

Percy FitzPatrick Institute of African Ornithology

July 2003 – June 2004

Department of Zoology
University of Cape Town
Private Bag
Rondebosch
7700
SOUTH AFRICA



+27 (0)21 650 3290
fitz@botzoo.uct.ac.za
<http://www.fitzpatrick.uct.ac.za>



University of Cape Town



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Prof. L.G. Underhill (UCT)
Mr F. van der Merwe (co-opted)

* *Dr Mokhele has indicated that he will attend meetings of the Advisory Board if his presence is required for a specific purpose.*

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Introduction

The identification by the National Research Foundation of research groups to be awarded Centre of Excellence status started in August 2003. This culminated in the naming of the Percy FitzPatrick Institute at the end of June 2004 as the host of one of only six such centres in South African science and technology. This award brings not only prestige to the discipline of conservation biology -- and more specifically ornithology -- but also the potential to sustain these disciplines at the forefront of South African scientific endeavour.

The South African Department of Science and Technology (DST) and the National Research Foundation (NRF) announced in June 2004 that we have been awarded the privilege to host one of only six Centres of Excellence (CoE), viz. the DST/NRF Centre of Excellence in "*Birds as Keys to Biodiversity Conservation at the Percy FitzPatrick Institute*". The reward recognizes the Institute's past successes, but also comes with the expectation that it will continue to deliver internationally competitive research and highly skilled conservation biologists who are able to tackle conservation issues in Africa.

The DST Centres of Excellence (CoE) have five key performance areas: (1) to develop research and create and advance new knowledge, (ii) to provide access to a highly developed pool of human expertise, (iii) to provide and maintain databases, (iv) to promote knowledge sharing and transfer, and (v) to promote collaboration with reputable individuals, groups and institutions.

The research programme of the CoE at the Percy FitzPatrick Institute will be based on two interlinked themes, viz. understanding and maintaining biodiversity. The first theme investigates the composition and structure of biodiversity, the processes responsible for its generation and how relationships between organisms and their environments influence the form and functioning of biological systems. The second builds on the strong theoretical and empirical foundations provided by the first to assess, predict and manage human impacts, with an emphasis on understanding the dynamic links that lead to biodiversity loss.

The award comes with substantial funding for a period of up to ten years, and which will allow the execution of innovative long-term approaches to conservation science in general, and ornithology in particular. Further, the award of the CoE has made it possible for the Percy FitzPatrick Institute to advertise the Pasvolsky Chair as a full-time position as soon as the post can be filled after an offer has been made -- hopefully by the end of 2004. This will bring to an end the dormancy that has arisen out of the unfortunate shortfall created by the process of inflation in the period between the drawing up of Mrs Pasvolsky's will, and her death in 1999.

The Conservation Biology Programme's Class of 2004/5 has once again delivered an outstanding batch of 15 students, bearing testimony to the fruits that come with a growing reputation. And once again, we have attracted in excess of 50 applications from across the world (representing five of the six continents) for the course that commences in January 2005. While we had expected a potential decline in non-South African students as a result of the discontinuation of the MacArthur bursary support for such students, we have been pleasantly surprised. The Tropical Biology Association (TBA) provided three of their top alumni (from Kenya, Tanzania and Uganda respectively) with full scholarships. In addition, we were able to raise external funding for two more African students (one each from Kenya and Lesotho). Of the remaining students, five were South African, two British, with a further one each from Canada, Kenya, and Zimbabwe.

The success of the Conservation Biology course relies heavily on the academic expertise of academic colleagues from Botany, Chemical Pathology, Economics, Leslie Hill Institute of Plant Conservation, Mathematics, Molecular Biology, Statistical Sciences, and Zoology. In addition, we have over the years contracted in the



expertise of a range of experts from across the world including Australia (Andrew Knight), Germany (Prof Christian Wissel), the UK (Dr Norman Myers), and USA (Prof Tony Starfield). The latter three in particular are stalwarts who have contributed significantly to the CB Programme over many years, and we are grateful to them for their continued interest in, and support of our students.

The Pola Pasvolsky Chair in Conservation Biology has remained inactive during the reporting period, although a well-known young conservation biologist from Cambridge, Dr Andrew Balmford, has been invited to occupy the Pola Pasvolsky Visiting Chair from August 2004 until March 2005 while he is on sabbatical in Cape Town. Dr Balmford stands to bring great enthusiasm and expertise to the Conservation Biology Programme.

The *Roberts VII* bird book project has not only continued to occupy, but also consume several key Fitztitute staff virtually round the clock, particularly Prof Phil Hockey. The project has, for a variety of reasons, experienced an unfortunate over-run in the anticipated date of completion. However, the date of publication has now been shifted out by five months to the end of May 2005. Thus, I am more than confident that by the next Fitztitute AGM, we shall literally be wheeling in the totally rewritten version of '*Roberts Birds of Southern Africa*'. In retrospect this project has perhaps drawn Fitztitute scientific capacity away from its other core activities of original research and post-graduate student capacity building. However, having seen the quality of a substantial part of *Roberts VII*, I can confidently say that the return on this investment will more than repay itself in terms of the impact that the work will make on southern African ornithology.

The Niven Library, under the able guidance and enthusiasm of Margaret Sandwith, continues to provide a vital service to Institute staff and students, other university researchers and outside users both with affiliations to BirdLife South Africa, and from further afield. Our link to BirdLife SA continues to leverage vitally important journal exchanges with overseas institutions. Further, the relationship with NISC (the electronic bibliographic company) continues productively with one of their full-time bibliographers, Michael Raine, continuing his work in the library.

I thank Prof. Daya Reddy, Dean of Science, for his support of the Institute and through him for the resources that the Institute receives from the University. Prof. Jenny Day, as HOD of Zoology, has also been highly supportive of the Institute and its activities. I have had the full support of the Advisory Board and many Board members assisted me with advice and support during the course of the year. I thank each and every one for their valuable support of the Percy FitzPatrick Institute.

I am once again grateful for the contributions of the Institute's academic staff, viz. Tim Crowe, Phil Hockey, Peter Ryan and Jane Turpie, and in particular their dedication to post-graduate student research. A number of Contract Staff and Research

Associates have also contributed significantly to postgraduate student education and/or supervision, viz. Prof. Sue Milton and Drs Richard Dean, Andrew Jenkins, Penn Lloyd, Rob Simmons and Antoni Milewski. The Fitztitute remains privileged to have dedicated and particularly competent support staff in Chris Tobler, Hilary Buchanan, Margaret Sandwith and Lionel Mansfield. Finally I thank Andrew Jenkins, Melissa Stander, and Hilary Buchanan for yet again putting together this rather visually pleasing annual report despite having had to beg – more than ever – for contributors' offerings in the face of competing commitments of the setting up of the Centre of Excellence structures, and the pre-parturition contractions of the *Roberts VII* project !

I trust that the reader will find the detailed material that appears in the rest of this report, both informative and, perhaps, even impressive.

Morné A. du Plessis (September 2004)

Director



Changes in Personnel

Dr Penn Lloyd continued his association with the Fitzitute whilst working with Prof. Tom Martin from the Montana Co-operative Wildlife Research Unit.

Graduates

MSc: Jane Hamblin, Amanda Hawn (December 2003)

Conservation Biology MSc: Karen Alston, Mark Bidwell, Bastian Bomhard, George Eshiamwata, Caiphaz Khumalo, Raphael Kongor, Jeff Muntifering, Juliet Nansikombi, Nir Peleg, Samantha Ralston and Kabelo Senyatso (June 2004)

New students

PhD: Kirsten Louw (supervised by Phil Hockey) upgraded from an MSc to a PhD and **Tshifhiwa Mandiwana** (co-supervised by Tim Crowe and Prof. Paulette Bloomer from U. Pretoria).

Conservation Biology (CB) MSc: Fifteen students began the CB MSc in January 2004.

Director

Du Plessis, M.A. PhD (Cape Town) Professor: July - June*

Academic and Research Staff

Crowe, T.M. PhD (Cape Town) Professor: July - June*

Dean, W.R.J. PhD (Cape Town) July - June

Hockey, P.A.R. PhD (Cape Town) Associate Professor: July - June*

Ryan, P.G. PhD (Cape Town) Lecturer: July - June*

Turpie, J.K. PhD (Cape Town) Senior Scientific Officer: July - June

Research Associates

Jenkins, A.R. PhD (Cape Town) July - June

Lloyd, P. PhD (Cape Town) July - June (external: University of Montana)

Milewski, A. PhD (Murdoch University, W. Australia) July - June

Simmons, R. PhD (Wits) July - June

Postgraduate students

Doctoral

Barnes, K.N. MSc (Cape Town) July - June

Cohen, C. BSc (Hons) (Cape Town) July - June

Loewenthal, D. MSc (Cape Town) July - June

Louw, K. BSc (Hons) (Cape Town) July - June

Mandiwana, T.G. (MSc (Cape Town) January - June

Seymour, C. MSc (Cape Town) July - June

Masters by Dissertation

Boix-Hinzen, C. BSc (Hons) (Pietermaritzburg, Natal) July - June

Curtis, O.E. BTech (Cape Town) July - June

Hamblin, J. BSc (Hons) (Cape Town) July - December

Hawn, A. BAS (Princeton University, USA) July - December

Parker, R. BSc (Hons) (Cape Town) July - June

Masters in Conservation Biology 2004

Da Silva, J. BSc (Hons) (Toronto) January - June

Farmer, H. BSc (Hons) (Bristol) January - June

Lawrence, C. B.Tech (Mangosuthu) January - June

Little, I. BSc (Hons) (Cape Town) January - June

Lowe, S. PhD (London) January - June

Mader, A. BSc (Hons) (Cape Town) January - June

Mao, A. BSc (Hons) (Moi) January - June

Marr, S. MSc Chem Eng (Cape Town) January - June

Napier, V. BSc (Hons) (Cape Town) January - June

Osano, P.M.M. BSc (Egerton) January - June

Owen, C.S. BSc (Hons) (Imperial College, London) January - June

Owino, A.O. BSc (Hons) (Moi) January - June

Rahlao, S. BSc (Hons) (Cape Town) January - June

Soka, G.E. BSc (Hons) (Soikoine) January - June

Spear, D. BSc (Hons) (Rhodes) January - June

Masters in Conservation Biology 2003

Alston, K. BSc (Hons) (Cape Town) July - February

Atukunda, A. MSc (Makerere) July - June

Bidwell, M. BSc (Northern British Columbia) July - February



Bomhard, B. MSc (Marberg) July - February
Eshiamwata, G. BSc (Hons) (Egerton) July - February
Khumalo, C. BSc (Hons) (Durban-Westville) July - February
Kongor, R. BSc (Hons) (Bangor) July - February
Jack, K. BSc (Durham) July - June
Muntifering, J. BA (St Johns) July - February
Nansikombi, J. BSc (Hons) (Makerere) July - February
Potter, L. BSc (Hons) (Cape Town) July - June
Ralston, S. BSc (Hons) (Cape Town) July - February
Senyatso, K. BSc (Botswana) July - February

Masters in Conservation Biology 2002

Maphisa, D. BSc Hons (Natal) July - June
Peleg, N. MSc (Ben-Gurion, Israel) July - February

Zoology (Hons)

Albrecht, G. January - June
Baudains, T. January - June
Edwards, J. January - June
Koch, E. January - June
Little, I. July - December
Napier, V. July - December
Potgieter, K. July - December
Taylor, B. July - December
Underhill, J. January - June
Watermeyer, K. January - June
Welz, A. July - December
Wright, D. January - June

Externally registered students*

Doctoral

Wichmann, M. MSc (Marburg) July - June (registered at U. Potsdam, Netherlands)
Spottiswoode, C. MSc (Cape Town) July - June (registered at U. Cambridge, UK)

Masters

Ranger, S. BSc (Hons) (Pretoria) January - June (registered at U. Pretoria)
Grant, T. BSc (Hons) (Pretoria) July - June (registered at U. Pretoria)
Rao, A. BSc (Hons) (XX) January - June (registered at Memorial University of Newfoundland, Canada)
Seoraj, N. BSc (Hons) (Durban-Westville) January - June (registered at U. Durban-Westville)
Solms, L. BSc (Hons) (Pretoria) January - June (registered at U. Pretoria)
Techow, M. BSc (Hons) (UCT) January - June (registered at Molecular and Cell Biology, UCT)
Tshiguvo, T. MSc (UCT) January - June (registered at U. Stellenbosch)

* External students are postgraduate students not based at the Fitztitute, who normally receive scholarships/salaries from sources outside the Fitztitute.

Roberts VII Project

Hampson, S. Project Manager July - June

Research Assistants

Barendse, J. April - June

Bragg, C. May - June

Herrmann, E. January - June

Frauenknecht, B. July - June

Lordan, F. March - June

Roux, G. March - June

Savy, C. July - June

Support Staff

Principal Technical Officer

Tobler, C.J. July - June*

Administrative Assistant

Buchanan, H. July - June*

Library Staff

Sandwith, M. July - June* (Librarian)

Dalglish, S. July - June (Volunteer)

Loubser, D. July - June (Volunteer)

Ntsham, N. March - June (Volunteer)

Departmental/Accounts Assistant

Mansfield, L.F. July - June*

Webmaster

Stander, M. July - June

- * Denotes permanent member of the UCT staff establishment. All other personnel are contractual or ad hoc appointees held against posts supported by grants in aid of research, bursary holders or part-time postgraduate students employed outside the Fitzitute.



Mission Statement

To promote and undertake scientific studies involving birds, and contribute to the practice affecting the maintenance of biological diversity and the sustained use of biological resources.

Prof. Morné du Plessis

serves as a member of the International Ornithological Congress Committee, the Advisory Board to the Institute for Plant Conservation, the Council of BirdLife South Africa, the Steering Committee of SAFRING and the Advisory Committee of the Mammal Research Institute at the University of Pretoria. He served as a Trustee to WWF-SA, as Chairman of both WWF-SA's Conservation Advisory Committee and its Projects Approval Group, and as Vice-President of the Board of Governors of the Africa Section of the Society for Conservation Biology. He served on the editorial board of the Southern African Journal of Wildlife Research.

During the review period, Morné co-convened the Zoology Honours course. He supervised two Zoology Honours students, three MSc students, two PhD students and worked with one post-doctoral researcher. He also co-supervised three MSc Conservation Biology students, provided project support to two further MSc CB students, and co-supervised three students registered at other universities. He regularly participates in nature programmes on both radio and television and gave two presentations to membership-based societies. He reviewed numerous NRF proposals, and reviewed 12 applications for research grants and 11 manuscripts submitted to scientific journals.

Prof. Morné du Plessis

together with Assoc. Prof. Phil Hockey leads the Life-history, Rarity & Conservation of Southern African Birds Research Programme.

Cooperative Breeding & Sociality in Birds

Programme leader

Prof. Morné du Plessis

Research team

Prof. Ben Burger (Laboratory for Ecological Chemistry, Univ. Stellenbosch)

Prof. Joseph B. Williams, (Ohio State Univ., USA)

Prof. Gerard Malan (Tshwane Univ. of Technology, SA)

Dr Andrew Radford (Cambridge Univ., UK)

Dr Rita Covas (Edinburgh Univ., UK)

Dr Claire Doutrelant (CNRS, France)

Dr Penn Lloyd, (Univ. of Montana, USA and PFIAO)

Dr Rob Simmons (PFIAO)

Mr Yuval Erlich (Ground Hornbill Research and Conservation Programme)

Mark Anderson (Northern Cape Nature Conservation)

Overview

Cooperative breeding is a reproductive system in which more than a pair of individuals show parent-like behaviour towards young of a single nest or brood. Numerous variations have been identified including helping-at-the-nest by non-breeding offspring that have delayed dispersal and remained with their parents on their natal territory, and various forms of cooperative polygamy or plural breeding in which more than a single male or female share breeding status within the same social unit. Aid generally consists of feeding nestlings or fledglings but can also include incubation and defence of the nest or territory. Aid-givers or co-breeders are often related to the focal breeding pair. The evolution of cooperative breeding can usually be broken down into two complementary processes: the decision to stay in the natal unit and the decision to help.

The objectives of this programme are (1) to conduct a broad, phylogenetically-controlled analysis of the ecological and life-history strategies of African birds that might predispose them to cooperative breeding; (2) to uncover the factors underlying the divergent evolutionary pathways that might lead to regular versus opportunistic cooperative breeding; (3) to perform a series of controlled experiments that investigate the effects of factors identified in (2) on the tendency for birds to breed cooperatively (i.e. among opportunistic cooperative breeders); (4) to develop and test dispersal models in two widely different cooperative breeding systems, viz. singular and colonial breeding systems; and (5) to experimentally investigate the ecological factors underlying reproductive sharing and the degree of help provided by non-breeders in cooperatively-breeding societies.

The Sociable Weaver project at Benfontein Game Farm, Kimberley, remains a highly productive research study after Dr Rita Covas-Monteiro's completion of her doctoral research. Claire Spottiswoode (a PhD student registered with Prof Nick Davies at Cambridge) is continuing the long-term work on this population while Rita Covas and Claire Doutrelant are in the process of completing several research papers on their work on this species. Eric Herrmann has continued in his role as the research manager at this field site and maintains the general capture and ringing aspect of the study.

Eric Herrmann has put a lot of effort into setting up the foundations for a longer-term study of Ant-eating Chats in order to allow deeper study into their social behaviour. To this end, he has now caught and individually colour-ringed a total of 64 adults and 75 fledglings in 24 groups. This species is not only facultatively cooperative in their breeding, but the males display white wing patches in what appear to be energetically expensive display flights. The potential exists for productive future research opportunities of this species.



Ground Hornbills: development of the young of this species is slow and one of the two nestlings is usually lost. Photo: Yuval Erlich.

In collaboration with Prof Ben Burger of Stellenbosch University, we are collecting and analysing the chemical composition of the uropygial gland secretions of scimitarbills. To this end, we have set up on Benfontein Farm a small number of nest boxes suitable for this species to breed and roost in so as to facilitate their study and capture. The Fitzpatrick is in an advanced stage of negotiating the establishment of a longer-term presence on the De Beers property at Benfontein.

Field work continues on the Green Wood-Hoopoe project. Andy Radford has produced several excellent publications on his woodhoopoe research and a few more manuscripts are currently in press. The study now enters its 24th year and this large dataset has enabled us to analyse data on the life-time reproductive success of 122 woodhoopoes for which we have full breeding histories (Amanda Hawn's MSc study).

A preliminary pilot study has commenced on the Ground Hornbill population in the Klaserie, Timbavati and Umbabat Nature Reserves along the Kruger National Park's western boundary. Yuval Erlich has been very active in setting this study up so that a future research student can take the project further. The intention of the project is to develop a better understanding of the basic ecological requirements of this species, and in particular to interpret the reasons for the slow development of young, the regular loss of one of the two nestlings, and cooperative breeding in this species. A total of 60 artificial nest cavities have been constructed and set up throughout these reserves, and a total of eight of these sites have been used by wild groups in the breeding seasons of 2002 and 2003.

Bernhard Frauenknecht began a study of Cape Penduline Tits at the Koeberg study site. This pilot study focuses on the role and possible benefits of supernumerary birds in the nesting cycle of this species, and specifically how non-breeding helpers influence nest attentiveness during incubation and the nestling period. During the 2003 breeding season he was able to locate and track the breeding activities on 15 different territories, several of which had non-breeding helpers.

Highlights

- The publication of two high-profile multi-disciplinary papers on sociable weavers in: *Proceedings of the Royal Society (London)* (Covas *et al.* 2004) and *Behavioural Ecology & Sociobiology* (Doutrelant *et al.* 2004).
- The publication of five papers on woodhoopoe research in international peer-reviewed journals: *Behavioural Ecology & Sociobiology* (Radford 2004a; Radford 2004b) *Behaviour* (Radford 2004c), *Auk* (Radford & du Plessis 2004a), and *Journal of Avian Biology* (Radford & du Plessis 2004b).

Students

Claire Spottiswoode (PhD, Cambridge); *Behavioural ecology and tropical life-histories in African birds*

Christian Boix-Hinzen (MSc); *Developing management tools for the conservation of hornbills in a developing country*

Amanda Hawn (MSc, graduated in December 2003); *The effect of territory quality on dispersal decisions in a model population of Red-billed Woodhoopoe*

Nimmi Seoraj (MSc, University of Durban-Westville) *Warning vocalisations and predator information transfer in social birds*

Bernhard Frauenknecht (BSc Hons) *Cooperative breeding in the Cape Penduline Tit* *Anthoscopus minutus*

Dale Wright (BSc Hons) *Post-fledging dispersal of facultatively cooperative-breeding Karoo Robins*

Gustav Roux (Diploma in Nature Conservation, Tshwane Univ. of Technology)

Lectures

Prof. du Plessis taught part of a seven-week module to UCT Honours students on 'Birds as models of ecological theory'. He was also responsible for a two-week lecture block on 'Conservation Biology' to 2nd year Zoology students.

Visitors

Prof. Nick Davies (Cambridge University, UK)

Dr Alan Kemp (formerly of Northern Flagship Institution, SA)

Prof. Tom Martin (University of Montana, USA)

Dr Andrew McKechnie (University of Witwatersrand, SA)

Dr Richard Pettifor (Institute of Zoology, London, UK)

Acknowledgements

De Beers Consolidated Mines Limited (Naseem Chohan, Morgan Hauptfleisch, Graham Main & Peter Gibbs); National Research Foundation; European Union; University Research Committee; private landowners in Komga district (Sean Cockin, Frank Cockin, Johan Breetzke, Willem Fourie, Trevor Brown, Mike Putzier & Carl Vernon) and Kei Mouth Municipality; Klaserie Nature Reserve (Mike Myers & Colin Rowles); Timbavati Nature Reserve (Bryan Smither & Scott Ronaldson) and Umbabat Nature Reserve (Paul de Luca); Dow Chemicals (Ross Maclean, Bruce Macdonald, Theresa Macdonald & Doritha Erwee).

Assoc. Prof. Phil Hockey

is also the leader of the **Ecology of Migration Research Programme**.

Prof. Morné du Plessis

is also the leader of the **Cooperative Breeding & Sociality in Birds Research Programme**.

Dr Peter Ryan

also leads the **Seabird Research Programme** and the **Island Conservation Programme** and, together with Prof. Tim Crowe, leads the **Systematics & Biogeography Research Programme**.

Life-history, Rarity & Conservation of Southern African Birds

Programme leaders

Assoc. Prof. Phil Hockey
Prof. Morné du Plessis
Dr Peter Ryan



The field research team for the Avian Life History Research Programme at Koeberg Nature Reserve. From left to right: Anna Chalfoun, Dr Rita Covas, Dr Penn Lloyd, Eric Kofoed, Sonya Auer, Ron Bassar and Prof. Tom Martin. Photo: Dr Penn Lloyd.

Research team

Prof Tom Martin & co-workers (Montana Univ., USA)
Dr Andrew Jenkins (PFAIO)
Dr Penn Lloyd (PFAIO)
Dr Andrew McKechnie (Witwatersrand Univ., SA)
Dr Rita Covas (Edinburgh Univ., UK)

Overview

Most biological theory is founded upon studies done in the northern hemisphere despite recent evidence strongly suggesting a Gondwanan origin for the majority of birds and the fact that more than 80% of all bird species reside in tropical and south temperate regions. It has also been established that birds inhabiting tropical and southern hemisphere regions have very different life histories (LH), generally laying smaller clutches and having higher survival than their northern counterparts. The implications of this are far-reaching, influencing the way we might assign conservation priority or develop conservation plans for birds in southern Africa.

A number of competing hypotheses have been suggested to account for the north-south differences in life history traits. Research in this programme will (1) consider and compare the relative allocation of effort by southern African birds to reproduction and survival, (2) compare LH traits of southern African birds relative to those of the northern temperate regions, (3) investigate whether different taxa are prone to different mechanisms of extinction, and, (4) assess whether different ecological factors are associated with different mechanisms of threat or extinction.



These comparisons can be used to gain insights into life history evolution in south temperate birds as compared to those living in the north temperate climes as well as an understanding of the mechanisms underlying the persistence of southern African birds. The programme also attempts to exploit unique opportunities offered by environmental gradients within southern Africa to tease apart the various causative factors underpinning regional differences in LH traits.

Koeberg Life-history Research

Dr Penn Lloyd has continued to work in a post-doctoral position with Thomas Martin at the University of Montana. His project investigating the effects of forest fragmentation on nest predation, brood parasitism, and population growth potential of forest-nesting passerines across the United States is now largely complete. This will allow him to focus more time on the analysis of the now considerable dataset that has been amassed for the Koeberg Avian Life-history Research Programme, which he co-ordinates. A collaborative venture between the University of Montana and the Percy FitzPatrick Institute, this programme investigates the environmental factors responsible for geographical variation in phenotypic traits of birds. Now in its fifth year, the field research involves intensive monitoring of over 1,500 nests each season, and the reproductive effort and survival of the over 1,800 adults of 20 species that have been individually colour-ringed to date. The principal focus of this research is to investigate the influence of climate, annual adult survival probability, food availability and nest predation risk on reproductive effort (e.g. clutch size, egg size, nest attentiveness and incubation temperature, nestling feeding rates, and annual fecundity), growth rate (incubation period length, hatching asynchrony, and nestling growth rate), and behavioural ecology (e.g. co-operative breeding, male investment in reproduction, extra-pair paternity, divorce, and dispersal) among species. The results from the Koeberg project are being integrated with the results from a network of similar field sites in Arizona, Argentina, Venezuela, New Zealand and Tasmania, to examine variation in phenotypic traits across broad environmental gradients. Dr Rita Covas (Edinburgh University) and Dr Andrew McKechnie (Wits University) are now also conducting independent projects within the research programme. The ground-work has now been laid for future student projects to take the Koeberg study a step further in examining the causes and consequences of individual variation in traits within species.

African Black Oystercatcher Research

Another long-term, ongoing study (since 1979) is of the population dynamics of the (regionally endemic) African Black Oystercatcher *Haematopus moquini* (e.g. Hockey 1996). This has involved data gathering throughout the species' breeding range and beyond at Namibian nurseries (see 'Migration'). Fortuitously, during the course of this study, there have been

significant environmental changes (especially invasion of the shore by an alien mussel species) that have affected the species' demographics (Hockey & van Erkom Schurink 1992). This environmental change is spatially variable and has allowed us to fine-tune demographic models in response to e.g. observed changes in reproductive performance. African Black Oystercatchers are excellent candidates for this type of modelling because a) they are linearly distributed, and b) they have extremely high natal philopatry, allowing local populations to be modelled as closed. The models (based on both age-linked dominance hierarchies and lifetime reproductive success) are proving remarkably robust and can explain (and predict) the range of stable bird densities observed. Not all of the coast has, as yet, been invaded by mussels, but robust data exist on the rate of invasion; these will allow us to both make, and test, predictions about future population changes. Construction of such models is heavily reliant on accurate, age-linked mortality data. Whilst these data now exist for most age-classes, we are still refining the data set for mortality between 1 year and first breeding; this component of the study links closely with ongoing studies of juvenile movements (see 'Migration').



Hundreds of juvenile African Black Oystercatchers, many of them from South Africa, gather for the first two years of their lives at a handful of nurseries along the southern and central Namib Desert Coast. Photo: Antje Leseberg.

Very few shorebird species in the world are as well-studied as African Black Oystercatchers, and almost all that are, are migratory. This places major constraints on the accuracy of models, because it is impossible to link breeding performance and non-breeding numbers at the spatial and individual resolution that we are able to achieve with local oystercatchers. When our suite of models are completed, we expect them to be the most accurate such predictive models for population changes of any shorebird in the world.

Rarity and extinction risk

Birds are perhaps the best-studied group of vertebrates worldwide; the breadth of this knowledge may explain why ca 12% of



The Knysna Warbler, endemic to the south coast lowlands of South Africa, is potentially threatened on the Cape Peninsula by reduced fire frequency which allows the lateral spread of riverine forest. Photo: Brent Visser.

the world's birds are included in the International Red Data Book (Hockey 2002). The forces that have driven birds towards extinction have changed over the past 400 years, from direct persecution to habitat loss and degradation, and invasion of alien taxa (Lennard 1998). Africa and Antarctica are the only continents to have experienced no recent avian extinctions, but this status is unlikely to persist for long.

For several years, researchers at the PFIPO have been studying the reasons for avian rarity and how these link to the most appropriate conservation action to prevent further population or species losses (e.g. Cameron 1999, Ruzikandekwe 2000, Lengyel 2001). 'Model' rare taxa that have been used in these studies range from grassland passerine endemics (Rudd's Lark *Heteromira fra ruddi*, Yellow-breasted Pipit *Anthus chloris* (Hockey *et al.* 1988, Muchai 2002) to forest-dwelling (Knysna Warbler *Bradypterus sylvaticus* (Visser & Hockey 2003), semi-desert (Red Lark *Certhilauda burra* (Dean *et al.* 1991), montane (Peregrine Falcon *Falco peregrinus* (Jenkins & Hockey)), coastal (Canarian Black Oystercatcher *Haematopus meadewaldoi*, African Black Oystercatcher *H. moquini* (Hockey 1987, Leseberg *et al.* 2000)) and freshwater (Wattled Crane *Bugeranus carunculatus* (Bento 2002)) taxa. In almost all cases, the search has been for the life-history stage(s) at which demographic bottlenecks occur, and identifying the root causes of such bottlenecks. These vary greatly. In the case of African Black Oystercatchers, for example, predation of small chicks is the key issue. Wattled Cranes in the Zambezi Delta are impacted by removal (poaching) of large herbivores, resulting in phytomass build-up and consequent increased frequency of fires (which kill flightless chicks). By contrast, Knysna Warblers appear to be negatively impacted by anthropogenically reduced fire frequency resulting in denser forest canopies, lowered light penetration, and loss of understorey vegetation. High altitude grassland endemics are highly sensitive to subtle habitat changes resulting from varying frequency of management fires. Ground-nesters in Namaqualand suffer high rates of nest loss to terrestrial predators such as mongooses. High densities of the latter are almost certainly a consequence of persecution of large predatory birds, such as eagles (Lloyd 1998).

Underpinning all these studies is the philosophy that conservation action is only likely to be effective if the root cause of the problem can be identified. This, for example, allowed PFIPO researchers to undertake a successful reintroduction of the last flightless bird in the tropical Indian Ocean to Picard Island in Aldabra atoll



(Wanless *et al.* 2002). Within 10 years, we predict that the world population of this bird (confined entirely to Aldabra) will increase by about 30% as a result of this success (Wanless 2002). Similarly, we will shortly be in a position to recommend removal of the African Black Oystercatcher from both National and International Red Data Books (perhaps the ultimate measure of success in 'Red Data conservation').

The pool of expertise that the PFIAO has developed in the field of linking life-history studies with remedial action for threatened taxa is considerable. This expertise has been applied in locations as disparate as sub-Antarctic Islands, tropical islands in Central America and the Indian Ocean, forests of the Albertine Rift and highland wetlands of Ethiopia and New Zealand. As increasing numbers of species are added to Red Data Lists, contin

ued development of this expertise will become ever more essential. We have already started this development by addressing problems associated with highly dispersed rare taxa (e.g. Black Harrier *Circus maurus* in South Africa, Wattled Crane in Ethiopia).

Highlights

- Several peer-reviewed papers were published in international journals, including those on African Black Oystercatchers in *Ibis* (Hockey *et al.* 2003), Sharpe's Longclaws of Kenya in *Biological Conservation* (Ndang'ang'a 2003), and sparrowlarks in *Ibis* (Lloyd 2004).
- David Maphisa conducted the second of two field seasons working on the Critically Endangered Rudd's Lark with the aim of gaining a better understanding of the patchy distribution of the bird within its localised range. David has developed a sound knowledge base of this species and is in the process of rounding off his dissertation. Many of the results are likely to lead to direct conservation action in the South African montane grasslands.

Students

Doug Loewenthal (PhD); *Population dynamics and conservation of the African Black Oystercatcher* *Haematopus moquini*

Odette Curtis (MSc); *Raptors and habitat fragmentation; contrasting responses of a harrier and a hawk.*

Anu Rao (MSc); *Conservation requirements of juvenile African Black Oystercatchers* *Haematopus moquini*.

Bernhard Frauneknecht (BSc Hons) *Cooperative breeding in the Cape Penduline Tit* *Anthoscopus minutus*

Dale Wright (BSc Hons) *Post-fledging dispersal patterns of facultatively cooperative-breeding Karoo Robins*

Lectures

Profs Hockey and Du Plessis, and Drs Ryan and Lloyd contributed to the teaching of a seven-week module to UCT Honours students on '*Birds as Models of Ecological Theory*'. In addition, many lectures were given to bird clubs, natural history societies and other NGO's throughout the year.

Visitors

Ms Sonya Auer (University of Montana, USA)

Mr Ron Bassar (University of Montana, USA)

Dr Richard Beilfuss (International Crane Foundation, USA)

Dr Keith Bildstein (HawkMountainSanctuary, USA)

Prof Carlos Bosque (Caracas, Venezuela)

Dr Bob Cheke (University of Greenwich, UK)

Dr Ross Coleman (University of Plymouth, UK)

Dr Rita Covas (Edinburgh University, UK)

Prof Nick Davies (Cambridge University, UK)

Dr John Hanks (Conservation International)

Dr Alan Kemp (formerly of the Transvaal Museum/Northern Flagship Institution, SA)

Kevin McCann (Endangered Wildlife Trust)

Kariuki Ndang'ang'a (National Museums of Kenya)

Dr Richard Pettifor (Institute of Zoology, London)

Acknowledgements

Cape Bird Club; Cape Nature Conservation; Claude Harris Leon Foundation; Disney Wildlife Conservation Fund; Endangered Wildlife Trust; ESKOM; Gordon Spriggs Scholarship Fund; International Crane Foundation; IUCN (Ramsar Convention); John D. and Catherine T. MacArthur Foundation; Luc Hoffmann/Mava Foundation; Mazda Wildlife Fund; MTN; Namakwa Sands; National Research Foundation; Somerset West Bird Club; South African National Parks; Tony and Lisette Lewis Foundation; Tygerberg Bird Club Bird Ringing Unit; University of Cape Town Research Committee; Working for Water (DEAT); WWF & WWF-SA.

Assoc. Prof. Phil Hockey

is a member of the Board of Trustees of the Seychelles Island Foundation. He is also a member of the Bird Taxon Advisory Group to the Pan-African Association of Zoological Gardens, Aquaria and Botanical Gardens, the Editorial Board of the journal *Biological Conservation*, and the BirdLife South Africa Rarities Committee (past Chairman).

Phil co-ordinates the Oystercatcher Conservation Programme, which has proved to be a high impact subregional project. He also spearheads the bird migration programme. He is Editor-in-Chief of the rewrite of Roberts Birds of Southern Africa (which during the year under review has taken most of his time) and a co-author of the best-selling Sasol Birds of Southern Africa. In the year under review, he supervised the work of two PhD students and three MSc students. He also helped organise and teach an Ornithology module to the Zoology Honours students. He authored or co-authored three scientific papers and one semi-popular article, and refereed three papers for three journals.

Assoc. Prof. Phil Hockey together with **Prof. Morné du Plessis**, also leads the **Life-history, Conservation & Rarity of Southern African Birds Research Programme**.

Ecology of Migration

Programme leader

Assoc. Prof. Phil Hockey

Research team

Dr Richard Noskie (Northern Territories University, Australia)

Dr David Bishop (Consultant, Sydney, Australia)



Migration researchers stumped! The identity of this migratory tern, photographed in Saldanha in February, remains a mystery... Photo: Phil Hockey.

Overview

During 2002-2003, we directed much effort at unravelling ecological correlates of short- to medium-distance migrations among African birds. Migration patterns are, *inter alia*, closely linked with climatic seasonality, habitat structure, diet and foraging mode. These findings are summarised in a book chapter currently in press (Smithsonian Institution Press). Several so-called paradigms, stemming mostly from studies in the Americas, do not apply in Africa. We have therefore revisited the big picture, by making inter-flyway comparisons, not previously attempted across all three major flyways (Americas, Africa and Asia).

Locally, we have also continued studies of movement patterns of juvenile African Black Oystercatchers, having found indications of what appears to be a unique, dichotomous movement pattern.

Highlights: inter-flyway comparisons

- Physical geography, especially peninsula bottlenecks and barriers, strongly influences migration patterns. Africa presents the fewest barriers to migration and South-east Asia the most (the sea crossings of Indonesia). This is mirrored in the relative prevalence of leap-frog migration across flyways (whereby those birds breeding the furthest north migrate the furthest south).
- Among land birds, leap-frog migration is most strongly developed in the Palearctic-African system, weakly developed in the New World and absent on the Eastern Palearctic-Asian flyway. A consequence of this is that while a large number of long-distance migrant land birds reach southern Africa, only four reach equivalent latitudes in Australia.
- On the non-breeding grounds in central and South America, migrants use



different habitats in proportion to their availability, and many are nectarivorous. In Africa and Asia, however, migrants strongly avoid forested habitats, and most are insectivorous. Patterns of habitat usage in Africa and Asia are much more similar to one another than either is to the New World, despite that fact that Asia (like the Neotropics) is well-forested. Indeed, Asian forests may act as migration barriers in the same way that ocean crossings do. Predictions about migratory behaviour based solely on the relative abundance of different habitat types would thus be doomed to failure.

- On at least two flyways, habitat occupancy during the non-breeding season influences breeding habitat occupancy, rather than *vice versa*. This provides some support for migration having a tropical origin and a demographic basis (as proposed for the Neotropics).
- Overall, migratory behaviour on the two Old World flyways is remarkably similar, despite differences in geography and habitat; it is the New World flyway that is the “odd man out”. This strongly suggests that whatever ecological factors might be maintaining migratory behaviour, these are overlain with a strong evolutionary signal. By tackling a more detailed analysis of African migration patterns (ca 1800 species), and controlling these analyses for phylogeny, we are now assessing the strength of this “signal from history”.

Highlights: African Black Oystercatcher Movements

- Recent work carried out in the Northern Cape and Namibia suggests these movement patterns may be even more complex than previously thought. We have discovered roosts in isolated parts of the Northern Cape that contain significant numbers of ringed juveniles from further south. Whilst some of these might be birds ‘stopping over’ on their way to Namibia, other birds remain at these sites for extended periods and may represent ‘diffusion dispersers’.
- Data recently collected by us in central and northern Namibia confirm our belief that birds reaching these northern nurseries are indeed under the influence of a ‘migratory gene’. Evidence includes extensive stretches of totally inhospitable shoreline that birds have to (and do) bypass to reach these nurseries.
- Based on retraps and field sexing, we suspect that aggregations of juveniles in the most northerly Namibian nurseries are female-biased. This, however, still requires confirmation and has no immediately obvious explanation!

Students

Jane Hamblin (MSc, graduated with distinction in December 2003); *Dispersion patterns of Holarctic-breeding migrant landbirds: global paradigms or regional patterns*

Kirsten Louw (PhD); *Patterns and ecological correlates of*



Ringed juvenile oystercatchers have been turning up in some interesting places... Photo: Douglas Loewenthal.

migratory behaviour in African birds
Douglas Loewenthal (PhD); *Population dynamics and conservation of the African Black Oystercatcher* *Haematopus moquini*

Acknowledgements

International migration studies are funded through a grant to Phil Hockey from the National Research Foundation. Oystercatcher migration research is funded by the National Research Foundation, Conservation International and Namakwa Sands (through WWF).

Prof. Tim Crowe
also leads the **Gamebird
Research Programme.**

Dr Peter Ryan
also leads the **Seabird
Research Programme and the
Island Conservation
Programme.**

Systematics & Biogeography

Programme leaders

Prof. Tim Crowe
Dr Peter Ryan

Research team

Dr Keith Barker (University of Minnesota, USA)
Dr Nigel Barker (Rhodes University)
Drs George Barrowclough and Jeff Groth (American Museum of Natural History, New York, USA)
Dr Pamela Beresford (Stockton College, New Jersey, USA)
Assoc. Prof. Paulette Bloomer (Department of Genetics, University of Pretoria)
Dr Rauri Bowie (University of Stellenbosch)
Dr Gareth Dyke (University College, Dublin, Ireland)
Prof. Jon Fjeldså (Zoological Museum, University of Copenhagen)
Dr Shannon Hackett (Field Museum of Natural History)
Assoc. Prof. Terry Hedderson (UCT, Department of Botany)
Drs Mari Källersjö and Steve Farris (Swedish Museum of Natural History, Stockholm)
Dr Helen de Klerk (Western Cape Nature Conservation Board)
Ms Tshifhiwa Mandiwana (Transvaal Museum)
Ms Tshifhiwa Nangammbi (Natal Museum)
Prof. Mike Sorenson (Boston University)



Grassbird *Sphenoeacus afer*, a paleo-endemic from the Cape. Photo: Peter Ryan

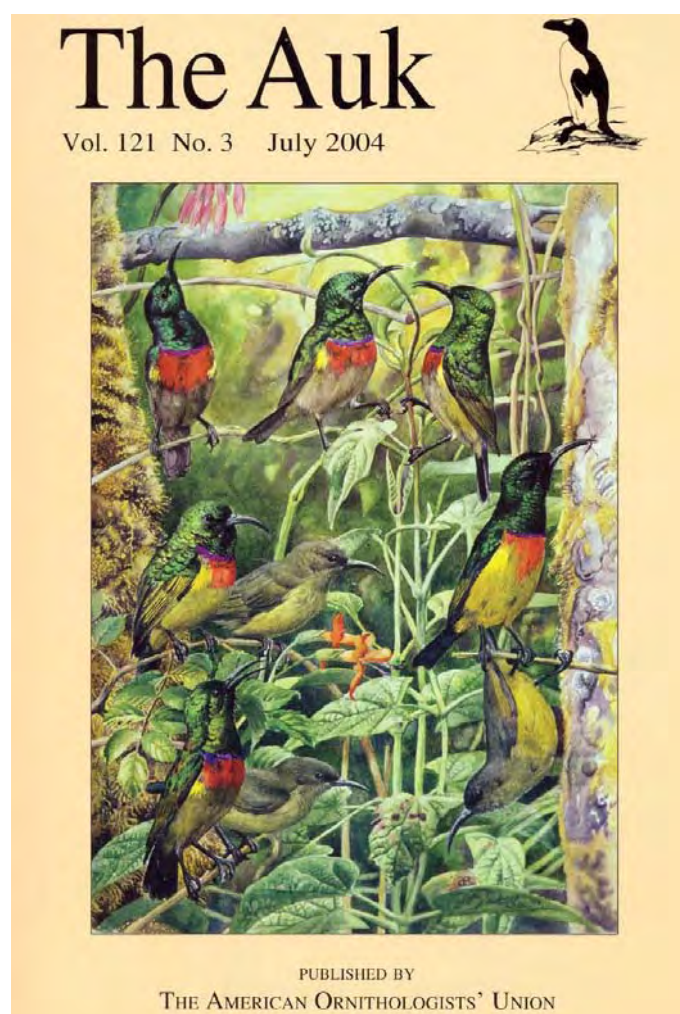
Overview

Members of this heterogeneous programme tackle a range of projects aimed at discovering and determining the taxonomic validity of species inferring their phylogeographic (within species and among populations), phylogenetic (evolutionary genealogical) relationships and identifying and explaining patterns of species distribution and diversity (biogeography). The research approach in virtually all projects is multi-faceted, using a range of organismal and molecular data and analytical approaches. The programme received several major boosts in the year



under review. The most significant development was the identification of a role for Programme research within the Fitzitute's Centre of Excellence and we are in the midst of mounting new projects and advertising for post-graduate students as we write. The programme has overlaps with other research programmes, e.g. the characterisation of inter-colony genetic differences in several seabird species in the seabird research programme.

Postdoctoral student Pamela Beresford returned to the USA and, with Keith Barker, Peter Ryan and Tim Crowe, completed an analysis of the phylogenetic relationships of 10 African endemic passerines of uncertain taxonomic affinities. The research team used two slow-evolving nuclear genes to infer their relationships since they suspected that some of these evolutionary 'enigmas' might have relatively ancient evolutionary histories. The first publication emanating from this research is now in review and has turned up some surprising and not-so-surprising results. It confirms earlier work by Keith that suggested that the White-tailed Shrike *Lanioturdus torquatus* is related to batises and a range of 'crow-like' birds that include Asian ioras (*Aegithina* spp.) and African puffback/bush/ shrikes (*Dryoscopus* and *Telephorus* spp.). The Herero Chat (*Namibornis herero*) appears to be more closely related to muscicapid flycatchers than to thrushes, although the composition of each of those groups is in flux. Nicators (*Nicator chloris*) are not related to bush-shrikes (Malaconotidae) or bulbuls (Pycnonotidae), instead appearing at the base of the branch that includes Alaudidae (larks) and a broad range of sylvioid warblers, leading further on to lineages within which the balance of the 'enigmas' reside. Three different groups emerge within this group of sylvioid warblers. The first includes longbills (*Macosphenus* spp.) crombecs (*Sylvietta* spp.) and a variable array of southern African endemics, including three 'enigmas': the Damara Rockrunner (*Achaetops pycnopygius*), Cape Grassbird (*Sphenoeacus afer*) and Victorin's Warbler (*Bradypterus/Cryptillas victorini*). The second large group includes the Tailorbird (*Orthotomus sutorius*) and the Cinnamon-breasted Warbler (*Euryptila subcinnamomea*) in the Cisticolidae. The third group includes the megalurine and *Bradypterus* warblers, the Broad-tailed Warbler (*Schoenicola brevirostris*), and a range of Madagascar endemics. While there is no strong support for the superfamily Passeroidea, two groups within it are noteworthy in that they were not predicted by traditional classifications. The first includes the sugarbirds (*Promerops* spp.), the Dapple-throat (*Arcanator orostruthus*), and the Spot-throat (*Modulatrix stictigula*), all of which are endemic to sub-Saharan Africa, supporting the idea that the latter two taxa either be included in Promeropidae or be recognized with their own family name. This novel evolutionary grouping is related to a large group that includes other Old World nectarivores (Nectariniidae, Irenidae, and Dicaeidae) and core Passeridans. Surprisingly, the African endemic Fairy Flycatchers (*Stenostira scita*) is strongly supported as part of



The double-collared sunbirds: Rauri Bowie is part of the team who recently added to our understanding of origins of these colourful birds.

The previously-recognized "sylvioid flycatcher" clade, which comprises the flycatcher genera *Elminia* and *Culicicapa*.

These results indicate that much of the current Old World warbler diversity may be attributable to radiation *in* and subsequent dispersal *out of* Africa. Certain focal enigmatic taxa did not appear to be particularly "old," as indicated by, for example, the estimated age of the divergence between *Lanioturdus* and *Batis* at 14.3 Ma, or that between *Namibornis* and *Muscicapa* and 7.1 Ma, although these estimates are certainly older than the Plio-Pleistocene time-frame traditionally associated with African avian diversification. Similarly, the date of divergence for the Cinnamon-breasted Warbler is 6.1 Ma (± 1.0 s.d.), and the most basal split within the Cisticolidae sampled – between *Apalis* and the other genera – appears to be relatively young, in the middle Miocene (17.2 Ma ± 2.0 s.d.). The data generated by this research provide the first quantitative assessment of divergence times for all of the endemic passerine radiations in Madagascar, which suggests that as for mammals dispersal of these lineages into

Madagascar was asynchronous. The oldest of these is the suboscine Philepittidae (2 genera, 4 species), which appears to have dispersed into Madagascar between 42.0 and 31.8 Ma, based on divergences from the broadbill *Psarisomus* and divergences within the family. These dates clearly postdate Gondwanan rifting, but are consistent with putative landbridge (or near-landbridge) connections between Madagascar and mainland Africa during the Late Eocene/Early Oligocene.

The double-collared sunbirds of the Eastern Arc Mountains of Tanzania and south-eastern Kenya are characterized by striking regional variation in morphology and plumage. That variation has resulted in considerable dispute over their taxonomic status and delineation of range boundaries. It has even been suggested that Moreau's Sunbird (*Nectarinia moreaui*) arose from a hybridization event between the more widely distributed Eastern Double-collared Sunbird (*N. mediocris*) and the narrowly distributed Loveridge's Sunbird (*N. loveridgei*). Research by Rauri Bowie and several other programme members on the morphometrics, plumage and DNA of these sunbirds suggests that Moreau's Sunbird is a valid species most closely related to Loveridge's Sunbird. Furthermore, the Eastern Double-collared Sunbird is actually three distinct evolutionary lineages, separated from each other morphologically and by substantial genetic divergence (approximately 8–10% sequence divergence – far greater than that between subspecies of the same species). This suggests that each of those lineages should be recognized as full species: *N. mediocris*, *N. usambarica* and *N. fuelleborni*.

Highlights

- Rauri Bowie took up a lectureship in the Department of Zoology and Botany at the University of Stellenbosch in January 2004.
- Paulette Bloomer was promoted *ad hominem* to associate professor.
- Tshifhiwa Mandiwana took up the post of researcher in the Department of Ornithology at the Transvaal Museum and initiated her PhD research (co-supervised by Tim Crowe and Paulette Bloomer) on the systematics of francolins (*Francolinus* spp. *sensu lato*) and spurfowls (*Pternistis* spp.). In July, she visited the American Museum of Natural History (New York, USA) to gather data and learn new techniques involving molecular systematics. During this trip she presented preliminary results of her research at the 22nd Meeting of the Willi Hennig Society.
- Tshifhiwa Nangammbi took up a post as assistant curator (for molluscs) at the Natal Museum (Pietermaritzburg) and initiated her PhD research (co-supervised by Tim Crowe) on the systematics of "Pheasant shells" (*Tricolia*, *Phasianella* and *Gabrielona*), a group of taxonomically enigmatic marine molluscs.
- Tim Crowe (with a range of Programme team members) completed a paper on "total-evidence" phylogenetic analyses of galliform birds, now in press with the Proceedings of the 23rd International Ornithological Congress.
- Liesl Solms completed her MSc research and graduated from the University of Pretoria in September.
- A paper emanating from Oatley/Wakeling/Wright's 3rd-year research project was accepted for publication in the Richard Liversidge Memorial Issue of the Ostrich.
- In July, Tim Crowe and students Callan Cohen, Tshifhiwa Mandiwana and Tshifhiwa Nangammbi participated in the 4th Symposium of the Southern African Society for Systematic Biology (held at the University of Pretoria). All students presented oral papers on their research.

Students

Keith Barnes (PhD, co-supervisor Prof. Paulette Bloomer); *The evolution of Africa's larks* Alaudidae

Callan Cohen (PhD); *The evolution of the bustards: implications for African biogeography, evolution of display and conservation*



Tshifhiwa Mandiwana (PhD, co-supervisor Prof. Paulette Bloomer); *Systematics of Francolins and Spurfowls*

Jonathan van Alphen-Stahl (MSc, co-supervisor Prof. Paulette Bloomer); *The phylogeography and speciation of Helmeted Guineafowl*

Graeme Oatley, Julia Wakeling and Dale Wright (3rd-year, co-supervisors *Rauri Bowie and Callan Cohen*); *Taxonomy and phylogenetics of southern African Serinus canaries*

Acknowledgements

The National Research Foundation, South Africa/ Sweden Bilateral Programme and the Willi Hennig Society for financial support.. The American Museum of Natural History (New York), Field Museum (Chicago), University College (Dublin), University of Pretoria and Boston University for access to facilities, specimens and logistical support.

Prof. Tim Crowe

is the current president of the Southern African Society for Systematic Biology, an Elected Fellow and immediate past member of the council of the Willi Hennig Society of Systematic Biology, a member of the International Ornithological Congress Committee, the editorial board of the journal *Systematic Biology*, the Steering Committee of the South African Biosystematics Initiative (of which he is chairperson), the Board of the South African Biological Information Facility and a research associate at the American Museum of Natural History in New York. He acts as external examiner for the M.Sc. Programme in Mammalogy at the University of Pretoria.

Tim is deputy leader of the Fitzitute's Centre of Excellence, co-ordinates the Postgraduate Programme in Conservation Biology and runs the module *Characterizing Biodiversity*. In the year under review he supervised or co-supervised three honours students, one M.Tech student, two MSc students and one PhD student. He taught modules to two undergraduate classes and three additional MSc classes in the Zoology and Botany Departments. He was author or co-author of five scientific papers. He attended and presented papers at one international meeting and one local conference and gave talks to three membership-based societies. He refereed eight scientific papers for five different journals and reviewed three applications for research grants and three assessments for personal scientific evaluation for the National Research Foundation.

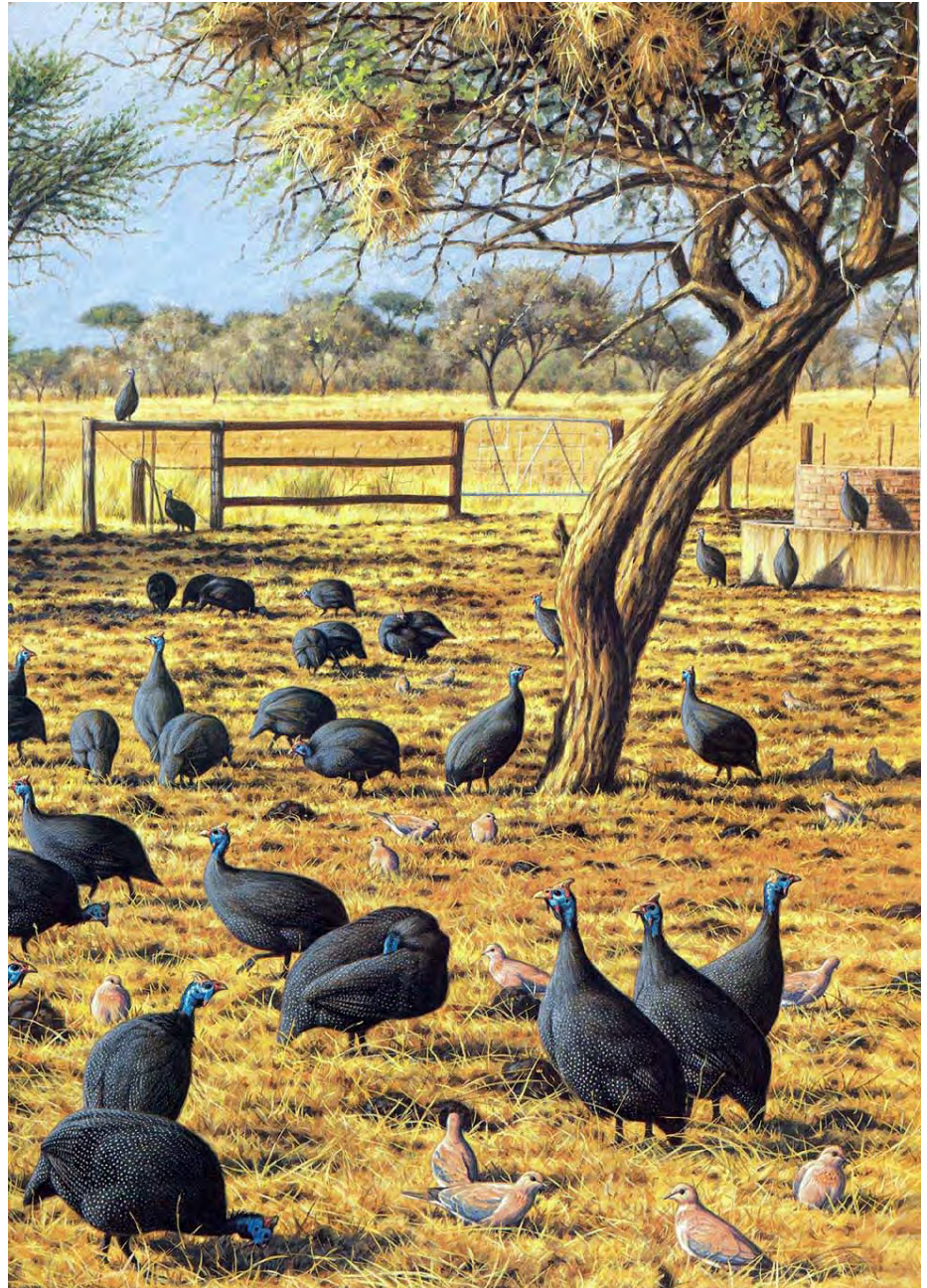
Prof. Tim Crowe, together with **Dr Peter Ryan**, also leads the **Systematics & Biogeography Research Programme** and is deputy leader of the Fitzitute's **Centre of Excellence**.

Gamebird Research

Programme leader
Prof. Tim Crowe

Research team

Assoc. Prof. Brian Reilly (Department of Nature Conservation, Pretoria Technikon)



Honours student Ian Little discovered that Helmeted Guineafowl inhabiting rehabilitated strip mines at the Middleburg coal mine occur at 100 times the density observed in the nearby natural vegetation. Painting by Simon Barlow from Little & Crowe: 'Gamebirds of Southern Africa'.

Overview

This programme was initiated in 1990 and aims to identify the key factors that sustain or otherwise affect populations of gamebirds (e.g. guineafowl, francolins, spurfowl, sandgrouse and ducks/geese), develop area-specific management strategies for the



species concerned, and to determine the extent to which they can act as indicators of the status of overall avian diversity. Publications produced by programme researchers have tended to focus on ecology, demography, ecotoxicology and parasitology of the species studied. The key practical products of this programme's research have been the development of biologically sustainable and economically viable wingshooting industries and area-specific management strategies for key gamebird species.

In terms of more academic research, key findings have emphasised the importance of maintaining gamebird meta-populations. These are structured populations the components of which (demes) provide immigrants for those that may be declining. For example, demographic and genetic research by Dr Rob Little demonstrated that the meta-populations of Greywing Francolins *Scleropiida africanus* in the Eastern Cape are healthy and there is regular movement between demes. On the downside, Charles Ratcliffe (MSc December 2000) and a team of researchers showed that meta-populations of Helmeted Guineafowl in the Midlands of KwaZulu-Natal have collapsed over the last two decades and provided remedial measures that can reverse this demographic disaster.

The project, the Riemland Gamebird Project, launched in May 2002 finished in October 2003. This project was a joint endeavour with the Pretoria Technikon (now the Tswane University of Technology) and involved A/Prof. Brian Reilly as co-leader (with Tim Crowe) and M.Tech. student, Ms Helen Prinsloo. The aims of this project were to identify the key factors that sustain massive populations of Helmeted Guineafowl *Numida meleagris* in the vicinity of Petrus Steyn, a small town in the Riemland Region of the northeastern Free State. The key findings of this project were outlined in last year's annual report. Essentially, they provide empirical support for the importance of maintaining meta-populations structure to ensure sustainability of wingshooting. In marked contrast to the situation found in the Midlands of KwaZulu-Natal, landuse in the Riemland has maintained the necessary mosaic of interconnected natural and human-transformed biotopes that allow Helmeted Guineafowl (and probably Swainson's Spurfowl and Orange River Francolin) sub-populations to exist at sufficient densities to withstand even annual heavy wingshooting.

A new project '*The effectiveness of habitat rehabilitation on grassland birds at an open-cast coal mine in the Middelburg District, Mpumalanga Province*' was conducted during the period under review. Bird species richness and abundance were investigated at six rehabilitated sites within the Middelburg Coal Mine and compared with those in pristine climax grassland found in the nearby Witbank Nature Reserve. Time since initiation of rehabilitation was found to have little or no effect on richness or abundance. Proximity to currently active mining combined with the current land management practices had much more profound effects. Sites close to active

mining had lower richness and abundance. Those with fallow land, strips of un-mowed grass and artificial ponds had much higher bird richness and abundance. Nevertheless, it is highly unlikely that these transformed habitats will return, through oldfield succession, to the pre-mining, climax Highveld grassland. Three species of gamebirds Swainson's Spurfowl *Pternistis swainsonii*, Shelley's Francolin *Scleroptila shelleyi* and the Helmeted Guineafowl *Numida meleagris* were given special attention to determine their potential utilization for wingshooting (gamebird hunting). Only the guineafowl appears to occur at abundances sufficient for wingshooting. An additional finding that complements previous research by team members is that guineafowl sub-populations occur at even higher densities than in the Riemland. We suspect that this is due to the much closer proximity of focal resources, especially food (from feeders) and water, demonstrating a clear need for follow-up research.

Highlights

- Two papers emanating from Ms Prinsloo's dissertation and one from Ian Little's honours project are currently under review.

Students

In December, M.Tech. student Helen Prinsloo's M.Tech. dissertation was passed with distinction. Honours student Ian Little graduated in June and is currently participating in the Fitzitute's Masters Programme in Conservation Biology.

Lectures

Tim Crowe gave two talks to gamebird-hunting organizations outlining past and current research results. There was also a report-back to investors in the Riemland Gamebird Project during June and prospects for further financial support for new projects appear good.

Acknowledgements

In addition to funding to Tim Crowe from the National Research Foundation, The Honourable Charles Harris, Mr Peter Wales and a range of wingshooters provided the balance of funds necessary to launch the Riemland Gamebird Project. Tim would like to thank the host of colleagues (in particular Dr Rob Little), students, wingshooters (in particular Messrs Roger Johnson and Peter Wales) and farmers for making this Programme possible.

Dr Peter Ryan

is on the Editorial Board of *Ostrich* and is a member of the IMAF Working Group of CCAMLR, the IUCN World Commission on Protected Areas and BirdLife South Africa's Rarities Committee. He is Secretary of the Gough Island Nature Reserve Advisory Committee as well as a Tristan da Cunha Conservation Officer.

Peter continues to act as academic co-ordinator of the Conservation Biology MSc course and teaches two modules on this course. He contributed to the ornithology module of the Zoology Honours course, supervised one honours project, led the ornithology section of the Zoology third year field camp and teaches on the Applied Marine Science MSc programme. He is external examiner for the conservation biology programme at the University of Pretoria. During the review period he supervised three CB MSc projects and two PhD and two MSc students. He authored or co-authored 16 scientific papers, 1 book, 60 species accounts for the *Handbook of the Birds of the World*, and continued to work on the revision of *Roberts' Birds of Southern Africa*. He gave several talks to bird clubs and other special interest groups. In addition to his editorial role for *Ostrich*, Peter reviewed 12 manuscripts submitted to 9 scientific journals, including *Science*.

Dr Peter Ryan

also leads a programme on **Island Conservation** and, together with **Prof. Tim Crowe**, leads the **Systematics & Biogeography Research Programme**.

Seabird Research

Programme leader

Dr Peter Ryan

Research team

Dr Rob Crawford (Marine and Coastal Management)
Dr John Croxall (British Antarctic Survey, Cambridge, UK)
John Cooper (Avian Demography Unit, UCT)
Dr Marianne de Villiers (Avian Demography Unit, UCT)
Dr David Grémillet (CNRS, Strasbourg, France)
Dr Geoff Hilton (Royal Society for the Protection of Birds, UK)
Dr Deon Nel (World Wide Fund for Nature, South Africa)
Dr Colleen O'Ryan (Molecular and Cell Biology Department, UCT)
Dr Yan Ropert-Coudert (National Institute of Polar Research, Japan)
Prof. Les Underhill (Avian Demography Unit, UCT)
Barry Watkins (Marine and Coastal Management)

Overview

The seabird programme has received a boost with Samantha Petersen, the BirdLife South Africa Seabird Conservation Officer, being based at the Fitzitute from 2004. Samantha completed her BSc Honours in Zoology at UCT in 2003 and is currently registered for an MSc at the Fitzitute looking at bycatch of a suite of taxa (seabirds, turtles and sharks) in several fisheries. She also runs various education and mitigation implementation programmes for BirdLife and WWF South Africa.

But it's not all good news. While real progress on longline fishery impacts on seabirds is being achieved, a new threat has emerged from the commercially important hake trawl fishery. Fishery observers at the Falkland Islands started recording albatrosses and to a lesser extent large petrels being dragged underwater and drowned by trawl warps. A pilot programme in the South African hake fishery funded by I&J has revealed the same problem occurs locally. We are working closely with the Deep Sea Trawling Association to assess the extent of the problem and devise effective mitigation measures to both protect threatened seabirds and enable the fishery to retain its newly-awarded Marine Stewardship Council certification.

The project to assess and mitigate the impacts of longline fishing continues, mainly under Samantha Petersen's leadership, with new initiatives funded by a generous grant from the Benguela Current Large Marine Ecosystem (BCLME) programme to Deon Nel of WWF South Africa. This will allow the programme to expand from its current South African focus to include Namibia and hopefully Angola. We also continue monitoring longline by-catch and demographic performance of breeding populations of affected species at Marion and Gough Islands. Much of the work on the Prince Edward Islands has been summarised in a special section of the inaugural issue of the *African Journal of Marine Science* (formerly *South African Journal of Marine Science*), published in late 2003.

Ross Wanless and Andrea Angel, both Fitz MSc graduates, have spent much of the review period on Gough Island, following up Richard Cuthbert's suspicions that introduced House Mice are having a catastrophic impact on the breeding success of several bird species, including some of conservation concern. Ross and Andrea have obtained video footage of mice killing chicks of Tristan Albatrosses, Atlantic Petrels and Great Shearwaters. The extent of the Tristan Albatross mortality is staggering. In some parts of the island almost 90% of chicks are killed, clearly not sustainable, and it remains a challenge to understand the marked regional differences in mortality. Also, while we previously thought mice only attacked chicks in winter, when other food sources are limited, a shearwater chick was killed in late summer. The evidence suggests that all birds on Gough are at risk of predation and the possibility that a long-



term decrease in the island's once vast population of burrow-nesting seabirds might have been overlooked.

Ross, Andrea and Richard Cuthbert will deploy GLS loggers on all three albatross species breeding on Gough Island during 2004 to track their movements over a 1-2 year period, including the critical non-breeding ranges. These data are essential to identify key foraging areas and thus areas of overlap with potentially dangerous fisheries. Recent data from devices deployed on Wandering and Grey-headed Albatrosses breeding on Marion Island generated some fascinating results. As expected, most Grey-headed Albatrosses circumnavigated the Southern Ocean during their sabbatical year, but some did not, including one bird that attempted to breed in its year off. Conversely, although most Wandering Albatrosses remained within the Indian Ocean and eastern South Atlantic, a few elected to travel around the world. The question is whether these differences reflect individual choices that remain consistent between years, perhaps reflecting experiences obtained during the birds' years at sea as an immature, or whether the differences are facultative or adaptive, reflecting choices made based on local conditions.

Work on the foraging ecology of Cape Gannets and African Penguins initiated by a joint NRF-CNRS grant to David Grémillet and PGR in 2001/02 continues to prove productive. David and bio-logger extraordinaire, Yan Ropert-Coudert, deployed heart-rate monitors on gannets, and found that they are much more efficient fliers than previously thought, barely raising their heart beat during sustained flight. Meanwhile, Sue Lewis, a postdoc at CEH Banchory in Scotland, collected data on foraging ecology of gannets at colonies of different sizes. Together with David and Yan she obtained gannet foraging tracks from Malgas Island and Lambert's Bay in South Africa, and with Benedict Dundee and Francis Daunt from Ichaboe and Mercury Islands in Namibia. She expected to find greater sex-linked differences at larger colonies. Inter-colony differences masked any behavioural responses, but she obtained the first data on foraging ranges of gannets in Namibia, where populations are decreasing, and provided a clear picture of why the diets of birds from Mercury and Ichaboe are quite different.

Samantha Petersen's study of African Penguin foraging behaviour using GPS loggers developed by Dr Gerrit Peters has resulted in three papers, and prompted further field work. Celine Le Bohec, a doctoral student from France, spent two months on Dassen Island in mid 2004 obtaining foraging tracks for African Penguins, including the first tracks for incubating birds. Not surprisingly, incubating birds, which spend up to 10 days at sea, travel much further than birds provisioning small chicks, with at least one bird from Dassen Island heading around Cape Point onto the Agulhas Bank to feed.

Highlights

- South Africa finally signs the Agreement on the

Conservation of Albatrosses and Petrels.

- BirdLife SA Seabird Conservation Officer based at the FitzPatrick.
- Tracking Wandering and Grey-headed Albatrosses from Marion Island around the world during their sabbatical year at sea.
- Discovery that significant numbers of albatrosses are being killed by trawlers off the Cape.
- Confirmation that mice on Gough Island are killing large numbers of seabird chicks.

Students

Benedict Dundee (MSc Applied Marine Science); *Diet and foraging ranges of decreasing Cape Gannet populations in Namibia*

Samantha Petersen (MSc); *Managing the bycatch of seabirds, turtles and sharks in selected fisheries off southern Africa*

Mareille Techow (PhD, co-supervisor Dr Colleen O'Ryan, Molecular and Cell Biology, UCT); *Using molecular tools to identify population-specific markers for White-chinned and Giant Petrels*

Lectures

Samantha Petersen gives regular lectures on seabird conservation to the public, and runs seabird identification training courses for fishery observers. She is presenting papers at the Albatross and Petrel Conference in Montivideo and the Penguin Conference in Ushuaia in Aug/Sep 2004.

Visitors

Dr David Grémillet (CNRS, Strasbourg, France), Dr Yan Ropert-Coudert (National Institute of Polar Research, Japan), Sue Lewis (CEH Banchory in Scotland) and Celine Le Bohec (CNRS, Strasbourg, France).

Acknowledgements

Seabird research in the Southern Ocean is supported logistically by the Directorate: Antarctica and Islands, Department of Environmental Affairs and Tourism, with seabird monitoring at Marion Island supported by grants to Dr Rob Crawford from the Department of Environmental Affairs and Tourism. Bird research on Gough Island is funded by the Royal Society for the Protection of Birds, together with a grant by the British Ecological Society to Richard Cuthbert. Studies on the foraging ecology of Cape Gannets were initiated as part of a collaborative NRF-French programme but are now supported by the CNRS and a grant from the British Ecological Society to Sue Lewis. Colleagues both at the university and in the field are thanked for their assistance. This programme is a truly collaborative effort.

Dr Andrew Jenkins

supervised one CB MSc student and one MSc student during the period under review. He served on the transitional committee of the newly reconstituted Raptor Conservation Group of the Endangered Wildlife Trust, co-authored two scientific papers and three semi-popular articles, attended one scientific meeting, and reviewed five manuscripts submitted to three different scientific journals.

Raptor Research Programme

Programme leader

Dr Andrew Jenkins

Research team

Dr Rob Simmons (Fitz research associate)

Odette Curtis (MSc student/ Fitz research assistant)

Anthony van Zyl (ex-Fitz PhD student)

Koos de Goede (Endangered Wildlife Trust)

Dr Bettine Jansen van Vuuren (Department of Zoology, University of Stellenbosch)

Assoc. Prof. Phil Hockey



A Black Harrier nest in mountain fynbos. Photo: Andrew Jenkins.

Overview

The Western Cape Raptor Research Programme (WCRRP) has continued to develop as the administrative hub of a variety of raptor studies.

During the review period, the Black Harrier Project completed its first year as a CEPF-funded component of the C.A.P.E. initiative. Significant progress was made in both (i) assessing the relationship between Black Harriers and threatened lowland habitats in the Fynbos Biome, and (ii) promoting the harrier as a flagship for broader conservation efforts in the region. Over 40 lowland renosterveld fragments were surveyed for breeding harriers, and only two active nests were located in relatively large, undisturbed fragments. This suggests that the species may be highly sensitive to processes of habitat destruction and degradation. In addition, a brochure punting the Black Harrier as an 'avian icon of Cape conservation' was produced and distributed to landowners, conservancies and conservators throughout the Overberg and the Swartland. As a result, good numbers of individuals or organizations within these areas are now actively involved in various aspects of the Black Harrier Project.

Now in its third year, the Eskom Electric Eagle Project is nearing completion, and a set of recommendations for minimizing eagle-related line faulting on Eskom transmission lines in the Karoo will be produced by the end of 2004. The study now includes nearly 90 large eagle territories spread along high-voltage powerlines throughout the central and southwestern Karoo, and has monitored the breeding performance of this population over three years. To date, 11 'problem' nests that have been associated with frequent line-faulting have been relocated to platforms situated below the conductors. Six of these platforms have subsequently been used by breeding eagles, indicating that this is a viable and useful management option for



Eskom. We have also determined that much of the eagle-related faulting recorded on transmission lines is caused by roosting adults and not active nests. We will be developing a refined bird-guard management plan to address this unexpected outcome.

Long-term studies of Peregrine, Rock Kestrel and Black Sparrowhawk populations on the Cape Peninsula were continued during the review period. An analysis of 10 years of survey data has shown that the Peninsula mountain chain supports 96 pairs of cliff-nesting raptors and ravens, including very high densities of Peregrine Falcon and Rock Kestrel, and disappointingly low numbers of Verreaux's Eagle.

A preliminary evaluation of the utility of the Barn Owl as a biocontrol agent for pest rodents in grain farming areas of the southwestern Cape concluded that Barn Owls present an effective means of controlling Cape Gerbils in West Coast wheatlands. The target species makes up over 85% of owl diet, and a study population of 20 pairs of owls, occupying specially provided nest boxes on a single property, accounted for at least 20 000 gerbils in one year, restricted rodent activities in cultivated fields, and significantly reduced the farmer's application of environmentally harmful rodenticides. A similarly short study of levels of persistent organochlorine pesticides in the blood of piscivorous (Fish Eagle) and bird-eating (Black Sparrowhawk) raptors in the Breede River Valley, an area under intensive viticulture and fruit farming, revealed that contamination by these agrochemicals was negligible. Pending the availability of funding, both these baseline studies will be expanded on in 2004/2005.

New studies within the programme in 2004 include a suite of projects on the effects of alien tree removal schemes on tree-nesting raptors in southern Africa some time during 2005, provided that the required funding is secured.

Highlights

- Black Harriers recorded breeding in large, pristine lowland renosterveld fragments, confirming that these habitats are suitable for the species provided that they are relatively undisturbed.
- Successful breeding by both Martial and Black Eagles in nests relocated from the top of Eskom towers to platforms positioned below the conductors, out of harm's way.
- Completion of a paper summarizing a decade of survey and monitoring work on the Cape Peninsula's cliff-nesting raptor community.

Students

Odetta Curtis (MSc); Raptors and habitat fragmentation; contrasting responses of a harrier and a hawk

Leigh Potter (MSc Conservation Biology); Latitudinal life-history patterns of the Barn Owl (Tyto alba) and its potential role as an agent of biocontrol

Kath Potgieter (BSc Hons); Small mammal abundance and



The Barn Owl: an effective biocontrol agent in West Coast wheatlands. Photo: Andrew Jenkins.

diversity in pristine, modified and transformed habitats in the Fynbos Biome, South Africa: implications for floral conservation

Adam Welz (BSc Hons) Raptors as indicators of agrochemical contamination of the Breede River Basin, South Africa.

Lectures

Members of the WCRRP gave at least five talks to membership-based societies during the review period, and Andrew Jenkins presented a paper on Black Harrier research at the Fynbos Forum gathering at Hartenbos in August 2003.

Acknowledgements

The Black Harrier Project is funded by the CEPF; the Electric Eagle Project is conducted on contract to Eskom TSI Division; the Goudini Fish Eagle Project is funded by Goudini Wine Cellar while raptor research on the Cape Peninsula is sponsored by Peregrine Properties. Thanks to Chris van Rooyen for facilitating the EEEP so effectively, Nico Dippenaar and Hendrik Myburgh of Goudini Wine Cellar for their continued support, and Anne Koeslag and members of the Cape Bird Club for their help with monitoring sparrowhawk nests on the Cape Peninsula.

Dr Peter Ryan

also leads the **Seabird Research Programme** and, together with **Prof. Tim Crowe**, the **Systematics & Biogeography Research Programme**.

Island Conservation

Programme leader

Dr Peter Ryan

Research team

Prof. Steven Chown (Department of Zoology, University of Stellenbosch)

John Cooper (Avian Demography Unit)

Dr Rob Crawford (Marine and Coastal Management)

Dr Geoff Hilton (Royal Society for the Protection of Birds, UK)



Oceanic Islands are among the most sensitive of ecosystems. Photo: Peter Ryan

Overview

This programme dovetails with the Seabird Research Programme, but covers the broader issues of island conservation, including the control of alien organisms and conservation of land birds on islands. Oceanic islands – those that have never been connected to a continental landmass – are among the most sensitive of terrestrial ecosystems. They have a large number of endemic species, many of which lack appropriate defences against introduced predators. Surrounding large stretches of open sea prevent many elements typical of continental biota from colonising oceanic islands. Invasion of these environments by man and his commensals has had catastrophic results. Even where species persist, they are often at greatly reduced population sizes, and are thus prone to extinction from chance events such as environmental variability and catastrophes (e.g. cyclones).

Despite the sad history of human associations with islands – more than 90% of avian extinctions since 1600 have been of island forms – some relatively untouched islands remain. These are exciting laboratories for research in ecology and evolution, and are worthy targets for conservation action. During the year under review, Inaccessible Island has been listed as a natural World Heritage Site, linked to the existing Gough Island World Heritage Site. Tristan da Cunha now has more than 40% of its land area proclaimed as World Heritage Sites! Progress is underway to revise the Gough Island management plan as well as the Tristan da Cunha Conservation Ordinance. The latter is important to allow the United Kingdom's ratification of the Agreement on the Conservation of Albatrosses and Petrels to extend to Tristan da Cunha. The three-year project to conduct biodiversity audits and promote local capacity to implement the requirements of the Convention on Biological Diversity at



Tristan da Cunha, funded by the Darwin Initiative, enters its second year. Dr Alison Rothwell returns to Tristan in September 2004, and a contract entomologist should be appointed to conduct field work in early 2005.

The main activity during the review period has been arranging for a clearing programme to remove the invasive New Zealand flax *Phormium tenax* from Inaccessible Island in September 2004. This was postponed from 2003 to 2004 due to lack of ship's berths on the SA Agulhas. Thanks to Guy Preston's support, two high-altitude experts from the Working for Water programme have been seconded to the clearing exercise, in what promises to be an exciting and challenging operation. It will be followed in November 2004 by a survey of Spectacled Petrels, five years after the first complete survey in 1999/2000. During these visits, the distribution of alien plants will again be mapped as part of a long-term monitoring programme on the distribution and spread of aliens at the island.

Closer to home, Juliette Nansikombi assessed the possible impacts of helicopter flights on birds and other organisms on Dassen Island as part of a proposed programme to use helicopters to fly tourists to the island. In the event, the flights failed to attract sufficient tourists, but Juliette managed to obtain some useful information from a few trial flights as well as observations of regular flights by Portnet to re-supply the lighthouse on the island.

The project to assess the impacts of climate change on Lesser Sheathbills at Marion Island planned for 2004 has been postponed to 2005, in part due to the lack of suitable students. The funds are ear-marked for historically disadvantaged South Africans.

Highlights

- Inaccessible Island awarded World Heritage Site status as part of the Gough Island WH Site.
- Plans to remove introduced flax from Inaccessible Island finally come to fruition.

Students

Juliette Nansikombi (MSc Conservation Biology); The impacts of helicopter flights on the birds at Dassen Island

Lectures

Peter Ryan gave a talk on island conservation to the new Gough Team in September 2003. He regularly gives popular talks on island conservation.

Visitors

Mike Hentley, Tristan's newly-appointed Administrator, and Ben Body, the new South Atlantic Desk Officer at the UK's Foreign and Commonwealth, both called at the FitzPatrick en



Lourence Chiloane uses rock-climbing to access and eradicate invasive New Zealand flax growing on Inaccessible Island. Photo: Peter Ryan.

route to Tristan in April and June 2004, respectively, to be briefed on numerous matters of conservation concern at Tristan and Gough islands.

Acknowledgements

I thank the Darwin Initiative and UK Foreign and Commonwealth Office for their support of conservation work at Tristan da Cunha. Monitoring and research activities at the Prince Edward Islands were supported by the Department of Environmental Affairs and Tourism, through grants to Dr Rob Crawford. Funds for work on the impacts of climate change on Lesser Sheathbills at Marion Island have been obtained from USAID through a collaborative project headed by Prof. Steven Chown.

I am grateful to the numerous people who together help conserve our fragile islands. The ongoing support of the Tristan community is especially important.

Dr Richard Dean

served as the Scientific Editor of Ostrich during 2003-2004 and as Editor and contributing author of the Roberts' VII Project.

During the review period he co-supervised one PhD student and one MSc student. He authored one book, authored or co-authored six scientific publications, co-authored two book chapters and attended three scientific conferences. He participated in numerous talks and outings with Karoo residents and landowners to raise awareness of local environmental issues. He reviewed six scientific papers submitted to four different international journals, and three scientific papers submitted to local journals. Dr Dean also spent one month at the British Museum at Tring, Herts, UK, extracting details of southern African bird specimens from the collection.

Prof. Sue Milton

Holds an honorary professorship at the Percy FitzPatrick Institute and is a part-time lecturer in the University of Stellenbosch's Conservation Ecology Department.

Land-use & Biodiversity

Programme leaders

Dr Richard Dean

Prof. Sue Milton (PFIAO, Conservation Ecology Department, University of Stellenbosch)

Research Team

Dr Nicki Allsopp (Agricultural Research Council, W Cape)

Mr Mark Anderson (Northern Cape Nature Conservation Services, Kimberley)

Dr J. Aronson (CNRS, Montpellier, France)

Dr Charles Boucher (Botany Department, University of Stellenbosch)

Dr John Donaldson (National Botanical Institute, Kirstenbosch, Cape Town)

Dr Karen Esler (Botany Department, University of Stellenbosch)

Dr Florian Jeltsch (Department of Ecology, University of Potsdam, Germany)

Dr Richard Knight (Botany Department, University of the Western Cape)

Ms Annalise le Roux (Western Cape Nature Conservation Board)

Dr Melodie McGeoch (Conservation Ecology Department, University of Stellenbosch)

Dr Guy Midgley (National Botanical Institute)

Dr Peter Ryan (Percy FitzPatrick Institute, University of Cape Town)

Dr Michael Schwartz (University of California at Davis, California, USA)

Dr Jane Turpie (Percy FitzPatrick Institute, University of Cape Town)

Ms N Visser (Western Cape Department of Agriculture)

Dr Thorsten Wiegand (Department of Ecological Modelling, UFZ, Leipzig, Germany)

Prof. Christian Wissel (Department of Ecological Modelling, UFZ, Leipzig, Germany)

At present, four related ecological research initiatives fall loosely within this programme:

1. Functions, value, management and rehabilitation of biodiversity capital in the Northern and Western Cape Provinces

Cape biodiversity is rapidly being diminished by land transformation, alien plant invasion and climate change but it is difficult to argue that it should be conserved and rehabilitated to a near natural state without strong evidence that diverse plant and animal communities are more valuable than impoverished ones.

The Western and Northern Cape Provinces house the species-rich endemic floras of the Cape Floral kingdom, namely the Fynbos, Renosterveld and Succulent Karoo. The amphibian, reptile and invertebrate faunas of these regions also include many endemic genera and species. Little is known of the functional significance of Cape biodiversity in maintaining soil fertility, stabilising biomass production under fluctuating weather conditions, or providing resistance to invasions of alien weeds. Recent research elsewhere indicates that diverse rangelands are more productive and more resistant to weed invasion. The services that untransformed landscapes offer to rural and urban people include water and air purification, flood control, pollination, recreation, utility products (wood, flowers, medicines) and a reserve of genetic material for future development.

The climate of these areas ranges from Mediterranean to arid with further aridification predicted within the next 50 years. Large areas of the arable lowlands have been transformed for dryland agriculture and recent development of irrigation infrastructure, of new agricultural markets for grain, oil, wine and vegetables, and of open-cast mining enterprises may threaten remaining fragments of natural lowland vegetation in the southwestern parts of the Western Cape. Arid savanna and Karoid areas within these provinces are threatened by management designed to increase stocking densities for domestic livestock, and by an urban market for firewood from indigenous hardwood Acacias.



This project aims to quantify rates and biodiversity costs of natural habitat transformation, understand the functions and value of biodiversity in the region, and provide guidelines for sustaining and restoring biodiversity in utilized and conserved rural and peri-urban Cape landscapes. The key outcomes of the project will be the development of (i) a theoretical framework for incentives and policy for biodiversity restoration based on an understanding of the role of vegetation diversity in secondary production, faunal diversity and resistance to alien plant invasions, and (ii) recommendations for conservation management and rehabilitation of selected Cape vegetation types (Renosterveld, Strandveld and Succulent Karoo) based on theoretical modelling, observation and experimentation.

2. Karoo ecosystem responses to land-use: changes in biodiversity, plant demography and soil processes

The key objectives of this project are (i) to investigate the effects of land-use in the Karoo on the distribution of nutrients, water and energy in rangelands, plant population processes invertebrate assemblages and invasive alien plant distribution and abundance, (ii) to model the probability, direction and rate of change in Karoo ecosystems following resource use or rehabilitation management, (iii) to build capacity in sustainable resource use through field training of postgraduate students, and (iv) to enhance public awareness of the role of ecological research in facilitating sustainable use of Karoo ecosystems.

3. Land-use effects on plant and animal communities in the Karoo and Kalahari

Key questions for the conservation of biodiversity are: What are the mechanisms for changes in nutrient distribution and vegetation pattern along a gradient of increased grazing intensity? Does grazing-induced rarity of insect-pollinated plants result in cascading effects in animal communities or accelerated rates of plant population decline? How important are refuges for population recovery when grazing pressure is reduced? Does foraging guild structure in invertebrate, bird and small mammal communities change predictably with grazing-induced vegetation change?

4. Shifting distributions of southern African birds: evidence from collections

The objectives of the project are to investigate the changes in bird distribution ranges in southern Africa over the last 200 years and to determine their causes. Evidence for historical shifts in bird distributions may provide an early warning for southern hemisphere countries similarly affected by global change. There have been few detailed studies on the causes of population declines and range decreases in bird species and, to the best of our knowledge, no attempt to quantitatively link land use transformation (e.g. increases in impoundment areas, grassland conversion to plantations) to range changes in birds

at a sub-continental scale.

Highlights

- A book on the movements of birds in desert ecosystems was completed and published (Dean, W. R. J. (2004) *Nomadic desert birds*. Adaptations of Desert Organisms series. Springer Verlag, Berlin, Heidelberg, New York).
- A database containing almost 100 000 georeferenced bird specimen records has been built from museum records.
- School pupils from a formerly disadvantaged rural community have been involved in SET-awareness activities including excursions to nature reserves where aspects of the science syllabus are demonstrated in the field.

Students

Colleen Seymour (PhD, co-supervised by Dr Jeremy Midgely); *The role of Acacia erioloba in preserving biodiversity in the Kalahari, Southern Africa.*

Thidi Tshiguvho (MSc, University of Stellenbosch, co-supervised with Dr S.J. Milton (formerly with Dr Isla Grundy who has emigrated); *The role of the sacred tradition in species and land conservation: The case of the Vhavenda of Northern Province, South Africa.*

George Eshiamwata (MSc Conservation Biology, co-supervised with Dr Bärbel Bleher, Johannes Gutenberg-Universität Mainz, Mainz, Germany) *The importance of strangler fig (Ficus Thonningii) trees as centres for seed deposition and seedling establishment in the agricultural landscape..*

Visitors

Dr Thomas Leuteritz (UWC & Conservation International, Washington DC, USA) is carrying out a study of movements of radio-tracked Tent Tortoises at Tierberg. Dr Richard Pettifor, (Senior Research Fellow, Institute of Zoology, Zoological Society of London) spent a few days at Prince Albert to discuss common research interests and projects.

Dr Jane Belnap, US Geological Survey, spent a week at Prince Albert to discuss common research interests and potential collaboration on several projects in the Succulent Karoo.

Acknowledgements

Work on changes in woodland structure in Kalahari arid savanna was partly funded by the Deutsche Ministerium für Bildung und Wissenschaft (BMBF) (BIOTA - southern Africa project). Sponsors for the Karoo project are: National Research Foundation, Stellenbosch University, Potchefstroom University, National Department of Agriculture, Jan Kitshoff and the BMDF. The bird specimen database was funded by The Leverhulme Trust, U.K.

Dr Jane Turpie

is on the editorial board of the African Journal of Marine Science and is associate editor of the South African Journal of Wildlife Research. She is a member of the Working for Water Programme's Resource and Development Economics Research Review Panel, and sits on the steering committee of three Water Research Commission projects concerning estuarine ecology, management and economic evaluation. Jane's research and consulting interests incorporate resource economics, conservation planning and estuarine ecology. She teaches the Resource Economics modules of the Conservation Biology MSc and Applied Marine Science MSc courses and teaches applied ecology at second-year level; she is also external examiner for the third year Resource Economics course in UCT's School of Economics. During the review period Jane supervised one PhD and one MSc by dissertation in environmental economics.

Environmental & Resource Economics and Water Resources & Estuarine Conservation

Project leader

Dr Jane Turpie

Environmental & Resource Economics

Overview

This programme concentrates on research which aids policy and decision making relating to the conservation of biodiversity. Projects initiated, ongoing or completed during the review period included the Conservation Farming project - a study of the economic implications of conversion to more biodiversity-friendly farming methods in four areas of South Africa (completed), an economic valuation study of Knysna estuary, the role of economics in combating alien invasive plants, and a study of the economic impacts of the ban on off-road vehicles in the coastal zone in the Greater St Lucia Wetland Park.



One of the problems investigated was whether game farming can viably promote the recovery of degraded thicket vegetation in the Eastern Cape. Photo: Jane Turpie

Highlights

- The **conservation farming project** integrated three years of data collected on ecological, social and economic aspects of different farming methods in four areas of the country, with the use of ecological-economic modelling. Conservation issues and solutions differ markedly from area to area. Benefits to broader society can be demonstrated through ecological-economic analysis in most cases, but the benefits to farmers are variable. Where globally-significant biodiversity is concentrated in a small area on a few farms, as on the Bokkeveld Plateau, the risk involved in trying to coerce farmers to change their practices is high, and more formal arrangements might be appropriate. In areas where conservation involves maintaining ecological processes and populations over extensive areas, as in the Nama Karoo, economic incentives, applied generally, are the best alternative. In the Thicket Biome in the eastern Cape, the rising demand for game-related tourism, is producing an incentive for conversion from stock farming to game farming without any intervention. In the Drakensberg



foothills, economic driving forces are promoting conversion of grassland to planted dairy pastures, crops and trees, and only direct regulation will ensure the protection of biodiversity. The costs and benefits of these options are discussed. In order for conservation-friendly farming to be promoted more widely in South Africa, the heterogeneity in terms of both ecological and economic characteristics of different regions will have to be recognised, and appropriate research and action will have to take place in each different ecoregion.

- **Value of Knysna estuary:** the first phase of the two-phase study indicates that the recreational value of the estuary is in the order of R928 million per annum, and degradation of the estuary would result in a potential loss of R54 million. Users were willing to pay R76 million per annum towards the conservation of the estuary. The estuary contributes an estimated R1.5 billion to property value. The subsistence fishery contributes just over R1 million per year to poverty alleviation. The estuary is estimated to be worth some R240 million per year to South Africans in terms of existence value. These values are high and support the future conservation and wise management of the estuary and surrounding areas.
- **Economics and alien invasive plants:** recognition of their economic impacts has led to expenditure of over R3 bn in combating IAPs by Working for Water. Although its use has been inconsistent in the past, resource economics now offers a useful tool in evaluating the costs and benefits of working in alternative areas for prioritising action, of clearing versus biological control programmes, evaluating existing incentives to clear aliens, and implementing appropriate incentive programmes. Nevertheless, the quality of resource economics outputs is dependent on the quality and relevance of ecological research.
- **Impacts of the ORV ban in St Lucia.** The CB 2004 students undertook a project to estimate impacts of the ORV ban in the coastal zone. Analysis of visitor trends indicated a major initial impact followed by recovery. Based on interviews with 330 visitors, it was established that different types of visitors (e.g. ORV drivers vs ecotourists) spent differently, and foreigners spend more than locals. Over half of visitors still wanted access to the beach, and analysis was made to determine the optimum amount of access. 76 business interviews indicated that there had been impacts, but that many had changed their strategies to accommodate the new situation.

Students

Ruth Parker (MSc, co-supervised by Mark Botha, Botanical Society of South Africa); *Incentives for conservation of Renosterveld*

Tony Knowles (PhD, Stellenbosch University); *Carbon*

sequestration and opportunities for carbon trading in South Africa

Water Resources and Estuarine Conservation

Overview

This programme aims to improve decision making regarding the allocation of water resources and the management and conservation of estuarine and other aquatic habitats. Research projects completed during the review period included the development of a strategy for the conservation of estuarine biodiversity, and a set of research projects designed to improve our understanding of estuarine biodiversity with a view to improving existing importance rankings.

Highlights

- A conservation strategy for estuaries: Based on an analysis of health status, threats and current protection efforts, guidelines were developed for a strategy for estuarine biodiversity conservation. The main components include research and knowledge management, regulation and enforcement, the creation of conditions and incentives that support estuary protection, monitoring and adaptive management and rehabilitation. It is envisaged that all estuaries should be categorised as Estuarine Protected Areas (with formal protection), Estuarine Conservation Areas (involving co-management), and Estuarine Management Areas (subject to general regulation).
- **Predicting estuarine invertebrate diversity.** Based on Dave Knox's MSc data on invertebrate fauna of 16 estuaries plus other existing data, it was established that the invertebrate species richness of estuaries could be very well predicted on the basis of the size of an estuary in relation to the size of the 'potential species pool', which was derived from species distribution data. This has filled a very large gap in determining the importance of different estuaries for conservation.



MSc CB student, Cloverley Lawrence interviewing holiday makers at Sodwana over the Easter period. Photo: Jessica da Silva.

Dr Andrew Jenkins

- See **Raptor Research Programme** p. 19

Dr Penn Lloyd

- See **Life-history, Rarity & Conservation of Southern African Birds** p. 27

Research Associates



Nesting Black Harrier. Photo: Andrew Jenkins

Dr Antoni Milewski

Antoni Milewski spent Aug.-Sept. 2004 at the Fitztute, and the rest of the year in Western Australia. His current efforts are directed mainly at interpreting nature for the lay public (with an emphasis on intercontinental comparisons and sex in nature), and fundamental theorising on the driving forces in ecology, evolution and biogeography. Antoni's collaboration with Anthony Mills of the National Botanic Institute continued, with submissions of manuscripts to *Science* and *BioScience* on the topic of global environmental controls of vegetation height. He presented a ten-week course, 'Why are Australian animals and plants different?' to the Mature Adults Learning Association in Perth, April-May 2004. He published articles in *Veld and Flora*, *African Wildlife*, *Wingspan* (magazine of *Birds Australia*) and *Australasian Science*. Antoni also featured in a documentary on Superpredators, made under the auspices of *National Geographic*.

Dr Rob Simmons – See Raptor Research Programme p. 19

Rob is a British-born ecologist, conservation biologist and ornithologist specialising in behavioural and population ecology. His studies have taken him from the UK to Canada, Sweden and Africa with his main interests being mating systems of harriers, sibling aggression in eagles, reproductive constraints in subtropical species and sexual selection in giraffe. He has recently moved from Windhoek where he was part of the Biodiversity Programme for 14 years, specializing on the conservation of endemic and wetland birds in Namibia. He now lives in Cape Town drawn here by Black Harriers, Black Eagles, whales and a stimulating research environment. His academic research interest in harrier ecology across continents resulted in the publication of his first book *Harriers of the World: their behaviour and ecology*. He is continuing that work in collaboration with Odette Curtis and Andrew Jenkins with a 5-yr study of the endemic Black Harrier in the Northern and Western Cape, re-assessing its world conservation status. He is beginning studies of climate change effects on birds, the evolutionary interaction between plants and their pollinators and province-wide small mammal assessments with friends and colleagues. From his long term studies of threatened birds in Namibia he is currently writing his second book on Namibia's Red data birds, due for publication in early 2005. He watches Peregrines and whales from Glencairn with his wife and two daughters.



Announcement of DST Centre of Excellence in Birds as Keys to Biodiversity Conservation at the Percy FitzPatrick Institute

Six new DST Centres of Excellence were launched by the National Research Foundation (NRF) and the Department of Science and Technology (DST) at a ceremony held in Pretoria on June 26 2004, and one of them is at the Percy FitzPatrick Institute:

- *DST Centre of Excellence in Birds as Keys to Biodiversity Conservation at the Percy FitzPatrick Institute* (Hosted by the University of Cape Town)
- *DST Centre of Excellence for Invasion Biology* (Hosted by Stellenbosch University)
- *DST Centre of Excellence in Strong Materials* (Hosted by the University of the Witwatersrand)
- *DST Centre of Excellence in Catalysis* (Hosted by the University of Cape Town)
- *DST Centre of Excellence for Biomedical TB Research* (Hosted by Stellenbosch University)
- *DST Centre of Excellence in Tree Health Biotechnology at FABI* (Hosted by the University of Pretoria)

Centres of Excellence are defined by the DST and NRF as:

"...physical or virtual centres of research which concentrate existing capacity and resources to enable researchers to collaborate across disciplines and institutions, on long-term projects that are locally relevant and internationally competitive in order to enhance the pursuit of research excellence and capacity development."

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12th July 2004



(From left) Prof Daya Reddy, dean of science and chair of the NRF board; Prof Morné du Plessis; Prof Cheryl de la Rey, DVC for research and innovation; Prof Jack Fletcher; and dean of engineering and the built environment, Prof Cyril O'Connor.



External/Contractual lecturers

Prof. Sue Galatowitsch

(University of Minnesota)

Prof. Eric Harley (Chemical Pathology Department, UCT)

Assoc. Prof. John Hoffmann (Zoology Department, UCT)

Prof. Timm Hoffman (Institute for Plant Conservation, UCT)

Andrew Knight (TERU, University of Port Elizabeth)

Rainer Krug (University of Stellenbosch)

Prof. Sue Milton (University of Stellenbosch)

Prof. Norman Myers (Oxford University)

Dr Colleen O'Ryan (Molecular and Cell Biology Department, UCT)

Assoc. Prof. Dave Richardson (Institute for Plant Conservation, UCT)

Dr Tony Starfield (University of Minnesota)

Prof. Christian Wissel (University of Leipzig)

Prof. Nik van der Merwe (Archaeology Department, UCT)

Conservation Biology Masters Overview

Course co-ordinators

Dr Peter Ryan

Prof. Tim Crowe

Assistant to the course co-ordinators

Sharon Bosma



The 2004 MSc Conservation Biology class with Prof. John Hoffmann. Photo: Peter Ryan.

The 12th cohort of conservation Biology students graduated in June 2004 with 10 of the 13 students in the 2003/2004 class graduating. Kirsten Jack and Leigh Potter completed their projects, but not in time to graduate while Apophia Atukunda is pursuing her PhD studies in Uganda. The remaining students from the 2002/2003 cohort, David Maphisa and Nir Peleg, also completed their projects, although David's two year study on Rudd's Larks still awaits assessment. Of the ten graduands from the 2002/03 class, four were awarded their degrees with distinction, Mark Bidwell emerging as the top student and deserving recipient of the Dr H.E. Joosub Award. The research projects spanned a range of topics, from understanding the breeding biology of Blue Cranes and foraging ranges of cheetahs to assessing the impacts of introduced giraffes on trees and determining the effectiveness of the Ukuvuka campaign in changing people's attitudes to alien plants.

The current cohort of 14 CB students continues the tradition of strength through diversity, with seven countries represented. The class is larger than usual because of the quality of applications and the inclusion of PhD student Sean Marr, who is preparing for the switch from an engineering background. The course component returned to a more manageable seven months but not at the expense of reduced content, as we were unable to resist Prof. Sue Galatowitsch's kind offer to return to teach an abbreviated module in restoration ecology. This year's field trips saw the students making the long trek to northern KwaZulu-Natal to examine resource economics issues surrounding the Greater St Lucia Wetland Park and a more modest outing to the Anysberg Nature Reserve as part of the Disturbance Ecology module.

We are extremely grateful to the many people who contribute to the ongoing success of the programme. Foremost among these are the module leaders, many of whom are based outside the Fitztitute: Eric Harley, John Hoffman, Timm Hoffman, Andrew Knight, Rainer Krug, Sue Milton, Norman Myers, Colleen O'Ryan, Dave



Richardson, Tony Starfield, Nik van der Merwe and Christian Wissel. Many other people contribute through guest lectures or practicals. The programme also couldn't run without the sterling support of the Fitz and Zoology support staff, especially Meg Ledebor who handles umpteen queries from potential students.

Conservation Biology projects: 2003

Alston, Karen: *The roles of habitat features, disturbance and distance from putative source populations in structuring alien plant invasions at the urban/wildland interface on the Cape Peninsula, South Africa*
Supervisor: D. Richardson

Bidwell, Mark: *Breeding habitat selection and reproductive success of blue cranes *Anthropoides paradiseus* in an agricultural landscape of the Western Cape, South Africa*
Supervisors: P. Ryan & K. Shaw

Bomhard, Bastian: *Potential impacts of future land use and climate change on the Red Data Book status of the *Proteaceae* in the Cape Floristic Region*
Supervisor: D. Richardson

Eshiamwata, George: *The importance of Strangler Fig (*Ficus thonningii*) trees as centres for seed deposition and seedling establishment in the agricultural landscape*
Supervisor: W.R.J. Dean

Khumalo, Caiphaz: *A comparative study of giraffe (*Giraffa camelopardalis*) browse impact on South African savanna ecosystems*
Supervisor: W. Bond

Kongor, Raphael: *A retrospective analysis of the host specificity of a seed-feeding beetle *Melanterius servulus* Pascoe (Coleoptera: Curculionidae); a biological control agent for *Acacia cyclops* and *Paraserianthes lophantha* in South Africa*
Supervisor: J. Hoffmann

Jack, Kirsten: *Increasing the contribution of conservation planning to conservation through implementation*
Supervisors: M. Rouget & M. du Plessis

Maphisa, David (Commenced 2002): *Breeding biology and habitat selection of the critically endangered Rudd's Lark *Heteromirafra ruddi*: Implications for conservation*
Supervisor: P. Ryan

Muntifering, Jeff: *Using habitat characteristics to model cheetah (*Acinonyx jubatus*) high use areas: a novel approach*

to managing the matrix
Supervisor: P. Ryan

Nansikombi, Juliet: *Impacts of helicopter flights on the birds at Dassen Island*
Supervisor: P. Ryan

Peleg, Nir (Commenced 2002): *Studies on the population genetics of the phenotypically-variable *Acacia* karoo in South Africa*
Supervisors: D. Ward & P. Ryan

Potter, Leigh: *Latitudinal life-history patterns of the Barn Owl (*Tyto alba*) and its potential role as an agent of biocontrol*
Supervisors: A. Jenkins & M. du Plessis

Ralston, Samantha: *The role of legislation in the management of invasive alien plants: human dimensions affecting the implementation of legal instruments on the Cape Peninsula, South Africa*
Supervisor: D. Richardson

Senyatso, Kabelo: *Applicability of the IUCN Red List criteria at a regional level: A case study of birds in Botswana*
Supervisor: P. Ryan

MSc Conservation Biology: St Lucia & Anysberg Field Trips – CB 2004 Class Representative, Vici Napier



Vici Napier conducts an interview with beach users in St Lucia in order to learn more about the economic impact of the beach-driving ban. Photo: Vici Napier.

St. Lucia

The Conservation Biology (CB) visited the Greater St. Lucia Wetland Park (GSLWP) in KwaZulu-Natal for their Resource Economics module with the aim of investigating the economic impact of the beach-driving ban on the GSLWP.

After many hours and plenty of frustration, the CB class learnt what it meant to participate in a workshop environment and produced a questionnaire aimed at extracting information on various beach-driving scenarios and tourists' activities and economic expenditure while on holiday.

Armed with their questionnaires, CB students took to the beaches of Kosi Bay and Sodwana Bay in the north and Cape Vidal and St. Lucia in the south. Some students had difficulty leaving their interviewees, particularly foreigners, who, on occasion, provided ice-creams and chatted to students about South Africa. Generally tourists were willing to be interviewed although some, particularly 4X4 owners, did not have the time or inclination to participate. The class learnt a great deal about how to approach people, explain the purpose of their study and maintain composure when faced with people who were clearly unhappy about the beach-ban.



Conservation Biology students getting to grips with vegetation. Photo: Peter Ryan

Anysberg

As part of the Disturbance Ecology module, the CB class visited the Anysberg Nature Reserve in the Karoo to look at whether Old-Man's Saltbush *Atriplex nummularia* (an alien planted on abandoned agricultural fields) delayed the return of biodiversity to disturbed areas within an arid landscape.

The CB students learnt about plant identification, ant trapping techniques, central-point surveys for birds and small mammal trapping. We set out to survey three types of fields: natural undisturbed areas, ploughed areas (both old and recently disturbed) and areas planted with *A. nummularia*. Throughout the surveys the class learnt the importance of standardised techniques and accurate replication and, on a few occasions, had to redo a transect or bird count. On analysis of the data it was determined that *A. nummularia* facilitates recruitment of native plant but results in a shift of plant and bird species assemblages and long-term changes in soil chemistry which may inhibit the establishment of many perennial plant species associated with typical karroid vegetation. Thus, while facilitation may occur initially, as *Atriplex* becomes established its role is likely to become inhibitory.

The conservation biology class really enjoyed their field trips and all agreed that it was during these trips that they learnt the most about real world conservation issues and study techniques. Hands-on work is definitely the best way to learn.

FitzPatrick students present dissertation research at Cambridge - CB 2003 Class Representative, Mark Bidwell

From March 24-26 2004 Bastian Bomhard and I represented the FitzPatrick Institute



at the 5th Annual Student Conference on Conservation Science at the University of Cambridge. This conference, co-organized by Dr. Andrew Balmford who is currently on sabbatical at the FitzPatrick Institute, brings together young conservation scientists from around the world to present their research and network with representatives of various conservation organisations. There are also plenary talks by distinguished conservation scientists.

We gave talks on the research we undertook during the 2003 MSc Conservation Biology programme. Bastian investigated potential impacts of future land use change and climate change on the Red Data Book status of some 200 Proteaceae in the Cape Floristic Region, while I studied habitat selection of Blue Cranes, and factors contributing to their nesting success, on farms in the Overberg region of the Western Cape. In total, students presented 35 talks and some 60 posters, and attended practical workshops on subjects such as how to write a scientific paper, how to measure the outcomes of conservation action, and how to get a job in conservation organisations.

We found that the conference was well worth attending, and recommend that Fitz students consider submitting proposals to present their research. Most of the participants at this conference are students, so the atmosphere is very relaxed and collegial, with some nice social side events. Nonetheless it is a great opportunity to make contacts, look for jobs or PhD

positions, and stay out too late drinking the night before your talk!

The deadline for submitting an application to attend the 2005 conference is November 10 2004. We gratefully acknowledge travel bursaries from the FitzPatrick Institute, which covered our registration and accommodation expenses.



*Anysberg field trip: Prof. Sue Milton supervising the recording of data.
Photo: Conservation Biology Class of 2004.*

Roberts VII team

Scientific Editors

Assoc. Prof. Phil Hockey
Dr Richard Dean
Dr Peter Ryan

Managing Editor

Sharon Maree

58 contributing authors

(14 are staff or students at the Percy FitzPatrick Institute)

7 artists

Publishing

Proof reader/sub-editor: Brenda Brickman
Designer: Gillian Black

The Roberts VII Project

Project Manager

Sharon Maree

The bird formerly known as ...

Over 300 local species renamed as South Africa conforms to worldwide standards

ISRAEL MLAMBO and
KAREN VAN ROOYEN

SOUTH African birding is catching up with international standards by changing the names of popular local species.

Among over 300 changes, the Grey Lourie will become the Grey Go-Away Bird, and the Black Eagle will be known as Verreaux's Eagle.

Other name changes include Cape Francollins, now known worldwide as Cape Sparrow, and the Jackass Penguin, now the African Penguin.

The turnaround comes as the international Ornithological Congress sets out to eliminate confusion surrounding the use of bird names across international borders.

According to Aldo Berruti, director of BirdLife South Africa, a national umbrella body of bird clubs: "This is a major name change... it has never happened on this scale before in 100 years." South Africa "is catching up and falling in line with international usage of bird names", he said.

Hundreds of local bird names would be phased out from reference and guide books to be replaced by a "globally acceptable set of common names", said Peter Ryan, a member of the editorial team that produces the acclaimed guide *Roberts Birds of South Africa*. Local bird names were not in line with international bird names and this caused "chaos", he said.

The need for the name change came about because an ever-increasing number of birders adventure beyond local borders. As this happens, Ryan said, "confusion reigns" — a single bird may be known by different names.

The Indian Mynah, as it was recognised in South African birding circles, is known as the Crowned Mynah elsewhere in the world. The internationally acceptable name has now been adopted in South Africa to end the confusion.

The changes were pioneered by the international Ornithological Congress, which has regional committees to identify problematic names and make standardisation recommendations.

The African committee has representatives across the continent and receives input from regional birding groups. A draft African list was combined with lists from other regional committees and the standardised names were finalised as those to be used in future bird guide books.

According to Berruti, the process of name changes "happened over five years starting around 1997" with the setting up of regional committees.

Ryan, who is also one of the committee's regional members, said the process of selecting standard names had not been easy.

"Africa was particularly problematic because of regionalisation so, for example, there was a huge difference between names in South Africa and East Africa," Ryan said.

"I won't mince my words, there's a lot of resistance; people are upset that the names have been changed, but there's nothing stopping them from using the old names," he said.

Berruti said the name of the Grey Lourie had changed because there were three other largely grey-coloured Louries in other parts of Africa. The Grey Lourie was also known as Grey Go-Away Bird throughout East Africa.

The African Penguin name took over Jackass Penguin because it is the



Sunday Times,
January 18 2004

THE BIRD CALL: 1. The Purple-crested Lourie is to be known as the Purple-crested Turac; 2. The Redbilled Woodhoopoe becomes the Green Woodhoopoe; 3. The Black Eagle becomes Verreaux's Eagle; 4. The Grey Lourie becomes the Grey Go-Away Bird; 5. The Crowned Plover becomes the Crowned Lapwing; 6. The Jackass Penguin becomes the African Penguin; 7. The Natal Robin becomes the Red-capped Robin-chat; 8. The Black-eyed Bulbul becomes the Dark-capped Bulbul; 9. The Cape Francolin becomes the Cape Sparrow; 10. The Spotted Dikkop becomes the Spotted Thick-knee; and 11. Stanley's Bustard becomes Demin's Bustard

only penguin that breeds in Africa.

The change of the Cape Francolin to Cape Sparrow was based on research that shows that all Francollins fall under two groups: Francollins and Sparrows.

The name of the Cape bird was changed to mark the difference because it has a spur on the back of its legs.

"The reason for the change from Black Eagle to Verreaux's Eagle is because there is another Black Eagle

elsewhere in the world. Jules Verreaux was a French explorer who lived in South Africa in the early 1800s and found the first specimen of this bird.

Ryan said the new names would be incorporated in the latest revised edition of *Roberts Birds of South Africa*, to be released by the end of the year.

"We're running with the new name, and where that differs [from] the old name it will be given equal prom-

inence. Old names will wither away, but they will never go completely. They'll live on in people's vernacular."

Berruti said the "name change has stirred controversy because people feel that the changes are being pushed on them by outside forces".

André Mare, chairman of Pretoria Bird Club, sees the name changes as a positive step towards bringing South Africa closer to the international bird-

ing community after so many years of isolation. "I think it's sensible for South Africa, as part of the African family, to adopt names that are used throughout the continent."

Gillian Leisegang, chairman of BirdLife Port Natal, said: "It is necessary to change these names and sometimes changes seem to be for the better." And it did not distract birders from their recreation "at all".

The proposed name changes for Roberts VII continue to contribute to a lively debate in the local press: *Sunday Times*, January 8, 2004.

ORNITHOLOGY FOR THE NEW MILLENIUM

To create an invaluable research tool in handbook format, summarising what is known about the biology and habits of southern African birds

The *Roberts VII* project was originally planned as a four-year contract to the Percy FitzPatrick Institute to produce a rewritten edition of *Roberts Birds of Southern Africa*. The project has since been extended by 12 months to allow for the completion of the artwork and species accounts. An additional 12-18 months is allowed for publication and printing and a provisional shelf date for the final product is set for April/May 2005.

Work on the project was started in early 1998, with preliminary research on format and style, editorial and co-authorship proposals and budget layout. Our proposals were approved in June 1998, and the project was officially announced to the birding



community at the International Ornithological Congress in Durban in August 1998. During the course of the first year, potential contributing specialists were approached and subcontracted to produce the text accounts for the 950 southern African bird species. Thirty-six of the 58 contributing authors have contributed 10 or more species accounts and will be acknowledged as authors on the title page.

Bibliographic database

One of the first projects initiated was the development of an electronic bibliography of Afrotropical bird literature (Bird Information Retrieval Database - BIRD). The database was designed to aid authors in their literature search for writing species accounts.

BIRD has since been handed to National Inquiry Services Centre (NISC), who has taken over the production and maintenance of BIRD; and has ensured its existence (and financing) into perpetuity. The contributing authors of *Roberts* have, and will always have, full access (through the Percy FitzPatrick Institute) to this database for purposes of *Roberts* text revision.

Artwork

Seven local artists were commissioned to produce a total of 80 colour plates for the new edition of *Roberts*. The standard of the artwork has been over and above our highest expectations! All colour and electronic corrections are completed and the plates are ready to be printed.

As a special feature, we will include Norman Lighton's frontispiece to the original *Roberts*, depicting a bushveld scene with Common Ostriches, a Southern Ground-Hornbill and Bateleurs soaring overhead.

Internet and media

The FitzPatrick Institute's web-site has provided an ideal opportunity to make draft texts available to birders for comment and input. This has played a valuable role in enabling the birding community to become actively involved in data gathering and helping to fill some of the gaps that exist in our knowledge of southern African birds. In many instances, the unpublished data received from the birding public are the only source of reference available to us. Continued web-postings will be made until final proofs are ready for printing. This will serve well to keep the birding community enthused about the final product.

More recently, the web-site has proved indispensable in providing authors the opportunity to check their own work. This has enabled more efficient and speedier checking of peer reviewed texts and final proofs.

The editors of *Roberts* have been invited to interviews and several broadcasts have been aired on local radio stations across South Africa. These, together with continued publications in birding magazines and bird club newsletters

have contributed to keeping the birding community up to date with the progress of the new *Roberts*.

Publication

Black Eagle Media has been contracted to publish *Roberts VII*, and the final product will be printed by Tien Wah Press in Singapore. We have been in constant contact with the publishing team and have been submitting final species texts for layout and proof printing. This has been an extremely demanding time for the *Roberts* team; with deadlines to adhere to on an almost daily basis, scrutinising page proofs, design and layout, and tracking down the final bits and pieces to complete species accounts.

Invitations for special edition copies and prepublication offers for *Roberts*, will be advertised in our publisher's magazine, *Africa, Birds & Birding* towards the end of this year. Keep your eye on our web-page and the press, as the excitement mounts and the end of the Project draws near!

Acknowledgements

John Voelcker Bird Book Fund and the Tony and Lisette Lewis Foundation for funding the project.

Librarian:
Margaret Sandwith

Niven Library

Overview

The most pressing issues during the past year were those of space and the urgent need to upgrade the Niven Library catalogue to make it available to users at their desks. These issues are discussed in more detail below.

2003 – 2004 was a busy year as can be seen from the statistics provided in the relevant sections below. The increased usage of the library internationally can be attributed both to the high profile of PFIAO staff and their international connections and to the Internet presence of the Institute.

The Niven Library was put under pressure by the various *Roberts VII* authors around the country who either required verification of information or needed a copy of that missing citation, now! The addition of a scanner to the electronic equipment of the Niven Library has facilitated rapid information dissemination.

Staff and Staff Development

Volunteer Staff

Des Loubser: Des has continued his invaluable work with the reprint collection, supplying reprints on request around the world, filing and weeding the collection. He has also assisted with the inter-library loan service when the demand was high.

Sally Dagleish: A returned volunteer, in the past Sally worked with the reprint collection alongside Richard Brooke. During the past year Sally has worked off campus inputting new records into the reprint collection, principally the donations from Phil Hockey and Dean Fairbanks.

Nomgcobo Ntsham: Nomgcobo worked as a volunteer at the Niven Library from March 2004 on a mentoring programme. Although she had already completed her mandatory practical work in libraries towards her degree in Librarianship, she wished to gain more experience. She has been invaluable in doing routine tasks such as shelving and shelf-reading, photocopying inter-library loan requests and interfiling the two new reprint collections into the Richard Brooke Memorial collection. In addition she has performed various professional tasks under guidance in order to extend her experience.

Library Development

Collection Management

Reprints: Des has been methodically weeding duplicate reprints from the collection in order to accommodate new papers. These duplicates are made available users who visit the library. Two new collections were donated to the library: Phil Hockey's complete reprint collection including waders and shorebirds and Dean Fairbanks' collection of GIS papers.

New Books: A number of books for review were sent to the Niven Library during the year, including *Birds of Africa*, volume 7 which completed the series. Volume 8 of *Handbook of the birds of the World* was also received as was *Gaston's Seabirds: a natural history*. The Niven Librarian is currently joint review editor for *Ostrich* increasing the potential for review books for the Niven Library. During June 2004 a handsome ornithological bequest was received from the estate of Walter Stanford, a FitzPatrick Institute founder member.

Promotion of the Niven Library Collection

The presence of the *Roberts' VII* texts on the PFIAO web page has promoted the collection considerably and many of the queries from other parts of South Africa and internationally have come via this resource.

Dr. Linda Birch, Librarian of the Alexander Library, Edward Grey Institute of Field Ornithology at Oxford University has been a stalwart in the supply of photocopies of material unobtainable in South Africa to *Roberts VII* authors, many of these of the type



specimen papers published in early volumes of *Ibis* not held by the Niven Library.

Upgrading the Niven Library System

2003/2004 was a disappointing year with regard to the proposed upgrade of the Niven Library Database. The hoped for migration to the UCT Aleph system and contribution to the Calico library network in the Western Cape did not materialise. In view of this delay the librarian investigated alternative database software from UNESCO.

UNESCO's CDS/ISIS is one of the most widely used information retrieval packages in the world and is supplied freely on registration. The database can be manipulated to suit the library and the users in a very precise way and has many useful additions.

A database format has been developed for the Niven Library by the Librarian and, at the time of reporting, data from the old InMagic database is being reformatted in order to migrate this to the new database. When the opportunity to join the Calico network presents itself, the work of reformatting the database to the required standard will have already been done.

Space

During December 2003 a student was employed for three weeks to assist with the packing up of archival journal titles for removal to storage. This provided some much needed space for the growth in the journal collection. The catalogue was modified to reflect the change in location and titles were relabelled. At the same time the collection was refilled strictly alphabetically by title with see references to previous and subsequent changes in title.

A weeding exercise is planned for the 2004/2005 vacation for the book collection, at which time the proceedings will be reintegrated with the rest of the book collection.

A weeding exercise in the reprint collection is ongoing.

Security

Since May 2003 the Niven Library has been kept locked as a matter of course. Users are required to use their cards to gain entry or ring the buzzer to be admitted by the Librarian. This has worked fairly well on the whole, with users being cooperative about the need for security.

Material continues to be taken from the library without completing a loan slip necessitating general e-mail requests for items to be returned. This does not always elicit a response and inconveniences users wishing to consult the material.

A request has been placed with Access Control to modify use for certain categories of users, limiting use to library opening hours. When the Access Control software has been modified to permit this level of control, this will be implemented.

An enquiry was made to find out if surveillance cameras could be installed in the library, unfortunately there is no backbone in the Zoology Department to support this at present.

Use of the Library

Table 1. Niven Library stock circulation over the past 4 years.

	2003/04	2002/03	2001/02	2000/01
Monographs	519	409	537	658
Reprints	83	155	153	133
Journals	278			
Videos/CDs	7			
Total	887	564	690	791

On average, 74 items per month are recorded as having been borrowed during this period. Many of the book and journal loans can be attributed to the various staff/students who are employed in the final edit of *Roberts VII*. Short-term journal loans were permitted to allow Zoology and Botany staff and students to make copies on their own photocopiers.

Document Delivery

A document delivery service is provided to users from other institutions such as national and international universities and technikons, governmental institutions, NGO's, ornithological societies and for private research.

Approximately 80% of the photocopies supplied were free of charge to other tertiary institutions. This is within the IULC agreement between librarians of tertiary institutions. Photocopies requested by the Niven Library for staff and students were also supplied free of charge under this agreement. The Niven Library continues to be a net supplier of articles through the national interlending system. There is a need in the future to consider charging for photocopies made from the BirdLife collection in order to generate the funds to do much needed binding of this collection. Cash redeemed from coupons received in payment for inter-library loans totalled R1257.50.

Table 2. Niven Library inter-library loans over the past 4 years.

	2003/0 4	2002/0 3	2001/0 2	2000/0 1
Photocopies requested (by PFI/O staff/students)	95	154		
Photocopies supplied	403	365	130	208
Requests not satisfied	24	13	33	69

Reprint requests

During the period 1 June 2003 to 31 May 2004 275 [178] [485] requests for reprints of the Percy FitzPatrick Institute's

publications were received by the Niven Library, in addition to those submitted directly to authors in personal letters.

Table 3. Requests for PFI AO Reprints.

	2003/04	2002/03	2001/02	2000/01
Number of reprint requests	275	178	485	554
Number of countries	37	38	40	50

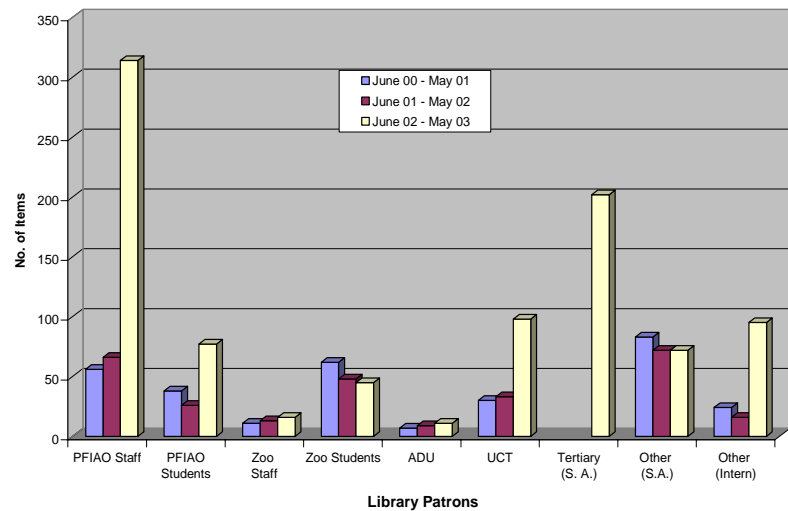


Fig. 1. Research requests.

The drop-off in reprint requests has probably stabilised to an expected level. The academic reliance on electronic journals, particularly in the western world, is widespread and is not expected to diminish the influence of PFI AO research on international ornithology. Once again interlibrary loan requests have included a proportion of PFI AO articles. In addition to the Inter-library loans and reprint requests, the Niven Library has also processed 474 requests for information, amounting to the provision of 460 articles. 133 pdf or jpg files were supplied by e-mail to users locally, nationally and internationally. In addition 69 literature searches were compiled and e-mailed to users. Other usage of the library was for verification of information, mainly for *Roberts' VII* authors, and numerous general queries.

The breakdown by countries is: Argentina 1(6), Australia 10(6), Botswana 5(0), Brazil 11(2), Burkina Faso 8(0), Canada 1(3), Czech Republic 1(3), Eritrea 1(0), France 5(20), Germany 13(7), Hungary 1(2), India 14(0), Iran 1(5), Italy 2(1), Japan 1(0), Kenya 3(1), Mexico 5(1), Morocco 1(1), Mozambique 1(0), Namibia 11(2), The Netherlands 3(0), New Zealand 1(2), Oman 1(0), Pakistan 1(0), Philippines 1(0), Poland 5(2), Portugal 3(1), South Africa 82(39), Spain 18(20), Swaziland 5(1), Switzerland 4(0), Turkey 1(0), United Kingdom 17(6), United States of America 30(19), Uruguay 1(0), Venezuela 1(0), Zimbabwe 5(0).

Members of the Percy FitzPatrick Institute continue to send reprints to workers around the world and reprints are also given out directly to visitors to the Niven Library on request.

Cash photocopying

The cash photocopy facility in the library was used by undergraduate students or library visitors from other parts of campus or beyond who do not have a photocopy code. Approximately ? [8688] [10017] copies with a cash value of ? [R2607.19]



[R2659.10] were made. The cost of photocopies has remained constant at 35c per page.

Research requests

The Library received approximately 474 [400] [285] research requests from the staff and students of the PFIPO, the Zoology Department and users from other institutions and individuals, both local and international (see figure 1) amounting to the supply of over 970 items of information. The demand for the supply of information in pdf format increased during the year under review as had been expected.

Requests for information

Requests from other South African Institutions include Absa, African Sporting Expeditions, Benfontain Game Farm, Black Eagle Publishers, Brenthurst Library, Die Burger, Cape Bird Club, Cape Technikon, CSIR at Stellenbosch, Durban Natural Science Museum, Ekangala Grassland Trust, Grintek Ewation, Ground Hornbill Project, KZN Wildlife, Marine and Coastal Management, Ian MacDonald (Environmental Consultant), Mpumalanga Parks Board, National Botanical Institute (Pretoria), National Museum (Bloemfontein), NISC, Overberg District Municipality, Potchefstroom University, Rhodes University, SA Technikon, Sothebys South Africa, Southern Cape Herbarium George, Southern Waters, SRK Consulting, Stellenbosch University, Tshwane University of Technology, UNISA, University of KwaZulu-Natal, University of the North, University of Pretoria, University of the Witwatersrand, Dept. Water Affairs & Forestry, Western Cape Nature Conservation Board.

Requests for information (over and above reprint requests) were received from individuals and international institutions in Australia, Botswana, Burkina Faso, France, Germany, India, Japan, Kenya, Mexico, Mozambique, Namibia, Namibia, Netherlands, Spain, Switzerland, United Kingdom, USA, Zimbabwe.

Acquisitions and collection building

At the end of May 2004 the bibliographic records on the OPAC system totalled 43128 [41834] [40906].

Table 4. Numbers of individual items processed in the Niven Library.

	2003/04	2002/03	2001/02	2000/01
Monographs	108	145	200	277
Journals	520	629	952	909
Newsletters	304	465	359	475
Reprints	1078	754	514	681

Added to the collection were books ordered by members of the Institute and donated and review books for BirdLife South Africa. The jump in reprint figures is due to the incorporation of the collection donated by Phil Hockey. A large number of

reprints have been collected in the form of pdf files which are stored on a PFIPO local drive and backed-up to CD. These have yet to be captured to the Niven Library database.

The Zoology Department, SAFRING and the African Seabird Group continued to donate their exchange journals to the Niven Library. A substantial number of books were donated to the library by Prof Roy Siegfried, the estate of the late Walter Stanford, and Prof Alec Brown. The majority of these have yet to be processed and the actual numbers donated will be reflected in next year's statistics.

The Zoology Department has allocated funds towards the binding of periodicals in the Niven Library. There were insufficient funds to bind an equivalent number of BirdLife titles during this period, but these are urgently in need of binding.

Table 5. Total items bound.

	2003/04	2002/03	2001/02	2000/01
PFIPO	66	51	205	204
BirdLife SA	1	10	0	0

Future Development

A number of initiatives are projected for the coming year. Once again the greatest priority is the completion of the new Niven Library database in order that users may access the database remotely. It is also hoped to launch this on the library web page so that off site users will be able to access the database.

Access to lapsed and additional ornithological journal titles, a part of the contract with NISC in the development of the Afrotropical Bird Database, has been ongoing during the year, but there are still a number of titles which require reinstatement on the Ostrich exchange. The AfroTropical bird database has once again been put to good use during the year.

Donations

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Semi-popular articles published in 2003

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Financial Report

The Financial Report is available on request from the Percy FitzPatrick Institute