



DCA- GM- AGA 13

**PROCEDURE FOR RECORDING AND REPORTING
WILDLIFE STRIKES TO AIRCRAFT**

First Edition
2 May, 2023

**Department of Civil Aviation
Ministry of Transport and Communications
Myanmar**

Foreword

MCAR Part 139 Section 2 requires that action be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.

The purpose of this document is to provide guidance to regulators, aerodrome operators, aircraft operators and Air Navigation Service Providers (Air Traffic Controllers) to fulfil the requirements stipulated by MCAR Part 139 Section 2.

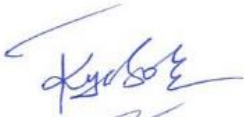
DCA-GM-AGA 08 focused on the control of birds/wildlife on, and in the vicinity of, aerodromes for the purpose of reducing the hazard of birds/wildlife strikes to aircraft. Therefore, this guideline was expanded to include the establishment of a Wildlife Hazard Management Programme (WHMP) at aerodromes, recording of wildlife strikes, aerodrome wildlife safety assessment, data analysis and reporting of wildlife strikes.

Readers should forward advice of errors, inconsistencies or suggestions for the improvement of WHMP at the address shown below:

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1. INTRODUCTION

- 1.1 The presence of wildlife on, or in the vicinity of an aerodrome poses a serious threat to aircraft operational safety.
- 1.2 In accordance with 9.4.1 of the MCAR Part 139 Section 2, Aerodrome Standards, the wildlife strike hazard on, or in the vicinity of, an aerodrome shall be assessed through:
- a) the establishment of a national procedure for recording and reporting wildlife strikes to aircraft;
 - b) the collection of information from aircraft operators, aerodrome personnel and other sources on the presence of wildlife on or around the aerodrome constituting a potential hazard to aircraft operations; and
 - c) an ongoing evaluation of the wildlife hazard by competent personnel.
- 1.3 Furthermore, the wildlife strike reports shall be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database (9.4.2 of MCAR Part 139 Section 2).
- 1.4 An effective Wildlife Hazard Management Programme (WHMP) depends on accurate and reliable data. Reviewing and analysing wildlife strikes and wildlife observations will help quantify hazards at the aerodrome and its vicinity and indicate the effectiveness of current wildlife strike prevention methods.
- 1.5 All wildlife hazard management programs need to be monitored to see if they are working effectively and whether they need to be modified, extended or improved. The only effective way to do this is by collecting data on the strikes including at the aerodrome concerned. Other measures, for example counting the wildlife on the airside, provide useful additional information, but are not a direct measure of the strike risk at the aerodrome.
- 1.6 All strikes should be reported, whether or not they cause damage to the aircraft and report whatever wildlife species was involved. It is important that airport operator do not penalise staff for reporting wildlife strikes. Even though strikes to large jet airliners from small species such as swallows or sparrow-sized birds are unlikely to cause significant damage to an aircraft, staff should report them.
- 1.7 Similarly, the total number of strikes at an aerodrome should never be used as a measure of strike risk or of the performance of the wildlife controllers. Staff must be encouraged to report all sightings and strikes of wildlife. Collection of information on wildlife around the 13 km range from the aerodrome reference point is of utmost importance and relevance to wildlife hazard management. The main risk arises from strikes with large species, especially birds that form flocks. A risk assessment process that combines potential strike frequency with likely severity needs to be adopted to properly assess the risk. Such a process cannot work effectively unless all strikes are reported.

- 1.8 A properly trained and equipped wildlife controller should be present on the airfield for at least 15 minutes prior to any aircraft departure or arrival. Thus, if aircraft are landing or taking off at intervals of less than 15 minutes there should be a continuous presence on the airfield throughout daylight hours. The wildlife controller should not be required to undertake any duties other than wildlife control during this time. Note that for aerodromes with infrequent aircraft movements, 15 minutes may not be long enough to disperse all hazardous wildlife from the vicinity of the runway. In this case the wildlife controller should be deployed sufficiently in advance of the aircraft movement to allow full dispersal to be achieved.
- 1.9 At night, active runways and taxiways should be checked for the presence of wildlife at regular intervals and the dispersal action taken as needed.

2. SCOPE AND PURPOSE

2.1 Purpose of the Document

- 2.1.1 The purpose of this document is to provide guidance to regulators, aerodrome operators, aircraft operators and Air Navigation Service Providers (Air Traffic Controllers) to fulfil the requirements stipulated by MCAR Part 139 Section 2 as described in paragraphs 1.2 and 1.3 above including the materials that are not provided in PANS-Aerodromes (Doc 9981) and Airport Services Manual (Doc 9137), Part 3 – Wildlife Hazard Management and Annex 19 Safety Management.

3. AERODROME WILDLIFE HAZARD MANAGEMENT PROGRAMME (WHMP)

3.1 Establishment of a WHMP at Aerodromes

- 3.1.1. A wildlife hazard management programme (WHMP) is a method for aerodrome operators to adopt reasonable wildlife risk control measures, address features that may attract wildlife, control the presence of wildlife on, and in the vicinity of, the aerodrome. A WHMP should be developed based on the wildlife hazard risk assessment, according to the size and complexity of the aerodrome.
- 3.1.2 An aerodrome should establish procedures for data collection, risk analysis and the implementation of wildlife control measures. Aerodrome personnel should be competently trained in wildlife hazard management with well defined roles and responsibilities.
- 3.1.3 The WHMP should not only consider the establishment of internal actions specific to the aerodrome operator. For it to be effective, involving different stakeholders and external entities throughout its development will be needed, since they may be linked to the presence of wildlife, attracting habitats, land use, etc.
- 3.1.4 Wildlife hazards on, and in the vicinity of, the aerodrome are constantly changing due to modifications in land use, management policies, and environmental factors. In addition, wildlife can adapt or habituate to control strategies that were once effective, or they might develop new behavioural or feeding patterns on, or near, the aerodrome. These factors can affect the efficacy of the WHMP's success.

3.1.5 The WHMP should be reviewed if changes to wildlife hazards are observed (e.g. planned land use changes, significant strike event, new wildlife species observed, operational changes, etc.) and at a minimum, this review should occur annually. The WHMP should be revised as necessary.

3.1.6 A WHMP should include, as a minimum:

- a) a description of the organization of the WHMP;
- b) the roles and tasks of aerodrome personnel involved with the WHMP;
- c) a description of the aerodrome operations;
- d) procedures including means and aerodrome personnel for collecting, reporting and recording data on observed wildlife and wildlife strike events;
- e) a wildlife safety risk assessment method and procedure (including annual reviews);
- f) procedures, means and personnel for habitat and land management;
- g) procedures, means and personnel for the expelling, deterring and removing of wildlife, including lethal means where appropriate;
- h) procedures for coordinating with internal and external stakeholders;
- i) procedures, means and provisions for the training of aerodrome personnel; and
- j) procedures and performance indicators to monitor the mitigation measures applied and assess their effectiveness, as well as the effectiveness of the WHMP itself (in terms of increase or decrease on the wildlife strike risk level).

3.2 Roles and tasks in the WHMP

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

- a) develop and implement the WHMP;
- b) oversee the daily activities (detailed in the sections below);
- c) record wildlife (presence and movements);
- d) record and analyse the collected data (observations, wildlife strikes, etc.);
- e) carry out periodic surveys, wildlife studies and safety risk assessments to develop and implement the WHMP;
- f) manage the habitat to reduce the attractiveness of identified areas, if relevant;
- g) expel, deter and remove hazardous wildlife;
- h) report wildlife strikes to the CAA and ICAO;
- i) coordinate with stakeholders and external entities;
- j) evaluate and update the WHMP as needed; and
- k) for any other reason, is involved in wildlife hazard management.

- 3.2.2 In addition to the previous responsibilities, the aerodrome operator should appoint a wildlife manager or coordinator who will coordinate all tasks related to wildlife hazard management associated to the WHMP.
- 3.2.3 With regard to the wildlife control personnel at the aerodrome, if they do not cover the operating hours of the aerodrome, it should be indicated which groups would be in charge of wildlife control in their absence.

4. RECORDING WILDLIFE STRIKES

4.1 Record all suspected and confirmed strikes

- 4.1.1 As traffic numbers increase, aircraft manufacturers use quieter aircraft that are larger in size and while wildlife populations increase. Accordingly, greater effort is required to control and monitor wildlife activities on and in the vicinity of aerodromes. Every strike must be reported to the relevant authorities, actions taken and communicated to all relevant stakeholders.

4.2 Record all strikes reported by Pilot and ATC irrespective of ground confirmation

- 4.2.1 Aerodrome operators should ensure all strikes reported by airlines/pilots and ATC are logged. In this case, aerodromes should consider the adoption of smart devices to collate data onto a robust system capable of easy data access and ability to draw speedy conclusions with the help of analytical tools.
- 4.2.2 The cost of inspection and repair of aircraft following wildlife damage or suspected wildlife damage is significant. The additional costs and disruption as a result of aborted flights, rescheduling of aircraft passengers and air cargo, transfer of passengers to alternative means of transport, overnight accommodation at the expense of the aircraft operator and the deleterious effects on connecting flight schedules that can be significant and damaging to airline operating budgets and the passenger experience which are also major factors in the cost of a bird strike. Therefore, suspected strikes must be treated with greater significance.

4.3 Record all carcass on the runway as suspected strikes

- 4.3.1 Trained and competent staff who should be able to detect and record the presence of wildlife and assess the wildlife hazard and expel hazardous wildlife by using active/passive measures or interventions. It is recommended that the training syllabus for aerodrome staff engaged in wildlife control activities include an element of ecology and biology knowledge, to enable them to make reliable and accurate identifications of wildlife both from observations and post-strike during the collection and analysis of wildlife remains. The unidentifiable remains/carcass (including blood smears on aircraft components) should also be addressed and sent to relevant organizations for deoxyribonucleic acid (DNA) analysis.

5. STANDARD SPECIES NOMENCLATURE ACROSS SPECTRUM FOR REPORTING PURPOSES

- 5.1 Wildlife species vary across the Country. It is important to set up a wildlife library of standard names for all wildlife species.

6. STANDARD FORM FOR MONITORING AND RECORDING OF WILDLIFE ACTIVITY

- 6.1 Ideally, aerodrome wildlife controllers should record the following at least every one hour however patrols will depend and vary on the number of movements, and surrounding habitat. For example, if there has been frequency of rain which might significantly increase presence of insects in the airfield which will lead to more wildlife activity. In such instance's patrols must be customized accordingly.

- i) Areas of the aerodrome patrolled,
- ii) Numbers, location and species of wildlife seen,
- iii) Action taken to disperse the wildlife, and
- iv) Results of the action.

- 6.2 More general information such as the name of the wildlife controller on duty, time on and off duty, weather conditions etc. should be recorded at the start of a duty period. Refer to the standard form given in 6.3.

- 6.3 A standard form for monitoring and recording of wildlife activity should be developed. Additional fields which are relevant to aerodromes can be added.

i) **General Information:**

- 1. Date of Recording
- 2. Time of Activity
- 3. Zone on aerodrome where activity was spotted
- 4. Sky Condition when Activity is noted
- 5. Wind Direction at time of activity
- 6. Weather Condition at time of activity
- 7. Grid number (if aerodrome grid map is Available)
- 8. Previous 24 hrs. weather conditions (like rain, or hail)

ii) **Wildlife Related**

- 1. Name of Wildlife Species
- 2. Number of the Species Observed
- 3. Activity Species is doing at time of observation
- 4. Altitude at which species was observed
- 5. Direction of flight of species (if relevant)
- 6. Start Time of Activity
- 7. End Time of Activity
- 8. Dispersal required
- 9. Type of method used for dispersal
- 10. Action due to dispersal

- iii) **Supplemental Information**
1. Runway in Use
 2. Scaring Device used (Type)
 3. Time of Scaring device used
 4. Number of Pyrotechnics used (if used)
 5. Number of wildlife monitoring personnel on shift at time of Activity
 6. Proof of Activity – Photographs

7. AERODROME WILDLIFE SAFETY RISK ASSESSMENT

7.1 Introduction to Safety Risk Management

7.1.1 Safety risk assessments can take many forms including enabling the aerodrome operator to understand the very real risk of catastrophic outcomes from wildlife strikes.

7.1.2 The first step in a safety risk assessment of wildlife hazards is to define the area that will be assessed. This should include the entire aerodrome and its vicinity, in particular aircraft approach and take-off.

7.1.3 Knowledge of the wildlife living in the aerodrome and its vicinity, their movements and to which areas they are attracted, is essential. This can be achieved with an adequate wildlife monitoring programme and by keeping historical records.

7.1.4 An important element of the safety risk assessment is understanding the definitions used for aerodrome wildlife management:

a) a *hazard* is a condition or object with the potential to cause or contribute to an aircraft incident or accident. In this context, a hazard is the presence of certain wildlife on or near an aerodrome; and

b) a *safety risk* is the predicted probability and severity of the consequences or outcomes of a hazard. In this context, safety risk is the probability of a wildlife strike by a particular species multiplied by the severity of damage to the aircraft that might reasonably occur.

safety risk = (probability of a strike) × (severity of damage caused)

7.1.5 Any assessment of risk needs to estimate the probability that a strike will occur and the likely level of harm that may result. Estimation of harm is relatively straightforward because the analysis of various wildlife strike databases around the world show that there is a consistent relationship between wildlife mass and the percentage of damage to aircraft. Strikes involving flocks of a given species of bird are more likely to result in damage to the aircraft than strikes with single birds of the same species. The larger the bird and the greater its tendency to be struck in groups, the greater the risk.

7.1.6 It is more difficult to estimate the likely strike frequency of a particular population of birds or other wildlife because their behaviour cannot be predicted with certainty. There are a number of possible approaches to estimating strike probability which vary in sophistication, skill level, experience and input data needed to apply them.

- 7.1.7 The most common form of safety risk assessment involves the categorization of both strike probability and severity into a number of levels, usually very low, low, moderate, high and very high. These levels would apply in a double entry matrix in which wildlife species would be classified according to a determined level of risk.
- 7.1.8 The results of a risk assessment matrix should be used to prioritize wildlife management techniques and methods. These actions should be documented in the WHMP.

7.2 ESTIMATING THE PROBABILITY OF A STRIKE

7.2.1 The probability of a wildlife strike should be calculated using wildlife incident data and current data on the presence, location and behaviour of wildlife in the aerodrome and its vicinity. Strike records also allow the determination of daily and seasonal trends to determine the likelihood of future strike events.

7.2.2 Using wildlife strikes to calculate probability depends on the number of strikes and the reporting culture. Aerodromes with fewer operations may generate fewer collisions; therefore, the limited data may not allow accurate or useful predictability on strike probability.

7.2.3 If the aerodrome does not have good quality strike data, it is important to consider the potential risk of collision determined by the existence of wildlife and their movements on and in the vicinity of the aerodrome.

7.2.4 The more knowledge about the presence and behaviour of wildlife on, and in the vicinity of, the aerodrome, the stronger the estimation of wildlife strike probability and the final safety risk assessment for each relevant species.

7.2.5 The aerodrome should have records of wildlife incidents, as well as information about observed wildlife, its habits, preferred areas, etc. This information can provide an input for wildlife probability calculation.

7.2.6 Due to the differences in resources available depending on the aerodrome, the data to be used in the safety risk assessment can be quantitative and qualitative. Best practice is to use quantitative data.

7.2.7 Both quantitative and qualitative measurements of abundances of wildlife and number of strikes are used to rank probabilities of a species being involved in a strike at a particular aerodrome since aerodromes differ in the quality and quantity of information that they hold. This is useful to take into account different levels of knowledge and available statistics for different aerodromes.

7.2.8 An example is shown in Table 7-1 regarding the values of some descriptive variables of a specific species, in order to be categorized (quantitatively and qualitatively) for probability of impact:

Table 7-1. Example of impact probability categorization

	<i>Probability category</i>				
	<i>Very high</i>	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Very low</i>
QUANTITATIVE APPROACH Presence of wildlife (<i>number of days per year a species is observed on the aerodrome and its surroundings</i>)	> 200	100-200	50-100	50	10
QUALITATIVE APPROACH Presence of wildlife (<i>subjective evaluation</i>)	Permanent	Most	Some	Few	Occasional
QUANTITATIVE APPROACH Average number of strikes per year (5 years)	>10	3-10	1 - 2.9	0.3 - 0.9	0 - 0.2
QUALITATIVE APPROACH Strikes per year (<i>subjective evaluation</i>)	Very often	Often	Some	Occasional	Rare/None

7.2.9 Different biological and behavioural characteristics of wildlife species can help classify them in specific risk levels. For instance:

- a) species that shy away from aircraft noise or that learn to avoid aircraft could be rated as low probability;
- b) birds that flock in large numbers to certain habitats in the flight path could be rated a high or very high probability;
- c) solitary animals might be rated as moderate probability;
- d) species with low or erratic flights could be rated as high or very high probability; and
- e) species with nocturnal activity on aerodromes with nocturnal flights should have a higher probability of impact.

7.2.10 Other behavioural factors should also be considered. The probability might also vary with the season, age or gender of the creatures, or other conditions such as grass length or rain and other weather conditions.

7.2.11 Other variables to assess the risk more accurately include: flight activity on the aerodrome (the higher number of air operations, the higher the probability of wildlife strike), the type of aircraft using the aerodrome (larger, faster aircraft are likely to increase the risk of wildlife strike). Relating the number of impacts with the number of flight operations may help better understand if an increasing frequency of impacts can be related to a greater number of operations, to a greater wildlife presence, or both.

7.3 ESTIMATING THE SEVERITY OF A STRIKE

7.3.1 The next step is to rank the expected severity of the impact or damage resulting from a strike event. A scale similar to the strike probability scale can be used.

7.3.2 Wildlife strikes have a directly associated severity, defined by the damage that the animal has caused to the aircraft after the impact. For observed wildlife, the severity scale will

depend essentially on the size of the animal and its tendency to flock or congregate. Generally, heavier wildlife and greater flock size increases the probability of damaging an aircraft and impacting its flight performance. Flocking behaviour could include multiple impacts or increase the probability of a strike.

7.3.3 Severity can be rated, among other approaches, in terms of aircraft damage and human casualty, wildlife strikes with a consequence of damage to the aircraft, and number of events with an adverse effect on flights (for example missed approach or aborted take-off).

7.3.4 Table 7-2 describes how to categorize, in two different approaches, the severity related to a determined species according to the damage this species has caused in the strikes recorded by an airport. In this example, the severity of the common kestrel to aviation in a theoretical airport is analysed:

Table 7-2. Example of severity categorization (common kestrel)

	<i>Severity category</i>				
	<i>Very high</i>	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Very low</i>
Percentage of strikes with common kestrel causing damage (compared with the total amount of wildlife strikes at the airport)	>20%	10-20%	6-10%	2-6%	0-2%
Type of aircraft damage and/or human casualty (in strikes with common kestrel)	Catastrophic	Hazardous	Major	Minor	Negligible

Table 7-3. Example of safety risk severity

Catastrophic	<ul style="list-style-type: none"> - Equipment destroyed; and - multiple deaths.
Hazardous	<ul style="list-style-type: none"> - large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely; - serious injury; and - major equipment damage.
Major	<ul style="list-style-type: none"> - A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency; - serious incident; and - injury to persons.
Minor	<ul style="list-style-type: none"> - Nuisance; - operating limitations; - use of emergency procedures; and - minor incident.
Negligible	<ul style="list-style-type: none"> - No safety consequences; - no aircraft damage; and - near miss.

7.3.5 In case of species for which no data about the severity of the damage they can cause is available, the severity could be calculated by the mass multiplied by the type of flock.

7.3.6 To perform this calculation, previous categories of weights or sizes of wildlife, and flock sizes should be established by the aerodrome operator to fit each species within a category.

7.3.7 Table 7-4 and Table 7-5 are example of wildlife categorization:

Table 7-4. Example of wildlife categorization based on body mass

<i>Body Mass</i>	<i>Examples</i>	<i>Body Mass Value</i>
< 50 g	Sparrows	2
51-200 g	Starlings	4
201-1 000 g	Pigeons	8
1-5 kg	Large gulls	16
>5 kg	Big birds of prey	32

Table 7-5. Example of wildlife categorization based on flock size

<i>Flock size</i>	<i>Examples</i>	<i>Flock value</i>
Usually solitary or widely spaced	Big birds of prey, Sparrows	1
Often in loose flocks	Pigeons, Large gulls	2
Often in tight flocks	Starlings	4

7.3.8 Flock size may depend on specific aerodrome location and species involved.

7.3.9 With the example values given in 7.3.7, it is possible to locate the analysed species in one of the severity ranges that could cause a collision with an aircraft.

Table 7-6. Example of severity categorization based on severity value

	<i>Severity category</i>				
	<i>Very high</i>	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Very low</i>
Severity value (mass category value x flock category value)	32-128	16	8	4	2

7.3.10 Regarding the severity categories to be established, each aerodrome should determine its own scale. The severity of collision also depends on the type of aircraft, the range of aircraft sizes or types of aircrafts operating at an aerodrome.

7.4 ESTIMATING THE SAFETY RISK OF WILDLIFE SPECIES

7.4.1 A safety risk assessment matrix is completed by combining the probability and severity of each species to determine whether further action is required. A safety risk assessment should be reviewed at least annually or following a significant wildlife strike event and existing wildlife control measures adjusted to see if further action is required.

7.4.2 An example of a risk assessment matrix is shown in Table 7-7:

Table 7-7. Example of risk assessment matrix

		PROBABILITY				
		<i>Very high</i>	<i>High</i>	<i>Moderate</i>	<i>Low</i>	<i>Very low</i>
SEVERITY	Very High					
	High					
	Moderate					
	Low					
	Very Low					

7.4.3 The three risk levels are defined as follows and should be the main focus when interpreting the risk matrix:

- Level 1 (Green) — Acceptable. The risk is acceptable as it is. No further action is required.
- Level 2 (Yellow) — Tolerable. The risk can be tolerated based on the safety risk mitigation. Review current action undertaken, identify possible further action.
- Level 3 (Red) — Intolerable. Take immediate action. Further action is required to reduce the risk.

8. WILDLIFE DATA MODELLING AND ANALYSIS

8.1 Aerodrome operators shall perform wildlife data modelling and analysis yearly from the collected data.

8.2 Some sample reports from a wildlife data modelling and analysis application is given in **Attachment 1**.

9. CONTINUAL MONITORING: RECORDING AND REPORTING OF WILDLIFE STRIKE

9.1 Continual Monitoring Program for Wildlife Hazards

9.1.1 When an aerodrome completes an assessment of wildlife strike hazards, it should consider implementing a continual monitoring program. A continual monitoring program is a best management practice. Recurrent wildlife monitoring to be outlined in the programme.

9.1.2 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.

9.1.3 Continual monitoring allows the aerodrome operator to regularly determine trends in wildlife, and target mitigation practices to reduce the possibility of strikes, thus positively effecting safety. The aerodrome 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 will reduce the likelihood of wildlife strikes. Additionally, continual monitoring will help decrease the time, effort, personnel hours, and money spent on mitigation because hazards will be identified before they pose a high risk.

9.2 Continual Monitoring Report:

9.2.1 As part of a continual monitoring program, an aerodrome should consider preparing periodic (an annual/half annual) report to summarise the efficacy of its wildlife mitigation program, including:

- i) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.
- ii) Identification and location of features on and near the aerodrome that attract wildlife.
- iii) Description of wildlife hazards to aircraft operators.
- iv) Description of wildlife strikes during the year.
- v) Discussion of any significant modifications on or near the aerodrome property.
- vi) Summary/Analysis of wildlife management, patrol, monitoring data logs.
- vii) Periodic report can be compared with the airlines monitoring report for any gaps.

9.3 Reporting wildlife sighting – Process for Aerodrome/Airline Personnel (on- ground)

9.3.1 Process for reporting of wildlife sighting by aerodrome/airline personnel is shown in

Figure 1.

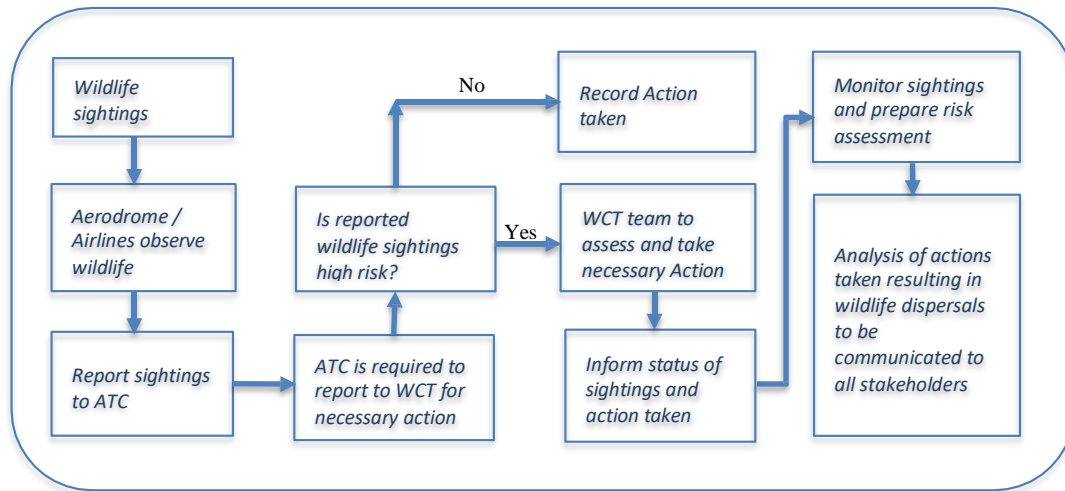


Figure 1: Reporting wildlife sighting – Process for Aerodrome/Airline Personnel

9.3.2 It is recommended that:

- Use of technology smart application to enable users to just click on location to record species and number for effective wildlife hazard management.
- In addition, the recording system should reflect standard global names of wildlife species and information of the standard reporting form.

9.4 Reporting wildlife sightings – Process for Aircrew in-flight

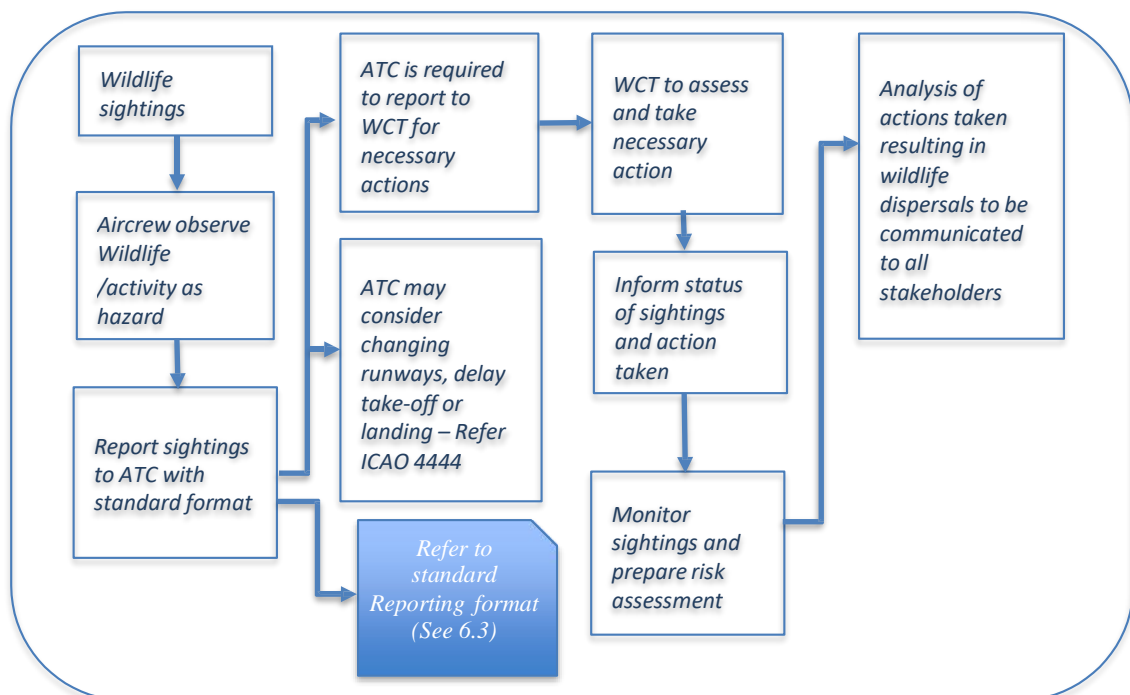


Figure 2: Reporting wildlife sightings – Process for Aircrew in-flight

9.5 Reporting of Confirmed and Suspected Strike Process

Confirmed Strikes

9.5.1 Any reported collision between a bird or other wildlife and an aircraft for which evidence in the form of a carcass, remains or damage to the aircraft is found (including blood smears or feathers or may include in-flight ‘smell’ through air-conditioning). Any bird/wildlife found dead on an airfield where there is no other obvious cause of death (e.g. struck by a car, flew into a window etc.)

Unconfirmed strikes or Suspected Strikes

9.5.2 Any reported collision between a bird or other wildlife and an aircraft for which no physical evidence is found.

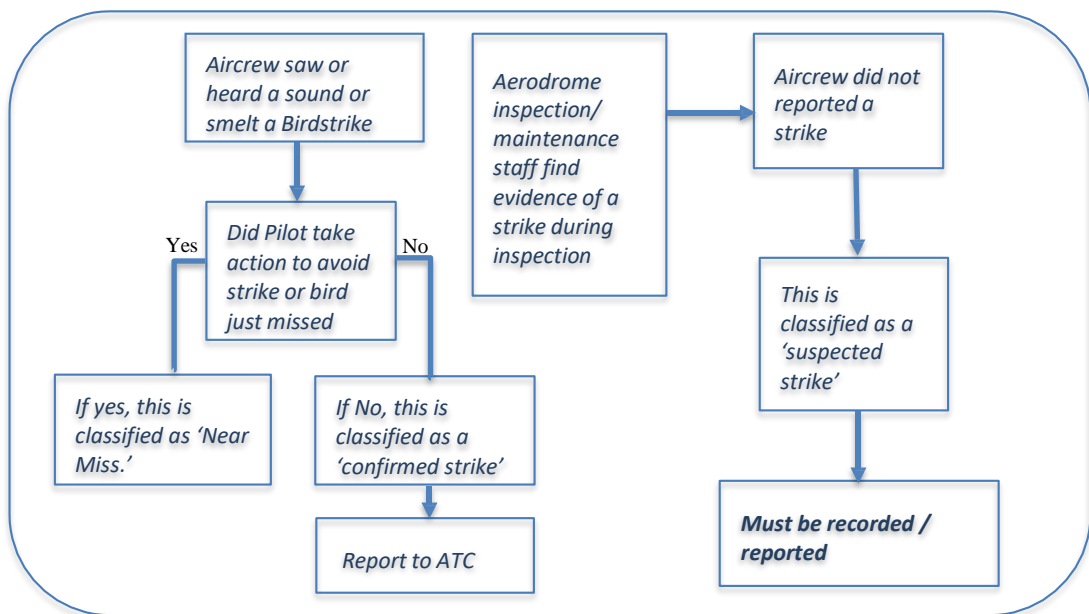


Figure 3: Reporting of Unconfirmed or Suspected Strike Process

9.6 Wildlife Location Determination Process

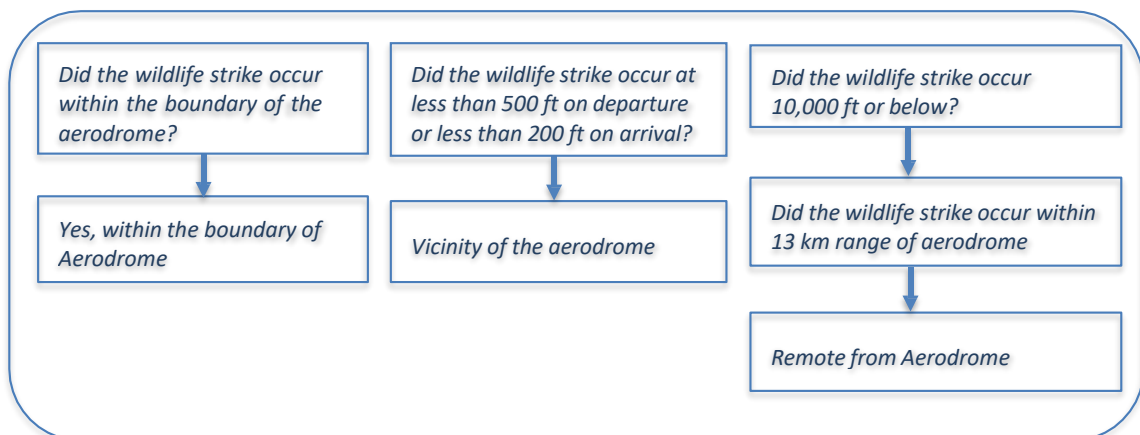


Figure 4: Wildlife Location Determination Process

9.7 Wildlife Incident Reporting Criteria

9.7.1 The reporting forms (paper or electronic format) used by the aerodrome operator or other stakeholders at the aerodrome for reporting wildlife strikes, should contain at least the following information:

- a) operator involved;
- b) aircraft make/model;
- c) engine make/model;
- d) aircraft registration;
- e) date (dd/mm/yyyy);
- f) local time;
- g) dawn/day/dusk/night;
- h) aerodrome name;
- i) runway used;
- j) location if en route;
- k) height above ground level (AGL) in ft;
- l) speed (indicated airspeed (IAS)) in kt;
- m) phase of flight:
 - 1) parked;
 - 2) taxi;
 - 3) take-off run;
 - 4) climb;
 - 5) en route;
 - 6) descent;
 - 7) approach;
 - 8) landing roll;
- n) part(s) of aircraft struck or damaged:
 - 1) radome;
 - 2) windshield;
 - 3) nose (excluding radome and windshield);
 - 4) engine number (1/2/3/4);
 - 5) propeller;
 - 6) wing/rotor;
 - 7) fuselage;
 - 8) landing gear;
 - 9) tail;
 - 10) lights;
 - 11) other (to be specified);
- o) effect on flight:
 - 1) none;
 - 2) aborted take-off;
 - 3) precautionary landing;
 - 4) engines shut down;
 - 5) other (to be specified);
- p) sky condition:
 - 1) no cloud;
 - 2) some cloud;
 - 3) overcast;

- q) precipitation:
 - 1) fog;
 - 2) rain;
 - 3) snow;
- r) wildlife species;
- s) number of wildlife:
 - 1) seen
 - i) 1;
 - ii) 2 to10;
 - iii) 11 to100;
 - iv) over 100;
 - 2) struck:
 - i) 1;
 - ii) 2 to 10;
 - iii) 11 to 100;
 - iv) over 100;
- t) size of wildlife:
 - 1) small;
 - 2) medium;
 - 3) large;
- u) pilot warned of wildlife: yes/no;
- v) remarks (description of damage, injuries and other pertinent information);
- w) reporting person/organization;
- x) address within the State to which any wildlife remains, including feather fragments, should be sent.

9.8 Common Understanding of Terms

9.8.1 It is crucial to standardize the use of various terms and ensure a common understanding among stakeholders, including pilots, air traffic controllers, airport wildlife hazard controllers and other parties. These terms include description of bird size (large/medium/small), number of birds, etc. These parameters must be determined and understood by all relevant stakeholders.

9.9 Risk Assessment

9.9.1 In the report, it would also be useful to include the wildlife actions or type of activities, e.g. flying, standing on ground, roosting, hovering, etc if observed, at the time of the report. The information will be useful for risk level analysis, which is related to the type of activities, size, number, whether in flocks, etc.

9.10 Real-time Reporting Format

9.10.1 Aviation frontline personnel including pilots, ATC and aerodrome wildlife controllers constantly face time pressure in their jobs. They are required to make decisions based on the available information in a timely manner. Therefore, it is crucial to standardize the format of real-time wildlife reporting to minimize the time for transmitting the information and subsequent clarifications.

- 9.10.2 In Doc 4444 PANS-ATM Para. 7.5.2, temporary hazards including birds on the ground or in the air are regarded as essential information on aerodrome conditions.
- 9.10.3 As a minimum, the following items could be considered when formulating the real-time reporting format:
- i) Date and UTC Time;
 - ii) Altitude of aircraft (for pilot reports only);
 - iii) Location of sight/strike;
 - a) With reference to prominent features on ground or in the air;
 - b) Aerodrome zoning to be applied for ATC and aerodrome personnel.
 - iv) Movement and altitude of birds;
 - v) Number of wildlife – with a standardized categorization; and
 - vi) Size of wildlife – with a standardized categorization.
- 9.10.4 It is recognised that the frontline personnel may face various workload at the time of wildlife sighting and strike. Therefore, flexibility for fewer items may be allowed during the first reporting, but the personnel involved should supplement missing information at the earliest opportunity and submit as much information as they can including attaching photos, if required.
- 9.10.5 Standardized wildlife strike reporting forms are available in Manual on the ICAO Bird Strike Information System (Doc 9332).

10. WILDLIFE STRIKE REPORTS TO ICAO

- 10.1 Effective analysis of wildlife strike data is particularly important. For example, separating strikes that occur on the aerodrome (under 200 feet on approach and 500 feet on climb out using the ICAO definition) from those that occur further out in the approaches helps to define those strikes that are likely to be influenced by the aerodrome bird management programme. Similarly, separating strikes with species that are over 100g in weight (i.e. those more likely to cause damage), and giving greater emphasis to strikes with flocks all help to identify trends in the real wildlife strike risk at the aerodrome. So, for example, an aerodrome with an increasing rate of wildlife strikes is not necessarily becoming a more risky place to fly. If the increase in strikes is due to an increase in incidents with small species, whilst the rate of strikes with large species and flocks is falling, then this is indicative of both better wildlife control and better reporting of strikes.
- 10.2 The wildlife strike reports shall be collected and forwarded to ICAO for inclusion in the ICAO Bird Strike Information System (IBIS) database (9.4.2 of MCAR Part 139 – Section 2, Aerodrome Standards).
- 10.3 Once the wildlife strike report is received, Aerodrome Standards and Safety Division is responsible to submit these report to ICAO in the format of either ECCAIRS.e5f files or the standard ICAO ECCAIRS Excel-based form available at <http://www.icao.int/ibis>.
- 10.4 The reports should be sent to the following email addresses:
wildlife@icao.int, icaohq@icao.int, aoi@icao.int, and iaa@icao.int

11. DETAILS OF REPORTING

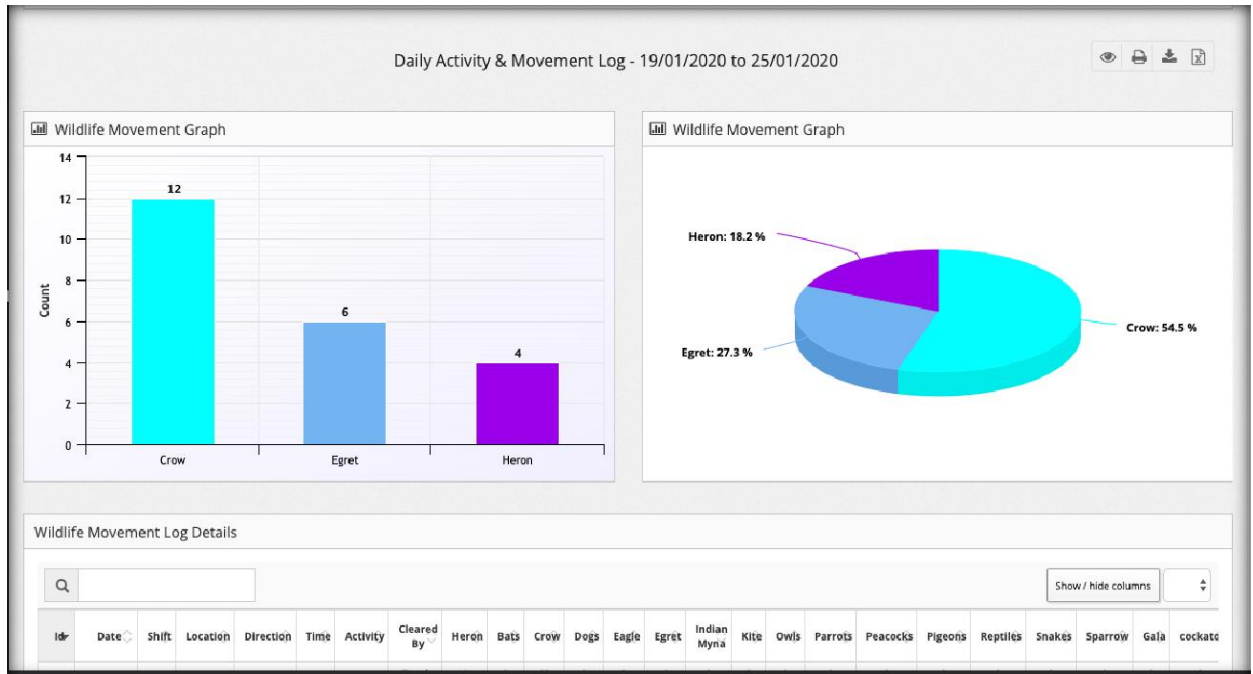
11.1 Aerodrome wildlife control staff may conduct numerous wildlife activity monitoring inspections throughout the day, to build up a more complete understanding of wildlife patterns around the Airport. Extensive reporting functionality in compliance with ICAO and Myanmar civil aviation requirements, allows wildlife data to be drilled down, so that aerodromes can better understand their most prevalent species, locate high wildlife traffic areas, wildlife attractants, seasonal distributions and patterns. Adopt adequate hazard management plans to mitigate the risk by better understanding the environment.

11.2 Example of reports for Activity and Strike is provided in **Attachment 1**.

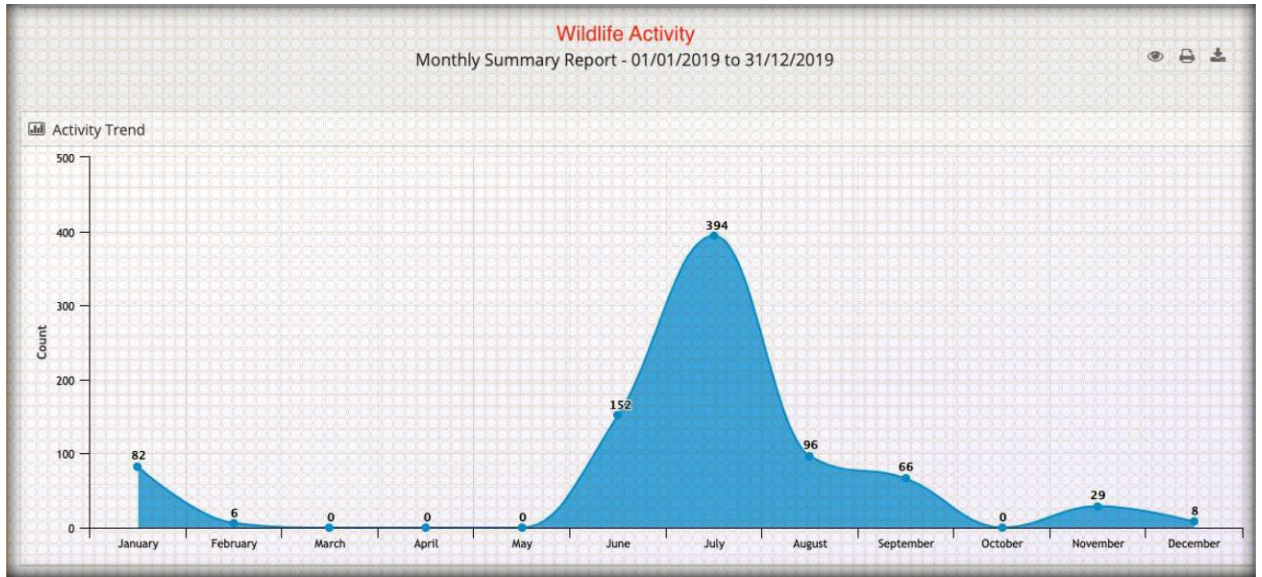
Analysis of Activity and Strike

Sample Reports

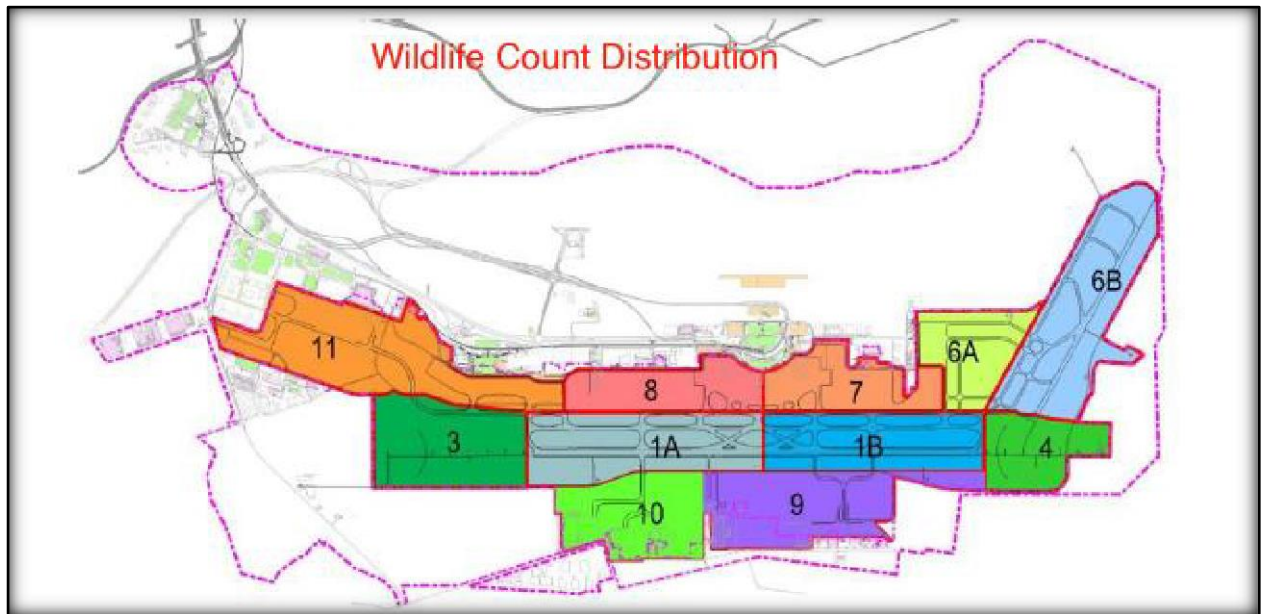
1. Daily Activity Reports



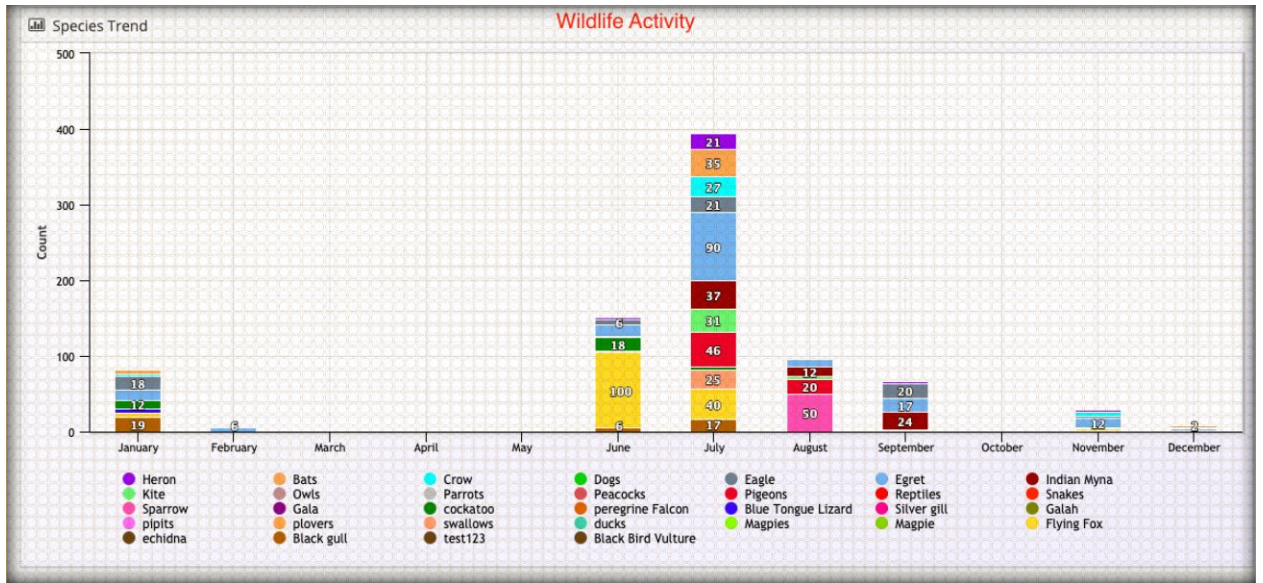
2. Monthly Activity Report (Weekly can be seen as well)



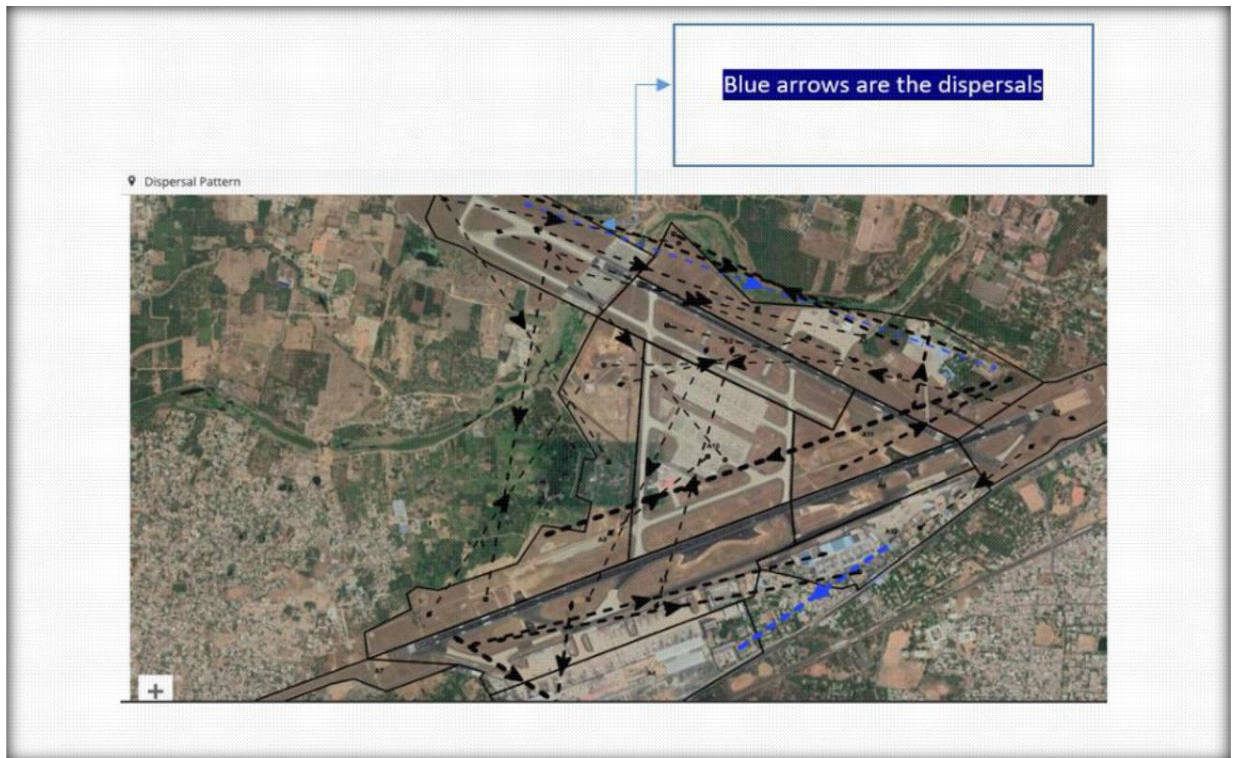
3. Wildlife Count Distribution



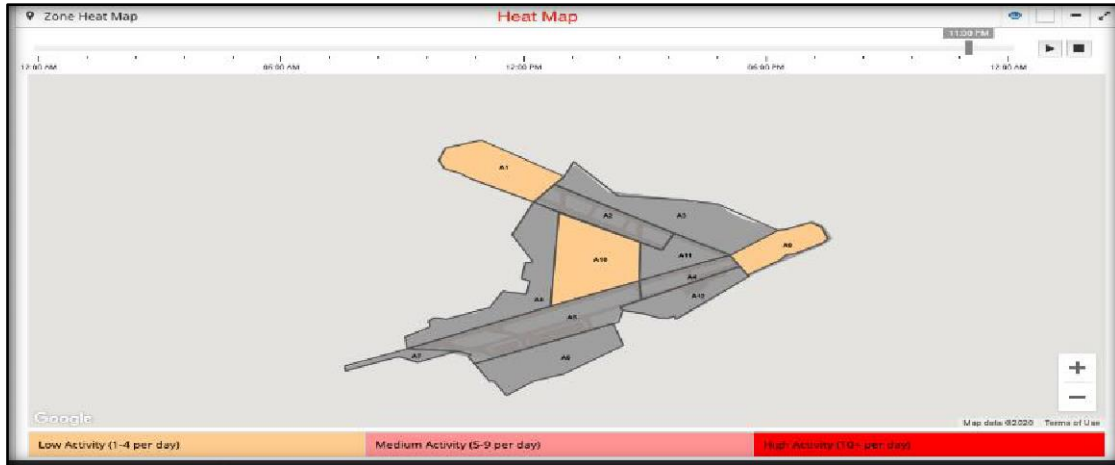
4. Species Trend



- Activity Maps
- Dispersal Maps
- Dispersal Patterns

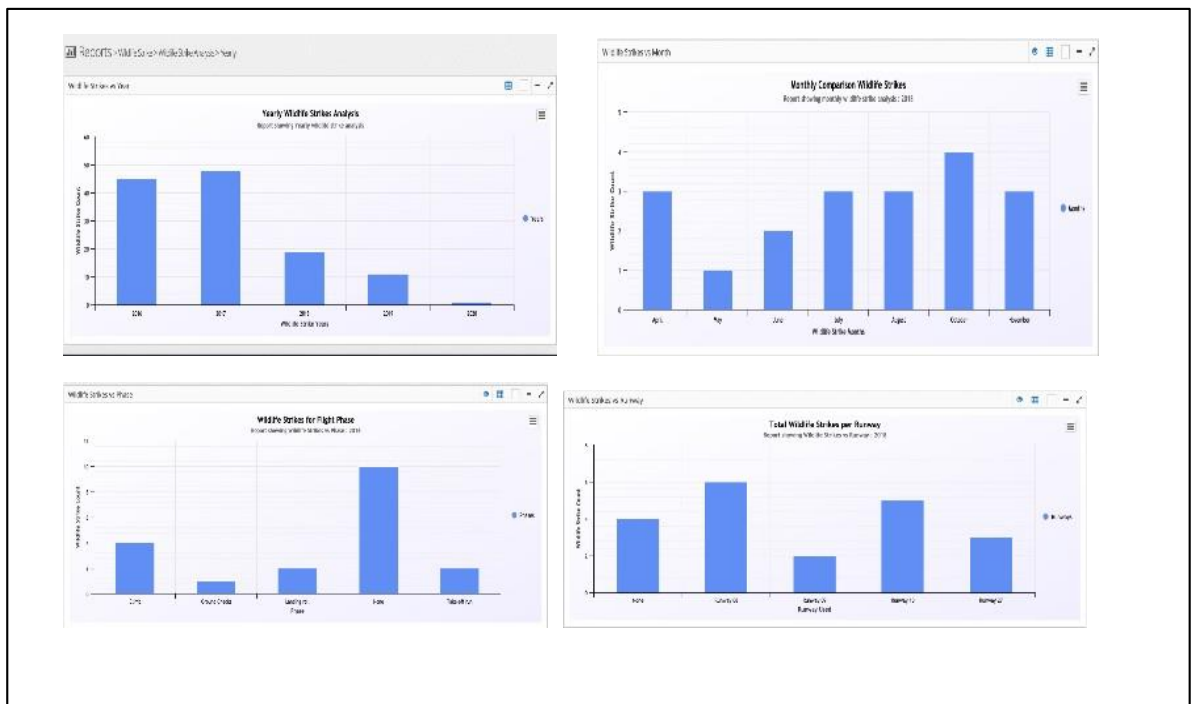


5. Zone Heat Maps

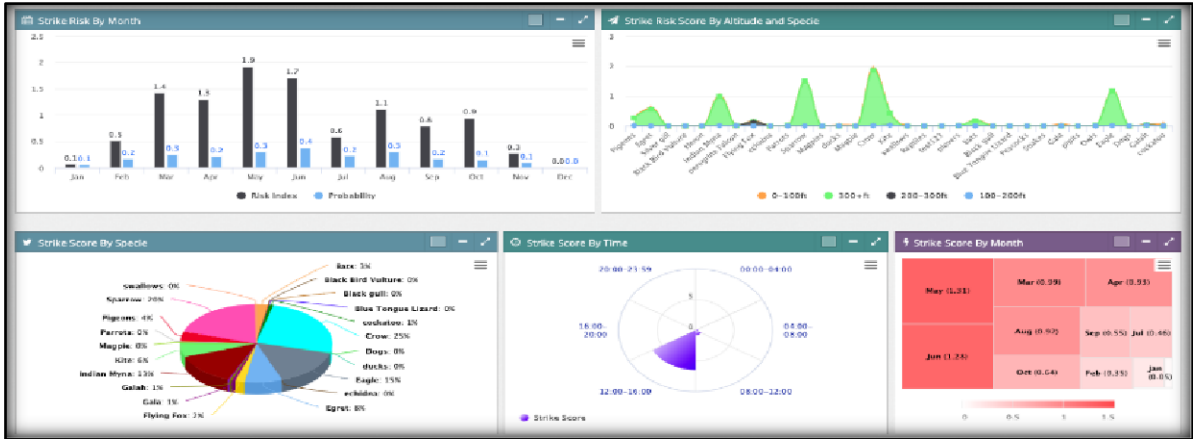


6. Wildlife Strike Data

- Year to Year Analysis
- Strikes Per Month
- Wildlife Strike vs Phase of Flight
- Wildlife Strike Vs Runways Used
- Wildlife Strikes per Light Conditions
- Designated Wildlife Strikes Per Runway Used
- Wildlife Strikes at Flight Altitudes
- Wildlife Strike per Species (High Risk Species)



7. Wildlife Probability Report



ACRONYMS AND ABBREVIATIONS

ANSP	Air Navigation Service Providers
APAC	Asia and Pacific
ATC	Air Traffic Controllers
IBIS	ICAO Bird Strike Information System
DNA	Deoxyribonucleic Acid
MCAR	Myanmar Civil Aviation Requirement
PANS	Procedures for Air Navigations
WHM	Wildlife Hazard Management
WHMP	Wildlife Hazard Management Programme
WCT	Wildlife Control Team

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REFERENCES

1. ICAO Annex 14 Aerodromes, Volume I – Aerodrome Design and Operations
2. Procedures for Air Navigation Services - Aerodromes (Doc 9981)
3. ICAO Airport Services Manual (Doc 9137), Part 3 – Wildlife Hazard Management
4. Asia Pacific Guidance for Establishment of National procedure for Recording and Reporting of Wildlife Strikes to Aircraft
5. Australian Airports Association – Wildlife Hazard Management at Airports
6. ICAO Doc 4444 PANS -ATM