



UFS  
UV



# Human-Wildlife conflict takes flight; ecological scrutiny of aircraft- wildlife collisions in Namibia.

Morgan Hauptfleisch<sup>1</sup> and Nico Avenant<sup>1,2</sup>

<sup>1</sup>*Centre for Environmental Management, University of the Free State, South Africa*

<sup>2</sup>*Department of Mammalogy, National Museum Bloemfontein, South Africa*



# One of the most ferocious man killers?

Can kill up to 300 people in seconds



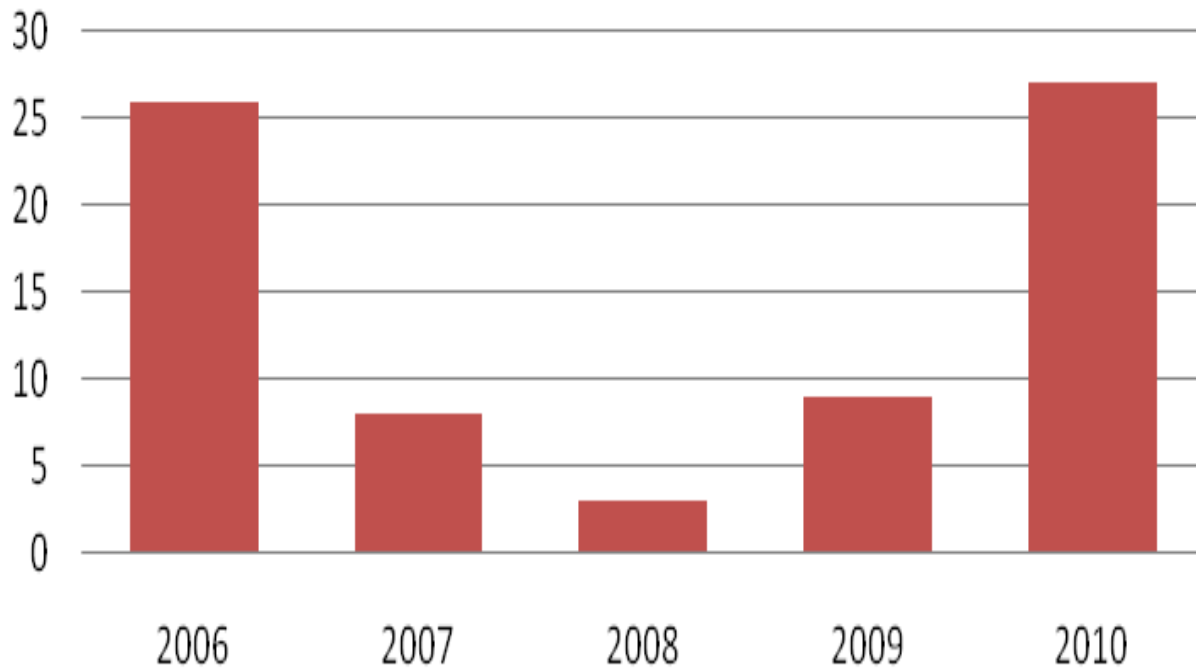
# Setting the scene

- 210 deaths in the last 10 years
- US\$ 600 M damage per annum in USA alone
- Two serious incidents in Namibia in the last 5 years
  - R 27 Million
  - R 1 M



# Setting the scene

Number of Aircraft Wildlife Collision Incidents at Eros Airport (2006-2010)



# Introduction

- Birds & Aircraft Research Namibia Project (BARN) has been studying the problem in Namibia since 2008
- It was established to provide scientific input into minimising the risk of aircraft-wildlife collisions in Namibia
- Builds aviation industry's capacity to deal with the problem



# Changing from symptomatic thinking to ecosystem thinking

- Conventional measures to solve “birdstrikes”
  - Shooting
  - Scaring with sounds (gas canons, pyrotechnics)
  - Scarecrows
  - Dogs or falcons
- The project punts the need to consider the airport as an ecosystem and treat root causes (provision of ecosystem services)



- We consider ecosystem parameters to identify root causes of the attraction of wildlife (mostly birds) to airports in Namibia
- Solutions at ecosystem level to the problems are expected to be more effective than symptomatic solutions

# Airports as Ecosystems

- Ecosystem services provided by airports include:
  - Food (airline food waste, gardens, grazing)
  - nesting sites & roosts (hangars, windsocks, antennae, radar beacons)
  - safety from predators (fenced off)







# Study sites

<b>Hosea Kutako International Airport</b>	<b>Eros Aerodrome</b>
Rural setting	Urban setting
Predominantly jet-turbine aircraft	Predominantly propeller engined aircraft
Low aircraft traffic volume	High aircraft traffic volume
Game and cattle ranching and as dominant surrounding land-use	Urban and recreational (golf) surrounding land- use

# Ecosystem factors taken into account

**Grass height (mowed to ICAO standard vs unmowed)**

**Airport property to surrounding land use**

**Woody structure**

**Urban vs rural airport surrounds**

**Summer vs winter small-mammal and insect abundance and diversity**



# Methodology

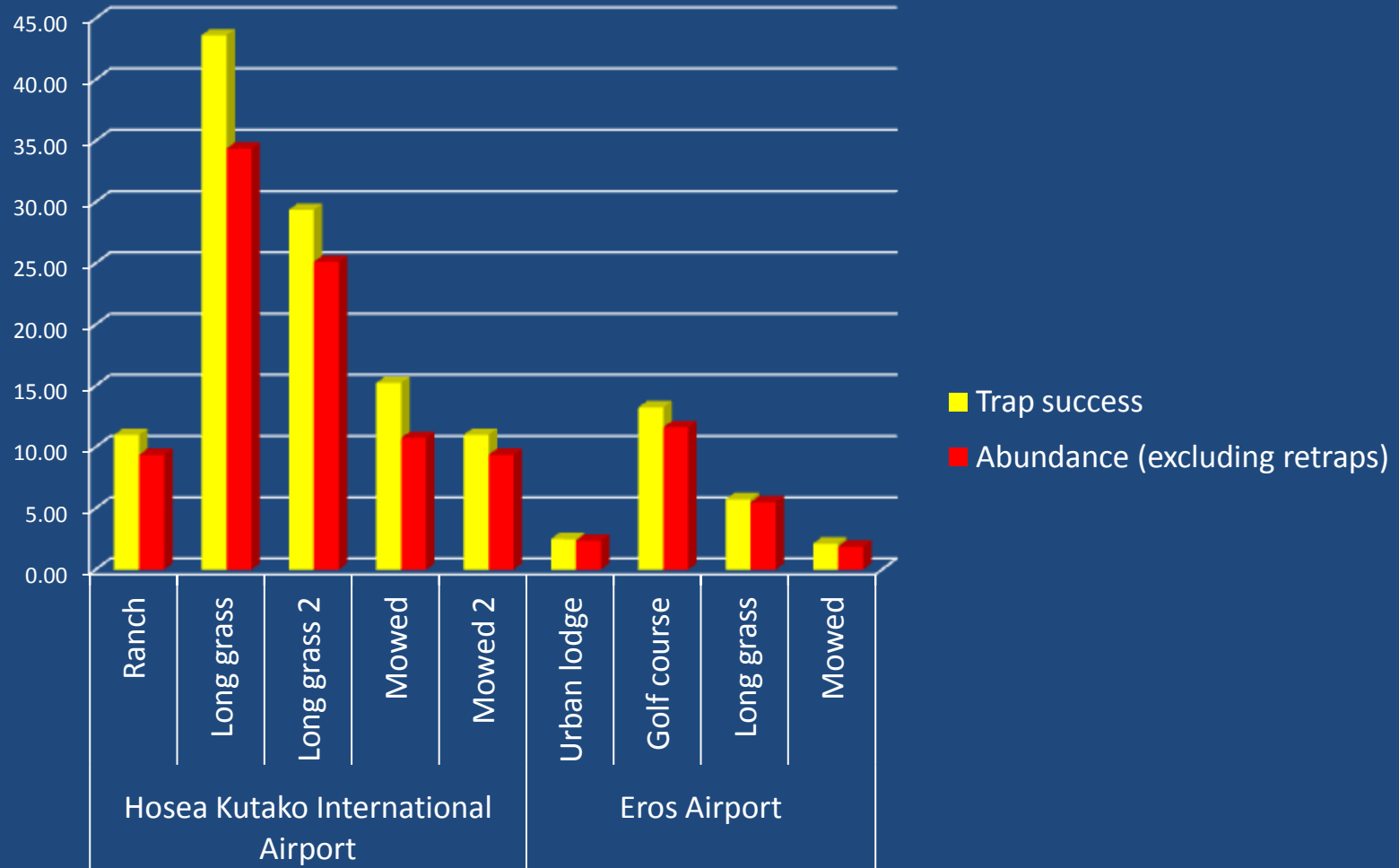
- Small-mammal surveys
  - 9 transects of 100 traps (5m apart)
  - 4 x 24 hour trapping period (recording 2 x daily)
  - Repeated for summer and winter
- Step point plant surveys (nearest Poacea)
- Ecological index method to determine VCI for the same 9 transects as above



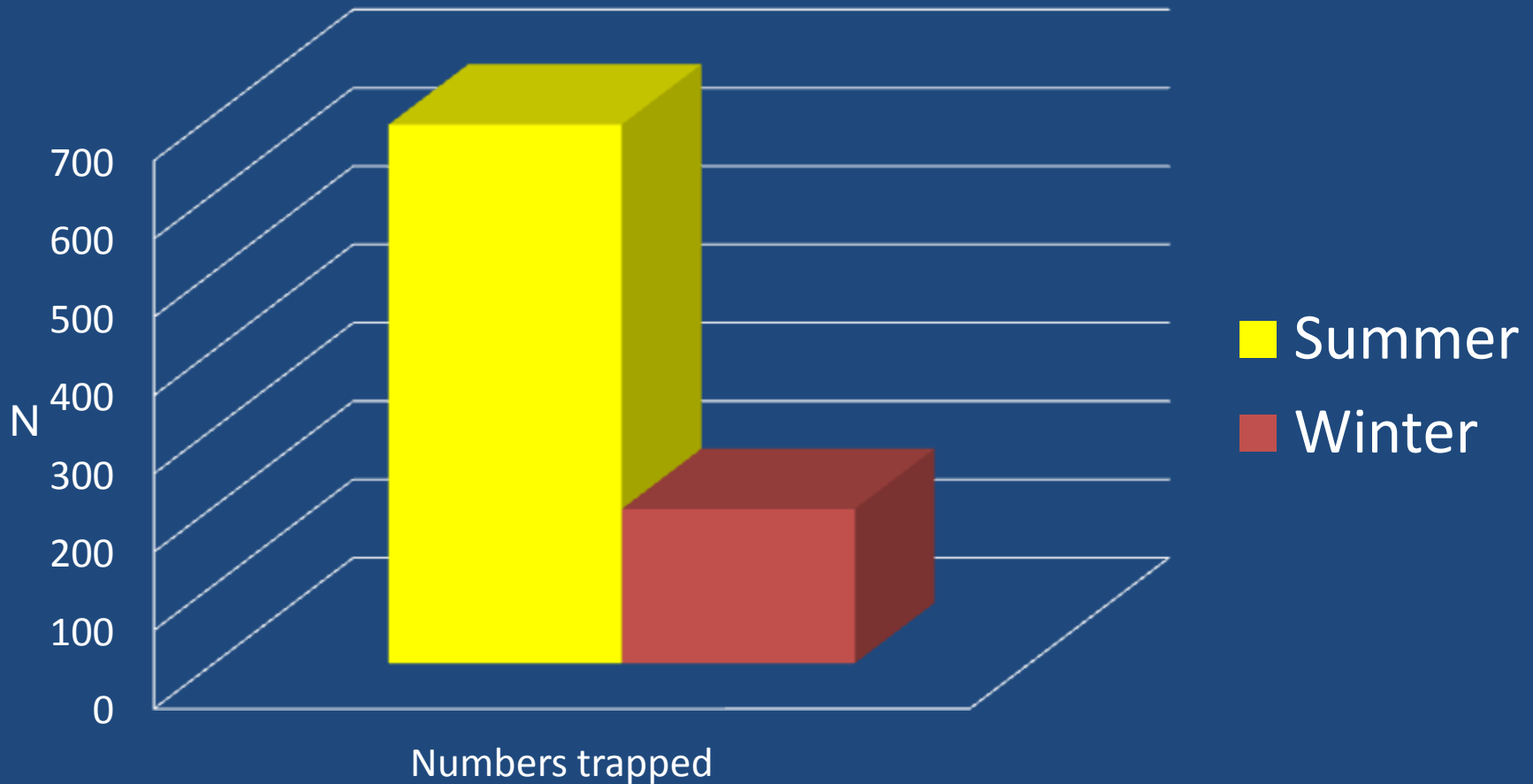
# Results

Airport	Transect	Trap success	Abundance (excluding retraps)	Species richness	Shannon diversity (log)	Simpson diversity (1/D)	Evenness
<b>Hosea Kutako International Airport</b>	Game Ranch	11.00	9.38	6	2.14	0.25	0.42
	Undisturbed	43.63	34.38	7	1.46	0.53	0.20
	Undisturbed 2	29.38	25.13	7	1.50	0.45	0.18
	Short grass	15.25	10.75	6	1.36	0.52	0.26
	Short grass 2	11.00	9.38	3	1.47	0.38	0.52
<b>Eros Airport</b>	Urban lodge	2.50	2.38	3	1.12	0.53	0.61
	Golf course	13.25	11.63	4	1.46	0.42	0.47
	Long grass	5.75	5.50	4	1.47	0.39	0.37
	Short grass	2.13	1.88	4	1.24	0.53	0.51

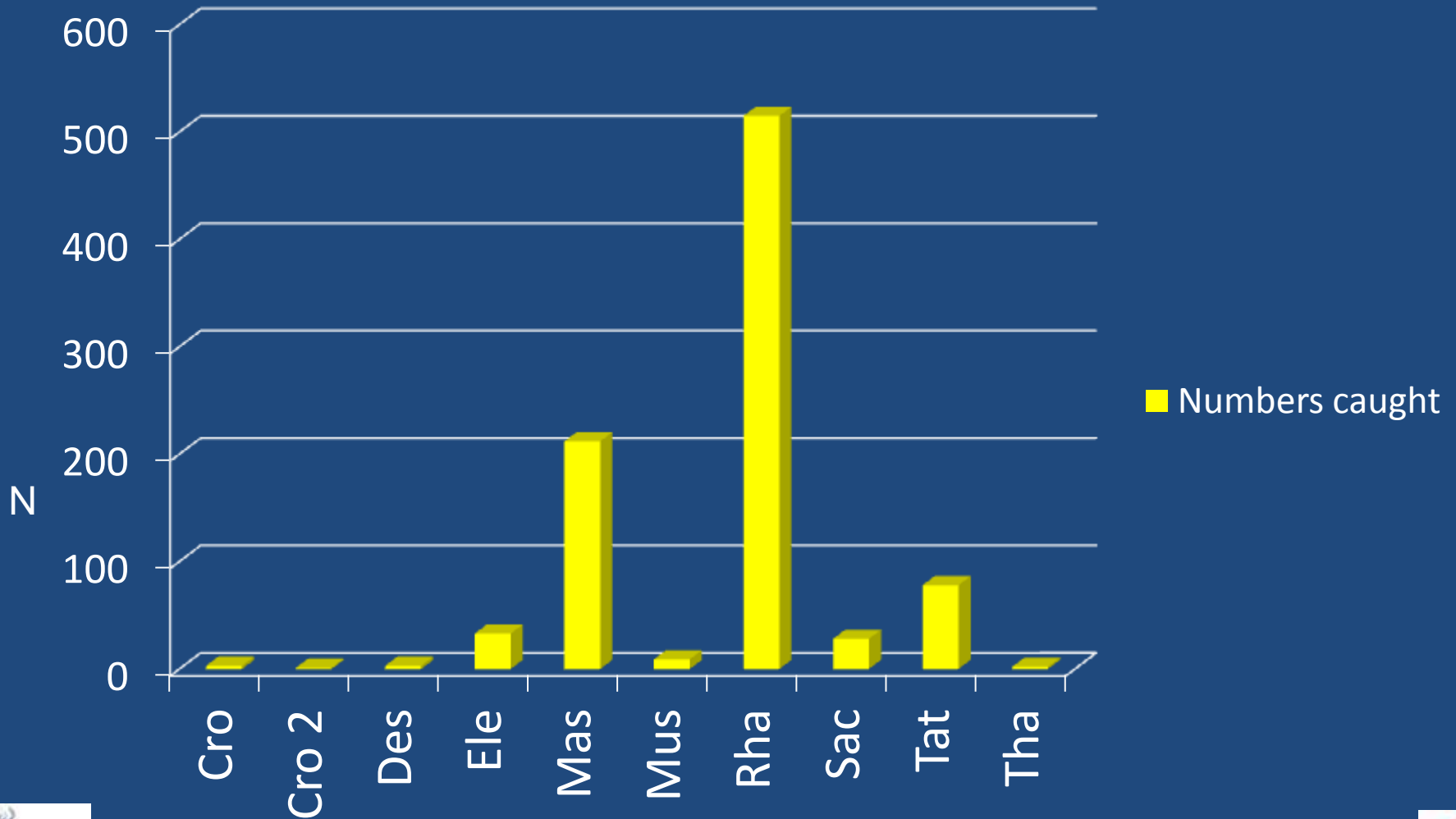
# Comparison of small-mammal population at 2 Namibian Airports



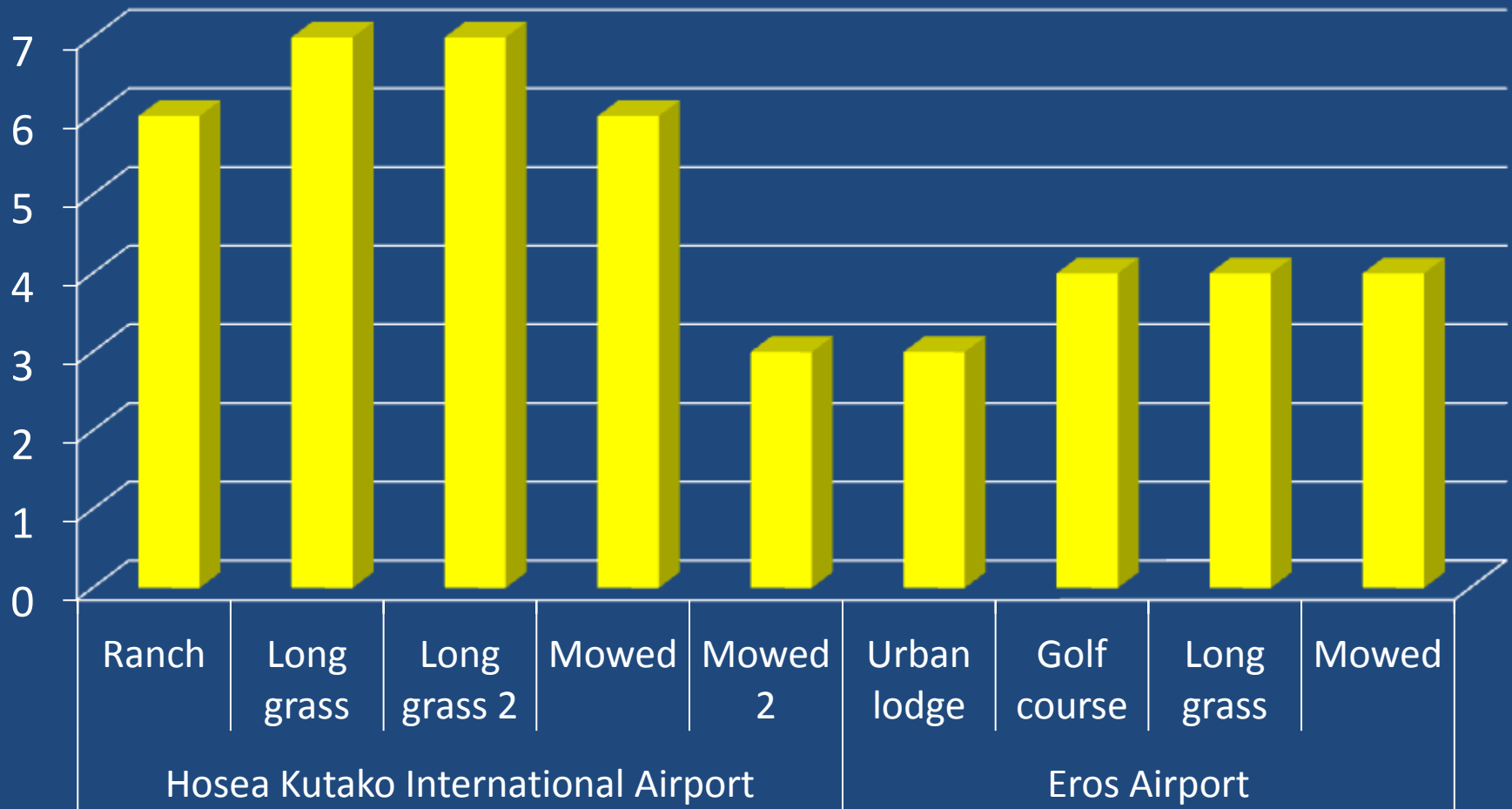
# Comparison of seasonal variations in small mammal populations



# Total numbers caught per species



# Total Species richness



# Results

- Hosea Kutako

- Significant differences in small mammal numbers between mowed areas and one untouched area;
- Significantly lower small mammal populations in the neighbouring game farm
- Little difference in species richness
- Based on a number of assumptions  
(few sample repetitions, habitats / substrates are uniform, no underlying management differences)



# Results

- Eros
  - Differences in small mammal numbers between mowed area and untouched area (not significant);
  - Significantly lower small mammal populations in the neighbouring urban lodge area
  - No difference in species richness
  - Higher small mammal numbers in the neighbouring golf course

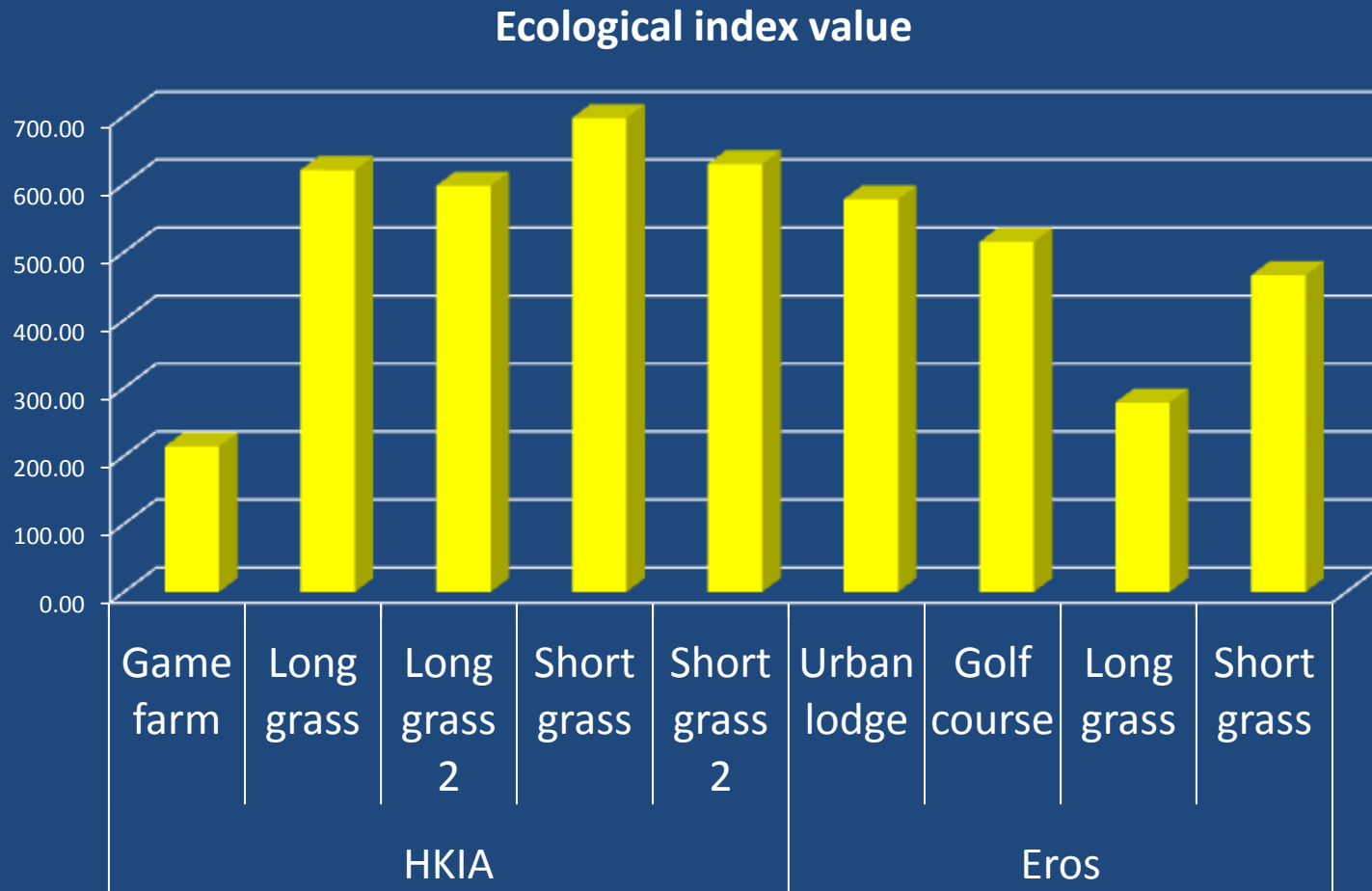


# Plant surveys

- EI comparisons of same surveys as used for small mammals



# Results (Plant surveys)



# Conclusions

- Mowing grass lowers the number of small mammals occurring at an airport (significant)
- Neighbouring land use influences the abundance of small mammals around airports
- At the rural airport the abundance of small mammals is higher as veld condition better than outside the airport

Almost finished – just hang in there!



# So what?

- Likely correlation with raptor numbers (predators) which are risk species at airports, can help determine risk;
- Indicates effectiveness of mowing of grass at airports as a control measure for aircraft-wildlife collisions (International literature is inconclusive);
- Small mammals can be an effective monitoring indicator for ecosystem changes at airports – early warning system

# What else is BARN doing?

- Developed & delivered (6x) a training course in wildlife management at airports;



# Managing perch sites



# Capacity Building

- Build capacity for young Namibian scientists to solve this and other problems to achieve Vision 2030

4x Polytech students completed internships



# Airport Toolkit

- A toolkit was produced for Airport Management on the management of wildlife conflict:
  - Training programme based on ICAO best practice
  - Monitoring system
  - Management plan framework
  - Risk assessment



# Birdstrike centre



# For SAWMA 2012 in Namibia

Correlate small-mammal, plant, bird and insect surveys

Produce a risk model which relies on the above ecosystem factors to predict the risk of collisions at airports in Southern Africa.

# Thank you for your attention



To subscribe to the BARN  
newsletter send an e-mail  
to:  
[morgan.hauptfleisch@  
SAIEA.com](mailto:morgan.hauptfleisch@SAIEA.com)

**Birds & Aircraft Research Namibia (BARN) +264 61 220 579**

**Pictures © Morgan Hauptfleisch (All pictures taken at the two study sites)**