



# Rufford Small Grants Conferences Southern African Conference Proceedings Kirstenbosch National Botanical Gardens 16-17 April 2015

Compiled by: Dr Ian Little and Jiba Magwaza



## **Introduction**

The 2015 Southern African Rufford Small Grants Conference was held in Cape Town from the 16<sup>th</sup> to 17<sup>th</sup> April. The conference was kindly hosted at the South African national Biodiversity Institutes Colophon Room within the conservation wing, a building which was suitably constructed through sponsorship from the Rufford Foundation. The conference delegates were comprised of members by invite only and were primarily previous grant recipients. The region comprises recipients from seven countries including Namibia, Botswana, Zimbabwe, Mozambique, Swaziland, Lesotho and South Africa. Eighty five recipients were invited and although some contact details were old almost all previous recipients were contacted. Of these 31 recipients were able to attend and present at the conference which hosted a total of 56 delegates including plenary speakers, guests and thirteen current conservation biology students (MSc) from the Percy FitzPatrick Institute of African Ornithology. These budding conservation students enjoyed the experience of listening to and meeting a suit of experienced and active conservation practitioners and researchers from across the region.

## **Objectives and impacts of the conference**

The key objectives of this event were three fold including to facilitate networking and partnership development between conservation practitioners that would otherwise likely not have met, to promote the role that The Rufford Foundation plays in supporting conservation at a local, national and international level and to provide a platform for local MSc conservation biology students to learn from experienced conservation practitioners from across the region. The Rufford foundation offers small grant funding for nature conservation programmes and pilot projects in the developing world. The Rufford conference serves a very important role as a platform of bringing together recipients to share their success stories and challenges in their projects. This forum provided an opportunity to discuss ideas, problems, issues and create invaluable networking opportunities for important ongoing conservation projects.

Rufford funding has in many cases acted as a catalyst to achieve disproportionately large and tangible conservation impacts. This can be seen in many of the projects such as the highland grassland research project by the now Dr Ian Little. This project was focussed on understanding the impacts of grazing and burning practices on grassland biodiversity (including birds, insects and plants). The work has guided the development of the national Grazing and Burning guidelines for grasslands, Bird-friendly Best-practice guidelines for grasslands, management plans for the most important bird conservation area in Mpumalanga province and of course the development of Ian Little himself who is now the manager of the Threatened Grassland Species Programme at the Endangered Wildlife Trust and was the person who organised this event. Another project that showed major catalytic results from the funding was the Sungazer Project run by Shivan Parusnath. This project has led to a broader understanding of the conservation requirements and current status of this previously poorly understood species. The results are guiding the development of a Biodiversity Management Plan, update of the red-list status, development of a formal Non-detriment

Finding in line with CITES II requirements and are guiding the geographic focus of a broader Biodiversity Stewardship project aimed at protected area expansion in the region. Of course we must never forget the individual development, Shivan is now working towards his PhD in genetics focussed on this same species and is certainly the world expert on the species today. Another example is the pangolin trade work, which has contributed to the establishment of the African Pangolin Working Group and further far reaching conservation efforts across the African continent and globally looking at the trade routes and market countries.

The overwhelmingly most important aspect that this funding does for all of the recipients is in their personal development. Contributions to individual projects are valuable to those species and their associated habitat but the development of the conservationists themselves will reap far reaching benefits to many species and habitats on much longer and wider ranging scale than any one project. This conference itself also assisted, in two short days, with the development of a class of young and enthusiastic MSc students in Conservation Biology. These students were exposed to the wide variety of projects and conservationists that Rufford has supported in the region and undoubtedly walked away with a far stronger understanding of how conservation practices are implemented on the ground.

Some of the projects showcased really creative ways of achieving their conservation objectives. Some examples of this include Leif Petersen's "Herbanisation Project" where wild harvesting of traditional medicinal plants is leading to population pressure for the species in high demand. In order to address this the Sustainable Livelihoods Foundation is in the process of building linkages between resident Khoi-linked Rasta herbalists and the broader conservation audience through the establishment of street gardens where indigenous herbal medicinal plants are grown within in the urban community of Seawinds. This approach has both provided sustainable income for herbalists and reduced pressure on the wild populations of sought after medicinal plants. Another project that has shown some key innovation at a local scale is Sue Miltons project dubbed "Renukaroo", this project focussed on the development of a locally sustainable nursery for both the rehabilitation of degraded areas and to encourage local people to utilise indigenous plants in their gardens which results in reduced water usage in a very water scarce area. While indigenous nurseries are nothing new, the horticultural principles that were developed here are certainly a first of their kind. Another example is the African wild dog meta-population project (David Marneweck) in northern KZN. This innovative research project established protocols to allow wild dogs to stay in Hluhluwe Imfolozi Park and also for the monitoring and conservation of this extremely scarce and contentious species (predation of domestic livestock) in the region. A further example of some unique management outcomes was work done by Simon Elwen focussing on dolphin research and the impacts of tourist boats on their behaviour and breeding. This work has established limits for tourist boats allowing the dolphins to have refugia for resting and play while still promoting the responsible development of the tourism industry, all-be-it with boundaries to where they can and can't go to pursue the animals.

Raising funds for the conservation of species is always a challenge and is becoming more and more so in the current financial climate. In most cases the big and charismatic animals are given priority. The Rufford Foundation however certainly does not show any bias or leniency and there are a number of projects which enjoyed support for the smaller, less charismatic but equally deserving species. Projects supported include a wide variety of species from the more charismatic such as sharks, dolphins, wild dogs, leopard, cheetah, hyena, turtles, vultures, elephants and zebra to projects focussing on the more obscure and unknown species such as bats, sardines, Oribi, crocodiles, pangolins, sungazers, ground hornbills and even the Knysna Seahorse. The latter group of species would have been unlikely to achieve even a portion of what they have done without The Rufford Grants as these species are traditionally poorly known and more difficult to raise conservation funds for. Project topics were also varied and included aspects of applied conservation from climate change modelling, population monitoring and atlasing to more focussed biological research and addressing trade and wildlife conflict issues and even addressing traditional medicinal demands through urban herb garden development. So it is clear that The Rufford foundation does not only support the more traditional forms of conservation practice but also those projects that seek alternative and out-of-the-box approaches to achieving conservation for the benefit of a wide range of species and ecosystems.

This funding has also contributed to building a network of future generation conservationists. There were two key examples from the projects presented at this conference; the first was the Matobo Biodiversity Monitoring Project (MBMP) presented by Cedric Maforimbo (Recipient was Nicola Pegg). The MBMP works with five rural secondary schools close to Matopos National Park in the Matobo Hills World Heritage Site in south-western Zimbabwe. The MBMP principal aim is to develop community based natural resource monitoring through schools that will ultimately be self-sustaining and which will generate quantified data to help communities to identify and mitigate against natural resource depletion. This work is ongoing and therefore will generate and train future conservationists. Rosemary Grooms work looked more directly at how community education and engagement impacts on conservation goals. These kinds of projects have long-term impacts and through the education of older generations through teaching young children can show considerable short term changes in mind-set as well. These changes in community mind-set are what will result in sustainable conservation outcomes going forward.

It is important that conservation and research findings be published in not only popular formats such as magazines and newsletters but also as peer reviewed scientific publications. Many of the projects that have been supported by The Rufford Foundation in southern Africa have led to peer reviewed publication but it is difficult to estimate how many actual publications have accrued from these projects. A rough estimate that more than fifty percent of projects result in journal publications is probably an under-estimate and in most cases projects result in more than one publication. What was evident from the presentations is that

the academic standard is exceptional across the range of research projects supported. It would certainly be interesting for The Rufford Foundation to find a way to estimate their publication reach and it would no doubt be wide reaching and substantial.

In closing, there was overall positive feedback about the event from all participants and there is little doubt that the networking opportunities have strengthened the participants abilities to achieve their objectives in what often feels like very isolated and lonely circumstances. The leaving sentiment from the delegates was that there is a need to have more platforms like the Rufford conference in order to share information and stimulate this kind of networking.

**Message from the organiser:**

It was evident that all of the recipients were incredibly grateful for the support that they received and for that we as a collective would like to extend our gratitude to the extreme and dedicated generosity of this invaluable source of conservation funding. The conservation battle is one that we all often feel will result in an inevitable long-term loss, but even losing battles are worth fighting for and it is up to passionate and hardworking conservation soldiers to fight forth inch-by-inch in order to alter the perceptions of the masses. Hopefully through this collective effort we will reveal to the planets mass majority the honour, pleasure and splendour of what nature has to offer. It is truly enlightening to see a young child suddenly and most alarmingly grasp the miracle that is something as small and seemingly insignificant as a butterfly's first flight. If all living adults could achieve this basic appreciation of nature then most of our battle would be won.

A handwritten signature in black ink, appearing to read 'Ian Little', written in a cursive style.

Dr Ian Little

“If the earth were only a few feet in diameter, floating a few feet above a field somewhere, people would come from everywhere to marvel at it... the people would marvel at all the creatures walking around the surface of the ball and at the creatures in the water. The people would declare it as sacred because it was the only one, and they would protect it so that it would not be hurt. The ball would be the greatest wonder known, and people would come to pray to it, to be healed, to gain knowledge, to know beauty and to wonder how it could be.”

(Joe Miller “date unknown”)



**PROGRAMME**  
**2015 Rufford Small Grants conference**

**Thursday, 16 April 2015**

Colophon Room		
Day 1	Talk title	Speaker
08:30	Registration	
09:00	Welcome address: Ian Little	
	<b>Chair: Ian little</b>	
09:15	<b>Plenary:</b> The role of conservation NGOs in a changing landscape	<b>Yolan Friedmann</b>
10:00	'Should I stay or should I go?' Investigating the potential impact of climate change on bat distributions in southern Africa	<b>Rachael Cooper-Bohannon</b>
10:20	The Distribution and Populations of Southern African Birds– the Need for More Data	<b>Vincent Parker</b>
10:40	Tea	
	<b>Chair: Keenan Stears</b>	
11:00	An investigation into the occurrence and distribution of white sharks <i>Carcharodon carcharias</i> in Algoa Bay, South Africa	<b>Matthew L Dicken</b>
11:20	Investigating abundance, distribution and habitat use of Indo-Pacific bottlenose dolphins <i>Tursiops aduncus</i> along the southeast coast of South Africa	<b>Olga Alejandra Vargas-Fonseca</b>
11:40	Demography and space use of a fenced population of African wild dogs <i>Lycaon pictus</i> in Hluhluwe-iMfolozi Park: implications for metapopulation management	<b>David G. Marneweck</b>
12:00	Namaqua National Park: Anatolian dogs for Wildlife Conservation	<b>Eianza van Lente (Paul van Helden)</b>
12:20	Population connectivity of sardines <i>Sardinops sagax</i> of the KZN sardine run using meristic, morphological and genetic data	<b>Brent Chiazzari</b>
12:40	Leopard population density in a mixed land use area of the Mangwe district of Zimbabwe	<b>Tanith Grant (Daniel M. Parker)</b>
13:00	<b>Group Photo</b>	
13:10	Lunch	
	<b>Chair: David Marneweck</b>	
14:00	Citizen science in cheetah research: the use of a photographic survey to estimate the minimum population size and conservation status of cheetahs in The Northern Tuli Game Reserve, Botswana	<b>Eleanor El Brassine</b>
14:20	Cape Cryptic Carnivore: An ecological and sociological survey for the conservation of the last brown hyena population in the Western Cape Province, South Africa	<b>Elsa EMS Bussière</b>
14:40	Sea turtle conservation efforts in Mozambique	<b>Jessica L. Williams</b>
15:00	The influence of season and stocking rate on the nature of interspecific interactions between cattle and oribi: conservation implications and management	<b>Keenan Stears</b>
15:20	Mapping biodiversity in False Bay: integrating underwater camera technology into marine spatial planning	<b>Lauren De Vos</b>
15:40	Tea	
	<b>Chair: Lauren De Vos</b>	
16:10	"Herbanisation" – Establishing the Seawinds cultural and conservation street garden; Cape Town, South Africa	<b>Leif M. Petersen</b>
16:30	Breeding Biology of the African White-backed Vulture <i>Gyps africanus</i> in Swaziland	<b>Machawe M. I. Maphalala</b>
16:50	Sessions end	
	<b>Social event: drinks, dinner and networking.</b>	

For more information, please contact Dr Ian Little on 033 330 6982/084 240 7341 or [ianl@ewt.org.za](mailto:ianl@ewt.org.za).

Friday , 17 April 2015

Colophon Room		
Day 2	Talk title	Speaker
	<b>Chair: Vincent Parker</b>	
08:30	<b>Plenary:</b> Future Earth: human capacity development in a risk society	<b>Jim Taylor</b>
09:15	Mercury contamination of the Nile Crocodile <i>Crocodylus niloticus</i> in the Okavango Delta, Botswana: A Baseline for the Assessment of Future Threats	<b>Vincent VA Shacks</b>
09:35	Elephant <i>Loxodonta africana</i> Conservation Planning and Monitoring in Mozambique Central Ecosystem Using GIS and Remote Sensing	<b>Armindo F. da Silva</b>
09:55	Ethnomedicinal use of African pangolins by traditional healers in Ghana and Sierra Leone	<b>Maxwell K Boakye</b>
10:15	TEA	
	<b>Chair: Sue Milton-Dean</b>	
10:40	Individual-based monitoring of mountain zebra populations in Namibia	<b>L. Morris Gosling</b>
11:00	Monitoring nature through tomorrow's leaders	<b>Cedric Maforimbo (Nicola Pegg)</b>
11:20	Conservation genetics of the endangered Knysna seahorse, <i>Hippocampus capensis</i> Boulenger 1900 (Syngnathidae)	<b>Thomas K. Mkare (Peter Teske)</b>
11:40	Decoupling environmental and trophic niches to examine native and non-native fish distributions	<b>Wilbert T. Kadye</b>
12:00	Sea-level changes and evolution of a southern temperate stream fish fauna	<b>Albert Chakona</b>
12:20	Management and conservation of Critically Endangered Cape lowland vegetation: impacts of alien grasses, herbivory and fire	<b>Jasper A. Slingsby</b>
12:40	Education for Conservation: The impact of education and community engagement on conservation goals in southern Zimbabwe	<b>Rosemary Groom</b>
13:00	Lunch	
	<b>Chair: Jasper Slingsby</b>	
14:00	Cape mountain zebra conservation – ensuring the future stability of this vulnerable sub-species	<b>Halszka Hrabar</b>
14:20	Saving <i>Smaug</i> : Conservation of the Sungazer <i>Smaug giganteus</i>	<b>Shivan Parusnath</b>
14:40	Lessons learnt from re-wilding of hand-reared Southern Ground-Hornbills	<b>Natasha Nel (Lucy Kemp)</b>
15:00	Renu-Karoo Veld Restoration cc – birth and growth of a sustainable biodiversity-based business	<b>Sue Milton-Dean</b>
15:20	The Namibian Dolphin Project - Cetaceans conservation in the face of human development.	<b>Simon Elwen</b>
15:40	Tea	
	<b>Chair: John Donaldson</b>	
16:00	<b>Plenary:</b> Scaly ant-eaters, giant hornbills and dragons: case studies of strong muti in Africa	<b>Ray Jansen</b>
16:45	Closing: John Donaldson	
16:55	Conference end	

For more information, please contact Dr Ian Little on 033 330 6982/084 240 7341 or [ianl@ewt.org.za](mailto:ianl@ewt.org.za).

**Please note: times and programme topics/speakers subject to change**

## Plenary Speaker



### **Yolana Friedmann**

Yolana Friedmann is the CEO of the Endangered Wildlife Trust, one of the largest conservation NGOs in southern Africa. She has an academic background in Veterinary Nursing (Onderstepoort Veterinary Faculty, University of Pretoria), a BA in English and Communications, an MSc in Environmental Studies (WITS) and MDP (Programme for Management Development) from the Gordon Institute for Business Science (University of Pretoria). She is a member of

the Golden Key International Honour Society and is a Certified Director by the Institute of Directors South Africa. Yolana was the first female recipient of the SAB Nick Steele Environmentalist of the Year award which she won in 2011. She was also the winner of the CEO Most Influential Woman in Business and Environment award in 2012 in the Environmental category, as well as the recipient of the 2012 Green Globe award.

Yolana is involved in many levels of conservation leadership and development and chaired the IUCN South African National Member's Committee and the Regional Advisory Committee of the IUCN's Regional Office for Southern Africa for two terms. She was the first South African to serve as a Regional Councillor the Council of the IUCN (International Union for the Conservation of Nature) and co-chaired the IUCN's Constituency Committee for four years. She is an Advisory Board member of the Ford Wildlife Foundation and Board member of Indalo Yethu, the South African Environmental Campaign. Yolana is also a non-executive director and member of the Board of the Institute of Directors South Africa (IoDSA) and serves on the IoDSA Sustainability Forum as well as its Social and Ethics Committee. She is a member of the South African Advisory Committee of the United Nations Global Compact. She is a judge of the Ecologic Awards, having previously judged the Green Trust Awards for several years. Yolana is currently a member of the Committee of Inquiry tasked with investigating the possibility of a trade in rhino horn, reporting to the Minister of Environmental Affairs.

A key focus of Yolana's career has been leadership development and strategy facilitation, and she has participated in programmes such as the Gordon Institute for Business Science Nexus Development Programme (2006), the Leadership for Conservation in Africa council, the African Leadership Seminar and is a Fellow of the Archbishop Tutu Leadership Fellowship (2007). Yolana was invited to participate in the Crans Montana Forum in 2015 and was selected as a GreenMatter Senior Fellow in 2014.

### **Talk Title:**

**The role of conservation NGOs in a changing landscape**

## Plenary Speaker



**Dr Jim Taylor**

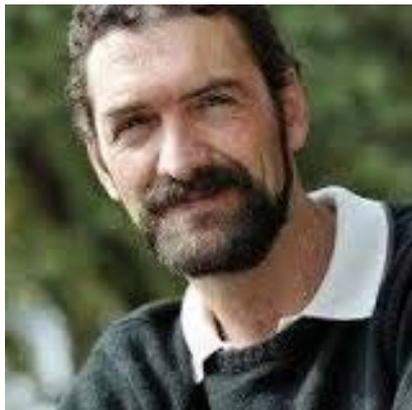
*WESSA Portfolio: Director of Environmental Education*

Jim has worked for WESSA for 30 years in the broad field of environmental education, social change processes and monitoring and evaluation. He has been directly involved in the establishment of a number of national and international initiatives including Eco-Schools in South Africa and the SADC Regional Environmental Education Programme. Jim is a founder member and Past President of the Environmental Education Association of Southern Africa (EEASA). He is also the recipient of a Human Rights award.

### **Talk Title:**

**Future Earth: human capacity development in a risk society**

## Plenary Speaker



**Professor Ray Jansen**

Appointed as an Associate Professor in Population and Community Ecology at Tshwane university of Technology, his teaching responsibilities involves lecturing at undergraduate and supervising post graduate students in environmental resource utilisation, ecology, population and community ecology. Research interests involve the impact of various forms of land management on montane grassland ecosystems with specific reference to avian community dynamics. He is also involved with research on a number of rare and endangered birds, reptiles and mammals and he has post graduate students undertaking research on the Southern Ground Hornbill populations outside of protected areas, population dynamics and distribution of the Giant Girdled Lizard and on the ecology, population distribution and genetics of the Ground Pangolins in Africa. Ray is currently the Chairman of the African Pangolin Working group affiliated to the IUCN.

### **Talk Title:**

**Scaly ant-eaters, giant hornbills and dragons: case studies of strong muti in Africa**

## PRESENTATION ABSTRACTS

### **‘Should I stay or should I go?’ Investigating the potential impact of climate change on bat distributions in southern Africa**

Rachael Cooper-Bohannon<sup>1,2,8\*</sup>, Hugo Rebelo<sup>2,3,8</sup>, Gareth Jones<sup>2</sup>, Orly Razgour<sup>1,8</sup>, Fenton (Woody) Cotterill<sup>4</sup>, Ara Monadjem<sup>5</sup>, Corrie Schoeman<sup>6</sup>, Peter Taylor<sup>7</sup>, Kirsty Park<sup>1,8</sup>

<sup>1</sup>University of Stirling, Stirling, Scotland, UK

<sup>2</sup>University of Bristol, Bristol, England, UK

<sup>3</sup>University of Porto, Portugal

<sup>4</sup>University of Stellenbosch, Stellenbosch, South Africa

<sup>5</sup>University of Swaziland, Kwaluseni, Swaziland

<sup>6</sup>University of KwaZulu Natal, Durban, South Africa

<sup>7</sup>University of Venda, Thohoyandou, South Africa

<sup>8</sup>Bats without Borders, University of Stirling, Stirling, Scotland, UK

\*Email: rachael.cooper-bohannon@stir.ac.uk

---

Southern Africa is a subcontinent with a rich bat fauna, but limited distribution data hinders ecological and conservation research. Climate change and extensive land use change are recognised as major threats to bats globally. Despite bats being a major taxonomic group in southern Africa we are unable to measure biodiversity change and consequently cannot implement any proactive measures to counter any declines. Southern Africa is an environmentally vulnerable region, ill-equipped for coping with extreme events. As such, climate change is likely to have a significant impact on biodiversity in this region. We used Maximum entropy modelling (Maxent) to investigate potential species ranges for past, current and future bat distributions. We projected to conditions during the Last Glacial Maximum (LGM) to determine species’ palaeo distribution across the subcontinent. We compared current distributions with both past projections and future forecasts. For forecasting we also used four different global climate change models (GCMs) under different IPCC5 climate change scenarios. This study illustrates how predictive modelling can be used as an important conservation tool to potentially fill knowledge gaps and highlight priority areas for conservation priorities, such as species likely to be affected by major range contractions and therefore most at risk from regional extinctions.

## **The Distribution and Populations of Southern African Birds– the Need for More Data**

Vincent Parker\*

\*Email: [vinparker@yahoo.com](mailto:vinparker@yahoo.com)

---

The first southern African bird atlas survey was completed in 1992 and bird atlas surveys for southern and central Mozambique were completed in 1999 and 2003 respectively. While atlas data are preferably collected by volunteers, the remote regions require a more dedicated effort. In Mozambique, data contributed by volunteers covered about 10% of the region and the balance was covered by the compiler. The second atlas survey for South Africa, Swaziland and Lesotho (SABAP2; currently underway) is revealing more extensive changes in species distribution than was anticipated. Range expansion westwards is the most frequently observed change. This can be attributed to human activities through the provision of water and trees in previously waterless and treeless regions, and through bush encroachment. The Important Bird Areas (IBA) and other conservation initiatives are based on the assumption of static distributions. To address the question of how these should be adapted to take into account the reality of shifting distributions requires additional data. Simple count data can reveal patterns of seasonal movement within the region which atlas data failed to reveal. Transect counts at a location in Pretoria revealed that the Amethyst Sunbird is a non-breeding migrant over a significant part of its range. The consequence for the IBA program is that the part of a species range included in the IBA network does not necessarily overlap with the breeding range. Until recently, SABAP2 could not produce species distribution maps for the target region because of a lack of data for a large part of the Northern Cape. Since November 2013, I have conducted an atlas survey of the most remote part of the Northern Cape, to the extent that new species distribution maps for South Africa, Swaziland and Lesotho are now feasible.

## **An investigation into the occurrence and distribution of white sharks *Carcharodon carcharias* in Algoa Bay, South Africa**

**Matthew L Dicken<sup>1\*</sup>, Malcolm J Smale<sup>2,3</sup>, Michelle Bradshaw<sup>3</sup>**

<sup>1</sup>KwaZulu-Natal Sharks Board, Private Bag 2, Umhlanga 4320, South Africa

<sup>2</sup>Department of Zoology, Nelson Mandela Metropolitan University, PO BOX 77000, Port Elizabeth 6031, South Africa

<sup>3</sup>Port Elizabeth Museum, P.O. Box 13147, Humewood, 6013, South Africa

\*Email: matt@shark.co.za

---

This study provides information on the occurrence and distribution of white sharks *Carcharodon carcharias* in Algoa Bay, South Africa. Aerial surveys and key informant interviews with fishermen identified the location and seasonal occurrence of sharks close to beaches. Further offshore, boat based trips were made to Bird Island, a seal colony, to chum for sharks. A total of 59 white sharks were fitted with acoustic V16 tags to investigate their fine scale movement patterns using an array of VR2 listening stations. Between October 2010 and March 2012 a total of 50 white sharks were sighted during aerial surveys with a maximum sighting rate of 7 sharks per hour. The majority (96.0%) of sharks observed were less than 2.5 m in length, immature and sighted in the spring and summer months between October and March (98.0%). A total of 58 white shark catches were recorded from key informant interviews. Sharks ranged in size from 1.5 to 2.5 m TL with young of the year sharks (< 1.75 m) accounting for 69.0% of the catch suggesting the existence of a possible nursery area. In contrast, sharks were only sighted at Bird Island in the winter months and reached up to 5 m in length. These results indicate a seasonal shift in the summer/winter distribution of sharks between inshore and offshore locations, respectively. Tag detections confirmed this movement pattern and that sharks are not confined to any specific part of the Bay. Understanding the movement and residency patterns of white sharks is critical for their management and conservation in Algoa Bay. It also provides important information which can be used to reduce the chance of encounters between bathers and sharks.

**Investigating abundance, distribution and habitat use of Indo-Pacific bottlenose dolphins *Tursiops aduncus* along the southeast coast of South Africa**

O. Alejandra Vargas – Fonseca<sup>1\*</sup>, Stephen P Kirkman<sup>2</sup>, Vic Cockcroft<sup>1,3</sup>, Pierre A Pistorius<sup>1</sup>

<sup>1</sup>Department of Zoology, Nelson Mandela Metropolitan University, PO Box 77000, Port Elizabeth 6031

<sup>2</sup>Department of Environmental Affairs, Oceans and Coasts Research, PO Box 52126, Victoria and Alfred Waterfront, Cape Town 8000

<sup>3</sup>Centre for Dolphin Studies; PO Box 1856, Plettenberg Bay 6600

\*Email: ale@earthcollective.net

---

The Indo-Pacific bottlenose dolphins *Tursiops aduncus* mostly utilise inshore waters and are susceptible to anthropogenic pressures. All bottlenose dolphins were classified as *T. truncatus* 1999, when *T. aduncus* was recognized as a separate species. Because much of the older scientific data do not distinguish between the two species, they are of little use in terms of investigating population trends, conservation status and other traits of each species. On account of this situation, the IUCN Red List of threatened species lists *T. aduncus* as data deficient. Limited information on *T. aduncus* is matched by a poor understanding of the effectiveness of current protection measures including protected area networks for the conservation of these marine top predators. This study will attempt to address these gaps by furthering our understanding of *T. aduncus* population abundance, spatial and temporal distribution, habitat use and genetic structure, specifically along the south east coast of South Africa between Sedgefield and Groot River. This part of the coast coincides with a network of three marine protected areas (MPAs), namely Goukamma, Robberg and Tsitsikamma. Emphasis will be placed on assessing the dolphins' utilization of the MPA network, identifying hotspots of activity outside of the MPAs and trying to explain spatial and temporal variability in dolphin presence and activity patterns. Preliminary results from the first few months of the study (2013-14) indicate that habitat use and preferred areas of *T. aduncus* have remained constant, relative to a previous assessment in 2002-03, but that there has been a decrease in the presence of the species in this area concomitant with a decrease in average group size. Low re-sighting rates of known individuals based on fin characteristics seem to confirm that *T. aduncus* in the study area are migratory, however further validation is required.

## **Demography and space use of a fenced population of African wild dogs *Lycaon pictus* in Hluhluwe-iMfolozi Park: implications for metapopulation management**

David G. Marneweck<sup>1,2\*</sup>, Dave J. Druce<sup>3,4</sup>, Kelly A. Marnewick<sup>2</sup>, Chris Kelly<sup>5</sup>, Michael J. Somers<sup>1,6</sup>

<sup>1</sup>Centre for Wildlife Management, University of Pretoria, South Africa

<sup>2</sup>Carnivore Conservation Programme, Endangered Wildlife Trust, South Africa

<sup>3</sup>Ezemvelo KwaZulu-Natal Wildlife, Hluhluwe-iMfolozi Park, South Africa

<sup>4</sup>School of Biological and Conservation Sciences, College of Agriculture, Engineering and Science, University of KwaZulu-Natal

<sup>5</sup>WildlifeACT Fund, uMkhuze Game Reserve, South Africa

<sup>6</sup>Centre for Invasion Biology, University of Pretoria, South Africa

\*Email: davidm@ewt.org.za

---

The African wild dog *Lycaon pictus* population in northern KwaZulu-Natal has increased steadily over the past decade due mainly to a managed metapopulation approach which aims to increase the number of wild dogs in South Africa. In the fenced Hluhluwe-iMfolozi Park (HiP), concerns are of a burgeoning wild dog population utilising the whole of HiP with negative effects on the ungulate population. In this study, we assessed the demographics over the past decade and current space use by wild dog packs in HiP. Demographic results from the last 10 years indicate that wild dog numbers in HiP are stable which contradicts the perception of a burgeoning population. HiP is also crucial as a feeder population for other metapopulation reserves at both provincial and national levels. We also found that although wild dog outer home ranges overlap slightly at the periphery, core areas are exclusive with breeding dens located in the core. Neighbouring packs' outer home ranges that did overlap contained highly related individuals. Most interestingly, we found data to suggest that 11% (~size of a pack's core use area) of HiP is unoccupied by wild dogs. This suggests that HiP is not saturated with wild dog home ranges, with potential space for either dispersers or a newly formed pack. These evidence-based results contradict the opinion-based assumptions of too many wild dogs and not enough space for wild dogs in HiP currently. We suggest that careful management is needed for wild dogs in HiP that is based on data driven research to assess concerns of the wild dog population. We discuss that such an approach is important to avoid knee-jerk reactions to perceived population trends that could have negative knock on effects to both the provincial and national population of wild dogs in South Africa

## **Namaqua National Park: Anatolian dogs for Wildlife Conservation**

Elanza van Lente\*

Namaqua National Park, PO Box 117, Kamieskroon 8241

\*Email: [elanza.vanlente@sanparks.org](mailto:elanza.vanlente@sanparks.org)

---

All over the world the age old battle between livestock farmers and nature always leads to heartbreak on both sides. Farmers target in particular jackal and caracal, but in the process thousands of other– often beneficial– animals are killed. This causes imbalances in nature.

The Anatolian dog's origins are the Anatolian Plateau of Turkey. The existence of the dog goes as far back as far as 3000 years. The dogs are excellent guard dogs, but unlike other breeds they lived almost entirely on their own with minimum interaction with the shepherds. They worked, ate, slept and traveled with the flock and were accepted as members of the flock.

History has shown that is always better to farm with nature than against it. To achieve this goal NNP has started an Anatolian Dog Breeding project in June 2008. This follows 2 successful pilot projects.

The purpose of the project is to breed and train the Anatolian Dog, provide support and training and to make it affordable for the local communal and commercial farmers.

The project consists of 4 breeding pairs (3 males and 4 females). Holding pens were constructed and kennels erected at Namaqua National Park. The dogs were sourced from various blood lines across the country. Litters can be anything from 2 -10 puppies. These puppies are placed with the farmers' stock at age 8 weeks. This is where the dog is at its happiest, and the puppy will now grow up to be part of the flock. Training and veterinary care is provided during the growing year.

Over the past 4 years numerous pups has been placed with decidedly positive results. Cape Leopard Trust (CLT) recently started a 3 year research project which investigates, amongst other, the effectiveness of the Anatolian dogs.

## **Population connectivity of sardines *Sardinops sagax* of the KZN sardine run using meristic, morphological and genetic data**

Brent Chiazzari<sup>1\*</sup>, Angus H.H. MacDonald<sup>1</sup>, Sean O'Donoghue<sup>2</sup>

<sup>1</sup>University of KwaZulu-Natal

<sup>2</sup>eThekweni Municipality

\*Email: [brent.chiazzari@gmail.com](mailto:brent.chiazzari@gmail.com)

---

The Sardine run occurs annually when large schools of sardine *Sardinops sagax* travel from the Agulhas Bank towards KwaZulu-Natal, and has significant ecological and anthropogenic importance. Recent investigation has highlighted the nature and mechanisms resulting in the sardine run, however, critical questions about why the sardine run occurs remain unanswered. Therefore, the aim of this project was to elucidate the population diversity, connectivity and structure of sardines undertaking the sardine run. Sardines were sampled at four sites along the South African coast, and their morphology assessed using meristic data and geometric morphometrics. Nine exon-primed, intron-crossing (EPIC) DNA markers and the mitochondrially encoded cytochrome oxidase I (mtCOI) region of DNA were used for population and phylogeographic genetic analyses. Morphological analyses revealed significant differences between head size and shape of sardine run stock compared with other regions, and supports the delineation of a Western Cape and Agulhas Bank stock. Phylogeographic analysis using cytochrome oxidase I data, supported the idea that the *Sardinops* genus is monotypic despite current taxonomy. Genetic analyses confirmed low levels of segregation between sardines from the sardine run and the Western Cape stock. However, larvae spawned in KwaZulu-Natal demonstrated moderate levels of isolation from the Western Cape stock. The results reveal that there is successful recruitment of KwaZulu-Natal juveniles to the adult stock undertaking the sardine run, but not to the Western Cape population. This suggests that although sardines from the West Coast and Agulhas Bank may partake in the sardine run, only a certain subpopulation of the Agulhas Bank stock spawn successfully in KwaZulu-Natal. These results support the hypothesis that the sardine run represents a subpopulation spawning migration of *Sardinops sagax* in South Africa.

## **Leopard population destiny in a mixed land use area of the Mangwe district of Zimbabwe**

Tanith Grant\*, Daniel M. Parker

Wildlife and Reserve Management Research Group, Department of Zoology and Entomology,  
Rhodes University, Grahamstown, South Africa

\*Email: [tanithgrant@gmail.com](mailto:tanithgrant@gmail.com)

---

Very little robust population data exist for African leopards *Panthera pardus* in general, and almost no density or spatial ecology data exist for leopards in Zimbabwe. Zimbabwe has one of the highest annual CITES leopard trophy hunting quotas in Africa, the sustainability of which has not been assessed. The focal area of this study was within the Mangwe district, in the south-west of Zimbabwe. The region is dominated by cattle and wildlife ranches, with high levels of leopard hunting, making it an important area for assessing leopard population density and spatial ecology. Three population density estimation methods were employed: a spoor index survey, an unbaited camera-trapping survey and a baited camera-trapping survey. Spoor indices appeared to underestimate the leopard population (1.28-3.29 leopards/ 100 km<sup>2</sup>). In addition, the unbaited camera survey only produced six leopard photographs, unsuitable for individual identification and analysis. By contrast, the baited camera survey produced 292 identifiable leopard photographs, from which 13 individuals were identified. Density estimates ranged between 4.79±0.83 leopards/100 km<sup>2</sup> and 5.12±0.62 leopards/100 km<sup>2</sup>. Our data represents the first robust leopard density assessment for Zimbabwe. In addition, our results indicate that the current hunting quota issued to the Mangwe area is unsustainable. Consequently, we recommend revising the quota to five leopards for the entire area, and halving the current national leopard quota to 250, until a national leopard census is completed.

**Citizen science in cheetah research: the use of a photographic survey to estimate the minimum population size and conservation status of cheetahs in The Northern Tuli Game Reserve, Botswana**

Eleanor EI Brassine\*, Dan DM Parker

Wildlife and Reserve Management Research Group, Department of Zoology and Entomology, Rhodes University, Grahamstown, South Africa

\*Email: [alienor.brassine@gmail.com](mailto:alienor.brassine@gmail.com)

---

The cheetah population *Acinonyx jubatus* of the Northern Tuli Game Reserve (NOTUGRE) in Botswana has until now been unstudied. Botswana is considered a strong hold for free roaming cheetahs, believed to hold the second largest cheetah population in Southern Africa and together with Namibia, Kenya, and Tanzania to hold the last remaining viable populations of cheetahs in Africa. However, Botswana has had limited research on its cheetah populations and information specific to the east of the country is lacking. A photographic survey was conducted between January 2012 and November 2013 to describe the cheetah population of NOTUGRE, including estimates of the minimum population size, demographics, and distribution. A total of 447 cheetah sightings were received amounting to 13179 photographs for a period of eight years (2006-2013). Sightings were more frequent during the cool dry season, possibly because of a more open landscape and improved visibility. But it also coincides with the peak tourism season. A minimum population estimate of 10 cheetahs was estimated for 2013, although the population is likely to be continuous with cheetahs occurring outside the reserve. There is however, no clear evidence of cheetah movement between South African and Botswana. Photographs from this survey also provided an indication of the changes in population size over the last eight years. Notably, fewer individuals were identified in 2013 than in previous years (2006, 2010, 2011, and 2012) despite the larger sample size and survey effort in 2013. This may be as a result of increased intra-guild predation with a recovering lion population but could also be due to human related killing. The use of photographic records, including recent and dated photographs, may provide an alternative to intensive field studies that involve high financial and time expenses. A full population understanding requires further research on the cheetahs occurring in South Africa and Zimbabwe, particularly establishing whether connections between these sub-populations exist.

## **Cape Cryptic Carnivore: An ecological and sociological survey for the conservation of the last brown hyena population in the Western Cape Province, South Africa**

Elsa EMS Bussièrè<sup>1\*</sup>, Les LG Underhill<sup>1</sup>, Greg Distiller<sup>2</sup>

<sup>1</sup>Animal Demography Unit, Department of Biological Sciences, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa

<sup>2</sup>Department of Statistical Sciences, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa

\*Email: [elsabussiere@gmail.com](mailto:elsabussiere@gmail.com)

---

The Little Karoo is a mountainous semi-desert located in the Western Cape Province of South Africa. The landscape is a mosaic of farms and small protected areas, and it is part of a unique biogeographic region, one of the 34 internationally recognized biodiversity hotspots. This unique ecosystem suffers from an endless war between farmers and wildlife. Hundreds of years ago, this area housed a plethora of mega-fauna including lions, elephants, buffaloes and even black rhinoceros. These have all been extirpated. However, in the roughest mountains of the Western Cape Province, a wonderful array of smaller wild animals still exists. The two last large carnivores of the area are the brown hyena *Hyaenna brunnea* and the Cape mountain leopard *Panthera pardus*; the latter has become a keystone species and plays the critical role of maintaining the structure of the ecological community. The region has a low agricultural productivity, allowing extensive animal farming only. Livestock depredation threatens the agricultural sector, and retaliatory killing depletes the carnivore populations.

Throughout Africa, the major threats to leopard and brown hyena are habitat conversion and intense persecution, especially in retribution for real and perceived livestock loss. Although these carnivores are adaptable and widespread species, there are many threatened subpopulations. The last brown hyena population of the Western Cape Province is now found in the mountains of the Little Karoo, and may only number around 50 individuals at any one time.

This ecological and sociological study aims to estimate the population density of Cape mountain leopards and brown hyenas by deploying camera traps, to understand the ecology of livestock-raiding leopards/brown hyenas on farmlands by deploying GPS satellite collars, to understand the sociological challenges that farmers face when livestock raiding occurs, and to identify collaborative opportunities to establish economic initiatives promoting production-with-protection strategies by leading questionnaire surveys.

## Sea turtle conservation efforts in Mozambique

Jessica L. Williams<sup>1,2,3,4,5\*</sup>, Simon J. Pierce<sup>2,3</sup>, Mariana MMP Fuentes<sup>1,4</sup>, Mark Hamman<sup>1</sup>

<sup>1</sup>James Cook University, School of Earth and Environmental Sciences, Townsville, QLD 4811, Australia

<sup>2</sup>Marine Megafauna Foundation, Tofo Beach, Inhambane, Mozambique

<sup>3</sup>All Out Africa Research Unit, Marine Research Centre, PO Box 153, Lobamba, Swaziland

<sup>4</sup>ARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville, QLD 4811, Australia

<sup>5</sup>Tartarugas para o Amanha Lda, Praia do Tofo, Inhambane, Mozambique

\*Email: [jess@mozturtles.com](mailto:jess@mozturtles.com)

---

Despite being legally protected since 1965, poaching is an increasing threat to regional Mozambican sea turtle populations. The project area has been confirmed habitat for four of the five Mozambican sea turtle species Loggerhead *Caretta caretta*, Green *Chelonia mydas*, Hawksbill *Eretmochelys imbricata* and Leatherback *Dermochelys coriacea*. The nesting species are primarily Loggerhead and Leatherback although some Green nesting occurs. Poaching of all species occurs throughout the year however during the nesting season (Oct-Mar) nesting species are likely to be at greater risk.

This project is providing the first information from the country on the extent of sea turtle poaching and its impact on nesting and in-water sea turtle populations. By working directly with former and current poachers we will better-understand why poaching has increased and how to develop practical alternatives and/or enforcement strategies. Here we will present an overall summary of the different parts of the project and the results to date and future planned works. Including; work exploring the link between recent declines in nesting turtles with a rise in poaching, beach surveys and interviews to understand motives, identify suitable alternative livelihood concepts and site visits to known and suspected poaching hotspots to quantify the impacts across a wider geographical region.

Keywords: Sea Turtles, Conservation, Mozambique, Praia do Tofo, Poaching, Alternative livelihoods, citizen science, Photo-identification

## **The influence of season and stocking rate on the nature of interspecific interactions between cattle and Oribi: conservation implications and management**

Keenan Stears

School of life Sciences, University of KwaZulu-Natal, Private Bag X01, Scottsville 3209, South Africa

Email: [keenan.stears@gmail.com](mailto:keenan.stears@gmail.com)

---

Domestic herbivores forage alongside wildlife in many parts of the world. Through their feeding, domestic herbivores can greatly impact wildlife. However, these impacts are not always negative. I explored the influence of cattle stocking rates and season on the foraging behaviour, and the resulting nutritional intake rates, of Oribi antelope *Ourebia ourebi*, in a South African rangeland. During the wet season when cattle and Oribi utilised the same feeding areas, there was high dietary overlap and both species fed from swards of similar height. At low stocking rates (1.7 ha/AU), relative grass regrowth was high enough for Oribi and cattle to utilise the same species and grass height. However, in the high stocking rate camp (0.94 ha/AU) there was less relative regrowth. In response, Oribi adjusted their feeding and focused on the green leaves available in taller grass swards not used by the cattle. This adjustment allowed these Oribi to achieve the same nutritional intake as the Oribi in the lower stocking rate camps. Overall, Oribi maintained higher crude protein intake rates feeding with cattle than they did when feeding in ungrazed camps. Thus, cattle facilitated Oribi during the wet season. During the dry season, Oribi obtained their lowest crude protein intake in the high stocking rate camp, while Oribi obtained higher, but similar crude protein intake rates when feeding in camps with low and intermediate stocking rates. Moreover, the high intensity wet season grazing by cattle in the high stocking rate camp reduced the availability of high quality grass for Oribi in the dry season. Thus, wet season cattle feeding competed with Oribi dry season feeding. Finally, across both seasons, cattle grazing altered grass height and structural heterogeneity, which could potentially increase the predation risk of Oribi.

## **Mapping biodiversity in False Bay: integrating underwater camera technology into marine spatial planning**

Lauren De Vos<sup>1\*</sup>, Anthony TF Bernard<sup>2</sup>, Albrecht Götz<sup>2,3</sup>, Colin G Attwood<sup>1</sup>

<sup>1</sup> Department of Biological Sciences and Marine Research Institute, University of Cape Town, Private Bag X3, Rondebosch, Cape Town 7701, South Africa

<sup>2</sup> Elwandle Node, South African Environmental Observation Network (SAEON), Grahamstown, South Africa

<sup>3</sup> Department of Zoology, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa

\*Email: [laurendv01@gmail.com](mailto:laurendv01@gmail.com)

---

Increasing anthropogenic pressures on our oceans have amplified the global focus on an ecosystem-based approach to conservation. This has renewed efforts to understand how fish are distributed across a region and which environmental factors distinguish these community types. Establishing this baseline information for regions and species of interest informs monitoring, and contributes towards evidence-based marine spatial planning. False Bay in the Western Cape of South Africa has a long history of human-use, with consequences for the current state of its marine biological diversity and abundance. Where biodiversity meets anthropogenic-pressures, an effective monitoring strategy and informed conservation planning are essential to understand the system, manage resources and mitigate conflict. However, adequate sampling in False Bay to assess fish populations, and indeed, long-term monitoring along the South African coastline, is limited largely by the logistical challenges presented by traditional monitoring methods. Underwater visual census is restricted by depth, sampling (dive) duration and the availability of skilled labour. Controlled angling surveys do not achieve equally efficient representation of species in a region and catch-per-unit-effort measures must account for variation in fisher skill and species' catchability. With recent advances in camera technology quality and affordability, recent research points to baited remote underwater video systems (BRUVs) as a technique that eliminates inter-observer variability and increases statistical power. These systems offer low impact assessments that are particularly useful for large-bodied, mobile predators and resident reef fish populations. Jump camera surveys replace traditional scuba assessments to quantify benthic, macro-invertebrate communities. This project introduces both camera techniques as a non-extractive means of understanding the ecological patterns of biological communities in False Bay. A first exploration of the relationships between abiotic factors, invertebrate communities and fish assemblages in the region will ultimately inform a conservation plan for the bay.

Keywords: baited remote underwater video systems (BRUVs), biodiversity, spatial planning

**“Herbanisation” – Establishing the Seawinds cultural and conservation street garden;  
Cape Town, South Africa**  
Petersen, L.M.\*, Reid, A.M.

Sustainable Livelihoods Foundation, Wynberg, Cape Town, South Africa

\*Email: [leif.petersen@livelihoods.org.za](mailto:leif.petersen@livelihoods.org.za)

**Video link:** <https://www.youtube.com/watch?v=o8N1bKiHx6g&feature=youtu.be>

---

Wild harvesting of traditional medicinal plants from natural environments has taken place over millennia in Africa. However urbanization and cash economies have effectively altered harvesting from a cultural, traditional and subsistence activity to a subculture of commonly illicit activities located primarily within the cash-based urban informal economy. The metropolitan area of Cape Town has more than 23 formally protected conservation areas which have been established alongside a highly diverse cultural and economically divided population who share distinct and potentially conflicting perspectives on access to, and management of, resources in this globally unique natural environment. These groups share diverse ideologies, poverty and profit motives towards the utilisation of local biodiversity.

With initial funding support for research into the scale of local harvests from city reserves from Rufford Small Grants for Nature, and subsequently from the Table Mountain Fund (an associated trust of WWF-SA), the Sustainable Livelihoods Foundation is in the process of building linkages between resident Khoi-linked Rasta herbalists and the broader conservation audience through the establishment of street gardens of local habitat and herbal medicinal plants in the community of Seawinds. The gardens bring an opportunity for engagement, experimentation and urban renewal, with the intention of promoting inclusive management of urban public space with a non-conventional conservation audience through the use of economically and culturally important plants.

Keywords: street gardens, traditional medicine

**Breeding Biology of the African White-backed Vulture *Gyps africanus* in Swaziland**  
Machawe M.I. Maphalala

University of Swaziland, Private Bag 4, Kwaluseni M201, Swaziland

Email: machawe158@gmail.com

---

The African White-backed Vulture is a species that has seen rapid declines in its population across its range due to threats such as loss of habitat, reduced availability of carrion, poaching for traditional medicine purposes and many other threats that also affect other species of vultures. Due to the severity of these threats this species has been upgraded to Endangered. There is a need to investigate specific threats for each region because the importance of these threats may vary geographically. In Swaziland threats to vultures have not been quantified yet but previous studies have shown that African White-backed Vultures are increasingly being limited to breeding within protected areas even though suitable habitat does occur outside protected areas. The current study therefore investigates threats that are faced by vultures breeding in Swaziland at Mlawula Nature Reserve where 11 pairs of vultures have been breeding in the 2014 breeding season. Camera traps were used as a tool to investigate contribution of food provision to the breeding success of the breeding vultures. Camera traps were installed in seven of the active nests to monitor food provision to the chicks. Food provision and growth rate were monitored from about four weeks after hatching until fledging (for successful nests). The specific objectives of the study were: to determine the breeding success, determine food provision rate to the chicks and to determine the growth rate of the chicks. This study provides baseline data that will assist conservation authorities in deciding if there is a need to provide supplementary feeding at least during the breeding season in order to improve breeding success.

**Mercury contamination of the Nile Crocodile *Crocodylus niloticus* in the Okavango Delta, Botswana: A Baseline for the assessment of future threats**

Vincent VA Shacks\*, Adam AC Smith, Anson AW Mackay, Sven SL Bourquin

Okavango Crocodile Monitoring Programme, PO Box HA 146 HAK, Maun, Botswana

\*Email: vshacks@gmail.com

---

Mercury is a global neurotoxicant especially dangerous in wetlands and newly flooded areas which can be sites of enhanced monomethylmercury, a form of mercury that can be readily biomagnified. The study was conducted in the Okavango Delta, Botswana, a wetland ecosystem characterized by both permanent and seasonal floodplains. Because of the biogeochemical cycling properties of mercury it is expected that wetlands can potentially be sites of elevated levels of monomethylmercury which hold potential threats for both the subsistence fishing communities as well as crocodiles. Samples from individual crocodiles *Crocodylus niloticus*, fish (*Clarius gariepinus*, *Oreochromis andersoni*, *Serranochromis angusticeps* and juvenile *Tilapia* sp.), macrophytes (*Nymphaea* sp.) and bottom channel sediments were collected from the Delta and analysed for Mercury levels. The results showed significant evidence of mercury biomagnification with mean concentrations for fish and crocodiles an order of magnitude higher than macrophytes and sediment. This exploratory study presents evidence for mercury biomagnification in the Okavango ecosystem

## Elephant *Loxodonta africana* Conservation Planning and Monitoring in Mozambique Central Ecosystem Using GIS and Remote Sensing

A.F. da Silva<sup>1</sup>, E.E.Nombora<sup>2</sup>

<sup>1</sup>Geographer and wildlife manager, National Statistics Bureau and University Eduardo Mondlane, Department of Biological Sciences, Maputo. Mozambique

<sup>2</sup>Forestry Engineer and Lecturer, Higher Polytechnic Institute of Manica, P.O.Box 147 Chimoio, Mozambique

Emails: [ndo.silva@gmail.com](mailto:ndo.silva@gmail.com) and: [nombora@yahoo.com.br](mailto:nombora@yahoo.com.br) or [nombora@gmail.com](mailto:nombora@gmail.com)

---

Kernel spatial movement analysis was used to assess elephant distribution. Elephant core home range was primarily (48.54%) found in community land comparatively to hunting blocks (35.00%) and national parks (16.45%). The analysis of habitat distribution diversity and availability by means of Landsat 7 ETM<sup>+</sup> NDVI-Normalized Difference Vegetation Index, Shannon Winner Index and General Linear Model-GLM long-established that NDVI performance differed significantly ( $p = 0.000$ ) between the habitats, expressing the larger effect size variability between them (Partial Eta= 0.952;  $p=0.000$ ). Further, NDVI increases with altitude ( $r=0.945$ ,  $p= 0.001$ ) and decreases with plant richness ( $r= -0.416$ ;  $p= 0.727$ ). This had implications to elephant habitat use. Spatial correlation between elephant distribution and habitat types denoted that Elephant foremost (53.54%) utilized the semi-arid plateau of *Combretum sp* and *Colophospermum mopane*; reasonably (34.92%) used the degraded lowlands of Urema and Zambezi floodplains and relatively avoided (11.54%) the moist evergreen afro-montane of *Brachystegia spiciformis*. Repeated ANOVA has shown that elephant habitat use differed significantly ( $p = 0.003$ ) between habitats. Semi-arid plateau was 118.51 times more utilized than the moist evergreen afro-montane. Spatial Model for Landscape Elephant Conservation-SMLEC identified that habitat use by elephant was detrimental to water availability (40.2%;  $p=0.000$ ), human activities (36.80%;  $p=0.000$ ) and vegetation diversity (35.00%;  $p=0.000$ ). Aridity index mostly (8.3%;  $p=0.000$ ) determined the factors influencing elephant habitat use in different landscape units, confirming the hypothesis that elephant survivor in the ecosystem was a strategy of adaptation to the impacts of climate change and variability.

Elephant-Habitat Prediction Model-EHPM concluded that most habitats in need of protection are almost found outside protected areas facing the impacts of drought and human land uses/needs.

## **Ethnomedicinal use of African pangolins by traditional healers in Ghana and Sierra Leone**

**Maxwell K Boakye**<sup>1\*</sup>, Darren W Pietersen<sup>4</sup>, Antoinette Kotzé<sup>2,3,4</sup>, Desiré-Lee Dalton<sup>2</sup>, Raymond Jansen<sup>1,4</sup>

<sup>1</sup>Department of Environmental, Water and Earth Sciences, Tshwane University of Technology, P/Bag X680, Pretoria, 0001, South Africa

<sup>2</sup>National Zoological Gardens of South Africa, P.O. Box 754, Pretoria, 0001, South Africa

<sup>3</sup>Genetics Department, University of the Free State, P.O. Box 339, Bloemfontein 9300, South Africa

<sup>4</sup>African Pangolin Working Group, Pretoria, South Africa

\*Email: [maxwell\\_boakye@yahoo.com](mailto:maxwell_boakye@yahoo.com)

---

Traditional medicine has been practised in Ghana and Sierra Leone for centuries with the majority of people in both countries still patronising the services of traditional healers. Pangolin (Pholidota: Manidae) is a mammal that is frequently used for medicinal purposes in Africa. However, very little is known about the extent of use and which body parts are used to treat, alleviate or cure particular ailments and diseases. The aim of this study was to determine the prevalent use of pangolin body parts as a therapeutic remedy and the level of knowledge of use among traditional healers in Ghana and Sierra Leone. Ethnozoological data were gathered through semi-structured interviews from 48 and 63 traditional healers in Ghana and Sierra Leone, respectively. A total of 21 pangolin parts and tissue oil was found to be used to treat various ailments in Sierra Leone while 13 body parts were used to treat various ailments in Ghana. The results revealed that pangolin body parts play a vital role in the primary health care of the people. Pangolin scales was found to be the most culturally significant body part according to the use agreement value in both countries. However, Wildlife Conservation Act in both Ghana and Sierra Leone prohibits any person from hunting or being in possession of pangolins. It is likely that the unregulated harvesting and poaching of this threatened species, for medicinal purposes, is unsustainable. A study on the population status and ecology of the three species of African pangolins occurring in both countries is urgently required in order to determine the impact this harvest for traditional medical purposes has on their respective populations as current levels appear to be unmonitored and unsustainable.

## **Individual-based monitoring of mountain zebra populations in Namibia**

L. Morris Gosling\*

University of Newcastle, Newcastle upon Tyne, UK; and Mountain Zebra Project, Namibia Nature Foundation, Windhoek, Namibia

\*Email: [l.m.gosling@ncl.ac.uk](mailto:l.m.gosling@ncl.ac.uk)

---

Mountain zebra range from southern Angola, down the mountainous escarpment that runs the length of Namibia, and into South Africa. The animals in Namibia and South Africa have a degree of genetic distinctiveness and can be regarded as subspecies, respectively Hartmann's mountain zebra *Equus zebra hartmannae* and Cape mountain zebra *Equus zebra zebra*. The two subspecies have quite distinct conservation problems. Cape mountain zebra have a small, fragmented population that is only slowly recovering in protected areas. Hartmann's are more abundant and extensive but their populations are more dependent on access to very large areas, particularly in areas with low and unpredictable annual rainfall and their populations can crash in times of severe drought. Apart from their intrinsic conservation value, mountain zebra in Namibia have a substantial commercial value in terms of both consumptive and non-consumptive use. The population is divided between animals in state protected parks and areas with various forms of multiple-use. Communal conservancies are strongly supported by national legislation and have increased in recent years, particularly in the north-west; mountain zebras have been widely reintroduced to these conservancies and are increasing steadily. Populations are monitored using a variety of techniques including air surveys and road transects counts. The work outlined here employs individual recognition using variation in stripe patterns in a number of study areas. The individual-based approach allows a number of additional monitoring techniques such as mark-recapture estimates, and, ultimately more important, an understanding of the population processes that limit mountain zebra populations in an arid environment.

## **Monitoring nature through tomorrow's leaders**

Cedric Maforimbo\*, Nicola Pegg

Dambari Wildlife Trust, P.O. Box 3863, Bulawayo, Zimbabwe

\*Email: [education@dambari.com](mailto:education@dambari.com)

---

The Matobo Biodiversity Monitoring Project (MBMP) was established in March 2012 by Dambari Wildlife Trust (DWT) with major funding from Rufford SGP. We work with five rural secondary schools close to Matopos National Park in the Matobo Hills World Heritage Site in south-western Zimbabwe. This project fits within DWT's "conservation across boundaries" initiative, which seeks cross-boundary and interdisciplinary solutions to conservation challenges in the cultural landscape. The MBMP's principal aim is to develop community-based natural resource monitoring through schools that will ultimately be self-sustaining and which will generate quantified data to help communities to identify and mitigate against natural resource depletion. The specific objectives are (i) to teach high school pupils how to collect basic ecological data, (ii) for them to monitor resources in their environment whilst going about their daily routines, (iii) to create awareness on environmental issues through production of awareness material, (iv) to cultivate environmental stewardship in the pupils, and (v) to introduce the pupils to career paths in the environmental field. Pupils are taught a range of simple, repeatable data collection methods focused on vegetation, birds and invertebrates in the three school terms. Longitudinal data are therefore collected, which will help with tracking environmental health and populations of key flora and fauna. Interest in the natural environment is encouraged through lectures, DVDs and games, and environmental awareness in surrounding communities is promoted through printed media and pupils sharing experiences. Our presentation will report on the successes and challenges of the project in its first three years, and the specific aims of the project going forward.

Keywords: biodiversity, conservation, environmental education, monitoring

**Conservation genetics of the endangered Knysna seahorse *Hippocampus capensis* Boulenger 1900 (Syngnathidae)**

Thomas K. Mkare<sup>1\*</sup>, Bettine, J. van Vuuren<sup>1</sup>, Peter R. Teske<sup>1</sup>

<sup>1</sup>Department of Zoology, University of Johannesburg, Kingsway Campus, Auckland Park 2006, South Africa

\*Email: thomasmkare@yahoo.com

---

The South African Knysna seahorse, *Hippocampus capensis*, is the most threatened species in the genus *Hippocampus* according to the IUCN Red List, because it has the smallest distribution range of any of the world's seahorses. It occurs only in the Knysna, Swartvlei and Keurbooms estuaries on the South African south coast. Following reports of invasive species and continued degradation of the species' habitats due to human encroachment, there is great uncertainty about the long-term survival of *H. capensis*. Moreover, the populations in the Swartvlei and Keurbooms estuaries are frequently subject to mass mortalities. Genetic research conducted a decade ago using mitochondrial DNA sequence data could not provide answers to several questions of conservation relevance. First, if one of the populations becomes extinct, would it be acceptable to restore it by translocating individuals from another population? Second, should occasional translocations be used as a management tool to increase genetic diversity in all three populations, and in that way reduce the risk of inbreeding depression? Using highly polymorphic microsatellite loci, this study will generate information useful for the improved management of this endangered species.

## **Decoupling environmental and trophic niches to examine native and non-native fish distributions**

Wilbert T. Kadye\*, Anthony J. Booth

Department of Ichthyology and Fisheries Science, Rhodes University, P.O. Box 94, Grahamstown 6140, South Africa

\*Email: [kadyew@yahoo.com](mailto:kadyew@yahoo.com)

---

Ecological niche theory predicts that coexistence in natural communities is driven by niche differentiation arising from both physical factors and biotic interactions. By comparison, successful invaders are assumed to override this theory because they are considered to be primarily driven by niche opportunities that facilitate the invaders to exploit a wide range of habitats and resources. To test these hypotheses, we used two complementary concepts of environmental and trophic niches to investigate coexistence patterns of native and non-native fishes within an invaded river system. For the native fishes, we found contrasting environmental niche breadths that varied from being small to being large, and that overlapped for most species except minnows that were restricted to headwater tributaries. We also found high niche overlap among fishes with similar distribution. In comparison, stable isotope analyses revealed trophic niche segregation for species that had overlapping environmental niches. We therefore inferred that spatial organisation was important in explaining native species distribution patterns, whereas trophic niche partitioning suggested that species occurring in similar environmental conditions differed in their resource utilisation patterns. Most non-native fishes were found to have broad environmental niches, and these fishes were associated with high tolerance to environmental conditions, which partly supported the niche opportunity hypothesis. These fishes, nevertheless, exhibited trophic niche segregation, which suggested that resource utilisation was either non-random or was explained by trophic niche conservatism. The broad patterns in distribution and trophic interrelationships of both native and non-native fishes were corroborated by a three-matrix based approach that identified four functional groups based on their similarities in isotope niche metrics. Native and non-native species richness were found to be negatively correlated. We further inferred that both high non-native species richness and alteration of flow regime were likely to have negative impact on native species.

## Sea-level changes and evolution of a southern temperate stream fish fauna

Albert Chakona\*, Ernst R. Swartz, Gavin Gouws

South African Institute for Aquatic Biodiversity, P. Bag 1015, Grahamstown, South Africa

\*Email: [a.chakona@saiab.ac.za](mailto:a.chakona@saiab.ac.za)

---

This study used phylogenetic analyses of mitochondrial cytochrome b sequences to investigate genetic diversity within three broadly co-distributed freshwater fish genera (*Galaxias*, *Pseudobarbus* and *Sandelia*) to shed some light on the processes that promoted lineage diversification and shaped geographical distribution patterns. A total of 205 sequences of *Galaxias*, 177 sequences of *Pseudobarbus* and 98 sequences of *Sandelia* from 146 localities across nine river systems in the south-western Cape Floristic Region (South Africa) were used. The data were analysed using phylogenetic and haplotype network methods and divergence times for the clades retrieved were estimated using \*BEAST. Nine extremely divergent (3.5–25.3%) lineages were found within *Galaxias*. Similarly, deep phylogeographic divergence was evident within *Pseudobarbus*, with four markedly distinct (3.8–10.0%) phylogroups identified. *Sandelia* had two deeply divergent (5.5–5.9%) lineages, but seven minor lineages with strong geographical congruence were also identified. The Miocene-Pliocene major sea-level transgression and the resultant isolation of populations in upland refugia appear to have driven widespread allopatric divergence within the three genera. Subsequent coalescence of rivers during the Pleistocene major sea-level regression as well as intermittent drainage connections during wet periods are proposed to have facilitated range expansion of lineages that currently occur across isolated river systems. The high degree of genetic differentiation recovered from the present and previous studies suggest that freshwater fish diversity within the south-western CFR may be vastly underestimated, and taxonomic revisions are required.

**Management and conservation of Critically Endangered Cape lowland vegetation: impacts of alien grasses, herbivory and fire**  
Jasper A. Slingsby

Fynbos Node, South African Environmental Observation Network (SAEON), Centre for Biodiversity Conservation, Kirstenbosch Gardens, Private Bag X7, Rhodes Drive, Claremont 7735, Cape Town, South Africa and,  
Centre for Statistics in Ecology, Environment and Conservation, Department of Biological Sciences, University of Cape Town

Email: [jasper@saeon.ac.za](mailto:jasper@saeon.ac.za)

---

The highly diverse lowland vegetation of the Cape Floristic Region has suffered large-scale transformation and less than 10% of its original extent remains, making the species and vegetation types it contains some of the most endangered in the world. Unfortunately, the fragments that have persisted are typically small and isolated (0.25-4000ha); scattered across agricultural or urban landscapes and threatened with further transformation. Alien plant and animal species invasions and the disruption of natural ecological processes such as fire and herbivory regimes and pollinator or seed dispersal mutualisms provide additional threats. Where fragments are actively managed to maintain biodiversity, managers are faced with a dearth of knowledge and appropriate research to guide actions or support management decisions. Here I report on a project using vegetation survey and remote-sensing tools to explore post-fire recovery of vegetation biomass and biodiversity in two reserves that support two Critically Endangered vegetation types. Firstly, the project aimed to quantify the impacts of invasive alien grasses, indigenous large herbivores, and the potential interaction between them, and make recommendations for the management of indigenous large herbivores in lowland vegetation fragments. Secondly, these reserves comprise the largest remaining contiguous habitat for the Geometric Tortoise *Psammobates geometricus*, and the project aimed to produce a detailed vegetation map and a library of DNA barcode sequences to support research into the tortoise's diet and habitat use.

Keywords: DNA barcoding, Geometric Tortoise, *Psammobates geometricus*, Swartland Shale Renosterveld, Swartland Alluvium Fynbos, satellite remote-sensing, vegetation survey

**Education for conservation: The impact of education and community engagement on conservation goals in southern Zimbabwe**

Rosemary J Groom

African Wildlife Conservation Fund, Chishakwe Ranch, Po Box 47, Birchenough Bridge, Zimbabwe

Email: [rosemary@africanwildlifeconservationfund.org](mailto:rosemary@africanwildlifeconservationfund.org)

---

The African Wildlife Conservation Fund (AWCF) aims to conserve the large carnivore guild in southern Zimbabwe with a particular focus on the endangered African wild dog *Lycaon pictus*. We take a multi-disciplinary approach, combining management-driven research, active hands-on conservation, policy dialogue and education and community engagement. We focus here on the latter and discuss what aspects of the community education programmes have been most successful and what lessons have been learned.

We have 123 schools in the education program in five districts, involving over 30,000 students and 500 teachers. We also engage with 37 communities (defined by wards), and operate a mobile education unit in many of these. Program components include provision of conservation-awareness materials, support for environmental clubs, DVD showing, secondary school scholarships and provision of libraries. Experience indicates that low literacy levels can be a stumbling block for school based conservation-awareness programs and literacy programs may need to be run concurrently. Whilst policy issues are critical, preliminary insights indicate that education efforts and community involvement in projects give the most successful outcome on the ground. Proper evaluation of all education and outreach efforts is imperative and we demonstrate some ways of doing this.

## **Cape mountain zebra conservation – ensuring the future stability of this vulnerable sub-species**

Halszka Hrabar\*, Graham I. H. Kerley.

Centre for African Conservation Ecology, Nelson Mandela Metropolitan University, P.O. Box 77000, Port Elizabeth 6031, South Africa

\*Email: [Hrabar.Halszka@live.nmmu.ac.za](mailto:Hrabar.Halszka@live.nmmu.ac.za)

---

Despite the increase in Cape mountain zebra *Equus zebra zebra* numbers to over 2700 individuals by 2009, the security of the sub-species is still questionable. Concerns include: threats associated with small populations, poor performance of some sub-populations and ineffective management decisions due to a poor understanding of CMZ behaviour. The study therefore aimed to gain a better understanding of these issues by addressing the following questions: 1) What factors influence population performance of CMZ; 2) What factors determine a successful translocation and initial reintroduction and 3) What determines reproductive sex allocation in CMZ? One finding was that the adult sex composition of a population appears to influence herd structure. A higher male: female ratio was associated with smaller breeding herds i.e. an abundance of surplus males seems to promote the formation of new breeding herds and as a consequence, the effective population size is increased, as more adult males are contributing to the gene pool. Translocation success was found to be determined by release method and founder population size. Hot releases (animals released straight off the truck into their new habitat) were more successful than releasing animals into bomas (a 7% versus 14% death rate respectively). Small founder populations (less than 14 individuals) resulted in poor population performance or failed reintroduction. Interestingly, reproductive sex allocation results showed a trend opposite to predictions of the Trivers-Willard hypothesis (TWH), which states mothers in good condition should produce more sons. We found that below average rainfall (i.e. reduced resources) during the year of conception tended to result in more male foals while the male: female ratio was close to 1 when rainfall was not much different to the annual mean. All these findings clearly have useful management implications and the need for further research into additional threats, such as inbreeding and hybridization, is therefore evident.

## **Saving Smaug: Conservation of the Sungazer *Smaug giganteus***

S. Parusnath<sup>1\*</sup>, M.J. Cunningham<sup>2</sup>, I.T. Little<sup>3</sup>, R. Jansen<sup>4</sup>, G.J. Alexander<sup>1</sup>

<sup>1</sup>School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, PO Wits, Johannesburg, Gauteng 2050, South Africa

<sup>2</sup>Department of Zoology and Entomology, University of Pretoria, Pretoria 0002, South Africa

<sup>3</sup>Endangered Wildlife Trust, Private Bag X11, Modderfontein, Johannesburg, South Africa

<sup>4</sup>Department of Environmental, Water and Earth Sciences, Faculty of Science, Tshwane University of Technology. Private Bag 680, Pretoria 0001, South Africa

\*Email: shivan.parusnath@gmail.com

---

The Sungazer *Smaug giganteus* is an endemic lizard species that is threatened by habitat destruction and illegal harvesting, and as a result, is listed as 'Vulnerable' on the IUCN Red Data List. However, this conservation status is based on outdated data from the 1970's, and in light of continued trends of habitat destruction and illegal harvesting, a call has been raised to reassess the conservation status of the species using current parameters of the species' distribution and population ecology. The Extent of Occurrence (EOO) polygon was calculated as 5 833 800 ha, of which only 2 053 035 ha remains natural. We visited 120 randomly selected sites across the EOO, and found that Sungazers occupy only 4.17% of this area, yielding an Area of Occupancy (AOO) of 103 678 ha. Based on a burrow density of  $6.14 \pm 0.87$  burrows/ha, a total of  $610\,927 \pm 86\,679$  Sungazers were calculated as occupying  $545\,490 \pm 77\,395$  burrows. We visited 39 sites where Sungazers were reported as occurring in 1979, and found a population decline of 20.51% at these sites (0.59% decline/year). A GIS analysis showed a decline in natural land area across the distribution of 13.3% between 2001 and 2009 (1.48% per year), due primarily to an increase in cultivated areas. These demographic measures were used to assess the conservation status of *S. giganteus* using Version 3.1. of the IUCN Categories and Criteria. This assessment confirmed the conservation status of the species as 'Vulnerable', under criteria A2bcd and B2ab, due to a small AOO and rate of population decline. Finally, ecological niche models were used to identify areas of optimal Sungazer habitat across the distribution, to be used as priority areas for conservation efforts. Five priority zones were identified, representing 3-4.4% of the species' population, and are expected to contain four to five times the mean minimum viable population (MVP) estimated for vertebrate species.

## Lessons learnt from re-wilding of hand-reared Southern Ground-Hornbills

Lucy Kemp, [Natasha Nel\\*](mailto:natasha@ground-hornbill.org.za)

Mabula Ground-Hornbill Project, Bela Bela, Limpopo, South Africa

\*Email: [natasha@ground-hornbill.org.za](mailto:natasha@ground-hornbill.org.za)

---

Southern Ground-Hornbills *Bucorvus leadbeateri* face a myriad of threats including the loss of habitat, secondary or accidental poisoning, persecution (due to their habit of breaking windows – seeing their reflection as the ‘enemy’), electrocution, live trade and use in traditional cultural practices. These threats, coupled with slow-breeding rates, have contributed to the endangered status of the species, with continued declines outside of protected areas such as the Greater Kruger National Park. As mandated by the national Single Species Recovery Plan, the Mabula Ground Hornbill Project is testing various reintroduction techniques as one of their contribution to the major conservation action objectives. In 2014 a new threat to the species was documented due to the careful monitoring of all released individuals. One of the released birds, an adult alpha female, became critically ill and veterinary results showed high levels of lead toxicosis. This was as a result of feeding on meat from a porcupine carcass shot with lead ammunition. Although lead poisoning is well researched elsewhere, particularly for avian species, this was the first recorded incident of lead-poisoning in Southern Ground-Hornbills, and subsequent successful chelation treatment. The main effects of lead poisoning are behavioural, physiological and biochemical. The species cooperative nature and almost exclusive carnivorous behaviour puts them at greater risk of exposure than many other savannah species. Little is known about the long-term effects of lead poisoning, however, some studies have shown that long lived species are especially susceptible to bioaccumulation of lead in bone. The Mabula Ground Hornbill Project has now initiated a public awareness campaign and there has been initial buy in from several private and provincial reserves, who are now changing their management practices to ensure no lead ammunition is used for hunts or culls, only lead-free alternatives. Maximizing the species’ potential as a flagship species these mitigations ensure these areas are safe for other scavenging species such as vultures and meso-predators.

**Keywords:** lead poisoning, Southern Ground-Hornbill, threats

**Renu-Karoo Veld Restoration cc – birth and growth of a sustainable biodiversity-based business**

Sue J. Milton-Dean, W. Richard J. Dean

Renu-Karoo Veld Restoration cc, P.O. Box 47, Prince Albert 6930, South Africa

E-mail: [renukaroo@gmail.com](mailto:renukaroo@gmail.com)

---

Renu-Karoo Veld Restoration started an indigenous seed collection and plant propagation business in 2007 with the help of Rufford funding. Seven years later Renu-Karoo stocks ca. 20,000 indigenous plants of 540 species. It supplies 20 species of indigenous seeds in bulk and has sold 1100 kg of Karoo seed 15% of which was produced in its own orchard, 55% collected along roadsides and 30% purchased. Of our 93 seed clients about 60% are farmers and most the remainder are engineering companies. Our business has contributed to appropriate rehabilitation of damaged vegetation in the Karoo. We have raised awareness of Karoo biodiversity through our nursery, as well as through talks in our village and at conferences. Renu-Karoo has 10 employees – including the owners. This makes a substantial contribution to employment in a rural village with 60% unemployment. Renu-Karoo received awards for “Small Business” in 2010, and for “Green Business” in 2012. Over the 7 years of our operation we have hosted 9 post-graduate student interns, two of whom have since registered for restoration-related Masters degrees. We have also presented courses on Karoo biodiversity and plant propagation to groups from the Endangered Wildlife Trust, South African National Parks and Agricultural Research Institute as well as to clubs and interest groups. Our annual outings for the local primary school have reached about 600 learners over 7 years. The 113 ha Wolwekraal Nature Reserve was gazetted on 14 February 2014 following five years of discussions, management plan development, signing of a management agreement with the local conservation authority (Cape Nature). The Wolwekraal Conservation and Management Organisation (WCRO) Non-Profit Organisation (121-059NPO) established in 2013 to oversee management of funds to maintain the nature reserve and to carry out research on ecological restoration and conservation in the Karoo, has developed excellent links with Cape Nature (the western Cape conservation authority), Endangered Wildlife Trust (an NPO carrying out rare mammal habitat restoration in the Karoo), SAEON (the South African Environmental Observatory Network).

## **NOT IN ATTENDANCE**

### **Ecoexist Project – Reducing Human-Elephant Conflict and Fostering Coexistence**

**Anna Songhurst\***, Graham McCulloch, Amanda Stronza

Ecoexist Trust, P.O. Box HA122HAK, Maun, Botswana

\*Email: [anna.songhurst@hotmail.com](mailto:anna.songhurst@hotmail.com)

---

People and elephants are in competition for access to water, food, and space throughout the elephant range in Africa and Asia. In Botswana, interactions between people and elephants are becoming more frequent and Human-Elephant Conflict (HEC) incidents are increasing as more land is converted to arable farming and the elephant range expands. Consequently, HEC is one of the most challenging wildlife management and conservation issues in the country. I conducted a four year study to gain a greater understanding of the complexities of the competition between people and elephants in the eastern Okavango Delta Panhandle, focusing on elements that can be investigated in the short term and could aid in devising effective mitigation and management strategies. My findings showed that combinations of social and ecological factors are involved in shaping competition between people and elephants. Contributory factors to HEC identified included: actual and perceived conflict levels; farmer vulnerability to risk and available coping strategies; susceptibility of crops to elephant foraging; methods used to measure damage; natural and modified behaviour of people and elephants affecting resource and spatial use; and human feelings and perception towards elephants and the situation, which are influenced by an array of socio-economic factors. To be successful, effective conflict resolution and management strategies will, therefore, require consideration of short and long term dynamics, as well as a combination of mitigation approaches that consider all elements affecting conflict extent. Finding sustainable solutions to HEC also requires understanding current policies and incentives related to wildlife management, agriculture, and rural development, and then facilitating cooperation between government, private sector, and local communities to align goals. Our current Ecoexist Project aims to implement recommendations from this research. In the short term, we will reduce real and perceived HEC by addressing failures and gaps in current mitigation responses. Over the longer term, we will collaborate with local, regional, and international stakeholders to address the root causes of conflict and help align policies and incentives to support human-elephant coexistence.

## **NOT IN ATTENDANCE**

### **The interspecific relationships of black rhinoceros *Diceros bicornis* in Hluhluwe-iMfolozi Park**

Roan David Plotz

**Video link:** <http://youtu.be/n6KsSf7ftJ0>

**URI:** <http://hdl.handle.net/10063/3695>

Date: 2014

Rights: No known rights restrictions other than copyright.

---

As habitat loss, predators (human and non-human) and disease epidemics threaten species worldwide, protected sanctuaries have become vital to species conservation. Hluhluwe-iMfolozi Park (HiP) in South Africa is at the centre of one of the world's greatest conservation success stories. The formal proclamation of HiP in 1895 prevented the extinction of the south-central black rhino *Diceros bicornis minor* population. In recent times HiP has been a strategic source population for the D. b. minor range expansion program, facilitating an 18-fold population increase across southern Africa. However, HiP's own black rhino population appears to be in decline. Evidence for decline is most often attributed to overpopulation and poor habitat quality that is driving apparently significant increases in the average home range sizes, poor growth rates (i.e., low calf recruitment) and poor body condition of black rhino. Other factors such as non-human calf predation and parasitism have also been raised as potential causes of decline but remain untested. HiP does have some of the highest densities of lion (*Panthera leo*) and spotted hyena (*Crocuta crocuta*). HiP's black rhino population also suffers from remarkably severe chronic haemorrhaging lesions caused by a filarial parasite (*Stephanofilaria dinniki*). Empirical evidence if or indeed why the HiP black rhino population might be in decline is lacking. Investigating this population's true status and any potential causes of an apparent decline is urgently needed. This thesis therefore aimed to test three hypotheses for poor performance that included: (1) investigations of the average black rhino home range size, (2) confirmation of black rhino calf predation and (3) the relationship between filarial lesions and black rhino body condition. I inserted horn-implant VHF radio transmitters into 14 adult (i.e., >5 years) female black rhino in HiP and regularly monitored them on-foot over a three-year period. I found that average home range estimates (9.77 km<sup>2</sup>) were not significantly dissimilar to estimates using a similar technique obtained forty years prior (i.e., 7.5 km<sup>2</sup>). I also established the first confirmed link between predation attempts and tail amputation during a lion attack on a black rhino calf. Black rhino body condition, while significantly inversely and temporally correlated to lesion severity, did not appear to be driven by lesion severity itself and highlights the need for further research. An additional research focus for my thesis developed while in the field. I regularly witnessed red-billed oxpeckers (*Buphagus erythrorhynchus*) feeding at black rhino filarial lesions while also alarm calling to alert them to my presence. Studies have found it difficult to empirically show how oxpecker-host interactions have net positive benefits that make it a mutualism. Thus, two chapters were designed to determine if red-billed oxpeckers were predominately mutualistic or parasitic when visiting black rhino. Determining this depended on whether I could identify net positive benefits or net costs to black rhino. Oxpeckers provide rhino with two possible benefits i.e., benefit 1 is cleaning ectoparasites and benefit 2 is increasing vigilance, and one cost i.e., lesion parasitism. More than 50 hours of behavioural observations established that oxpeckers favoured haemorrhaging filarial lesions over sites of tick attachment on black rhino. Moreover,

black rhino appeared to be completely tolerant of oxpeckers that fed at lesions. To test whether oxpeckers increased rhino's anti-predator vigilance, I conducted 84 human approach trials towards black rhino both with and without oxpeckers present. Results showed that rhino were immediately responsive to oxpecker alarm calls and benefitted from more than a two-fold increase in human detection rate and detection distance. Rhino predominately orientated to face towards their sensory blind spot (i.e., downwind) after an oxpecker alarm call. The traditional name (Askari wa kifaruru) of the red-billed oxpecker, which translates as the rhino's guard, appears to be validated. However, future research will need to confirm whether black rhino's tolerance of parasitic oxpeckers is directly related to vigilance benefits. In summary, black rhino managers in HiP can be confident that the average home range sizes have not increased significantly. Further, predation of calves might be a greater problem than previously realised and requires further investigation. Monitoring changes in the filarial lesion severity of black rhino might be a useful tool for detecting impending changes in a rhino's condition. Finally, black rhino are clearly eavesdropping and benefitting from oxpecker alarm calls a co-evolution that has implications for conserving oxpecker populations as well.

## **NOT IN ATTENDANCE**

### **Are endangered sawfishes still present in Mozambique? A baseline ethno-ecological survey**

Ruth H. Leeney

Benguela Research & Training, Walvis Bay, Namibia.

Email: [ruth.leeney@gmail.com](mailto:ruth.leeney@gmail.com)

---

Sawfishes (Pristidae) are endangered worldwide and are thought to be locally extinct along much of the African coast. Baseline data are urgently needed in order to determine where conservation activities for sawfishes are required. Interviews were conducted with fishermen, fish traders, fisheries observers and recreational anglers in all coastal provinces of Mozambique, to collect local ecological knowledge on the distribution, past and present abundance, socio-economic and cultural importance of sawfishes. 201 interviews were completed between May and August 2014. Measurement data were also collected from all sawfish rostra encountered during the study. 77% of respondents recognised the image of a sawfish and had seen a sawfish at least once during their life. Fishermen and fisheries observers working on trawlers had made the most recent observations of sawfishes, which appear to be bycaught frequently in the shrimp fishery. According to interviewees, sawfishes have been captured as recently as 2014, both by industrial trawl fisheries and with artisanal gears such as shark nets. Sawfishes do not appear to be culturally significant to coastal communities in Mozambique. Two areas have been identified as being areas where sawfishes are likely to still be present, based on reports of very recent captures and observations of rostra. Rostra from both green sawfish *Pristis zijsron* and from largetooth sawfish *P. pristis* were observed during the study (n=13). Mozambique appears to be one of the last parts of Africa where sawfishes have not become extinct and urgent action must now be taken to ensure that the remaining sawfish populations are protected and monitored.

Keywords: bycatch, interview surveys; Largetooth sawfish; *Pristis pristis*; trawl fisheries

## **NOT IN ATTENDANCE**

### **Let Elephants Be Elephants - Reducing demand for ivory in South East Asia**

Tammie K. Matson

Let Elephants Be Elephants, Bangkok, Thailand

Email: [tammiekmatson@gmail.com](mailto:tammiekmatson@gmail.com)

<http://www.letelephantsbeelephants.org> (video)

---

*Let Elephants Be Elephants* is a grass-roots awareness raising campaign based in and focused on South East Asian consumers of ivory. The mission of the project is to reduce the demand for ivory that is decimating Africa's elephant population. The campaign was initiated in January 2013 in Singapore and uses the power of local celebrities, especially the campaign's co-founder, TV host Nadya Hutagalung and her following, plus social and traditional media, an interactive website, audio visuals, events, movie screenings and school talks, to educate people across Asia about the link between the devastating poaching problem in Africa and the consumption of ivory products in Asia. Many people in SE Asia do not make the link between the poaching of elephants in Africa and the ivory that they buy in shops and market places. The campaign also leverages local government and corporate support, including the High Commissions of the United Kingdom, USA and Australia, JWT advertising and the Fox Network to gain further support for the cause. To date *Let Elephants Be Elephants* has launched in Indonesia, Singapore and Hong Kong, and will soon launch in the Philippines and Thailand. Each South East Asian country has a different level of consumption and transit of ivory, therefore the approach is different in each country and depends on engagement of local partners. Thailand is the largest unregulated market for ivory worldwide and is the focus of the campaign in 2015. Learnings from the campaign to date will be shared and discussed.

## **NOT IN ATTENDANCE**

### **Sulphur isotopes in the central Namib Desert ecosystem**

**Keir Soderberg**<sup>1,2\*</sup>, Joh Henschel<sup>3,4</sup>, Robert J. Swap<sup>2,5</sup>, Stephen A. Macko<sup>2</sup>

<sup>1</sup>S.S. Papadopoulos & Associates, Inc., Bethesda, MD, USA

<sup>2</sup>Department of Environmental Sciences, University of Virginia, Charlottesville, VA, USA

<sup>3</sup>South African Environmental Observation Network, Kimberley, South Africa

<sup>4</sup>Gobabeb Training and Research Centre, Walvis Bay, Namibia

<sup>5</sup>North West University, Potchefstroom, South Africa

\*Email: keir.soderberg@gmail.com

**Video link** -<https://www.youtube.com/watch?v=o8N1bKiHx6g&feature=youtu.be>

---

The Namib Desert is hyper-arid in terms of rainfall, but its ecology is influenced by frequent fog events. Fog utilisation by Namib biota has been well studied, but its role in nutrient deposition and cycling, particularly with respect to soil processes, still has open questions. Given its potential for distinguishing between various ecosystem components and fluxes, sulphur isotopic composition ( $\delta^{34}\text{S}$ ) is evaluated here as a passive tracer of aerosol deposition and plant water sources in the Namib. Measurements of  $\delta^{34}\text{S}$  in Namib fog, groundwater, soils, plants and aerosols are presented and are consistent with the previously described system of sulphur cycling: primary marine sulphur accumulates as gypsum in the gravel plains and is redistributed by wind. Kuiseb River sediments had a wide range of  $\delta^{34}\text{S}$  values, with several samples that were quite depleted relative to soils, plants, groundwater and gypsum of the gravel plains. This depleted signal appears more commonly in the fine (0.5, 1.0  $\mu\text{m}$ ) rather than in the coarse (1.5, 7.6  $\mu\text{m}$ ) aerosol size fractions. Fog and aerosol  $\delta^{34}\text{S}$  values are consistent with local dust as a major sulphur source, limiting the utility of  $\delta^{34}\text{S}$  as a unique tracer of fog deposition. It can still provide useful information in certain situations. For example, the 16.5‰  $\delta^{34}\text{S}$  value for the brackish groundwater at Hope Mine is distinct from the 10.2‰ value in *Welwitschia mirabilis* stem material at that site. This type of comparison could be one useful line of evidence in evaluating plant water sources.

## DELEGATE CONTACT LIST

SURNAME	FIRST NAME	EMAIL ADDRESS
Amis	Mao	<a href="mailto:mao@africege.org">mao@africege.org</a>
Angoh	Jennifer	<a href="mailto:jenniferangoh@gmail.com">jenniferangoh@gmail.com</a>
Boakye	Maxwell Kwame	<a href="mailto:maxwell_boakye@yahoo.com">maxwell_boakye@yahoo.com</a>
Brassine	Eliénor	<a href="mailto:alienor.brassine@gmail.com">alienor.brassine@gmail.com</a>
Brink	Christiaan	<a href="mailto:christiaanwillebrink@gmail.com">christiaanwillebrink@gmail.com</a>
Bussière	Elsa	<a href="mailto:elsabussiere@gmail.com">elsabussiere@gmail.com</a>
Chakona	Albert	<a href="mailto:a.chakona@saiab.ac.za">a.chakona@saiab.ac.za</a>
Chiazzari	Brent	<a href="mailto:Brent.chiazzari@gmail.com">Brent.chiazzari@gmail.com</a>
Cole	Josh	<a href="mailto:josh@rufford.org">josh@rufford.org</a>
Cox	Samuel	<a href="mailto:Sanual.e.l.cox@gmail.com">Sanual.e.l.cox@gmail.com</a>
da Silva	Armindo	<a href="mailto:ndo.silva@gmail.com">ndo.silva@gmail.com</a>
De Vos	Lauren	<a href="mailto:laurendv01@gmail.com">laurendv01@gmail.com</a>
Dean	Sue Milton	<a href="mailto:Renukaroo@gmail.com">Renukaroo@gmail.com</a>
Dicken	Matt	<a href="mailto:matt@shark.co.za">matt@shark.co.za</a>
Donaldson	John	<a href="mailto:Donaldson@nbict.nbi.ac.za">Donaldson@nbict.nbi.ac.za</a>
Ferguson	Angela	<a href="mailto:Angferguson3@gmail.com">Angferguson3@gmail.com</a>
Fleury	Gabriela	<a href="mailto:fleurygs@dukes.jmu.edu">fleurygs@dukes.jmu.edu</a>
Fonseca	O. Alejandra Vargas	<a href="mailto:ale@earthcollective.net">ale@earthcollective.net</a>
Friedmann	Yolan	<a href="mailto:yolanf@ewt.org.za">yolanf@ewt.org.za</a>
Grant	Tanith	<a href="mailto:tanithgrant@gmail.com">tanithgrant@gmail.com</a>
Gosling	L. Morris	<a href="mailto:l.m.gosling@ncl.ac.uk">l.m.gosling@ncl.ac.uk</a>
Groom	Rosemary	<a href="mailto:rosemary@africanwildlifeconservationfund.org">rosemary@africanwildlifeconservationfund.org</a>
Havemann	Bryan	<a href="mailto:Contact@capeleopard.co.za">Contact@capeleopard.co.za</a>
Hrabar	Halszka	<a href="mailto:Hrabar.Halszka@live.nmmu.ac.za">Hrabar.Halszka@live.nmmu.ac.za</a>
Jansen	Ray	<a href="mailto:jansenr@tut.ac.za">jansenr@tut.ac.za</a>
Kadye	Wilbert Takawira	<a href="mailto:kadyew@yahoo.com">kadyew@yahoo.com</a>
Little	Rob	<a href="mailto:rob.little@uct.ac.za">rob.little@uct.ac.za</a>
Little	Ian	<a href="mailto:ianl@ewt.org.za">ianl@ewt.org.za</a>
Lloyd	Kyle	<a href="mailto:Kyle.john.lloyd@gmail.com">Kyle.john.lloyd@gmail.com</a>
Maforimbo	Cedric	<a href="mailto:education@dambari.com">education@dambari.com</a>
Magwaza	Jiba	<a href="mailto:jibam@ewt.org.za">jibam@ewt.org.za</a>
Maphalala	Machawe Innocent	<a href="mailto:Machawe158@gmail.com">Machawe158@gmail.com</a>
Marneweck	David Gary	<a href="mailto:davidm@ewt.org.za">davidm@ewt.org.za</a>
Matimele	Hermenegildo	<a href="mailto:matimele@gmail.com">matimele@gmail.com</a>
Mkare	Thomas Kalama	<a href="mailto:thomasmkare@yahoo.com">thomasmkare@yahoo.com</a>
Mostert	Harriet Davies	<a href="mailto:harrietd@ewt.org.za">harrietd@ewt.org.za</a>
Nel	Natasha	<a href="mailto:project@ground-hornbill.org.za">project@ground-hornbill.org.za</a>
Parker	Vincent	<a href="mailto:vinparker@yahoo.com">vinparker@yahoo.com</a>
Parusnath	Shivan	<a href="mailto:Shivan.parusnath@gmail.com">Shivan.parusnath@gmail.com</a>
Petersen	Leif	<a href="mailto:Leif.petersen@livelihoods.org.za">Leif.petersen@livelihoods.org.za</a>
Pistorius	Penny	<a href="mailto:pennypistorius@gmail.com">pennypistorius@gmail.com</a>
Pretorius	Adele	<a href="mailto:Adele-pretorius@hotmail.com">Adele-pretorius@hotmail.com</a>

Shacks	Vincent	vshacks@gmail.com
Slingsby	Jasper	jasper@saeon.ac.za
Songhurst	Anna	anna.songhurst@hotmail.com
Stears	Keenan	Keenan.stears@gmail.com
Suri	Jessleena	Jessleena.suri@gmail.com
Taylor	Jim	jt@wessa.co.za
Taylor	Liz	n/a
Tokura	Wataru	turaturawako@hotmail.com
Turnbull	Helen	contact@capeleopard.org.za
van Helden	Paul	pvh@sun.ac.za
van Lente	Elanza	elanza.vanlente@sanparks.org
Van Velden	Julia	juliavanvel@hotmail.com
Visser	Elke	Elke-visser@hotmail.com
Williams	Jessica	jess@mozturtles.com

Financial travel support received by delegates of the Southern African Rufford Conference 2015.

	Flight			Accommodation	Other	TOTAL
	Intl	Local	Fuel			
Brent Chiazzari		2005.44				2005.44
David G. Marneweck		1383.58				1383.58
Eleanor El Brassine			3731.18			3731.18
Halszka Hrabar			1600			1600
Jessica L. Williams	2500			3509.46		6009.46
Keenan Stears		1561.12			1141.03	2702.15
Machawe M. I. Maphalala	2500			1744.12		4244.12
Maxwell K Boakye		1877		2506.5		4383.5
Rachael Cooper-Bohannon	6000					6000
Sue Milton-Dean			900			900
Vincent Parker			1000	1140		2140
Wilbert T. Kadye				1200		1200
Natasha Nel (Lucy Kemp)		2061.72		1200		3261.72
Shivan Parusnath		1965.72				1965.72
Rosemary Groom				1950		1950
Jiba Magwaza		2402.38		1050		3452.38
L. Morris Gosling	3978.06			2083		6061.06
Yolan Friedman		3096.04		850	969.9	4915.94
Ian Little		2166			6722.64	8888.64
Jim Taylor		2174.84				2174.84

Values are in South African Rands

“Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy and a continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can, in a global partnership for sustainable development.”

(A-1: Preamble Agenda 21 – Rio Earth Summit 1992)

“We should live here on earth, as though we are intending to stay here for good, not just visit for the weekend”  
(Damm 2002)

“Biodiversity is both a product of evolution and the essential raw material for diversification of life on earth”  
(Darkoh 2003)



**We thank the Rufford Foundation on behalf of all the Southern African recipients for their support of our work and their dedication to conservation efforts around the world.**

