

AARDVARK

Newsletter of the Zoological Society of southern Africa
June 2014

LETTER FROM THE EDITORS

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Submit articles to mnakin@wsu.ac.za or teresa.kearney@africanbats.org by the last week of April for the April/ May

This should have been the second issue of Aardvark for 2013. Unfortunately it got waylaid; so apologies to all those who had hoped to see their articles available sooner. You will find interesting articles by last year's recipients of the various ZSSA medal and travel awards. They leave no doubt that the awards were well deserved. Last year the ZSSA also hosted a very successful public debate, which you can find more about in this issue.

The other articles were submitted following a request for local museums and institutions with natural history collections, to publicize what they have been doing, and reflect on any problems they face. A report* on the relatively recent audit of all South Africa's natural science collections, which was commissioned by the National Research Foundation (NRF), found the collections are major national assets that have sadly not been recognized as such. Funding responsibility differs across the collections, and appears in part to contribute to their current state. Hopefully, the plan proposed as part of the audit, which, suggested urgent interventions to ensure the value of the collections does not erode will make a difference.

Vincent and Teresa

* Hamer, M., Raath, M., Rourke, J., Oliver, T., Mandiwana-Neudani, T., Mwale, M., Bartels, P., Marasas, W. (2011). *NRF Audit Report of South Africa's Natural Science Collections*. Gerard, F. (Ed).

ZSSA Executive Council (2014-2015)

- | | |
|----------------------------------|-------------------------------|
| President | Bettine Jansen van Vuuren |
| Vice-president | Corrie Schoeman |
| Immediate past president | Sarita Maree |
| Honorary secretary | Kwezi Mzilikazi |
| Subscriptions | Sandy Willows-Munro |
| Honorary treasurer | Colleen Downs |
| Honorary Editors African Zoology | Carol Simon & Theresa Wossler |



Highlights 2012 and 2013

ZSSA Public Debate 2013: Along the vein of informing the general public on matters of national and global concern, the first ZSSA public debate was held at the University of Pretoria (Nov 2013) on a somewhat controversial topic: "To trade, or not to trade: Legalizing the trade in rhino horns... will it stop the massacre?" (Read full article in this issue).

Honorary Membership of ZSSA: Professor Timothy Clutton-Brock (FRS), Director of Research and formerly Prince Philip Professor of Ecology and Evolutionary Biology at the University of Cambridge, was recently bestowed with a Honorary Doctorate from the University of Pretoria where he has been an Extraordinary Professor in the Mammal Research Institute for more than a decade. His contribution to mammalian research, particularly in the fields of behavioural, evolutionary and population ecology has been monumental. For this life-long contribution he was awarded Honorary Membership of the ZSSA. Karl Ammann, Prof Morné du Plessis (CEO, WWF South Africa), Dr. Cindy Harper (UP), John Hume, Julian Sturgeon (*Resource Africa*) and Dawie Roodt (CEO, *The Efficient Group*) also received this award for their individual efforts in respect of fighting the Rhino Poaching Crisis. We are honoured to welcome them as champions of the Society.

ZSSA Conference: ZSSA 2013 united Zoologists from several South-African universities and museums and five other SADC countries and was co-hosted by Universities of Venda and Limpopo. Special congratulations to Peter Taylor (UniVen), Wilmi Powell and Derek Engelbrecht (Limpopo) for organizing an outstanding event steeped in local culture and first-rate science. The "bush-isolation" at Tshipise (UniLim) created the ideal ambience for sharing of ideas, establishing collaborations and forging new friendships. Leading local and international plenary speakers delivered stimulating presentations at the cutting-edge of zoological research (Professors Franz Hoelker, Tom Gilbert, Ara Monadjem, Colleen Downs and Drs Michelle Hamer, Danie Pienaar and Ian Geigher). A former Director of SANParks, Dr. Salomon Joubert and author of "*Kruger National Park – A History*" gave an inspirational after-dinner address at the banquet. More than two-thirds of the 150 were students of which most presented orals and posters of an exceptionally high standard and they maximized the opportunity to interact with one another, the plenary speakers and "more seasoned" delegates. Their enthusiasm for zoology was contagious and promises a bright future for the ZSSA! The student delegates elected Emmanuel Matamba (MSc student from UniVen) as the next ZSSA student representative. However, the incoming council needs to

address the marked decline in attendance of established members, honours groups and number of institutions represented.

ZSSA Awards: In recognition of his exceptional internationally acclaimed contribution to research on marine ecosystems and coastal ecology, with impacts ranging from the localized effects of biological invasions to large-scale issues of global climate change, the **Gold Medal** was awarded to Prof. Christopher McQuaid (Rhodes). Karl Ammann received the **Stevenson Hamilton Silver Medal** for his life-long contribution to "Speak for those who cannot speak for themselves". His masterly coverage of the global illegal trade in animal products from Africa, through investigative journalism, photography, documentaries and books has been monumental. Dr. Duncan MacFadyen received the **Corporate Award** on behalf of De Beers Diamond Route for their outstanding conservation efforts and for providing excellent opportunities for biological and archaeological research and student training on 10 Diamond Route properties. **ZSSA Presentation Awards** at ZSSA 2013 went to Lindy Thompson (UKZN) for the Best Oral Presentation and Shaun Welman (NMMU/UKZN) and Terry Ramsaroor (UKZN) were runners-up. The Best Poster was by Matthew Noakes (UP), with Charles Nyalangu and Tshepiso Ramalepe, both from UniLim the runners-up. **ZSSA Student Travel Bursaries** were awarded to Sasha Hoffmann (UP) and Shaun Welman (NMMU/UKZN) who made us proud with excellent presentations at the International Mammalogical Congress 2013 in Belfast (UK). **Academic Excellence Awards** were presented to the Best Final Year and Honors students in Zoology at 13 South-African universities. The Society wishes to acknowledge academic excellence of students throughout the SADC region in 2014. To this end, Dr. Seth Eiseb (Namibia), Dr. Prince Kaleme (DRC), Ms. Tiwonge Mzumara, Henry Makina (Malawi) have been co-opted, as country representatives and more will follow. We call on members to assist us in ensuring that we receive nominations from every department in southern Africa by also informing your collaborators based there.

ZSSA International Society Affiliations: Through institutional membership of the *International Society of Zoological Sciences* (ISZS) and the *International Federation of Mammalogists* (IFM), which are both affiliated to the International Union of Biological Sciences (IUBS, <http://www.iubs.org>), ZSSA members can enjoy unique opportunities to forge collaborations with leading zoologists around the world.

International Society of Zoological Sciences: You are encouraged to join ISZS as an individual (full voting) member. For more information on the society, their journal

Integrative Zoology, conferences (e.g 5th Conference on Rodent Biology and Management (ICRBM), 25-29 August 2014 in Zhengzhou, Henan, China), research programmes (BCGC, Biological Consequences of Global Change), working groups ([Bioethics](#), [Taxonomic Impediment](#), Wildlife Disease, Rodent Biology and Management, Alien Species and Tiger Conservation) that run under the ISZS umbrella see the website (<http://www.globalzoology.org>).

The ZSSA will host the ISZS's 2020 International Congress of Zoology (ICZ) in South Africa (the first in Africa), which promises to strengthen links between ZSSA and ISZS and provide important international networking opportunities for African zoologists. Peter Taylor and myself will co-chair the local organizing committee for ICZ 2020 necessary – ZSSA members interested to help with the organization should e-mail us (smaree@zoology.up.ac.za, peter.taylor@univen.ac.za). I was privileged to be elected to the ISZS Executive Council (2012-16) at ICZ2012 and, therefore, will gladly attend to any further questions regarding ISZS and its activities.

International Federation of Mammalogists (former International Theriological Society): ZSSA has representation on the IFM's Board of Directors (<http://www.mammalogyinternational.org>), a body that coordinates interaction between mammal societies across the globe and organises the International Mammalogical Congress (IMC) every four years. Four Standing (Archives/Historian, Conservation, Nomenclature and Systematic Collections) and three Ad Hoc Committees (Future Directions, Conference Advisory and Local Organizing committee) function continuously and ZSSA members are encouraged to become involved in the various committees. As Current Secretary of the IFM Board (2013-17), I am available to assist with further information regarding IFM.

Website: The “new face” of the Society website (www.zssa.co.za) emerged in 2013 along with an online membership system through enormous efforts by Corrie Schoeman and Colleen Downs. It boasts improved functionality and, thanks to Mark Keith's “Ear on the ground”, features topical, hot off-the-press Biodiversity News, which is also on Facebook (<https://www.facebook.com/ZoologicalSocietyOfSouthernAfrica>), while Dan Parker compiled an up-to-date on-line Careers booklet. Links to societies, professional bodies, conservation organizations, NGOs and databases of interest are also provided. Future plans include an Education Section.

Membership: Each ZSSA member can apply for a Certificate of Membership to use as proof if their institutions cover membership fees (request per e-mail to Kwezi Mzilikazi zssasec@gmail.com). The inevitable change to online membership resulted in many long-standing and student members not submitting renewals.

While the incoming council will continue to address this, we call on members to remind their colleagues that everyone needs to register online to be on the current Member Database.

Marketing: Victor Rambau, Andrew McKechnie and Dan Parker, launched several marketing initiatives (flyers, promotional banners, conference marketing and 2014 calendars) to recruit members from South Africa, the SADC region and internationally. I had the opportunity of delivering a ZSSA promotional lecture at the International Society of *Integrative Zoology* 2013 (Beijing, China) and Victor Rambau operated a promotional stall at IMC 2013 (Belfast, UK). Victor embarked on a marketing drive among students and staff at local universities starting with a lecture by Karl Ammann and screening of “The Rhino and the Bling” at the University of Cape Town. The aim is to broaden the membership base of zoologists working at academic institutions, museums, governmental and non-governmental organizations, and conservation agencies throughout southern Africa.

Treasury and Secretary: The financial status of the Society is excellent thanks to BioOne revenues, and most importantly, Colleen Downs' meticulous management of the Society's finances. Her association with ZSSA has been admirably long and extraordinarily devoted, and she has contributed to most cogs of the Society engine. Thank you Colleen! Kwezi Mzilikazi deserves a special mention for her hard work and support to ensure that communication within the society is effective, different awards are presented at the appropriate time and for the support that she gives to each council member in their respective portfolios. Her administrative and moral support during the past two years, as well as that of Bettine van Vuuren (Incoming President) truly made my term as president an enjoyable journey.

The Aardvark: After an absence of two years, our bi-annual ZSSA newsletter was resurrected in an exciting new format. Newsworthy issue featured news on a diversity of activities, accomplishments and research findings of zoology departments and organizations in southern Africa (e.g. UNISA, UJ, US and Univen). This issue places the spotlight on museums, which are an invaluable link in the chain of zoological research in southern Africa. Future plans involve showcasing research at institutions from outside South Africa and one issue per year will showcase student research. Thank you to Teresa Kearney and Vincent Nakin for your enthusiasm for this vital communication tool of our Society.

African Zoology: Four issues (~800 pp) appeared under co-editorship of Hannes van Wyk and Carol Simon, which featured high-quality manuscripts by local and international authors on a diversity of topics. 2013 saw Carol Simon joining Hannes as co-editor, Josephine de Minck's appointment as journal manager and extensive

restructuring of the Editorial Board. These changes have streamlined the manuscript pipeline and substantially improved turn-around time, without jeopardizing the rigorous peer-review principles. A special word of thanks to Hannes van Wyk (outgoing Editor) for his contributions over the past 3 years. He was instrumental in implementing the current on-line submission and review system (OJS) and conducted extensive research on publishing models and publishers that served as groundwork for Council to make an informed decision as to the inevitable transition from the society publishing AZ independently, to a larger publishing house. Special words of appreciation are due to Sandi Willows-Munro who managed the institutional and library Subscriptions so efficiently, and to Dr. Nico Dippenaar and his team (*Isteg Scientific Publications*) for their excellent service, loyalty and support to AZ, and for often walking an extra mile with the ZSSA, for the last almost 20 years.

Finally, I wish to thank Peter Taylor for his exemplary leadership and enthusiasm concerning the Society and its future. Although his term should have ended in 2013, Council decided to co-opt him for special projects (e.g. SACNASP and ICZ 2020). I am also indebted to the 2012/2013 council and members of the ZSSA for their loyalty and support during my presidency of ZSSA. It has been my extraordinary privilege to serve the zoological community of southern Africa and I wish Bettine and the Incoming Council of 2014/ 2015, ZSSA members and students all the best for the future. Bettine is a highly respected zoologist with a passion for molecular biology and conservation. She was recently elected as the Vice-Chair of the SANBI Foundational Biodiversity Information Program chaired by Michele Hamer. I have no doubt that Bettine will lead the ZSSA to a different level in the two years ahead.

With my best wishes,



Dr. Sarita Maree (University of Pretoria), ZSSA President (2012 – 2013), Immediate Past President (2014-15)

Dear Zoological Society Members,

Time waits for nobody, and we again stand at the beginning of a two-year term for council. It is with great pleasure and anticipation that I look forward to serving our society (i.e., all of you) for the next two years. I follow in the footsteps of Sarita Maree who has done an outstanding job; our society owes her a great deal of thanks. During Sarita's term several projects came to completion including updating the website (here we have to acknowledge Corrie Schoeman's efforts), we remain financially healthy (thanks to the efforts of Colleen Downs), and all is progressing well with the organization of the 2020 International Zoological Conference that will be hosted in Cape Town. Largely thanks to the efforts of Kwezi Mzilikazi (our Honorary Secretary), we have a finger on the pulse of the daily running of the society. A chain is only as strong as its weakest link, and with the backing of a very strong council, and the support of Corrie Schoeman as Incoming President, I feel confident that all will go well for the next two years. Theresa Wossler joined our team as Editor-in-Chief of *African Zoology*, and together with Carol Simon is taking our journal forward. It has become clear that the way to move *African Zoology* forward is to partner with a publishing house. To this end, we have signed a contract with Nisc, a local publishing house, who will take over the day-to-day journal management. For an interim period, Nico Dippenaar will remain involved with the journal to ensure a smooth takeover, but at his request will be scaling back his involvement. The editorial decisions remain with our Editors-in-Chief, who will now have significantly more time to direct the course of the journal.

With these few words I wish to urge and inspire all our members to remain active participants in our society, to promote the zoological sciences in South Africa (and indeed globally), and to wish all the best to all for 2014.

**Prof Bettine van Vuuren (University of Johannesburg)
ZSSA President (2013 – 2014)**



Along the vein of informing the public on matters of national and global concern, the first ZSSA public debate was held at the University of Pretoria (Nov 2013) on a somewhat controversial topic: "To trade, or not to trade: Legalizing the trade in rhino horns... will it stop the massacre?" The need for such sprouted at ZSSA 2013 from the screening of the documentary "The Hanoi Connection" by Karl Ammann, well-known conservation activist, journalist and photographer (<http://www.karlammann.com>). It served as a stern reminder, not only of the snow-balling poaching crisis, but also the urgency of drawing on ideas from all South-African citizens and industry to assist the government in developing strategies to more effectively combat the carnage, and understand the complexities involved in the drivers of global illegal trades in animal products. According to Karl Ammann, one of the key questions remains: "What do we really know about the demand characteristics of the trade?" South Africa is intending to request once-off sale of rhino horn when the Convention on the Trade in Endangered Species (CITES) next convenes in 2016.

The panel included Karl Ammann, Prof Morné du Plessis (CEO, WWF South Africa), Dr Cindy Harper, a veterinary forensic expert (Onderstepoort, UP), John Hume, South Africa's largest private rhino breeder, Julian Sturgeon (*Resource Africa*) and Dawie Roodt, leading South African economist. James Steyn (50/50 presenter) facilitated a dynamic deliberation of diverse vantage points from panel members and an often, heated exchange of questions from the audience. Pro-trade advocates proposed that more rhino breeders and a legal trade would reduce poaching, minimize extinction risk, create employment in rural communities, promise economic growth and substantial investment returns (John Hume, Julian Sturgeon and Dawie Roodt).

Professor Morné du Plessis cautioned that, although the current situation is unacceptable, evidence that a legalized trade will reduce poaching is limited and unconvincing. He said: "There is no practical pathway that we can confidently go for. Panic alone is not a big enough excuse to make huge decisions." Dr. Cindy Harper emphasized that a large number of horns tested by the RhODIS system (a forensic tool used in collaboration with the SAPS Forensic Science Laboratory, the Environmental Crime Investigating Unit of SANParks and the National Wildlife Crime Reaction Unit) are not authentic rhino horn, which emphasizes fraud as a significant factor to consider when deciding to legalize the trade. According to Karl Ammann, there will be significant opposition from the international community and *Interpol* to legalize the trade due to South Africa's history of corruption and evasion of former trade embargos to sell horn. A final vote from the audience tilted the balance in favour of a legal trade (but many remained impartial).



Karl Ammann at the debate

Among the more than 300 attendants counted ZSSA members, representatives of governmental and non-governmental conservation organizations, SANParks, museums, independent animal-rights groups, industry, students, scholars and the public. Media coverage included newspaper articles (*Mail & Guardian*, *Beeld*, *The Citizen* and *Afriforum*), radio interviews (*RSG Monitor*, *ClassicFM Business* and *TuksFM*) and video recording (Phil Hattingh, *Earthwatch*). *Carte Blanche* questioned Karl Ammann on the alarming increase of the illegal trade in rhino horn, but also lion and tiger bones from Africa and Asia. *The Zookies Youth Club* of the National Zoological Gardens organized a striking foyer display showcasing a youth march to the Union Buildings on *World Rhino Day* 2013 led by the CEO of SANParks, Dr David Mabunda, the

MMC for Environmental Management Services (Tshwane), Petunia Mashaba, and the Deputy Director-General for Biodiversity and Conservation of DEA, Fundisile Mketeni. Ofentse Litsele (Zookie Chair) presented the Minister of Water and Environmental Affairs, Edna Molewa, with a *Memorandum of Support from the Youth to the Government of South Africa to Protect our Rhino*. It included a six-point action plan of action and stated: "... the youth of South Africa are touched and concerned about the country's rhino and the effect poaching will have on their futures". Last year saw 1004 rhinos slaughtered and 376 so far in 2014, in spite of enormous efforts from government, NGOs, donors, farmers and the public to achieve the opposite. The DEA recently urged all its partners to reconsider South Africa's existing anti-poaching tactics and provide government with suggestions. A tragic lesson was learnt from the extinction of the Javan rhinoceros subspecies from Vietnam (last one poached in 2010, *Biological Conservation* 74, 2014). Its demise was collectively due to unsuccessful on-site protection, inadequate conservation and donor responses, poor political will and insufficient knowledge on the population status and the pressures it faced. Fortunately, quite the opposite is true for South Africa's rhinos, but even so, we are not winning the fight (yet).

Dr. Sarita Maree (University of Pretoria), ZSSA President (2012 – 2013), Immediate Past President (2014-15)

Gold Medal – Prof Christopher McQuaid

I must go down to the sea again, to the lonely sea and the sky



When I was asked to write a short passage on my research I was forced to ask myself what I actually do. In one way that's not as easy as it sounds, because I seem to have an incredibly diverse research portfolio. On the other hand it's really rather straightforward because the short answer is that I do research on topics that interest me. I keep this as wide as possible because I am actually interested in Nature rather than a career as such, but I confess that I find myself confined to marine studies.

Most of what I research is guided by the interests of the people I work with, meaning students and postdocs. This is because I don't regard them as extra pairs of hands to carry out projects I am interested in, but rather as extra brains who come with new ideas and ways of looking at things that are different from mine. So if a student can persuade me that their pet topic is both scientifically interesting and feasible, I am prepared to give it a go. Yes, I have my own lines of interest, but these tend to complement, rather than dictate what my students and post-docs study. This means that I end up working on very diverse topics and sometimes well outside my comfort



zone. It also means that I end up collaborating with people with different skill sets to address particular questions. I guess this is a bit different from the ways in which most scientists work, but it works for me and means I have published on subjects ranging from bacteria to whales. Most of my work has been either intertidal or in the sub-Antarctic, and I have had students working in Zanzibar, Kenya and Tristan da Cunha, while my own studies have taken me to fieldwork in the Antarctic, the Arctic, Morocco, Argentina, Chile and China as well as Scotland.

One of my main lines of research has been the interactions between indigenous and invasive mussels. Biological invasives are one of the key threats to biodiversity and in South Africa we have an invasive Mediterranean species (*Mytilus galloprovincialis*) that has successfully invaded every continent except Antarctica. On the south coast *Mytilus* shows partial habitat separation with the indigenous mussel *Perna perna* - interestingly one of the very first marine animals to be included in the diet of early hominids 164 thousand years ago, and still heavily exploited by people in Morocco, Transkei and Kwa-Zulu Natal. The pattern of habitat separation is actually very simple, but reflects a balance amongst multiple factors, including inter and intra-specific competition, recruitment and differences in the species' tolerances of heat, desiccation, waves, sand burial etc. etc. A really interesting spin on this is the fact that, in South Africa, *Mytilus* reaches its eastern most distributional limit right where two genetic lineages of *Perna* with different physiological properties overlap. Coincidence?



Another major line of research right now is investigating how upwelling of cold, nutrient-rich water along the coast affects intertidal communities, especially

filter feeders, by effectively fertilising the ocean. The results have not been what we expected because biogeography is also critical. Here we try to generalise by working all around the South African coast and complement this with samples from West Africa and (we hope) Oman and Brasil. I think this is important, because if we want a good understanding of how ecosystems are structured and function, we need to derive strong generalities. I try to encourage my students to write so that their work on mussels in South Africa will be important to people working on trees in China.

For 20 years, I have worked with the Southern Ocean Group at Rhodes, which was (and remains) the most prolific group in the country publishing on Southern Ocean biology. We study biological oceanography and ran a very successful long-term project investigating the underpinnings of the ecosystem at sub-Antarctic Marion Island, collaborating with physical oceanographers from Cape Town to study the food web from the physics and chemistry, through the primary producers all the way up to the albatrosses. That was a very exciting project.



You can see how I end up collaborating with geneticists, oceanographers and physiologists.

When it comes to post-docs or people who want to do postgrad work, I would rather work with someone well trained in butterfly biology than someone badly trained in marine biology. So, for students, I think the moral of all this is that one should try to get the best training one can, so you can be a good scientist, but then you should study whatever interests you rather than pursuing either research funding or the latest hot topic. After all, this is one's working life we are talking about.



Prof Christopher McQuaid (Rhodes University)

Stevenson Hamilton Medal– Karl Amman

The tiger bone commerce and how its characteristics might affect the discussions on the rhino horn trade

At the recent CITES meeting in Bangkok in March 2013 I attended a press conference at which the SA minister for the environment announced that South Africa had tried a wide range of measures to curtail rhino poaching, and had failed, and it was now time to look at the option of legalizing the trade. This proposal will result into a continued heated debate for months or years to come. It will be a very polarized debate with neither side willing to give, on what they see as core principles, which, are, however, not always very measurable.

Having visited some ranches with very happy, live rhinos, enjoying what to me looked like a good quality of life – and being alive- made for a pretty convincing argument that having a dehorned rhino grazing or browsing with its calf, is a better option than an orphaned calf trying to suckle on its dead mother.

However, on my last trip to Laos and Vietnam in October 2013 I looked into the tiger bone trade, and found characteristics, which I feel should be looked at as an indicator of where the legalization of the rhino horn trade could lead.

In 2010 a group of Vietnamese journalists managed to get into one of the biggest tiger farms in Laos, and they reported in their story a price of U\$ 180 per kg of tiger. Buyers from China or Vietnam chose their tiger, and after the cat has been shot or electrocuted, they pay per kg, after a discount of some 7-10 kg for the intestines. Slightly more is charged for tigers above 100 kg, and a little less for tigers below 100 kg.

We managed to get a Vietnamese investigator into the farm on our recent trip. Instead of a 100 tigers they now have over 300, as well as some bears and clouded leopards. The farm is being expanded to accommodate some 700 tigers, and more of these farms, which are illegal under CITES resolutions passed in 2012, are in development. The breeding pattern is as commercial as it can be done, and the cats are pumped full of antibiotics with a weekly injection. Potentially several hundred tigers are butchered a year to be turned into traditional Chinese medicine (TCM). In addition, there are the imports of lion bones and skeletons from South Africa, which, are also sold as “tiger bone”, and turned into tiger wine in China, or tiger bone cake in Vietnam. Over 500 lion skeletons are being exported and imported on an annual basis, and there was recent talk of a 3 ton shipment about to arrive in Laos. When comparing prices between Hanoi, the Laos and Vietnam border, and the ‘tiger farm’, the indications are that there has been an overall increase in price, of some 30% over the past three years. While the Vietnamese media team recorded the price of U\$ 180 per kg in 2010, this year the quotes were around U\$ 250 per kg. This is

despite the addition of the new supply of farmed tigers, and lion bones from Africa.

If we then put that in context with the estimate of some 3000 tigers remaining in the wild, and only a handful left in a country like Laos, the message is that prices are going up, in particular for wild tigers as well as captive specimens. We were shown how to differentiate a wild tiger on the colour and degree of damage to the canines, relative to captive tigers that have snow white teeth, and no crack or breaks, as a result of their daily diet of chicken. Hence, poachers today get more per kilo than they did three years ago despite the drastic increase in supply. And, while it might be a fraction of the end consumer sales price (of around U\$ 25 000 per carcass), it is still more than enough for qualified tiger poachers to spread out from countries like Vietnam, to far off destinations in Malaysia and Myanmar, to get hold of some of the last wild tigers.

One thing, which, has not happened, on the back of the additional supply from captive farming and lion bones, which, by now far exceeds the supply from the remaining wild population, is that the overall price has not come down and decreased the incentive for poachers.

Is this an aspect of the demand and supply characteristics which, should be studied in more detail to tell us how increasing supply will affect demand prices and poaching levels when discussing legalization of the rhino horn trade?

Karl Amman (Wildlife photographer, environmental journalist and conservation activist - <http://www.karlamann.com>)

Corporate award – Diamond Route (De Beers, Ernest Oppenheimer & Son)

The Diamond Route



White-browed Sparrow Weaver building a nest

Few researchers and conservationists in southern Africa are not aware of the wide array of zoological, botanical and archaeological research and student training opportunities afforded by the ten ‘Diamond-Route’ (properties owned by E Oppenheimer & Son, the Oppenheimer family and the De Beers Group of Companies in South Africa, Zimbabwe, Namibia and Botswana. Launched at the World Summit on Sustainable Development in 2002, the Diamond Route has an overarching vision and strategy linking ten sites in a holistic manner through ecosystem and species research, including assessing the effects of climate change, as well as the conservation and restoration of areas under its stewardship to their natural ecological state. Certain properties have been conserved for over 100 years and provide important reference sites, invaluable to research. New invertebrate species are regularly recorded on the Diamond Route, including a number of new genera. At the heart of the Diamond Route is biodiversity conservation initiatives and research, and a number of national and international universities conduct research across the properties and to date more than 140 research projects have been conducted. All the properties exceed criteria for globally threatened, regionally threatened and biome and range restricted species and due to a high number of threatened species, are of huge conservation value. No other private landowner in Southern Africa has the size, combination and diversity of important biodiversity areas, and research opportunities afforded as the Diamond Route. The properties within the Diamond Route protect a great diversity of ecosystems from semi-deserts, marine, savannas, and grasslands through to urban indigenous gardens. Four dedicated research centres at Venetia Limpopo, Telperion, Tswalu Kalahari and Benfontein offer fantastic facilities for researchers. Zoological research conducted on Diamond Route properties range from

marine and freshwater fauna to invertebrates, reptiles, birds and mammals.



Dr Young and a White-browed Sparrow Weaver

Research which adds real value is of great importance to the Diamond Route, whether it is for management purposes, or for acquiring greater insights into species and ecosystem conservation. Research projects typically focus on important current issues such as restoration of old lands, effects of desertification and climate change, the pollination crisis, rhino crisis and the importance of researching and understanding biodiversity. Meaningful conservation and research initiatives are promoted by numerous diverse partners, including international and national universities, Texas A&M, Exeter, University of Pretoria, University of Venda, University of Cape Town, University of Witwatersrand, University of Stellenbosch, University of Johannesburg and University of Kwa-Zulu Natal. The Diamond Route has also supported and partnered with a number of NGO's, including BirdLife South Africa and the Endangered Wildlife Trust.



Damaraland Mole-Rat

The Diamond Route received a number of awards, including the Nedbank Green Mining Award, SanParks Kudu Award for Corporate Contribution to Conservation; an Enviropaedia Award for Biodiversity as well as the highly prestigious Zoological Society of Southern Africa' (ZSSA) Corporate Award for its outstanding service to zoological research and conservation in Southern Africa. The important zoological research conducted on Diamond Route properties is communicated by regular newsletters, social media, as well as an interactive and informative website. The concept of having a Research Conferences was implemented in order to take research a step further, creating a platform to highlight some of the wide variety of research projects undertaken on the Diamond Route and other conservation properties. Four Diamond Route Research Conferences have been held in Johannesburg, and have included South Africa's top zoological researchers and conservationists such as Dr Mark Berry, Dr Brian Huntley, Dr Ian Player, Professor Jonathan Jansen, Dr Bob Scholes, Clive Walker, Dr Gus Mills, and Dr Graham Williamson. Equally, the conference also provides opportunities for students to present their findings, and brings together researchers at all stages in their careers. Strilli Oppenheimer, founder of the Diamond Route commented, "After four years the Diamond Route Research Conference has continued to established itself amongst a very diverse (as diverse as the biomes of the Diamond Route) group of academics and attracted an audience from the heads of corporates to students, and those just trying to make sense of the world around them on a daily basis. Hopefully, this diversity of knowledge is disseminated to an ever widening field of people interested in our fragile planet and how we can help its sustainability through our awareness of what is part of our own backyard".

register a project on any of the properties, please feel free to contact me on Duncan.MacFadyen@eoston.co.za or visit the website www.diamondroute.com

Duncan MacFadyen (Ernest Oppenheimer & Son)



Duncan MacFadyen



2013 Diamond Route Research Conference participants.

A new and existing project has involved the development of the Diamond Route database, which allows for easy search and download of all research reports and papers conducted on the properties over the past decades. This service will provide managers and researchers an enormous amount of literature, and is a "one-stop shop" for reviewing previously conducted research on the properties. The Diamond Route welcomes innovative research ideas and proposals, and should you wish to

Not many people get given the opportunity to present their research at an international conference and although a daunting prospect for a student it was a chance I would not have missed for the world. My excitement started long before the actual trip to Ireland to attend the 11th International Mammological Congress (IMC 11) at Queen's University in Belfast. I applied for the ZSSA Travel Award, generously set up by society, and was ecstatic when I was informed that my application was successful. I could never have imagined how wonderful it felt to realise that soon I would be off to a different country, brushing shoulders with zoologists from abroad who share my passion and interest in mammology.



Queen's University, Belfast, Northern Ireland

Fast forward a few weeks of sorting out all my travel arrangements; which in itself was an interesting process for a South African girl who has never travelled outside of her own country before and you find me on a plane, desperately reading through my presentation again and again. Prepping myself for the first slot on the first day in which I was to present research from my honours year. As terrified as I was at the prospect of being the first speaker on the first day in hindsight I could not have asked for a better slot, it meant I could enjoy giving my talk to an attentive audience and after 15 short minutes I was free to truly relax and enjoy the remainder of the conference. I suppose it also helped that I am working on an interesting, quite different small mammal.

The research that helped me win the travel award and that I presented at the conference was on eastern rock sengi personality. Personality has gained much interest in explaining different aspects of how an animal interacts with its environment. It has been studied quite extensively in lab animals such as rodents, birds and fish. We investigated personality in a unique animal which is itself of interest; being that is an indigenous animal to

Africa belonging to the very interesting superorder Afrotheria. Most work done on sengis have been with regards to thermoregulation and its discordant diversification, few studies have looked at behaviour and captivity. As such the IMC was a perfect platform at which to present the interesting data that we found with regards to the personality of this amazing creature and to better understand and assist with the future research endeavours and conservation of an indigenous African small mammal.



Eastern Rock Sengi

Image by Katarina Medger

The feed-back I received was more than I could hope for and I soon realised how many people shared my interest in behaviour of animals, with regards to personality, and it was interesting to see first-hand what was currently being done in this field. I was also pleasantly surprised to find out that conferences are not all work and no play.



Flowers at the Belfast Botanical Gardens

We visited the zoo, the botanical gardens, and did a fair amount of pub crawls in the evening after long days listening to the research being done around the world, sharing for a brief moment the accumulation of years of sweat, blood and tears. Belfast itself is also beautiful; a city nestled among the green rolling hills of County Antrim in the flood plain of the River Lagan. It was here that the famous RMS Titanic was built and I briefly mention the city as part of my experience was just the sheer wonder of finding myself in another country, walking through the streets of another city. I also had the chance to visit Giant's Causeway, a UNESCO World heritage site and the most popular tourist attraction in Northern Ireland. It was almost unreal standing on the coast and seeing the large hexagonal columns that were made, believe it or not, entirely by natural forces.



Hexagonal basalt columns – Giant's Causeway

What was truly memorable however was being able to meet colleagues whom I had only known by names on publications; scoured through late at night while desperately writing on my own. Despite the hectic schedule of the conference there was still time to get to know people, to meet and talk about research and our work. It was extraordinarily wonderful being asked for my opinion on topics, to be asked about my work, and to discuss where I was going with my research. As a student still on the first rungs of the Zoological ladder I understand the impact made by speakers at international conferences and I am truly enthralled at the fact that I was able to experience this first-hand thanks to the ZSSA.

Sasha Hoffman (University of Pretoria)



Salmon fisherman's huts at Carrick-a-Rede

The 11th International Mammalogical Congress (2013) promised to be an action packed, star studded event, analogous to a Hollywood red carpet event. The program was crammed and would, as I soon found out, involve a whole-lot of running around; partly due to the size of the campus and partly because of the large number of concurrent sessions. At stages I even wondered if we were part of a secret rat-race experiment.

Arriving at the campus on Sunday 11th of August, I was immediately awestruck by the main building – the Lanyon Building, which impressed upon me a sense of nobility and royalty. The building and the surrounding grounds truly conveyed the prestigious nature of the university, and I was reminded of the rich history of incredible research and work that had been conducted at Queen's, and which I am sure will continue to be conducted well into the future. After collecting myself, I found the registration venue and was soon set for what promised to be an unbelievable week.



Front facade of the Lanyon building

Later on Sunday evening, after the welcoming ceremony, we had our first of seven plenary presentations. The presentation was by Prof. Paul. W. Sherman, who delivered an incredibly interesting talk entitled: Darwinian Gastronomy. Briefly, the focus of the talk was on contrasting paleo and modern diets; linking together how early humans dealt with parasites, pathogens and toxins, as well as what some of the repercussions are of our current unrestricted diet. Throughout the talk I could feel my own (and I am sure everyone else's) excitement and anticipation building. The air of excitement soon blended into amazement, as next, we were thoroughly entertained by a local Irish marching band. Immediately thereafter, I rushed back to my hotel to make some final touches on my presentation, which was scheduled for straight after lunch the next day.

The program commenced bright and early, and Monday morning flew by. At the start of my talk, I could not help but feel slightly intimidated by the fact that

several of the authors whom I frequently cited throughout my thesis were in the audience watching me. However, after the first couple of sentences and nodding of heads – indicating agreement, all nerves were settled. The rest of the day, like the rest of the conference, was spent running between venues and chatting with some of the international pioneers in the field of Zoology.



Local Irish marching band

The conference had a mid-week break, allowing delegates the opportunity to travel and explore the region, as well as refresh their minds. Various tours and workshops were offered during the day, and later that evening we were treated to a private tour of the Belfast Zoo, followed by a barbeque (or as we in SA like to say, a Braai). This was a fantastic opportunity for everyone to mingle and interact in a more informal and relaxed atmosphere.

Unfortunately I did not manage to explore the countryside as much as I would have liked, opting to attend one of the workshops instead. However, in hindsight, this was the best decision because I was able to build additional contacts, which will serve me well in my future endeavours. Attending the IMC was undoubtedly one of the best experiences of my life, being my first international conference. As promised, the conference lived up to all of my expectations and I am truly grateful to the ZSSA, Prof. Andrew Leitch of Nelson Mandela Metropolitan University, and Dr. Nomakwezi Mzilikazi for providing me with this opportunity. One of the major take home points from the conference is that we in South Africa, and indeed the rest of Africa, are fortunate to have richly diverse ecosystems from which we can study. Therefore, even though we have certain limitations, we as African biologists should never take our natural wealth for granted.

Shaun Welman (Nelson Mandela Metropolitan University)

South African Institute for Aquatic Biodiversity

Developing and Diversifying the SAIAB Natural History Collections

The South African Institute for Aquatic Biodiversity (SAIAB) in Grahamstown, South Africa, is a natural history Collections Platform of the National Research Foundation (NRF). Natural history collections are important, since they represent a sample of biodiversity as we know it at any point in time – a sort of snap shot. Such collections provide access to specimen information, and modern collection storage facilities are essential to ensure the safety and long-term preservation of valuable specimens and data. Natural history collections provide a major resource for systematists and taxonomists who classify and name organisms, try to explain biodiversity and understand conservation issues. The value of these records is enhanced by the amount of data associated with them. Value grows every time specimens are examined and our knowledge of those specimens grows. SAIAB's mission is to be an interactive hub focused on serving the nation through generating, disseminating and applying knowledge to understanding and solving problems concerning the conservation and wise use of African aquatic biodiversity.



SAIAB's collection facility

SAIAB's Collection and Associated Specialised Laboratories Platform offers state-of-the-art facilities, equipment and processes, accommodation for multiple users, and provides teaching platforms for students. The Platform comprises a range of wet collections and specialised laboratories. All these facilities are available to local, regional and international researchers. The Platform includes materials, expertise and networks for African aquatic biodiversity research in freshwater and marine environments. The SAIAB collections reflect SAIAB research areas over the past 30 years and are particularly

important for the southern African continent south of the DRC, the western Indian Ocean and southern Ocean regions.

In 2007 the National Fish Collection housed by SAIAB was moved into a purpose-built Collections Facility. The Collection Facility is designed to store valuable specimens in temperature-controlled conditions, to carry out basic preparation of specimens coming into the collection and for bulk handling of preservatives. Managing the care and use of these specimens requires dedicated and specially designed space. In 2010 a dedicated Collection Management Centre was constructed. Named for JLB Smith who with his wife, Margaret, laid the foundation of modern ichthyology in South Africa, the Collection Management Centre is designed to provide appropriate working facilities for the collections management team and researchers working on collections materials. In response to a major need for such a service, the Centre is the nerve core from which the curation team manages the Collection Facility and runs collection operations.

The Centre also enables SAIAB to open its collections and facilities to researchers. In addition to the Centre, SAIAB has a number of special, purpose-built laboratories, which are available to internal and external research scientists and students. These include: an X-ray Laboratory with a digital X-Ray inspection system; a specialised, insulated otolith preparation laboratory and a molecular preparation laboratory.



Ametia fuscigula x-ray

The infrastructural changes and move of the National Fish Collection precipitated a reassessment of collection aims and procedures at SAIAB. The result has been improvements in all aspects of procedures and care of the collections, providing improved research services to the scientific community and enabling SAIAB to broaden

the scope and taxonomic coverage of aquatic organisms within its collections. SAIAB has diversified its holdings to include amphibians, diatoms, aquatic invertebrates, cephalopods, tunicates and marine mammals. In an interesting approach, which might be considered for collections at other institutions/museums, as SAIAB has no research or curatorial posts for these specialised taxa, selected Research Associates have been appointed as honorary curators of the various collections.

Focusing on one of the new diversified collections, for amphibians, SAIAB's aim is to provide world class support to amphibian researchers interested in southern African frogs by developing a comprehensive collection of southern African frogs, tissues, photographs and calls and by providing facilities for further research into these materials such as collections sorting labs, x-ray facilities and genetics laboratories. Currently the collection is small with 1339 specimens representing 462 species (see the screen shot from Specify database 6.5.03 below), but if growth continues the SAIAB amphibian collection will soon be an essential destination for amphibian researchers. SAIAB is actively involved in the International Barcode of Life Programme (IBOL) and the first batch of frog tissues were sent to Canada for barcoding. This will compliment similar fish studies and will aid a variety of taxonomic, systematic and biogeographic studies of southern African amphibians.



Arthroleptis xenochirus male left, female right, Zambia

SAIAB's collections are growing annually and now include a range of other bio-materials, such as tissues for genetic isotope analyses. The Biobank is an area of major growth for SAIAB with catalogued holdings of approximately 20,000 lots and several thousands of uncatalogued specimens. Biobank samples are stored in -80°C freezers. The collections are becoming more accessible and are being loaned with higher frequency, new collections are being developed, more scientists are visiting the collections, and systems within the Collections Division are being improved. The 2012 'Assessment of

zoological research collections in South Africa' by Professor Michelle Hamer (SANBI) found that, "SAIAB is an institution that illustrates the difference that an appropriate governance structure, a critical mass of employees and a research focus that addresses a range of inter-related topics around the collection can make" (South African Journal of Science 2012; 108(11/12)).



Roger Bills (Collection Manager)



Amathole Museum

Promoting science and nature conservation

The Shortridge mammal collection at Amathole Museum in King William's Town apart from serving as an important research collection has recently also been the focus of a number of public programmes geared towards promoting natural science and nature conservation.

Having had a successful first attempt at the 2012 National Science Week (NSW), the Amathole Museum yet



2012 National Science Week prize winners

again hosted a vibrant and well attended weeklong programme for NSW from 29 July to 2 August 2013. Ten high schools in total participated in various science oriented events, which were spread throughout the week, and climaxed a prize giving ceremony on the last day.



2013 National Science Week prize winners

The theme for the 2013 NSW was “Celebrating scientific areas in which South Africa has a competitive edge”. National Science Week is an initiative of the

National Department of Science and Technology that promotes greater awareness and appreciation of the contribution science and technology make to the nation.

With financial support from the South African National Committee of the International Union of Biological Science (IUBS), the museum was able to transport learners from ten schools in Buffalo City Municipality, and expose them to the museum environment through guided tours of the natural history displays, workshops, discussions, and an essay writing competition. The latter required the learners to write and submit an essay of not more than 350 words on either South Africa's biodiversity loss, with particular focus on the rhino, or the importance of the museum and IUBS in promoting science. Prizes were presented to five winning essays.

The main objectives of the museum's events for the 2013 NSW were to raise awareness of science, to promote careers in the natural sciences among learners, promote the activities of IUBS, promote and highlight the role of museums in the natural sciences. Museums have an important, but under-appreciated role to play in science, which include:

- Biodiversity research in museums can influence conservation management decisions
- Phenomena and ideas portrayed in museum exhibitions, create interest, trigger further research and innovations in science
- Museum collections and exhibitions keep records in time and space, which can be referred to by researchers. From these records emerge scientific improvements and modifications.
- Museum collections in the various scientific fields provide opportunities for research, which can lead to academic awards as high as PhD degrees, thus contributing to human capital development.
- Museum educational programmes compliment and strengthen what is acquired through the formal education setting.
- Museum visits during childhood help to develop positive attitudes and experiences, which shape interest, skills and success in formal school science.
- Museums act as communication channels about important scientific issues of great social significance, e.g. an HIV AIDS exhibition explaining transmission, spread and prevention of HIV AIDS, or an exhibition about treatment of snake bites.
- Museums provide platforms for public dialogues on important scientific issues, e.g. a public talk on global warming, and the events hosted during Science .

- Museum human resource development programmes offering internships, learnerships, mentoring, and volunteer opportunities, promote careers in science.

As part of the Amathole museum's objective for National Science Week to develop capacity and professional development in local young upcoming scientists, two young postgraduates from the Science Faculty at the University of Fort Hare were given the opportunity during NSW to work alongside the museum scientist and to interact with, and motivate the school learners.



Post-graduate student assistant

During the 2013 NSW one hundred and fifty learners between grades 10 and 12, from 10 schools, benefited from the events, and the museum reached schools it had not previously - interacted with, and future engagements with some of these schools are now in the pipeline. The museum also built on, and strengthened, the professional relationship with the Zoology Department at the University of Fort Hare. Community feedback, through social media and other channels, showed the museum's NSW campaign attracted the wider community of Buffalo City Municipality, beyond its primary target audience, the learners.

In a separate but related programme the Amathole Museum joined many other conservation oriented organisations and individuals throughout the world to mark World Rhino Day on 22 September 2013, with a temporary exhibition at the East London airport. The exhibition featuring all five rhino species; the black, white, Sumatran, Javan, and greater one horned rhino, but dedicated special focus to the species occurring in South African, the black rhino *Diceros bicornis*, and the white rhino *Ceratotherium simum*, both whose existence is threatened due to poaching for their horns. Whereas living animals in parks and reserves are the primary targets of poachers, museum specimens are not safe either. In December 2007, armed thugs held Amathole museum staff at gunpoint before robbing the museum of the rhino horns from the mounted displays. Since then, museum



The museum's exhibition at the East London airport to mark World Rhino Day

security was improved, and all remaining rhino horns removed from display and replaced with artificial replicas. Without diluting the important message about the conservation status of the two rhino species, the World Rhino Day display also highlighted the cultural significance of these animals continuing current efforts of museums to incorporate biological and culture information in their programmes.

Fred Kigozi (Museum Director)

Home of the world renown hippo - Huberta: Amathole museum in King Williams Town

Amathole museum is known for its world famous hippopotamus called Huberta. She was first known as Hubert as it was believed it was a male, but after discovering it was a female, it gained its latest title. Huberta's home houses a large collection, of more than 40 thousand mammal specimens, which represent about 19700 Rodentia specimens, 3428 in the order Insectivora, 3742 Carnivora, 700 Primates, 600 Lagomorpha, 1500 Artiodactyla, 3750 Chiroptera, 90 Proboscidea, 10 Pholidata, 21 Tubulidentata (which includes the Aardvark), 600 Hyracoidea, and 116 Perissodactyla. Much of our collection is proudly collected in South African, but we believe in diversity, and there are also representatives in the collection from Angola, Zambia, Namibia, Zimbabwe, Tanzania, Mozambique, Malawi, Algeria, Sudan, Europe, Britain, Zaire, Gold Coast, and Kenya. South Africa is known to have a rich biodiversity of plants and animals. That is reflected in the overall number of mammal species and specimens in this collection being third largest in Southern Africa, and second largest in South Africa. The collection draws local and international researchers, providing information for a diversity of studies, including geographic distribution of animals, ecology, taxonomy, and biodiversity.

Since its formation, the collections have grown tremendously through continuous expeditions by various curators throughout the history of the collection. The collections on display in the public galleries were once described by a member of the public as an indoor Kruger National Park, due to the large number of animals represented. Animals on display are to educate and inspire visitors. There are others specifically preserved and maintained behind the scenes for research purposes. The research collection is in form of dry and wet specimens, the latter has recently received attention, and the stores have been revamped to improve the conservation requirements of the collection. In 2010 the South African



Spanish researchers Nieves Lopez-Martinez and Fernando Palacios with Buyiswa Mahala (Mammal Curator) and Fred Kigozi (Museum Director)

National Biodiversity Institute (SANBI) financed the dry collection to improve the collection maintenance and enhance the chances of the collections long-term survival. SANBI, and in particular Michele Hamer, are acknowledged for driving the assessment of natural collection in South Africa that provided the impetus for this work.

The current curator of mammals, Buyiswa Mahala, started at the museum in 2008. She is registered at the University of Walter Sisulu for a masters degree, furthering her studies in zoology. Her research project is to reconstruct the diet of four-striped mouse (*Rhabdomys pumilio*) along the Pirie forest of King Williams Town in the Eastern Cape Province. Rather than using traditional methods of diet analysis, she is using a new technique used by ecologists of stable isotope analysis (SIA). The four-striped mouse is of interest, as it is known to be economic important and it occurs in a wide range of habitats and is distributed throughout southern Africa. In its behaviour it is also unlike almost all other rodents species, which are known to be nocturnal (active at night), as it is diurnal (active during the day). This species appears to risk daytime predation, because it occurs in large numbers and is always the first group caught. Besides this research Buyiswa's also been involved in the museums National Science Week program, and at the Science Festival Africa in Grahamstown, as part of the educational and public programmes.



In the dry collection store for a public program

Buyiswa Mahala (Curator of Mammals)



Griffiths Shayi in wet collection store

The main natural history collections housed at East London Museum are of molluscs and birds so it is perhaps not surprising that much of the museum's research centres around malacology and ornithology, with other projects on fish and coastal management.



Museum researcher Kevin Cole preparing to undertake a necropsy on a Short-finned Pilot Whale at Wavecrest, Wild Coast

Current work by the Malacology Department aims to improve our knowledge base of South Africa's biodiversity resources through the on-going documentation of our molluscan fauna, chiefly terrestrial, and the identification of the biogeographic patterns and evolutionary processes linked to this in order to enhance our capacity to manage and conserve these assets. Since 2000, fieldwork across the Eastern Cape in different habitats has provided new data on species distributions and habitat preferences. Eight new species have been described so far (Burse & Herbert 2004; Cole & Herbert 2009) in addition to specimens provided to other malacologists for their descriptions. Although large parts of South Africa remain very poorly sampled from a malacological perspective, the Eastern Cape is now fairly well documented and these data complement recent work in other parts of the country. Another challenge facing South African Malacology is that many families and genera need re-evaluation in terms of the validity of the nominate taxa and un-named species await description. A systematic revision of the endemic southern African genus, *Chondrocyclus* is being undertaken, and molecular data are now being gathered for a phylogeny of the genus as part of a Ph. D study. This genus is confined to forests throughout the country and during fieldwork species from other provinces were collected to augment the collection of the East London Museum. Incorporation of these has made an important contribution to enhancing its scope and the East London Museum terrestrial mollusc collection is now probably the second most important in the country. Work on *Chondrocyclus* is complementary to current work

on various other invertebrates and will continue to aid in identifying regions of high endemism and conservation value.

The Natural History Department maintains on-going liaison with a number of researchers in three key focus areas – ichnology, palaeoanthropology and coastal systems (including coastal management). The department also collates and manages natural history databases related to all forms of the biota with particular emphasis on coastal systems, mammals, reptiles, geology and fossils.



Mary Cole, museum malacologist processing terrestrial molluscs at Mtentu, Wild Coast.

Ichnology focuses on trace fossil research at the Nahoon Point Nature Reserve (East London). Aeolianite sandstone in this area has yielded a number of paleo-surfaces with animal track ways and in one instance a human track way. The museum curates the 124 000 year old *Homo sapiens* track way discovered in 1964 at Nahoon Point.

Palaeoanthropological work focuses on the Hofmeyr skull. Dated at 36 000 years old, researchers from the USA and Europe have contextualised this find in the story of human evolution. The lead institution in this regard is Stony Brook University in New York.

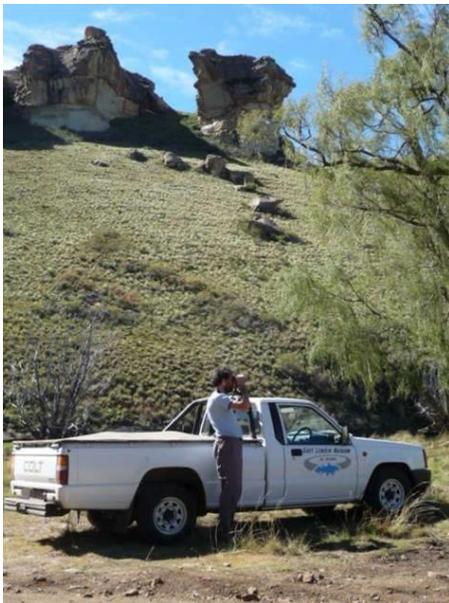
The department also contributes to impact assessments, environmental education and represents the museum on a number of environmental committees.

Current work by the Ornithology Department includes research into three species of terns, monitoring of Black-winged Lapwing numbers at the East London Grand Prix Circuit, investigating the effect of development on the bird populations and community structure within the East London Industrial Development Zone (ELIDZ) and

contributions to national projects such as SABAP₂, CWAC and CAR co-ordinated by the Animal Demography Unit at the University of Cape Town.

Antarctic terns breed on sub-antarctic islands in the Indian and Atlantic oceans and many spend the non-breeding season along the shores of South Africa. East London Museum is assisting with a project investigating the taxonomy of this species, for which up to six subspecies are currently recognised, using DNA and Stable Isotope analyses. The ecology of Roseate Terns at Bird Island is also being studied along with the relatively isolated Eastern Cape population of Damara Terns in Algoa Bay.

Counts of Black-winged Lapwings at the East London Grand Prix Circuit will hopefully reveal seasonal and other patterns related to grass height, disturbance levels or weather conditions. Numbers of birds are counted on the grass verges of the racetrack and adjacent areas twice a month from a slow-moving vehicle. All individuals of each species present in zones 1A, 1B and 1C of the ELIDZ are recorded on quarterly visits to see how numbers change as development progresses. Up to now, the project has mainly monitored natural changes but as more of the area is developed it is expected that numbers and species diversity will decline with the proportion of generalist species increasing. However, this remains to be seen.



Carrying out bird atlas work near Rhodes, Eastern Cape (Photo: Liz Watkins)

Fieldwork for the second South African Bird Atlas Project (SABAP₂) has been carried out in various parts of the Eastern Cape while counts for the national Co-ordinated Waterbird Counts (CWAC) project are made twice annually in conjunction with BirdLife Border at the Keiskamma and Kei rivers. BirdLife Border also oversees the Co-ordinated Avifaunal Road count (CAR) routes in the

Border Region. Ornithology staff and other bird club members drive a 32 km circular route in the area south of Cathcart in summer and winter each year, recording numbers of large terrestrial birds such as cranes, bustards and storks.

Challenges associated with carrying out research at the East London Museum include physically getting to study sites since the museum possesses only one vehicle for use by staff in natural and human sciences, exhibitions and administration. Access to Bird Island for tern work is with South African National Park's "rubber duck" and is totally weather dependent. Securing funding for projects is also a challenge and always beyond the museum's modest budget, making application for external funds a necessity.

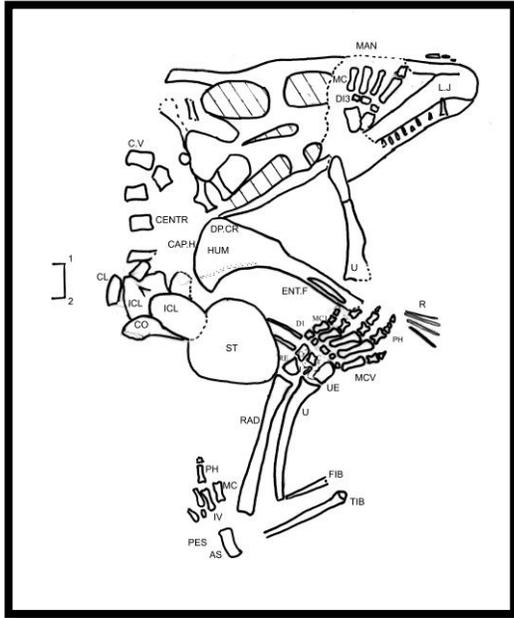
Dr Phil Whittington (Ornithologist), Mary Cole (Malacologist), and Kevin Cole (Principle Natural Scientist)

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Therapsida: Therocephalia post-cranium – morphology and function



Ventral view of *Ictidosuchooides* sp. (Council for Geoscience)

The focus of my research is the morphological description of the post-cranium of the Therocephalia. Often when fieldwork is done only the post-cranium is found and it is difficult to identify therapsids on the post-cranium alone. To add to this frustration, fossils are never complete or well preserved. Now these descriptions are adding to our knowledge, and it is possible for the first time to identify several individuals from groups within the Therapsida. This aids in biostratigraphic research, especially of the Permian Triassic boundary and its extinction event.

My research has also expanded to the mode of locomotion looking at function and gait. Therocephalia had been thought to have a dual-gait in the hind limbs and we are attempting to describe this in full. The challenge is that there are no modern relatives to compare with. Therocephalia is unique in having two anterior processes of the ilium, and a heel process on the calcaneum in a different position to other Therapsids. The basal forms are also quite different with a cartilaginous sternum and no cleithrum.

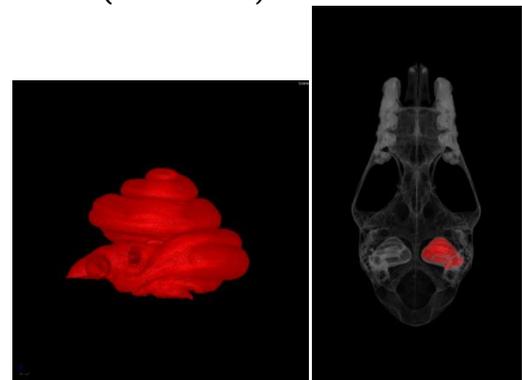
Dr Heidi Fourie (Curator Karoo fossils, Vertebrate Department)

Small mammals

The museum building is still in the throes of a maintenance and renovation program. This has not been an easy process with collections, museum staff, and contractors in the same building. Hopefully it will be worthwhile, and the less than adequate conditions of the small mammal collection, which were identified in the NRF audit, will be improved. A positive development is the opening of a post in the section for a collection manager, which should be filled in 2014. This will help in processing the large backlog of specimens that had been accepted in recent years, but not fully documented and accessible in the main collection.

The collection continues to be in demand for use, and reflecting new techniques in vogue, most of the requests are for sub-samples of material for analysis in molecular or isotope procedures.

Adequate funding for the collections and research remains a challenge. However, recent research and fieldwork has included contributions to Prof Peter Taylor (University of Venda) and other co-authors project assessing cryptic diversity in forest shrews of the genus *Myosorex* from southern Africa, with the description of a new species. Contributions to Prof David Jacobs (University of Cape Town) and other co-authors project documenting phenotypic convergence in genetically distinct lineages in a species complex of *Rhinolophus* bats. And, assisting with long-term bat fieldwork at the AfricanBats project at Meletse, with Prof Wanda Markotter and Dr Mark Keith (University of Pretoria), and Ernest Seamark (AfricanBats).



Horseshoe bat cochlea (left), and within the skull shown in ventral view (right)

Another interesting project has been using the superb imaging facility at NECSA, and micro-focus x-ray tomography to document the inner ear morphology in different species of horseshoe bats.

Dr Teresa Kearney (Curator Small Mammals, Vertebrate Department)