The dangers of academic ornithology

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I started a PhD programme in the ADU in May 2001. My project is to study the energetics of wader chicks, looking at a range of species that have different methods of rearing their young (see previous article in this issue). When Prof. Underhill suggested I use Robben Island as a study site, it seemed very appealing. Little did I know I would be risking life and limb.

After spending over a week on the island desperately searching for Crowned Plover nests, but not having much luck, I was feeling terribly tired. It was my last day in the field and I forced myself out early to search for the elusive nests.

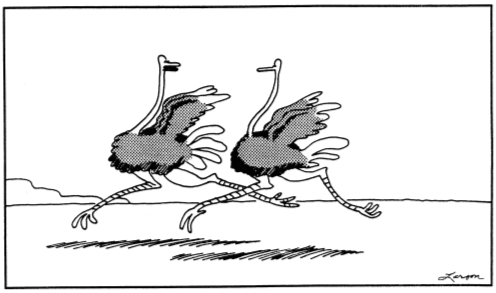
I was blundering around the area between the airstrip and the control tower, following a pair of Crowned Plovers. The next moment, I was standing in front of numerous perfectly clean, smooth ellipses. My imagination ran wild with Jurassic Park fantasies. Back in the here and now, I realized I was staring at Ostrich eggs.

Like a typical biologist, I started counting the eggs. I only got to nine before I heard something approaching me. I looked up and saw a male 'dinosaur' with magnificent pinky-red legs and face coming towards me at a rate I did not pause to appreciate. Abandoning my egg counting, I started running for the trees, desperately hoping that I could outrun a full-grown, healthy Ostrich! I felt like a tortoise lugging its shell with my backpack full of gear on my back.

Thankfully I made it to the trees before furious father caught up with me. He slowed and stopped before reaching my hiding place and, after a while, got bored and moved off. I caught my breath and jogged back to the safety of the MCM house, checking over my shoulder every now and then just to make sure that I wasn't being followed by a homicidal ratite. I feel lucky to have come away unscathed as I have heard of other, more harrowing, experiences.

Now, when I am out in the field, I try to keep my wits about me and definitely avoid those enormous clutches of giant eggs, and their prehistoric-looking daddies!

If you have the misfortune to be charged by an aggressive Ostrich, be advised that the recommended course of action, if there is no shelter or large solid object to interpose close at hand, is to lie flat on the ground, face down, and cover your head with your arms. Ostriches are too fast to outrun, and they can inflict serious wounds with their feet. – Ed.



'For crying out loud, Norm. Look at you … I hope I don't look half as goony when I run.'

The diet of Cape Fur Seals

PhD project, supervised by Prof. Les Underhill (ADU), Dr Rob Crawford (MCM), Dr Jean-Paul Roux (MFMR, Namibia) and Prof. Marthan Bester (UP)

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My PhD project is entitled 'Temporal and spatial variation of the diet of the Cape Fur Seal *Arctocephalus pusillus pusillus* in the Northern Benguela system'. The aim is to determine how the diet of the seals varies temporally and spatially, how diet composition and variability is related to environmental variables such as wind speed and direction, sea surface temperature and degree of upwelling, and finally the overlap between seal diet and fisheries will be examined, including determination of recruitment indices for commercial fish stocks in Namibia. This study will contribute to understanding interactions between the seals and their prey, as well as the seals and the fisheries, within the Northern Benguela system.

My study is based in Namibia. I investigate diet data obtained from analyses of scats (droppings) collected on a monthly basis since about 1994 (by the Ministry of Fisheries and Marine Resources (MFMR), Lüderitz) at three mainland colonies. These colonies are at Van Reenen Bay (south of Lüderitz), Atlas/Wolf Bay (south and close to Lüderitz), and Cape Cross (north of Swakopmund). Other scat data collected irregularly from smaller colonies (e.g. Possession Island, Ichaboe Island, Cape Frio and Spencer Bay) will also be looked at. Once scats are collected, they are washed and prey items (fish otoliths, squid beaks, crustacean hard parts, bird feathers) sorted from the washed material. Prey items are identified to species level where possible, and quantified.

Preliminary results have shown that the teleost (bony fish) composition in seal diets does differ between colonies, and with time.

Silvia with albino pup.

Averaging the monthly numerical abundance of each fish species over the entire study period, for each colony, shows that juvenile horse mackerel, bearded goby and juvenile Cape hake, form the bulk of the diet of seals at Cape Cross, with hake dominating towards the end of the year, followed by a dominance of horse mackerel around the first few months of the year, and changing to goby around August.

Myctophids (lantern fish) and bearded goby dominate at the Atlas/Wolf Bay colony, with goby dominating the diet around March and myctophids dominating in the second half of the year. At Van Reenen Bay, myctophids, Cape hake and bearded goby are important, with myctophids constituting a large part of the diet throughout the year, except around the first few months of the year when hake dominate and goby reach their peak. Pilchard and anchovy contribute minimally to the diet of seals.

These preliminary results show that the teleost part of the diet varies with time and space, and these patterns will be investigated in a more detailed manner using time series and multivariate analyses. From scat analyses this year, there is no indication that birds are an important prey item, with only two scats (one from Wolf Bay, one from Cape Cross), out of about 1000, containing feather remains. Squid and crustacean hard parts are found occasionally, mainly at Van Reenen Bay and Atlas/Wolf Bay colonies.

Other than collecting scats, I have had the privilege of helping the Marine Mammal Section at Atlas Bay colony during the breeding season (November–January) with tagging, sexing, weighing and resighting of new-born pups (data used to monitor pup survival and growth). Also, every few months a cross-sample of about 100 pups is carried out at all colonies. The pups are weighed and sexed to monitor growth.

Working at the colonies is most fascinating, especially watching all the activities in a colony, such as bulls holding territories, the various pup–mother interactions, and predation on pups by jackal and brown hyaena.

Acknowledgements

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'Let's move it, folks … Nothing to see here … It's all over …Move it along, folks … Let's go, let's go …'

Factors affecting productivity of the African Penguin on Robben Island

(MSc project supervised by Prof. Les Underhill, ADU, and Dr Robert Crawford, Marine & Coastal Management)

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The African Penguin *Spheniscus demersus* is endemic to southern Africa and its associated offshore islands. It faces a high risk of extinction in the wild in the medium-term future, with a Red Data status of Vulnerable, and is listed on Appendix II of the Convention for International Trade in Endangered Species (CITES). Population numbers have decreased dramatically over the past century from an estimated total population of two million in the early 1900s to 170 000 at the end of the 20th century.

Robben Island is one of the few breeding colonies of the African penguin where the population is actually increasing in size. After being exterminated by sailors in the 1800s, African Penguins returned to Robben Island in 1983 when 9 pairs were observed breeding. The numbers breeding on the island have steadily increased, with 3100 pairs in 1996, and 6723 pairs in 2001. This is now the third largest breeding colony, and it has the capacity to expand further.

numbers breeding on the island have steadily increased

It is thought that the availability of suitable breeding habitat together with abundant food resources in Table Bay has facilitated the rapid growth of this colony. Alien vegetation on the island provides nesting penguins with shade and protection from predators. It is thought that this cover reduces heat stress and associated nest desertions, and diminishes the impact of nest predation by Kelp Gulls *Larus dominicanus*, thereby increasing reproductive success. However, intensive alien-clearing programmes are currently underway throughout the Cape Peninsula, and are also being planned for Robben Island in order to reduce the risk of fire, and to increase grazing habitat for game on the island. It is therefore vitally important to assess the impact that removal of invasive aliens (i.e. rooikrans, pines and eucalyptus) within the breeding colony will have on the productivity of penguins, and to make recommendations for future vegetation management on Robben Island.

The main focus of my research is to assess to what extent habitat selection (macro-habitat) and choice of nest site (micro-habitat) affect nesting success of penguins on Robben Island. Other factors that are likely to influence reproductive success, such as nest density and the advantages offered by colonial breeding, distance of nest site from the sea, climatic conditions, food availability, timing of laying, and human disturbance, will also be examined. Where possible, the effect of nest and mate fidelity on productivity will also be assessed, taking into account the length of the relationship between the mating pair, and thus the strength of the pair bond.

Approximately 25 nests from each habitat (coastal grassland, coastal rooikrans thicket, inland rooikrans thicket, inland eucalyptus forest, and disturbed boardwalk) will be monitored weekly over at least two breeding seasons. Choice of nest types (burrow, scrape, vegetation, or artificial nest) and percentage cover/shading offered will also be

noted. The different vegetation types will be mapped using GIS software, and the nest sites marked on the computerized map. Daily temperature and rainfall data will be retrieved from a weather station situated on Robben Island and correlated to peaks in nest desertions and failures. I will also be conducting experiments, using temperature probes attached to a data logger, to compare nest temperatures between different nest types and habitat types.

From a conservation point of view, it is important for environmental managers to take cognizance of factors that positively or negatively affect breeding success in the African Penguin so that measures can be taken to enhance their productivity, and ultimately contribute to the survival of this species. My project is focused on enabling us to make management decisions based on sound scientific research.

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African Penguins and rubbish bins: population dynamics and conservation in Namibia

PhD project supervised by Prof. Les Underhill (ADU); Dr Jean-Paul Roux (MFMR, Namibia) and Dr Robert Crawford (MCM)

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African Penguins *Spheniscus demersus* currently breed on six islands and one mainland site in Namibia. Four of the islands are considered global Important Bird Areas (IBAs) (Barnes 1998) and support 97% of the Namibian penguin population. Three of these, namely Mercury, Ichaboe and Possession islands, are permanently staffed by the Ministry of Fisheries and Marine Resources, while the fourth, Halifax Island, is visited once a week. Penguin monitoring activities include bimonthly counts of moulting birds and monthly counts of active nests. Penguins are also regularly banded (usually as fledglings) and resightings provide useful information on penguin age structure and movements. While the species is classified as Vulnerable according to IUCN criteria (Ellis *et al.* 1998), numbers in Namibia have declined faster than in South Africa. As a result, the Namibian population has been classified Critically Endangered (Robertson *et al.* 1998).

While relieving island staff on Mercury Island for ten weeks during 1999, I discovered that although the islands had been monitored regularly for several years by dedicated staff, much of the information was tucked away in numerous notebooks. Although the islanders had a good intuitive feel for what was happening to penguin numbers on their respective islands, there was an urgent need to collate and make sense of the monitoring data to get a better grasp of penguin population dynamics in Namibia. Thus this project aims to explain current and long-term population trends for each island in terms of juvenile and adult survival rates, breeding success and inter-island movement, and to use the results to improve the conservation management of the species.

Population estimates have just been updated and trends indicate that the Namibian penguins continue to decline at roughly 3–4% per year (Kemper *et al.* in press). Worst off is Possession Island which supported at least 46 000 penguins in the 1950s; half a century later, there are fewer than 2000 penguins left. Ichaboe Island is showing a worrisome decline in peak numbers of active nests (i.e. nests containing eggs or chicks) of 18% per year since 1994. Numbers on Halifax Island have remained fairly stable over the last five years and only Mercury Island is showing a slight growth, but this is not enough to offset the overall decline.

Apart from lack of prey, degradation of breeding habitat is suspected to be a key factor in explaining the population decline. African Penguins ideally nest in burrows, but after large-scale guano removal, most penguins in Namibia are forced to nest on the surface, exposing eggs and chicks to gull predation and temperature fluctuations. One of the main goals of the project is to investigate breeding success in different breeding habitats and to find ways to improve breeding habitat to significantly boost breeding success. Artificial burrows may provide a viable solution, and a pilot project was recently initiated on Halifax Island, where predation and heat stress are fairly common causes of breeding failure. The challenge was to design shelters which would meet a range of requirements. Apart from actually attracting penguins in the first place, the burrows needed to:

forced to nest on the surface

Penguin in a bin nest.

- ❑ be spacious enough to accommodate an adult penguin and two fledglings,
- ❑ have narrow entrances to keep gulls at bay,
- ❑ provide good drainage during the occasional rainstorm,
- ❑ be made of a material which keeps the interior cool even during a hot east-wind day (i.e. not metal),
- ❑ be resistant to wear brought on by a combination of strong wind, harsh sunlight and sea spray,
- ❑ be relatively inexpensive and easy to install.

Previous attempts at providing burrows on Possession Island only proved successful for one breeding season. Then ticks invaded 'Rockytown', a colony of artificial shelters made from rocks and planks and since then the penguins have not attempted breeding there again. Since large numbers of ticks also lurk in the buildings and under rocks on Halifax, the burrows had to be made of a smooth, tick-unfriendly material. Eventually, with dimensions given by Maritz (1995) and Wilson & Wilson (1989) as a guideline, plastic dustbins (80 cm × 53 cm), cut in half length-wise, were used. These were dug into the ground at a slight angle, covered with rocks and sand to prevent them from blowing away, and the floor of the burrow was lined with guano. With the help of a group of enthusiastic volunteers, twelve shelters were installed during September 2001 in an area where penguins had attempted to burrow before.

Will the penguins like the bins? Will the ticks stay away? Will breeding success be significantly improved? Six weeks later, two bins were already occupied by breeding pairs and the first eggs were laid, even though very few penguins were laying eggs elsewhere on the island. In November, 'Bintown' will be extended to link up with the main surface-breeding colony. After that, disturbance on the island will be kept to a minimum to allow the penguins to explore Bintown in peace.

Acknowledgements

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