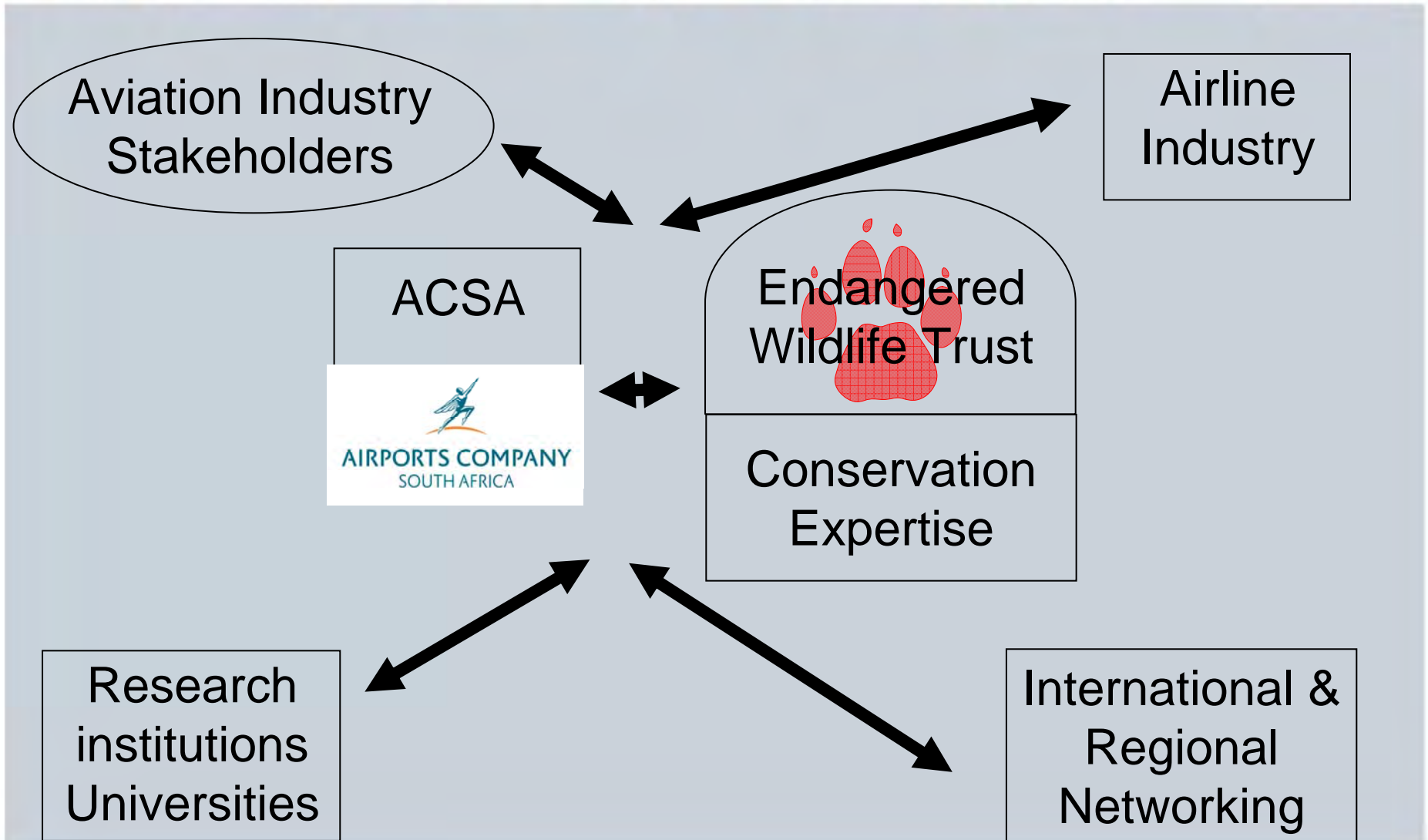




Developing Wildlife Management Plans in a South African Context







Endangered Wildlife Trust (EWT)

Species

- Cranes
- Blue Swallows
- Carnivores
- Birds of Prey
- Marine species

Community

- Conservation Leadership
- Rural and Urban Ecowarriers
- Human-Wildlife Conflict

Industry

- Power / Energy
- Airports

Biodiv.

- KZN Grasslands
- Biodiversity Stewardship
- Urban Conservation
- Freshwaters



ACSA – EWT Partnership Goal

Minimise bird strikes and other interactions between wildlife and airport facilities at ACSA airports by applying integrated environmental management techniques





Objectives

Initiated in 1999 to:

- Increase aviation safety in South Africa
- Establish airport bird control systems
- Develop a national bird strike reporting system
- Monitor airport bird presence and abundance
- Consider land uses surrounding airports
- Create awareness and share expertise
- Foster national and international networking



Management Actions

Pro-active

- Habitat management
 - Tree removal
- Grass management
 - Grass length
 - Species (Species Switch)
- Food sources
 - Refuse
- Open water
- Infrastructure
 - Exclusion
 - Anti-perching
- Radar

Re-active

- Bird Scaring patrols
- Border Collies
- Sirens
- Pyrotechnics
- Distress calls
- Lasers
- Lethal removal



Bird Strike data

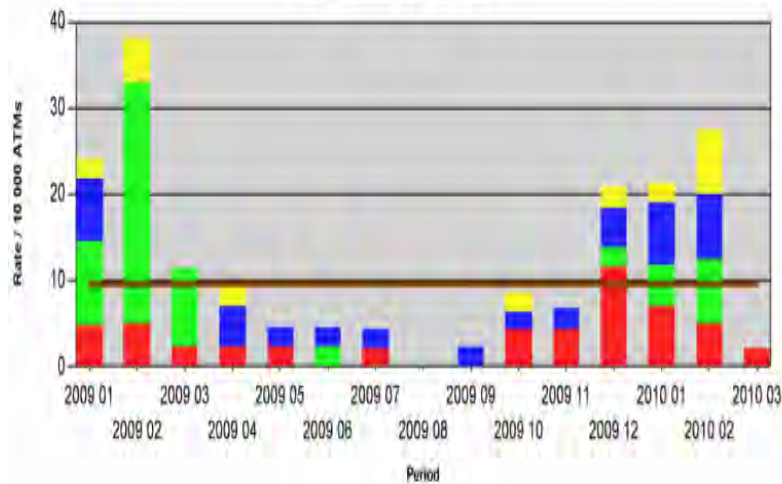
Collected from a variety of sources

Sent directly to airport or via EWT

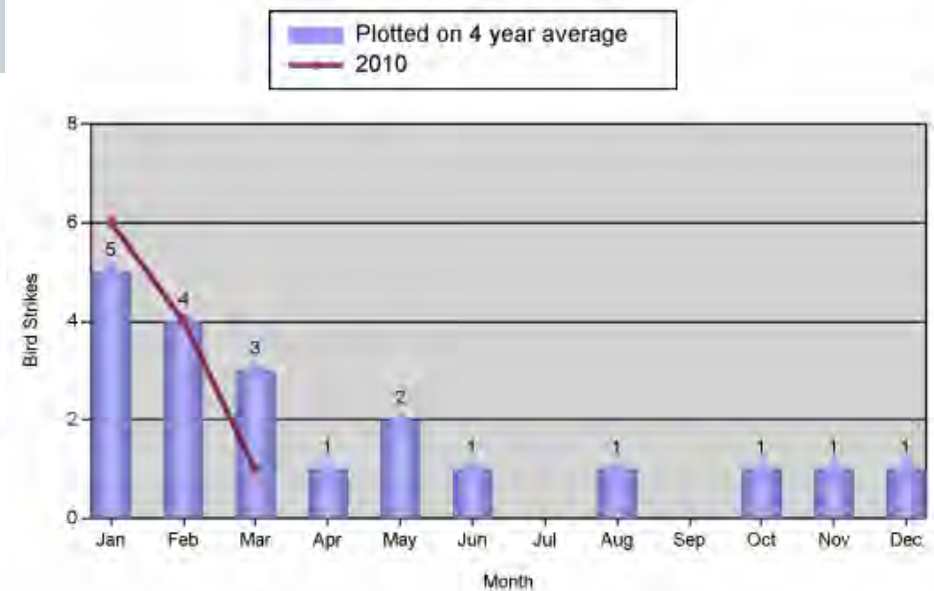
Captured on centralised database

Used to guide management programme

DURBAN INTERNATIONAL AIRPORT



Average Bird Strikes Per Month





Data Collection and Analysis

- Monitor bird presence and abundance
- Bird & Wildlife strike reporting system

GIS-based reporting system

- Speeds up process of data capture
- Allows for more data to be captured and analysed
- User-friendly
- Different modules – count, patrol, grass
- Centralised data storage





Wildlife Management Plans

- Looked at several templates but focused on the Canadian template
- The basic components of a WMP are Risk Assessment and the Management Plan

OR Tambo International Airport



2008

Wildlife Management Plan



Section A - Risk Assessment

- **Screening** for the application of the wildlife planning and management regulation
- **Goals and objectives**
- **Airport operations** – summary, aircraft movement types, aircraft types, movement numbers
- **Baseline information** on wildlife and habitats – airport setting, property, adjacent land use, wildlife strike data, temporal patterns for strike activity
- **Key wildlife hazards** - assessments
- **Risk assessment** – bird hazard zones, methods to determine risk and hazard scores

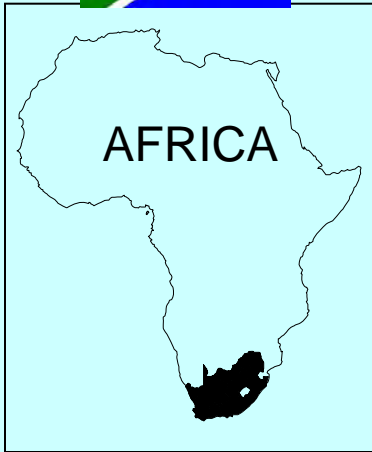


Section B - Wildlife Management Plan

- **Policy and Objectives** of the WMP
- **Applicable legislation** – Aviation regulations (International And National), nature conservation (National And Provincial), firearms, Etc.
- **Review Of Available Wildlife Measures** – Compliance actions, control strategies, passive techniques, reactive control, wildlife management priorities
- **Wildlife control procedures** – Regulatory requirements and best management practices, control procedures, documentation, training
- **Monitoring** – Daily management logs, wildlife strikes, radar systems
- **Summary of Activities and Approaches**
- **Communications** Procedures
- **Implementation** – Roles and responsibilities, training
- **Research Projects**



ACSA Airports



South Africa





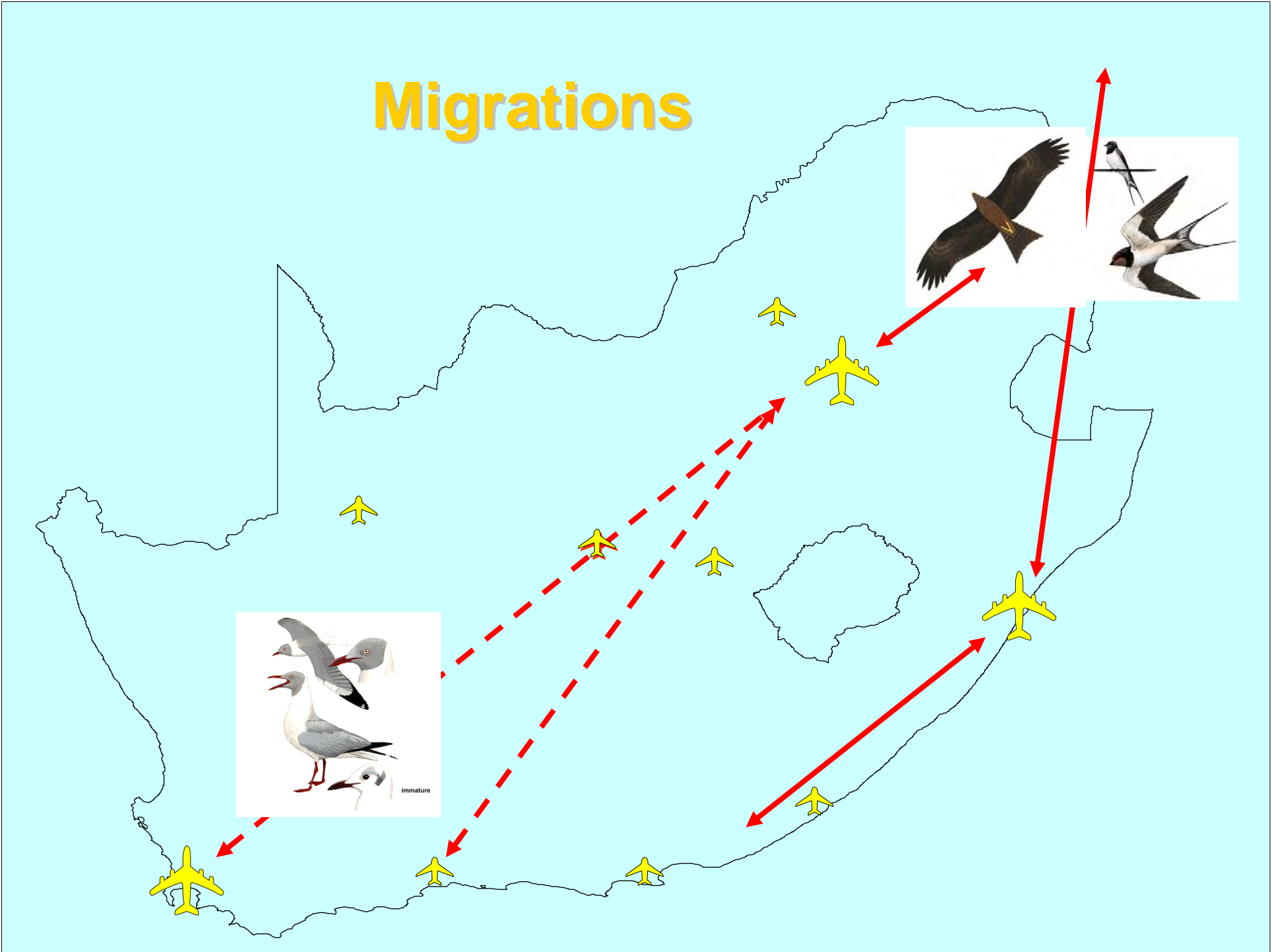


immature





Migrations

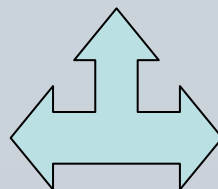
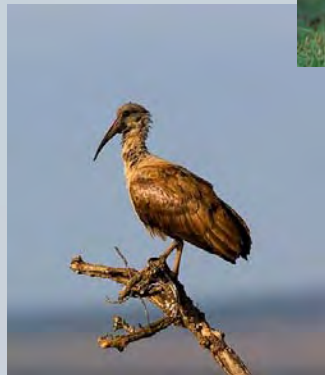




Key Bird and Wildlife Hazards

Prioritisation of hazardous birds

- Current done on an airport basis – not ‘national’ view
- By number of strike incidents



Grassland birds
 Gulls
 Swallows and swifts
 Lapwings and thick-knees
 Doves and pigeons
 Gamebirds
 Owls
 Ibis
 Herons
 Egrets
 Raptors (aerial)
 Waterfowl
 Raptors (terrestrial)
 Corvids
 General (shrikes and mynas)
 Hares
 Carnivores
 Snakes



Risk Assessment – Flocking and Mass Characteristics

Level of Risk	Level of Hazard	Characteristics	Airport Species
Level 1	H	Very large (>1.8 kg), flocking	Spur-winged Goose; Egyptian Goose
Level 2	H	Very large (>1.8 kg), solitary Large (1-1.8 kg), flocking	Secretarybird African Sacred Ibis; Hadedda Ibis; Helmeted Guineafowl
Level 3	M	Large (1-1.8 kg), solitary Medium (300 g – 1 kg), flocking	Black-headed Heron Glossy Ibis; Yellow-billed Duck; Cattle Egret; Pied Crow; Rock Dove; Swainson's Spurfowl
Level 4	M	Medium (300 g – 1 kg), solitary Small (50 – 300 g), flocking	Black Kite; Marsh Owl; Spotted Eagle-Owl; Spotted Thick-knee; Steppe Buzzard African Wattled Lapwing; Blacksmith Lapwing; Crowned Lapwing; Grey-headed Gull; Laughing Dove; Common Myna
Level 5	L	Small (50 – 300 g), solitary Very small (<50 g), flocking	Black-shouldered Kite Barn Swallow; Little Swift; White-throated Swallow; Greater Striped Swallow; White-rumped Swift; Long-tailed Widowbird
Level 6	L	Very small (<50 g), solitary	African Pipit; African Stonechat; Common Fiscal; Zitting Cisticola

Currently classify birds as 0-200g, 200g-3kg, 3kg and over

Risk Assessment

Species Group	General Risk and Hazard Ranking Tools			Airport				Risk Assessment by Aircraft Type	
	Mass/Flocking Rank	Relative Risk Score	South Africa Hazard Rank	Relative Abundance	Flocking & Weight Characters	Behaviour	Strike History	Jet Aircraft	Turbo Prop
Grassland Birds	5/6	2/7/17/18	1/12/16/17	M	5/6	M	H	H	M
Gulls	4	11	6	M-H	4	H	H	H	M
Swallows and Swifts	5	13	3	H	5	M	H	M	M
Lapwings, Plovers and Thick-knees	4	8	2	H	4	H	H	H	H
Doves and Pigeons	3/4	12	8	M	3/4	M	H	M	M
Gamebirds	2/3	4/10	9/11	H-M	2/3	M	H	L	M
Owls	4	5	10	M	4	M	H	H	M
Ibis	2/3	3	4	H	2/3	H	H	H	M
Hérons	3	6	5	M	3	L	L	M	L
Egrets	3	1	13	H	3	M	L	H	H
Raptors (aerial)	4/5	9	7	M	4/5	M	L	M	L
Waterfowl	1/3	14/15/16	14/15/18	M	1/3	M	L	M	M
Raptors (terrestrial)	2	---	---	L	2	L	L	L	L
Corvids	3	---	---	L	3	L	L	L	L
General	4/6	---	---	L	4/6	L	L	L	L
Hares	2	2	1	M	2	M	H	L	L
Carnivores	2	4	3	L	2	L	L	L	L
Carnivores	4	6	6	M	4	L	L	L	L
Snakes		---	---	L		L	L	L	L



Risk Assessment – Strike History

High

- More than 20 strikes

Medium

- 10-20 strikes

Low

- Less than 10 strikes

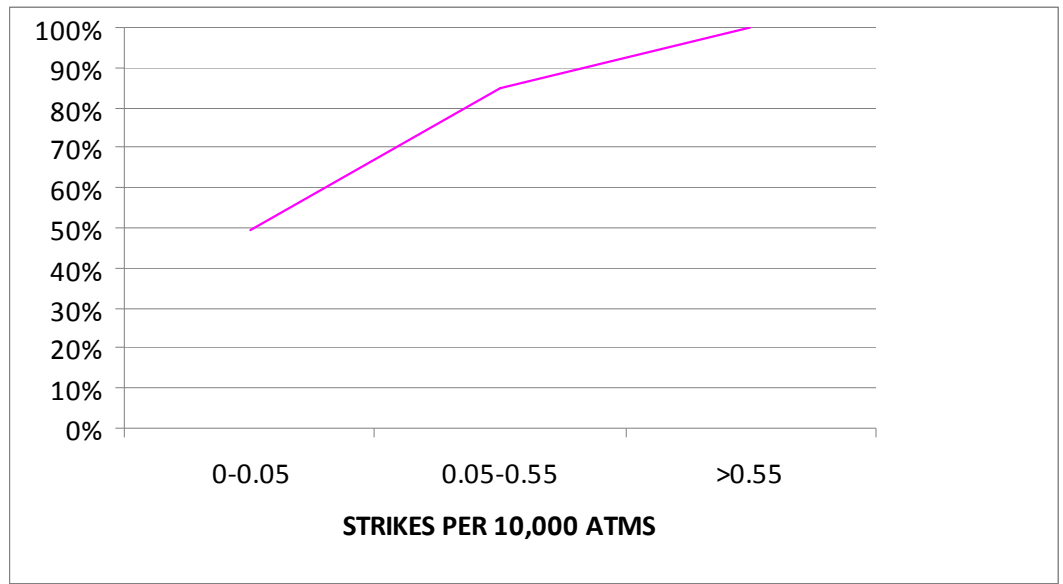
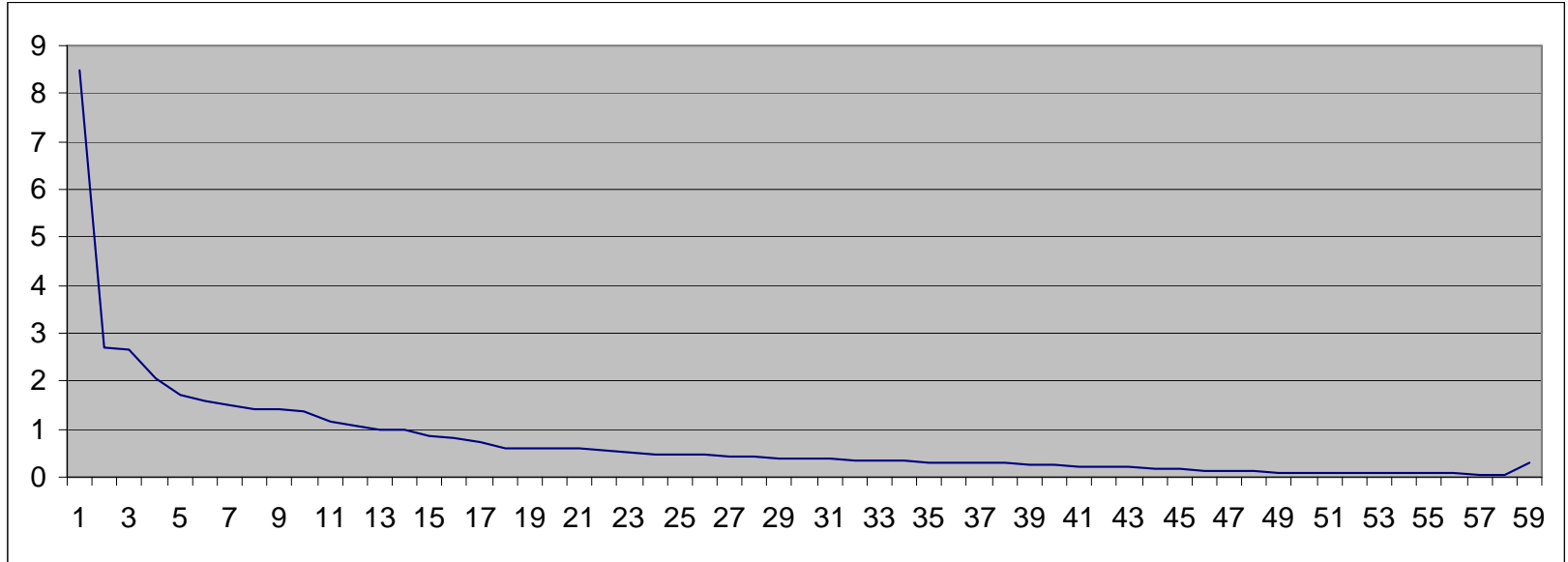


Risk Assessment – Strike History

	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8	AP9	AP10	Total
Unknown	8	19	39	11	19	6	146	1	8	1	258
Plover & Thick-knee	79	5	13	15	10	19	81		18	5	245
Swallow	17	3	68	8	3	10	64		7		180
Ibis		15	15	8	5		24		11		78
Black-headed Heron	1	4	44	6	3		9		6		73
Gull		3	1			1	64		3		72
Kite / Falcon / Hawk	5	5	41		2		7		3		63
Pigeon / Dove	6	2		1			50		2		61
Guineafowl	1				1		49				51
Owl	3		3		2	3	31		2		44
Korhaan / Bustard	8					10				4	22
Grassveld Pipit	1		9	4			3		1		18
Cattle Egret							9				9
Sparrow	1	1	1				3		1		7
Egyptian Goose		1	1				3		2		7
Yellow-billed Duck	1			4			2				7
Cape (Orangethroated) Longclaw				4			2				6
Spurwinged Goose							2				2

Risk Assessment – Strike History

	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP9	AP10	Total	Ave
Unknown	0.97	0.40	1.52	0.82	1.00	0.85	1.38	0.27	0.29	7.50	0.83
Plover	8.48	0.06	0.39	0.60	0.47	2.68	0.56	0.27	1.43	14.94	1.66
Dikkop	1.09	0.04	0.12	0.52	0.05	0.00	0.21	0.33	0.00	2.37	0.26
Swallow	2.06	0.06	2.64	0.60	0.16	1.41	0.61	0.23	0.00	7.78	0.86
Ibis - Hadedea	0.00	0.30	0.58	0.60	0.26	0.00	0.18	0.37	0.00	2.29	0.25
Ibis - African Sacred	0.00	0.02	0.00	0.00	0.00	0.00	0.05	---	0.00	0.07	0.01
Black-headed Heron	0.12	0.09	1.71	0.45	0.16	0.00	0.09	0.20	0.00	2.81	0.31
Gull	---	0.06	0.04	---	---	0.14	0.61	0.10	---	0.95	0.19
Kite / Falcon / Hawk	0.61	0.11	1.59	0.00	0.11	0.00	0.07	0.10	0.00	2.58	0.29
Pigeon / Dove	0.73	0.04	0.00	0.07	0.00	0.00	0.47	0.07	0.00	1.38	0.15
Guineafowl	0.12	0.00	---	---	0.05	0.00	0.46	0.00	---	0.64	0.11
Owl	0.36	0.00	0.12	---	0.11	0.42	0.29	0.07	---	1.37	0.20
Korhaan	0.97	---	---	---	---	1.41	---	---	1.14	3.52	1.17
Grassveld Pipit	0.12	0.00	0.35	0.30	0.00	0.00	0.03	0.03	0.00	0.83	0.09
Sparrow	0.12	0.02	0.04	0.00	0.00	0.00	0.03	0.03	0.00	0.24	0.03
Egyptian Goose	---	0.02	0.04	0.00	0.00	---	0.03	0.07	---	0.16	0.03
Yellow-billed Duck	0.12	0.00	0.00	0.30	---	---	0.02	---	---	0.44	0.09
Cape (Orangethroated) Longclaw	0.00	---	---	0.30	0.00	---	0.02	0.00	---	0.32	0.06
Spurwinged Goose	---	0.00	0.00	0.00	---	---	0.02	---	---	0.02	0.00
Cattle Egret	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09	0.00



Risk Assessment – Strike History

	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP9	Ap10	Total	Ave
Plover	8.48	0.06	0.39	0.60	0.47	2.68	0.56	0.27	1.43	14.94	1.66
Thick-knee	1.09	0.04	0.12	0.52	0.05	0.00	0.21	0.33	0.00	2.37	0.26
Korhaan / Bustard	0.97	---	---	---	---	1.41	---	---	1.14	3.52	1.17
Swallow	2.06	0.06	2.64	0.60	0.16	1.41	0.61	0.23	0.00	7.78	0.86
Unknown	0.97	0.40	1.52	0.82	1.00	0.85	1.38	0.27	0.29	7.50	0.83
Black-headed Heron	0.12	0.09	1.71	0.45	0.16	0.00	0.09	0.20	0.00	2.81	0.31
Kite / Falcon / Hawk	0.61	0.11	1.59	0.00	0.11	0.00	0.07	0.10	0.00	2.58	0.29
Ibis – Hadeda	0.00	0.30	0.58	0.60	0.26	0.00	0.18	0.37	0.00	2.29	0.25
Ibis - African Sacred	0.00	0.02	0.00	0.00	0.00	0.00	0.05	---	0.00	0.07	0.01
Owl	0.36	0.00	0.12	---	0.11	0.42	0.29	0.07	---	1.37	0.20
Gull	---	0.06	0.04	---	---	0.14	0.61	0.10	---	0.95	0.19
Pigeon / Dove	0.73	0.04	0.00	0.07	0.00	0.00	0.47	0.07	0.00	1.38	0.15
Guineafowl	0.12	0.00	---	---	0.05	0.00	0.46	0.00	---	0.64	0.11
Grassveld Pipit	0.12	0.00	0.35	0.30	0.00	0.00	0.03	0.03	0.00	0.83	0.09
Yellow-billed Duck	0.12	0.00	0.00	0.30	---	---	0.02	---	---	0.44	0.09
Cape (Orangethroated) Longclaw	0.00	---	---	0.30	0.00	---	0.02	0.00	---	0.32	0.06
Sparrow	0.12	0.02	0.04	0.00	0.00	0.00	0.03	0.03	0.00	0.24	0.03
Egyptian Goose	---	0.02	0.04	0.00	0.00	---	0.03	0.07	---	0.16	0.03
Spurwinged Goose	---	0.00	0.00	0.00	---	---	0.02	---	---	0.02	0.00
Cattle Egret	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09	0.00

Risk Assessment

Species Group	General Risk and Hazard Ranking Tools			ORTIA				Risk Assessment by Aircraft Type	
	Mass/Flocking Rank	Relative Risk Score	South Africa Hazard Rank	Relative Abundance	Flocking & Weight Characters	Behaviour	Strike History	Jet Aircraft	Turbo Prop
Grassland Birds	5/6	2/7/17/18	1/12/16/17	M	5/6	M	H	H	M
Gulls	4	11	6	M-H	4	H	H	H	M
Swallows and Swifts	5	13	3	H	5	M	H	M	M
Lapwings, Plovers and Thick-knees	4	8	2	H	4	H	H	H	H
Doves and Pigeons	3/4	12	8	M	3/4	M	H	M	M
Gamebirds	2/3	4/10	9/11	H-M	2/3	M	H	L	M
Owls	4	5	10	M	4	M	H	H	M
Ibis	2/3	3	4	H	2/3	H	H	H	M
Hérons	3	6	5	M	3	L	L	M	L
Egrets	3	1	13	H	3	M	L	H	H
Raptors (aerial)	4/5	9	7	M	4/5	M	L	M	L
Waterfowl	1/3	14/15/16	14/15/18	M	1/3	M	L	M	M
Raptors (terrestrial)	2	---	---	L	2	L	L	L	L
Corvids	3	---	---	L	3	L	L	L	L
General	4/6	---	---	L	4/6	L	L	L	L
Hares	2	2	1	M	2	M	H	L	L
Carnivores	2	4	3	L	2	L	L	L	L
Carnivores	4	6	6	M	4	L	L	L	L
Snakes		---	---	L		L	L	L	L

Hazard Ranking

	Strikes	Strikes + damage	%	Rank
Cattle Egret	9	2	22.2	1
Sparrow	7	1	14.3	2
Ibis	78	11	14.1	3
Guineafowl	51	7	13.7	4
Owl	44	4	9.1	5
Black-headed Heron	74	6	8.1	6
Unknown	258	21	8.1	7
Plover	245	13	5.3	8
Kite / Falcon / Hawk	63	3	4.8	9
Korhaan	22	1	4.5	10
Gull	72	3	4.2	11
Pigeon / Dove	61	2	3.3	12
Swallow	178	4	2.2	13
Egyptian Goose	7	0	0.0	14
Spurwinged Goose	2	0	0.0	15
Yellow-billed Duck	7	0	0.0	16
Grassveld Pipit	18	0	0.0	17
Cape (Orangethroated) Longclaw	6	0	0.0	18



Dolbeer et al. (2000)

- Scope of damage – Destroyed, substantial, minor, unknown, none, not reported
- Effect on flight – Aborted, engine shutdown, precautionary landing, other, none, not reported

Effect on flight largely undocumented

- Delays in receiving information
- Poor reporting



Concerns

- How to deal with strikes involving multiple species and/or multiple birds?
- Incorporate cost of damage / scope of damage
- 'Unknown' strikes need to be clarified and species allocated
 - Do the species lists on the database need to be relooked at?
- Can these be linked to KPI's of WCO's and HoD: Fire Fighting?
- Can we set a target by which to reduce benchmarks without compromising the effectiveness of programmes?
- Can the WMPs be structured to assist HoD: Fire Fighting motivate for equipment, additional staff etc.
- How often should they be reviewed and what process should be followed?
- How best to formally incorporate the WMPs into the policy and procedures?