



ICAO/ACI Wildlife Strike Hazard Reduction Symposium

ICAO HEADQUARTERS
MONTREAL, CANADA



**“Data-driven strategy to reduce the wildlife strike hazard”,
“Challenges in the regulations of WHM’ “Do we need more standards?”**

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Presentation outline

- Introduction
- Regulatory Framework
- Data Driven Strategy
- Challenges – Do We need more standards
- Conclusion

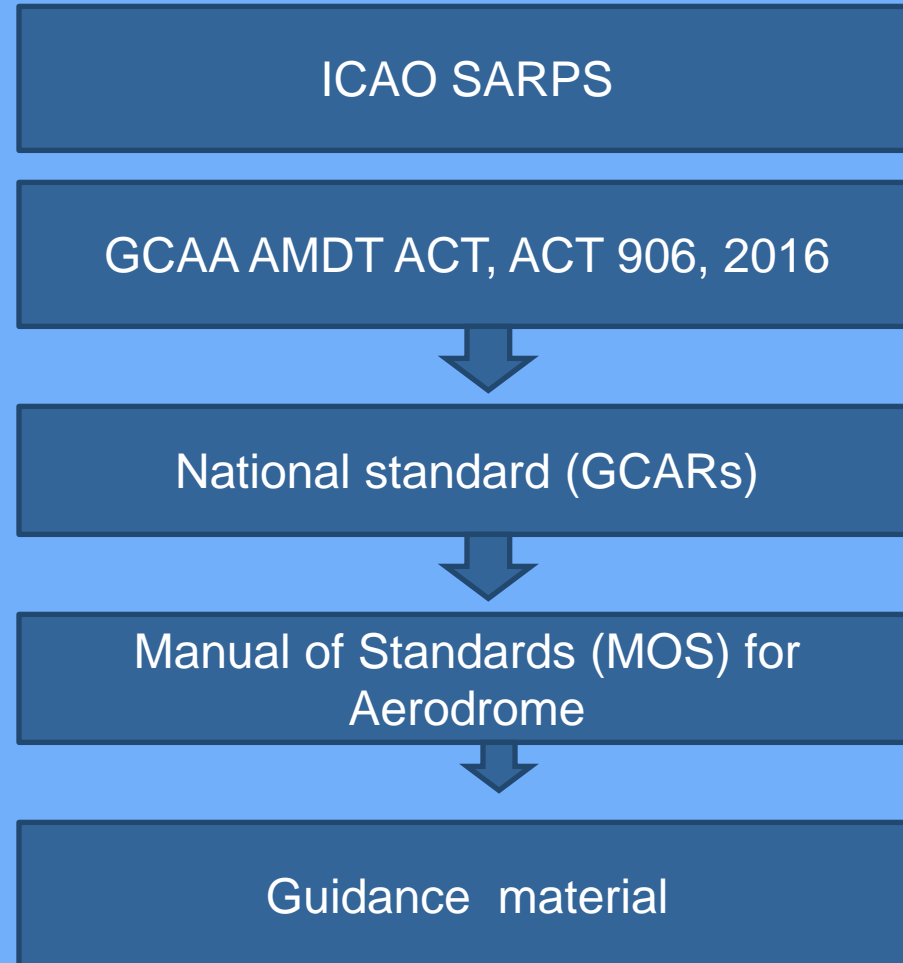


Introduction

- Ghana received its fair share of Wildlife/Bird strike collisions issues over the years.
- Strikes are mainly birds (dogs, snakes, bats are threats)
- Results in cost such as;
 - ✓ Direct – Damage to aircraft
 - ✓ Indirect – Delay in operation,
 - ✓ Ancillary – Hotel accommodation for passengers,
 - ✓ hull-loss – Total loss of aircraft
 - ✓ fatality – loss of lives
 - ✓ legal liability costs - litigation.



Regulatory Framework





Regulatory Framework – ICAO SARPS (Annex 14, 9.4)

- **Summary: Wildlife strike hazard reduction**
 - Threat Assessment
 - Establishment national reporting process & ICAO Bird Strike Information System (IBIS) (*Doc 9332*) connection
 - Risk Assessment and Mitigation
 - Compatible land use around aerodromes



Regulatory Framework – GCAA ACT

- GCAA (AMT) ACT 678 of 2016
 - The Director General has the power to Certify, Approve and Authorize operations of Aerodromes.
 - Section (e)v of the ACT
 - Ensures that air operators, airport operators, concessionaires and users of the airport abide by environmental protection laws and regulations including protection from aircraft noise and engine emissions, **Bird Hazard Control**, handling of hazardous material, petroleum products seepage, waste management and apply the appropriate sanctions in the event of a violation



Regulatory Framework – GCAA Regulations

- **Part 24 regarding wildlife hazard management**
 - **24.32 TRAINING RECORDS:** 24 consecutive months wildlife hazard management training records.
 - **24.33 TRAINING OF AERODROME PERSONNEL:** List of personnel requiring Wildlife Hazard Management training
 - **24.62, WILDLIFE HAZARD MANAGEMENT:** “When, who and How” to conduct a wildlife hazard assessment.



Regulatory Framework – GCAA Guidance Docs.

- **Manual of Standards (MOS)**
 - Provide standards to the aerodrome operator on Wildlife Hazard Management requirement
- **Advisory Circulars (AC)**
 - Provide guidance to the aerodrome operator on Wildlife Hazard Management requirement



Data-driven strategy

- A good data driven strategy helps to determine the adequacy or inadequacy of existing regulations and standards.



Data-driven strategy

- Data driven strategy is based on:
 1. Hazard Identification (On and Off Airport)
 2. Wildlife Strike Reporting
 3. Data Analysis and decision making.
 4. Hazard Assessment
 5. Risk Management
 6. Management Action



Hazard Identification – On Airport

- **Aircraft movements and types**
 - About ninety percent (90%) of aircrafts operating in Ghana are Jet Engine Powered thereby increasing the risk of wildlife strikes.
- **Habitats**
 - Habitat types in and around airports attractive to wildlife: Termite Mounds, Presence of Insects, Vegetation, Un-grassed areas, etc
- **Activities**
 - Aerodrome mowing, Dry Season burn offs around the airport, Runway Lights
- **Nature**
 - Annual seasonal rainfall



Hazard Identification – Off Airport

- **Habitats**
 - Attractive habitat types and activities occurring within 13km radius of the aerodrome.
- **Landfills sites,**
- **Slaughter Houses,**
- **Shopping Malls,**
- **Horse Stables/Polo Park, etc**
- **Local Bat Colonies:**



Wildlife Strike Reporting

Task	Description	Frequency	Responsible	Procedure/ Reference
Recording strikes	Record every reported strike.	As required	Aircraft operators, Airside Operations Manager	Strike reporting Form
Reporting strikes	Forward all reports to the Airside Operations Manager for entry into the strikedatabase.	As required	Aircraft operators, Airside Operations Manager,	Strike reporting Form
Data management	Maintain electronic records of wildlife strikes and review periodically to assess changes in populations	Ongoing	Safety and Environmental Manager	Data Base
Strike remains	Take pictures and collect strike remains from birds and animals for record purposes and disposal	As required	Aircraft operators , Airside Operations Manager	Camera

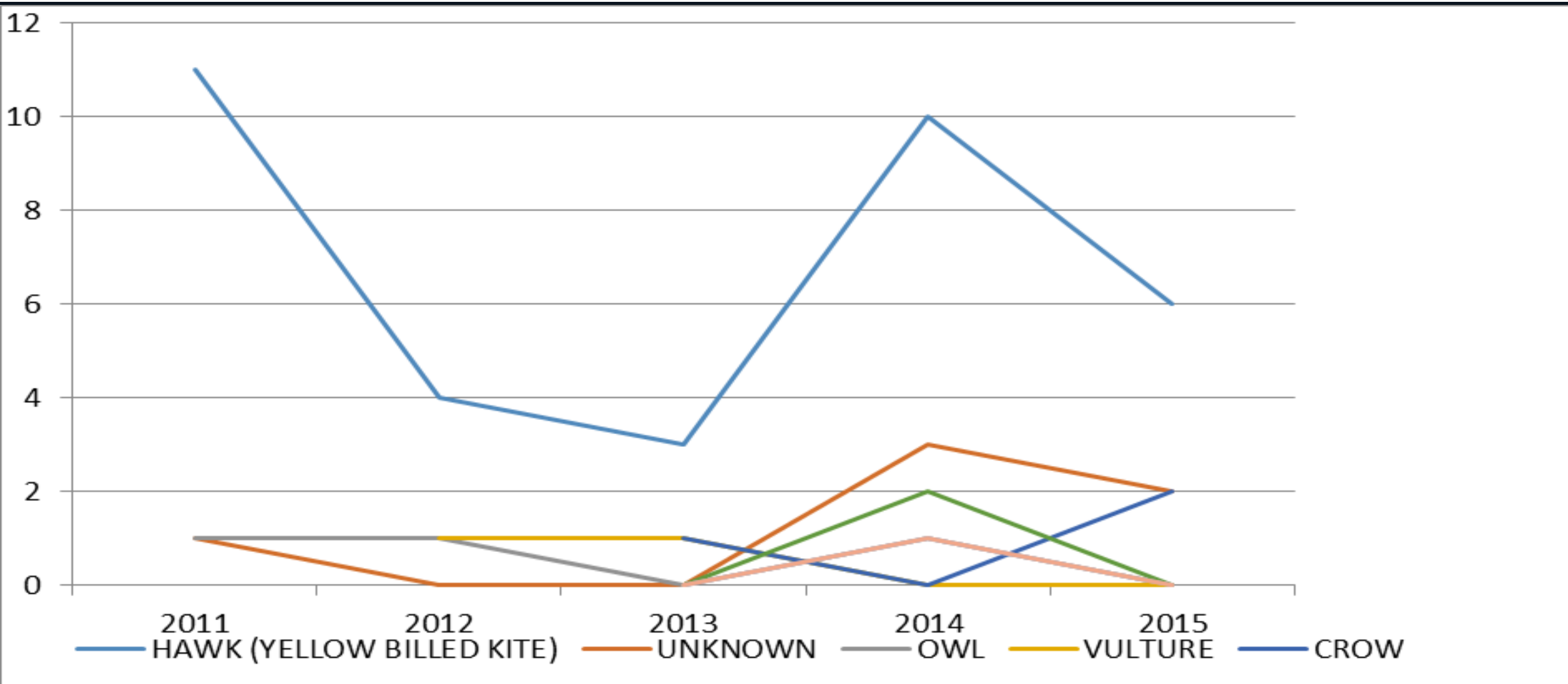


Data Analysis and Decision Making

Year	Total No. Strikes	No. Strikes / 1,000 aircraft movements	Total No. Damaging Strikes/ year	Comments
2011	13	0.35	0	Predominantly Hawks
2012	6	0.15	0	Predominantly Hawks
2013	5	0.11	0	Predominantly Hawks
2014	18	0.38	0	Predominantly Hawks followed by bats
2015	10	0.25	0	Predominantly Hawks



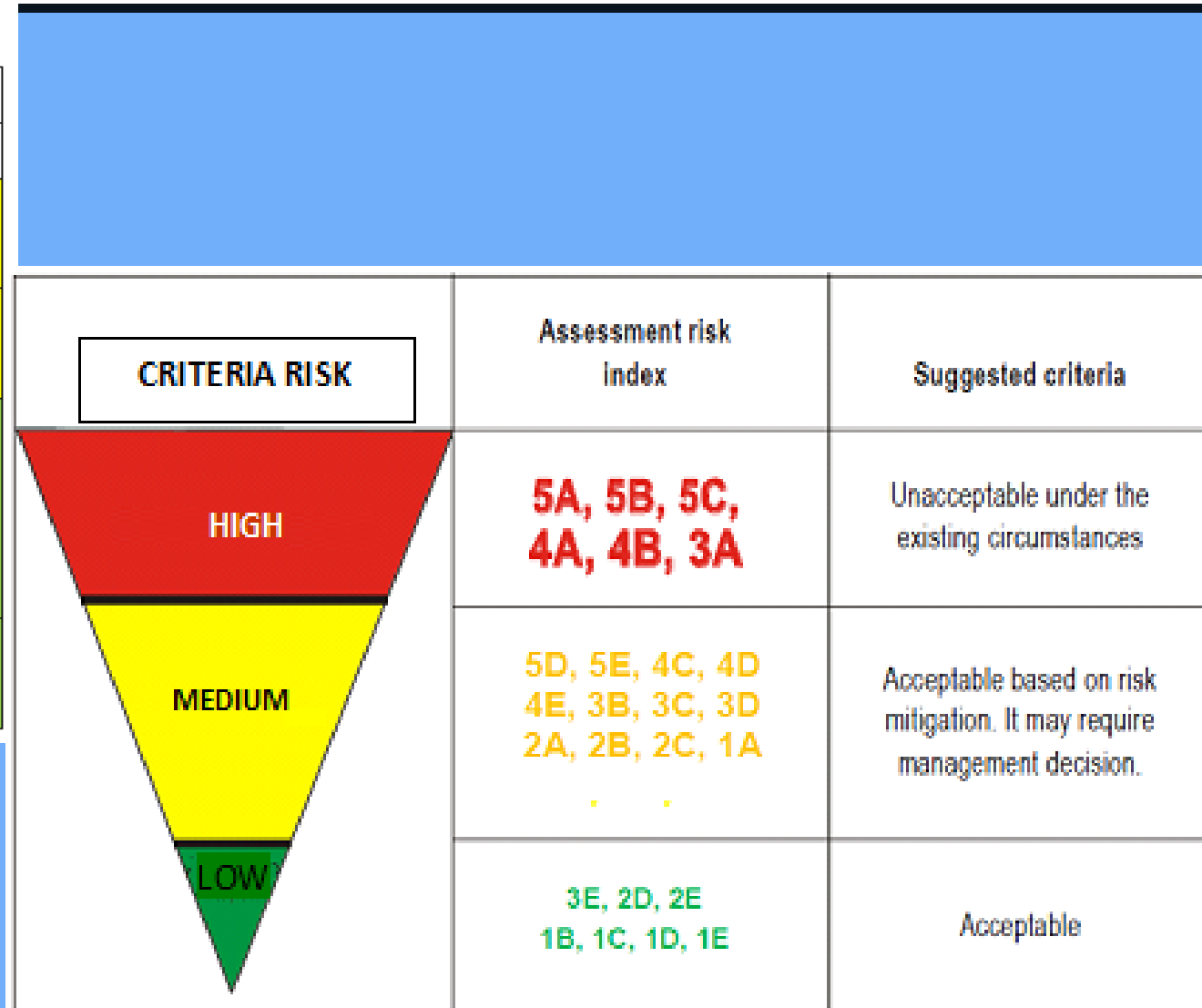
Data Analysis and Decision Making





Risk Assessment

RISK PROBABILITY	RISK SEVERITY				
	Catastrophic	Hazardous	Major	Minor	Negligible
	A	B	C	D	E
FREQUENT 5	5A	5B	5C	5D	5E
OCCASIONAL 4	4A	4B	4C	4D	4E
REMOTE 3	3A	3B	3C	3D	3E
IMPROBABLE 2	2A	2B	2C	2D	2E
EXTREMELY IMPROBABLE 1	1A	1B	1C	1D	1E





Risk Assessment -Guidance

Criteria	Risk Severity				
	No Safety Effect A	Minor B	Major C	Hazardous D	Catastrophic E
Effect on Aircraft Operations	No effect on safety	Slight reduction in safety margin/functional capabilities	Significant reduction in safety margin or functional capability	Substantial reduction in safety margin or functional capabilities	Hull loss
Effect on People	Inconvenience	Physical discomfort	Physical distress including minor injuries	Serious injuries or a fatality	Multiple fatalities
Effect on Airport Operations	Slight operational impact	Moderate operational impact	Significant operational impact	Determinate closure of airport	Indeterminate closure of airport
Financial Loss	Slight damage is less than \$1,000	Noticeable damage between \$1,000 and \$10,000	Large damage between \$10,000 and \$100,000	Major damage between \$100,000 and \$1,000,000	Severe damage exceeds \$1,000,000



Risk Assessment -Guidance

	Risk Likelihood				
Criteria	Extremely Improbable 1	Extremely Remote 2	Remote 3	Probable 4	Frequent 5
Quantitative (No. of Ops for One Event)	More than 1,000,000	Between 100,000 and 1,000,000	Between 10,000 and 100,000	Between 100 and 10,000	Less than 100
Qualitative	Less than once in 100 years	Once every 10 to 100 years	Once every 1 to 10 years	Once every month	More than once every week



Risk Management

Rank	Species	Description	Habitat	Strike history	Management actions
<p>HIGH RISK</p> <p>Immediate action required to reduce the current risk</p>	<p>YELLOW-BILLED KITE</p>	<p>The Afrotropic counterpart of the black kite, of which it is most often considered a subspecies. However, recent DNA studies suggest that the yellow-billed kite differs significantly from black kites and should be considered as a separate, allopatric species. As suggested by its name, the yellow-billed kite is easily recognized by its entirely yellow bill.</p>	<p>Found in almost all habitats and extremely opportunistic in its feeding habits. The diet includes small vertebrates, insects (including winged termites), carrion, offal, and dead or dying fish. They may pirate prey from other bird species, village dumps, and attend brushfires and grassland fires, sometimes in large congregations.</p>	<p>Last 5 years -34 Damaging Strikes-0 Last 12 months -6</p>	<p>Long Term – Management of ground insects and other food sources, better understanding of why these birds are attracted to the Airfield</p> <p>Short Term – Changes to grass heights, harassment methods, prevention of burning on and around the airfield.</p>
					



Risk Management

Rank	Species	Description	Habitat	Strike history	Management actions
MEDIUM RISK Review current management practices & options for additional action required	BAT	<p>Bats are mammals with the capability of true flight. They have extremely elongated fingers and a wing membrane stretched between, this gives the bat's wing the resemblance of the human hand. Almost 1,000 bat species can be found worldwide. Fruit bats are located along the southern corridor of the Kotoka International Airport.</p>	<p>Megabats or fruit bats mostly roost in trees and shrubs. They eat fruits or lick nectar from flowers</p> <p>At KIA, they are concentrated on the southern corridor outside of the Airport perimeter from the 37 Military Hosiptal through Cantonments, to Burma Camp</p>	<p>Last 5 years -1</p> <p>Damaging Strikes -0</p> <p>Last 12 months -0</p>	<p>Long Term – Will Encourage Airlines to avoid take-off and landing at key risk Periods</p> <p>Short Term – Monitoring of fruit bat movements in the vicinity of the airport. Currently engaged with Specialist in identify best options for relocating the bats.</p>





Risk Management

Rank	Species	Description	Habitat	Strike history	Management actions
RISK No further action beyond current management is required	CROW LOW	<p>The glossy black head and neck are interrupted by a large area of white feathering from the shoulders down to the lower breast. The tail, bill and wings are black too. The eyes are dark brown. The white plumage of immature birds is often mixed with black. It resembles the White-necked Ravens but has a much smaller bill.</p>	<p>Pied crows are close to human habitation and are omnivorous. Abundant source of food may bring large numbers of them together. They will eat anything which is edible including insects, seeds, the eggs and young of other birds, and small mammals or rodents.</p>	<p>Last 5 years -3</p> <p>Damaging Strikes -0</p> <p>Last 12 months -2</p>	<p>Long Term – Management of ground insects and other food sources</p> <p>Short Term – Changes to grass heights, use of harassment methods to keep birds out of the flight strip.</p>





Management Action - Stakeholder consultation

- Wildlife Hazard Management Committee
- Membership:
 - GCAA Representatives
 - Representative from each Municipal Assembly
 - Environmental Protection Agency
 - Airforce
 - Airline Operators Committee
 - Ground handler
 - Ghana wildlife Society
 - Ornithologist – Consultant
- Meets Quarterly



Management Action – (On/Off Airport)

- On Airport
 - Active Management
Directly removing or reducing the number of wildlife in the risky area
 - Passive
Modifying habitats or other aspects of the environment to indirectly remove or reduce the number of wildlife in the risky areas.
- Off Airport
 - Monitoring of incompatible land use activities within 13km radius of the airport





Management Action – Incompatible Land use



13 km radius
of aerodrome





Management Action – Quadrant 1

LOCATION	OBSERVATIONS AS AT DECEMBER 2015	ACTION PLANS	ACTION TAKEN	LONG TERM
OMANYE GALLERY AREA	<p>INADEQUATE REFUSE CONTAINERS (The sanitary condition of the area improved)</p> 	<p>Liase with LADMA to increase number of Waste Skips</p>	<p>Follow up inspection conducted.</p> <ul style="list-style-type: none"> • LADMA participated in Wildlfi Hazard Management Meeting. • Uncovered skips still being used. 	<p>Visit Site Twice Yearly</p>
TRADE FAIR SITE	<p>DUMPING OF REFUSE BANNED</p> 	<p>Identify Municipality in charge/Waste Collector and invite them to next Wildlife Hazard Management Meeting.</p>	<p>Follow up inspection conducted.</p> <ul style="list-style-type: none"> • LADMA participated in Wildlfi Hazard Management Meeting • Pocket of rubbish have been dumped at different areas. 	<p>Visit Site Twice Yearly</p>





Management Action – Quadrant 2

LOCATION	OBSERVATIONS AS AT AUGUST 2015	ACTION PLANS	SHORT TERM FOLLOW - UP	LONG TERM
<p>Adjiriganor (Nii Sowah Din Memorial – ADMA Basic Schools)/</p> <p>Pantang Hospital (Landfill Site)/</p> <p>Adenta Barrier (Area along the newly constructed road)/</p> <p>Ashaley Botwe – Old Town (area close to the Chief’s Palace)</p>	<p>COVERED SKIPS INTRODUCED (Improved Sanitation)</p>  	<p>Invite the Head, Waste Management Department Adenta Municipal Assembly Adenta/ Zoomlion to the next Bird hazard management meeting.</p> <p>Solicit information on</p> <ol style="list-style-type: none"> 1. Action plan by Municipal Authority on the closed Pantang Landfill site 2. Action plan by Municipal Authority on the indiscriminate disposal of waste along the Adenta Barrier main road 3. Action plan by Municipal Authority/Zoomlion on the indiscriminate disposal of waste at Ashaley Botwe – Old Town (area close to the Chief’s Palace) 	<p>Follow up inspection conducted.</p> <ul style="list-style-type: none"> • Adenta Municipal Assembly Adenta participated in Wildlife Hazard management meeting. • Uncovered skip replaced with covered ones for Adjiriganor/ Ashaley Botwe – Old Town <ol style="list-style-type: none"> 1. Pantang Landfill is still in use because of the non-availability of an alternative landfill. 2 &3. Adenta Municipal Assembly has introduced a taskforce which has the responsibility of clearing indiscriminate waste disposed around the area 	<p>Visit Site Twice Yearly</p>





Management Action – Quadrant 3

LOCATION	OBSERVATIONS AS AT DECEMBER 2015	ACTION PLANS	SHORT TERM FOLLOW - UP	LONG TERM
KWABENYA (Ashongman Area to Abokobi Area)	<p>Open Containers were full and overflowing. Indiscriminate waste disposal and refuse burning at collection points</p> 	<p>Liase with GAMA ensure regular waste collection.</p>	<p>The GA East Municipal Assembly (GAMA) has been identified as the body responsible for managing the Ashongman- Abokobi areas.</p> <p>The GAMA is to enforce the provision of containers and discourage indiscriminate waste disposal in these areas.</p>	<p>Visit Site Twice Yearly</p>
DOME	<p>Open Containers were full and overflowing. Indiscriminate waste disposal and refuse burning at collection points.</p> 	<p>Liase with GAMA ensure regular waste collection.</p>	<p>The GA East Municipal Assembly (GAMA) has been identified as the body responsible for managing the Dome Area.</p> <p>The GAMA is to enforce the provision of containers and discourage indiscriminate waste disposal in this area.</p>	<p>Visit Site Twice Yearly</p>



Management Action – Quadrant 4

LOCATION	OBSERVATIONS AS AT AUGUST 2015	ACTION PLANS	SHORT TERM FOLLOW - UP	LONG TERM
KOKOMLEMLE	<p>WASTE TRANSFER STATION</p> 	<p>Liaise with AMA to educate public on the need to use the waste transfer stations.</p>	<p>Follow up inspection conducted.</p> <p>Municipality in-charge identified.</p> <p>Municipality participated in Wildlife Hazard Management Meeting.</p> <p>Municipality to educate private waste collectors</p>	<p>Visit Site Twice Yearly</p>
NIMA MARKET	<p>OPENED CONTAINER FULL AND WASTE DUMPED ON THE GROUND</p> 	<p>Liaise with AMA to provide sufficient Skips for the communities and ensure regular collection of waste.</p>	<p>Follow up inspection conducted.</p> <p>Municipality in-charge identified.</p> <p>Municipality participated in Wildlife Hazard Management Meeting.</p>	<p>Visit Site Twice Yearly</p>



Challenges - “Do we need more standards”

Data indicates that:

- There is a lack of enforcement of local regulations to ensure compatible land use practices around airports.
- Waste management practices in highly populated and low income areas within the 13km radius is poor.



Challenges - ‘Way Forward’

In conclusion, the problem is not with the existing regulations, but rather there should be a focus on:

- Education and enforcement of regulations
- Collaboration and harmonization of regulations between various authorities (Zoning, Environmental, Airport, etc).
- Centralization of land use permit system



Thank You