduled at times when aircraft operations are limited or not present. Spotlights must not be pointed at aircraft, other vehicles or the airport tower. At a minimum, the survey must be conducted at least one time per month for the duration of the study.

Observations may be performed starting one half hour after sunset and ending after two to three hours or delayed, dependent on times of limited scheduled aircraft operations. In general, the survey route(s) are run only once per night although multiple runs can be made if time permits. All mammals and birds observed should be recorded by species and location. The start and end time of each survey and total distance driven should be recorded so that numbers seen per hour and distance can be calculated. Wildlife surveys should be conducted in most types of weather according to schedule, but it may sometimes be necessary to postpone survey periods during severe weather. Surveys should not be conducted in excessive wind or heavy rain as mammal activity may be significantly affected by weather.

### **(2) Catch-Per-Unit-Effort (small mammals)**

Small mammal populations may be measured if birds of prey or mammalian predators occur in the strike record. As a general guideline, transects with 50 traps each should be placed in at least four habitats or locations on the airport. Each transect should have 50 traps placed at 10-m intervals in one line or 25 traps each in two parallel lines 30 m apart. Traps are set in daylight hours and checked 24 hours later.

When checking traps, the following data should be collected for each trap: status of trap (sprung or unsprung) and species, if any, captured. Trapping results are recorded, by species, as the number of animals caught per 100 adjusted trap nights.

### **(3) Spot Mapping**

Spot mapping consists of plotting on a grid map the location, date, and time of mammal observations and provides a general overview of mammal activity on the airport. Often, airport operations officers, who are required to perform runway sweeps, can assist in collection of this data as can pilots or other airport personnel. Additionally, mammal observations made while performing designated bird and mammal surveys can be mapped and used to augment spot observations.

## **2.7. BASIC HABITAT SURVEYS FOR WILDLIFE HAZARD ASSESSMENTS**

Habitat evaluation is an essential part of an Assessment, and is required by ECAA. Many natural and artificial habitats are attractive to wildlife, and evaluation of these should provide

the Biologist with information about the quantity, quality, and seasonal nature of their use. Wildlife exploits these habitats for food, water or cover, which may vary seasonally and/or throughout an animal's life cycle. Although they may be considered either a direct or indirect attractant, it remains essential for safe air traffic operations to fully understand their influence.

Direct attractants (i.e., favorable vegetation for foraging) or indirect attractants (e.g., brushy vegetation may result in increased rodent populations which attracts hazardous raptors) can create equally hazardous environment for safe air operations.

Land-use practices that attract or sustain hazardous wildlife populations on or near airports, specifically those listed in AC No: ECAA –AC-AGA- 009 HAZARDOUS LAND USE PRACTICE IN AND AROUND AIRPOTS THAT ATTRACT WILDLIFE can significantly increase the potential for wildlife strikes.

The ECAA recommends the minimum separation criteria outlined in AC No: ECAA –AC-AGA- 009 for land-use practices that attract hazardous wildlife to the vicinity of airports. This separation criterion provides predetermined boundaries of concern around airports to be considered while conducting comprehensive, detailed studies and evaluations of wildlife populations and attractants.

**a. Pre-existing Habitat Data**

Pre-existing habitat inventory and geospatial information can prove useful regarding soils, vegetative species, topography, geography, habitat type, location and size. This data may be found in various locations or with various agencies such as:

- (1) Airport Layout Plan
- (2) Airport Master Plan
- (3) Airport Environmental Impact Statement

**b. Descriptive Habitat Data**

A general description of the study area needs to be included within the Assessment. This should describe natural and artificial attractants both on-site and off-site within the separation criteria defined in AC No: –AC-AGA- 009

**(1) Natural Habitat Data**

This may include characteristics such as geographic location, topography, soils, climate, vegetation, agriculture, and wetlands/water features (drainages, ponds, lakes, rivers, and water impoundments).

Natural habitat is defined for this purpose as biotic habitats including vegetation (e.g., grass, forest, shrub scrub, wetland, agriculture, desert, etc.) and water features (e.g., ponds, rivers, lakes, marine, retention/detention ponds, drainages, etc.).

Artificial environment is defined for this purpose as man-made features (e.g., buildings, structures, towers, paved/hard surfaces, waste disposal operations, waste containers, etc.).

## **(2) Artificial Environment Data.**

This may include items such as airport buildings, jet bridges, towers, antennas, runways, taxiways, ramp, hangars, waste disposal operations and waste containers)..

### **c. Food**

Naturally occurring wildlife foods such as insect and other invertebrate populations should be noted with descriptions, time of year, weather conditions, and environmental factors such as soil type, vegetative cover, and drainage conditions. In addition, management practices that enhance the production of these natural foods should be documented. An evaluation of small mammal populations as a food source for predators can be addressed in the sampling strategy discussed previously.

Plant seeds, fruits, and berries are other food attractants on airports for birds and mammals. Seasonal wildlife hazards may develop when seeds or fruits are abundant. Documentation of these food sources is an important component of the habitat analysis.

Review environments within 3km radius of the airport, and record food sources that attract wildlife. Agricultural fields, grain elevators, food product industries, fast food restaurants, livestock operations, wildlife refuges and sanctuaries, and waste handling facilities may attract significant numbers of birds and/or mammals, increasing the hazard to human safety and aircraft. A Wildlife Hazard Assessment should contain information relative to these sites such as the names and locations, and a description of the attractant and the potential hazard.

### **d. Vegetation**

Vegetation and cover requirements vary by species and time of year. Relationships between wildlife species and cover types provide information necessary to develop appropriate wildlife management strategies. In reviewing vegetative areas on an airport, it is important to record observations of species, management practices, seasonal growth, density, percent cover, and

any noted wildlife associations. Use of specific areas by animals in the airport environment may assist the observer in identifying vegetative attractants.

#### **e. Water**

Water sources are wildlife attractants, especially fresh water sources in coastal areas (Bahirdar). Reservoirs, streams, ponds, drainage basins, seep areas, and ephemeral water sources should be identified and mapped. Water birds and other kind of birds may be attracted to the airport because of abundant food or drinking and resting sites available in existing water resources.

#### **f. Structures**

Buildings, areas adjacent to buildings, and equipment on airports are readily used by some wildlife species, such as European starlings, pigeons, sparrows, crows, raptors, mice and rats. Wildlife use of structures can present threats to human safety and aircraft, and may cause unsanitary working conditions or damage to structures.

The reasons for use of most structural features by wildlife are usually easily determined, while others are less obvious. For example, feral pigeons may loaf on just one ledge of a particular building because it provides shelter from the wind or protection from predators. Airport Wildlife Biologist should determine what features are attractive to problem species, and why. A strategy can then be developed to reduce or eliminate the problem.

#### **g. Soil**

The type(s) and fertility of soils present on an airport is a general indicator of biological productivity. Habitat quality is directly related to soil fertility and other soil conditions. The nutritive value, quantity, and attractiveness of plant and animal food organisms varies widely with soil types and conditions. For example, sandy, well-drained soils that dry quickly after rainfall generally produce less biomass and are less likely to harbor an abundant population of earthworms and other invertebrates.

Identification and documentation of soil types and conditions on the airport and vicinity should be an integral part of an overall assessment or study

#### **h. Spot Mapping**

Because attractants may vary seasonally and following precipitation, spot mapping the location and date of features such as fruit and seed bearing vegetation, ephemeral pools and temporary ponding of water or puddles throughout the AOA will help identify food sources, drainage problems and grade deficiencies.

## **2.8. BASIC ASSESSMENT OF AIRPORT AND AIRCRAFT OPERATIONS**

Assessment of airport and aircraft operational procedures is an essential part of an Assessment. Hazardous wildlife only presents a risk to aviation if aircraft and wildlife occupy the airspace or movement areas at the same time and location. Persons conducting Assessments must also gather general observation data and other information related to airport and aircraft operations regarding wildlife hazards. Biologists should monitor NOTAMs and published Airport/Facilities Directory information to ensure specific information and not a blanket advisory is issued. Assessment of ATC's involvement in identifying potential hazards as observed or relayed by pilots or airport operations personnel should include determination that wildlife dispersal is coordinated with ATC such that hazards are not inadvertently increased by dispersing wildlife into the path of aircraft movements. ATC must provide wildlife control team's access to movement areas of the airfield, but also communicate with them during the implementation of mitigation measures to ensure dispersal paths are observed and de-conflicted with aircraft movements.

Biologists should also query users of the airport for their inputs on wildlife observed on and around the airport. For example, pilots should be interviewed about their experience in the local area as they have a perspective not available to ground-based personnel. Congregations of towering raptors or dove over off-airport facilities such as landfills and food-processing plants are often detected this way as are major roost sites of starlings, vultures, or crows. Time should be dedicated to visit the pilots' lounge or to visit the local airline representative/facility agent for informal interviews. Fixed-base operators (FBO's) should also be visited and personnel interviewed for their experience with hazardous wildlife in the local area. Pilots, especially those operating non-commercial or private aircraft, must be aware that they have the discretion to delay takeoffs or departures, ask for wildlife dispersal action, or requires alternate runways, departure .or approach paths to avoid identified hazards.

Airline and private maintenance personnel should similarly be interviewed for their perspective on local hazardous wildlife and their reporting procedures when strikes are detected on post-or pre-flight inspections of aircraft.

Other airport users must also be interviewed and included in the Assessment process. Aircraft Rescue and Fire Fighting (ARFF) and Airport Security Personnel are always present on airports during operations and have a unique view of the airfield. They must also be notified should major dispersal operations be conducted, such as with pyrotechnics, where the slight chance for grass fires or security concerns are present.

## SECTION 3

### PROTOCOL FOR THE PREPARATION OF A WILDLIFE HAZARD MANAGEMENT PLAN (PLAN)

#### 3.1. INTRODUCTION

When complete, the Assessment is submitted by the airport to the ECAA for review and approval. The ECAA will also use it to determine if the airport must do a Wildlife Hazard Management Plan. In reaching this decision, the ECAA will consider the Assessment, the aeronautical activity at the airport, the views of the certificate holder and airport users, and any other pertinent information.

The goal of an airport's Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport. The Plan accomplishes this through the identification of hazardous wildlife and their attractants, suitable proactive and reactive management techniques, necessary resources and supplies to successfully implement a wildlife hazard management program and personnel responsibilities and training requirements. Appropriate federal and possible local wildlife control permits should be identified as well as a schedule and methodology to evaluate and update the Plan.

#### 3.2 WILDLIFE HAZARD MANAGEMENT PLAN REGULATORY REQUIREMENTS AND METHODOLOGY.

This AC provides specific guidance as to what facts must be addressed in a Plan.

- a. ***“A list of the individuals having authority and responsibility for implementing each aspect of the plan.”*** This list shall assign or delegate specific responsibilities for various sections of the Plan to various airport departments and other interested federal or local agencies, such as:

- (1) Airport Director
- (2) Operations Dept.
- (3) Maintenance Dept.
- (4) Security Dept.
- (5) Planning Dept.
- (6) Finance Dept.
- (7) Wildlife Coordinator
- (8) Air Traffic Control

- (9) Airlines
- (10) Air-side tenants
- (11) Land-side tenants
- (12) Federal Wildlife authority
- (16) Local law enforcement authorities

**b. “A list prioritizing the following actions identified in the ASSESSMENT and target dates for their initiation and completion.”**

The Plan should provide a prioritized list of problem wildlife populations and wildlife attractants (food, cover, and water) identified in the Assessment, proposed mitigation actions, and target starting and completion dates. A list of completed wildlife population management projects and habitat modification projects designed to reduce the wildlife strike potential can be included to provide a history of work already accomplished. It is helpful to group attractants by areas and ownership.

Wildlife mitigation techniques at airports involve integrated and systematic methodologies that typically progress (based on necessity) from proactive measures to reactive measures. The reduction of wildlife threats at an airport is often the unintended or secondary consequence of ongoing habitat management such as mowing, tree removal, drainage reparations, out-of-grade surface restoration and the establishment or maintenance of perimeter fencing.

**(1) Wildlife population management**

Address species-specific population management plans (e.g., hyena, fox, kite and pigeon). The progression of techniques employed to mitigate hazardous species include habitat modification and resource protection, exclusion devices, repellent / harassment measures, and removal.

- (a) Habitat Management
- (b) Exclusion (fencing, netting, anti-perch/ nesting devices)
- (c) Repellents (chemical, audio, visual)
- (d) Harassment (pyrotechnics, falconry, dogs, radio-controlled models, etc.)
- (e) Capture (chemical, live traps, lethal traps)
- (f) Toxicants (oral and contact); Fumigants
- (g) Shooting

When applicable, airports should identify resident or seasonal “zero-tolerance” hazardous species based on historical strike records or recognized threat posed by such species at the facility. The ranking of hazard level for birds and terrestrial mammals in ECAA-AGA-AC 013 should also be considered when an airport determines zero-tolerance species and subsequent management protocols. Ungulates (i.e., gazelle, warthog), canids (i.e., hyena, domestic dogs) and certain avian species (i.e., black kite, pigeon) are candidates for zero-tolerance management protocols but other hazardous species may require conditional zero-tolerance management. Flocking birds such as white collar pigeon and speckled pigeon have a significant and increasing hazard to aircraft as flock size increases. Therefore, an airport may choose to require zero-tolerance management protocol for these (or similar) species only when an unacceptable flock size has been reached. Determination of action based on flock size is often difficult and requires experienced consideration of variables such as hazard relative to species, airport operation type, and current aircraft activity. Zero-tolerance designation in the airport environment denotes wildlife species that represent an unacceptable high risk to safe aircraft operations. Their presence in the airport environment cannot be tolerated and warrants immediate management action to remove them from the AOA using appropriate techniques (i.e., harassment, lethal take, capture/ relocate, etc.).

## **(2) *Habitat modification***

Address natural and artificial habitats that may provide a food, water or cover source to hazardous species to reduce their attractiveness. Advisory *Circular ECAA –AC-AGA- 009 HAZARDOUS LAND USE PRACTICE IN AND AROUND AIRPORTS THAT ATTRACT WILDLIFE* provides in-depth discussion on acceptable/unacceptable habitats and land-use practices on and near airports. Management of the vegetative/prey food items for hazardous species is often season or weather related and may include rodent control, garbage storage, landscaping, and management of standing water.

### **(a) Vegetative/prey food items for hazardous species**

- (i)** Prey items (rodents, earthworms, and insects)
- (ii)** Vegetative food items (grain/seeds, fruit, and desirable grasses)
- (iii)** Garbage (handling, storage)
- (iv)** Handouts (feeding wildlife)

### **(b) Vegetation management may include:**

- (i)** AOA vegetation
- (ii)** Drainage ditch vegetation
- (iii)** Landscaping
- (iv)** Agriculture



**(c) Water management may include:**

- (i) Permanent Water
- (ii) Wetlands
- (iii) Canals / ditches / streams
- (iv) Holding ponds
- (v) Sewage (glycol) treatment ponds
- (vi) Ephemeral water
- (vii) Runways, taxiways, aprons
- (viii) Other wet areas

**(d) Airport buildings may include:**

- (i) Airfield structures
- (ii) Abandoned structures
- (iii) Terminal
- (iv) Airport construction
- (v) Leased facilities

**(3) Land use changes**

Eliminate agricultural activities and standing water on the airport. When feasible, off-site attractants within the defined separation criteria such as agricultural activities, waste handling facilities that are not fully enclosed, surface mining, urban development, wildlife refuges and storm water management systems should be eliminated as well. See Advisory Circular *ECAA –AC-AGA- 009* for an in-depth discussion on acceptable/ unacceptable land-use practices on and near airports.

**c. “Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.”**

Certain species of wildlife are protected at all levels of government—regional and federal. Address the specific species involved and their legal status in this section. Describe the wildlife management permitting requirements and procedures for all levels of government having jurisdiction.

- (1) Federal
- (2) Regional
- (3) City ordinance

**(4) If pesticides are to be used, the following are also needed:**

- (a) Pesticide-use regulations and licensing requirements
- (b) Federal regulations and licensing: Federal Insecticide, Fungicide, and Rodenticide Act

For the purpose of the Plan, summaries are generally adequate. It is not necessary to quote chapter and verse of federal laws and regulations.

**d. “Identification of resources that the certificate holder will provide to implement the plan.”**

Provide information identifying what resources the airport will supply in terms of personnel, time, equipment (e.g., radios, vehicles, guns, traps, propane cannons, etc.), supplies (e.g., pyrotechnics), pesticides (restricted/non-restricted use) and application equipment and supply sources for equipment and supply

**e. “Procedures to be followed during air carrier operations that at a minimum includes—“**

(1) **“Designation of personnel responsible for implementing the procedures.”** This section describes who is required for successful mitigation of wildlife hazards in the airport environment.

- (a) Wildlife Control Personnel
- (b) Wildlife Coordinator
- (c) Operations Dept.
- (d) Maintenance Dept.
- (e) Security Dept.
- (f) Air Traffic Control
- (g) Pilots
- (h) Airlines
- (i) Fixed-base Operators
- (j) Airside/landside tenants

(2) **“Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin.”** This section provides a description of known or anticipated locations that should be monitored for successful mitigation of wildlife hazards in the airport environment.

- (a) Runway, taxiway
- (b) AOA

- (c) Perimeter fence
- (d) Other areas attractive to wildlife

**(3) “Wildlife hazard control measures.”**

This section describes details current or anticipated techniques that may be implemented for successful mitigation of wildlife hazards in the airport environment. Techniques discussed in this section typically represent an integrated approach and include exclusion, repellent, harassment, capture, lethal control or even relocation measures in specific instances. In addition, operational control measures such as scheduling of flights, air traffic control advisories, Pilot Reports (PIREPS), avoidance procedures, delayed takeoffs and approaches, use of alternate runways or traffic direction, must be considered.

**(4) “Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.”**

This section provides a description of regulated and site-specific protocols for the communication and/ or notification of wildlife control activities, identified and current wildlife hazards on or near the airport environment or imminent wildlife threats to aircraft operations on or near the airport. Protocols may include training in airport communication and the development of notification procedures for airport personnel and Air Traffic Control when wildlife control procedures are implemented or in response to immediate wildlife threats to safe air operations to ensure dispersal activities do not inadvertently increase wildlife hazards. Communication and/ or notification procedures within the Plan should recognize pilot reports and ATC advisories and establish responsibilities for reporting wildlife strikes. This section may also provide equipment requirements that include radios, cellular phones, and lights and an official call list with numbers.

**f. “Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section,” including:**

At a minimum, the Plan should be reviewed once annually and anytime a triggering event occurs. The review(s) should include representatives from all airport departments involved in wildlife hazard management efforts and the Biologist who did the original Assessment. It is often helpful for the airport manager to appoint a Wildlife Hazards Working Group that periodically reviews the airport’s Plan and the plan’s implementation to make recommendations for further refinements or modifications.

**(1) “The plans effectiveness in dealing with known wildlife hazards on and in the airport’s vicinity and:”**

Input should be provided from all airport departments, Air Traffic Control, and the Biologist as to the effectiveness of the Plan. Good records are necessary to properly evaluate the effectiveness of a program.

**(2) “Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.”** For example—

- (a)** Number of times wildlife seen on AOA
- (b)** Requests for wildlife dispersal from air traffic control, pilots, or others
- (c)** Increased number of strikes

This plan cannot be effectively implemented or evaluated without documentation of wildlife strikes. The effectiveness of a Plan to reduce wildlife hazards both on and near an airport and the reevaluation of all facets of damaging/non damaging strikes from year to year requires accurate and consistent reporting. Therefore, every Plan should include a commitment to document all wildlife strikes that occur within the separation distances described in Advisory Circular *Hazardous Wildlife Attractants on or near Airports* to better identify, understand and reduce threats to safe aviation.

**g. “A training program conducted by a Airport Wildlife Biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan.”**

Recurrent training should equip personnel actively involved in an airports wildlife hazard management program with sufficient resources needed to comply with the requirements in their Airport Certification Manual and MOIS. Personnel identified in wildlife hazard management should be considered for inclusion within this recurrent training. Pesticide user training and certification requires its own regulated training and certification schedule and should be closely followed.

## **SECTION 4**

### **PROTOCOL FOR CONTINUAL MONITORING**

#### **4.1. INTRODUCTION**

Upon completion and approval of an Assessment and Plan, airport operator should consider implementing a continual monitoring program for wildlife hazards. Recurrent wildlife monitoring would be outlined in the certificate holder's Plan. The goal of systematic, long-term wildlife hazard monitoring in an airport environment is to identify changes to wildlife composition, numbers, attractants, travel corridors and the general airport environment in a timely manner that can affect the presence or behavior of wildlife. Continual monitoring would enhance safety because it allows the airport operator to regularly determine trends in wildlife fluctuations and target mitigation practices to reduce the possibility of strikes. The certificate holder can use this information to quickly and efficiently implement mitigation techniques and evaluate the efficacy of its mitigation program. Ultimately, the frequent hazard identification and adaptable mitigation would reduce the likelihood of wildlife strikes. Additionally, continual monitoring should decrease the time, effort, personnel hours, and money spent on mitigation because hazards would be identified before they pose a high risk.

In contrast to an assessment or inventory of wildlife hazards in an airport environment, a monitoring program over time assesses changes and trends of the resources. Consideration should be given to data points and techniques tested and incorporated into an airport's Assessment for use in its long term monitoring protocol. Ultimately, the techniques used for long term monitoring may change over time dependent on the airports goals/ management objectives, personnel changes, availability of improved methodologies/ equipment or recommendations based on systematic evaluation of the monitoring program.

#### **4.2 CONTINUAL MONITORING PROTOCOL**

The monitoring should consist of monthly wildlife surveys and identification of significant changes to natural/ artificial habitats and other attractants. This monitoring would best be conducted by a Qualified Airport Wildlife Biologist.

##### **a. Avian Surveys**

- (1) Twelve months data collection
- (2) Minimum one survey/ month for each of the survey points during the diurnal periods of morning, midday and evening; unless the Assessment, strike records or monitoring data

justifies the elimination of a survey time period (i.e., elimination of midday surveys for example).

It may be beneficial to increase avian surveys during migrations season.

#### **b. Mammalian Surveys**

- (1) Twelve months data collection.
- (2) Airports that have documented hazardous terrestrial mammals (i.e., hyena, fox) should conduct a minimum of one survey/ month. Airports without recognized terrestrial mammal hazards should conduct a minimum of quarterly surveys throughout the year.

#### **c. Monitoring of Airport Procedures.** Monitoring of airport procedures should include:

- (1) ATC and airport “event logs” or wildlife management, patrol, monitoring logs
- (2) Wildlife/aircraft strike reports
- (3) Federal Depredation Permit use; Special Permit use (e.g., for endangered species)

### **4.3 CONTINUAL MONITORING ANNUAL REPORT**

As part of a continual monitoring program, a certificate holder may choose to prepare an annual report to best evaluate the efficacy of its wildlife mitigation program summarizing:

- (1) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences
- (2) Identification and location of features on and near the airport that attract wildlife
- (3) Description of wildlife hazards to air carrier operations
- (4) Description of wildlife strikes during the year
- (5) Discussion of any significant modifications on or near the airport property
- (6) Summary of ATC and airport “event logs” or wildlife management, patrol, monitoring logs
- (7) Summary of Federal Depredation Permit use; Special Permit use (e.g., for endangered species)

### **APPENDIX A: Airport Wildlife Hazard Site Visit Checklist**

Wildlife Hazard Site Visits must be conducted by a Qualified Airport Wildlife Biologist to provide an airport a quick analysis and actionable information concerning wildlife hazards that allows the airport to expedite the mitigation of these hazards. A Site visit can be used to investigate a triggering event or other significant event and determine whether an existing Plan adequately addresses the incident and if applicable, the necessity of an Assessment.

During the Site visit, the Qualified Airport Wildlife Biologist collects and compiles information on the airport's wildlife hazard history, documented and suspected wildlife hazards, habitat attractants, control activities, airport operations procedures, communications of hazards through ATC and pilots, aircraft operations and scheduling. A Site visit is typically conducted over a period of one to three days during which a Qualified Airport Wildlife Biologist evaluates the habitat on and surrounding the airport and records direct or indirect wildlife observations; and reviews the current Plan, current wildlife management activities and airport wildlife strike data.

The following is a Checklist that can be utilized to insure a complete and detailed site visit. The checklist can also be used to review the site visit protocol and report.

The following is a Checklist that can be utilized to insure a complete and detailed Site visit. The checklist can also be used to review the Site visit protocol and report

#### **Airport Wildlife Hazard Site Visit Checklist**

Airport name :		
Date of site visit :	<b>Time:</b>	
Airport representative :		
Airport wildlife biologist:		
	<b>Yes/No</b>	<b>Comments/Observations</b>
<b>Information review</b>		
Personnel and departments responsible for airport ops		
Type of airport/annual movements		
Recent improvements		
Strike records (in database or airport records)		
Depredation permits		
<b>Review of habitat management activities</b>		
Mowing		

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Clearing ditches of vegetation		
Tree removal		
Other		
<b>Review wildlife management activities</b>		
Pyrotechnics		
Fencing		
Wildlife removal (lethal, trapping, etc.)		
Nest removal		
Other		
<b>Review Plan (if applicable)</b>		
<b>Observe features on airport property that may attract wildlife</b>		
Wetlands		
Ditches		
Storm water Treatment Areas		
Forested/Shrub Areas		
Abandoned Structures		
Construction Sites/Debris		
<b>Observe features adjacent to airport property that may attract wildlife (13km)</b>		
Wetlands		
Agriculture		
Forested/Shrub Areas		
Grass field		
Other		
<b>Observe and identify wildlife species and/or sign</b>		
List all wildlife observed		Please list on separate data sheet
List all wildlife sign observed		Please list on separate data sheet
<b>Site Visit Report</b>		
General airport information		separate data sheet
Strike data analysis		
List of bird/mammal species observed and times of observations		separate data sheet
State and federal status of species		separate data sheet
Description of habitat features (natural and man-made) that may attract wildlife on and near the		separate data sheet



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airport		
Map of airport with location of wildlife attractants on or near airport and observations		
Recommended actions* for reducing identified wildlife hazards to air carrier operations		
Recommendation regarding whether a 12-month wildlife hazards assessment is necessary		

\*Recommendations can include (but are not limited to) the following:

- clearing vegetation in ditches to improve drainage and reduce nesting habitat
- Mowing grass to recommended heights
- Tree removal inside the perimeter fence
- Repair breaches in perimeter fence when observed
- Keep vegetation maintained along fencing
- Install perching deterrents on signs and lights
- Use pyrotechnics to disperse hazardous wildlife
- Trap and remove hazardous mammal species (beavers, feral hogs, etc.)

**APPENDIX B: Airport Wildlife Hazard Assessment and Report Checklist**

A Wildlife Hazard Assessment (Assessment) is a 12-month assessment of wildlife and wildlife attractants on or near an airport. An Assessment provides the baseline data and understanding of wildlife hazards and trends for preparing a Wildlife Hazard Management Plan (Plan).

The following is a Checklist that can be utilized to insure a complete and detailed Assessment. The checklist can also be used to review the Assessment protocol and report.

### Airport Wildlife Hazard Assessment and Report Checklist

<b>Airport Name:</b>
<b>Airport Representative:</b>
<b>Qualified Airport Wildlife Biologist:</b>
<b>Assessment Dates (Initiation/Completion):</b>
<b>Assessment Report – Date Completed:</b>
<b>Assessment Report – Date Approved by ECAA:</b>

	Yes/No	Comments/Observations
<b>ASSESSMENT CHECKLIST</b>		
<b>Analysis of the event or circumstances that prompted the assessment</b>		
<b>General Airport Information Review</b>		
Personnel and departments responsible for airport ops		
Type of airport/annual movements		
Recent improvements		
Strike records (in database or airport records)		
Depredation permits		
Wildlife hazard management plan (if applicable)		
Mowing		
Drainage maintenance/clearing		
Tree removal		
Other		
<b>Review of Wildlife Management Activities</b>		
Harassment		
Exclusion		
Wildlife removal (lethal, trapping, etc.)		
Nest removal		
Other		

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<b>Identification and location of features on airport that attract wildlife</b>		
Wetlands		
Drainages		
Agriculture		
Water impoundments/ponds/streams/marine		
Forested/Shrub Areas		
Structures/towers/antennas		
Construction Sites/Debris		
<b>Identification and location of features near airport (13Km) that attract wildlife</b>		
Wetlands		
Ditches		
Agriculture		
Water impoundments/ponds/streams/marine		
Landfill		
Forested/Shrub Areas		
Grass field		
Other		
	<b>Yes/No</b>	<b>Comments/Observations</b>
<b>Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences</b>		
Assessment = Minimum of 12 consecutive months		
Locate standardized observation points on airport (observation points off airport are optional) to adequately observe wildlife and their movements on all parts of AOA.		
Point count surveys conducted morning, midday and evening		
Avian surveys conducted a minimum of twice monthly		
Mammal surveys conducted a minimum of once monthly		
Record results of point count surveys and all general wildlife observations (including wildlife sign)		
Small mammal trapping (optional)		
Record presence of state and/or federally listed		

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species		
<b>REPORT SECTION-(Assessment Report must have a Methods, Results and Recommendations section to provide required information)</b>		
Executive summary and qualified airport wildlife biologist qualifications (recommended)		
<b>Analysis of the event or circumstances that prompted the study</b>		
General airport information (refer to General Airport Information Review section at beginning of appendix)		
Strike data spreadsheet		
<b>Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences</b>		
Description of avian and mammal survey methodologies (minimum survey methodologies described above)		
List and description of bird/mammal species observed		
federal status of species		
Record results of point count surveys and all general wildlife observations (including wildlife sign)		
Small mammal trapping (optional)		
Record presence of federally listed species		
Map of airport with location of observation points		
<b>Identification and location of features on and near the airport that attract wildlife</b>		
Description of habitat features (natural and man-made) that may attract wildlife on and near the airport		
Map of airport with location of wildlife attractants on airport property		
Map of airport with location of wildlife attractants near airport (13km).		
<b>Description of the wildlife hazards to air carrier operations</b>		
List the wildlife hazards that have been observed		

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that are unique to this airport		
<b>Recommended actions for reducing identified wildlife hazards to air carrier operations</b>		
List of prioritized recommendations* that are unique to this airport (is a Section 7 Consultation required based on these recommendations?)		

\*Recommendations can include (but are not limited to) the following:

- Clearing vegetation in ditches to improve drainage and reduce nesting habitat
- Mowing grass to recommended heights
- Tree removal inside the perimeter fence
- Repair breaches in perimeter fence when observed
- Keep vegetation maintained along fencing
- Install perching deterrents on signs and lights
- Use pyrotechnics to disperse hazardous wildlife
- Trap and remove hazardous mammal species (beavers, feral hogs, etc.)

### APPENDIX C: Airport Wildlife Hazard Management Plan Checklist

A Wildlife Hazard Management Plan (Plan) is a document that is prepared by the airport if the ECAA determines a Plan is necessary based on the results of an Assessment. The goal of the Plan is to minimize risk to aviation safety, airport structures, or equipment, or human health posed by populations of hazardous wildlife on and around the airport. The items of the plan are listed and further described in the list below.

The following is a Checklist that can be utilized to insure a complete and detailed Plan. The checklist can also be used to review the Plan contents

#### Airport Wildlife Hazard Management Plan Checklist

<b>Airport Name:</b>
<b>Airport Representative:</b>
<b>Plan Preparation Date:</b>
<b>Plan ECAA Review Date:</b>
<b>ECAA Reviewer:</b>

	Yes/No	Comments/Observations
<b>Brief introduction describing hazards identified in the Assessment and the wildlife attractants on and near the airport</b>		
<b>A list of individuals having authority and responsibility for implementing each aspect of the plan</b>		
Decision making roles and responsibilities including: Airport manager, Wildlife Coordinator, Operations Supervisor, Maintenance Supervisor, Security Dept., Planning Dept., Finance Dept., Wildlife Hazard Working Group		
Other		
<b>A list prioritizing the following actions identified in the Assessment and target dates for their initiation and completion</b>		
(i) Wildlife population management (list of problem wildlife populations and mitigation actions/target dates)		
(ii) Habitat modification (list of wildlife attractants)		

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and mitigation actions/target dates)		
(iii) Land use changes (list of land use on and near airport that attract wildlife and mitigation actions/target dates)		
Ongoing data collection and analysis		
Recordkeeping		
Other		
<b>Requirements for and, where applicable, copies of Federal wildlife control permits (Copies of all valid permits must be included in Plan)</b>		
Federal depredation permit		
Pesticide-use license/permits		
Other		
<b>Identification of resources that the certificate holder will provide to implement the plan</b>		
Personnel		
Field identification guides		
Pyrotechnics		
Vehicles		
Pesticides and application equipment		
Other (binoculars, traps, guns, radios, etc.)		
<b>Procedures to be followed during air carrier operations that at a minimum includes</b>		
(i) Designation of personnel responsible for implementing the procedures (Wildlife patrol staffing and primary responsibilities, hours of availability, etc.)		
(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin <input type="checkbox"/> Routine inspection procedures, <input type="checkbox"/> Documentation of inspections and observations <input type="checkbox"/> Runway/taxiway sweeps, perimeter fence inspections		
(iii) Wildlife hazard control measures <input type="checkbox"/> Monitoring <input type="checkbox"/> Recordkeeping,		

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<input type="checkbox"/> Dispersal/harassment procedures <input type="checkbox"/> Procedures for wildlife control during different seasons and heavy air traffic times)		
(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower <input type="checkbox"/> Training in communication procedures <input type="checkbox"/> Procedures for immediate coordination and response to pilot-reported wildlife strikes or observations		
Other		
<b>Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following a triggering event,</b>		
(i) The plan’s effectiveness in dealing with known wildlife hazards on and in the airport’s vicinity and (ii) (ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated <input type="checkbox"/> One or more meetings with Wildlife Hazard Working Group to review Plan <input type="checkbox"/> Procedures for documentation of wildlife observations and wildlife control activities <input type="checkbox"/> Protocol to meet training requirements		
<b>A training program conducted by a qualified airport wildlife biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan</b>		
Training participation documentation		



### APPENDIX D: Airport Wildlife Hazard Continual Monitoring and Report Checklist

Upon completion and approval of an Assessment and Plan, airports can implement a continual monitoring program that will be outlined in their Plan and ACM. Continual monitoring is an ongoing assessment of wildlife hazards at an airport that results in an annual report. The annual report will include recommendations for wildlife hazard mitigation and data on the effectiveness of mitigation programs at the airport and seasonal trends of species behavior and utilization of the airport.

The following is a Checklist that can be utilized to insure a complete and detailed Continual Monitoring program. The checklist can also be used to review the monitoring protocol and report.

#### Airport Wildlife Hazard Continual Monitoring and Report Checklist

<b>Airport Name:</b>
<b>Airport Representative:</b>
<b>Qualified Airport Wildlife Biologist:</b>
<b>Initial Assessment Dates (Initiation/Completion):</b>
<b>Continual Monitoring Dates (Initiation/Completion):</b>

	Yes/No	Comments/Observations
<b>Identification and location of features near airport (13km) that attract wildlife</b>		
Wetlands		
Ditches		
Agriculture		
Storm water Treatment Areas		
Landfill		
Forested/Shrub Areas		
Grass field		
Other		
<b>Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences</b>		
Minimum of 12 months data collection		
Locate standardized observation points on airport (observation points off airport are optional) to adequately observe wildlife and their movements		

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on all parts of AOA. Use points established during initial Assessment is recommended		
Point count surveys conducted morning, midday and evening (unless Assessment, strike data, or monitoring data justifies the elimination of a survey time period)		
Avian surveys conducted a minimum of <b>once</b> monthly		
Mammal surveys conducted once a month for airports with documented hazardous terrestrial mammals <b>OR....</b>		
Mammal surveys conducted quarterly for airports without recognized terrestrial mammal hazards		
Record results of point count surveys and all general wildlife observations (including wildlife sign)		
Small mammal trapping (optional)		
Record presence of federally listed species		
<b>Report Checklist</b>		
<b>General airport information (refer to General Airport Information Review section at beginning of appendix)</b>		
<b>Identification and location of features on and near the airport that attract wildlife</b>		
Description of habitat features (natural and man-made) that may attract wildlife on and near the airport		
Map of airport with location of wildlife attractants on airport property		
Map of airport with location of wildlife attractants near airport (13km).		
<b>Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences</b>		
Description of avian and mammal survey methodologies (minimum survey methodologies described above)		
List and description of bird/mammal species observed		

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federal status of species		
Map of airport with location of observation points		
<b>Description of the wildlife hazards to air carrier operations</b>		
List the wildlife hazards that have been observed that are unique to this airport		
<b>Description of wildlife strikes during the year and table depicting strike data</b>		
<b>Summary of ATC and airport records including wildlife observations, patrol, control, and monitoring</b>		
<b>Summary of Federal depredation permit use; special permit use (Eagle Disturbance or Nest Removal permits)</b>		
<b>Recommended actions for reducing identified wildlife hazards to air carrier operations</b>		
Recommendation regarding whether or not modifications should be made to existing Plan		

\*Recommendations can include (but are not limited to) the following:

- Clearing vegetation in ditches to improve drainage and reduce nesting habitat
- Mowing grass to recommended heights
- Tree removal inside the perimeter fence
- Repair breaches in perimeter fence when observed; keep vegetation maintained along fencing
- Install perching deterrents on signs and lights
- Use pyrotechnics to disperse hazardous wildlife
- Trap and remove hazardous mammal species (beavers, feral hogs, etc.)





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