



AARDVARK

Newsletter of the Zoological Society of southern Africa
Oct/Nov 2012

LETTER FROM THE EDITORS

After an absence of two years, the Aardvark is back and in an updated, more modern, format. The cartoons were commissioned by the society for our 50th anniversary, to represent the four ages of society, but also the members. There is the baby aardvark, the skateboarder, the award winner and the biker, which must surely represent the undergraduate, the post-graduate, the tenured lecturer and finally, the emeritus professor. We hope you like them!

This is the only issue for 2012, and as such, it is jam-packed with news. Various institutions share with us their achievements over the past years and highlight some of the research projects that they are involved in. Our students have also been very active, and have provided us with many interesting articles with some fantastic photographs. Perhaps these articles could spark some ideas for future collaborations.

On a sadder note, we pay tribute to Prof. Phillip Tobias, one of South Africa's greatest scientists, who passed on this year. He will be greatly missed.

As of 2013, we will be reverting to two issues a year. The April/May issue will be devoted to student research, and the October/November issue to institutional news. Both issues will also include any general research articles that members may want to contribute.

And now, all that remains is to wish you a very happy Christmas and a prosperous New Year.

Carol, Vincent and Genevieve

THE CURRENT COUNCIL

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Submit articles to cSimon@sun.ac.za,
mnakin@wsu.ac.za or gend@sun.ac.za
by the 2nd Friday of April and October.
Articles must be a maximum of 800 words, with photo's attached separately.



ZSSA CONFERENCE

14 – 17 JULY 2013

Host:

UNIVERSITY OF VENDA

Venue:

Tshipise Resort

Contact Peter Taylor:

Peter.Taylor@univen.ac.za



LETTER FROM THE CURRENT PRESIDENT

It remains a challenge for voluntary societies to add value and remain relevant in a fast evolving scientific and technological environment. I hope that my overview of three focal projects recently initiated by the ZSSA council will adequately reflect their dedication and enthusiasm for the cause of our society and Zoology as a discipline.

South Africa is to host the International Congress of Zoology in 2020

In September this year Peter Taylor (Past President) and I successfully presented a bid to the Executive Committee of the International Society of Zoological Sciences (ISZS) in Haifa to host the 2020 International Zoological Congress in South Africa; a first for Africa. The congress will be hosted in Cape Town and the ZSSA will act as the official hosting society. It is held every four years and aims to promote Zoology by improving communication between zoologists and zoological organizations on a global scale. Bringing zoologists from all over the world to South Africa will provide a unique networking opportunity for African zoologists to forge active intra-African and international collaborations. In the current global economic climate, most scientists experience severe funding constraints and limited opportunities to visit international institutions and attend conferences and workshops abroad. One of the main goals of the Local Organizing Committee (ICZ2020) will be to source funding and sponsorships that will allow as many zoologists and students as possible from previously disadvantaged institutions and countries in Africa to attend. In this way, we hope to plough back into the earth from which we have already gained so much.

Members of the ICZ2020 Local Organizing Committee are: Sarita Maree, UP (Chair), Peter Taylor, UniVen (Vice-chair), Bettine Jansen van Vuuren (UJ) & Nigel Bennett (UP), Academic Committee), Andrew McKechnie (UP), Emmanuel Do Linh San (Fort Hare), Colleen Downs (UKZN), Nomakwezi Mzilikazi (UP), Nico Avenant (National Museum Bloemfontein) and Duncan MacFadyen (Ernest Oppenheimer & Son). Should you want to get involved with organizing or sponsoring this very exciting event, please send an e-mail to the secretary at zssasec@gmail.co.za.

What is in a name? Membership drive...

The ZSSA officially represents zoologists from all countries south of the Zambezi and Kunene Rivers, but our current membership profile is highly skewed towards South Africa. To become true to our name again, council considers a renewed membership drive among active zoologists practising throughout the SADC region (and elsewhere in Africa) a top priority. We aim to reach zoologists from universities, other academic institutions, museums, zoos, governmental and non-governmental nature conservation organizations, private enterprises (e.g. environmental management agencies) as well as amateur zoologists. Formerly, highly significant research contributions at conferences and competent council members originated from the likes of such individuals.

Considering the “integrated” zoological milieu of the present day, the ZSSA will benefit greatly from getting them back on board. Only then will the society truly fulfil its role to promote, facilitate and encourage zoological research within southern Africa, and to facilitate communication between zoologists at institutions and organizations abroad. To achieve this we need help! Please provide the secretary with names and contact details of active zoologists from such institutions, both locally, and beyond our borders.

ZSSA website metamorphosis underway!

The good news saved for last... The ZSSA website (<http://www.zssa.co.za>) is undergoing a major transformation at the hands of Corrie Schoeman (UKZN) assisted by Victor Rambau (US). The launch of the new website is planned for January 2012, and is an important step towards enhancing the profile of the ZSSA in a global and African context. During the past year, Hannes van Wyk, Editor-in-Chief of African Zoology, has successfully implemented an on-line submission and review system based on the Open Journal System at Stellenbosch University. The planned integration of the African Zoology website with that of the society will clearly enhance exposure on both fronts.

The new fully interactive website will boast modern advances in website design and management. Some state-of-the-art functionalities include: 1) a thrilling new appearance with interactive image gallery; 2) on-line membership management based on user-provided information; 3) differential user privileges e.g. full member, public, forum participant etc.; 4) on-line conference management; 5) easily updatable content e.g. society and office-bearers information, current news and events; 6) forums where members can view and post information e.g. exchange ideas, showcase publications and research; 7) “Opportunities” for advertising and seeking projects and job vacancies, and promoting conferences and workshops; 8) a Students’ page; 9) links to related websites and national and international sister societies; 11) links to quality teaching material, Envirokids magazine; 12) Career information linked to Zoology departments and relevant organizations within SADC countries; On the Careers front, Dan Parker (Rhodes University) produced a sterling update of the “careers booklet” that can be downloaded as a PDF – “You want to become a what?”

It will only be with support from our membership that our goals for serving the ZSSA membership in a relevant and efficient way can be reached. I therefore invite any further suggestions as to how the ZSSA can support you, as you live out your career as a zoologist.

Sarita Maree

Current President (2012 – 2013); Chair of ICZ 2020 Local Organizing Committee
University of Pretoria; E-mail: smaree@zoology.up.ac.za

OBITUARY: Professor Phillip Tobias

On 7 June 2012 we lost a great South African, Professor Phillip Vallentine Tobias, who had a long and illustrious career spanning more than 50 years at Wits University and who inspired generations of medical and science students.

Professor Tobias was internationally renowned for his scholarship and dedication to a better understanding of the origin, behaviour and survival of humanity; and for his many major scholarly contributions to palaeoanthropology, anatomy, human biology, cultural anthropology, the evolution of the brain, cytogenetics and the history and philosophy of science. As a world authority in palaeoanthropology, he authored over 1130 publications.

His name is synonymous with the initiation of the research and excavation of the Sterkfontein caves where over a third of all known early hominid fossils have been found. As a consequence, he is associated with “Mrs Ples” (*Australopithecus africanus*), “Little Foot” (the most complete *Australopithecus* specimen ever found), the “Taung child” (*Australopithecus africanus*) and “Dear Boy” (*Australopithecus boisei*) – some of the most famous of hominids in the world.

After matriculating from Durban High School, Phillip Tobias enrolled at the University of the Witwatersrand and graduated with a BSc in Histology and Physiology in 1946. He then completed his honours in 1947 with a first class pass in Histology, his MBBCh in 1950 and his PhD in 1953. In 1955, he was a Post-doctoral Fellow in Physical Anthropology in the Duckworth Laboratory, Cambridge. He continued with post-

doctoral studies in 1956 in the Departments of Anatomy, Human Genetics and Anthropology at Chicago University and in the Department of Anthropology at Michigan University. Back in South Africa, he obtained his DSc at his alma mater, Wits, in 1967.

In his time at Wits, Phillip Tobias served as Professor and Head of the departments of Anatomy and Human Biology until 1990. From 1980 to 1982 he served as Dean of the Faculty of Medicine, Honorary Professor of Palaeoanthropology and Professor of Zoology. In 1994 he became Professor Emeritus of Anatomy and Human Biology and Honorary Professorial Research Fellow in Anatomical Sciences at Wits, positions he held until his death. He was also visiting professor at the Universities of Pennsylvania, Florence, Cornell and Vienna, amongst others.

The list of his achievements and awards is exhaustive and includes being nominated for a Nobel Prize on three occasions. He received a lifetime achievement award from the National Research Foundation in September 2010 and a National Order from the Presidency. In addition, he was also awarded several honorary degrees from the Universities of Pennsylvania, Cambridge, California, Natal, Cape Town, Unisa, Durban Westville, Walter Sisulu, Western Ontario, Alta, Guelph, and Wits.

His passing has left a deep wound in the South African story and the scientific community around the world.

Courtesy of Wits University

INSTITUTIONAL NEWS

University of Johannesburg

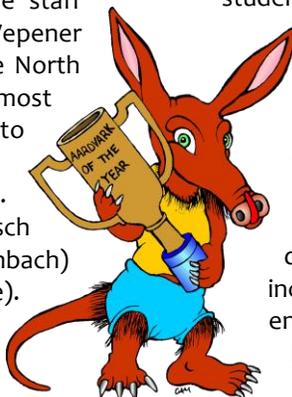
A recently released a press statement announced that UJ has doubled the research outputs of the Rand Afrikaans University (one of the four higher institutions which amalgamated to form UJ) in half the expected amount of time. The Department of Zoology, comprising 11 permanent academic staff and eight technical / administrative staff, made a notable contribution to this achievement. During 2011 the department published 21 SABSE accredited publications, two book chapters (Proffs Annemarie Oldewage and John Maina) and a reference text book on gas exchange (Prof. John Maina). This increased to over 40 SABSE accredited publications in 2012 so far, and two book chapters (Proffs John Maina and Annemarie Oldewage). The department has seen some changes to the staff component; Proffs Nico Smit (2011) and Victor Wepener (2012) accepted positions at the University of the North West, Ms Susann Breytenbach, our secretary of almost 30 years, retired early in 2012 and Mrs Lerato Masetle, our Technical Assistant, left for Cape Town. New faces joining our ranks include Prof. Bettine van Vuuren (previously from Stellenbosch University), Ms Gugu Moya (replacing Ms Breytenbach) and Ms Refilwe Modise (who replaced Ms Masetle). We have more than 60 full-time registered research MSc and PhD students as well as

students registered for course-work Masters in Aquatic Health. We also train over 750 undergraduate students in Zoology, Human Physiology and Human Anatomy. Our staff and students received several awards across both academic and outreach fields; Dr Erna Bruwer received the UJ Women CE Recognition Award and CE Recognition Award Adullam & Parks Alive Projects in 2011, while several students won numerous awards at national and international meetings (Ruan Gerber, best PhD presentation at the Annual Conference of the Southern African Society for Aquatic Sciences 2011; Kerry Malherbe, best poster presented by a student at the International Fish Parasite Conference in Chile 2011, Byron Bester, second prize for the best student presentation at the SASAQuS Conference 2012;

Quinton Dos Santos, two prizes for Science photography and Lourelle Everts, best senior student presenter, both at the European Multicolloquium for Parasitology in Romania 2012; Quinton Dos Santos, best student poster at the Parasitological Society of Southern Africa 2012.).

Several large collaborative projects are housed in our department or with UJ Zoology staff involvement including several projects on the health of our environment and a project to barcode our biodiversity.

Prof. Bettine Jansen van Vuuren



University of the Western Cape: Biodiversity and Conservation Biology

Biodiversity is defined as the variety of forms of living organisms at various levels while **Conservation Biology** is the study of how we can prevent species and habitats from being lost while still maintaining sustainable human societies. The Department of Biodiversity and Conservation Biology (BCB) at the UWC teaches and trains in these fields to promote an understanding of conservation at an ecosystem level, approaching the disciplines of Botany and Zoology in an integrated manner.

Within the BCB department, nine areas of specialisation exist: **African Amphibian Studies; Off-shore Marine Biology; Chelonian Biodiversity and Conservation; Plant Ecophysiology; Southern African Angiosperm Systematics; Behavioural Ecology; Medicinal Plant Use; Marine Benthic Biodiversity; and Landscape and Social Ecology.** Each area of specialisation is further subdivided into 2-3 thematic programmes that focus more specifically on a particular research question. A number of these thematic programmes have a strong zoological emphasis.

Research within the BCB department is driven by nine academic staff. Each staff member is required to teach (for three terms of the year), represent the department at various faculty committees, supervise postgraduate students (currently 36 masters and PhD students are registered in BCB) and produce subsidy driven peer-reviewed publications. Since the existence of the department in 2003, BCB staff have authored 20-30 peer-reviewed publications per year in an array of top local and international journals. Despite this heavy teaching and research work load, members of the BCB Department still find the time to attend conferences, write popular articles, give public lectures, and engage in numerous outreach activities. The department is proud of its productivity and its many achievements.

Prof. Gavin W. Maneveldt, Head of Department

AFRICAN AMPHIBIAN STUDIES include investigation of the systematics, life history strategies and taxonomy of African amphibians. Field work for this research specialisation takes place in most of central, eastern and southern Africa. Recent projects include the conservation of the Desert Rain Frog, *Breviceps macrops*, a specialist burrower in coastal dunes, which occur in high population densities in suitable habitats, and are fairly sedentary, with recaptures showing minimal movement from one year to the next. The tadpole of the Ruwenzori River Frog has been investigated; it is adapted for life in fast flowing, high altitude rivers, but shows evidence of being infected with the amphibian chytrid fungus, believed to be responsible for the loss of many amphibian populations worldwide. The long reed frogs in the *Hyperolius nasutus* group are small, green and are the frog equivalent of "little brown birds". A molecular study with collaboration from many co-workers across the range of this cryptic group has increased the number of species significantly.

Longer term projects include the systematics of the genus *Amietia* (common river frogs) throughout their range from Ethiopia to the Cape. During a recent field trip a new rain frog was discovered in the Namaqualand diamond mining area. The new species, named *Breviceps branchi* and dubbed the Diamond



An unnamed species of long reed frog from northern Tanzania.

Frog by some journalists, appears to be at extreme risk from habitat modification. 2012 saw the publication of the book *Tadpoles of Africa*, a collaboration between Alan Channing, Mark-Oliver Rödel from Berlin, and Jenny Channing who prepared the artwork. The book was published by Edition Chimaira in Frankfurt am Main and represents the first book to deal with the tadpoles of a continent. Previous books from this programme include *Amphibians of Central and Southern Africa*, and *Amphibians of East Africa*, both published by Cornell University Press.

Prof. Alan Channing, Principal Investigator

MARINE BENTHIC BIODIVERSITY field work takes place mostly along the southern west and south coasts of South Africa. Within this specialisation are two thematic programmes with a zoological emphasis. The first investigates the role of molluscs in controlling intertidal species distributions on rocky shores. Chitons, limpets and winkles are important grazers of the marine benthic environment and research has shown that these molluscs can influence the distributional limits of species' recruitment and colonisation. Through long-term monitoring of experimental plots, we have shown that grazing is a powerful driver of diversity and succession in the marine intertidal zone. Our research also showed that many seaweeds often thrive under, and even require, intense herbivory. Still other intertidal organisms depend on molluscs for secondary settlement substrates because they are often outcompeted and excluded by their competitors from growing on the primary substrate. On many rocky shores, grazing by molluscs is proving to be more important in structuring marine intertidal communities than physical factors associated with aerial exposure. The ultimate aim of this programme is the documentation of intertidal marine species diversity for the public and for education.

The second programme is the integrated aquaculture of seaweeds and abalone. This is a collaborative programme with other academic institutions and the private sector with the aims of developing and testing the bio-engineering concept of

integrated land-based abalone and seaweed cultures, the implementation of re-circulation systems in abalone farming, and the benefits of seaweeds and their products in the diet of South African abalone. Many research breakthroughs have been achieved in this programme and many commercial entities have benefitted from this research.

Prof. Gavin W. Maneveldt, Principal Investigator

CHELONIAN BIODIVERSITY AND CONSERVATION focuses mainly on tortoises. Approximately one-third of the world's tortoise species occur in southern Africa and most of these species are endemic to the region. We assess biodiversity by studying the distribution, genetics, morphology, ecology and physiology of chelonians, and our research provides information on their life histories, resource requirements, reproductive ecology, and physiological tolerances. Our research programme is one of few in the world to use ultrasound scanning to assess the reproductive status of female tortoises. This research led to the discovery that some endemic species extend their reproductive season, a pattern not previously known in species outside the tropics. Additionally, we found that aridity and unpredictable rainfall influence egg size, which necessitates pelvic kinesis in speckled padloper females when laying their eggs.

Research on chelonian systematics is ongoing, through local and international collaboration. Our research refuted the notion of two subspecies for the speckled padloper; instead, we found that the species' morphology reflects selection for crypsis on the substrates where they occur. In contrast, our studies on wide-ranging species such as leopard tortoises and African hinged and helmeted terrapins indicated the presence of cryptic species, which calls for taxonomic revision.

In close collaboration with conservation agencies, we assess the conservation status of endemic species and pay particular attention to taxa on the Red Data List. Such studies resulted in the recent elevation of the Red List status for the speckled padloper, *Homopus signatus*, and the geometric tortoise, *Psammodromus geometricus*. Due to the Critically Endangered status of geometric tortoises, conservation-oriented studies on this species will have priority over the next few years. A wildfire in January 2012 destroyed the largest remaining habitat of geometric tortoises, which necessitates research to facilitate their recovery through assessments of habitat and dietary requirements, threats to the population, and the feasibility of *in situ* breeding and head-starting of juveniles.

Prof. Margaretha D. Hofmeyr, Principal Investigator

OFFSHORE MARINE BIOLOGY includes both studies in the pelagos and the benthos. The department has networked extensively across the world to develop local expertise in the taxonomy of a number of marine invertebrate taxa including bryozoans, sponges, polychaetes, nematodes, foraminifera and jellyfish. All of these taxa are relatively difficult to identify, but they are nevertheless important ecological components of the systems in which they occur.

The main expertise here is in the area of pelagic marine ecology, with a special focus on plankton. Interests include population genetics and connectivity, local and regional biogeography, and the role that life-history strategies play in influencing pattern. The core interest is in community ecology and in the processes that contribute to the structure of zooplankton assemblages at a range of spatial and temporal scales – from diel vertical migration through seasonal, to inter-annual processes.

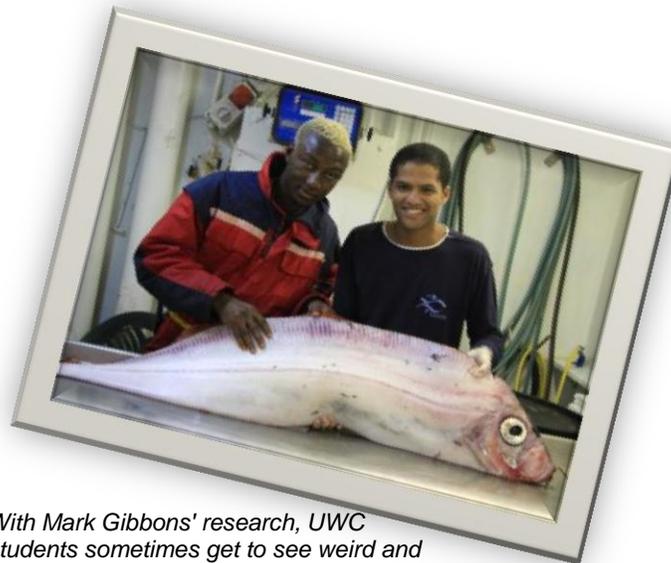
Much of our work in recent time has focused on jellyfish. This reflects a long-standing interest in the Cnidaria as well as recognition of the fact that jellyfish are signals of environmental change in the coastal marine environment. This work is

conducted with colleagues from across the world, but has had a strong geographic focus in Namibia; pioneering work using multi-beam hydro-acoustic techniques have indicated that there are now more jellyfish off Namibia than finfish and that the ecosystem there has changed significantly since the demise of sardines and anchovies at the end of the 1960s. Another organism that has recently increased in abundance off Namibia is the bearded goby and our work with Norwegian and Namibian collaborators has shown how this intriguing fish is able to thrive there so that it is now

supporting much of the commercial fisheries, providing many higher predators with much needed sustenance. Within this programme, projects are moulded to suit the preferences and abilities of different students.

Prof. Mark J. Gibbons, Principal Investigator

BEHAVIOURAL ECOLOGY focuses on sexual and ecological selection in bladder grasshoppers (family Pneumoridae) which represent a small, but charismatic group of insects endemic to the coastal regions of southern Africa. The most striking feature of these insects is the incredibly loud advertisement call (which ranks them as one of the loudest insects in the world) produced by males. The hollow, inflated abdomen, which gives the grasshoppers their common name, serves as a resonator that amplifies sound, enabling males to call at intensities of 98 decibels at a distance of one metre (approximately as loud as a hand drill). This ability, coupled with unique abdominal hearing organs, allows individuals to communicate over distances of up



With Mark Gibbons' research, UWC students sometimes get to see weird and wonderful examples of marine diversity on the high seas!

to 2 km. Females use the male call as a recognition cue and are able to discriminate amongst males of their own species on the basis of signal characteristics. Nocturnal courtship involves acoustic signalling as flying males attempt to locate stationary females that respond to their calls. However, morphologically distinct sneaker males that are unable to produce any sound have been observed in several species. These sneaker males adopt a different mating strategy in which they eavesdrop on the acoustic duet between courting males and females, and attempt to reach the female first. Small and unable to fly, they use their proportionately longer legs to track females. Sneaker males are believed to be more common in populations at higher densities. If there are enough females in close proximity, this less costly strategy (sneaker males have double the adult

lifespan of primary males) may be more beneficial.

Bladder grasshoppers have been observed to exhibit much variation in body size and structure of the advertisement call across their geographic ranges. This variation is linked to local environmental conditions, particularly rainfall. Each species of bladder grasshopper feeds on only a small variety of plants and host-plant switching may also trigger divergence within a species. Colour patterns also vary within a species, so that individuals are extremely well camouflaged to the particular plant species on which they feed. Current research is focused on gaining a deeper understanding of how both mate choice and ecological factors contribute to species divergence.

Dr Vanessa Couldridge, Principal Investigator

Walter Sisulu University

The Zoology Department currently has 16 registered postgraduate students (9 Honours and 7 MSc) doing their projects in research fields which include marine and estuarine ecology, freshwater ecology, developmental biology studies, terrestrial ecology (biodiversity and conservation), animal behaviour and physiology.

In **Marine and Estuarine Ecology**, there are a total of 7 students (4 Hons and 3 MSc). Some projects in this field of study focus mainly on the influence of sediment characteristics on the biodiversity of fish and invertebrates in Mngazana Estuary. Three honours students involved in this area are working in collaboration with South African Institute for Aquatic Biodiversity (SAIAB) in the African Coelacanth Ecosystem Programme (ACEP). Other projects range from the reproduction of Gobidae and assessing the aquaculture potential of a sea urchin (*Tripneustes gratilla*) on the Transkei coast while the Rocky Shore Ecology students focus on marine reserve effects on population dynamics of intertidal limpets with the aim of contributing to their effective management.

The **Freshwater Ecology** students' research projects focus mainly on water quality studies using benthic macro-invertebrates (biological monitoring) and stable isotope ecology in selected Transkei rivers. There are 2 students involved (1 Hons and 1 MSc). In **Developmental Biology** studies, the focus is on histological analysis of internal organs of selected fish and frog species and there are 3 students involved (1 Hons and 2 MSc). There are also 3 honours students working in **Terrestrial Ecology** with more emphasis on biodiversity and conservation. Projects in this field of study include use of habitats by ungulates in selected nature reserves in the Eastern Cape, the role of nature reserves in education, tourism and community livelihood upliftment, biodiversity of invertebrates in protected and non-protected areas and in relation to invasive plants. Other projects relate to resource management focusing on the use and efficiency of some environmental management tools in conserving biodiversity.

Dr Vincent Nakin

DEVELOPMENTAL BIOLOGY: The zebrafish is a small tropical fish that has become one of the favoured animal model systems for studying gene function during embryonic development. The primary aim of my research is to elucidate the mechanisms that

underlie mitotic-meiotic transformation in *Danio rerio* and *Tilapia sparrmanii* gonads. I study the processes of embryo-genesis in *Danio rerio* gonads as a way of unravelling the mitotic-meiotic transformation, which is difficult to resolve in an adult gonad. It is therefore necessary to describe the ordered series of morphological changes that occur in the formation of the oocyte from primordial germ cells, to provide information about the earliest period of oogenesis, which has received little attention. Various markers and probes are employed for correlation with known events of gonadogenesis using the light and laser scanning confocal microscope. Results of these studies sparked my interest in the mechanisms underlying sex inversion in fish. Therefore, projects are extended to the role of cytoskeletal proteins and the processes of apoptosis during sex inversion. My research interests include Fish pathology, histology, environmental toxicology, especially environmental effects on early stages of development in aquatic vertebrates. Areas of emphasis include basic studies of effects of pollutants. I use *Danio rerio*, *Xenopus leavis*, and *Tilapia sparrmanii* as models to investigate effects of contaminants using molecular approaches and histopathology. A primary objective of my research is to connect effects observed in the laboratory at the molecular level to effects in organisms. Long term projects include the effects of Engineered Nanomaterials on *Danio rerio* embryonic development.

Dr Grace Emily Okuthe, Principal Investigator

INVERTEBRATE CONSERVATION RESEARCH undertaken in the School of Applied & Environmental Sciences specialises in entomological (pest, entomo-faunal diversity) and macro-invertebrate survey work. Areas of special interest include the impact of landscape fragmentation and alien plant invasions on the distribution and diversity of insects and other invertebrates, various aspects of environmental ecology with emphasis on the use of aquatic macro-invertebrates as quality indicators of freshwater ecosystems. This research is conducted in collaboration with national museums of natural history e.g. the Iziko, Natal and Albany museums as well as research institutes e.g. SANBI, the ARC and the Water Research Commission (WRC).

Inventorying and monitoring of terrestrial invertebrates within protected and non-formally protected areas of the OR Tambo District Municipality, Eastern Cape is on-going. The diversity and

distribution patterns of epigaic invertebrate assemblages in Silaka Nature Reserve was undertaken during two sampling seasons to assess the conservation value of four *a priori*-selected sites that varied in vegetation as well as intensity of wood-fetching and/or grazing and clearing disturbance. It was found that the 'minimally disturbed natural forest patch' had both common/widespread and rare/typical invertebrate taxa, and therefore was of high value for conserving invertebrate biotic communities within the reserve. The other three sites also offered optimal and unique habitat requirements for protecting and preserving species such as *Ancylotrypha zuluensis*, Lycosidae sp. and the Opiliones. Some measured site variables accounted for the distribution trends observed across sites. The conservation implications of the study were that biotope management in the reserve should aim at preserving a variety of habitat patches that differ in structural and compositional vegetation. Also, anthropogenic pressures resulting from frequent clearing should be regulated especially during the summer to cater for various developmental (including immature) stages of the invertebrate assemblage of the reserve.

Butterflies (Lepidoptera) have attracted more attention as indicators of terrestrial ecosystems than other invertebrates. The preliminary phase of a study to determine butterfly species turnover at selected habitat patches inside Nduli Nature Reserve and its surrounding landscape and their response to measured environmental variables has been concluded. Hierarchical clustering using Bray-Curtis similarity matrices and other multivariate techniques grouped sampling units according to butterfly species sampled, and site variables. Site patches outside the reserve were richer in butterfly species and overall

abundance than inside the reserve. The conservation implications of the study were that patch level management of habitats with sufficient flowering herbs, and compositional vegetation, and minimum disturbance within and outside the reserve can encourage rare and common butterfly species richness and diversity. The study was also of critical importance for determining movement corridors between the reserve and its surrounding landscape for rare endemic butterfly species at a local spatial scale.

Cowpea (*Vigna unguiculata* L. (Walp)) is a subsistence crop and major source of cheap vegetable protein for rural farmers of the Transkei region of South Africa. This crop is usually preferred by farmers because of its role in fixing nitrogen and maintaining soil fertility above adverse thresholds as well as production of nutritious fodder for livestock. Arthropod assemblages monitored on cowpea during the two cropping seasons in the Transkei area showed that aphids, Lepidoptera larvae, blister beetles and pod-sucking bugs accounted for high levels of population infestations, persistence and overall damage inflicted on the crop. Natural enemies recorded during the study were ladybird beetles, wasps, assassin bugs and spiders. Insect pest activity was much concentrated between eight and thirteen weeks after sowing corresponding to flower budding and pod formation stages of cowpea respectively. Results from this study have significant implications for the integrated control of the insect pest complex of cowpea in sub-tropical agro-systems.

Dr Augustine S. Niba (Principal Investigator)

STUDENT RESEARCH

Walter Sisulu University

MARINE RESERVE EFFECTS ON DENSITY, DIVERSITY AND SIZE STRUCTURE OF INTERTIDAL LIMPETS IN ROCK POOLS ALONG THE TRANSKEI COAST

Limpets are harvested by people in South Africa, but are selected in terms of species and size. As a result, some target limpet populations are now depleted on exploited shores of the Transkei coast with natural recovery of the denuded areas being very slow. The coastal environment is characterized by numerous habitat types, some of which are distinct isolated rock pools. Relative to studies on emergent rocks, little is known about processes that determine the structure of assemblages in rock pools. For conservation purposes, it is important that significant amounts of habitat in an ecosystem such as rock pools where most limpets recruit are conserved in order to ensure persistence of populations and species diversity. We therefore investigated the effects of marine reserves on the community structure of intertidal limpets in rock pools inside and outside marine reserves. A comparison of limpet diversity and size structures in rock pools was done monthly at two reserve (Dwesa-Cwebe & Hluleka Nature Reserves) and non-reserve sites (Nqabara & Presley's Bay) on the southeast coast

of South Africa for a period of 12 months. Limpet diversity was highest at Dwesa, while Hluleka recorded the lowest number of species found (Limpet diversity: Dwesa>Nqabara>Presley's Bay>Hluleka). There was no clear pattern indicating reserve effects on mean maximum sizes. Out of four common species, *Cellana capensis* and *Siphonaria serrata* had the highest mean maximum size at Nqabara, a non-reserve site, whereas *Siphonaria concinna* and *Helcion concolor* had the highest mean maximum sizes at Dwesa, a reserve. Mean sizes of the four common species, however, were higher inside marine reserves with the highest mean sizes of all common species recorded at Dwesa. The results showed that limpet diversity in rock pools was independent of site exploitation however mean maximum sizes varied with each species due to the fact that harvesters tend to target certain palatable species such as *H. concolor* (which is regarded as heavily exploited). This highlights the importance of considering rock pools in designing marine reserves and understanding limpet assemblages in rock pools can be useful in biodiversity management.

**T. Loqo, Masters student
Zoology Department**

First law of Laboratory work:
Hot glass looks exactly the same as cold glass
Arthur Bloch: Murphy's Law, Complete, 1985

North-West University

FROGS ABOUT TOWN: ECOLOGY AND CONSERVATION OF FROGS IN THE URBAN HABITATS OF SOUTH AFRICA

Urbanisation has a number of harmful effects on the ecosystem and includes increased temperature, severe effects on wetlands and water availability, usage and quality, habitat destruction or alteration, and establishment of exotic plants and animals. In addition to these noticeable changes in the physical structure of the environment, urbanisation also causes a striking change in the acoustic environment. This change may possibly hinder the capability of male frogs to attract females by decreasing the distance in which males can be heard by females. These disturbances in female perception of male calls may lead to reduced breeding success.

The newly built King Shaka International airport is right next to the Mount Moreland wetland which hosts one of the largest remaining populations of the critically endangered Picker's reed frog (*Hyperolius pickersgilli*). This population is exposed to very loud aeroplane noise and there is a severe threat of chemical pollution from the airport. To help determine the impact of the noise from the aeroplanes, detailed call analyses are being conducted with state of the art recording equipment imported from the USA.

Assessing how frogs cope in the urban environment is the first step in conserving South Africa's frog populations where urbanisation is taking its toll on the environment. In this part of the study undertaken by Kruger as member of the African Amphibian Conservation Research Group, the city Potchefstroom will be the main study area where frog populations in different levels of urbanisation will be monitored. Potchefstroom does not only provide a vast selection of sites along a rural-urban gradient, but it is also a developing city which gives us the opportunity to monitor the early effects of



Green female pattern of Picker's reed frog, *Hyperolius pickersgilli*, perching on a SongMeter SM2 microphone.

urbanisation on frog populations and how frogs deal with the urban environment.

Our objectives are to 1) assess the breeding distribution of frogs in wetlands along an urban-rural gradient in Potchefstroom; 2) examine community relationships with habitat quality and landscape context; 3) establish if frogs can adapt to the urban environment through changes in their vocalizations, migration patterns and/or reproductive strategies and 4) develop recommendations on how to make existing and future urban developments more frog-friendly in collaboration with town and regional planners.

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Donnavan Kruger completed his M.Sc. degree at the North-West University in Potchefstroom and is currently busy with his Ph.D. with Prof. Louis du Preez as his supervisor.

THE INFLUENCE OF THE TERRAPIN PET TRADE ON PARASITE DISSEMINATION AROUND THE WORLD

Terrapins have been spread across the globe in the pet and food trade. If juveniles are attractive, adults are usually less beautiful as they tend to lose their colours as they grow. This results in them being released into the environment where they may establish natural populations due to their ability to adapt to a broad range of habitats with the consequent threat of outcompeting indigenous species. The Red eared slider, *Trachemys scripta*



Trachemys scripta elegans

elegans, native to the USA, is one of the species used in the pet trade. It's estimated that between 1989 and 1997 roughly 52 million specimens were exported worldwide. Though some countries banned turtle imports, 3-4 million terrapin hatchlings are still exported each year. In France *T. s. elegans* is now considered as an invasive threat to indigenous species (see the Global Invasive Species Database:

<http://www.issg.org/database/welcome/>), the European pond turtle *Emys orbicularis* and the Medi-

terrestrial turtle *Mauremys leprosa*, as they may compete for resources and habitat. The same happened in South Africa where naturalised populations of *T. s. elegans* were documented and probably contributed to the local extinction of indigenous *Pelusios rhodesianus*. A wide variety of terrapins are infected with various parasites, species of the Polystomatidae (Platyhelminthes, Monogenea) are widespread among amphibians, freshwater turtles, salamanders, lungfish and the hippopotamus. These parasites are transported with the terrapin wherever it goes. When terrapins are released and natural populations are established, parasites can escape and infect native host species. Evolutionary old parasitic relations rarely have unfavourable effects on the host, but when host switching takes place and new parasitic relations are formed, infections often are relentless with adverse effects. The goals of this PhD project is to document the extent of parasitic invasions from *T. s. elegans* to natural terrapin populations in both France and South African countries and to examine the risks of such

host switching for species. Thus far we found that host switching does take place in captivity between host species and non-host species in a terrapin farm in Sorede in the south of France. Another threat is the importation of *Pelomedusa subrufa* (Marsh Terrapin) which is indigenous to South Africa to France; it is a carrier of a variety of ecto- and endoparasites namely leeches, Haemogregarines and Trypanosomes. These importations could also be the foundation to various new parasite-host infections.

Leon Meyer, Olivier Verneau, Louis Du Preez

A collaborative study with Univ Perpignan Via Domitia, Centre de Formation et de Recherche sur les Environnements Méditerranéens, UMR 5110, F-66860, Perpignan, France and CNRS, Centre de Formation et de Recherche sur les Environnements Méditerranéens, UMR 5110, F-66860, Perpignan, France

'There are no turtles anywhere.'

Ponder Stibbons

University of Venda

ANTS IN THE WESTERN SOUTPANSBERG MOUNTAIN

In the past four years I have been working on a long-term altitudinal project in the Western Soutpansberg Mountain which is the focal point for the recently established Vhembe Biosphere Reserve. The first two of these years were for my Masters project, which focused on the drivers of ant (Formicidae) diversity and establishing the patterns of ant richness, density, abundance and assemblage structure across the altitudinal gradient. The Project initiation established baseline data for monitoring the impacts of climate change on ants.

I enrolled for my PhD towards mid-2011 and now my focus is on ant diversity and ecosystem functioning across an altitudinal gradient. This project seeks to test some of the hypotheses proposed to explain species diversity across environmental gradients, to also find out the relative contribution of behavioural dominance to structuring ant activities and test the applicability of Australian and American ant classification schemes for the first time in a savannah biome in Africa.

My experience at UniVen as a postgrad (Opportunities versus difficulties)

University of Venda is the only university in the world found in a biosphere reserve making this institution a great place for environmental research (Ecology, Zoology, Botany etc.) including human-environment conflict studies. With the recently proclaimed biosphere reserve and more research needed to inform the management of the biosphere, studying at UniVen provides a great opportunity for research with reasonable access to the study area. Within the biosphere, previous studies have reported higher species diversity in high taxonomic levels than in other areas of interest in South Africa and diversity of species in the biosphere compares favourably to that found in species rich regions of the world. However, like any other rural-



Caswell collecting ants

based university, UniVen is facing problems such as shortage of research people (no post-doctoral fellows), few Masters and almost no PhD students. Postgraduate administration is also poor; e.g. registration of postgraduates is not open all year round, poor housing for full-time postgraduates, Masters and especially PhD students still cannot drive University vehicles themselves when conducting their research, lack of research materials (laboratory equipment, limited access to internet), shortage of working space and limited postgraduate funding. But despite these challenges the post-grad numbers are increasing more than ever before and with the recent NRF initiatives e.g. Research chairs and improved post-grad funding programmes, the conditions might improve in the near future.

Caswell Munyai is 26 years old and is currently enrolled in the 2nd of his year PhD. He is also a 2012 Graduate Student Network (GSN) main Committee Coordinator for the (SAEON). (<https://sites.google.com/a/saeon.ac.za/saeon-gsn>).

SHADOWS IN THE BLUE: KILLER WHALES AT MARION ISLAND

It's almost as if Marion Island doesn't exist. Scan a world map or globe and you won't easily find it, if it is indicated at all. The Prince Edward Islands – consisting of Prince Edward Island (45 km²) and the larger Marion Island (300 km²) – are a couple of pinpricks in the vast, frigid Southern Ocean. The remote islands lie some 1,700 km south east of Cape Town and the nearest terra firma – 950 km to the east - is the equally isolated Crozet Archipelago. Yet such islands are vital to millions of seals and seabirds which are drawn there by the physical necessity of breeding ashore. The Prince Edward Islands support breeding populations of thousands of southern elephant seals, Antarctic fur seals and Subantarctic fur seals as well as hundreds of thousands of king, macaroni, rockhopper and gentoo penguins. Drawn in turn by these predators are the oceans' apex predators: killer whales.

Killer whales¹ are among the most widespread mammals on earth, having been recorded in every ocean and sea. Globally, they predate on a massive variety of animals and over 140



An adult male (M005 – Atlas) surfaces.

species² have made it into a killer whale stomach somewhere. Among the most remarkable aspects of their ecology is their ability to adapt their behaviour, both social and hunting, to exploit available prey. Their massive size (the heaviest killer whale recorded tipped the scales at 6,600 kg; males measure up to 9 m long, females up to 7.7 m), mobility, large energy requirements and diverse diet means they potentially exert a very strong influence on marine ecosystems.

Killer whales are most abundant at Marion Island during the summer when seals and penguins breed on the island. The whales patrol up and down the leeward eastern coast, their presence occasionally betrayed by their large black dorsal fins or loud blows as they breathe. They regularly swim as shallow as they can, rubbing right up against the rocky shore. The adult males are easily recognised by their huge, spike like dorsal fins which can grow up to 1.8 m tall and tower above the water surface. The whales presumably prefer elephant seals for their high fat, and thus energy, content, but they also take Subantarctic fur seal pups (although they seem to ignore adults entirely) as well as king, rockhopper and macaroni penguins. They probably hunt silently as their calls can be heard by seals

over long distances, which would give them a chance to evade the whales.

About 40-50 whales frequent the island in groups averaging 2-5 individuals. Their residence patterns vary from whales seen regularly throughout the year to those seen mainly in summer, but nearly all the individuals are sighted year after year and group composition is quite stable. This stability is a result of their highly matrilineal society. In certain populations a female's offspring (up to 2 or 3 generations) will remain associated with her for their entire lifetimes. However, groups which feed on mammalian prey have energetic constraints on their group size resulting from their diet, which forces some individuals in a matriline to disperse for long periods, or permanently.

Their close, stable associations offer benefits such as cooperative hunting. Hunting behaviours seem to represent culture transmitted through social learning as evidenced by such unique hunting behaviours as washing seals off ice floes in the Antarctic or carousel feeding on herring in the North Atlantic. An adaptive feeding strategy which is causing headaches among fisherman is stealing fish off longlines. Within the Crozet Islands' Exclusive Economic Zone, killer whales are estimated to steal about 27% of Patagonian toothfish off longlines with fish losses adding up to millions of Euros. A small number of these whales are sighted inshore at Marion Island where they probably take other prey as well, representing a remarkable range of feeding strategies.

The late Michael Biggs's insight in the 1970s that killer whale



A juvenile (M027 – Seabiscuit) attacks a southern elephant seal

individuals could reliably be identified by characteristics (such as scars, mutilations and colouring) of their dorsal fins was a game changer. For the first time scientists could relatively easily start collecting long-term datasets on individual whales. Yet research on killer whales at Marion was surprisingly sporadic and opportunistic (considering their massive charisma and regular occurrence at the island) until 2006 when a thorough photographic catalogue was started by the Mammal Research Institute, helped greatly by the widespread advent of digital photography. This catalogue has grown and now includes 47 individuals.

Every year dedicated Sealers and Whalers, field assistants of the Mammal Research Institute who spend a year on the island, brave foul weather to regularly photograph individuals. The

resulting photo-ID dataset is the foundation of a growing research programme and the metaphorical spotlight illuminating killer whale ecology at Marion. Besides providing context for several research aspects (mentioned below) the dataset has already been used to estimate the size of the population at Marion and is currently being used to elucidate their social organization. Years down the line this dataset will be used to investigate the population's demography and facilitate comparisons with other populations. For instance, resident killer whales in the Northeast Pacific reach ages of 80-90 and survive for decades post-reproductively.

Quite unusually (and fortunately, given the ferocious temperament of the Southern Ocean) all killer whale work at the island is shore-based. The difficulties of studying such cryptic, deep-diving and far-ranging animals have inspired some creative technology and thinking among marine mammalogists. To address questions about the diet, movement patterns and population structure of killers at Marion, the Mammal Research Institute is currently also remotely deploying satellite tags on whales and collecting biopsy samples for stable isotope, fatty acid and genetic analyses. Still, questions about their ecology offshore are particularly vexing: where do killer whales go when they aren't at Marion, and do they switch prey there?

Ryan R Reisinger and PJ Nico de Bruyn

Notes and Acknowledgements:

Killer whale research at Marion Island is conducted by the Mammal Research Institute of the University of Pretoria; the principal investigator is Dr. PJ Nico de Bruyn. Ryan R. Reisinger is a PhD student with the project. Both Ryan and Nico have each completed two year-long expeditions to Marion Island and have conducted research on various other sub-Antarctic islands. The work would not be possible without the unwavering efforts of several field assistants at the island and the involvement and support of Prof. Marthán Bester. The research is funded by the Thuthuka programme of the National Research Foundation, the Mohammed bin Zayed Species Conservation Fund (project number 10251290) and the Department of Science and Technology through the National Research Foundation. Logistical support is provided by the Department of Environmental Affairs through the South African National Antarctic Programme.

Further reading:

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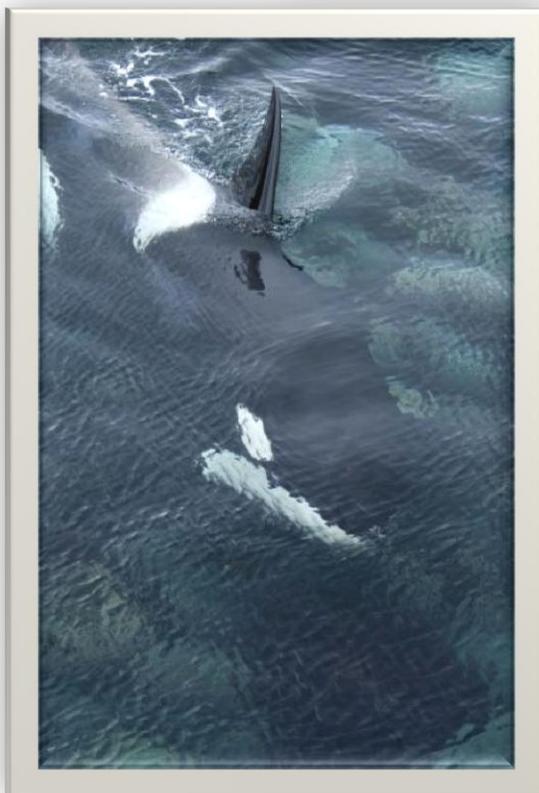
A killer whale calf (M024 - David) spyhops. Its yellow colour is caused by diatoms on its skin.

Marine Science 33: 99-105. doi:10.2989/1814232X.2011.572356

Footnotes:

1: A footnote for those who prefer to call them orcas, believing the name has a neutral connotation: 'orca' (from the species name *Orcinus orca*) apparently derives from 'Orcus', a god of the underworld in Roman mythology. Orcus was also used as a name for the underworld itself. The common name 'killer whale' derives from the term *ballena asesina* (whale killer), bestowed by Basque whalers. Many killer whale populations prey on large whales. Killer whales are the largest members of the family Delphinidae and are thus dolphins.

2: This includes the odd moose.



A killer whale patrols for seals.

DRAGONS OF THE FREE STATE

"My armour is like tenfold shields... the shock of my tail is a thunderbolt..."

—Smaug

While many people are eagerly waiting for the release of J.R.R. Tolkien's *The Hobbit* later this year, few are aware that miniature versions of Smaug, the dragon encountered by Bilbo Baggins, wander around in the highlands of the Free State. The creature I am referring to is none other than the Sungazer or Giant Girdled lizard, recently renamed *Smaug giganteus*. According to Tolkien, Smaug is derived from the Old German verb *smugan*, meaning 'to squeeze through a hole'. Just like Smaug, the Sungazer is a heavily armoured creature that spends much of his time underground. Coincidentally, Tolkien was born in the Free State province, the core distribution area of this species, and one could speculate that an encounter with Sungazers might have been the inspiration for Smaug himself...

Sungazers belong to the family of the girdled lizards or Cordylidae, a group that is almost endemic to the Sub-Saharan region. These large (up to 40 cm) lizards are characterised by their elongated head spines and large spiny scales on the neck, sides and tail. In contrast to most members of the family, which are primarily rock-dwellers, Sungazers inhabit self-excavated burrows on grassland slopes. The burrows, dug to about half a meter below soil surface, can be up to 2 m long and are usually inhabited by a single adult. An interesting consequence of living underground is this lizard's defence mechanism: upon a predatory threat, the Sungazer retreats headfirst into its burrow, jams the enlarged head spines into the roof of the burrow and slams his heavily spined tail at the predator.

How does a sub-terrain life relate to a dragon-like morphology? In order to fully understand this, one should look at the impact of predation pressure on the species. Lizards typically experience two types of predation: aerial predation (e.g. birds of prey) and terrestrial predation (e.g. mammals and snakes). While aerial predators are highly visually orientated and

mostly diurnal, terrestrial predators can not only see, hear and smell their prey, they are both diurnal and nocturnal and in many cases able to extract lizards from their shelters. Because of this, aerial and terrestrial predation pressures have opposing demands: aerial predation favours a speedy retreat, while terrestrial predation favours deterring mechanisms such as armour or spines. Interestingly, heavily armoured Cordylidae have proven to run more slowly than less armoured species, suggesting that the morphology of a species is dictated by the relative importance of aerial and terrestrial predators in their life history.

Sungazers remain very close to their burrows and will experience little predation by birds of prey. An earthen burrow, however, does not protect them against the terrestrial predators, such as meerkat and mongoose, which are quite abundant in the grasslands of the Free State. Without protection, Sungazers would have been very vulnerable inside their burrow, especially at night or when hibernating. Speed will be of little importance, as these ectothermic creatures will be too cold to run during periods of inactivity, making them easy prey for their warm-blooded enemies. Well-developed armour in the form of thick scales and sharp spines, however, may render it difficult for terrestrial predators to extract and subdue a lizard. Although not made of *mithril*, heavy armour seems to be a perfect adaptation of these little dragons to a life underground and the risks associated with this life-style.

Unfortunately, like Smaug, Sun-gazers too have a missing scale on their underbelly. Habitat destruction and extensive farming in their distribution area cause a serious threat for the remaining populations of the Sungazer. The survival of this species depends highly on the conservation of their natural habitat, and all means are necessary to



Adult male Sungazer showing the enlarged head, neck and tail spines.



The yellow mongoose (*Cynictis penicillata*), one of most abundant terrestrial predators in the area.

protect this magnificent little dragon.

Chris Broeckhoven (PhD candidate)

'With magic, you can turn a frog into a prince. With science, you can turn a frog into a PhD and you still have the frog you started with.'

Terry Pratchett, Ian Stewart and Jack Cohen, *Science of the Discworld*, 1999

MammalMAP- AN AFRICA-WIDE MAMMAL CONSERVATION PROJECT

To effectively manage and conserve wildlife we need to know where they are and understand why they're there. But the reality is that across Africa, our knowledge of the whereabouts of many mammal species is at best outdated, and at worst based on unverified anecdotes. This is true for so many mammal species that the last Red Data Book of southern African Mammals – published in 2004 – recommended that surveys of the current distribution of mammals be carried out with urgency. Nearly a decade later the Animal Demography Unit (ADU) at the University of Cape Town and Mammal Research Institute (MRI) at the University of Pretoria have teamed up to take on this challenge with an initiative named MammalMAP: the African Mammal Atlas Project.

The overall goal of MammalMAP is to map the current distribution (occurrence) of all mammals ranging on the African continent and in Africa's territorial waters (up to 200 nautical miles offshore). Where possible, MammalMAP will also determine the relative abundance of mammal species.

We are gathering the data needed to produce these maps in three ways. The primary way is by collaborating with scientists and field rangers working across Africa, and by consolidating all of their identifiable and reliable mammal records (e.g., photographs, sound files) into one centralised database. The second way is through the data collection projects that we initiate across the continent (initially focused in southern Africa) during which we collect new mammal distribution records and test new techniques and technologies for gathering information. The third and final way that we are amassing mammal occurrence data into MammalMAP is through citizen science. Absolutely anyone, anywhere, can get involved in this initiative. All that's needed is an interest in wildlife and to be a registered "MammalMAPPER". Once registered, anyone can submit their African mammal photographs to the MammalMAP database.

All mammal records that come into MammalMAP are processed in the same way. First they all go into an online, open-

access database called the Virtual Mammal Museum. Once there, a team of experts identifies the records to species level. Then the database software uses the GPS coordinates that accompany each record to delineate the current geographic range of each species.

The conservation benefits of this research are multiple. First, comparisons of MammalMAP's current distribution records with both historical and future records, and analyses of identified mammal distributions shifts (range expansions, contractions, and fragmentations) in relation to changes in habitat and climate variables, will yield both explanatory and predictive results that will inform species-level (rather than population-level) management and conservation policies. Second, in conjunction with these analyses, and by identifying and documenting the threats facing the most vulnerable of African mammal species, MammalMAP data will provide crucial guidance to the IUCN Red Data Lists. Third, MammalMAP data can be used to guide landscape conservation regulations, to identify which tracts of land need be purchased for maximum biodiversity protection, and to indicate how scarce conservation resources can be best spent. Fourth, the research will promote and facilitate interdisciplinary and international collaboration amongst scientists and conservation practitioners, with potential benefits to the advancement of conservation science. Finally, by actively involving people of all ages, cultures and geographies, MammalMAP provides a cross-continental platform to increase awareness and understanding of Africa's biodiversity.

To find out more about MammalMAP please browse our website, send us an email, join us on Facebook or follow us on Twitter. Remember that anyone can contribute to MammalMAP, and every contribution is valuable. So please do get involved.

Dr Tali Hoffman, MammalMAP project manager

Project website: <http://mammalmap.adu.org.za>

Email: mammalmap@gmail.com

Facebook and Twitter: 'MammalMAP'

South African Council for Natural Scientific Professions (SACNASP)

The Natural Scientific Professions Act (Act No 27 of 2003) require practising natural science practitioners to be registered with the South African Council for Natural Scientific Professions (SACNASP). The mission of SACNASP is to "establish, direct, sustain and ensure a high level of professionalism and ethical conscience". Practising professionals are urged to register with SACNASP, as either (a) professional natural scientist; (b) candidate natural scientist; and (c) certificated natural scientist. There are currently 18 fields of practice set out in the Natural Scientific Professions Act, within which professionals have to register and practice. The fees for registering in 2012 as a SACNASP natural scientist and other information can be found <http://www.sacnasp.org.za/>.

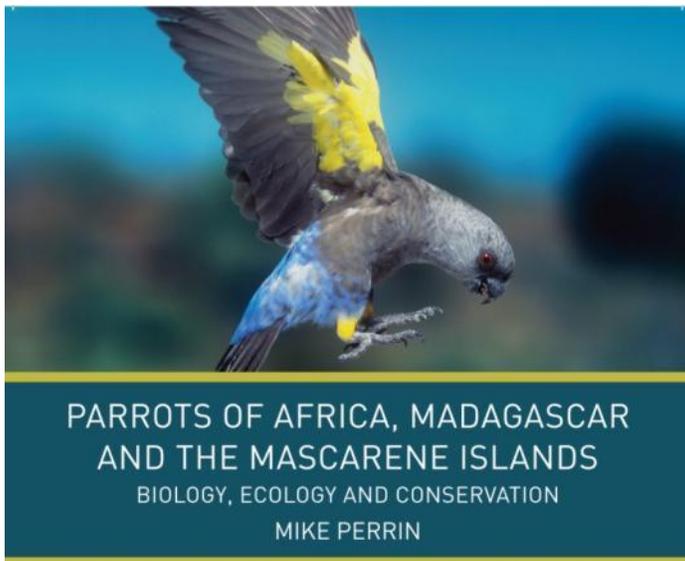
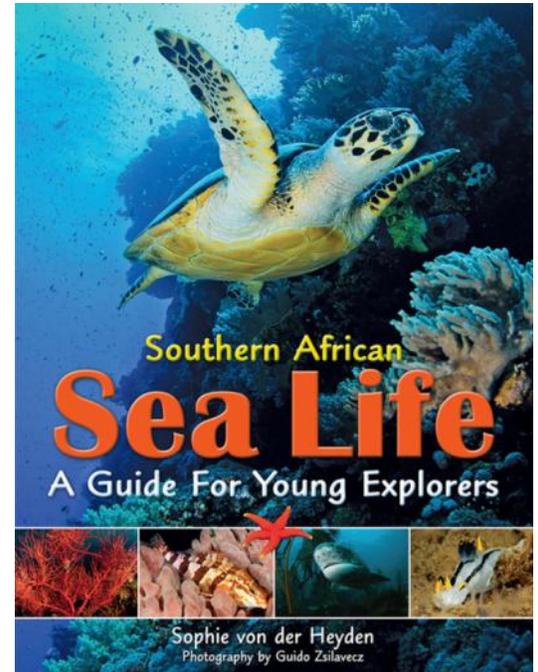
Mark Keith

SOUTHERN AFRICAN SEA LIFE: A GUIDE FOR YOUNG EXPLORERS

Sophie von der Heyden, with photographs by Guido Zsilavec

This is an exciting guide for young explorers (aimed at 7 to 14 year olds) which combines scientific facts, brilliant full-colour photographs and illustrations, bringing a variety of ocean creatures to life. It includes detailed chapters covering marine habitats such as sandy beaches, rocky shores and coral reefs; marine plants and animals such as algae, molluscs, crustaceans, birds and mammals, and finally, provides guides to what to do on our coasts, from Mozambique to Walvis Bay. Additional chapters focus on threats to the marine environment and careers in the marine science. This will make a perfect gift for a budding marine biologist or someone who loves the beach.

It is published by Struik Nature, and retails for R100, ISBN: 978-1-77007-893-2. For more information contact Sophie at svdh@sun.ac.za.



PARROTS OF AFRICA, MADAGASCAR AND THE MASCARENE ISLANDS. BIOLOGY, ECOLOGY AND CONSERVATION

Mike Perrin

This book is aimed at ornithologists, conservation biologists, avian ecologists, academics, erudite bird watchers and the informed public. It is extremely well-illustrated, with very high quality original photographs, although it is not a coffee table book. It includes distribution maps, some figures and a few tables.

This book provides complete coverage of our current knowledge of all aspects of the biology of extant African, Malagasy and Mascarene parrots, and reviews our knowledge of extinct and fossil parrots from the region. The idea was conceived following a wide range of original research projects on southern African parrots supervised by the author. Particular themes developed in the book include the behavioural and ecological characteristics of parrots, their species characteristics and conservation biology. Several current concepts in avian and conservation biology are also discussed.

For ordering information please go to <http://witspress.co.za>. Estimated price: R600 ISBN: 978-1-86814-552-2

Leo Beister's First Computer Axiom
When putting it into memory, remember where you put it.
 Arthur Bloch: Murphy's Law, Complete, 1985

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