



# AARDVARK

Newsletter of the Zoological Society of southern Africa  
For December 2014

## LETTER FROM THE EDITORS

Following on from the museum theme in the last issue there is an interesting piece in this newsletter on the Albany Museum in Grahamstown. As the current President indicates in her letter, Grahamstown is where the ZSSA conference is going to be held in July 2015.

The other pieces in this issue come from various universities, and provide insight into the interesting research being undertaken.

In 2014 the ZSSA Council agreed to reduce the bi-annual issue of Aardvark Newsletters to just one issue per year. We hope you will continue to contribute articles sharing your images and news of your successes and interesting research.

Vincent and Teresa

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Submit articles to [mnakin@wsu.ac.za](mailto:mnakin@wsu.ac.za) or [teresa.kearney@africanbats.org](mailto:teresa.kearney@africanbats.org).



## LETTER FROM THE CURRENT PRESIDENT

Dear ZSSA Community,

We have come to the end of another year. I trust that you had a productive year and wish you a quiet time over the festive season. May 2015 be a good year for all of us.

There were some exciting changes during 2014 which may be worth recapping here in short. The most important is probably the migration of our journal, *African Zoology*, to NISC in partnership with Taylor & Francis. This move happened with the blessing of our previous publisher, Dr Nico Dippenaar. ISTEg handled *African Zoology* for many years, but Nico indicated that he will slow down in the next year or so, and has been facilitating the move to NISC. We will formally acknowledge the contribution by Dr Nico Dippenaar at the next ZSSA conference. The new online submission system is in place, and the first issue in the new format is due in March 2015. We thank Mike Schramm, Lester Isaacs and their team for being so helpful. We look forward to this new era for our journal, and are confident that with this move *African Zoology* will continue the upward trajectory which started with our recent past editors, Charlie Griffiths, Gary Bronner, Le Fras Mouton and Hannes van Wyk. Dan Parker is the Organiser of the 2015 ZSSA conference, which will be a joint conference with ESSA in Grahamstown in July.

We make a plea to all members to support us; this is also a very good opportunity to expose honours students to the conference landscape. Accommodation is affordable, and Grahamstown is a nice small, and cosy environment to interact in (mostly at the Rat and Parrot, South Africa's best known pub). Furthermore, the organisation for the 2020 international zoological conference, with Cape Town as the host city, is proceeding well.

I wish to extend my warmest thanks to the ZSSA council. To Carol Simon and Theresa Wossler for handling the move to NISC, to Colleen Downs and Sandy Willows-Munro for performing the inenviable task of keeping our finances and subscriptions in order, Sarita Maree whose advice supports the ZSSA ship, Corrie Schoeman who is a pillar of strength, Victor Rambau for ensuring that you will all make your 2015 deadlines with a smart desk calendar and Teresa Kearney and Vincent Nakin for getting together another issue of the *Aardvark*. Finally, to Kwezi Mzilikazi, our honorary secretary; thank you very much for your support and being the oil that keeps the ZSSA cogs turning.

**Prof Bettine van Vuuren**  
**University of Johannesburg**  
**ZSSA President (2014 – 2015)**



## The Albany Museum Natural Science Collections and Research

"The identification of species is the commencing point of all our studies; faulty determinations lead to confusion, and much otherwise good research is often stultified thereby."

John Hewitt: Director of the Albany Museum 1910–1958.



The Albany Museum's Natural Science Building.

### Introduction

Established in 1855, the Albany Museum is the second oldest museum in South Africa. Considering the Natural Sciences only, collections and expertise currently specialise in research on Palaeontology (focusing on fossil vertebrates, plants and invertebrates); Terrestrial Entomology and Arachnology, (focusing mainly on wasps); Freshwater Invertebrates (especially aquatic insects) and Botany - the Selmar Schönland Herbarium has an Eastern Cape focus, and is the 4th largest Herbarium in the country.

The freshwater fish collection, historically the biggest in Africa, holds important collections of southern African freshwater fishes. It incorporates the holdings of the Natal Museum, dating from 1905, and the South African Museum (Iziko), dating from 1875. Dr Rex Jubb, who worked at the Albany Museum from 1959 – 1980, began collecting freshwater fishes from 1931. This collection comprises over 14500 accessions, totalling over 250 000 specimens. Following the retirement of Dr Jim Cambray, the last appointed curator, in 2010, the fish collection began its move to SAIAB in 2012 on a 99 year loan, as it made logistical sense to have the two fish collections curated under one roof in the same town.

Since then, there has been a resurgence filling of critical vacant posts, and three essential scientific research posts have been filled in Entomology, Palaeontology,

Freshwater Invertebrates (and one in humanities in the adjacent History museum). Thus the museum once more has a healthy age pyramid with motivated younger researchers to ensure the well-being of the collections for years to come.

### Palaeontology

Within the broad discipline of "Earth Science" the Albany Museum houses a number of geological collections which cover the subjects of Mineralogy, Petrology, Economic Geology, Stratigraphy and a small collection of Meteorites. The Albany Museum is also the primary palaeontological repository for the Eastern Cape, after a rationalisation of collections and curatorial expertise in 1993 resulted in all palaeontological and geological collections from Eastern Cape provincial museums being relocated to the Earth Sciences Department. The Palaeontology Collection consists of more than 7200 fossil specimens, including important type specimens, and is the second oldest collection of geological materials in South Africa, started by Mr Andrew Geddes Bain and Dr William G. Atherstone in the mid-19th century. The material is largely South African, with good coverage of vertebrates, invertebrates, plants and trace fossils of varying age. Each year the department hosts a variety of local and international researchers wishing to study these collections.

The Earth Science Department is growing rapidly, with two permanent staff and one research associate. In the past, research by Dr Billy de Klerk has focused on therapsids (mammal-like reptiles) and dinosaurs, resulting in many exciting discoveries, such as "Kirky" (*Nqwebasaurus thwazi*, which means "Fast running messenger") from the lower Cretaceous Kirkwood Formation ( $\pm 135$  million years old). It is regarded as the most primitive Ornithomimosaur ("bird-mimic dinosaur") from Gondwana. Dinosaurs are found in rocks of two different ages in the Eastern Cape. The oldest are the upper Triassic to lower Jurassic (210 -195 Ma) Elliot and Clarens Formations, of the upper Karoo, Stormberg Group. The younger, lower Cretaceous rocks (c. 135Ma) belong to the Uitenhage Group, Kirkwood Formation, in the Algoa and Gamtoos Basins.



Dr Billy de Klerk and “Kirky”.

Dr Rose Prevec, who was appointed to a permanent position in the Earth Sciences department in 2013, specializes in research on the Permian fossil plants of South Africa, particularly the *Glossopteris* floras that produced the massive coal reserves we rely on so heavily today. Due to recent discoveries, particularly in the Nieu Bethesda area, we now have a rapidly growing palaeobotanical collection. Extensive insect damage to leaves has been documented, improving our knowledge of how plant-insect interactions changed through time, particularly across the great Permian-Triassic extinction event. Dr Prevec is also investigating the floras of the lower Cretaceous Kirkwood formation, and the role that wildfires played in these high oxygen environments.



Dr Rose Prevec

*Phyllothea australis*

Dr Robert Gess is currently with the museum as a post-doctoral fellow and research associate, and is becoming well known for his research on the Palaeozoic fossils from Waterloo Farm near Grahamstown. Fossils have been found of the earliest lamprey in the world, Gondwana’s earliest known terrestrial animal (a scorpion), Africa’s earliest fossil Tetrapod, and a plethora of fish including coalacanth and placoderms. The age of all the Waterloo Farm material, including the lamprey is 360 million years old, placing it in the late Devonian, providing

a last glimpse of the Devonian world before the end-Devonian extinction wiped out most vertebrate orders.



Dr Robert Gess excavating fossils.



Our enthusiastic fossil preparators: Mr Luvuyo Mayi, Mr Armstrong Khoso, Mrs Khokela Camagu, Mr Lindikhaya Sandi (latter three on NRF contract funding)

### **Entomology and Arachnology**

The Entomology Department was established in 1958 by Dr Charlo Jaco-Guillarmod. Dr Fred Gess joined as curator in 1968 when Dr Jaco-Guillarmod took over as museum director, building up the small collection until, together with Dr Sarah Gess (from 1972 onwards) and Mr A. Weaving (from 1981 to 1995), they succeeded in establishing the Department as an internationally known research centre for the study of aculeate wasps. Following Dr Fred Gess’ retirement in 2002 and Dr Sarah Gess’s retirement in 2003, Dr Ashley Kirk-Spriggs was employed as curator from 2007 to 2009. In the interim years, the Drs Gess ran the department as volunteers until Dr John Midgley was appointed as curator in 2013. The collection

also holds a substantial collection of beetles (Coleoptera), with a core collection of true flies (Diptera). Significant collections are the aculeate wasps and bees (142 000 specimens), the J.C. van Hille (1910–1991) collection of Anthicidae (Coleoptera), the Martin Villet collection of Cicadidae (Homoptera) and the Randall Hepburn collection of honey bees (Hymenoptera: Apoidea). Although the majority of specimens originate from the Eastern Cape and elsewhere in South Africa, there is also extensive material from Namibia, Lesotho and comparative material from Australia, Europe and the United States.



*Dr John Midgley, the new curator.*

### **Department of Freshwater Invertebrates**

The National Collection of Freshwater Invertebrates was founded in 1972 from the amalgamation of several institutional collections. Between 1950 and 1970 the National Institute for Water Research (NIWR) of the Council for Scientific and Industrial Research (CSIR) undertook a number of surveys of the fauna, flora and water chemistry of many South African rivers. As a result, large collections of freshwater plants and animals were identified and described by local and overseas scientists. Mr C F Jacot-Guillarmod, then Director of the Albany Museum, offered to accommodate these collections and the freshwater invertebrates were transferred to the Museum in 1972. This material, together with existing collections and the donation of Prof Joseph and Dr Joyce Omer-Cooper's collections of aquatic beetles (collected across the African continent between the late 1930's to the 1950's), founded the National Collection of Freshwater Organisms, which at that time included fish and diatoms and other algae. The fish and diatoms became separate collections hence now the collection is of freshwater invertebrates. The collection is continually expanding through active departmental research, donations and voucher specimens from projects carried out by other researchers. The collection covers the entire Afrotropical Region, with focus on southern African.

The collection holds in excess of 2 million specimens including over 1000 primary and secondary types. Most of the collection comprises ethanol-preserved specimens in small glass-vials, stored in more than 4500 sealed glass jars, supplemented by a small collection of pinned specimens of selected adult insects stored in unit tray in 150 drawers in insect cabinets; microscope slide mounted specimens in 40 slide storage boxes and a photographic record of selected specimens and sites sampled. Information relating to the collection is in handwritten



*The late Dr Fred Gess with Dr Sarah Gess (squatting), Mrs Bulyewa Mtuze (technician), Mrs Catherine Botha (temporary database inputter).*

As the collection is the only repository for insects between Cape Town (the South African Museum) and Pietermaritzburg (the Natal Museum), the collection must serve a wide range of public and private institutions, organisations and other users, as well as the international scientific community as a whole. The collection is used by the general public, for teaching purposes and by researchers throughout the world, hence the collection is rich in type material, especially in the Hymenoptera and Coleoptera. Departmental staff endeavour to curate and maintain the collection to the highest international standards and to make material available to *bona fide* researchers and students upon request, subject to our loan policy. The appointment of Dr John Midgley as Curator ensures the long term continuation of this valuable collection.

catalogues which are gradually being transcribed onto an electronic database and made available via SANBI's digital internet archive.



From top left to bottom: Dr Helen James (Curator), Mr Musa Mlambo (Assistant Curator), and Dr Ferdie de Moor (Emeritus Curator)

All groups of aquatic invertebrates are represented in the collection, this comprises 13 Phyla, about 19 Classes and over 70 different orders. At present, the staff consists of two full time researchers, one emeritus researcher, one technical assistant and a database manager (the latter two are employed using externally generated funding), and an NRF intern.

The researchers carry out or supervise curatorial duties and collection management, do teaching at both university and school level, offer identification services, and provide support for the National River Health Programme, DWA, Cape Nature and SanParks. Many students do projects or internships under our supervision.



A new species of mayfly recently discovered by the team.



From top to bottom: Mr Mbuyiseli (Kek) Soxujwa (technician, externally funded), Ms Rouxlyn Roux (NRF intern), Mr Dez Weeks (database manager, externally funded), Ms Lyndall Pereira da Conceicao (Rhodes University PhD student).

## Selmar Schonland Herbarium

The Albany Museum Herbarium began five years after the Albany Museum itself had been founded in 1855. The first curator, Prof Selmar Schonland, was also the last Albany Museum staff member to curate the collection. After Schonland the herbarium was entirely staffed and funded by the Botanical Research Institute (which later became the National Botanical Institute and is now the South African National Biodiversity Institution) until Rhodes University amalgamated its herbarium with the Albany Museum Herbarium in 1993 and named the collection the Selmar Schonland Herbarium. Since then the herbarium has been curated and partly funded by Rhodes University. Today the herbarium houses over 200 000 plant specimens, primarily from the Eastern Cape Province from mid-19th Century, making it the 4th largest herbarium in South Africa and the 9th largest on the African continent. Thanks to Prof Schonland's early exchange programmes the herbarium is exceptionally rich in type specimens. The herbarium is unique in the country in that it is open daily to public for consultation and information requests without appointment. It is one of only two Museum-based herbaria in South Africa, the other being Kimberley Museum herbarium. Currently the Herbarium is headed by Mr Tony Dold (curator) (post funded by Rhodes University), whose research interests lie in the taxonomy of South African Hyacinthaceae and Apocynaceae, Ethnobotany and Biocultural Diversity, and Mr Phumlani Cimi (assistant curator) whose research interests focus on edible plants and environmental education. Volunteers include former curator Mrs Estelle Brink (retired), Heather Surridge and Jean Kelly.



Mr Tony Dold



Ms Cynthia Gxekwa and Mr Phumlani Cimi.

## Bird collection

The small bird (~ 3600 specimens) and egg collection (~ 900 eggs) is used as a teaching collection by Rhodes University, and is overseen by Prof Adrian Craig for the Zoology Department there. Dr John Midgley has recently become the person responsible in the museum.

## Conclusions

Although still short of staff and underfunded, the Albany Museum continues to offer a great service to its immediate community, as well as internationally. Through its close association with Rhodes University and SAIAB, much collaboration takes place in terms of research and mutual support. Museum staff teach undergraduate courses in three different departments at Rhodes University (Botany, Geology and Zoology and Entomology), supervise post-graduate projects and house post-doctoral fellows. SAIAB supports the freshwater invertebrate collection by providing ethanol to top up the wet material. Visitors from other African countries and from across the globe make frequent use of the various collections, carrying out both collaborative and independent research, thus increasing the value of the collections. Most of the researchers undertake contract research, providing an important service towards effective environmental and heritage management in the Eastern Cape. All researchers assist the museum's education officer by actively participating in the teaching of school groups of all ages. Thus, although not without problems, the Albany Museum plays a very important role in research, education, and natural and cultural heritage management in the Eastern Cape.

It is critical that any evaluation of the status of natural heritage collections in South Africa, takes the value of local context into account. Although some collections in

smaller provincial museums may benefit physically from consolidation with larger, better-funded and staffed institutions, it is important not to underestimate the important role that these collections have to play both in research and outreach activities at a provincial and local level. Consolidation, while solving some logistical issues, reduces the value of specimens by placing them out of their local context, while simultaneously impoverishing communities that lack the resources to travel beyond their municipal or provincial boundaries to observe or obtain first-hand knowledge of their local fauna and flora.

**H.M. Barber-James, F.C. de Moor, R. Prevec, J. Midgley, T. Dold and W.J. de Klerk**

## Wildlife Conservation Physiology, Brain Function Research Group, University of the Witwatersrand



*An aardvark gives a quick jump after the delivery of an immobilizing dart, Tswalu Kalahari Game Reserve.*

“The adrenaline pulsed through my body as I brought the dart-gun to my shoulder and viewed the rump of a foraging aardvark (*Orycteropus afer*) through the scope. We had been stalking this wild animal for days, and now, finally, she was within 20 meters of me and I was ready to deliver a dart. As I pulled the trigger, I silently pleaded that I had accounted for the multitude of variables and that the dart would successfully, and safely immobilize this enigmatic creature. She was part of our study investigating the potential threat that a hotter, drier climate will have on these keystone animals.” This experience, described by Anna Haw, a veterinarian and research officer working with the Wildlife Conservation Physiology section of the Brain Function Research Group (BFRG), University of the Witwatersrand, reveals the type of research in which we excel.

Our research team, comprising Professors Andrea Fuller, Duncan Mitchell and Shane Maloney (University of Western Australia), and Doctors Robyn Hetem, Anna Haw and Leith Meyer (University of Pretoria), focuses its research on two broad themes. The first theme, in which the above-mentioned aardvark study falls, involves the investigation of the physiological capacity of animals to respond to environmental change. The second theme focuses on studying the physiological responses and improving the welfare of wild mammals during game management procedures, like capture and immobilization.

Although the research entity is based at the University of the Witwatersrand in Johannesburg, data collection during 2014 took place at a variety of field sites,

often where harsh climatic conditions occur. Melinda Boyers is undertaking her PhD research in the Central Kalahari Game Reserve in Botswana, a perfect environment for a comparative study of movement and thermoregulatory responses of blue wildebeest and gemsbok to aridity. By studying the physiological mechanisms of ungulates currently coping with extreme environments, we will improve our understanding of the kind of physiological plasticity that free-living ungulates are likely to implement as conditions in Africa get progressively hotter and drier.



*A gemsbok displaying her newly fitted satellite collar, Central Kalahari Game Reserve.*

The Kalahari also offers a harsh environment for PhD student, Nora Weyer, to study the elusive aardvark, together with the ant and termite species that make up the aardvark’s diet. Compared to many other animals, aardvark appear less able to adapt to changes in the environment and climate, possibly as a result of their relatively specific diet. Changing climatic conditions may influence the aardvark’s prey base, possibly leading to starvation-related die-offs. Indeed, we have evidence to suggest that during particularly hot and dry conditions, aardvark lose condition and daily minimum body temperatures fall, presumably as a result of insufficient energy to defend their normal body temperatures.

Social interactions within gregarious species, such as vervet monkeys and lions, also may influence an individual’s ability to cope under changing climatic conditions. One of our long-term studies on vervet monkeys in the Karoo combines vigorous behavioural data, collected by students and field assistants from the University of Lethbridge, Canada, with body temperature

and activity data collected via internal abdominal data loggers. With this information, Dr Richard McFarland, a postdoctoral fellow, and the team can determine the influence of social hierarchy and interactions on an animal's physiological well-being. The long-term nature of the study provides a unique data set where individuals have been followed from birth and both inter- and intra-trope social dynamics have been carefully monitored over several years. In 2014, we also have collaborated with PhD student Paul Trethowan (Oxford University) on his long-term study of lions, investigating body temperature and activity patterns in these animals, in parallel with their behaviour and social dynamics.

Our second research theme on the physiological responses of wild animals to capture events has grown with the developing wildlife industry in southern Africa. The capture and immobilization of wild animals for transport, management and veterinary interventions is now common practice, and therefore protocols that minimize physiological derangements during these stressful operations, are imperative.

Respiratory depression is a common side-effect of potent opioids, the class of drugs used in dart combinations to bring about the immobilization of large herbivores. Certain species, such as the white rhinoceros, are extremely sensitive to this respiratory depression resulting in life-threatening cardiorespiratory derangements during immobilization. PhD student Anna Haw, in collaboration with the SANParks Veterinary Wildlife Services, is working towards improving our understanding of the cardiorespiratory physiology of the immobilized white rhino so that we can effectively minimize the negative side effects. SANParks veterinarian and PhD student Peter Buss also is working on protocols to improve the cardiorespiratory physiology of immobilized wildlife.

Apart from the drug-induced side-effects, intense exertion and hyperthermia commonly lead to morbidity and mortality in wild-caught animals. This year, we joined researchers from the University of Pretoria and the University of Cape Town in a large, in-depth collaborative study to investigate the short- and long-term effects of capture in blesbok.



*A sedated white rhinoceros is guided into a transport crate, Kruger National Park.*

Ultimately, our team hopes to find reliable ways to improve the immediate well-being of the thousands of animals that are captured and immobilized in South Africa each year. We also wish to better understand the physiological responses of free-living mammals, so that we can better predict how species will respond to global climate change, improving conservation strategies.

**Dr Anna Haw**

Southern Ground-Hornbills *Bucorvus leadbeateri* are globally *Vulnerable*, but have been up-listed to *Endangered* in South Africa. They have experienced a two-thirds reduction in their national distribution and population size in the past 100 years. Since 2000, they have been a research focus by the FitzPatrick Institute, UCT, largely to inform activities of the Mabula Ground-Hornbill Project (MGHP) and the national Ground-Hornbill Action Group who are our partners in implementing the national Species Recovery Plan. Our study area is the Associated Private Nature Reserves (APNR) adjacent to the central Kruger National Park.

Co-operatively breeding Southern Ground-Hornbill groups have large spatial requirements, and the APNR supports about 30 groups. We have reproductive histories spanning a decade for more than 20 of these groups. We have been able to show that positive influences on breeding success include group size, the availability of artificial nests, and the amount of open habitat within 3 km of the nest site. A fair amount of information exists about the density of ground-hornbill groups, with the highest density recorded in southern Africa being one group per 40 km<sup>2</sup> at Mana Pools in Zimbabwe. In most places however, including the APNR, densities are much lower at a group per 100 - 250 km<sup>2</sup>.

There were however important aspects of their biology about which we knew very little, including the size of home ranges, whether they abut or overlap, and whether seasonal use of home ranges change and is reflected in different seasonal patterns of habitat preference. Trying to answer these questions we deployed the first satellite transmitter on a bird in the APNR in February 2010, and since then have had up to five devices transmitting simultaneously. Each device sends a positional signal once an hour starting before sunrise, while the birds are still on their over-night roosts, until after they return to a roost that evening. We now have more than 25 000 positional fixes, accurate to within a few metres.

During 2011, BSc Honours student William Wyness undertook a preliminary analysis of the satellite data from four ground-hornbill groups, each of which had been tracked for at least a year. This is being continued in more detail by MSc student Blair Zoghby. William's results suggested that the areas used by different groups across the year ranged from 55 km<sup>2</sup> to 103 km<sup>2</sup>. In the summer breeding season, however, home ranges contracted dramatically. Three of the four groups bred successfully and, during the breeding season these groups used only 24 - 36% of the areas they used in winter. The fourth group

attempted to breed, but failed at the chick stage, and ended up using 70% of their winter range during the summer. In summer, there was no overlap between home ranges, in fact, groups never even got close to one another. In winter, however, when groups ranged over much larger areas, there was a small amount of home-range overlap.



*Inspecting breeding activity in an artificial Southern Ground-Hornbill nest. Photo credit: Phil Hockey*

We had hypothesised that the boundaries of home ranges may be set by patches of high resource density, as has been shown for foxes. However, this was not the case. Whilst there are some favoured areas that do lie on the edges of home ranges, such hot spots cannot explain the boundaries convincingly. Fortunately a detailed, geo-referenced vegetation map of the study area allowed William to analyse seasonal patterns of habitat preference in more detail. Despite the large home ranges, the proportions of these that were favoured at any time of year were fairly small (0.5 - 22% across four groups and four seasons). On average, more habitat types were avoided than preferred (2 - 55%), but most habitats were used in proportion to their availability (23 - 98%). The birds were apparently more 'choosy' about habitats in the breeding season, but this may be spurious because at this time of year, group members regularly visit the nest to feed the incubating female or the chick. This central place foraging in summer may merely be an unwillingness of the birds to go too far from the nest. One habitat type that was consistently favoured was open ground. Although open habitats are fairly rare, this may explain why those groups that do have relatively large amounts of open ground close to their nests are the most successful. It also suggests that bush clearance should be used as a management tool to provide optimal sites elsewhere for the placement of artificial nests or for the reintroduction

of ground-hornbills. To further inform the reintroduction programme PhD student Kate Carstens is investigating the dispersal behaviour and population structure of subpopulations.

Reintroductions depend on the availability of birds for release which are usually wild stock. Fortunately, ground-hornbills lay two eggs, yet invariably rear only a single chick. The second hatched chicks succumb to dehydration after a few days, having been largely ignored by the incubating female, and are therefore available for harvest and captive rearing allowing reintroduction with no impact on the source population. Since 2010, with permission from the APNR management, we have harvested 17 second-hatched chicks which have been transported by MGHP staff to partner facilities at Loskop Dam, Boscia Birds, Montecasino Bird Gardens and the Johannesburg Zoo where they are reared for the captive breeding and reintroduction programmes. Reintroduction initiatives are already underway at three sites in the Limpopo Province and release techniques for this socially complex species are being refined. We work closely with this initiative which is led and implemented by the MGHP and with the national Ground-Hornbill Action Group.



*A harvested second hatched Southern Ground-Hornbill chick.  
Photo credit: Kate Carstens*

To help us with data on current populations and breeding sites please send any records of groups and active nesting sites, particularly outside protected areas, to Lucy Kemp at [project@ground-hornbill.org.za](mailto:project@ground-hornbill.org.za). For more information on the Mabula Ground-Hornbill Project visit [www.ground-hornbill.org.za](http://www.ground-hornbill.org.za).

**Dr Rob Little**  
**DST/NRF Centre of Excellence, FitzPatrick Institute, UCT**  
Website: [www.fitzpatrick.uct.ac.za](http://www.fitzpatrick.uct.ac.za)  
Email: [rob.little@uct.ac.za](mailto:rob.little@uct.ac.za)

## MANAGING EGYPTIAN GEESE ON GOLF COURSES

Human-wildlife conflict is increasing in the modern world where human populations are usurping or modifying indigenous wildlife habitats. Egyptian Geese *Alopochen aegyptiaca* numbers have increased with burgeoning cereal production and dam construction in the Western Cape. Habitat choice is influenced by the absence of predators and increased visual openness of landscapes which increases perceived safety levels. Preferred habitats are at water bodies, particularly man-made dams, with open shorelines and unhindered view of the surrounding area. Urbanization, including golf courses, further alter perceived predation risk, since natural predators are often scarce and large, irrigated grazing lawns are interspersed with artificial water bodies, thus geese experience safer conditions than in natural landscapes. The accumulation of goose feces pollutes the greens and fairways which diminishes the aesthetic and recreational value of the area.



*South African golf courses experience similar problems with Egyptian Geese as are experienced with Canada Geese on golf courses in North America. Photo credit: Richard Gie*

There are 106 golf courses in the Western Cape, providing geese with almost 5,000ha of attractive habitat. During 2012, Jess Sutton surveyed the perceptions of residents and members of the Steenberg Golf Estate, Cape Town, towards Egyptian Geese. Of 548 questionnaires sent to residents and to non-resident golfing members, most respondents (84%) considered that geese are a problem on the estate. However, only 57% of non-golfers perceived the geese as a problem, suggesting that the issue is more problem specific to the golfers. People that indicated that there was a problem ranked the problem as minimal (15%), moderate (33%) and severe (52%). Most golfers (87%) felt that the goose population requires active management. This was supported by 86% of the non-golfing residents. The majority (86% of all respondents)

considered that the goose population should be reduced by 50% or more.

Traditional goose control methods can be non-lethal or lethal. Non-lethal methods have included visual and audio displays such as scarecrows, fake predators, flashing lights, sirens, bird alarms and fireworks. However, most have had little success because the geese soon become habituated to their presence. The use of trained herding dogs has proved to be more successful. However, dogs are expensive to purchase, need expert training and have high maintenance costs. Relocation of geese to new habitats is also expensive and there are concerns that the geese will return to the site of capture, or will begin novel conflicts in other areas.

Lethal measures include egg adding and culling. However, the high mobility of the geese renders both relatively ineffective at the level of local populations. Furthermore, when geese abandon unsuccessful nests, they typically make a new nest and thus a repeated clutch. Shooting geese in residential areas is largely considered unethical, and while lethal methods are more cost-effective than non-lethal options, they are often deemed socially unacceptable. In general, the failure of most control methods is due to their short term efficacy, high cost or ethical unacceptability, with no long-term solutions to the problem. While it is not necessary to eliminate geese from a property, managing their numbers at a level where they are tolerated by managers and golfers may be important.

Following the perceptions survey, Beth Mackay investigated the vigilance behaviour of Egyptian Geese at Steenberg and the attributes of various habitat features at 10 golf courses in the Western Cape to understand what makes them attractive to the geese. Predation risk is reduced by being vigilant, which includes visual scanning to increase the probability of detecting a predator. Vigilance is thus higher in areas of increased predation risk and can act as a surrogate for the perceived safety of the geese in their surroundings. Beth found that although goose vigilance levels were related to group size, decreasing with increasing group size, vigilance levels were less in 'hotspots' than in areas less favoured 'non-hotspots', independent of group size, confirming that certain habitat characteristics cause the geese to feel secure.

Hotspots, where geese aggregate on a daily basis, and thus where goose faeces needed most frequently to be removed, were defined by two predictable habitat features. The most important of these was the distance to

water, with hotspots most often being areas <100m from the nearest water body. The other important correlate of goose hotspots is the size of open patches of lawn, with patches >1.5ha in size most favoured. The area sensitivity of the geese is driven by openness, i.e. how much of the bird's field of view is not obstructed by visual barriers such as vegetation or man-made structures which reduce their ability to detect potential danger.

**Dr Rob Little**

**DST/NRF Centre of Excellence, FitzPatrick Institute, UCT**

Website: [www.fitzpatrick.uct.ac.za](http://www.fitzpatrick.uct.ac.za)

Email: [rob.little@uct.ac.za](mailto:rob.little@uct.ac.za)



*Egyptian Geese are considered 'pleasant' until the damage caused to lawns reaches unacceptable levels. Photo credit: Richard Gie*

The adaptability and persistence of Egyptian Geese suggests a need for a shift from active control of the birds themselves to environmental management of golf courses to reduce the goose numbers. Golf course management should therefore focus on modifying the landscape to reduce the number of favoured sites or to have favoured sites located in the non-playing areas of the course. Whilst water bodies adjacent to large, open lawns could be avoided when designing a golf course, poorly sited ponds on existing courses should be modified with physical barriers to restrict access to the water. These barriers can be fences along the edge of the water, or a wire grid placed over the water surface. The most inexpensive and attractive method is to plant vegetation along the edge of the water which will interrupt their access to the water and decrease their ability to detect predators.

Considering that large patches of open lawn are attractive safety features for geese, tall grass and shrubs can also be planted around the fairways of existing golf courses which will reduce the openness, and hence the safety levels perceived by the geese. Designing golf courses and adjacent vegetation so that they are attractive to local bird species while simultaneously being less attractive to Egyptian Geese involves short-term costs with potential long-term benefits.

## Department of Zoology, University of Johannesburg

The University of Johannesburg is going from strength to strength. Not yet 10 years old, UJ has proven to be a formidable new kid on the block. We remain firmly placed in the top 4% of universities globally (QS Rankings released September 2014) and the only African University to be accepted into Universitas 21. Our Faculty of Science is placed in the top 2% and is currently placed as the #4 science faculty in SA (behind UCT, Wits and SUN).

Staff and students in the Zoology Department contributed significantly to UJ's accomplishments during 2014. Although we are a comparatively small academic department (we comprise 11 academic and 8 support staff), we certainly hold our own. No less than 18 MSc and 2 PhD Zoology students graduated this year, and (full time and visiting) staff / students contributed to almost 50 publications in peer-reviewed journals. On the personnel front, Reynald George and Lloyd Bogopa joined our technical ranks. Peter Teske was promoted to Associate Professor, Annemarie Oldewage was invited to serve as Subject Editor for the journal *African Zoology*, Bettine van Vuuren became the South African representative on one of the Scientific Committee for Antarctic Research Steering Committees and Francois Durand received both the Faculty of Science as well as the Vice Chancellor's Distinguished Awards for Teaching Excellence. Members in our department successfully co-hosted the 6<sup>th</sup> International Toxicology Symposium in Africa with researchers from the University of Hokkaido and NWU. Our students excelled at recent conferences with Kelly Dymond receiving a prize for the best first time poster presentation at PARSAs while Lizaan de Necker and Simone Dahms received special mentions for their presentations at SASAQs.

This year also saw the formation of a zoological society on the UJ campus. The aim of the society is to popularise zoology, to give students the opportunity to meet researchers and to participate in projects in conjunction with Nature Conservation, other universities and NGO's (to expose students to the wide diversity of job opportunities and direction available to Zoology students). Recent talks included "Life as a Bat Specialist" (Monika Moir), "Rain forest biodiversity" (Dr Prince Kaleme) and "From the Cradle to the Grave: Applying Forensic Science from Prehistory to Present" (Dr Patrick Randolph-Quinney).

Our department continues to grow our international profile and visibility through our student exchange programme with the University of Hong Kong (Prof Gray Williams from the Swire Institute of Marine Science). Two of our students also spent some time in the Environmental

Toxicology Laboratory at the University of Hokkaido, Japan.

**Prof Bettine van Vuuren**