Second Meeting of the Asia/Pacific Wildlife Hazard Management Working Group (AP–WHM WG/2)

Virtual Meeting, 27 to 29 May 2020

Agenda Item 4: Progress Update on Tasks assigned to States and International/Regional Organizations

NATIONAL PROCEDURE FOR RECORDING AND REPORTING WILDLIFE STRIKES TO AIRCRAFT

(Presented by World Birdstrike Association)

SUMMARY

This paper presents a method to develop guidance for establishment of a National Procedure for recording and reporting wildlife strikes to aircraft.

This paper is prepared in response to AP-WHM WG Task 1/11.

1. INTRODUCTION

1.1 The more information that is recorded about a wildlife strike incident the better. As a minimum, the data required on the ICAO wildlife strike reporting form should be collected as fully as possible. If some data items are not available (e.g. altitude of strike) then as much information as possible should be collected and due account taken of the missing data during subsequent analyses.

2. DISCUSSION

Record all suspected and confirmed strikes

2.1 The growing traffic numbers comprised quieter and larger aircraft and the increase in wildlife populations, greater effort is required to control and monitor wildlife movements on and within the vicinity of airports. Every strike must be reported to the relevant authorities, actions taken and communicated to all relevant stakeholders. [Ref.: Annex 14, Volume I STD 9.4.1 b) & 9.4.2].

2.2 The aerodrome operator should ensure safety performance targets are set with reference to Annex 14, Volume I and Annex 19.

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

2.3 Airport operator should ensure all strikes reported by airlines/pilots and ATC are logged. In this sense, airports should adopt use 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.

2.4 The cost of downtime for inspection and repair of aircraft following bird/wildlife damage or suspected bird/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.

Report all carcass on the runway as suspected strikes

2.5 Trained and competent staff who should be able to detect and record the presence of birds/wildlife and assess the bird/wildlife hazard and expel hazardous birds/wildlife by using active/passive measures or interventions. It is recommended that the training syllabus for airport staff engaged in wildlife control activities include an element of ecology and biology knowledge, to enable them to make reliable and accurate identifications of birds both from observations and post bird strike during the collection and analysis of wildlife remains. For an unidentifiable carcass following a strike, it should also be described in the management program, and sent to relevant organizations for further DNA analysis.

Standard species nomenclature across spectrum for reporting purposes

2.6 Currently every region within APAC has different wildlife species as per their Habitat, so it's important to set up a wildlife library of standard names for all wildlife species in this region.

Standard form for all strikes and monitoring activity across APAC Region

2.7 A standard wildlife strike and recording activity must be developed across this region. A suggested set of fields shall include:

2.7.1 **General Information:**

- 2.7.1.1 Date of Recording
- 2.7.1.2 Time of Activity
- 2.7.1.3 Zone on Airfield where activity was spotted
- 2.7.1.4 Sky Condition when Activity is noted
- 2.7.1.5 Wind Direction at time of activity
- 2.7.1.6 Weather Condition at time of activity
- 2.7.1.7 Chainage Number / Perimeter Pillar Number (if Available)
- 2.7.1.8 Previous night weather conditions
- 2.7.1.9 Apron Area or not

2.7.2 **Wildlife Related**

- 2.7.2.1 Name of Wildlife Species
- 2.7.2.2 Number of the Species Observed
- 2.7.2.3 Activity Species is doing at time of observation
- 2.7.2.4 Altitude at which species was observed
- 2.7.2.5 Direction of flight of species
- 2.7.2.6 Start Time of Activity
- 2.7.2.7 End Time of Activity

2.7.3 **Supplemental Information**

2.7.3.1 Runway in Use

2.7.3.2 Scaring Device used (Type)

2.7.3.3 Time of Scaring device used

2.7.3.4 Number of Pyrotechnics used if used

2.7.3.5 Number of wildlife monitoring personal on shift at time of Activity

2.7.3.6 Proof of Activity – Photographs

Develop risk assessment and matrix as per size of species

2.8 An important step in managing wildlife hazard is to assess the level of risk that each species of animal presents to aircraft operations at the aerodrome. This risk assessment is more than simply surveying the species found in and around the aerodrome; it involves assessing the likelihood of each species striking an aircraft and the probability and extent of damage that may result with the strike. This allows the aerodrome operator to prioritise actions to target the highest risks. The Risk assessment should whenever possible, identify the biological factors that cause different wildlife species to present a risk to aviation safety. Identification of these factors will greatly aid in the formulation of a Wildlife Hazard Management Program. Therefore, this signifies the reporting of wildlife activity around the airfields.

2.9 The risk assessment methodology recommended by the International Birdstrike Committee and World Birdstrike Association determines the level of risk that each species of wildlife presents based on the combination of the probability that it will be struck by an aircraft and the severity of the outcome.

2.10 Prior to discussing the assessment of the risk of wildlife strikes, it is important to ensure that consistent terminology is used.

2.11 Specific meanings in the science of risk analysis:

2.11.1 Hazard: A hazard is defined as a situation that, in certain circumstances, can lead to an event that results in harm. In this context, a hazard is the presence of certain birds/wildlife on or near an aerodrome.

2.11.2 Risk: A risk is the probability that the harmful event will occur, multiplied by the severity of the harm that could result. In this context it is the probability of a wildlife strike by a particular group of wildlife multiplied by the severity of damage to the aircraft that results.

2.11.3 Risk = (probability of an event) × (severity of harm) and so for wildlife strikes: Risk = (probability of a strike) × (severity of damage caused).

2.11.4 Rank the expected severity of the impact or damage resulting from a strike. The ranking will depend on the size and weight of the wildlife. Heavier wildlife have a greater capacity to damage an aircraft with the impact. As per biology and historical data wildlife that tends to flock and weigh more than 1.8 - 2.0 kg can cause the most severe damage to the aircraft. Flock behavior might mean that a strike could include multiple impacts or it could increase the probability of a strike.

2.11.5 Refer to **Appendix A** for Risk assessment Matrix to determine its risk level. The 3 risk levels require 3 different responses.

2.11.6 Risk level 3 - Risk from this species is rated very high. Additional management actions should be detailed and be implemented and documented.

2.11.7 Risk level 2 - Risk from this species means further review of all available options and appropriate actions. Risk management for this species should be reviewed from time to time with actions

2.11.8 Risk level 1 - Risk from this species is low. No actions are required, however should be reviewed from time to time.

2.11.9 The actions and risk assessment need to fit what can realistically be achieved. At all times Level 3 is 'unacceptable'. Aerodrome operators must work towards removing this risk entirely

2.11.10 Develop a probability matrix based on historical data (the index is only a tool capable of describing an airport specific wildlife strike risk, based upon historical trends of wildlife observations, in order to identify critical periods during the year. Therefore, the index is not meant to be a prognostic index since bird distribution throughout the years is unlikely predictable although it can be applied to assess specific theoretical risk scenarios)

Data Management for Effective Wildlife Hazard Management

2.12 Using technology to record strikes and monitor activity is of utmost importance for effective wildlife management. However, we are not talking of airports investing in expensive Radar technology and alike.

2.13 Maintaining a consistent record of wildlife strikes at an airport is essential for defining the wildlife hazard level and for evaluating the airport's Wildlife Hazard Management Plan. In addition to their internal use at the airport, the strike reports, when incorporated into the National Wildlife Strike Database, provide a means for engineers, biologists, and safety analysts to better understand national and regional trends in strikes and thereby develop, justify, and defend more effective management programs and wildlife-resistant aircraft and engines. The data collection has been extremely useful in identifying which wildlife species are most commonly involved in strikes, the seasonal pattern of strikes for various species, the extent and types of damage resulting from wildlife strikes, and which aircraft types and components are mostly affected.

2.14 Similarly maintaining a record of wildlife activity monitoring provides helpful information with Habitat management, uses of interventions and how effective it is with wildlife. For example, airports can cut their budgets for pyrotechnics, as with the use of data analysis patterns will emerge as the most effective species to a bird bomb.

2.15 Paper based forms must not be used, as it is not effective to analyse paper based forms manually, and it is both time consuming and ineffective use of valuable resources.

Data Modelling and Analysis

2.16 Airport operator shall adopt data modelling and analysis to derive useful information and conclusion from the collected data. Some sample reports from a wildlife data modelling and analysis application is available in **Appendix B**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss and arrive at a logical template for recording and reporting wildlife strikes to aircraft; and

c) discuss any other relevant matters as appropriate.

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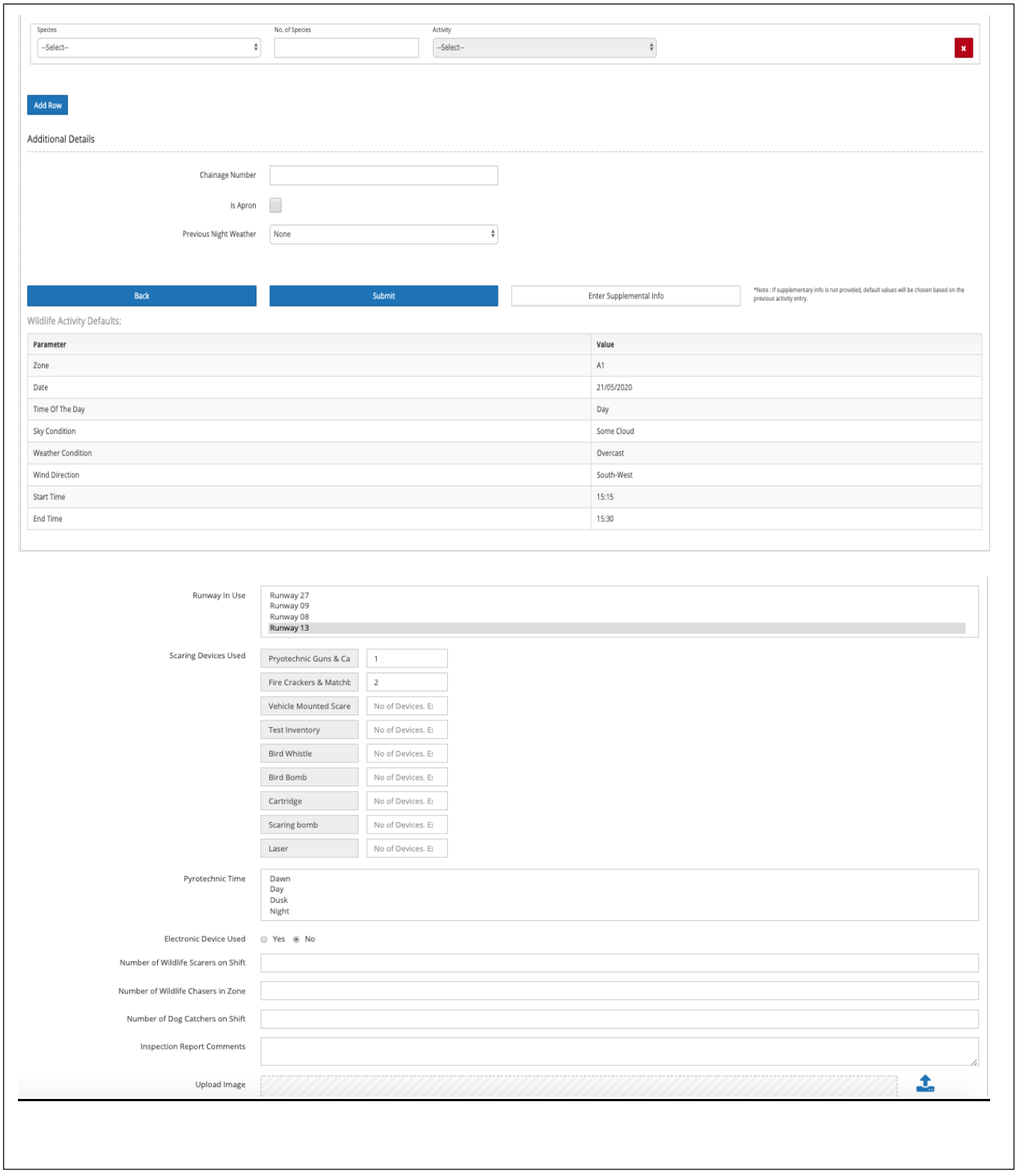
Appendix A

SEVERITY	PROBABILITY				
	Very high	High	Moderate	Low	Very low
Very high	3	3	3	2	2
Moderate	3	3	3	2	2
High	3	3	2	1	1
Low	2	2	1	1	1
Very low	1	1	1	1	1

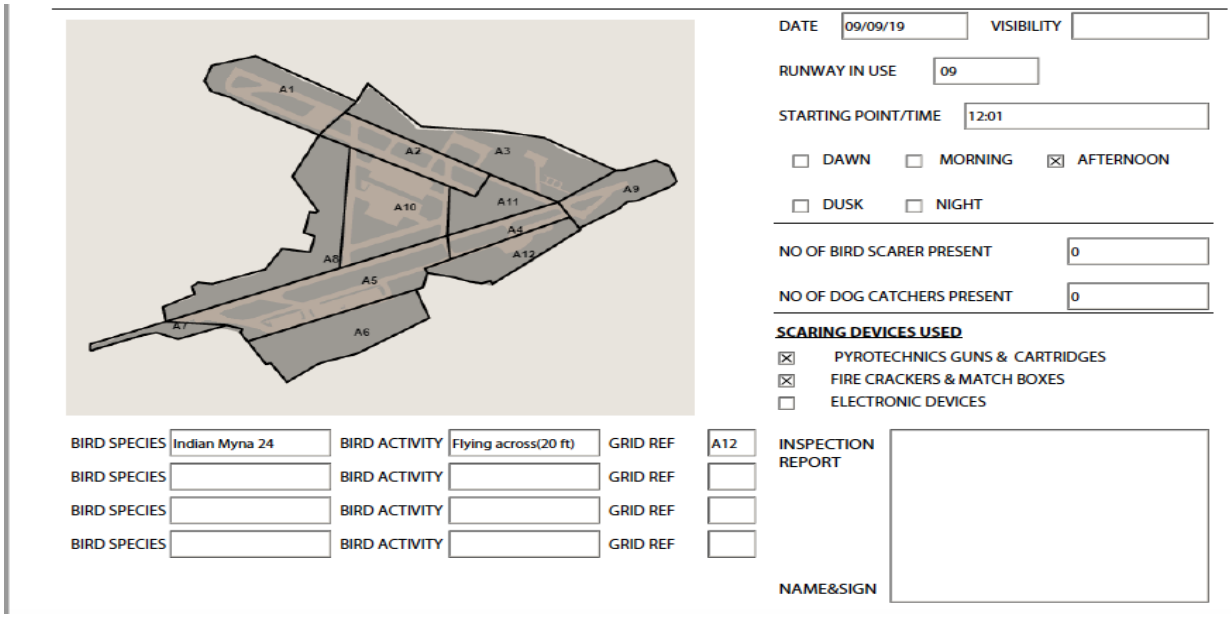
Appendix B

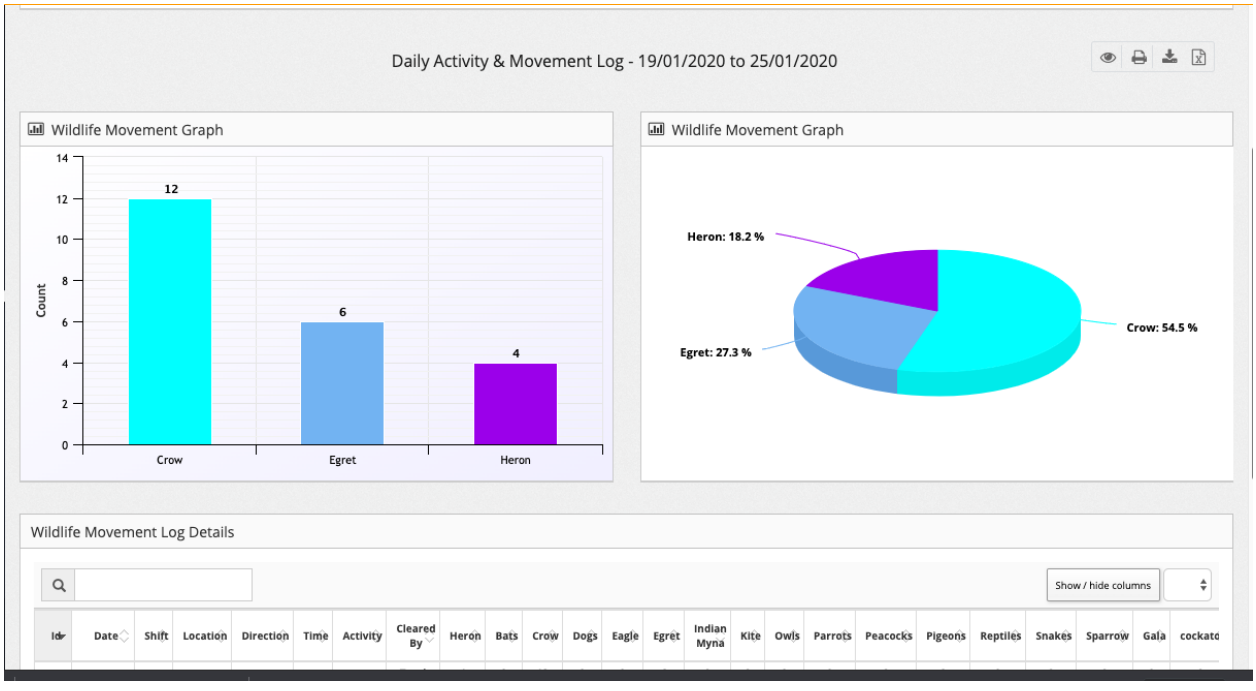
Wildlife Activity Input Form



Some Sample Reports

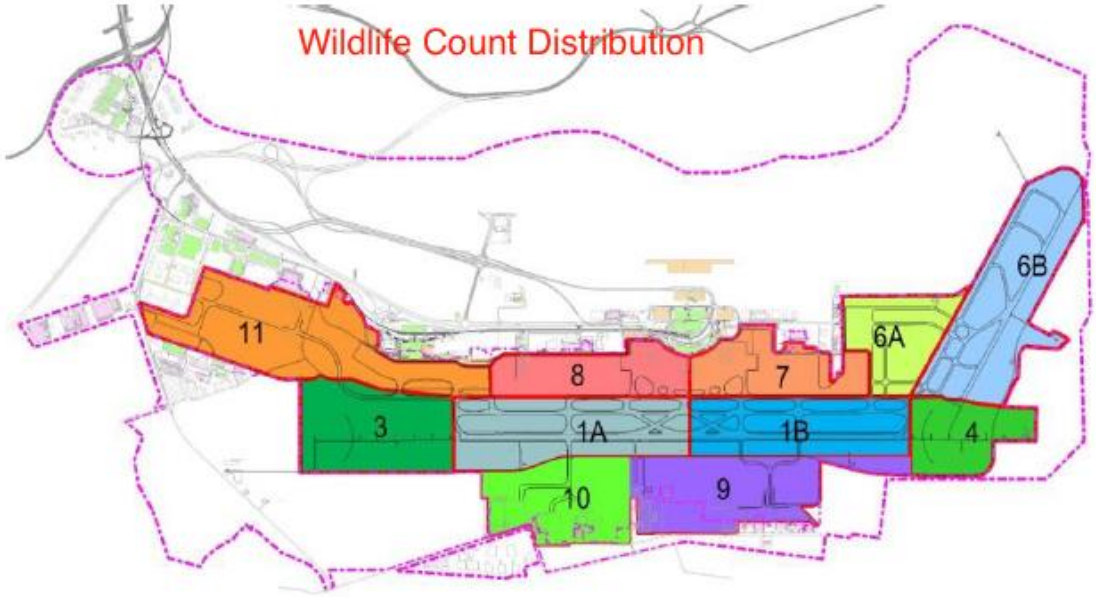
Daily Activity Reports



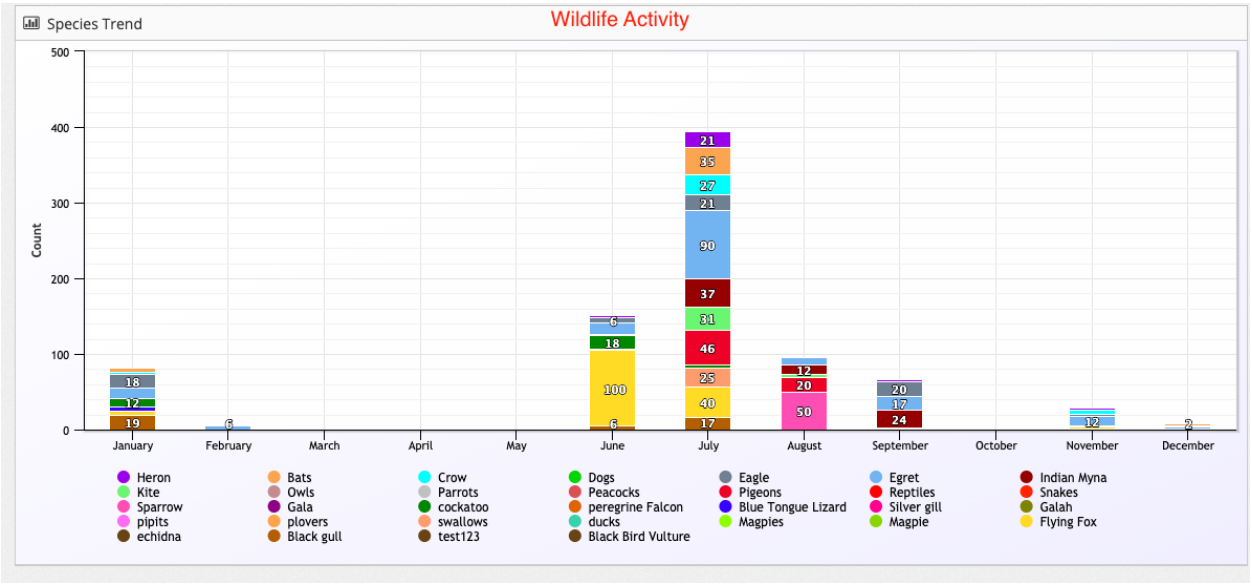


Monthly Activity Report (Weekly can be seen as well)

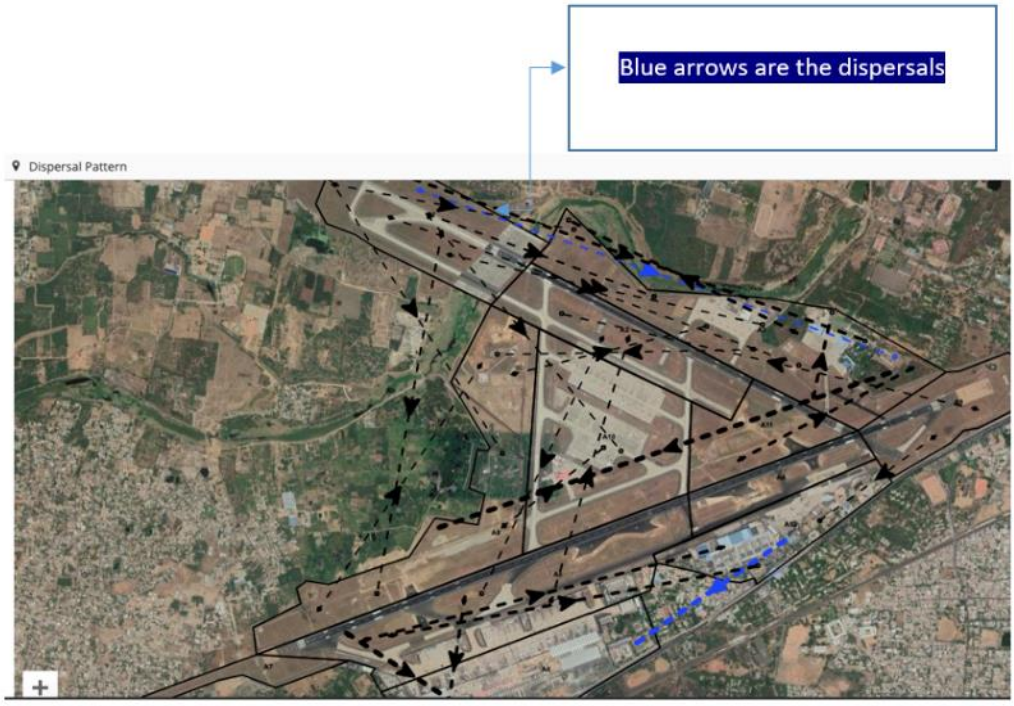
Wildlife Count Distribution



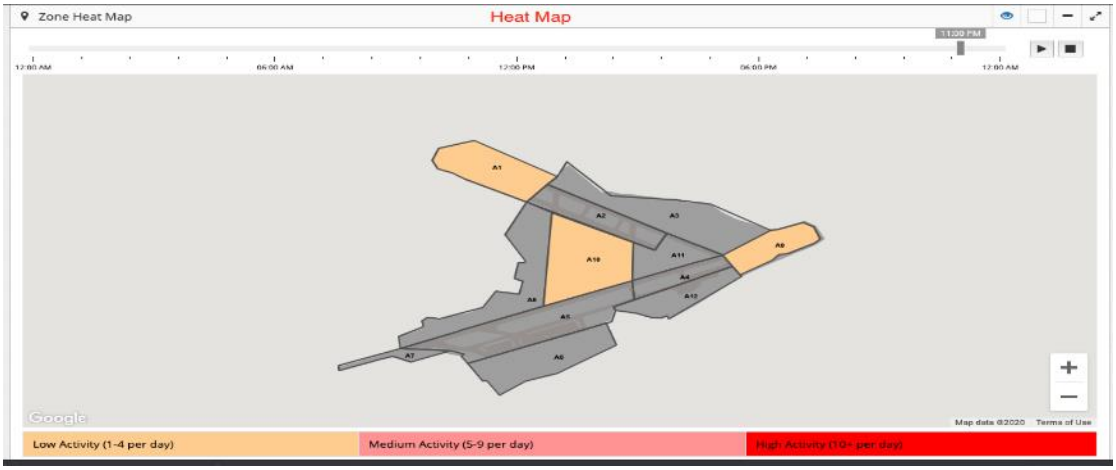
Species Trend



- Activity Maps
- Dispersal Maps
- Dispersal Patterns

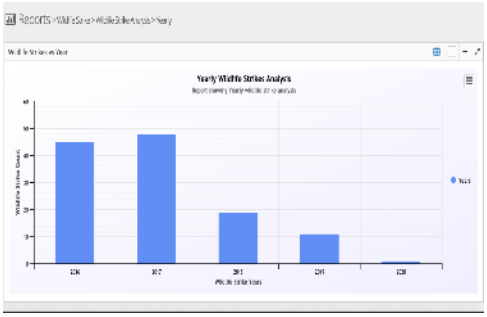


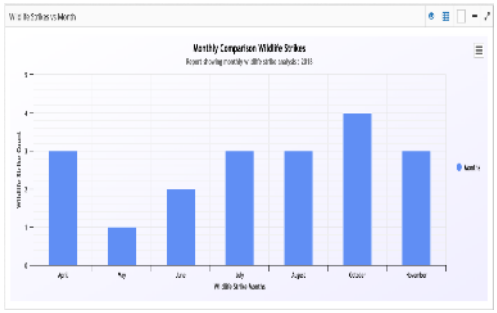
- **Zone Heat Maps**

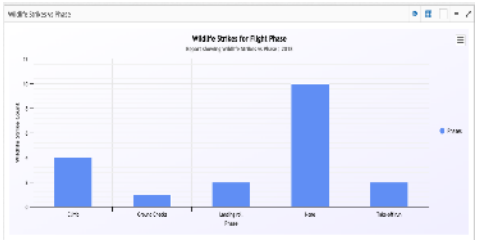


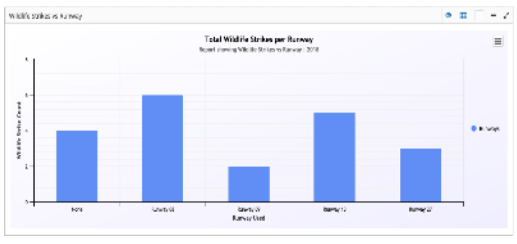
Wildlife Strike Data

- Year on 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)

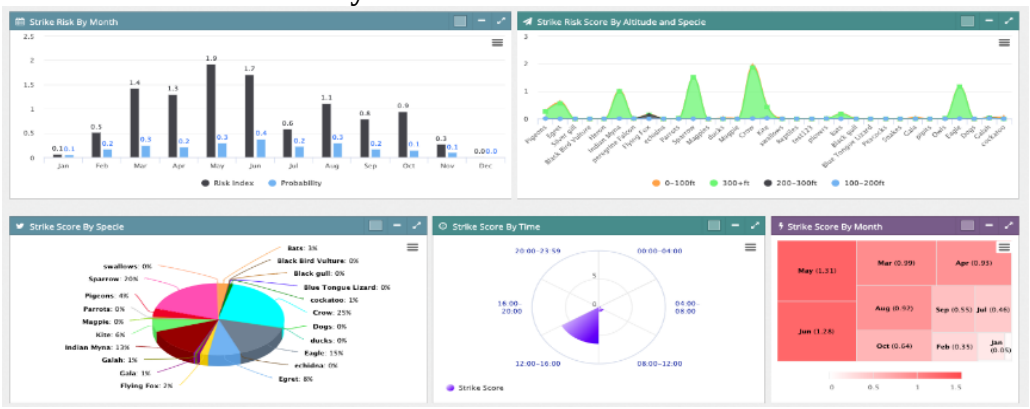








Wildlife Strike Probability



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