

2012 – ADU Report



Prof. Les Underhill

The Animal Demography Unit believes that the best way to achieve biodiversity conservation is through enabling conservation decisions to be based on solid quantitative evidence. We achieve this in three ways. We gather enormous volumes of data through our expanding citizen science programmes. We lead Africa in the emerging discipline of statistical ecology, and use its approaches to understand the dynamics of animal populations. We multiply our effectiveness by training postgraduate students to apply this paradigm. This report describes our progress during 2012.

Animal Demography Unit

University of Cape Town, Rondebosch 7701

+27 (0)21 650 2423

<http://adu.org.za/>



TABLE OF CONTENTS



1. A WORD FROM THE DIRECTOR	1		
2. ATLASES AND CITIZEN SCIENCE PROJECTS	2		
a. SABAP2: SECOND SOUTHERN AFRICAN BIRD ATLAS PROJECT	2		
b. MammalMAP: AFRICAN MAMMAL ATLAS PROJECT	3		
c. CAR: COORDINATED AVIFAUNAL ROADCOUNTS	4		
d. OdonataMAP: ATLAS OF ODONATA OF SOUTHERN AFRICA	5		
e. SARCA /SABCA: REPTILE AND BUTTERFLY ATLASES	6		
3. SAFRING	7		
4. MARINE AND SEABIRD RESEARCH	8		
a. BANK CORMORANT CONSERVATION PROJECT	8		
b. ROBBEN ISLAND - AFRICAN PENGUIN POPULATION PROJECT	9		
c. ROBBEN ISLAND – AFRICAN PENGUIN FORAGING PROJECT	10		
d. AFRICAN PENGUIN BODY CONDITION PROJECT	11		
e. AFRICAN PENGUIN FORAGING BEHAVIOUR PROJECT – NIMPA	12		
f. AFRICAN PENGUIN PRESSURE MODEL PROJECT	13		
g. AFRICAN PENGUIN JUVENILE DISPERSAL PROJECT	14		
h. NIMPA FOOD WEB STRUCTURE PROJECT	15		
i. NORTHERN ROCKHOPPER PENGUIN PROJECT	16		
j. OCEAN-DESERT NUTRIENT TRANSPORT PROJECT	17		
k. CAPE GANNET WINTER MIGRATION PROJECT	18		
5. TERRESTRIAL BIRD RESEARCH	19		
a. SOUTHERN BALD IBIS PROJECT	19		
b. WRAP: WEAVER RESEARCH AFRICA PROJECT	20		
c. INGULA HIGH ALTITUDE GRASSLAND PROJECT	21		
d. BARN SWALLOW MOULT PROJECT	22		
e. BLACK EAGLE PROJECT	23		
f. LARGE TERRESTRIAL BIRD PROJECT	24		
6. TERRESTRIAL MAMMAL RESEARCH	25		
a. TSWALU BROWN HYENA PROJECT	25		
b. HUMAN-PREDATOR CONFLICT PROJECT	26		
7. STATISTICAL MODELLING	27		
a. MODELLING THE ROLE OF CLIMATE CHANGE ON RANGE DYNAMICS OF SOUTHERN AFRICAN BIRDS	27		
b. MODELLING AVIAN RANGE CHANGES BETWEEN SABAP1/2	28		
c. MODELLING SOUTH AFRICAN CO ₂ FLUX	29		
d. AFRICAN REED WARBLER PROJECT	30		
8. HISTORICAL RESEARCH	31		
a. HISTORY OF BIRD ATLASING IN SOUTH AFRICA 1985 - 2012	31		
9. THE E-JOURNAL: ORNITHOLOGICAL OBSERVATIONS	32		
10. DESK TOP PUBLISHING (DTP)	33		
11. INFORMATION TECHNOLOGY	33		
a. VIRTUAL MUSEUM – VM	33		
12. PARTNERS AND SPONSORS	34		
13. PUBLICATIONS	36		
14. DONATIONS	39		
15. PHOTO CREDITS	40		

1. A WORD FROM THE DIRECTOR

The Animal Demography Unit (ADU) is based in the Department of Biological Sciences at the University of Cape Town. We curate, analyse and disseminate information about biodiversity. Citizen scientists are our eyes and ears and their participation in our projects is key to our success. The data submitted by citizen scientists is analysed using the tools of statistical ecology in such a way that it ultimately influence conservation policy.

2012 was the ADU's 21st year, having first been formally recognised as a Research Unit of the University of Cape Town in 1991. The ADU has come of age. 2012 was the year of a formal review of the ADU by the University of Cape Town. We chose to be reviewed to international standards, and we have come through that review with flying colours.

As one browses through this annual report, one cannot but be impressed by the scope of the research activities. When the ADU started, the A stood for "Avian" and the scope of the projects was limited to birds. This report certainly justifies the A standing for "Animal". The answer to the obvious question "How can this diversity of research be supported within such a small academic group?" is straightforward. The red thread which runs through all these projects is their common need for statistical ecology.

The breadth of activities is sustained by a team of partners and co-supervisors, who provide their specialist input to the monitoring and atlasing projects and to the research projects of the postgraduate students. I am grateful to all of them.

The activities are also sustained by a team of sponsors. I am grateful to all of them for their support.

Les Underhill



Website: <http://adu.org.za>

Email: Les.underhill@uct.ac.za



Then: Les Underhill receives his doctoral graduation from Harry Oppenheimer, Chancellor of the University of Cape Town, in 1973.



Now: Emer Prof Les Underhill receives his Harry Oppenheimer Fellowship Award for 2011 from Mary Slack, chairperson of the Oppenheimer Memorial Trust.



2. ATLASES AND CITIZEN SCIENCE PROJECTS

The ADU is a leader in atlas projects in South Africa and this is thanks to all the citizen scientists who get involved and collect data on a regular basis. Each data point which the ADU's citizen scientists collect is a piece in the jigsaw puzzle of biodiversity. The ADU's mission is to fit together all the puzzle pieces, so that we can map South Africa's biodiversity through time. We turn the myriad bits of raw data into the kind of information that conservation decisions can be based on. As a member of the public, you no longer need to be an "activist" to contribute to conservation; you can be a citizen scientist, contributing your pieces to the jigsaw.

SABAP2: SECOND SOUTHERN AFRICAN BIRD ATLAS PROJECT

PROJECT TEAM: Dr Doug Harebottle, Michael Brooks, Sue Kuyper, Prof Les Underhill

WHY: During the past 15 years bird distributions in southern Africa have continued to change, possibly more rapidly than during the previous 30–40 years. Large-scale landscape changes, resulting in widespread habitat loss, transformation and fragmentation, and in some cases habitat creation, coupled with climate change and invasion have contributed to changing bird distributions. Monitoring and documenting these distributional changes are crucial if we are to put in place proper and effective management plans to conserve bird populations and diversity in southern Africa into the future, especially as changing landscapes and climate patterns will continue to change.



OBJECTIVES: SABAP2 aims to be a scientifically rigorous, repeatable platform for tracking the impacts of environmental change on southern African birds tracking through time and space. It achieves this by standardized data collection on bird distribution and an index of abundance.



It also aims to increase public participation in biodiversity data collection and public awareness of birds, through large-scale mobilization of citizen scientists.

TIMEFRAME: 2007 – Ongoing

PEOPLE INVOLVEMENT: There are 1127 atlasers (citizen scientists) who are actively participating and who have submitted at least one full protocol checklist to the project since its beginning.

2012 ACHIEVEMENTS: Coverage grew from 57% to 65%. 5000 (28.9%) pentads – geographical grid cells – were surveyed in 2012 alone.

The Western Cape and Free State provinces passed the 80% coverage mark while the North West and Swaziland now have 70% coverage.

Two major atlasing trips, one to the North-West Province, the other to the northern parts of the Western Cape, improved coverage substantially in these areas.

The project launched Spring MAP2012 to monitor arrival of spring migrants. This runs from the beginning of August to the end of November. To date 327 observers have covered 1706 pentads during this period.

Articles were written for Farmers Weekly and Landbouweekblad to create awareness of the project amongst the farming community. Some good feedback was received from some farmers about the article and their willingness to assist with SABAP2.

Website: <http://sabap2.adu.org.za/index.php>

Facebook page: <https://www.facebook.com/groups/sabap2/>

Email: Doug.Harebottle@uct.ac.za



MammalMAP: AFRICAN MAMMAL ATLAS PROJECT

PROJECT COORDINATOR: Dr Tali Hoffman

WHY: In Africa, our knowledge of mammal distribution patterns is based largely on historical records. However, the last three centuries have seen extensive human-modification of African landscapes with the associated conversion, compression and fragmentation of natural land. With further land development presenting a likely reality for the future, the effectiveness of mammal conservation efforts depends on ecological records being updated so that they accurately reflect mammal distribution patterns in the 21st Century.

OBJECTIVES: The aim of MammalMAP, a partnership between the ADU and the Mammal Research Institute (MRI) at the University of Pretoria, is to update the distribution records of all African mammal species, through collaborations with professional scientists, conservation organisations, wildlife authorities and citizen scientists across Africa. The database software automatically generates online distribution maps of all recorded species which are instantly visible and searchable. We will compare these updated distribution records with both historical and future records to detect species' distribution changes in response to human-related and climate-related habitat changes. We want to offer interactive, dynamic and widely applicable education tools suitable for both formal and informal education sectors.

TIMEFRAME: MammalMAP will be driving a concerted data collection exercise for the next five years (from 2013 to 2017) in order to determine the 'current' distribution of African mammals. Once this time period is over, however, MammalMAP will remain open as a platform for consolidating mammal distribution records in perpetuity.



PEOPLE INVOLVEMENT: MammalMAP is a project reliant on collaboration – and although still in its infancy—is already officially collaborating with more than 20 conservation organisations and 130 registered citizen scientists across Africa. We expect our number of collaborators to grow larger and larger over the years.

2012 ACHIEVEMENTS: Having officially started in 2012, MammalMAP is still a young project. Despite this, we have taken many strides during 2012 towards turning MammalMAP into a success. In terms of MammalMAP's primary 'currency' – mammal photographs – 2012 has set us off to a good start. We have more than 7000 mammal photographs in the MammalMAP database with records from South Africa, Namibia, Kenya, Tanzania, Gabon, Senegal, Sudan – to name but a few countries!

In terms of generating publicity for the project, we have also done well in 2012:

- Close to 1000 people have attended MammalMAP talks.
- Another 1200 people having signed up to the MammalMAP Facebook group.
- An estimated audience of 100 000 people during monthly radio features on 702 Talk Radio and Cape Talk, and many more listeners during radio interviews on Radio Sonder Grense and Radio Vredendal.
- In the months and years to come, as MammalMAP increasingly involves schools, universities and adults across Africa, so the number of people engaged in the project could approach millions.
- MammalMAP has been approached by several film makers who are interested in documenting the project's progress over the years for broadcast on national and international television stations. The first of these was a MammalMAP feature that was broadcast on 50/50 in November.

CONTACT:

- **Website:** <http://MammalMAP.adu.org.za>
- **Email:** Tali.S.Hoffman@gmail.com
- **YouTube:** <http://goo.gl/FeLAj>
- **Facebook:** <https://www.facebook.com/groups/MammalMAP/>



CAR: COORDINATED AVIFAUNAL ROADCOUNTS

PROJECT COORDINATOR: Donella Young



WHY: Large terrestrial birds in agricultural lands are under threat due to loss of habitat through crop agriculture, afforestation, rise in human population densities as well as poisoning through agrochemicals and collisions with man-made structures e.g. powerlines.

OBJECTIVES: The project plans to monitor trends in populations of large terrestrial bird species. 15 of the 36 species monitored have Red Data Threat Status. With the proposed developments of wind/solar farms it is vital to continue this monitoring.

TIMEFRAME: CAR began in the Overberg in the Western Cape in 1993 and there are now 350 fixed routes in seven provinces. Most areas have been monitored for 10 years or more.

PEOPLE INVOLVEMENT: About 800 volunteers, including farmers, bird club members, conservationists and some schools are involved in the project.

2012 ACHIEVEMENTS: A focus of the project has been to encourage sustainable management practices on farms, especially as 80% of South Africa's land is agricultural. In 2012 Sally Hofmeyr completed her PhD on the CAR data. Using CAR and SABAB2 data Sally developed national population indices for specific species. The marked decline in the Southern Black Korhaan population in the Western Cape led to Sally suggesting that Red Data Status of the species must be changed to Vulnerable. Online data capture by participants began this year. The CAR Working Group, in consultation with 40 local Organisers, has decided to include a few pole-perching raptors and also the crows in CAR surveys from July 2013.

Email: Donella.Young@uct.ac.za

Website: <http://car.adu.org.za/>

Facebook page: www.facebook.com/groups/103532956456685/



OdonataMAP: ATLAS OF ODONATA OF SOUTHERN AFRICA

PROJECT COORDINATOR: Dr René Navarro



OdonataMAP dragonflies and damselflies spend most of their lives as larvae in the aquatic environment, they form an important component of fresh-water communities and are highly sensitive to water pollution and landscape disturbance. Adults are also sensitive to vegetation disturbance. For these reasons Odonata are considered to be excellent indicators of the health of wetlands and rivers and the surrounding terrestrial environment, as well as good models to study the effects of climate change.

OBJECTIVES: OdonataMAP is a Virtual Museum project aiming to: (1) map the current distribution (occurrence) of the insect Order Odonata occurring in South Africa, Lesotho and Swaziland; and (2) to serve as a repository of all existing distribution data for this group in the geographic extent of the project.

TIMEFRAME: September 2010 – ongoing

2012 ACHIEVEMENTS: Through collaboration with scientists, conservation organisations, wildlife authorities and citizen scientists across southern Africa, all current and historical distributional are being consolidated into a single open-access digital database. The Virtual Museum contains 3398 sets of photographic records, several of which represent range expansions.

Email: Rene.navarro@uct.ac.za

Website: <http://vmus.adu.org.za>



SARCA / SABCA: REPTILE AND BUTTERFLY ATLASES

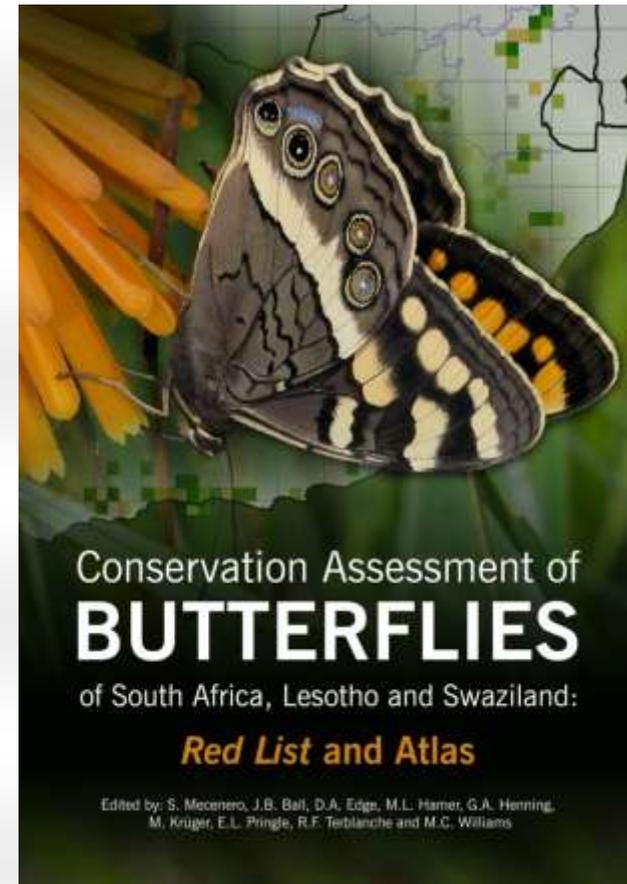
PROJECT COORDINATORS: Marianne de Villiers and Silvia Mecenero

WHY: Unless we know the distributions of species, and how they are changing, we cannot easily set priorities for conservation projects. This is as true for reptiles and for butterflies as any other taxon.

OBJECTIVES: These projects set out to determine the ranges of all reptiles and butterflies, and also to determine their conservation priorities. For the butterflies, for example, there are 657 species in South Africa, Lesotho and Swaziland. Some of the species have subspecies, and it was at the level of subspecies that the conservation assessment was undertaken. Thus 794 taxa were assessed. Three are "Extinct" and 14 are "Critically Endangered" and four of these 14 are considered to be "Possibly Extinct." Another 27 taxa are classified as "Endangered," 19 as "Vulnerable," five as "Near Threatened" and nine as "Data Deficient." The remaining 717 taxa are "Least Concern."

2012 ACHIEVEMENTS: These two projects are grouped here because the manuscripts for both the reptile atlas and the butterfly atlas are complete. The reptile atlas will be published by SANBI, and the butterfly atlas will be jointly published by Safronics and the ADU. The butterfly atlas will appear first, and the prepublication offer is due to commence in January 2013. Publication is scheduled for April. The reptile atlas will be published later in 2013. Both books include a conservation assessment of all the species that occur in South Africa, Lesotho and Swaziland.

In spite of the formal end of the data collection for publication purposes, the Virtual Museums for both projects continued in 2012, and were actively supported. In total, about 10000 records were submitted to these two Virtual Museums in the year. The identifications panels were maintained and strengthened.



3. SAFRING

PROJECT COORDINATOR: Dr H. Dieter Oschadleus



WHY: The ringing of birds remains the primary mean to obtain information about demographic parameters of birds, such as survival rates, the age at first breeding and breeding frequency. It also provides a convenient way of uniquely marking birds so that mate fidelity, breeding productivity of individual pairs of birds, dispersal within and between colonies and rates of immigration and emigration can be measured. For these reasons it has been widely applied worldwide, including in Africa. Often the objective of bird ringing has been to obtain information that is required for the management of species.

OBJECTIVES: SAFRING provides bird ringing services, including ringing equipment, training courses, communication networks and curation of all bird ringing data in South Africa and other African countries.

TIMEFRAME: 1948 – ongoing

PEOPLE INVOLVEMENT: In 2012, there were approximately 200 active ringers. There is a large, but unknown, number of people making use of the ringing data (directly through web or email queries) and indirectly through using published data about ringing.

2012 ACHIEVEMENTS: 27529 ringing records for 2012 have been processed, 2971 recaptures and 129 recoveries. During the current year a large number of records for previous years has been processed. Nine Afring News articles have been published online. 23 new ringers have been registered.

Email: Dieter.Oschadleus@uct.ac.za

Website: <http://safring.adu.org.za>

Facebook page: <http://www.facebook.com/groups/safring/>



4. MARINE AND SEABIRD RESEARCH

BANK CORMORANT CONSERVATION PROJECT

PROJECT COORDINATORS: Corlia Meyer (MSc), Philna Botha (MSc) and Dr. Richard Sherley (PostDoc)

WHY: The Bank Cormorant *Phalacrocorax neglectus* is an 'endangered' (IUCN 2004), poorly studied seabird, endemic to the western coast and Benguela Upwelling System of South Africa and Namibia. The population has decreased by 66% in the past 40 years to only c. 3 000 breeding pairs in 2011.

OBJECTIVES: The main focus is conservation research, to primarily determine the main reasons for the population decline, focusing on climate variability and prey availability. The aim is to also develop an annual monitoring programme and initiate long-term datasets to assist in conservation decision making.

TIMEFRAME: 2012 – Early 2014.

2012 ACHIEVEMENTS: Two MSc students, Philna Botha and Corlia Meyer, are respectively responsible for foraging and climate change research. Fieldwork and data collection occur throughout the winters of 2012 and 2013 on three study sites: Robben Island, Stony Point and Jutten Island. Monitoring is based on visual observation, temperature loggers and the use of video cameras to record Bank Cormorant behaviour for later analysis.

Email: Corlia.meyer@uct.ac.za, Philna.botha@uct.ac.za, Richard.sherley@uct.ac.za



ROBBEN ISLAND - AFRICAN PENGUIN POPULATION PROJECT

PROJECT COORDINATOR: Dr. Richard Sherley (Postdoc) and Professor Peter Barham (Honorary Research Associate)



WHY: This research forms part of an interdisciplinary, multi-organisation research initiative to build a better understanding of the changing ecology of the Benguela upwelling ecosystem and develop an ecosystem approaches to fisheries in South Africa. The African penguin is endemic to southern Africa and the present population is estimated to be about 2% of what it was 80 years ago as a result of prolonged anthropogenic influences in the region. Robben Island hosts the longest running time-series on the species; through a collaboration between the Department of Environmental Affairs (DEA), the University of Cape Town (UCT) and the University of Bristol (UoB), the breeding population has been monitored since 1989.

OBJECTIVES: A sample of around 200 nests is followed intensively to monitoring breeding success as part of an Earthwatch project. Individually marked birds are monitored to obtain data on survival rates, longevity and lifetime reproductive success. Counts of penguins moulting along the shoreline and an annual census of breeding pairs are also conducted (these data forms the basis of assessments for the IUCN). From 2008 the monitoring contributes to an investigation on the efficacy of closing areas around seabird colonies to fishing as a conservation tool. As penguins are restricted to foraging within about 20 km of their breeding colony while feeding chicks, it is hoped that such closures will benefit breeding birds by increasing the prey available to them. By monitoring any differences in the birds' ability to supply food to their chicks in the closed and open areas, we can obtain crucial information to guide future legislation on fisheries

management. In each year a sample of chicks are weighed and have their head and/or flippers measured. These data provide an index of body condition and growth rates over time for closed and open colonies, allowing assessment of if and how fishing impacts on the species.

TIMEFRAME: 2012-2014

PEOPLE INVOLVEMENT: The project involves an array of scientists and technical staff from DEA, UCT, the University of Bristol (U.K.), Robben Island Museum, Bristol Zoo (U.K.) and BirdWorld (U.K.).

2012 ACHIEVEMENTS: The data obtained from Robben Island are used in reports to DEA and other working bodies responsible for overseeing pelagic fisheries in South Africa. In addition, the project had two publications summarising the recent results of the breeding success studies accepted in 2012.

E-mail: Richard.sherley@uct.ac.za

Website: https://sites.google.com/site/richardsherley/research/penguin_dispersal

Website: <http://penguins.adu.org.za/>



ROBBEN ISLAND - AFRICAN PENGUIN FORAGING PROJECT

PROJECT COORDINATOR: Dr. Antje Steinfurth (Postdoc), Kate Robinson (PhD), and Joana Agudo (PhD) and Yolokazi Galada (MSc)

WHY: The dramatic decline of the African penguin's population over the last century, with a current population that represents only 10% of the one that was found a century ago, has raised serious concern. The penguin's small population, restricted distribution, and vulnerability to ever-increasing human threats led to its classification as endangered by BirdLife International in 2010 giving the species a high conservation priority. The decline in population numbers and localised differences in breeding success are believed to be closely related to changes in oceanographic conditions and prey availability. Poor understanding of the bird's foraging strategies combined with the expanding latter day human activities within the waters of the Western Cape make a good case for urgent studies to obtain basic ecological information for this species.

OBJECTIVES: The attachment of Global Positioning System temperature-depth (GPS-TD) data loggers to penguins enables us to derive information on their horizontal distribution and movement at sea during their foraging trip, and also provides data on dive depth, duration and patterns thus giving a three-dimensional view of the birds' movements at sea related to the oceanographic features of their environment.

The overall aim of this project is to identify penguin foraging areas, to monitor and detect reasons for habitat changes, and as such to assist the South African government and other stakeholders in determining appropriate approaches to the design and implementation of long-term conservation strategies at penguin breeding sites in the Western Cape.

TIMEFRAME: 2008-2014

PEOPLE INVOLVEMENT: This project forms part of an international and interdisciplinary project in collaboration of the following academic, governmental and non-governmental institutions and organisations: University of Cape Town, Department of Environmental Affairs, Department of Agriculture, Fisheries and Forestry, Robben Island Museum, BirdLife South Africa, University of Bristol, UK, Earthwatch, Cape Nature, WWF-SA.

2012 ACHIEVEMENTS: Fieldwork was successfully carried out on Robben, Dassen and Dyer islands. All tracks were timed to correspond with the small scale hydro-acoustic surveys that estimate pelagic fish abundance and distribution within a 20 km radius around the islands. Additionally, data on diet composition, chick growth and breeding success were collected to gain a more comprehensive understanding of the African Penguin foraging strategy.

E-mail: Ktae.robinson@uct.ac.za

Website: <http://penguin-tracks.blogspot.com/>



AFRICAN PENGUIN BODY CONDITION PROJECT

PROJECT COORDINATOR: Leanne Tol (MSc)

WHY: This species is classified as Endangered because it is undergoing a very rapid population decline. This trend currently shows no sign of reversing. Many aspects are being researched to determine the reason for the decline in population of the African penguin *Spheniscus demersus*, but the condition of the adult at the start of the breeding term is something that has not previously been studied.



OBJECTIVES: This project plans to determine the weight of an adult during the time that it commences breeding, as well as looking at weight changes throughout the breeding period. Primarily, the aim right now is to test a new method that has been developed to determine the weight of an adult when it starts to breed. This method involves a digital scale being set up in front of a nest so that a weight is recorded whenever something steps onto it, along with a camera trap placed nearby to identify the activity on the scale. Through this project, we will test the operation of scale and its ability to accurately record weights in the field in conjunction with the camera trap; in order to identify the bird that corresponds with the weight.

TIMEFRAME: 2012-2014

2012 ACHIEVEMENTS: Two working scales have been obtained to test in the field on Robben Island. They have been placed, with camera traps, at various nest boxes throughout the season. There has been successful recording of weight measurements at nests at different stages of the breeding period, and it has been possible to capture images of birds on the scale at the same time as a recording. Further data will be collected the following season.

E-mail: leanne.tol@uct.ac.za



Bushnell

09-20-2012 18:58:17



AFRICAN PENGUIN FORAGING BEHAVIOUR PROJECT - NIMPA

PROJECT COORDINATOR: Dr Katrin Ludynia (Postdoc)



WHY: The lack of food (mainly sardine and anchovy) and a shift to lower quality prey (bearded goby) has led to a dramatic decline of African penguin numbers in Namibia. It is therefore essential to not only protect the breeding sites but also the foraging grounds of this endangered species. The Namibian Islands' Marine Protected Area (NIMPA) was declared in 2009, based on data obtained as part of my research on the foraging distribution of African penguins, Cape gannets and bank cormorants.

OBJECTIVES: The project uses GPS data loggers to study the foraging ranges and the foraging behaviour of African penguins breeding on Mercury and Halifax Islands each year. As a monitoring tool for NIMPA, this study helps to verify that the boundaries of NIMPA are appropriate and to detect positive or negative changes within the birds' foraging areas.

TIMEFRAME: Ongoing

PEOPLE INVOLVEMENT: The project involves five scientists and technical staff from the Ministry of Fisheries and Marine Resources, Lüderitz, Namibia.

2012 ACHIEVEMENTS: We have successfully conducted field work on Mercury and Halifax Islands, deploying breeding penguins with GPS data loggers.

Email: kludynia@gmail.com



PENGUIN PRESSURE MODEL PROJECT

PROJECT COORDINATOR: Dr Katrin Ludynia (Postdoc)

WHY: Penguin numbers have dramatically declined at Dyer Island over the last decades, presumably due to a combination of natural and human-induced factors.

OBJECTIVES: The project aims to evaluate the effects of fishing activities, disturbance, oiling, predation by seals and gulls, as well as climatic effects on breeding birds and reduced food availability due to shifts in prey abundance. The model aims for a better understanding of interacting processes and will be used as a tool in advising fisheries working groups applying the Ecosystem Approach to Fisheries. The model allows us to predict trends in African penguin population numbers under different climate change scenarios as well as other environmental changes.

PEOPLE INVOLVEMENT: The project involves more than 15 participants.

2012 ACHIEVEMENTS: The model allows us to predict trends in African penguin population numbers under different climate change scenarios as well as other environmental changes.

Email: kludynia@gmail.com



AFRICAN PENGUIN JUVENILE DISPERSAL PROJECT

PROJECT COORDINATOR: Dr Richard Sherley (Postdoc)

WHY: The African Penguin population in South Africa has undergone a dramatic and sustained decrease within the last decade. One of the main factors believed to be behind this decline is a mismatch between the locations of breeding colonies in the Western Cape and the availability of the sardines and anchovies on which this Endangered species feeds. Juvenile birds are theoretically free to disperse to areas where resources are plentiful and may move considerable distances from the colony at which they hatched. This emigration behaviour is thought to be a response, at least in part, to changes in the local or regional availability of prey, but seabird breeding colonies are restricted to sites free from disturbance and protected from land-based predators. One of the main gaps in our knowledge pertains to the behaviour of these young birds at sea: where they go to find food and whether birds from colonies where numbers are stable and those where numbers are decreasing behave in the same way.

OBJECTIVES: The project aims to understand at what age penguins develop the knowledge of where they will breed and how this decision may relate to the conditions they experience as chicks in the nest as well as the conditions they experience at sea post fledging.

TIMEFRAME: 2011 – 2013

2012 ACHIEVEMENTS: African penguin chicks have been fitted with flipper bands or with tracking devices. The retrieved data enabled us to identify some key foraging areas used by juvenile penguins on the west coasts of South Africa and Namibia.

Website: https://sites.google.com/site/richardsherley/research/penguin_dispersal

Website: <http://penguins.adu.org.za/>

Email: Richard.sherley@uct.ac.za



NIMPA FOOD WEB STRUCTURE PROJECT

PROJECT COORDINATOR: Dr. Sophie Kohler (PostDoc)

WHY: The Northern Benguela Upwelling System has historically been one of the world's most productive ocean area, supporting large amounts of shoaling fish and breeding colonies of seabirds and pinnipeds. However, overexploitation, coupled with unfavorable environmental conditions, drove the collapse of the sardine stocks in the late 1960s which has not recovered since. Concurrently seabird species (Cape Gannets, African Penguins, Bank Cormorants), have undergone drastic declines in the region over the past five decades. The Namibian Islands' Marine Protected Area (NIMPA) was proclaimed in 2009 with the aims of protecting the breeding and foraging habitats of these threatened seabirds and improving fisheries management.

OBJECTIVES: Investigate the trophic dynamics of the degraded NIMPA food web, with a focus on the food partitioning among marine top-predators (seabirds and mammals).

TIMEFRAME: June 2012 – July 2014

2012 ACHIEVEMENTS: The project is still at its early stage. The launch of the project required a lot of network building and organisation in order to meet all the logistic needs. Three months of data collection in the field have been completed. Several funding applications have been submitted in order to fund future fieldwork expeditions.

Email: sophie.kohler@uct.ac.za



NORTHERN ROCKHOPPER PENGUIN PROJECT

PROJECT COORDINATOR: Dr. Antje Steinfurth (Postdoc)



WHY: The Northern Rockhopper Penguin (*Eudyptes moseleyi*) is found in the temperate South Atlantic and Indian oceans, breeding on seven islands between 37–40° S. The penguin's decline of 90-99% in the global population since the 19th century, led to its classification as Endangered by BirdLife International in 2008 and to its inclusion in the IUCN Red List of Threatened Species.

The penguin's vulnerability was strikingly evident after 16 March 2011 when the cargo ship M.S. Oliva ran aground on Nightingale Island. Approximately 800 tons of fuel oil and heavy crude oil escaped from the ship, encircling Nightingale and Middle islands, and also washing ashore on Inaccessible Island. Together these islands support more than 67% of the global population of Northern Rockhopper Penguins. Fortunately most penguins had already left the island for their winter-feeding areas. However, an estimated 20,000 oiled penguins died. The fact that a significant amount of shipping passes the archipelago means that there is always the possibility of future contamination, and highlights the need for further work. Only detailed knowledge of the bird's ecology would help to define, if necessary, appropriate conservation strategies by authorities to inform policy and action plans on how to prepare for and respond to future oil spill.

OBJECTIVES: The main objective is to work collaboratively for the conservation of the endangered Northern Rockhopper Penguin by obtaining basic data on the penguin's foraging and breeding ecology, and strengthening local capacity on Tristan to conduct scientific research, implement practical conservation

measures, and support robust decision-making for the sustainable management of this species.

TIMEFRAME: 2012 - 2014

PEOPLE INVOLVEMENT: The project is being developed as a joined initiative between the University of Cape Town, the Royal Society for the Protection of Birds, the Tristan Conservation Department and BirdLife SA.

2012 ACHIEVEMENTS: Fieldwork was carried out on Nightingale Island between September and December 2012, while on Gough Island fieldwork is still ongoing. Data on foraging behaviour during the breeding stages incubation, guard and crèche as well diet composition were obtained. Additionally 102 nests were followed from egg-laying to crèching to obtain information on egg-morphometrics, egg-laying and chick hatching dates, chick growth, chick condition and fledging i.e. breeding success.

Email: antje.steinfurth@uct.ac.za



OCEAN-DESERT NUTRIENT TRANSPORT PROJECT

PROJECT COORDINATOR: Dr. Sophie Kohler (PostDoc)

WHY: The Namib Desert is a hyper-arid desert that displays low primary productivity and yet supports an exceptionally high diversity of desert-adapted endemic succulents. The Sperrgebiet National Park (SNP), formerly named Diamond Area 1, was proclaimed in 2008 and remains almost pristine. Because of the restricted access to the area over a century, little is known about its connectivity with the bordering and highly productive Benguela current. Coastal areas can receive substantial inputs from the ocean and these marine subsidies can have significant effects on recipient terrestrial ecosystems.



OBJECTIVES: Investigating the influence of marine-derived nutrients and organic matter to desert plants in the Sperrgebiet National Park, with a particular focus on the latrines of Brown hyenas feeding in seal colonies and wind-blown detritus.

TIMEFRAME: June 2012 – July 2014

2012 ACHIEVEMENTS: The project is still at its early stage. The launch of the project required a lot of network building and organisation in order to meet all the logistic needs. Three months of data collection in the field have been completed. Several funding applications have been submitted in order to fund future fieldwork expeditions.

Email: sophie.kholer@uct.ac.za



CAPE GANNET WINTER MIGRATION PROJECT

PROJECT COORDINATOR: Dr Katrin Ludynia (Postdoc)

WHY: Cape gannets breed on six islands off Namibia and South Africa. Several studies have looked at the distribution of foraging gannets during the breeding season but little is known about their winter distribution during the non-breeding season. Gannet numbers have been declining within the entire range of the species and main threats during the breeding season include lack of food and predation of fledglings by seals.



OBJECTIVES: The project aims to identify the overwintering areas as well as the potential threats, in order to comprehensively address the conservation of the species.

TIMEFRAME: Ongoing

PEOPLE INVOLVEMENT: The project involves six scientists and technical staff.

2012 ACHIEVEMENTS: We have deployed 68 global location sensors (GLS) on breeding Cape gannets on Mercury and Ichaboe Islands, Namibia as well as on Malgas and Bird Islands, South Africa. Birds carried these devices during the winter months and we are currently retrieving the devices. Using light information, the overwintering areas of these birds can be identified. We will deploy a second set of 45 GLS during the 2013 breeding season.

Email: ludynia@ftz-west.uni-kiel.de



5. TERRESTRIAL BIRD RESEARCH

SOUTHERN BALD IBIS PROJECT

PROJECT COORDINATOR: Kate Henderson (PhD), BirdLife South Africa



WHY: One of the species impacted by the Ingula Pumped Storage Scheme is the bald ibis *Geronticus calvus*, a “Vulnerable” species. This project, part of the Ingula Partnership between Eskom, BirdLife South Africa and the Middelpunt Wetland Trust, aims to improve our understanding of this species in order to assess the current conservation status of this species. It will also produce a Biodiversity Management Plan for long-term conservation of the species.

OBJECTIVES: The project aims to collect all possible information on the species in order to develop management plans. To do so, the project aims to monitor breeding colonies. It also undertakes an overall survey of breeding colonies (mainly in the eastern Free State, Mpumalanga, KwaZulu-Natal and Lesotho). The project also examine various aspects of bald ibis ecology: breeding success, mean annual survival, changes in distribution and numbers.

TIMEFRAME: July 2011 - 2013

2012 ACHIEVEMENTS: This year, PhD fieldwork was completed: breeding colony surveys, summer and winter roost surveys, radio tracking and colour-ringing of juveniles. Three draft manuscripts were written.

Email: Kate.henderson@uct.ac.za



WRAP: WEAVER RESEARCH AFRICA PROJECT

PROJECT COORDINATOR: Dr H. Dieter Oschadleus



OBJECTIVES: WRAP aims to coordinate research and disseminate information on the weaver family, Ploceidae (species defined in Handbook of Birds of the World 2010), globally but particularly in Africa where the majority of species occur. The most important project is PHOWN, PHOTOS of Weaver Nests, whereby scientists and citizen scientists

collect breeding records of weavers.

TIMEFRAME: 2010 – Ongoing

PEOPLE INVOLVEMENT: There are 197 participants in PHOWN, and 203 people on the weavers list-server which was set up less than a month ago.

2012 ACHIEVEMENTS: 1921 PHOWN records have been accepted in 2012. Two workshops on PHOWN were held in Kenya in May 2012. A plenary, symposium and Round Table Discussion on weavers were held at the 13th PAOC in Arusha, Tanzania, during October 2012.

Email: Dieter.Oschadeus@uct.ac.za

Website: <http://weavers.adu.org.za>

Facebook: <http://www.facebook.com/groups/weaverbird>



INGULA HIGH ALTITUDE GRASSLAND PROJECT

PROJECT COORDINATOR: David Maphisa (PhD)

WHY: There was a great deal of controversy over the planned construction of the Ingula Pumped Storage Scheme because of the existence of a very special bird – the White-winged Flufftail – in these high altitude wetlands. The Ingula Partnership between BirdLife South Africa (BLSA), Eskom and



Middelpunt Wetland Trust, was formed in 2002 to offset the negative impacts of the construction and operation of the Ingula Pumped Storage. Adaptive management of high altitude grasslands at Ingula is a case study to inform the management about the direction of the future reserve.

OBJECTIVES: The project aims to provide an adaptive management algorithm to Ingula Partnership, which can be used to manage the Ingula reserve in order to maximize explicit biodiversity targets. The adaptive management algorithm will be broadly applicable to high altitude grasslands.

TIMEFRAME: 2010 – 2013

2012 ACHIEVEMENTS: A systematic survey of birds and vegetation was carried out between 2005 – 2010. Analysis of this data has just been completed and the write-up has been started. This data will form the basis for comparison of bird species richness before construction and post construction phase. It will also inform the management about the habitat requirements of some target priority species for conservation.

Experimental plot surveys have been running since 2010 (birds, vegetation, and insects). Surveying birds within experiment plots is an alternative to transect line method. Part of the adaptive management is to inform the management through monitoring how well they have achieved set conservation objectives. Analysis of this second dataset is currently in progress.

These two datasets will be compared and contrasted to come out with the better method that can be used in future to monitor Ingula avian diversity.

Email: braamhoek@birdlife.org.za

Website: www.birdlife.org.za/conservation/threatened-habitats



BARN SWALLOW MOULT PROJECT

PROJECT COORDINATOR: Marc Burman (MSc)

WHY: There is mounting evidence that global climate change has extended growing seasons and altered the phenology of bird migration. Northern Hemisphere springs are starting earlier and are becoming warmer than 40 years ago. Changes in the timing of arrival at the Northern Hemisphere breeding grounds, linked to climate change, have been found for migratory species, and a recent study shows that Barn Swallows are leaving South Africa earlier to return to Europe. Breeding, migration and moult comprise the annual life-cycle of migratory birds, and each stage is energetically demanding and constrained by the other two. Estimating and monitoring the timing of one of these three stages is important to describe and understand the impact of climate change on avian migration phenology. By using new statistical tools, the timing of primary moult can now be estimated more accurately than the timing of migration and breeding.

OBJECTIVES: The project aims to investigate whether the timing of moult is changing in line with observed trends in the Southern and Northern hemispheres. Precisely, the project aims to explore the constraints on changes in timing of moult and to analyse the trends across a geographic gradient. It will cross-map the changes in timing of departure from and arrival at the breeding grounds with changes in timing of moult at the wintering grounds.

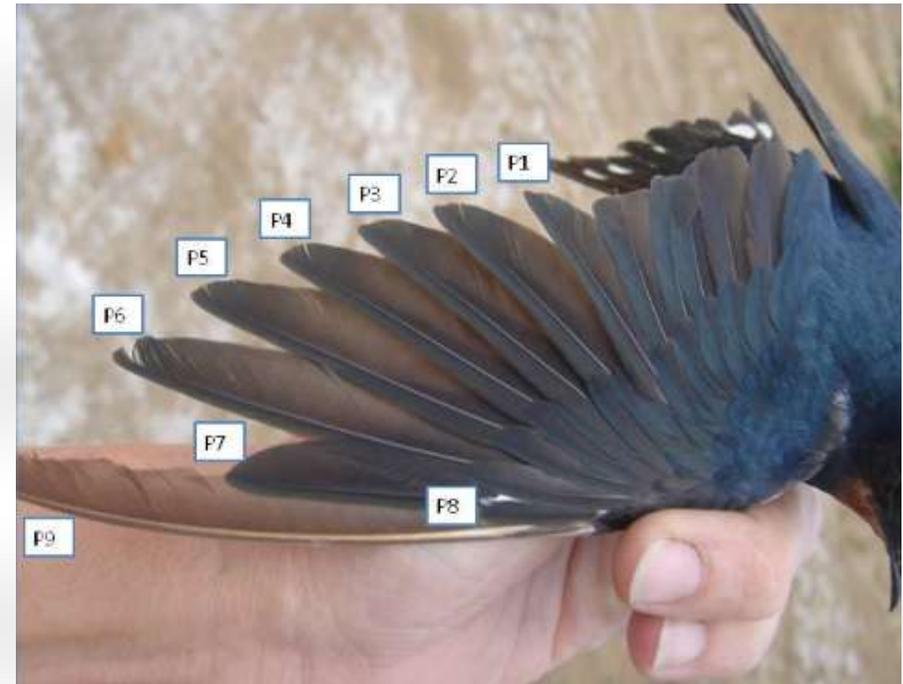
TIMEFRAME: 2012 – 2014

PEOPLE INVOLVEMENT: The data were collected by the bird ringing community in South Africa over five decades.

2012 ACHIEVEMENTS: Preliminary results using the moult package (based on the Underhill-Zucchini moult model and R-package developed by Dr Birgit Erni) have been produced. They indicate that in northern South Africa, for 1984 to 2012, the

mean start date of moult was 14 days earlier than for 1970 to 1983. In the middle latitudes (KwaZulu-Natal) the mean start date was 10 days earlier, and in the south it was 3 days earlier. These results are in line with the evidence of earlier arrival at the breeding grounds. I presented these results in a poster at the Pan African Ornithological Congress in Arusha, Tanzania, in 20 October 2012. The poster was adjudged one of the two best posters at the conference.

Email: Marc.burman@uct.ac.za



BLACK EAGLE PROJECT

PROJECT COORDINATOR: Megan Murgatroyd (PhD)



WHY: The iconic flight of the Verreaux's eagle *Aquila verreaux* is a breathtaking phenomenon. In the Cederberg Mountains it is still a common sight to see a pair flying in a unique pendulum formation over the cliffs and territory that they defend. However, in other parts of the country their long-term survival might be threatened by radical change in land-use. In the Western Cape at present these eagles remain prevalent and breeding in the Sandveld; in spite of this area being classified as the second most highly threatened ecosystem in South Africa. At least 50% of the Sandveld has been converted for agriculture.

OBJECTIVES: This project aims to compare the diet and the hunting behaviour of the Verreaux's eagle in two areas of the Western Cape; the Cederberg Mountains and the Sandveld. This project aims to assess the breeding productivity in both areas and examine diet and hunting behavior with the view of detecting behavioral indicators of the ecosystem health.

TIMEFRAME: Fieldwork commenced in March 2011 and will continue until 2014.

2012 ACHIEVEMENTS: Thus far 30 pairs have been identified and monitored for breeding. This year three adult Verreaux's eagles were successfully GPS tagged with the latest technology which is providing high resolution information on their behaviour. Prior to hatching this year, five motioning sensing cameras were installed at nests.

Blogspot: www.blackeagleproject.blogspot.com

<http://www.facebook.com/pages/The-Black-Eagle-Project/166520386739894?fref=ts>

Email: Megan.murgatroyd@uct.ac.za



LARGE TERRESTRIAL BIRD PROJECT

PROJECT COORDINATOR: Dr Sally Hofmeyr (PhD)



WHY: Five of the species studied (Denham's Bustard and four korhaan species) are poorly understood. The sixth, Blue Crane, is an unusual case in that it is a species which is severely threatened in its natural range but which has become highly successful in a relatively new, anthropogenic habitat: agricultural lands in the Fynbos biome.

OBJECTIVES: The project aimed to study the Impacts of environmental change on large terrestrial bird species in South Africa.

TIMEFRAME: 2009 – 2012

PEOPLE INVOLVEMENT: The data were collected by the hundreds of citizen scientists who participated in the CAR project.

2012 ACHIEVEMENTS: The thesis was submitted in February. Dr Sally Hofmeyr graduated in December. The main findings included: the Southern Black Korhaan population has declined significantly over the 20-year study period, and that this species should be classified as globally Vulnerable on the IUCN Red List; the Blue Crane population of South Africa as a whole increased, even though the Grassland biome population probably decreased over the last 20 years, and the core of the range has shifted south and west. Further analysis showed that some species are more reliably counted than others, depending on flocking behaviour, movements and nomadism, abundance and habitat. The Southern Black Korhaan results were presented at the 13th Pan-African Ornithological Congress in Arusha, Tanzania, in October.

Email: Sally.hofmeyr@uct.ac.za



6. TERRESTRIAL MAMMAL RESEARCH

TSWALU BROWN HYENA PROJECT

PROJECT COORDINATOR: Elsa Bussière (PhD)

WHY: Among 70 African carnivores, the brown hyena, *Hyaena brunnea*, is listed sixth in terms of conservation importance. The Southern Kalahari, in the Northern Cape of South Africa, is only suitable for extensive livestock production and has suitable habitats to support a viable population of brown hyenas. The persistence of strong negative attitudes prompts the use of lethal methods persecuting this protected species, which is believed to be in population decline.



OBJECTIVES: The project, based at Tswalu Kalahari Reserve in the Northern Cape, aims to develop statistical and managerial methods to improve the conservation of brown hyenas in an agricultural area where persecution is strong and distribution data are missing.

TIMEFRAME: June 2012 – June 2015

2012 ACHIEVEMENTS: The project deployed 11 camera traps in order to sample the brown hyena population and identify different individuals. The second step will be to test and use spatially explicit capture-recapture models to estimate population density. The project is also collecting brown hyena scats to analyze diet. A pamphlet describing how to recognize the signs of brown hyena activity on farms was created in order to encourage farmers to take part in the study.

Email: elsa.bussiere@uct.ac.za

Facebook : <http://www.facebook.com/TswaluBrownHyenaProject/>

Website : www.brownyena.ek.la



HUMAN-PREDATOR CONFLICT PROJECT

PROJECT COORDINATOR: Lorraine Boast (PhD)

WHY: Habitat loss and the lethal removal of predators due to human-wildlife conflict are the biggest threats to the long-term survival of large carnivores in Africa. Game ranching is promoted as a land use that is potentially more profitable and less damaging to the environment than traditional livestock farming. However, it may pose a greater threat to the survival of large predators as the farmers' livelihood, the stocked game are the predators' natural prey. Therefore, depredation can be substantial, difficult to prevent and may result in a negative perception of predators and their indiscriminate removal. The number



of game ranches in Botswana has dramatically increased in the last 15 years, generating an urgent need to mitigate conflict and encourage coexistence between game farmers and large predators.

OBJECTIVES: This project will conduct interviews to discuss the major issues affecting large predator conservation on private ranch land. The potential solutions such as game management techniques, the utilisation of predators in eco-tourism and trophy hunting and the effectiveness of the translocation of 'problem' predators will be discussed. Predator population estimates will be calculated using camera trapping and spoor surveys in North West Botswana and the survival of GPS collared translocated cheetahs will be examined.

TIMEFRAME: 2012 - 2013

2012 ACHIEVEMENTS: The project is still at its early stage. This year funding has been sought and received to enable the conduction of interviews with game ranchers and cattle farmers around Botswana. Interviews began in September 2012 and will continue until the end of the year.

Email: Lorraine.boast@uct.ac.za



7. STATISTICAL MODELLING

MODELLING THE ROLE OF CLIMATE CHANGE ON RANGE DYNAMICS OF SOUTH AFRICAN BIRDS

PROJECT COORDINATOR: Zingfa Wala (PhD)



WHY: Observed geographic range shifts are among the clearest examples of how wild animals and plants appear to be reacting to climate change. The first (1987 - 1991) and second (2007 - ongoing) Southern African Bird Atlas Projects (SABAP), have collected detailed data on bird occurrence across southern Africa. This offers a good opportunity to study the mechanics and dynamics of species' ranges and investigate to what extent this dynamics is influenced by climate.

OBJECTIVES: Gain a more mechanistic understanding of the dynamics of species' geographic ranges using new statistical tools. Aim to significantly advance our understanding of how climate limits distributions and examine processes that lead to prominent macro-ecological patterns at a large spatial scale.

TIMEFRAME: 2012 – 2015

2012 ACHIEVEMENTS: The project started in June 2012. During these four months, Zingfa attended training workshops and worked on the development of the working proposal which, hopefully, will be concluded by the end of 2012.

Email: Zingfa.wala@uct.ac.za



MODELLING AVIAN RANGE CHANGES BETWEEN SABAP1 AND SABAP2

PROJECT COORDINATOR: Megan Loftie-Eaton (MSc)



WHY: Many bird species have undergone major range changes in South Africa over the past two decades. It is important to understand the mechanisms that influenced these changes if we want to suggest management solutions.

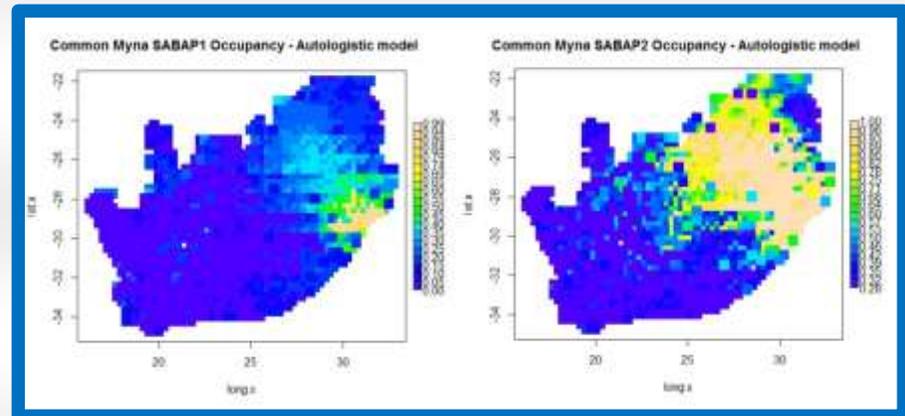
OBJECTIVES: The project aims to use dynamic multi-season occupancy models, which are able to account for the observation process, to gain an understanding of the dynamics of species' geographic ranges in relation to a series of explanatory variables such as habitat and land-use change. The project plans to estimate the occupancy, colonization and persistence probabilities for a large number of bird species across South Africa; to calculate the changes in

the extent of occupancy for each species.

TIMEFRAME: 2011 – 2013

2012 ACHIEVEMENTS: The project ran different models that were improved through an iterative development. The models were fitted using a Bayesian framework in program WinBUGS. Occupancy, persistence and colonization maps for various species have been produced. The project also calculated the changes in the extent of occupancy.

Email: Megan.Loftie-eaton@uct.ac.za



MODELLING SOUTH AFRICAN CO₂ FLUX

PROJECT COORDINATOR: Alecia Nickless (PhD)

WHY: Interest in understanding the global carbon cycle has intensified over the last two decades as carbon dioxide (CO₂) has been recognised as the greatest contributor to the anthropogenic greenhouse gas effect.



OBJECTIVES: The goal of this project is to determine regional estimates of CO₂ sources and sinks in South Africa through the method of inverse modelling. The project plans to (1) assess the best locations throughout southern Africa to locate high precision CO₂ monitoring sites to obtain the most reliable estimates of CO₂ fluxes, (2) obtain estimates of

southern African regional fluxes by means of inverse modelling, (3) assess the influence of different covariance structures on estimates of fluxes, and determine the most reasonable covariance structures to implement in atmospheric inverse modelling and (4) investigate the impact of different prior information structures on the estimates of CO₂ for the southern African region.

TIMEFRAME: 2011 – 2014

2012 ACHIEVEMENTS: In 2012 two measurement sites for atmospheric CO₂ have been set up in the Cape Town area. Information has been retrieved for the prior covariance matrices, such as population data and transportation data in the city of Cape Town, and the code for running the inversion has been installed on the CHPC computing facility.

Email: Alecia.Nickless@uct.ac.za



CO₂



AFRICAN REED WARBLER PROJECT

PROJECT COORDINATOR: Dorine Jansen (PhD)



WHY: At present, the African reed warbler *Acrocephalus baeticatus* is fairly common, but 48% of its freshwater wetlands habitat is critically endangered in South Africa. Climate change predictions of decreased rainfall in the east, present future threats to its habitat. As with most passerines its recapture rate is

low which complicates the analysis of ringing data. As a potential indicator species for wetlands baseline data is needed regarding its survival.

OBJECTIVES: The project uses multi-state state-space models in a Bayesian framework to estimate survival while accounting for detectability and transience (birds passing through, i.e. non-residents). For 1998 to 2010 estimates ranged from 0.38 (95% CI 0.20 - 0.66/0.63) for 2007/2008 and 2008/2009 to 0.80 (95% CI 0.64 - 0.96) for 1999/2000. The mean probability of being a resident (and not a transient) was estimated at 0.45 (SD 0.04).

TIMEFRAME: 2009 – 2013

2012 ACHIEVEMENTS: By the end of 2012 analyses of high effort data (ringing sites with more than 22 days of ringing over the study period) grouped by location with a spatial random error and time-dependent residence probability should yield more precise and more biologically plausible estimates of survival. The project aims to submit the results for publication by the end of 2012.

Email: Dorine.Jansen@uct.ac.za



8. HISTORICAL RESEARCH

HISTORY OF BIRD ATLASING IN SOUTH AFRICA 1985 – 2012

PROJECT COORDINATOR: Arnold van der Westhuizen (PhD)



BACKGROUND: The Animal Demography Unit was founded in 1991 as part of the first Southern African Bird Atlas Project in the southern African sub-continent. The unit was established as the Avian Demography Unit in the Department of Mathematical Statistics at the University of Cape Town. The first aim of the unit was statistical analyses of bird distribution data collected by thousands of citizen scientists to generate maps of bird species – presence and abundance. Reports on seasonal changes were incorporated in the two volumes eventually published in 1997.

In 2007 SABAP2 was launched to build on the baseline of the first atlas project and to document the changes over time elapsed since the first project. New methods were employed and the technological developments of email, internet and computer programmes to submit data directly to the database were implemented. The history of the ADU was never systematically documented.

OBJECTIVES: This current study was born to do comparative analyses between the two projects. It will also include a chapter on the history of the unit itself – evolving from Avian to an Animal Demography Unit with a focus far wider than just bird populations and distribution. The involvement of the force of citizen scientists will be analysed and documented. A cost-benefit analysis will form part of the study to estimate the value and significance of the two projects combined.

TIMEFRAME: 2010 – 2014

2012 ACHIEVEMENTS: Interviews with key players in the history of the ADU and the atlasing projects were undertaken. This documents the oral history, since a large part of the history is in the memories of those involved. Diverse data have been analysed such as archival material (minutes, documents, papers, invoices, drafts). Several draft chapters have been written. Finally, we collected information of the broader political influences from the imperial powers cataloguing the species in areas under their control.

*The ADU was founded
in November 1991 ...*

The intrinsic value of this study lies in unlocking the significance of the contribution of citizen scientists to the conservation of bird life and their habitat through dedicated and sustained return visits to collect data to paint the picture of human-wildlife interaction.

Email: arnold.vanderwesthuizen@uct.ac.za



9. THE E-JOURNAL: ORNITHOLOGICAL OBSERVATIONS

PROJECT COORDINATOR: Arnold van der Westhuizen (Editor)

MOTIVATION AND OBJECTIVES: OO is a semi-scientific e-journal that documents ornithological observations in the form of short papers (but some excellent longer submissions were already received and published). It wants to create a platform for a broad audience to publish relevant material on birds and their behaviour, habitats and related reports on birding events (conferences, etc). The journal wants to encourage citizen scientists to document their observations and share it in a "friendly environment" (not the strict process of scientific peer reviews) with a broader scientific community. The journal presents the opportunity to young researchers to submit first publications in preparation for a career in publishing scientific papers. Though submissions are not peer-reviewed, a high standard is maintained by the Editorial Committee. The aim is to publish submissions as quickly as possible on the website in downloadable PDF-format. Submissions from anywhere in the world are accepted. This journal is published in partnership with BridLife South Africa.



TIMEFRAME: The first paper was published on 31 August 2010 and the project is ongoing.

2012 ACHIEVEMENTS: By the end of 2012 a total of 72 papers had been published in the three volumes since 2010. A total of 22 608 downloads of the respective papers were made. In July 2012, a record, 1 485 downloads were made – and then a goal of 2 000 downloads per month was set. The target was met; 1538 downloads were made between August and December, 2308 per month. The papers cover a broad range of topics. This is where you find “the best

birding reads” and “real articles about real birds”. Two of the papers had links to YouTube where a short video clips capturing the behavioural observations can be viewed.

Email: arnold.vanderwesthuizen@uct.ac.za Website: <http://oo.adu.org.za/index.php>
Facebook page: www.facebook.com/groups/Ornitobs/



Best birding reads - OO - Ornithological Observations. Real articles about real birds.



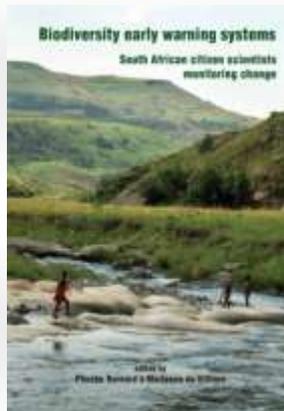
10. DESK TOP PUBLISHING (DTP)

COORDINATOR: Marja Wren-Sargent

The dtp facility supports the work of the ADU by assisting staff and students in publishing resources for their projects such as newsletters and booklets for project participants, such as citizen scientists, as well as materials to disseminate research findings such as booklets and reports. The dtp facility also produces publications for other organisations when time permits.

2012 ACHIEVEMENTS: Marja produced:

- newsletter for CAR
- compiled Review of the ADU
- flyer for PHOWN for Safring
- invitation for WRAP for Safring
- certificates for Safring
- papers for POAC 12 published online
- presently: Butterfly Atlas work
- 3 issues of the Wader Study Group Bulletin
- report: Carbon Capture and Storage (CCS) – towards a regulatory and legal regime in South Africa for ACIDI and IMEL at UCT
- booklet: Biodiversity early warning systems – South African citizen scientists monitoring change for the Department of Environmental Affairs for COP17



Website: <http://adu.org.za/conservation.php>

Email: Marja.Wren-Sargent@uct.ac.za

11. INFORMATION TECHNOLOGY

VIRTUAL MUSEUM - VM



PROJECT COORDINATOR AND DEVELOPER: Dr René Navarro

MOTIVATION AND OBJECTIVES: The Virtual Museum (VM) is a database system and corresponding web front-end, it is a research tool with the following main objectives: (1) to provide a platform for citizen scientists to contribute to science-driven biodiversity projects; submitted records are identified and vetted online by a panel of experts; (2) to serve as a repository for the long term curation of distributional data sets; (3) to provide open access to distributional data in the form of maps and lists; and (4) to provide a platform to carry out the conservation assessment (CA) of any taxa according to IUCN guidelines and criteria as the VM includes an independent implementation of IUCN's Species Information Service database. This is a key component since allows experts widely dispersed geographically to collaborate in the CA of a given taxa; it greatly simplifies the logistics of coordinating the assessment of hundreds of species and scores of authors, evaluators and editors, all in a centralized database that provides the most up-to-date distributional data available for the taxa under review. The VM has been used to as the platform for the CA of reptiles (project completed), butterflies (project completed), and birds (ongoing).

TIMEFRAME: 2005 – ongoing

2012 ACHIEVEMENTS: Currently the VM hosts eight biodiversity projects: ReptileMAP (reptiles), SABCA (butterflies), FrogMAP (frogs), PHOWN (weaver nests), OdonataMAP (dragonflies and damselflies), ViTH (trees), MammalMAP (mammals of Africa) and EchinoMAP (sea stars, sea urchins and brittle stars). Non-biodiversity collections such as BOP (odd plumages of birds) and BirdPix (repository of bird pictures) are also part of the VM system.

Website: <http://vmus.adu.org.za>



12. SPONSORS AND PARTNERS

The Animal Demography Unit would like to thank all the partners and sponsors for making all these projects possible.





Bristol
ZOO
Gardens



THE
CAPE LEOPARD
TRUST



13. PUBLICATIONS

Abadi F, Gimenez O, Jakober H, Stauber W, Arlettaz R, Schaub M 2012.

Estimating the strength of density-dependence in the presence of observation errors using integrated population models. *Ecological Modelling* 242: 1–9.

Altwegg R, Broms K, Erni B, Barnard P, Midgley GF, Underhill LG 2012. Novel methods reveal shifts in migration phenology of barn swallows in South Africa. *Proceedings of the Royal Society of London – B*. 279:1485–1490.

Arlettaz R, Maurer ML, Mosimann-Kampe P, Nusslé S, Abadi F, Braunisch V, Scahub M (2012). New vineyard cultivation practices create patchy ground vegetation, favouring woodlarks. *Journal of Ornithology* 153: 229–238.

Barshep Y, Meissner W, Underhill LG 2012. Timing of migration of the curlew sandpiper (*Calidris ferruginea*) through Poland in relation to Arctic breeding conditions. *Ornis Fennica* 89: 120–129.

Barshep Y, Ottosson U, Waldenström J, Hulme M 2012. Non breeding ecology of the whinchat *Saxicola rubetra* in Nigeria. *Ornis Svecica* 22: 25–32.

Bonnevie BT, Oschadleus HD. 2012. Adaptations in primary wing moult of southern African Viduidae and their hosts (Estrildidae). *Ostrich* 83: 91-98

Braby J, Braby SJ, Braby RJ, Altwegg R 2012. Annual dispersal and survival of a seabird adapted to a stable environment: implications for conservation. *Journal of Ornithology*.

Crawford RJM, Dyer BM, Geldenhuys D, Makhado AB, Randall RM, Upfold L, Visagie J, Waller LJ 2012. Trends in numbers of crowned cormorants in South Africa, with information on diet. *African Journal of Marine Science* 34: 411–424

Cury PM, Boyd IL, Bonhommeau S, Anker-Nilssen T, Crawford RJM, Furness RW, Mills JA, Murphy EJ, Österblom H, Paleczny M, Piatt JF, Roux J-P, Shannon L.J,

Sydeaman WJ 2011. Global seabird response to forage fish depletion – one-third for the birds. *Science* 334:1703-1706.

Dean WRJ, Franke U, Joseph G, Gonçalves FM, Mills MSL, Milton SJ, Monadjem A, Oschadleus HD 2012 Type specimens in the bird collection at Lubango, Angola. *Bulletin of the British Ornithologists' Club* 132:41–45.

Dehnhard N, Ludynia K, Almeida A 2012 Record of a Royal Penguin (*Eudyptes schlegeli*) in the Falkland Islands? *Marine Ornithology* 40: 95–98.

Distiller G, Altwegg R, Crawford RJM, Klages NTW, Barham B 2012. Factors affecting adult survival and inter-colony movement at the three South African colonies of Cape gannet. *Marine Ecology Progress Series* 461: 245–255.

Duckworth GD, R Altwegg, DM Harebottle 2012. Demography and population ecology of the hadeda ibis (*Bostrychia hagedash*) at its expanding range edge in South Africa. *Journal of Ornithology* 153: 421–430.

du Toit L, Bennett NC, Nickless A, Whiting MJ 2012. Influence of spatial environment on maze learning in an African mole-rat. *Animal Cognition* 15: 797–806.

Evans DM, Barnard P, Koh LP, Chapman CA, Altwegg R, Garner TWJ, Gompper ME, Gordon IJ, Katzner TE, Pettorelli N 2012. Funding nature conservation: who pays? *Animal Conservation* 15: 215–216.

Garthe S, Ludynia K, Hüppop O, Kubetzki U, Meraz JF, Furness RW 2012. Energy budgets reveal equal benefits of varied migration strategies in northern gannets. *Marine Biology* 159: 1907–1915.

Gordon IJ, Acevedo-Whitehouse K, Altwegg R, Garner TWJ, Gompper ME, Katzner TE, Pettorelli N, Redpath S 2012. What the 'food security' agenda means for animal conservation in terrestrial ecosystems. *Animal Conservation* 15: 115–116.



Groeneveld JC, Kirkman SP, Boucher M, Yemane D 2012. From biomass mining to sustainable fishing — using abundance and size to define a spatial management framework for deep-water lobster. *African Journal of Marine Science* 34: 547–557.

Hofmeyr GJG, Kirkman SP, Pistorius PA, Bester MN 2012. Natal site fidelity by breeding female southern elephant seals in relation to their history of participation in the winter haulout. *African Journal of Marine Science*. 34: 373–382.

Huisamen J, Kirkman SP, van der Lingen CD, Watson LH, Cockcroft VG, Jewell R, Pistorius PA 2012. Diet of the Cape fur seal *Arctocephalus pusillus pusillus* at the Robberg Peninsula, Plettenberg Bay, and implications for local fisheries. *African Journal of Marine Science* 34: 431–441.

Huntley B, Barnard P, Altwegg R, Collingham YC, Hole DG 2012. Modelling relationships between species spatial abundance patterns and climate. *Global Ecology and Biogeography* 21: 668–681.

Hutchings L, Jarre A, Lamont T, van den Berg M, Kirkman SP 2012. St Helena Bay (southern Benguela) then and now: muted climate signals, large human impact. *African Journal of Marine Science* 34: 559–583

Kirkman SP, Yemane D, Oosthuizen WH, Meÿer MA, Kotze PGH, Skrypzeck H, Vaz Velho F, Underhill LG 2012. Spatio-temporal shifts of the dynamic Cape fur seal population in southern Africa, based on aerial censuses (1972–2009). *Marine Mammal Science*.

Lewison R, Oro D, Godley BJ, Underhill LG, Bearhop S, Wilson RP, Ainley D, Arcos JM, Boersma PD, Borboroglu PG, Boulinier T, Frederiksen M, Genovart M, González-Solís J, Green JA, Grémillet D, Hamer KC, Hilton GM, Hyrenbach KD, Martínez-Abraín A, Montevecchi WA, Phillips RA, Ryan PG, Sagar P, Sydeman WJ, Wanless S, Watanuki Y, Weimerskirch H, Yorio P 2012. Research priorities

for seabirds: improving conservation and management in the 21st century. *Endangered Species Research* 17: 93–121.

Ludynia K, Dehnhard N, Poisbleau M, Demongin L, Masello JF, Quillfeldt P (2012) Evaluating the impact of handling and logger attachment on foraging parameters and physiology in southern rockhopper penguins. *PLoS ONE* 7(11): e50429. DOI10.1371/journal.pone.0050429

Ludynia K, Dehnhard N, Poisbleau M, Demongin L, Masello JF, Voigt CC, Quillfeldt P 2012. Sexual segregation in rockhopper penguins during incubation. *Animal Behaviour* [doi:10.1016/j.anbehav.2012.11.001](https://doi.org/10.1016/j.anbehav.2012.11.001)

Ludynia K, Kemper J, Roux J-P 2012. The Namibian Islands' Marine Protected Area: using seabird tracking data to define boundaries and assess their adequacy. *Biological Conservation* 156: 136–145.

Merino S, Hennicke J, Martínez J, Ludynia K, Torres R, Work TM, Stroud S, Masello JF, Quillfeldt P 2012. Infection by *Haemoproteus* parasites in four species of frigatebirds and description of a new species of *Haemoproteus* (Haemosporida: Haemoproteidae). *Journal of Parasitology* 98: 388–397.

Pistorius PA, Meyer MA, Reisinger RR, Kirkman SP 2012. Killer Whale predation on Subantarctic Fur Seals at Prince Edward Island. *Polar Biology*. 35: 1767–1772

Quillfeldt P, McGill RAR, Furness RW, Möstl E, Ludynia K, Masello JF 2012. Impact of miniature geolocation loggers on a small petrel, the thin-billed prion *Pachyptila belcheri*. *Marine Biology* 159: 1809–1816.

Schaub M, Reichlin T, Abadi F, Kéry M, Jenni L, Arlettaz R 2012. The demographic drivers of local population dynamics in two rare migratory birds. *Oecologia* 168: 97–108.



Sherley RB, Barham BJ, Barham PJ, Leshoro TM, Underhill LG 2012. Artificial nests enhance the breeding productivity of African penguins (*Spheniscus demersus*) on Robben Island, South Africa. *Emu* 112: 97–106.

Sherley RB, Ludynia K, Underhill LG, Jones R, Kemper J 2012. Storms and heat limit the nest success of Bank Cormorants: implications of future climate change for a surface-nesting seabird in southern Africa. *Journal of Ornithology* 153: 441–455.

Sjöström M, Zhao M, Archibald S, Arneth A, Cappelaere B, Falk U, de Grandcourt A, Hanan N, Kergoat L, Kutsch W, Merbold L, Mougín E, Nickless A, Nouvellon Y, Scholes RJ, Veenendaal EM, Ardö J 2013. Evaluation of MODIS gross primary productivity for Africa using eddy covariance data. *Remote Sensing of Environment* 131: 275–286.

Sun Z, Gebremichael M, Ardö J, Nickless A, Caquet B, Merbold L, Kutsch W 2012. Estimation of daily evapotranspiration over Africa using MODIS/Terra and SEVRI/MSG data. *Atmospheric Research* 112: 35–44.

Towner A, Smale MJ, Jewell O 2012. Boat-strike wound healing in *Carcharodon carcharias*. In: *Global Perspectives on the Biology and Life History of the White Shark* (ed. ML Domeier). CRC Press, Boca Raton, Florida, pp. 405–417.



14. INFORMATION FOR DONATIONS

Any donation (regardless of the amount) is very welcome and will be greatly appreciated. If you would like to make a donation to the Animal Demography Unit or to a specific project of the research unit, please follow the information below.

All donations should go through the University of Cape Town donations account before being transferred to the Animal Demography Unit. It is therefore very important that you mention the Animal Demography Unit when doing a donation, by sending an email to Abieda.Abrahams@uct.ac.za and Sue.Kuyper@uct.ac.za.

If you would like more information, please use the contact details provided below:

CONTACT DETAILS:

Prof. Les Underhill (Director)

+27 (0) 21 650 3227

Sue Kuyper (Executive Assistant)

+27 (0) 21 650 2423

Animal Demography Unit, Department of Biological Sciences
7701 Rondebosch
South Africa
Fax: +27 (0) 21 650 3301
www.adu.org.za

THE UCT DONATIONS ACCOUNT DETAILS ARE:

Standard Bank Rondebosch 025009

Swift Code SBZAJJ

Donations Account 071522387

Beneficiary reference 231454

Postal address: PO Box 1, Rondebosch 7701

Physical address: Southern Riverside Centre, Belmont Road, Rondebosch 7700

Please send an email to Abieda.Abrahams@uct.ac.za AND Sue.Kuyper@uct.ac.za to ensure donation reaches the correct project.

UCT will issue an official tax certificate in terms of Section 18A of the Income Tax Act.



15. PHOTO CREDITS

The photographs were taken (or provided – artist unknown) by the following people:

Alan Manson – Photo 2, p5

Alecia Nickless – Photos p29

Antje Steinfurth – Photo p10; photos p16

Arnold Van Der Westhuizen – Photo p31

Barry Peiser – Photos 1 and 2, p25

Callan Cohen – Photo 3, p19

Corlia Meyer – Photo1, p8

David Maphisa – Photos p21

Dieter Oschadleus – Photo 2, p30

Derek Engelbrecht – Photo 1, p32

Donella Young – Photos p4

Dorine Jansen – Photo 1, p30

Doug Harebottle – Photo 1, p2

Elsa Bussi re – Photos 1 and 2, p3; photo 1, p6; photos p7; photo 3, p8; photo 2, p9; photos 1 and 2, p11; photo 3, p12; photos p13; photo 2, p15; photo 3, p25; photo 1, p26

Ingrid Wiesel – Photo 2, p17

Leanne Tol – Photo 3, p11

Lorraine Boast – Photo 2, p26

J.A. Mortimer – Photo 2, p32

Jim Coda – Photo 2, p22

Kate Henderson – Photos 1, 2 and 4, p19

Katrin Ludynia – Photos 1 and 2, p12

Les Underhill – Photo 1, p5

Lia Steen – Photo 3, p24

Martin Mecnarowski – Photo 1, p20

Marc Burman – Photo 1, p22

Marja Wren-Sargent – Photo p33

Megan Loftie-Eaton – Photo 4, p3; Photos p28

Megan Murgatroyd – Photos p23

Michelle Wcisel – Photo 3, p3

Ralph Muller – Photo 2, p18

Rene Navarro – Photo 3, p18

Richard Sherley – Photo 2, p8; photo 1, p9; photos p14;

Sally Hofmeyr – Photos 1 and 2, p24

Sophie Kohler – photo 1, p15; photos 1 and 3, p17

Trevor Hardaker – Photo 3, p32

Ute Bradter – Photo 2, p20

Zingfa Wala – Photos 1 and 2, p27



Biodiversity

WE ARE ALL IN THIS TOGETHER



This is the message of the new EU campaign on biodiversity aiming to raise awareness of the fact that we humans are not only a part of the larger web of life, called biodiversity, but that we are interlinked with it and interdependent with all of its elements. The campaign shows the real implications biodiversity loss will have for our daily lives and promotes actions people can take to protect nature.



© Animal Demography Unit 2013
Department of Biological Sciences, University of Cape Town,
Rondebosch 7701, South Africa
Fax number for all projects: +27 (0) 21 650 3301
Enquiries: Phone: +27 (0) 21 650 2423; Email: adu-info@uct.ac.za