DST/NRF Centre
of Excellence at the

Percy FitzPatrick Institute

Annual Report
July 2004 – December 2005

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Dr G. Verdoorn (BirdLife South Africa)

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The Annual Report may also be viewed on the Percy FitzPatrick Institute's website: http://www.fitzpatrick.uct.ac.za

Introduction

The reporting period represents the building phase of the DST/NRF Centre of Excellence (CoE) at the Percy FitzPatrick Institute and its integration into the Institute as it had existed previously. This process has required significant effort from a number of the Institute's staff and is part of a process of ongoing strategic adaptation. The year 2005 also represents the birth of the Seventh Edition of *Roberts Birds of Southern Africa* (*Roberts VII*) as arguably one of the sub-region's most comprehensive handbooks, and dealing with our best-known animal taxon. The Institute's publication outputs have once again been solid. Most pleasing is that the quality of our research publications (as measured by SCI impact factors) is steadily improving.

This annual report is the first of a new cycle of annual reports that will be synchronised with the calendar year. To this end, the current reporting period covers an 18-month block during which significantly positive changes have taken place at the Institute.

As one of only six national Centres of Excellence (CoE), the "*DST/NRF Centre of Excellence at the Percy FitzPatrick Institute*", has established a sound foundation upon which its medium-term future can be built. One of the key approaches to promote research excellence at the Institute, has been to blend into the pre-existing Institute, a strong mix of four young dynamic team members at partner institutions (Northern Flagship Institution, and the Universities of Pretoria, Wits and Stellenbosch), and a cadre of eight top-class postdoctoral researchers.

With the establishment of the CoE, a second Advisory Board has been formed to specifically act on behalf of the Department of Science & Technology (as primary funder), and the National Research Foundation (NRF) (as the disbursers of the funding). While this Annual Report has traditionally been prepared for the Annual General Meetings of the Advisory Board of the Percy FitzPatrick Institute, it will in future also serve the purpose of informing the CoE Board. Although there have been some initial growth pains in establishing the precise nature of the relationship between the Boards (and the entities that they represent), we are now moving in the direction of significant strategic integration of the previous Percy FitzPatrick Institute and the CoE. In short, the former will in effect 'gain' the contributions of a number of external team members who are based at other tertiary education institutions. Similarly, the CoE will benefit from the Institute by inheriting a significant potential to leverage further funds towards its own ends.

In a practical sense, the CoE funding has enabled the appointment of a well integrated biologist, Dr Penn Lloyd, as a full staff member (Manager of the CoE) of the Institute. Penn Lloyd has worked as a postdoctoral associate at the Institute for some years, and more recently completed a postdoc with Prof. Tom Martin at the University of Montana. He will continue to build on the significant research foundation that has been put in place at the Koeberg Bird Life-History Programme over the past five years.

The CoE funding has also enabled the Percy FitzPatrick Institute to internationally advertise the Pola Pasvolsky Chair in Conservation Biology as a full-time position. To this end, Dr Graeme Cumming has been appointed to the Chair as from 01 January 2006. Graeme Cumming grew up in Zimbabwe, completed his BSc Hons at Rhodes and graduated as a Rhodes Scholar with a PhD from Oxford. More recently, he spent five years in various academic positions in the USA. Dr Cumming has significant interests in African conservation and is primarily a spatial ecologist. His appointment brings 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 CoE also enables us to invest in much-needed support staff in the form of a secretary, Ms Nokuthula Malamlela, and a web coordinator, Ms Melissa Stander.

A well-known and dynamic conservation biologist from Cambridge, Dr Andrew Balmford, joined the Institute for a year starting in August 2004, as the Pola Pasvolsky Visiting Chair. While he was in Cape Town, Prof. Balmford was not only exceptionally productive (see publication list), but he also interacted with, and co-supervised two of the Conservation Biology MSc student research projects. He also completed a detailed review of the coursework MSc Programme.

The coursework MSc in Conservation Biology Programme produced a full house of 15 graduates (2004/5 cohort), and another 11 students are in the final throes of their research projects (2005/6 cohort). Once again, we have attracted in excess of 60 applications from across the world, 14 of whom were offered places for the course that commences in January 2006. Most pleasing is the pattern of funding of successful African students (i.e. non-South

African). Over the reporting period, the Tropical Biology Association (TBA) has provided five of their top alumni (from Cameroon, Kenya, Tanzania and Uganda) with full scholarships. In addition, Conservation International (CI) funded two students, Wildlife Conservation Society (WCS) one, the Lesotho Government one, and the Royal Society for the Protection of Birds (RSPB) and BirdLife International jointly one.

The success of the Conservation Biology course relies heavily on the academic expertise of colleagues from Archaeology, Botany (including the Leslie Hill Institute of Plant Conservation), Economics, Mathematics, Molecular Biology, Statistical Sciences, and Zoology. In addition, we have over the reporting period contracted the expertise of a range of experts from across the world including Dr Andrew Knight (Australia), Dr Norman Myers (Oxford, UK), Prof. Tony Starfield (Minnesota, USA), and Prof. Christian Wissel (Lepizig, Germany). The latter three in particular 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.

Late in 2005, I attended the Society for Conservation Biology's annual research symposium in Brazil. It was particularly pleasing to note that 25 researchers with student or staff association to the Percy FitzPatrick Institute, were listed as authors or co-authors on the scientific programme. Several prominent conservation biologists at the meeting remarked positively on the impact that our Conservation Biology Programme at UCT is having.

The year 2005 will be remembered by many as the year that saw the birth of *Roberts VII,* a massive undertaking that commenced as far back as 1997. The Percy FitzPatrick Institute is grateful to the Trustees of the John Voelker Bird Book Fund, and in particular its chairperson, Mr Patrick Niven, for entrusting this task to the Fitztitute. The new *Roberts* is so different and so completely revamped, that it even elicited acerbic comment from a satirist in the *Mail & Guardian*. Such comment is surely reserved only for non-trivial achievements! Every other review published to date has been lauditory. Prof. Phil Hockey and Drs Peter Ryan and Richard Dean are to be congratulated on coordinating the production of the text to this massive tome that weighs in at 5.25kg. We trust that the return on this investment of time and effort in the *Roberts VII* Project will more than repay itself in terms of the impact that the work will make on southern African ornithology.

When assessing the research publication output of the CoE at the Percy FitzPatrick Institute, we are constantly mindful of Science Citation Index (SCI) Impact Factors. To this end, we are aiming at meeting an ever-rising quality target. With a significant contingent of postdoctoral associates, an increasing number of PhD students and two additional full-time researchers on our staff, the prognosis for elevating our research output looks good.

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 (BLSA) and from further afield. Our link to BLSA continues to leverage vitally important journal exchanges with overseas institutions, although we are concerned about BLSA's omission to contractually bind NISC, the current publishers of its journal Ostrich, to honour these agreements. Although NISC has selectively concluded exchange agreements with some key institutions, this is by no means comprehensive and has resulted in an attrition of journal exchanges without any consequence to the publishers. Sustaining the acquisition of journals that have previously formed part of BLSA's contribution to the Niven Library holdings is placing an increasing burden on the finances of the Institute.

Dr Richard Dean retired at the end of 2005 after over two decades of highly productive years at the Fitztitute. We trust that both Richard and ourselves will find many excuses to continue our relationship as he clearly still has much to offer both African ornithology and the Fitztitute. See Dedication on page 6.

I regret having to report the tragic death in May 2005 of Kirsten Louw, a PhD student at the Fitztitute and one of South Africa's most talented young naturalists.

Prof. Daya Reddy, Dean of Science, retired from the deanship at the end of 2005, after seven years as chairperson of the Institute's Advisory Board. This period has both represented some of the worst and some of the best years of the Institute, and we are grateful to Prof. Reddy for his unwavering support of the Institute throughout. We wish him well in his future endeavours. At the same time, we welcome his replacement, Prof. Kathy Driver (formerly from Wits), to the Advisory Board. We look forward to a fruitful and mutually beneficial relationship over the years to come, and wish her a stimulating and satisfying stint at the helm of UCT's Faculty of Science.

Once again I have been privileged to have had the full support of the Advisory Board; many Board members assisted me with specific 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 again grateful for the contributions of the Institute's academic staff, viz. Tim Crowe, Phil Hockey, Penn Lloyd, 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. Profs Andrew Balmford and Sue Milton, and Drs Richard Dean, Andrew Jenkins, Rob Simmons and Antoni Milewski. The Fitztitute remains privileged to have dedicated and particularly competent support staff in Chris Tobler, Hilary Buchanan, Nokuthula Malamlela, Margaret Sandwith and Lionel Mansfield. Finally, I thank Andrew Jenkins, Melissa Stander, and Hilary Buchanan for yet again putting together this visually pleasing annual report!

In a report such as this, one has to constantly balance detail with overview. For those who desire more information on the specifics of any research programme or project, we have a comprehensive website which is updated regularly: www.fitzpatrick.uct.ac.za

Morné A. du Plessis (February 2006)
Director

Changes in Personnel

Dr Richard Dean *retired at the end of December 05, but will continue his association with the Institute as an Honorary Research Associate.*

Dr Penn Lloyd *was appointed as the Manager of the DST/NRF Centre of Excellence and* ***Ms Nokuthula Malamlela*** *took up an appointment as Senior Secretary for the Centre of Excellence from September 2005.*

Dr Phoebe Barnard *and* ***Dr Alan Kemp*** *have formalised their association with the Institute by their appointment as Honorary Research Associates for a five year period starting September 2005.*

Four new post doctoral students joined the Institute in Cape Town: ***Dr Corine Eising***, ***Dr Amanda Ridley***, ***Dr Lizanne Roxburgh*** *and* ***Dr Andrew Taylor*** *and another two were based at CoE team members' labs, viz.* ***Dr Wayne Delport*** *(University of Pretoria) and* ***Dr Ulf Johansson*** *(University of Stellenbosch).*

Kirsten Louw *(PhD) passed away tragically in May 2005.*

Graduates

MSc: Odette Curtis *(Dec 2005)* ***Conservation Biology MSc: David Maphisa***, ***Nir Peleg*** *(Dec2004);* ***Jessica da Silva***; ***Helen Farmer***, ***Ian Little, Steven Lowe, Andre Mader***, ***Angua Mao***, ***Vici Napier***, ***Philip Osano***, ***Sam Owen***, ***Alfred Owino***, ***Seb Rahlao***, ***Geofrey Soka***, ***Dian Spear*** *(Jun 2005);* ***Cloverley Lawrence*** *(Dec 2005).*

New students

PhD: Ross Wanless *(supervised by Peter Ryan).*
MSc: Duan Biggs *(supervised by Jane Turpie);* ***Graeme Oatley*** *(supervised by Tim Crowe);* ***Samantha Peterson*** *(supervised by Peter Ryan) and* ***Zach Vincent*** *(supervised by Peter Ryan).*
Conservation Biology (CB) MSc: *Twelve students began the CB MSc in January 2005.*

Director

Du Plessis, M.A. PhD (Cape Town) Professor: Jul 04 - Dec 05*

Academic and Research Staff

Balmford, A. PhD (Cambridge) Pola Pasvolsky Visiting Chair: Aug 04 - Jul 05
Crowe, T.M. PhD (Cape Town) Professor: Jul 04 - Dec 05*
Dean, W.R.J. PhD (Cape Town) Jul 04 - Dec 05
Hockey, P.A.R. PhD (Cape Town) Associate Professor: Jul 04 - Dec 05*
Lloyd, P. PhD (Cape Town) Manager, Centre of Excellence: Jul 05 - Dec 05
Milton, S.J. PhD (Cape Town) Honorary Professor: Jul 04 - Dec 05
Ryan, P.G. PhD (Cape Town) Lecturer: Jul 04 - Dec 05*
Turpie, J.K. PhD (Cape Town) Senior Scientific Officer: Jul 04 - Dec 05

External CoE Team Members

Bloomer, P. PhD (Pretoria) - University of Pretoria
Bowie, R.C.K. PhD (Cape Town) - University of Stellenbosch
Mandiwana, T. MSc (Cape Town) - Northern Flagship Institution
McKechnie, A.E. PhD (Natal) - University of Witwatersrand

Research Associates

Barnard, P.E. PhD (Uppsala) October 05 - Dec 05
Jenkins, A.R. PhD (Cape Town) Jul 04 - Dec 05
Kemp, A. PhD (Rhodes) October 05 - Dec 05
Milewski, A. PhD (Murdoch University, W. Australia) Jul 04 - Dec 05
Simmons, R. PhD (Wits) Jul 04 - Dec 05

Postgraduate students

Post-doctoral students

Delport, W. PhD (Pretoria) Jul 05 - Dec 05
Eising, C.M. PhD (Groningen) Apr 05 - Dec 05
Johansson, U. PhD (Stockholm) Apr 05- Dec 05
Ridley, A.R. PhD (Cambridge) Jan 05 - Dec 05
Roxburgh, L. PhD (Ben Gurion) Mar 05 - Dec 05
Taylor, W.A. PhD (Pretoria) Jul 05 - Dec 05

Doctoral

Barnes, K.N. MSc (Cape Town) Jul 04 - Dec 05
Cohen, C. BSc (Hons) (Cape Town) Jul 04 - Dec 05
De Ponte, M. MSc (Cape Town) Jul -04 - Dec 05
Loewenthal, D. MSc (Cape Town) Jul 04 - Dec 05
†Louw, K. BSc (Hons) (Cape Town) Jul 04 - May 05
Mandiwana, T.G. MSc (Cape Town) Jul 04 - Dec 05
Seymour, C. MSc (Cape Town) Jul 04 - Dec 05
Wanless, R. MSc (Cape Town) Jan 05 - Dec 05

Masters by Dissertation

Biggs, D. BSc (Hons) (Pretoria) Jan 05 - Dec 05
Boix-Hinzen, C. BSc (Hons) (Pietermaritzburg, Natal) Jul 04 - Dec 04
Curtis, O.E. BTech (Cape Town) Jul 04 - Dec 05
Hampton, S. BSc (Hons) (Cape Town) Jan 05 - Dec 05
Oatley, G. BSc (Hons) (Cape Town) Jan 05 - Dec 05
Parker, R. BSc (Hons) (Cape Town) Jul 04 - Dec 05
Petersen, S. BSc (Hons) (Cape Town) Jan 05 - Dec 05
Vincent, Z. BSc (Hons) (Port Elizabeth) Jan 05 - Dec 05

Masters in Conservation Biology 2005

Baudains, T. BSc (Hons) (Cape Town) Jan 05 - Dec 05
Fox, S.J. BSc (Hons) (Cape Town) Jan 05 - Dec 05

Kaliba, P. BSc (Hons) (Malawi) Jan 05 - Dec 05
Lauret-Stepler, M.A.V. BSc (Hons) (Reunion) Jan 05 - Dec 05
Maswime, T. BSc (Hons) (Pretoria) Jan 05 - Dec 05
McDonell, Z.J. BSc (Hons) (British Columbia) Jan 05 - Dec 05
Nzuzi, A. BSc (Hons) (Luanda) Jan 05 - Dec 05
Scovronick, N. BSc (Hons) (Emory) Jan 05 - Dec 05
Shine, K.I. BSc (Hons) (Trinity) Jan 05 - Dec 05
Stephen, V. BSc (Hons) (London) Jan 05 - Dec 05
Suinyuy, T. BSc (Hons) (Buea) Jan 05 - Dec 05
Vickers, K. BSc (Hons) (British Columbia) Jan 05 - Dec 05

Masters in Conservation Biology 2004

Da Silva, J. BSc (Hons) (Toronto) Jul 04 - Jun 05
Farmer, H. BSc (Hons) (Bristol) Jul 04 - Jun 05
Lawrence, C. B.Tech (Mangosuthu) Jul 04 - Jun 05
Little, I. BSc (Hons) (Cape Town) Jul 04 - Jun 05
Lowe, S, PhD (London) Jul 04 - Jun 05
Mader, A. BSc (Hons) (Cape Town) Jul 04 - Jun 05
Mao, A. BSc (Hons) (Moi) Jul 04 - Jun 05
Marr, S. MSc Chem Eng (Cape Town) Jul 04 - Jun 05
Napier, V. BSc (Hons) (Cape Town) Jul 04 - Jun 05
Osano, P.M.M. BSc (Egerton) Jul 04 - Jun 05
Owen, C.S. BSc (Hons) (Imperial College, London) Jul 04 - Jun 05
Owino, A.O. BSc (Hons) (Moi) Jul 04 - Jun 05
Rahlao, S. BSc (Hons) (Cape Town) Jul 04 - Jun 05
Soka, G.E. BSc (Hons) (Soikoine) Jul 04 - Jun 05
Spear, D. BSc (Hons) (Rhodes) Jul 04 - Jun 05

Zoology (Hons)

Albrecht, G. Jul 04 - Dec 04
Baudains, T. Jul 04 - Dec 04
Coupar, K. Jan 05 - Dec 05
De Vos, A. Jan 05 - Dec 05
Edwards, J. Jul 04 - Dec 04
Frauenknecht, B. Jul 04 - Dec 04
Haupt, P. Jan 05 - Dec 05
Koch, E. Jul 04 - Dec 04
Le Roux, N, Jan 05 - Dec 05
Underhill, J. Jul 04 - Dec 04
Watermeyer, K. Jul 04 - Dec 04
Wright, D. Jul 04 - Dec 04

Externally registered students*

Doctoral

Knowles, A. MSc (Stellenbosch) Jul 04 - Dec 05 (registered at U. Stellenbosch)
Nangammbi, T. MSc (Cape Town) Jul 04 - Dec 05 (registered at U. KwaZulu-Natal)
Scott, A. MTech (Port Elizabeth) Jan 05 - Dec 05 (registered at NMMU)
Spottiswoode, C. MSc (Cape Town) Jul 04 - Dec 05 (registered at U. Cambridge, UK)
Techow, M. MSc (Cape Town) Jul 04 - Dec 05 (registered at Molecular and Cell Biology, UCT)
Wichmann, M. MSc (Marburg) Jul 04 - Dec 04 (registered at U. Potsdam, Netherlands)

Masters

De Wet, J BSc (Hons) (UKZN) Jan 04 - Dec 05 (registered at UKZN)
Dundee, B. BSc (Hons) (Cape Town) July 04 - Dec 05 (registered at Zoology, UCT)
Grant, T. BSc (Hons) (Pretoria) Jul 04 - Dec 05 (registered at U. Pretoria)
Kahsai, N.G. Jul 04 - Dec 05 (registered at U. Stellenbosch)
Pichegru, L. MSc (Paris) Jul 04 - Dec 05 (registered at U. Strasbourg)
Ranger, S. BSc (Hons) (Pretoria) Jul 04 - Dec 05 (registered at U. Pretoria)
Rao, A. BSc (Hons) (MUN) Jul 04 - Dec 05 (registered at Memorial University of Newfoundland, Canada)

Seoraj, N. BSc (Hons) (Durban-Westville) Jul 04 - Dec 05 (registered at U. Durban-Westville)
Solms, L. BSc (Hons) (Pretoria) Jul 04 - Dec 05 (registered at U. Pretoria)
Tshiguvho, T. MSc (Cape Town) Jul 04 - Dec 05 (registered at U. Stellenbosch)
Van Alphen-Stahl, J. BSc (Hons) (Cape Town) Jul 04 - Dec 05 (registered at Botany, UCT)

BTech
Rode, S Jul 04 - Dec 05 (registered at Tshwane University of Technology)

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

Research Assistants
Angel, A. Mar 05 - Dec 05
Barendse, J. Jul 04 - Dec 04
Bragg, C. Aug 04 - Mar 05
Burle, M.S. Sep 05 - Dec 05
Delport, W. Apr 05 - Jul 05
De Bruyn, P. Feb 05 - Jul 05
Daniels, F. Nov 04 - Mar 05
Frauenknecht, B. Jul 04 - Dec 04
Herrmann, E. Jul 04 - Dec 05
Little, I.T. Jul 05 - Dec 05
Lordan, F. Jul 04 - Nov 04
Okes, N.C. Jul 05 - Dec 05
Rode, S.C. Feb 05 - Dec 05
Ross-Gillespie, A. Nov 04 - Feb 05
Roux, G. Jul 04 - Dec 04
Russo, I.M. Aug 04 - Dec 05
Savy, C. Jul 04 - Dec 04
Shepherd, P. Dec 04 – Jan 05

Support Staff

Principal Technical Officer
Tobler, C.J. Jul 04 - Dec 05*

Administrative Assistant
Buchanan, H.J. Jul 04 - Dec 05*

Senior Secretary, Centre of Excellence
Malamlela, N. Sep 05 - Dec 05

Library Staff
Sandwith, M. Jul 04 - Dec 05* (Librarian)
Dalgliesh, S. Jul 04 - Dec 05 (Volunteer)
Loubser, D. Jul 04 - Dec 05 (Volunteer)
Ntsham, N. Jul 04 - Dec 05 (Volunteer)

Departmental/Accounts Assistant
Mansfield, L.F. Jul 04 - Dec 05*

Webmaster
Stander, M. Jul 04 - Dec 05

* 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 Fitztitute.

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.

DEDICATION

This Annual Report is dedicated to Dr Richard Dean who retired in December 2005, for the significant contribution he has made to the Institute over the past two decades.

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 also serves as a Trustee to WWF-SA, as member of WWF-SA's Conservation Committee, as member of the Interim Research Committee of the NRF's National Zoological Gardens, as Vice-President of the Board of Governors of the Africa Section of the Society for Conservation Biology, and as Chairman of the NRF's Funding Panel for the Focus Area on 'Inland Ecosystems and Biodiversity'. He serves on the editorial board of the Southern African Journal of Wildlife Research. Morné co-convened a seven-week module for UCT Honours students on 'Birds as models of ecological theory' in the latter part of 2004. In 2005, he and his team members presented a Zoology Honours discussion group. He supervised three MSc students, one PhD student and worked with five post-doctoral researchers. 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 three presentations to membership-based societies. He reviewed numerous NRF proposals, as well as 14 applications for research grants and 19 manuscripts submitted to scientific journals. During the course of 2004, he produced a semi-popular book on bird behaviour (Penvere, Protea Boekhuis).

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
Mark Anderson (Northern Cape Nature Conservation)
Prof. Ben Burger (Laboratory for Ecological Chemistry, Univ. Stellenbosch)
Dr Claire Doutrelant (CNRS, France)
Dr Penn Lloyd, (PFIAO)
Prof. Gerard Malan (Tshwane Univ. of Technology, SA)
Dr Rob Simmons (PFIAO)
Prof. Joseph B. Williams, (Ohio State Univ., USA)
Dr Rita Covas (Edinburgh Univ., UK)
Dr Andrew Radford (Cambridge Univ., UK)
Dr Mandy Ridley (UCT)
Dr Lizanne Roxburgh (UCT)
Dr Andrew Taylor (UCT)
Adin Ross-Gillespie (PFIAO)
Eric Herrmann (PFIAO)
Michael Mills (PFIAO)
Sieglinde Rode (PFIAO & Tshwane Univ. Technology)
Doug Schaeffer (PFIAO & Univ California Berkeley)

A Sociable Weaver nest with the chambers tagged. Doug Shafer (Berkeley) has remapped all the existing colonies at Benfontein Game Farm and captured and ringed over 90% of the birds in the study area. Photo: Morné du Plessis.

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.

Sociable Weaver Project

The Sociable Weaver project at Benfontein Game Farm, Kimberley, remains a highly productive research study. 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 earlier work on this species. Doug Schaefer (Berkeley) worked at Benfontein for just three months, yet managed to develop a single consolidated sociable weaver database by merging three different earlier datasets. He also fully remapped all the existing colonies in the study area, and captured and ringed over 90% of the birds in the study area.

Ant-eating Chat Project

Eric Herrmann continued our work on Ant-eating Chats, a southern African endemic cooperative breeder, in order to allow deeper study into their social behaviour. To this end, he has since 2002 caught and individually colour-ringed a total of 96 adults and 273 nestlings 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.

Green Woodhoopoe Project

Field work continues on the Green Wood-Hoopoe project. The study now enters its 26th year and this large dataset enables us to continue analysing data on life-time reproductive success of woodhoopoes. Michael Mills, Eric Herrmann and Doug Schaefer spent four weeks doing maintenance capture and ringing of the study population in July, and Morné du Plessis did so for two weeks each in Oct 2004 and Sep 2005 respectively. Currently, the study population consists of 26 adjacent groups in the Morgan's Bay area in which virtually all individuals are colour-ringed with a unique combination.

In 2004/5 a record 11 out of 20 Ground Hornbill Groups in the APNR study site produced fledgings. Photo: Yuval Erlich.

Pied Babbler Project

The Pied Babbler Research Project was set up by Dr Amanda Ridley, who joined the Fitztitute in early 2005 as a post-doc, with the purpose of studying social interactions among group members and the causes and consequences of helping behaviour. There are currently 14 colour-ringed groups, with a further six peripheral groups that project members aim to incorporate into the main population over the next season. All groups have been habituated to allow close observation from a distance of approximately two to three metres without causing the birds any distress. The birds have also been trained to jump on and off a top-pan balance for a small food reward. This allows researchers to monitor daily weight changes, which can be used to measure the cost of help, chick development, and many other aspects of behaviour in this species. Each group is worked with at least once every three days, and consequently levels of habituation on the project continue to improve markedly. Mandy Ridley has also worked in collaboration with Dr Andy Radford, who looks at elements of vocal communication, and Nicola Raihani (PhD student) (see Full Report under Amanda Ridley in the Post-doctoral Fellow section).

Ground Hornbill Project

Our pilot study on the Ground Hornbill population in the Klaserie, Timbavati and Umbabat Nature Reserves along the Kruger National Park's western boundary continues. 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. Adin Ross-Gillespie worked in the APNR over the 2004/5 breeding season. Sieglinde Rode took over the field work responsibilities at the start of 2005. The 2004/5 season turned out to be by far the most productive breeding season of the past four years. In a study area that sustains at most 20 groups, there were 11 active nests in the APNR (9 in artificial nests), leading to the production of nine fledglings. Of these five immatures were still alive in Sep 2005, but by December 2005, only two immatures were confirmed to be alive.

Cape Penduline Tit Project

Our work on Cape Penduline Tits, at the Koeberg study site, continued at a relatively low level of intensity. This 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. Bernhard Frauenknecht performed the bulk of the field work in 2004, before he left to take up a job as a teacher at a local high school.

Eric Herrmann and Nenashe Ghebrealfr Kahsai holding a Common Scimitarbill. Recent work on the chemical composition of the uropygial gland secretions of these birds amounts to the most detailed chemical analysis ever done in this context. Photo: Morné du Plessis.

Chemical Defence Projects

In collaboration with Prof Ben Burger of Stellenbosch University, we have analysed the chemical composition of the uropygial gland secretions of Common Scimitarbills, in what amounts to the most detailed chemical analysis ever done in this context. We have continued with the preparation of manuscripts on our earlier work on the chemical defence mechanism of Green Woodhoopoes.

Highlights

- The publication of four high-profile multi-disciplinary papers on sociable weavers in: *Auk* (Covas *et al*. 2004), *Behavioural Ecology & Sociobiology* (Covas & du Plessis 2005; Doutrelant *et al*. 2004), and *Proceedings of the Royal Society (London)* (Covas *et al*. 2004)
- The publication of nine papers on woodhoopoe research in international peer-reviewed journals: *Animal Behaviour* (Radford 2005), *Auk* (Radford & du Plessis

2004a), *Behaviour* (Radford 2004a), *Behavioural Ecology & Sociobiology* (Radford 2004b; Radford 2004c), Ethology (Radford 2004d), *Ibis* (Simmons *et al.* 2005), *Journal of Avian Biology* (Radford & du Plessis 2004b), and *Journal of Chemical Ecology* (Burger et al. 2004)

- Review chapter of the role of physiological ecology in the evolution of cooperative breeding (Du Plessis 2004)
- 2004/5 as record Ground Hornbill breeding season in our APNR study site where 11 of 20 groups produced hatchlings, and nine of these fledged (all but one of these were reared in artificial nest logs put out over the previous three years)
- Publication of a semi-popular book on bird behaviour (du Plessis 2004).

Students

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

Nimmi Seoraj (MSc, UKZN Durban-Westville, co-supervisor Dr Gerhard Malan) '*Warning vocalisations and predator information transfer in social birds'*

Sieglinde Rode (BTech, Tshwane University of Technology) '*Understanding the role of vocalisations in territoriality of Ground Hornbills'*

Nenashe Ghebrealfr Kahsai (MSc, U Stellenbosch, co-supervisor Dr Ben Burger) '*Chemical analyses of Common Scimitarbill preen gland secretions'*

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

Visitor, Dr Ben Hatchwell (University of Sheffield,) holding an Ant-eating Chat. Photo: Morné du Plessis.

Research on sociable weavers has led to the publication of four high-profile multi-disciplinary papers on sociable weavers. Photo: Morné du Plessis.

Lectures

Prof. du Plessis taught part of a seven-week module to UCT Honours students on 'Birds as models of ecological theory' in the latter part of 2004. In 2005, he and his team members led a discussion group on 'Routes to cooperative breeding in birds' for UCT Honours students.

Visitors

Prof. Nick Davies (Cambridge University, UK)
Dr Ben Hatchwell (University of Sheffield, UK)
Dr Alan Kemp (formerly of Northern Flagship Institution, SA)
Prof. Tom Martin (University of Montana, USA)

Acknowledgements

De Beers Consolidated Mines Limited (Naseem Chohan, Morgan Hauptfleisch, Graham Main & Peter Gibbs) for the establishment of and access to the Benfontein Research Centre outside Kimberley; 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 & Errol Peterson); Dow Chemicals (Ross Maclean, & Doritha Erwee). Yuval Erlich provided much advice on the Ground Hornbill project.

Dr Penn Lloyd
is the Manager of the DST/NRF Centre of Excellence at the Percy FitzPatrick Institute. He coordinates a long-term project on avian life-history strategies at Koeberg Nature Reserve. He supervised the research projects of one MSc student and one Honours student, and worked with three post-doctoral researchers. During the review period, he authored or co-authored seven papers, and peer-reviewed 11 manuscripts for nine local and international journals. In July 2005, he took six Fitz postgraduates to attend the Zoological Society of Southern Africa conference in Grahamstown, and advertise the activities of the Centre to prospective students. In June 2005, Penn spent 10 days in north-eastern Kenya, advising a community-based conservation initiative that will use gamebird hunting to generate additional revenue streams (from hunting levies, employment opportunities and other tourism revenues) for pastoral communities in an arid region with limited development opportunities. Building on an earlier trip in 2004 that broadly assessed gamebird populations, he spent this trip more specifically assessing sandgrouse populations, training local game scouts to monitor the numbers and breeding activity of sandgrouse, and meeting with community leaders.

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 Penn Lloyd
Dr Peter Ryan

Research team
Dr Corine Eising (PFIAO)
Dr Andrew Jenkins (PFIAO)
Prof Tom Martin & co-workers (Montana Univ., USA)
Dr Andrew McKechnie (Witwatersrand Univ., SA)
Dr Rita Covas (Edinburgh Univ., UK)
Dr Lizanne Roxburgh (PFIAO)
Dr Andrew Taylor (PFIAO)

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
Koeberg Nature Reserve, on the West Coast north of Cape Town, is the site of a long-term research programme examining the life history strategies of a community of southern hemisphere bird species. The study was initiated in 2000 by Tom Martin (University of Montana, USA), to complement similar studies at other sites in South America, North America and New Zealand for an examination of how the life history strategies of birds are adapted to global variation in environmental selection pressures. Penn Lloyd has co-ordinated field research at the site since 2002, and 2005 was the first year in which research on the study site was run entirely by the Fitztitute.

A group of volunteer bird ringers from the Tygerberg Bird Club continued to give their expert help with the annual colour-ringing of birds during the winter months on the 2 km^2 study site, where nearly 2,000 adults of 20 species have now been ringed with individually unique colour-ring combinations. During the 2005 breeding season, Penn Lloyd and Andrew Taylor examined the behavioural ecology of cooperative

breeding in the Karoo Robin, comparing the breeding performance and success of Karoo Robin pairs with and without helpers. This involved a concerted effort to colour-ring nearly all the birds on some 80 territories within the study area, including nearly 30 recruits first ringed as nestlings in previous years. Helpers (usually male offspring from a previous breeding season) were found to make a significant contribution to helping to feed the young chicks. As a result, pairs with helpers manage to raise young that grow faster, are heavier at fledging, are at much lower risk of starvation during the nestling period, and which have greater survival prospects during the first three weeks after leaving the nest. Over 600 blood samples have now been collected from adults and broods of chicks, for future studies that will examine: (1) levels of extra-pair paternity in Karoo Robins, particularly co-operative groups; (2) whether Karoo Robins manipulate the gender of their broods in relation to laying order and breeding group size; pairs without helpers are expected to lay more male eggs, especially among first-laid eggs (chicks from first-laid eggs have a higher chance of survival than those from last-laid eggs), to attempt to secure helpers for the next breeding season; and (3) the effects of strong natal philopatry on fine-scale population genetic structure and its implications for the behavioural ecology of the Karoo Robin. Andrew Taylor also collected blood samples from nestlings of all species for a study comparing immune system development across species to test the hypothesis that longer incubation enhances immunocompetence. Penn Lloyd continued field monitoring of annual fecundity and adult and post-fledging survival across species for a broad examination of the influence of age-specific survival prospects on life-history strategies.

Corine Eising started a new project examining how breeding females adjust their investment in eggs (clutch size, egg size, and hormone and carotenoid concentrations in eggs) according to the quality of their male partners, as measured by plumage characteristics and their food delivery rates to the nest. Females paired to higher quality males are expected to invest more in their eggs. She focussed these questions on Bar-throated Apalis, where males differ in the thickness of a black breast-band, and Lesser Double-collared Sunbird, where males differ in plumage colour brightness. Rita Covas spent a third field season completing a project to test the hypothesis that female investment in incubation varies with life-history, with shorter-lived species expected to invest more in incubation than longer-lived species.

Conservation Biology: Disturbance impacts on White-fronted Plover breeding success

The White-fronted Plover breeds during the summer months on sandy beaches of the southern African coastline, where increasing coastal development and recreational use of beaches is expected to impact on breeding success, through disturbance effects on nesting behaviours and direct mortality of nests and chicks. For her CB research project, Tammy

Male offspring of Karoo Robins often delay dispersal to help their parents raise young in later years resulting in higher quality young that have a survival advantage. Photo: Anna Chalfoun.

Baudains compared breeding success and disturbance effects on breeding behaviours between White-fronted Plovers breeding on beaches adjoining the suburb of Kommetjie (with extensive recreational use) with plovers breeding in a protected area in the Cape Point section of Table Mountain National Park. She found that disturbance effects on incubation attentiveness and egg temperatures were ameliorated by the habituation of birds to repeated human disturbance. Also, nest mortality was lower on disturbed beaches, because of fewer natural nest predators, but mortality rates of chicks before they can fly are much greater on disturbed beaches (where dogs are walked) than in the protected area. Because chick survival is more important for breeding productivity than nest survival, plovers breeding on disturbed beaches produce far fewer young than plovers breeding in the protected area. These results will help inform management of recreational activities on beaches, particularly the walking of dogs on beaches.

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 and the banning of off-road vehicles from South African beaches) 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.

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. Our models have now evolved to the point where we can accurately predict the long-term demographic consequences of stochastic events such as poisoning by Harmful Algal Blooms and mass mortalities resulting from disease, especially avian cholera.

Rarity and extinction risk

Birds are perhaps the best-studied group of vertebrates world-wide; the breadth of this knowledge may explain why ca 12% of 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 PFIAO 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 *Heteromirafra 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), shrubland (Black Harrier *Circus maurus* (Curtis *et al*. 2005, Curtis 2005), 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. Black Harriers are impacted by fragmentation of natural shrublands on which they depend both for breeding and for foraging. 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 human persecution of large predatory birds, e.g. 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 PFIAO 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). Based on an understanding of the demographics of non-breeding 'floater' rails, we were also able to predict a) the consequences of establishment of an

alien cat population, and b) the number of birds available annually for translocations to other islands within the species' former range (Hockey & Wanless, in prep.). Similarly, conservation measures put in place for African Black Oystercatchers, stemming from identification of the key population bottleneck (the small chick stage) have been partly responsible for an increase in population size of some 45% over the past 25 years.

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, continued development of this expertise will become ever more essential. We have already started this development by addressing problems associated with highly dispersed and/or rare taxa (e.g. Southern Ground-Hornbill *Bucorvus leadbeateri* in South Africa (Spear 2005), papyrus swamp endemics in Kenya (Ochieng 2005), Chaplin's Barbets *Lybius chaplini* in Zambia (see Roxburgh's postdoc report) and Northern Bobwhite Quails *Colinus virginianus* in Florida (Little 2005).

Highlights

- Several peer-reviewed papers were published in international journals, including those on Black Harriers in *Bird Conservation International* (Curtis *et al*. 2004), endemic birds of Gough Island in *Biological Conservation* (Cuthbert & Hilton 2004), and Tawny Eagles in *Ostrich* (Wichmann *et al*. 2004).
- Odette Curtis completed her study of the contrasting effects of habitat fragmentation on two near-sympatric species of raptors, Black Harrier *Circus maurus* and Black Sparrowhawk *Accipiter melanoleucus*. In the case of the former the impacts of habitat (particularly Renosterveld) fragmentation are severe because the birds both forage and breed almost exclusively within patches of natural habitat. The latter species, by contrast, benefits from a certain degree of habitat fragmentation because it breeds in small habitat patches (in this case pine plantations) but forages in the surrounding urban matrix. This study has led to a novel means of making rapid assessment of bird species' vulnerability to habitat fragmentation based on a simple assessment of a small suite of life-history traits.
- Dian Spear's mini-thesis contributed substantially to a Population and Habitat Viability Analysis Workshop that was held by the broader conservation community with an interest in Ground Hornbill conservation.

Students

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

Odette Curtis (MSc, Degree awarded with distinction, December 2005); *Responses of raptors to habitat fragmentation: from individual responses to population susceptibility'*

Anu Rao (MSc, registered at Memorial University of Newfoundland; thesis submitted December 2005); '*Movements and conservation of juvenile African Black Oystercatchers* Haematopus moquini'

Tammy Baudains (CB MSc); '*The effects of human disturbance on the nesting behaviour and breeding success of White-fronted Plovers'*

*Alfred Owino (*CB MSc*); 'Papyrus swamp habitat loss and degradation: Impacts on endemic birds in Kenya'*

Dian Spear (CB MSc*); 'Dealing with population viability analysis of species with complex social systems: the case of the Ground Hornbill in South Africa'*

Kylie Coupar (BSc Hons, degree awarded December 2005) *An investigation into life-history trade-offs between clutch size, and egg size '*

Philip Haupt (BSc Hons, degree awarded December 2005); '*The population size and conservation status of the African Black Oystercatcher: a re-evaluation'*

Dale Wright (BSc Hons, degree awarded December 2004); '*Post-fledging dispersal of facultatively cooperative- breeding Karoo Robin'*

Lectures

Profs du Plessis and Hockey, and Drs Lloyd and Ryan taught part of a seven-week module to UCT Honours students on 'Birds as models of ecological theory' in the latter part of 2004. In 2005, The team members led a discussion group on 'Routes to cooperative breeding in birds' for UCT Honours students. Dr Lloyd organises the weekly research Discussion Group meetings involving postgraduate students and staff.

In addition, the team collectively gave many lectures to bird clubs, natural history societies and other NGO's throughout the reporting period. Phil Hockey and Penn Lloyd travelled with six Fitz students to attend the Zoological Society of Southern Africa conference in Grahamstown in July 2005, with six members of the group presenting papers. A poster stand with pamphlets was also set on the activities of the DST/NRF Centre of Excellence at the Percy FitzPatrick Institute.

Acknowledgements

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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 review period has taken most of his time) and a co-author of the best-selling Sasol Birds of Southern Africa, the larger edition of which was republished in second edition in 2005. In the period under review, he supervised the work of two PhD students, five MSc students and one honours student. He also helped organise and teach an Ornithology module to the Zoology Honours students. He authored or co-authored two books, one book chapter and four semi-popular articles, 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
Currently in abeyance. The major project to be tackled during the review period (the relative roles of history and ecology in determining movement patterns of African birds – see below) has come to a temporary halt following the untimely death of the PhD student tackling this work (Kirsten Louw).

In the Old World, insectivorous species, such as this Banded Martin, make up the bulk of migratory species. Photo: Peter Ryan.

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 published in 2005 (John Hopkins University 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). Three papers are currently in preparation stemming from this work.

Locally, we have continued studies of movement patterns of juvenile African Black Oystercatchers.

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 ready to assess 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 medium-distance 'diffusion dispersers', as have been identified along the Cape south coast (Hockey *et al.* 2003).
- Data collected by 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 and the fact that densities of juvenile birds do not decrease uniformly with increasing distance from the breeding grounds.
- During 2006, we plan (in conjunction with Prof. Paulette Bloomer at the University of Pretoria) to use our extensive collection of oystercatcher blood samples to a) determine whether patterns of gene flow conform to patterns of movement observed in the field, b) reassess the evidence for geographically biased sex ratios at birth.

Juvenile African Back Oystercatchers exhibit an interesting duality in post-fledging dispersal, with some migrating north of the species' usual range, whereas others travel shorter distances and co-occur with adult birds. Photo: Peter Ryan.

Students

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

†*Kirsten Louw* (PhD); '*Patterns and ecological correlates of migratory behaviour in African birds*'. Deceased 2005

Anu Rao (MSc, registered at Memorial University of Newfoundland; thesis submitted December 2005); '*Movements and conservation of juvenile African Black Oystercatchers* 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 and Namakwa Sands (through WWF-SA).

Prof. Tim Crowe *is the past president of the Southern African Society for Systematic Biology, and an Elected Fellow and past member of the council of the Willi Hennig Society of Systematic Biology. He is a member of the International Ornithological Congress Committee, the Steering Committee of the South African Biosystematics Initiative (of which he is the immediate past 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 acted as external examiner for the MSc Programme in Mammalogy at the University of Pretoria.*

Tim is deputy leader of the Fitztitute'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, three MSc and three PhD students. He taught modules to two undergraduate classes and three additional MSc classes in the Zoology and Botany Departments. He was author or co-author o ten scientific papers. He attended and presented oral papers at one international meeting and one local conference and gave talks to three membership-based societies. He refereed 14 scientific papers for eight different journals and reviewed one application for a research grant and assessed one local researcher for personal scientific evaluation for the National Research Foundation.

Prof. Tim Crowe*, together with* ***Dr Peter Ryan****, also leads the* ***Systematics & Biogeography Research Programme.***

Gamebird Research

Programme leader
Prof. Tim Crowe

Research team
Assoc. Prof. John Carroll (University of Georgia)
Assoc. Prof. Brian Reilly (Department of Nature Conservation, Tswane University of Technology)
Dr Raymond Jansen (Department of Environmental Sciences, Tswane University of Technology)

MSc student Ian Little discovered that active under-storey vegetation management through burning and mechanical disturbance plays an important role in sustaining high Bobwhite abundances regardless of timber density. Photo: Tim Crowe.

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.

The period under review saw the completion of outstanding projects on: the use of predator control in fostering populations of Greywing Francolins; the effects of hybridization between wild and domesticated Helmeted Guineafowl; the relationship between rainfall and breeding in Swainson's spurfowl; and the effectiveness of measurements of overall size (= body mass), helmet and wattle size and the development of cartilaginous structures on the cere as predictors of the sex of adult guineafowl.

It was found that predator control had no significant positive effects on Greywing populations during years of average or above average rainfall. So, it was not

recommended as a management strategy. Rainfall was also found to be a positive proximal stimulus to breeding in Swainson's Spurfowl. Hybridization between wild and domestic guineafowl was found to be a potential threat (due to poor breeding success of hybridizing birds and lower fitness of hybrid offspring) and it was recommended that birds with any trace of domestic characteristics be removed from the wild. Finally, it was found that, although the various anatomical features assessed for guineafowl could discriminate between putatively old adult males and females and young males, they could not discriminate between young males and females.

The only new research was Ian Little' MSc project on the Northern Bobwhite Quail (*Colinus virginianus*). This American gamebird is an early successional species often found in fire maintained pine ecosystems. The southeastern United States was historically a Longleaf Pine (*Pinus palustris*) grassland savannah ecosystem, beneficial to Bobwhites. Shifts in recent decades to intensive Loblolly (*P. taeda*) and Shortleaf Pine (*P. echinata*) production, and conversion of land to intensive agriculture have led to extensive declines in Bobwhite abundance. He used timber density measurements and early morning covey call counts over 3 years (2002-2004) to assess the influence of timber density on Bobwhite abundance. Under-storey vegetation cover, height and species richness and abundance were investigated to address the causes of the resulting trend. Bobwhite abundance was negatively correlated with timber density (r = -0.4649, P = 0.0001), most pronounced from 4.62m^2/ha to 9.08m^2/ha. Decrease in abundance is probably due to gradual loss, from shading, of important ground vegetation with increased timber density and complete loss of Bobwhites at >21m^2/ha could be explained by complete loss of under-storey vegetation. Longleaf Pines (*P. palustris*) sustain higher populations of Bobwhites, at higher timber densities, than other pine species. This is likely a function of longleaf pine growth forms allowing more sunlight to the ground. Functionally, active under-storey vegetation management through burning and mechanical disturbance plays an important role in sustaining high Bobwhite abundances regardless of timber density.

Highlights

- One paper emanating from Ms Prinsloo's dissertation and one from Ian Little's honours project were published.
- Ian Little completed his studies in the Fitztitute's Masters Programme in Conservation Biology and received the Joosub Award for top student overall.

Students

Ian Little (CB MSc) *Does timber density influence the abundance of northern bobwhite quails* colinus virginianus?

Lectures

Tim Crowe gave two talks to gamebird-hunting organizations outlining past and current research results. He also completed the final management documents on the Riemland Gamebird

Project. Tim Crowe is developing a new research project with Dr Raymond Jansen, Tswane University of Technology on the effects of landscape transformation by humans on the conservation of birds. This will form the basis of Ian Little's PhD research, scheduled to start in 2006.

Cape Francolin. One of the primary practical aims of this research programme is to provide guidelines for maintaining biologically sustainable and economically viable populations for key gamebird species. Photo: Melissa Stander.

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, WWF South Africa), students, wingshooters (in particular Messrs Roger Johnson and Peter Wales) and farmers for making this Programme possible.

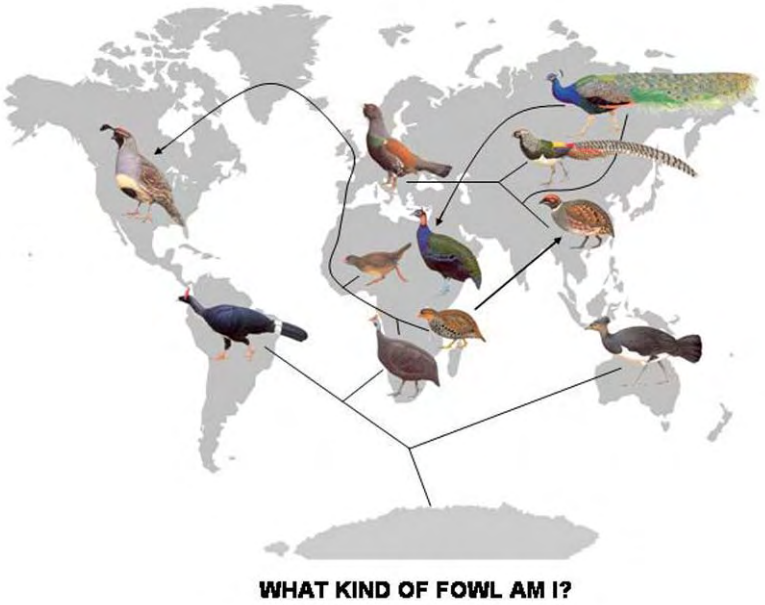
Prof. Tim Crowe
also leads the ***Gamebird Research Programme.***

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 John Bates (Field Museum of Natural History)
Drs George Barrowclough and Jeff Groth (American Museum of Natural History, New York, USA)
Dr Pamela Beresford (Stockton College, New Jersey, USA)
Dr. Michael Double (Division of Botany and Zoology, Australian National University)
Assoc. Prof. Paulette Bloomer (Department of Genetics, University of Pretoria)
Dr Rauri Bowie (Department of Botany & Zoology, 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)
Prof. Terry Hedderson (UCT, Department of Botany)
Drs Mari Källersjö and Steve Farris (Swedish Museum of Natural History, Stockholm)
Tshifhiwa Mandiwana (Northern Flagship Institution, Transvaal Museum)
Tshifhiwa Nangammbi (Natal Museum)
Dr Colleen O'Ryan (UCT, Department of Molecular and Cell Biology)
Asst Prof. Bret Payseur (Department of Medical Genetics, University of Wisconsin)
Dr Sergio Pereira (Department of Natural History, Royal Ontario Museum, Toronto)
Dr Ettore Randi (Istituto Nazionale per la Fauna Selvatica, Laboratorio di Genetica, Ozzano Emilia
Prof. Mike Sorenson (Boston University)
Dr Gary Voelker, (University of Memphis)



An evolutionary tree for the gamebirds (Aves: Galliformes) showing phylogenetic and biogeographical relationships. We thank Lynx Edicions, publishers of del Hoyo, J., Elliott, A. & Sargatal, J. eds. (1994). Handbook of the Birds of the World. Vol. 2. New World Vultures to Guineafowl. Barcelona, for permission to use the illustrations of gamebirds.

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) or 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 publication of the paper (discussed in detail in last year's report) by postdoctoral student Pamela Beresford, Keith Barker, Peter Ryan and Tim Crowe, on the phylogenetic relationships of 10 African endemic passerines of uncertain taxonomic affinities in the Proceedings of the Royal Society B. The cherry on the top was that the editor chose to use Peter's photo of the Grassbird (also from last year's report) as the cover illustration.

Following along this theme, Tim, Rauri Bowie, Paulette Bloomer, Terry Hedderson, Ettore Randi, Tshifhiwa Mandiwana and Sergio Pereira completed an even more ambitious study of the phylogenetics, biogeography and classification of, and character evolution in, gamebirds (Aves: Galliformes), exploring the effects of character exclusion, data partitioning and missing data. One-hundred and fifty-eight species, representing all suprageneric galliform taxa and 65 genera, were investigated using 102 morpho-behavioural (M/B) attributes and 4452 nucleic acid base pairs from mitochondrial cytochrome *b* (CYT *B*), NADH dehydrogenase subunit 2 (ND2), 12S ribosomal DNA (12S) and control region (CR), and nuclear ovomucoid intron G (OVO-G). Analysis of the combined character data set yielded a single, completely resolved cladogram that had the highest levels of jackknife support, which suggests a need for a revised classification for the phasianine galliforms. Adding 102 M/B characters to the combined CYT *B* and ND2 partitions (2184 characters) decisively overturns the topology suggested by analysis of the two mtDNA partitions alone, refuting the view that M/B characters should be excluded from phylogenetic analyses because of their relatively small number and putative character state ambiguity. Exclusion of the OVO-G partition (with >70% missing data) from the combined data set had no effect on cladistic structure, but slightly lowered jackknife support at several nodes. Exclusion of third positions of codons in an analysis of a CYT *B* + ND2 partition resulted in a massive loss of resolution and support, and even failed to recover the monophyly of the Galliformes with jackknife support. A combined analysis of putatively less informative, 'non-coding' characters (CYT *B*/ND2 third position sites + CR + 12S + OVO-G sequences) yielded a highly resolved consensus cladogram congruent with the combined-evidence cladogram. Traditionally recognized suprageneric galliform taxa emerging in the combined cladogram are: the families Megapodiidae (megapodes), Cracidae (cracids), Numididae (guineafowls), Odontophoridae (New World quails) and Phasianidae (pheasants, pavonines, partridges, quails, francolins, spurfowls and grouse) and the subfamilies Cracinae (curassows, chachalacas and the horned guan), Penelopinae (remaining guans), Pavoninae *sensu lato* (peafowls, peacock pheasants and argus pheasants), Tetraoninae (grouse) and Phasianinae (pheasants minus *Gallus*). The monophyly of some traditional groupings (e.g. the Perdicinae: partridges/quails/ francolins) is rejected decisively, contrasted by the emergence of other unexpected groupings. The most remarkable phylogenetic results are the placement of endemic African galliforms as sisters to geographically far-distant taxa in Asia and the Americas.

Blackbellied Korhaan. Callan Cohen is examining the evolution of the bustards including the evolution of display within these birds. Photo: Anna Chalfoun.

Biogeographically, the combined-data cladogram supports the hypothesis that basal lineages of galliforms diverged prior to the Cretaceous/Tertiary (K-T) Event and that the subsequent cladogenesis was influenced by the break-up of Gondwana. The evolution of gamebirds in Africa, Asia and the Americas has a far more complicated historical biogeography than suggested to date. With regard to character evolution: spurs appear to have evolved at least twice within the Galliformes; a relatively large number of tail feathers (>= 14) at least three times; polygyny at least twice; and sexual dimorphism many times. A massive (70+ page) manuscript summarizing the results of this research is currently in press with *Cladistics*.

Moving to a much finer evolutionary scale Rauri, John Bates, Jon Fjeldså, Shannon Hackett and Tim completed a study of within-species genetic variation within the Starred Robin *Pogonocichla stellata*. Although many studies have

documented the effect of glaciation on the evolutionary history of Northern Hemisphere flora and fauna, this study is the first to investigate how the indirect aridification of Africa caused by global cooling in response to glacial cycles at higher latitudes has influenced the evolutionary history of an African montane bird. Mitochondrial DNA sequences from the NADH 3 gene were collected from 283 individual Starred Robins. At least two major vicariant events, one that separated the Albertine Rift from all but the Kenyan Highlands around 1.3–1.2 Myrs BP, and another that separated the Kenyan Highlands from the northern Eastern Arc, and the northern Eastern Arc from the south-central Eastern Arc between 0.9 and 0.8 Myrs BP appear to underlie much of the observed genetic diversity and structure within Starred Robin populations. These dates of divergence suggest a lack of recurrent gene flow; although the Albertine Rift and south-central Eastern Arc share haplotypes, based on coalescent analyses this can confidently be accounted for by ancestral polymorphism as opposed to recurrent gene flow. Taken collectively, strong evidence exists for recognition of four major ancestral populations: (1) Kenyan Highlands (subspecies *keniensis*), (2) Albertine Rift (*ruwenzori*), (3) northern Eastern Arc (*helleri*), and (4) south-central Eastern Arc, Ufipa and the Malawi Rift (*orientalis*). The estimated divergence times cluster remarkably around one of the three estimated peaks of aridification in Africa during the Plio-Pleistocene centred on 1 Myrs BP. Further, time to most recent common ancestor (TMRCA) estimates (1.7–1.6 Myrs BP) of gene divergence between the Albertine Rift and the other montane highlands corresponds closely with a second estimated peak of aridification at about 1.7 Myrs BP. Collectively, these results suggest that aridification of Africa in response to glaciation at higher latitudes during the Pleistocene has had a profound influence on montane speciation in east and central Africa. A manuscript summarizing the results of this research is currently in press with Molecular Phylogenetics and Evolution.

At a more applied level, PhD student Mareile Techow has made good progress with a phylogeographic study of giant petrels *Macronectes* and selected *Procellaria* petrels. Both genera are frequently killed on long-lines and are protected under the Agreement on the Conservation of Albatrosses and Petrels. The initial aim of the study was to assess whether there was sufficient genetic structure among sub-populations to assess the origins of birds killed in different fisheries. Mareile's data confirmed that the Spectacled Petrel *P. conspicillata* is quite distinct from the widespread White-chinned Petrel *P. aequinoctialis*. She also found some regional structure within White-chinned Petrels, but the major division was between New Zealand and other populations. The greatest genetic diversity and the basal genotypes are all found in New Zealand birds, whereas there is little structure among other populations in the Atlantic and Indian Ocean sectors of the Southern Ocean. This suggests that White-chinned Petrels evolved around New Zealand, which is the centre of *Procellaria* diversity. Honours student Niki le Roux used microsatellites to assess genetic variability among Spectacled Petrels to compare with allelic diversity in birds caught at sea off Brazil. We are still awaiting results from the Brazil study (their draconian laws to protect against bioprospecting prevent any samples being sent from Brazil!). However, she found a surprising level of diversity within the Spectacled Petrels, with two major groupings more or less geographically segregated on Inaccessible Island. This may result from the population recovering from several remnant populations following its near extinction at the end of the 19th century when feral pigs roamed the island.

Keith Barnes' long-running PhD on lark systematics was given a much needed boost by involving Keith Barker to explore the relationships between genera using the conserved nuclear gene RAG-1. Keith has already resolved much of the species-level diversity within lark genera by sequencing mitochondrial genes (cytochrome b and 12S ribosomal DNA), but there was little power to infer deeper relationships. The RAG-1 data confirm the higher-level results obtained by Keith, but also resolved some outstanding oddities in his data. Keith now has a robust phylogeny including almost all lark genera (only *Pinarocorys* and *Chersophilus* are missing). He will complete his

PhD in early 2006.

With plans afoot to tackle the relationships among one of Africa's largest genera, *Cisticola*, Peter Ryan accepted a request from the editors of the prestigious Handbook of the Birds of the World to write the family account and most of the species accounts for the Cisticolidae. This ended up being a mammoth task, running to over 120000 words and citing more than 600 references, but it will provide a valuable starting point for the planned research into this fascinating radiation of African warblers.

Whitechinned Petrel Procellaria aequinoctialis. PhD student Mareile Techow is examining the phylogeography of the Procellaria and Macronectes petrels. Photo: Peter Ryan.

Highlights

- Tshifhiwa Mandiwana was offered a post as lecturer in UCT's Department of Botany which she will take up in January 2006.
- Terry Hedderson was promoted *ad hominem* to professor.
- In July, Tim Crowe attended the annual meeting of the Willi Hennig International Society of Systematic Biology in Fagernes, Norway and presented an oral paper summarizing the results of the research on galliform evolution mentioned above.
- In September, Tim, Tshifhiwa, Rauri, Shannon and Ettore participated in a workshop on the DNA bar-coding of birds at Harvard University.
- During several collecting trips conducted between September and December Ian Little and Graeme Oatley collected many of the specimens necessary for research to be conducted over the next three years.
- Jonathan van Alphen-Stahl completed his MSc studies and graduated in December.

Students

Wayne Delport (Postdoctoral, supervisor Prof. Paulette Bloomer)*; 'Phylogeography of Namaqua Sandgrouse'*

Ulf Johansson (Postdoctoral, supervisor Dr Rauri Bowie)*; 'Systematics, biogeography and evolution of life history traits in African Warblers'*

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); *'Taxonomy, phylogenetics and biogeography of francolins and spurfowls'*

Mareile Techow (PhD, co-supervisor Dr Colleen O'Ryan); *'The phylogeography of* Procellaria *and* Macronectes *petrels'*

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

Graeme Oatley (MSc, co-supervisor Dr Rauri Bowie); *'Exploring species boundaries within the Cape White-eye* Zosterops virens *and Orange River White-eye* Z. pallidus *complex using organismal and molecular evidence'*

Potiphar Kaliba (CB MSc, co-supervisor Dr Rauri Bowie); *'Faunal turnover between east and southern African birds and small mammals: is Malawi the geographical break?'*

Terence Suinyuy (CB MSc, co-supervisor Dr Rauri Bowie); *'Taxonomic status and phylogenetic relationships of some Cameroon phasianoid birds'*

Niki le Roux (Bsc Hons, co-supervisor Dr Colleen O'Ryan); *'Genetic diversity among Spectacled Petrels'*

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Dr Peter Ryan
is on the Editorial Board of Bird Conservation International and Ostrich, and is a member of the IMAF Working Group of CCAMLR and the IUCN World Commission on Protected Areas. 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 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 one CB MSc project, and five PhD and three MSc students. He authored or co-authored 8 scientific papers, 1 book, a chapter on pelagic predators for a review of the biology of the Prince Edward Islands, the section on Cisticolidae for the Handbook of the Birds of the World, and five popular articles. He gave several talks to bird clubs and other special interest groups. In addition to his editorial duties for Ostrich and Bird Conservation International, Peter reviewed 14 manuscripts submitted to 8 scientific journals.

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 Richard Cuthbert (Royal Society for the Protection of Birds, UK)
Dr Rob Crawford (Marine and Coastal Management)
Dr John Croxall (British Antarctic Survey, Cambridge, UK)
John Cooper (Avian Demography Unit, UCT)
Dr David Grémillet (CNRS, Strasbourg, France)
Dr Geoff Hilton (Royal Society for the Protection of Birds, UK)
Akiko Kato (National Institute of Polar Research, Japan)
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)
Dr Marienne de Villiers (Avian Demography Unit, UCT)

A Spectacled Petrel outside its burrow on Inaccessible Island. The 2004 survey suggests the species is doing much better than was feared, and can be down-listed from Critically Endangered to Vulnerable. Photo: Peter Ryan.

Overview
As a group, seabirds are among the most threatened birds in the world, with almost a third of all species listed in the global red list for birds. Seabirds also dominate the list of globally threatened species at a regional level in southern Africa. They are vulnerable to human activities both at sea and at their breeding sites. Consequently, the seabird research programme has a strong applied focus, assessing the magnitude of threats faced by various seabird species, and attempting to provide practical management solutions to mitigate against these threats. However, because many seabirds are easily observed and caught at their breeding colonies, they also provide excellent models for testing ecological and evolutionary theories. The programme thus includes several studies of a more academic nature.

One major thrust is investigating the foraging ecology of seabirds. This field continues to see significant progress thanks to the development of an ever more sophisticated logging devices that can record aspects of a bird's behaviour while at

sea. Work on the foraging ecology of Cape Gannets initiated by a joint NRF-CNRS grant in 2001/02 continues to prove productive, with the highlight being Sue Lewis's paper on the relationship between individual foraging performance and colony growth rates being accepted by Oecologia. David Grémillet returned in early 2005 to deploy geolocator and heart-rate loggers on adult gannets to collect data over the non-breeding season. The leg-mounted geolocators use day length and the time of sunrise and sunset to estimate position to approximately 200 km (except around the equinoxes, when latitudinal accuracy deteriorates). Six of seven devices deployed on birds at Malgas Island were recovered at the colony by PhD student Lorien Pichegru towards the end of 2005. Data are still being analysed, but it appears that most birds remained in South African waters, not moving up the west coast towards the Gulf of Guinea. The heart-rate loggers had to be implanted into the birds' body cavities, with electrodes placed around the heart. This delicate procedure required the services of a specialist veterinary surgeon, and Gregoire Kuntz came out to insert and later recover the devices. It is a testament to Greg's surgical skills that the only mishap was the loss of an oxygen bottle when the ladder on the jetty at Malgas was knocked into the sea by the boat collecting the team from the island! The data from the loggers will be combined with information collected during the breeding season to construct a bio-energetic model for the Cape Gannet population.

Lorien Pichegru had a useful field season in 2005, tracking foraging trips of breeding gannets using GPS loggers at both Malgas and Bird Island, Algoa Bay. This as the first tracking of gannets from Algoa Bay, and the fifth successive season at Malgas Island. Tracking studies at both colonies were timed to coincide with the acoustic survey of pelagic fish stocks by Marine and Coastal Management (MCM). Lorien also monitored the growth rate of gannet chicks using artificial nests that weigh the chicks at regular intervals, thus obtaining real-time information on parental investment and chick growth, which can be related to the feeding conditions around the islands, as revealed by the tracking data. In 2005, the MCM survey found virtually no pelagic fish off the west coast, and much of the food fed to chicks was offal and discards from the hake trawl fishery. While on Malgas, Lorien was also able to deploy dive depth and accelerometer recorders onto Cape and Crowned Cormorants. These devices, kindly provided by Akiko Kato and Yan Ropert-Coudert, allow reconstruction of the foraging dives of seabirds in great detail. The Cape Cormorants appeared to make a mix of benthic and pelagic dives, reaching maximum depths of 25-34 m, although their mean dive depths were only 7-17 m. Crowned Cormorants, which are thought to be mainly shallow water foragers, exploited a much greater depth range than previously thought, with one bird diving up to 18 m. Interestingly, there was little difference in dive durations, with both species diving on average 20-30 seconds, and maximum dives lasting only 50-70 seconds. The Crowned Cormorant is the smallest cormorant yet to be studied using this approach, and our findings suggest that previous direct observations of feeding birds have underestimated its diving ability.

David Grémillet and PhD student Lorien Pichegru sampling an adult Cape Gannet at Lambert's Bay. Photo: Peter Ryan.

We also tracked non-breeding albatrosses on their foraging grounds off the coast of South Africa. Thanks to a donation from the French BirdLife partner LPO, PhD student Samantha Petersen was able to purchase eight satellite transmitters, deploying four each on immature Shy and Black-browed Albatrosses in late winter 2005. Shy Albatrosses remained tied to areas where fishing activity is concentrated along the shelf edge, whereas the Black-browed Albatrosses made excursions into oceanic waters, with one crossing the Atlantic to forage off Argentina, and others visiting the Subtropical Front and Walvis Ridge. However, both species spent most time in areas of high fishing activity along the shelf break, where they are susceptible to potentially lethal interactions with trawlers and long-liners. Sam is now comparing the positions of albatrosses with those of fishing vessels obtained from MCM to assess how important vessels are in determining the distributions of these seabirds. Such data are crucial for planning sensible conservation management of offshore resources, especially if one of the management options is to create open ocean marine protected areas.

To round out the logging data, we continue to deploy GLS loggers on seabirds breeding at sub-Antarctic colonies to assess their foraging ranges during their non-breeding seasons. These data are essential to identify key foraging areas and thus areas of overlap with potentially dangerous fisheries. During the period under review, devices have been deployed on all three albatross species breeding on Gough Island, and we eagerly await their return. Data from Wandering and Grey-headed Albatrosses at Marion Island indicates that most Grey-headed Albatrosses circumnavigate the Southern Ocean during their sabbatical year, but some do not, including one bird that attempted to breed in its year off. Conversely, although most Wandering Albatrosses remain within the Indian Ocean and eastern South Atlantic, a few elected to travel around the world. These differences stimulated speculation about the role of non-breeding dispersal on breeding frequency in these species. MSc student Zach Vincent is analysing the long-term breeding histories of Wandering Albatrosses studied continuously since the early 1980s at Marion Island. Together with Peter Ryan, he was invited to attend the second meeting of the albatross demography working group, arranged by Hal Caswell in May 2005. This proved extremely worthwhile, as we were able to use multi-state mark-recapture models to estimate breeding and survival probabilities for our study populations of Wandering, Grey-headed and Atlantic Yellow-nosed Albatrosses. It was soon apparent that Grey-headed Albatrosses on Marion Island do things a little differently from those breeding at South Georgia. More than 5% of birds attempt to breed in the year after a successful breeding attempt, whereas only 1% attempt this at South Georgia. Although annual breeding appears to increase the risk of adult mortality, with two annual breeders found dead in the colony, at least some birds greatly enhanced their reproductive output. One male raised five chicks in five successive years, four with the same partner and one with another bird. The higher proportion of annual breeding at Marion Island suggests that conditions are more favourable, which is supported by higher average breeding success and shorter lags following both successful and failed breeding attempts at Marion. Factors favouring reproduction at Marion include reduced intra-specific competition (given the much smaller breeding population) and/or more predictable food supply (linked to meso-scale eddies associated with the Indian Ocean Ridge). Contrary to life history theory, there was no evidence that older birds were more likely to attempt annual breeding because of declining reproductive value. Zach is currently working on the much larger set of Wandering Albatross data to estimate both average population performance as well as to assess individual level variation in breeding success. He has already discovered that some pairs of Wandering Albatrosses also manage to raise chicks in successive years, despite being characterised in the literature as obligate biennial breeders.

At a more applied level, there has been a lot of conservation-related research conducted during the last 18 months. Peter Ryan was fortunate to return to Inaccessible Island in November 2004 to census the population of Spectacled Petrels. This species, which only breeds at Inaccessible, is listed as Critically Endangered, and has been touted to be one of the first species likely to go extinct as a result of long-line fishing. In the late 1990s, around 700 birds were estimated to be killed on long-lines off Brazil each year, with more birds killed in international waters. With a population estimated as only 1000 pairs in the early 1980s, this level of mortality appeared to be unsustainable. However, a careful census in 1999 revealed the situation was less gloomy, with the population closer to 4000 pairs, but it was unclear whether this was due to population growth or simply an improved census technique. When we revisited Inaccessible five years later, the answer was clear – numbers of Spectacled Petrels are increasing despite high levels of long-line mortality. By conducting the census during the incubation period we obtained a higher occupancy rate, suggesting the 1999 census underestimated the population, but the number of burrows increased 40-50%, indicating a real growth in population size at around 7% per year. This finding was initially met with some scepticism, but it appears that the Spectacled Petrel population has been increasing from a very small population in the

1930s, following its near extinction due to predation by introduced pigs. Recent estimates from Brazil also indicate long-line mortality may not be as severe as initially though, perhaps only 400-500 birds per year in the 1990s, decreasing to 300-400 more recently. The Spectacled Petrel population appears to be able to survive this level of mortality and still grow, with a total population currently estimated to be around 30 000.

The visit to Inaccessible stimulated the drafting of a monitoring manual for the island's seabird populations of conservation concern. It also allowed Peter Ryan to continue some other ongoing research interests at the island, not least keeping tabs on the island's bizarre buntings. He also sampled Subantarctic Skua pellets to monitor long-term changes in the amount of plastic ingested by seabirds. The skuas eat mainly seabirds, and regurgitate indigestible remains, including plastic pollution ingested by the birds. The total abundance of plastic hasn't changed much over the last 15 years, but the proportion of virgin pellets has dropped significantly across a suite of species. This mirrors findings from Northern Fulmars in the North Atlantic, Short-tailed Shearwaters in the North Pacific and White-chinned Petrels killed on long- lines off South Africa. It appears that industry measures to limit spillages of pellets have been effective in curbing this form of pollution. A survey of pollution along South African beaches was less conclusive, with pellet numbers in 2005 down in some regions, but up in others.

For her PhD, Samantha Petersen is assessing the impacts of a suite of long-line fisheries on seabirds, turtles and sharks, testing mitigation measures to reduce bycatch, and attempting to understand the impediments to the implementation of mitigation measures. She also is manager of the BirdLife & WWF Responsible Fisheries Programme, which keeps her extremely busy developing educational materials and running education and training programmes. Her training programme for fishery observers has been expanded to include enforcement officers, skippers and other interested parties from the fishing industry. After several years of good progress with managing bycatch in all South African fisheries, more tuna long-line permits were issued to South African companies, following the withdrawal of permits to foreign-licensed vessels. Many new entrants lacked the resources to purchase a fishing vessel, and thus entered into joint-venture agreements with other companies with surplus capacity, often resulting in foreign vessels once again fishing in South African waters. The main difference has been that foreign-flagged vessels are obliged to carry independent observers on all cruises, so we have obtained a good idea of their impacts on seabirds.

Since mid-2005, Korean and Philippine vessels fished along the edge of the Agulhas Bank, killing an average of 0.6 birds per 1000 hooks set, more than ten times the target level, and peaking at up to an unbelievable 18 birds per 1000 hooks. Most birds killed have been White-chinned Petrels and Shy Albatrosses, with smaller numbers of Black-browed and Indian Yellow-nosed Albatrosses, and a smattering of Atlantic Yellow-nosed, Tristan and Royal Albatrosses, and giant petrels. Depressingly, the three Southern Royal Albatrosses confirmed killed are the first specimen records for this species from southern Africa. Observers were supplied with well-designed tori lines to deploy during line setting, but even these failed to halt the carnage. Unless improved line weighting regimes can make a difference, the only way to stop killing birds may be to not fish in areas where birds are very abundant.

Samantha Petersen and Barry Watkins fitting an immature Shy Albatross with a satellite transmitter to study the movements of non-breeding birds off the coast of southern Africa. Photo: Peter Ryan.

Trawlers also pose a significant threat to albatrosses. After initial reports from the Falkland Islands of birds being killed when they were entangled on trawl warps and dragged underwater, it became apparent that the problem was widespread, with records from Argentina, New Zealand and South Africa. I&J and the South African Deep Sea Trawling Association funded investigations which showed that under certain conditions large numbers of Shy Albatrosses and, to a lesser extent, Black-browed Albatrosses and White-chinned Petrels, are killed by trawl warps. It was initially thought that they were drowned mainly during setting, but careful observations by Barry Watkins, Jaco Barendse and Steve Kirkman reveal that they are killed throughout the trawling operation. The speed of the ship's passage creates sufficient drag to pull under water any hapless bird unlucky enough to be entangled around the warp. Shy Albatrosses are especially prone to being caught because they have very long wings, which readily become entangled around the warps. Mortality is episodic, taking place only when large numbers of birds attend a trawler and scavenge discards and offal right under the stern of the vessel. Mitigation trials are ongoing, but is appears that short tori lines set over each trawl warp are quite effective, so flying tori lines will be required during fishing from July 2006. In the long run, better management of fishery wastes should solve the problem entirely. Several of the larger vessels now operating have fish meal plants aboard which process discards and offal. All they release is a stream of fine scraps from cleaning the processed fish, which are too small to attract albatrosses.

PhD student Ross Wanless continues to work on the impacts of introduced House Mice on seabirds at Gough Island. Two new field workers, Johnny Wilson and Marie-Helene Burle, were dispatched to Gough Island in September 2005. In addition to working on mouse ecology, they will also collect more information on numbers and breeding success of affected seabird species. After little progress during much of 2005, Marta de Ponte has resumed work on the impacts of the burgeoning Great White Pelican population on breeding seabirds at Dassen Island and other guano islands around Saldahna Bay. During late 2005, more than 100 pelicans descended on Malgas Island to eat large, 3-5 week-old gannet chicks. Added to the predation of fledgling gannets by seals, which was estimated to be around 6000 birds in 2004, and Cape Gannets are looking to be in trouble unless swift management action is taken. There also has been some work on African Penguins during the period under review. Several studies have shown lower survival rates of banded birds in other species of penguins, so MSc student Shannon Hampton is investigating the possible impacts of flipper bands on African Penguins. Shannon has implanted birds with passive transponders on Robben Island as an independent way to track their survival, and will compare the performance of banded and unbanded birds. As part of her Zoology Honours course, Alta de Vos showed that breeding success of penguins at Boulders was much lower in areas open to beach-goers than in the reserve area.

Finally, Steven Chown and William Froneman are editing a book on the natural history of the Prince Edward Islands, focusing on the interaction between marine and terrestrial systems. It will review the large volume of ecological research conducted at the islands since the 1970s. Peter Ryan and Marthan Bester teamed up to summarise the role of seals and seabirds as pelagic predators.

Highlights

- Comparing foraging tracks of Cape Gannets from the two largest colonies with real-time information on the distribution and abundance of pelagic prey.
- Tracking immature Black-browed and Shy Albatrosses at sea off South Africa in relation to fishing activities.
- Obtaining detailed information on the diving ecology of Cape and Crowned Cormorants using data-loggers.
- Recovering almost all geolocator and heart-rate loggers deployed on Cape Gannets over the non-breeding period.
- Field trials of the efficacy of different weighting regimes on line sink-rates in the tuna and hake long-line fisheries.
- Designing effective *tori* lines for use in long-line and trawl fisheries, and having their use included as mandatory in new fishery regulations in South Africa.
- Producing educational materials and training more than 100 fishery observers from South Africa, Namibia and Angola.
- Obtaining support from SANAP for research on albatrosses from 2006-2010.

Students

Marta de Ponte (PhD, co-supervisor Les Underhill); *'Food supplementation, population growth and impacts of Great White Pelicans on breeding seabirds'*

Lorien Pichegru (PhD, co-supervisor David Grémillet); *'Foraging behaviour and chick growth of Cape Gannets'*

Mareile Techow (PhD, co-supervisor Colleen O'Ryan); *'The phylogeography of* Procellaria *and* Macronectes *petrels'*

Ross Wanless (PhD, co-supervisor Geoff Hilton)*; 'The impacts of introduced mice on birds at Gough Island'*

Shannon Hampton (MSc, co-supervisor Les Underhill); *'The impacts of flipper bands of African Penguins'*

*Sam Petersen (*MSc, co-supervisor Len Compagno); *'Assessing and managing the impacts of long-line fishing on seabirds, turtles and sharks off southern Africa'*

Zach Vincent (MSc)*; 'Demography and individual variation in reproductive performance of Wandering albatrosses at Marion Island''*

Benedict Dundee (AMS MSc, co-supervisor Coleen Moloney) *'The diet and foraging of chick-rearing gannets on the Namibian islands in relation to environmental features: a study using telemetry"*

Alta da Vos (BSc Honours)*; 'Impacts of management zones on the breeding success of African Penguins at Boulders'*

Peter Ryan conducting an autopsy on a Wandering Albatross long-line casualty. Photo: Peter Ryan.

Lectures, Workshops and Symposia

In May 2005, Peter Ryan and Zach Vincent attended a workshop near Boston on albatross demography hosted by Hal Caswell from Woods Hole Oceanographic Institute. Samantha Petersen spends an inordinate amount of time out of the country: at the end of 2004 she spent presented papers at the Albatross and Petrel Conference in Montivideo in August 2004, followed by the Penguin Conference in Ushaia in September and then 5 weeks in New Zealand and Australia, attending ACAP meetings, the Global Seabird Programme AGM and spent time on vessels checking new mitigation options. In 2005 she attended the International Fishers Forum, Yokahama, Japan and the Indian Ocean Tuna Commision bycatch working group, Thailand in July and the BirdLife Global Seabird Programme AGM an Offshore Marine Protected Areas workshop in Spain in November. Sam. gives regular lectures on seabird conservation to the public, and runs training courses for skippers of fishing vessels, fishery observers and enforcement officials, both in South Africa and Namibia. Barry Watkins attended CCAMLR meetings in Hobart in November 2005, representing the South African toothfish industry. Peter, Sam and Marta de Ponte all presented lectures in a 2005 summer school series on seabirds and their conservation arranged by John Cooper.

Visitors

Dr David Grémillet (CNRS, Strasbourg, France) visited in January 2005, accompanied by PhD student Lorien Pichegru and vet Gregoire Kuntz to implant data loggers into Cape Gannets. Lorien returned to conduct fieldwork from September 2005, and was joined in November by Gregoire, who recovered the implanted loggers. Richard Cuthbert visited in August-October to accompany the seabird monitoring team to Gough Island. Geoff Hilton visited in October 2005, primarily to facilitate a workshop on eradicating rodents on islands (see Island Conservation), but he took the opportunity to work with PhD student Ross Wanless. Helen Booker from the RSPB visited on her sabbatical and spent a month working with Sam Petersen on an awareness brochure for the fishing industry.

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 European Union to David Grémillet. The study of the impact of trawlers on seabirds was funded by I&J and the Deep Sea Trawler Association. Studies of the impacts of long-line fishing are supported and funded by Marine and Coastal Management, the Benguela Current Large Marine Ecosystem Programme, WWF-SA, and the BirdLife partnership (including LPO and RSPB). The Charl van der Merwe Trust has supported the study of the potential impacts of flipper bands on African Penguins. Colleagues both at the university and in the field are thanked for their assistance. This programme is a truly a collaborative effort.

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
John Cooper (Avian Demography Unit)
Dr Rob Crawford (Marine and Coastal Management)
Dr Richard Cuthbert (Royal Society for the Protection of Birds, UK)
Dr Geoff Hilton (Royal Society for the Protection of Birds, UK)

Researcher Andrea Angel holds a Tristan Albatross on Gough Island; research has found introduced house mice are having a devastating impact on the albatross's breeding success, and management options are being investigated. Photo: Ross Wanless.

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. Most work has been conducted at Tristan da Cunha and Gough Island, where Peter Ryan and John Cooper are honorary conservation officers. During the year under review the Tristan da Cunha Conservation Ordinance was revised, and signed into law by the Governor of St Helena in time for the 500 year anniversary of the discovery of Tristan. The revised Ordinance *inter alia* allows the Agreement on the Conservation of Albatrosses and

Petrels to extend to Tristan da Cunha. The 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, is nearing completion.

A draft Biodiversity Action Plan for Tristan has been produced, and a photographic field guide to the natural history of *Tristan* and Gough Islands should be completed during 2006.

Attempts to eradicate the invasive Procumbent Pearlwort *Sagina procumbens* from Gough Island entered a new phase in September 2005. Niek Gremmen was contracted to lead the project, which has seen Given Moremu and Tristanian Ivan Green based on Gough for the summer of 2005/06. Given was one of the high-altitude experts from the Working for Water programme involved in the clearing of New Zealand Flax *Phormium tenax* from Inaccessible in 2004. However, the main activity during the year in review has been directed towards assessing the impacts of introduced rodents on Tristan and Gough. PhD student Ross Wanless confirmed that introduced House Mice *Mus domesticus* attack and kill chicks of seabirds at Gough Island, including those of Endangered Tristan Albatrosses *Diomedea dabbenena*. His dramatic video footage triggered massive media interest, especially in the United Kingdom. Derek Brown, a New Zealand consultant specialising in the eradication of rodents was funded to visit Tristan to assess the feasibility of eradications at Tristan (where there are rats and mice) and Gough Island (mice only). Derek is eminently qualified in this role, as he was the leader of the successful campaign to remove rats from Campbell Island – the largest island cleared of rodents to date at 125 km^2. After his visit to Tristan in September 2005, he concluded that an attempt to eradicate rats from Tristan was likely to succeed, and there was a fair chance that mice also would be removed. The largest impediments are the cost and the need to secure people and domestic animals during the eradication exercise. Derek was unable to visit Gough Island in 2005, but he will visit Gough in 2006, accompanied by a specialist helicopter pilot to assess the feasibility of an eradication effort there. In the meantime, Marie-Helene Burle and Johnny Wilson are currently based on Gough Island for a year, studying the biology of mice, which will provide essential information for planning any eradication attempt.

Closer to home, PhD students Marta de Ponte and Lorien Pichegru have been involved in management of predation and disturbance of seabird colonies at South African guano islands by Great White Pelicans *Pelecanus onocrotalus* and South African Fur-seals *Arctocephalus pusillus*, respectively. Honours student Alta de Vos conducted a study of the impact of different management strategies on African Penguin *Spheniscus demersus* breeding success at Boulders, Simonstown.

Highlights

- Tristan da Cunha Conservation Ordinance revised and enacted.
- Two researchers sent to Gough Island to study the biology of introduced House Mice.
- Rodent eradication expert Derek Brown visits Tristan to assess the feasibility of rodent eradications.
- Measures to eradicate Procumbent Pearlwort from Gough Island stepped up.

Students

Ross Wanless (PhD, co-supervisor Geoff Hilton); *'The impacts of introduced mice on birds at Gough Island'*

Alta da Vos (BSc Hons); *'Impacts of management zones on the breeding success of African Penguins at Boulders'*

Lectures, Workshops and Symposia

A successful workshop was held on Robben Island in October 2005 to discuss the options for rodent eradications at Tristan and Gough Island. PhD student Ross Wanless was contracted to convene a joint CBD/GISP workshop on invasive species in Montreal in November 2005. Peter Ryan gave a talk on island conservation to the new Gough Team in September 2005. He regularly gives popular talks on island conservation.

Visitors

Mike Hentley, Tristan Administrator, visited the Fitztitute en route from Tristan, and together with Anne Green, Chief Islander at Tristan, and Geoff Hilton and Sarah Sanders from the RSPB, attended the rodent eradication workshop on Robben Island. Richard Cuthbert (RSPB) also attended the rodent workshop during his two-month visit to the Fitztitute from August to October, during which time he led the new research team to Gough Island.

Acknowledgements

I thank the Darwin Initiative and UK Foreign and Commonwealth Office for their support of conservation work at Tristan da Cunha through the Overseas Territories Environmental Programme. 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. 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 Andrew Jenkins
co-supervised one MSc student during the period under review. He authored or co-authored two scientific papers and five semi-popular articles, attended one scientific meeting, and reviewed four manuscripts submitted to four different scientific journals.

Raptor Research

Programme leader
Dr Andrew Jenkins

Research team
Dr Rob Simmons (research associate)
Odette Curtis (MSc student)
Anthony van Zyl (research associate)
Koos de Goede (Bird of Prey Working Group, Endangered Wildlife Trust)
Dr Bettine Jansen van Vuuren (Dept of Botany & Zoology, University of Stellenbosch)
Assoc. Prof. Phil Hockey
Lucia Rodrigues (Zandvlei Trust)
Ann Koeslag (Cape Bird Club)

Overview
Birds of prey are generally rare, charismatic, top-of-the-food-chain predators, often suitable as indicators of environmental health, and ideal as icons for broader conservation initiatives. The Western Cape Raptor Research Programme is the administrative umbrella for a number of research projects focused on the biology and conservation of raptors and raptor habitats in the Western Cape Province and beyond. The programme includes established, long-term studies of raptor populations in the Cape Town area (Peregrines, Black Sparrowhawks, Rock Kestrels), and newer, more applied projects on raptors and land-use in the Karoo and Fynbos biomes (Black Harriers, Martial Eagles, Fish Eagles). Further afield studies of Greater Kestrel ecology under risk of predation is underway in the Northern Cape, An important objective of the programme is to identify the conservation needs of the region's birds of prey, and to develop synergies between these needs and broader national environmental initiatives.

The third funded year of the Black Harrier Project was completed during the review period. The Black Harrier *Circus maurus* is one of 16 species of harriers worldwide, with the most restricted range of any continental species. Endemic to the fynbos and grasslands of southern Africa, it has previously been the subject of only one breeding study, and is classified in South Africa as *Near-threatened* and globally *Vulnerable*. The latter was revised and updated by the Black Harrier Project. The BHP set out to investigate the breeding ecology and resource requirements of this species, to improve management strategies to meet conservation needs. The BHP is largely funded by the Critical Ecosystem Partnership Fund (CEPF) and the WWF's Table Mountain Fund, and is part of the C.A.P.E (Cape Action Plan for People and the Environment) initiative. As such, an important element of the project is to encourage the `buy-in' and involvement of civil society (e.g. landowners, conservators, birders) in developing a sustainable research and management network, using the Black Harrier as a conservation flagship and an indicator of habitat health.

To date, significant progress has been made towards achieving all of the major objectives of the project. A substantial sample of harrier nests has been located and monitored over successive years in a range of habitats across the Cape Floristic Region and Nama Karoo. The distribution of harrier nests in relation to the size and nature of fragments of threatened lowland habitat has been a particular focus and in the 2005 we investigated the relationship between the presence or absence of breeding harriers, and the net conservation and biodiversity value of a sample of renosterveld fragments measured in terms of avian, mammalian and floral diversity, rarity and endemicity. Odette Curtis completed her MSc thesis with distinction, analyzing habitat use by breeding harriers in relation to patterns of fragmentation, and modeling risk of extinction in relation to range size and fragmentation for harriers and sparrowhawks globally. Marion Atyeo, an Honours student from the University of Queensland, worked with us on this aspect of the project, and collected some of the first, substantial data on rodent populations in south coast renosterveld.

The Eskom Electric Eagle Project was started in 2002 with the primary objective of developing a management strategy to minimize the incidence of eagle-related faulting on Eskom transmission lines in the central and southwestern Karoo. A high incidence of faults has been recorded on these lines in close proximity to the nests of Martial (and

other large eagles) placed in the pylon structures. The problem has been traced to long streamers of excrement occasionally issued by eagles roosting on the pylons, or by parents or young at active nests. Now in its 4th year, the EEEP is nearing completion, and has largely fulfilled its initial brief. By discouraging eagles from roosting directly above the conductors (using 'bird guards'), and encouraging them to nest below the conductors (by relocating nests from the pylon-tops to platforms in the waist of the pylon structure), the project has effectively reduced faulting caused by eagles to economically acceptable levels.

The EEEP has also examined correlations between rangeland management practices and the quality of Karoo veld as a habitat for breeding Martial Eagles. Hypothetically, eagle densities and breeding success are depressed on poorly managed farms with compromised ecological integrity. A recent paper by CB Masters student Ronald Machange, provides some empirical support for this idea, and proposes the Martial Eagle as a possible indicator of rangeland quality in the Karoo.

Ann Koeslag and Lucia Rodrigues, both enthusiastic amateur raptor watchers, contributed enormously in 2005 to extending the scope and value of the Cape Peninsula Raptor Project. Initially confined to a handful of single-species studies centred in the Cape Town area, this project now involves a growing contingent of volunteers in an effort to survey and monitor a wide diversity of montane and forest raptor populations over the length and breadth of the Peninsula. Integral to this project are long term studies of Peregrine Falcon, Rock Kestrel and Black Sparrowhawk populations, all of which were continued during the review period. Andrew Jenkins' Peregrine work builds on 17 years of research on aspects of Peregrine biology on the Cape Peninsula, and focuses on the dynamics of this population – primarily survival, turnover and recruitment rates. Ultimately, the study will emphasise the relative influence of crucial features of the nesting habitat on the lifetime reproductive success of individually marked birds. The project also includes a molecular component, carried out in collaboration with Dr Bettine Jansen van Vuuren at the University of Stellenbosch. This will assess genetic structure in southern African populations of the Peregrine Falcon, and examine within and between-brood relatedness in Peregrine nestlings on the Cape Peninsula. The Black Sparrowhawk project moved into its 6th season this year, with a total of 28 nests on the peninsula, monitored by about 8 volunteers and overseen by Odette Curtis and Ann Koeslag.

Highlights

- A set of unique biodiversity data were collected to evaluate the utility of the Black Harrier as an indicator of the conservation value of threatened lowland habitat fragments in the Overberg, Western Cape.
- Response patterns of Black Harriers and Black Sparrowhawks to habitat fragmentation were found to be diametrically opposite, with contrasting conservation implications. This was revealed in Odette Curtis' MSc thesis, for which she graduated with distinction.
- Breeding by Black Sparrowhawks was found to be influenced by forest patch size and rainfall, but was largely controlled by Egyptian Geese. Geese take over even active sparrowhawk nests, either causing the hawks to fail outright or forcing them to build alternative nests and lay again later in the season.
- All the primary objectives of the Eskom Electric Eagle Project were met, with the installation of nest platforms and bird guards markedly reducing the incidence of eagle-related line faulting on Karoo transmission lines.
- Work on the demography and breeding biology of Peregrine Falcons on the Cape Peninsula entered its 17th year. This population has steadily increased over the last decade, and now totals 38 resident pairs. A record 47 young were colour-ringed at nests on the Peninsula in the 2005 breeding season.

Fledged Black Harriers from the West Coast National Park. Photo: Graham Searll.

Students

Odette Curtis (MSc); *'Raptors and habitat fragmentation: from individual responses to population susceptibility'*...

Lectures

Members of the WCRRP gave at least five talks to membership-based societies during the review period, Andrew Jenkins presented a paper on the Eskom Electric Eagle Project at the International Association of Science & Technology for Development's European Power and Energy Systems Conference held at Benálmadena, Spain in June 2005, and Odette Curtis presented a paper on Black Harrier research at the Fynbos Forum gathering at Port Elizabeth in August 2005.

Acknowledgements

The Black Harrier Project is funded by the CEPF and the Table Mountain Fund and supported by C.A.P.E., the Electric Eagle Project is conducted on contract to Eskom Transmission, and raptor research on the Cape Peninsula is sponsored by Peregrine Properties. Thanks to Chris van Rooyen for facilitating the EEEP so effectively, to Jay van Deventer and the Bateleurs for their generous assistance with aerial survey work on the EEEP, and to Lucia Rodrigues and Anne Koeslag for their help with raptor monitoring on the Cape Peninsula.

Dr Richard Dean
served as the Scientific Editor of Ostrich during 2004-2005 and as Editor and contributing author of the Roberts' VII Project. During the review period he co-supervised one MSc and two PhD students. He authored or co-authored three scientific publications, co-authored one book chapter, and attended two scientific conferences. He participated in numerous talks and outings with Karoo residents and landowners to raise awareness of local environmental issues. He reviewed seven scientific papers submitted to four different international journals, and two grant applications submitted to one local and one overseas funding agencies. Dr Dean also spent two months at museums in Berlin, Bonn, Dresden and Stuttgart, Germany, extracting details of southern African bird specimens in the collections.

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, and in Conservation at Nelson Mandela Metropolitan University's Saasveld campus. During 2004/2005 she supervised one Conservation Biology MSc student; authored or co-authored seven scientific publications, co-authored one book chapter, and presented papers at two scientific conferences. She also served as associate editor for the Journals of Arid Environments and Applied Ecology and served on scientific review panels for the National Research Foundation and the Succulent Karoo Ecosystem Programme.

Land-use & Biodiversity

Programme leaders
Dr Richard Dean
Prof. Sue Milton (PFIAO, Conservation Ecology Department, University of Stellenbosch)

Research Team
David Allan (Durban Natural Science Museum, Durban)
Mark Anderson (Northern Cape Nature Conservation Services, Kimberley)
Dr J. Aronson (CNRS, Montpellier, France)
Dr Phoebe Barnard (GISP, SANBI, Claremont)
Prof James Blignaut (Economics, University of Pretoria)
Dr Charles Boucher (Botany Department, University of Stellenbosch)
C Cupido (Western Cape Department of Agriculture)
Prof. Karen Esler (Botany Department, University of Stellenbosch)
Dr Florian Jeltsch (Department of Ecology, University of Potsdam, Germany)
Dr David le Maitre (Envionmentek, CSIR, Stellenbosch)
Prof. Melodie McGeoch (Conservation Entomology, University of Stellenbosch)
Prof. David Richardson (Centre for Invasion Biology, University of Stellenbosch)
Dr Peter Ryan (Percy FitzPatrick Institute, University of Cape Town)
Dr Jane Turpie (Percy FitzPatrick Institute, University of Cape Town)
Prof L G Underhill (ADU, University of Cape Town)
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)
Dr Friederike Woog (Natural History Museum, Stuttgart, Germany)
Prof. Richard Yeaton (Instituto de Investigación de Zonas Desérticas, Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico)

Contemplating the role of Acacia erioloba *in preserving biodiversity in the Kalahari? Photo: Richard Dean.*

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

Conservation Biology students getting to grips with Karoo vegetation. Photo: Helen Farmer.

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. Overgrazing and open-cast mining enterprises threaten arid savanna and Karoid areas within these provinces. 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 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 (Nama 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?

A herd of eland in Ghwarrieveld, Anysberg. Photo: Richard Dean.

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

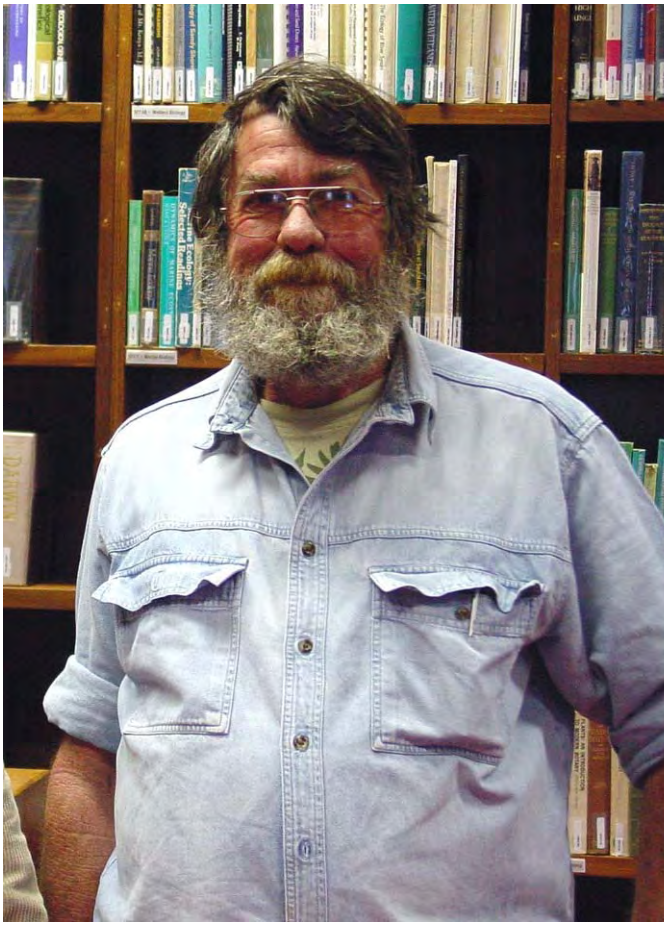
- A book on the movements of birds in desert ecosystems was completed and published (Dean, WRJ (2004) *Nomadic desert birds.* Adaptations of Desert Organisms series. Springer Verlag, Berlin, Heidelberg, New York).
- A book on the ecology and management of Karoo Rangelands has been updated and published. (Esler, KJ, Milton, SJ & Dean, WRJ 2005. *Karoo Veld - Ecology and Management*. Briza Press, Pretoria. 224 pages. ISBN 1 875093 52 4 (English), ISBN 1 875093 55 9 (Afrikaans).
- A database containing almost 200 000 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.
- A workshop in Prince Albert in September 2004 and another in St Louis, Missouri 2005 will lead to a multi-authored book on the economics of ecological restoration, edited by J. Aronson, S.J. Milton and J. Blignaut, to be published in 2007 as part of the SER International-Island Press book series, *Science and Practice of Ecological Restoration*.

Gibbeum pubescens *growing in the Anysberg. Photo: Richard Dean.*

Students

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

Ann Scott (D Tech, co-supervisor Dr Laurence Watson, NMMU*); 'Conservation aspects of the African Black Oystercatcher in De Hoop Nature Reserve,*



This report is dedicated to Dr Richard Dean for his contribution to the Percy FitzPatrick Institute over the past two decades. Photo: Chris Tobler.

Western Cape, South Africa'

Helen Farmer (CB MSc, co-supervisor Ms Collette van Deventer) '*Impacts of herbivores on the vegetation of Anysberg Nature Reserve, Succulent Karoo, South Africa'*

Visitors

Dr David le Maitre (CSIR) visited Prince Albert to discuss common research interests and potential collaboration on research in the Little Karoo, Dr James Aronson (CNRS, France) visited the FitzPatrick Institute and Prince Albert in 2004 and 2005 to collaborate on the Restoring Natural Capital Project.

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, DST, National Department of Agriculture, Jan Kitshoff and the BMDF. The bird specimen database was funded by The Leverhulme Trust, U.K and by GBIF.

Dr Jane Turpie'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. Jane 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 sits on the steering committees of Water Research Commission projects concerning estuarine ecology, management and economic evaluation. During the review period Jane supervised one PhD and three MSc students by dissertation in environmental economics, as well as four MSc Conservation Biology students.*

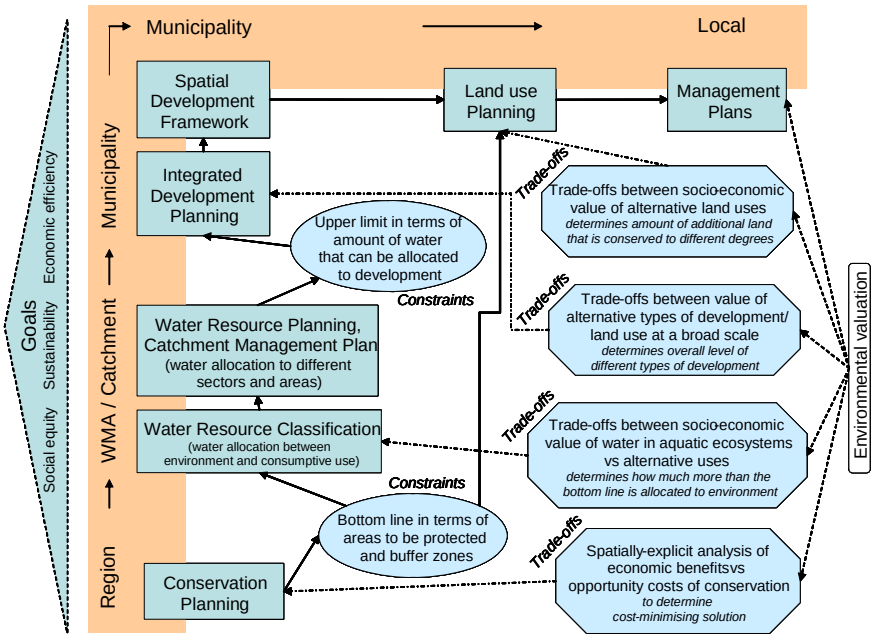
Environmental & Resource Economics and Water Resources & Estuarine Conservation

Project leader

Dr Jane Turpie

Overview

This programme is multidisciplinary, integrating ecological, social and economic research in order to inform policy and decision making relating to the conservation of biodiversity and socio-economic development. The programme has particular emphasis on water and estuarine and other aquatic ecosystems. Projects initiated, ongoing or completed during the review period included economic valuation studies of the Knysna and Mngazana estuaries with emphasis on subsistence uses, a valuation and financing study of Namibia's protected area system, development of approaches for incorporating estuary conservation and economic issues into development planning, and analysis of the potential for establishing Payments for Ecosystem Services in South Africa. Some of these studies were presented at a workshop on "*Resource economics as a tool for the management and conservation of estuaries in South Africa*" in March 2005, organised and edited by Jane Turpie and Stephen Hosking (NMMU).



The spatial scales, constraints and trade-offs involved in planning processes that affect estuary conservation.

Highlights

- The impacts of changes in freshwater inputs on estuarine birds: Long term count data were supplemented with field work to examine trends in the community structure and abundance of birds in relation to freshwater inputs and mouth condition. Studies included the Olifants, Berg, Kromme and Seekoei estuaries, and intensive fieldwork has begun on the East Kleinemonde and adjacent systems.
- A conceptual model of the Berg estuary: Based on the results of a three-year multidisciplinary study of the Berg River estuary, a conceptual model was constructed of the estuary ecosystem showing the types of relationships known or assumed to occur between different components of the system, and showing how freshwater inflow impacts on the system through a variety of pathways. This model will be used to devise a monitoring plan for the system, as well as being

used as one of the bases for determining the freshwater reserve of the estuary.

- Value of the Knysna estuary: Following a winter questionnaire survey in 2003 from which preliminary results were generated, a summer survey of people using the Knysna estuary was completed in 2004, raising sample sizes to a total of 1016 visitors and residents, 78 subsistence fishers and 505 people in the rest of the Western Cape. Some R1bn of annual expenditure by visitors to Knysna was attributed to the estuary. Resident investment in property with a view of the estuary was worth some R1.5-2 billion, or roughly R200 million per annum. Users were willing to pay R34 million per annum towards the conservation of the estuary, and degradation of the estuary could result in losses of up to R260 million per annum. The subsistence fishery contributes some R0.7-1.1 million per year to poverty alleviation. The estuary is estimated to be worth some R9.7 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.
- Value of Mngazana estuary: The Mngazana Estuary has the third largest mangrove forest in South Africa. Using information collected in a household survey and focus group discussions, market-price methods were used to estimate the value of mangroves harvested for building materials and the subsistence consumption of fish by the communities. Values were estimated for mangrove-dependent canoe trails and honey production operations, and the local economic impact of expenditure by visitors to holiday cottages adjacent to the estuary was estimated. The results were incorporated in 20-year valuation models with the net annual benefits then discounted to present value terms. Sensitivity analysis was performed to estimate lower-bound, upper-bound and most-likely values. The value of the mangroves to the local community was estimated to be in the order of R3.4 million (R0.5 to R7.0 million). An integrated approach is required to address the socio-economic needs of local communities while safe-guarding environmental resources.
- Maximising the socio-economic benefits of estuaries through integrated planning and management: This project examined the status, conservation and economic value of South African estuaries, and the various planning process that affect them, particularly conservation, water resource and development planning, and developed a protocol for integrating estuary values into planning and management processes.
- Development of an integrated conservation plan for the estuaries of the Cape Floristic Region: This project was initiated in October 2005, and aims to collate and augment biodiversity data for the approximately 65 estuaries of the CFR, to collect new data pertaining to their economic values, and to develop a conservation plan for the estuaries which takes economic values and opportunity costs into account.
- Economic value and financing of Namibia's protected areas: A process is underway to strengthen Namibia's protected area system, which currently comprises 14% of the country in 21 protected areas. However, tourism use and the value of this system is little understood, with poor visitor and financial records. We estimated that the parks had 214 000 visitors in 2003, 45% of whom were Namibians. These visitors were estimated to spend some N$52 million on accommodation and N$16 million on park fees. Based on enterprise and macroeconomic models, we estimate that their expenditure in parks and elsewhere added an estimated N$1.2-2.3 billion to the economy, though only 4% of this benefited households in the poorer communal areas. We showed that further investment in the system would pay off, and examined options for improving the financing of the protected area system.
- Payments for Ecosystem Services: An analysis was conducted of the Working for Water programme as an international model for achieving Payments for Ecosystem Services and presented at a workshop in Germany in 2005. We also developed a potential institutional model for establishing PES in the Maluti-Drakensberg Transfrontier Conservation Area.
- Restoring Natural Capital: An analysis was made of the potential for restoring the Thicket Biome by looking at the potential use of carbon markets. Because of our poor understanding of the recovery rates of thicket, it is difficult to be certain, but the potential appears to be there. The study contributed to the first of two volumes on the topic, with the second book (of more global scope) having been kicked off at a workshop attended in St Louis, USA in October 2005.

Students

Tony Knowles (PhD, Stellenbosch University); *'Carbon sequestration and opportunities for carbon trading in South Africa'*

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

John de Wet (MSc, University of KwaZulu Natal, co-supervisor Jessica Schroen)*; 'Value of the mangroves of the Mngazana estuary, Wild Coast'*

Vicky Napier (CB MSc, co-supervisor Barry Clark)*; 'Value and management of the subsistence fishery at Knysna estuary'*

Philip Osano (CB MSc, co-supervisor Andrew Balmford)*; 'Incorporating opportunity costs into conservation planning: a case study of the CAPE planning region'*

Takalani Maswime (CB MSc)*; 'The opportunity costs of conserving estuaries in the CAPE planning region: a study of property values'*

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

Dr Rob Simmons – *See Raptor Research Programme p. 19*

Rob Simmons. Photo: Phoebe Barnard

Rob's research is focused on the interface of conservation and ecology; solving conservation problems for individual species and providing broad-scale surveys to determine the threats to (Namibian) birds. Behavioural ecology is a secondary interest focusing on raptors to investigate evolutionary problems such as Reversed Size Dimorphism and siblicide. A third more recent interest is the threat that Global Warming poses for all southern African birds. Rob co-supervised one MSc student and one Honours student in 2005, and has a PhD student lined up for 2006. Dr Andrew Balmford was hosted for 8 months on sabbatical from Cambridge. Rob published two papers and two popular articles, reviewed numerous manuscripts submitted to scientific journals, remains on the *Ostrich* editorial board, and has completed 97% of Namibia's first Red Data Book on birds.

In terms of specific research developments during the review period, Rob continued his involvement in the Black Harrier Project (see Raptor Research Programme report), and collected another season of data in an analysis of the effects of predation risk on clutch size in Greater Kestrels. A small population of these birds breeds on telephone pole nests built by crows between Springbok and the coast in the Northern Cape Province. Evolutionary theory suggests that clutches laid under risk of predation may be smaller than those laid under no risk. Kestrels do not build their own nests and are often forced to breed adjacent to active crow nests. This poses a risk for the kestrels as Black Crows and Pied Crows are both potential predators of eggs and young. Five years of data from about 70 nests indicates that predation pressures are changing and kestrels may not be benefiting.

Rob has also examined aspects of the risks and responses of southern African birds to climate change. Climatic warming is now a reality and not just a theoretical construct of a few misinformed scientists. Global temperatures are now almost 1^{o}C higher than they were 100 years ago and rainfall may decrease – and with it more fires and more unpredictable storms will be the future norm. Virtually all organisms are expected to move, adapt or perish in the face of large-scale climate events predicted for the next 50 years. Yet southern African ecologists other than plant physiologists seem unconcerned or unaware of this. This research initiative, in collaboration with workers at the South African National Biodiversity Institute, has already reviewed

some of the likely changes to bird distributions, behaviour, ecology and those species under threat from new and adverse climates (Simmons *et al.* 2004). Follow-up work on various aspects including possible mutualism breakdowns among pollinator-pollinated systems, and species which be pushed up mountain sides or towards the coast is being planned for 2006. This is an exciting new field with numerous possibilities for future research and some surprises no doubt in store for those keen to look.

Rob has continued his work on the Namibian Red Data Book for birds, and completely re-evaluated threats to all 670 Namibian species against IUCN criteria, using an accumulation of atlas data, specialist studies, road counts, wetland count and breeding bird data from the last 25 years. About 60 species now qualify as threatened (*Extinct* to *Near Threatened*). Distribution maps and texts for all these, and a further 100 rare or peripheral species have been prepared will be published in 2006 under the title *Birds to Watch in Namibia: red, rare and endemic species*. This will be a joint publication of Namibia's National Biodiversity Programme and the Namibian Nature Foundation, co-authored by Chris Brown of the NNF.

Dr Phoebe Barnard

Although Phoebe trained as a behavioural and evolutionary ecologist, working mainly on birds of prey and highly ornamented African passerines, she has spent the last decade in conservation biology, policy and strategic planning. A senior scientist (and the only zoologist) at the Global Change Research Group, South African National Biodiversity Institute, she is resuming her research life to combine her twin 'work passions' of biodiversity and climate change by looking at the vulnerability and adaptation of African birds and other animals to environmental change.

Phoebe previously founded and ran the Namibian national biodiversity and climate change programmes, and worked as a scientific and technical coordinator for the Global Invasive Species Programme. Her interests in global environmental change in Africa include the roles of scientific networks, long-term environmental observatories and young scientists. Her ecological interests include the behavioural, genetic and life history determinants of species vulnerability to climate change, what bird data can tell us about population trends, ecosystem health and human well-being, and how species will move across fragmented landscapes in response to environmental change.

Dr Phoebe Barnard in the field. Photo: Michael Simmons

Post-doctoral Fellows

Corine Eising hard at work in the field. Photo: Penn Lloyd.

Dr Corine Eising

In May, Corine joined the Fitz from the Netherlands on a Claude Leon Harris Post-doctoral Fellowship. She is interested in behavioural and functional ecology as well as behavioural physiology. Using her previous work on costs and benefits of differential maternal hormonal investment in Black-headed gulls as a starting point, she is currently studying maternal reproductive decisions in relation to partner quality. Sexual selection theory predicts that good quality fathers produce good quality offspring and females should therefore invest more heavily in rearing offspring of sexy fathers. Such increased maternal investment can be measured in terms of clutch- and egg size, number of reproductive attempts per season or chick provisioning rates. In addition, research over the past decade has shown that maternal investment is not limited to the post-hatching phase only but may commence well before that. Avian mothers do provide their offspring with nutrients and other components such as hormones, carotenoids and immuno-globulins via the egg yolks, which may have long-term consequences for offspring development. Since most of these components are in limited supply, the mother should trade off the benefits of bestowing their offspring with these components against the costs to herself. Thus, it can also be expected that females adjust the level of their investment, both pre- and post-hatching to the quality of their mate.

From mid-July to the end of October 2005, Corine collected field data on two focal species, the Bar-throated Apalis and Lesser Double-collared Sunbird, both occurring at the Koeberg Nature Reserve. In both species, male plumages are characterized by elaborate breast-bands, which may be an indication of male quality. Corine is currently analyzing her data on egg quality and hormone content in relation to male morphology.

Dr Amanda Ridley

Mandy is continuing her research into the causes and consequences of cooperative breeding behaviour in the Pied Babbler (*Turdoides bicolor)*. She is the principal investigator of the Pied Babbler Research Project (link to web page), located in the southern Kalahari, at the Kuruman River Reserve. Established in 2003 while Mandy was a postdoctoral research fellow at Newnham College, Cambridge, the project now contains 15 fully habituated, colour ringed groups. Research on the project has

expanded since establishment, and there are now two PhD students, Nichola Raihani (University of Cambridge) and Martha Nelson (enrolling at University of Cape Town 2006) on the project, as well as another postdoctoral research scientist, Dr Andrew Radford (University of Cambridge). The Pied Babbler Research Project was recently featured on BBC Radio 4 (UK), in a programme entitled 'The Rules of Life' hosted by Prof Aubrey Manning.

Mandy Ridley habituating a group of Pied Babblers. Photo: Pied Babbler Project collection..

Currently, Mandy's specific research projects are:

- *Babbler-drongo interactions:* This research is based on the facultative response of babblers to drongos: in small groups, where there are few individuals to guard, babblers use drongos as an extra guard, consequently carrying the expense of occasional kleptoparasitism. In large groups, where there are sufficient members to guard, drongos are not tolerated at the group, and rates of kleptoparasitism are low. This work is being extended to look at how flexible the relationship between these two species is by using playbacks to manipulate the ratio of true:false alarm calls given by drongos, and also to manipulate perceived predator risk.
- *Facultative group size adjustment:* Specifically addressing the idea that the size of neighbouring groups is the most important factor determining group composition in terms of eviction, punishment, aggression, and acceptance of rovers.
- *Division of labour:* Although common in social insects, division of labour (which is neither an age- or weight-related polyethism) has not been proven in social vertebrates. With triple clutching occurring despite prolonged dependence of young in the Pied Babbler, Mandy aims to illustrate the occurrence of division of labour in this species, with the consequent benefits of greater reproductive output and less weight loss during the breeding period, particularly for the dominant pair.
- *The causes and consequences of helping behaviour:* Incorporating preferential care and sex ratio manipulation, this area of research looks at causes for variation in contributions to helping behaviour, the costs of helping behaviour, and the consequences of helping behaviour in terms of survival, growth and development of chicks. From the point of view of the helping individual, Mandy is looking at the effect of helping on future breeding opportunities, maintenance of body condition and dispersal opportunities
- *Adaptive deception and tactical deception:* In collaboration with Nichola Raihani, Mandy is investigating the use of specific calls and displays by adults to deceive young into following them at important times. This deception is adaptive because the chicks benefit by being deceived (e.g. leading chicks away from predators, between foraging sites, or to the roost tree). In addition, Mandy is investigating tactical deception during inter-group interactions, with the losing group attempting to deceive the winning group to retreat, or at least stop advancing, by giving predator alarm calls when the attacking group is in an exposed area.

Mandy has submitted four scientific papers during 2005 and is currently writing a magazine article about her Pied Babbler research.

One of Mandy Ridley's habituated and colour-banded Pied Babblers. Photo: Mandy Ridley.

Dr Lizanne Roxburgh

Lizanne began a postdoctoral fellowship at the Fitz in March 2005. The main aims of her project are to determine the factors limiting the distribution of Chaplin's Barbet *Lybius chaplini*, a threatened endemic barbet species that occupies a restricted range within Zambia, and to determine whether or not habitat transformation is threatening this species. She has spent much of the 2005 field season locating suitable study populations and measuring characteristics of occupied habitat, and in particular the availability of fruit and nest sites in

sycamore fig trees upon which the barbets are highly dependent.

She has begun collection of blood and tissue samples of Chaplin's and other barbets within Zambia and neighbouring African countries, with the ultimate aim of determining the phylogenetic relationships among several closely related *Lybius* barbets in cooperation with Dr. Rauri Bowie of the University of Stellenbosch. These blood samples will also be used to sex Chaplin's barbets and to determine dispersal among populations of barbets. Chaplin's barbets are cooperative breeders, as are at least half of all *Lybius* barbets, but no long-term study has been done on the breeding biology of any *Lybius* barbet. This breeding system is likely to have implications for the long-term persistence of populations of barbets as well as dispersal both between populations and into unoccupied habitat. Lizanne has begun to establish colour-banded populations of both Chaplin's Barbet and the ubiquitous and successful Black-collared Barbet, with the intention of studying their breeding systems and population biology.

Chaplin's Barbet: Lizanne Roxburgh is currently studying the breeding behaviour of this threatened Zambian endemic. Photo: Lizanne Roxburgh.

Apart from her research on Chaplin's Barbets, Lizanne is involved with the Zambian Ornithological Society, a Birdlife affiliate, and in particular with the launch and implementation of their Important Bird Areas (IBA) programme and coordination of the Zambian Ringing Scheme. She has produced the current status report for IBA ZM017 (Chisamba), an IBA in which a population of Chaplin's Barbets is found, and has written a review of the newly published book "Important Bird Areas in Zambia". She has an ongoing research project in Zambia on bird dispersal of mistletoes, and has published one paper, and continued data collection and submitted two additional first-authored papers on this project in 2005. She presented a seminar on this research to the Fitzpatrick Institute in April 2005.

Dr Lizanne Roxburgh. Photo: Collection Lizanne Roxburgh.

Dr Andrew Taylor

Andrew started a postdoc at the Fitz with Penn Lloyd and Morné du Plessis in August 2005 and, after a short preparation period, went straight into the field season with Penn at Koeberg Nature Reserve. He slotted in with the Avian Life-history Research Programme, and has been focussing on two long-term projects that had already amassed a considerable amount of data.

The first considers the trade-offs between life-history traits and age-specific survival, particularly the relationship between embryonic growth rate and immunocompetence. An important aspect of survival is the ability to combat and control infectious disease. If development of the immune system is inversely related to growth rate, slower growing species would have the advantage of a greater ability to fight infection at hatching. This would obviously trade-off against an increased chance of predation. Development time in chicks is known to influence immunocompetence, and this may also be the case for the development time of the embryo. Enhanced immune function is hypothesized to require longer incubation periods if this allows an increase in the number of cycles of stem cell differentiation, resulting in greater antibody diversity. The research question under investigation is then: Does immunocompetence trade-off with embryonic growth rate among species?

Plasma samples were collected from nestlings of 13 passerine species between August and October 2005, when chicks were at pin-break. These samples were sent to the University of Montana where they will be analysed using a haemolysis-haemagglutination assay to test the strength of the humoral immune system. Once the results are available they will be incorporated into a paper by Lloyd *et al.* that has already tested cell-mediated immunity in the same passerine species.

The second project considers facultative cooperative breeding in the Karoo Robin, specifically looking at the contribution of helpers to breeding performance and the raising of broods. Helpers are males, and appear to be the previous year's offspring of the breeding pair that they assist. If kin selection has played a role in the evolution of their helping behaviour, we expect helping to increase the success of broods. The project aims to determine whether or not this is the case by measuring a number of life history traits that are related to brood success. These include (1) egg size in relation to laying order, (2) clutch size, (3) re-nesting intervals after failure and successful fledging, (4) incubation nest attentiveness and mate-feeding rate, (5) nestling feeding rate, (6) nestling growth rates, (7) nestling survival (how many chicks starve), and (8) post-fledging survival.

One of the projects Andrew Taylor is working on in collaboration with Penn Lloyd and Morné du Plessis is a study on immunocompetance in Karoo Robins. Photo: Penn Lloyd.

In the next field season, aside from continuing with studies of cooperative breeding in Karoo Robins, Andrew hopes to focus on energy expenditure in Cape Robins, specifically looking at the costs of incubation.

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

The 2005 Conservation Biology class on a field trip. Photo: Takalani Maswime.

The 13th cohort of Conservation Biology students completed the course with 13 of 14 students in the 2004/2005 class graduating in June 2005, and the final student graduating in December 2005. Sean Marr, who sat in on half of the modules, has registered for a PhD in freshwater biology with Jenny Day and Charles Griffiths. Of the 14 graduands from the 2004/05 class, four were awarded their degrees with distinction. Ian Little was the top student, and received the Dr H.E. Joosub Award Sadly Dr Joosub died during the period under review. Research projects spanned a range of topics, from sustainable trophy hunting of elephants in Botswana to the impacts of grazing on pollinating beetles in Namaqualand, and from conservation of sub-tidal reefs to the population genetics of an endangered cycad.

With the extended reporting period covered in this annual report, we can also report on a second batch of CB projects arising from the 2005/06 cohort of CB students. Of the 12 students starting the course, only 11 were allowed to progress to the project stage. Unfortunately one student struggled throughout the coursework, and failed to make the grade in the final exams. Of the remaining 11 students, at the time of writing, 9 have already submitted their projects for examination, and two are expected to do so shortly (one has been plagued by ill-health and the other hamstrung by repeated delays in access to key data).

The 2006/07 cohort continues the tradition of strength through diversity, with seven countries represented among the 14 students. This includes our first Antipodeans, with both Australia and New Zealand represented, and our first student from the Peoples' Republic of Congo, sponsored by the Wildlife Conservation Society. The class is larger than usual because of the quality of applications. The course component has been bolstered by the arrival of Graeme Cumming, the Pola Pasvolsky Chair in Conservation Biology. He will take over teaching the landscape ecology and conservation planning module, which has been run with considerable

professionalism over the last few years by Andrew Knight. Andrew was unable to teach this year, so the timing couldn't have been better. Graeme is also co-ordinating a new, week-long module on climate change, which has key inputs from Guy Midgley from SANBI and Mike Lucas from UCT's Zoology Department.

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: John Hoffmann, 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 Ledeboer who handles umpteen queries from potential students, and Hilary Buchanan who administers the project examination process as well as acting as an *ad hoc* surrogate mother to the newly-arrived foreign students.

Conservation Biology projects: 2004

da Silva, Jessica: *Can conservation genetics save one of South Africa's critically endangered cycads?* Supervisors: T. Hedderson, G. Reeves

Farmer, Helen: *Factors influencing spatial use of the landscape by indigenous herbivores: Implications for vegetation monitoring in the Succulent Karoo.* Supervisors: S.J. Milton; C. van Deventer

Lawrence, Cloverley: *Biodiversity survey towards conservation of subtidal reef habitats in KwaZulu-Natal.* Supervisors: G.M. Branch; J. Harris

Little, Ian: *Does timber density influence the abundance of Northern Bobwhite Quails* Colinus virginianus? Supervisor: T.M. Crowe

Lowe, Steven: *The impact of invasive fish and invasive plants on the invertebrate fauna of a river in the Cape Floristic Region.* Supervisor: J.A. Day

Mader, Andre: *Elephant impact on trees in the Little Karoo.* Supervisor: T.M. Hoffman

Mao, Angua: *Assessing the ecological integrity of freshwater ecosystems.* Supervisors: M. Rouget; A. Balmford; J.A. Day

Napier, Victoria: *Evaluation of the subsistence fishery in the Knysna estuary, South Africa.* Supervisors: J.K. Turpie; B. Clark

Osano, Philip: *Estimating the opportunity cost of biodiversity: A case study of the Western Cape, South Africa.* Supervisors: A. Balmford; M. Rouget; J.K. Turpie; M.A. du Plessis

Owen, Cheryl-Samantha: *Is the supply of trophy elephants to the Botswana hunting market sustainable?.* Supervisor: P.A.R. Hockey

Owino, Alfred: *Papyrus swamp habitat loss and degradation: Impacts on endemic birds in Kenya.* Supervisor: P.G. Ryan

Rahlao, Seb: *Long-term vegetation change in the succulent Karoo, South Africa following 67 years of rest from grazing.* Supervisor: T.M. Hoffman

Soka, Geoffrey: *The importance of monkey beetle (Scarabaeidae: Hopliini) pollination for Aizoaceae and Asteraceae in grazed and ungrazed sites at Paulshoek, Succulent Karoo, South Africa.* Supervisors: M. Picker; C. Mayer

Spear, Dian: *Dealing with socially complex species in population viability analysis: a case study of the cooperatively-breeding southern ground hornbill,* Bucorvus leadbeateri. Supervisor: M.A. du Plessis

Conservation Biology projects: 2005

Baudains, Tammy: *The effect of human disturbance on the response behaviour and breeding success of a common shore-nesting bird, the White-fonted Plover* Charadrius marginatus *on the Cape Peninsula.* Supervisor: P. Lloyd

Fox, Sarah-Jane: *Habitat fragmentation and strandveld bird assemblages in an 'ecologically friendly' golf estate in the Western Cape, South Africa.* Supervisor: P.A.R. Hockey

Kaliba, Potiphar: *Faunal turnover between the eastern and southern African birds and small mammals: Is Malawi the geographical break?* Supervisors: T.M. Crowe; R.C.K. Bowie

Lauret-Stepler, Marie: *Nesting seasonality and population trends of green turtles,* Chelonia mydas *(Linnaeus, 1758) breeding on Eparses islands, south-western Indian Ocean.* Supervisor: P.G. Ryan

Maswime, Takalani: *The contribution of estuaries to residential property values in the Cape Floristic Region, South Africa.* Supervisor: J.K. Turpie

McDonell, Zoe: *Distribution, abundance and demography of Ocean Sunfish,* Mola mola*, off southern Africa: Cause for concern?* Supervisor: C. Griffiths

Scovronick, Noah: *Adding value? The effect of becoming a transfrontier park on visitor numbers and attitudes in the Kgalagadi Transfrontier Park* (provisional title). Supervisor: J.K. Turpie

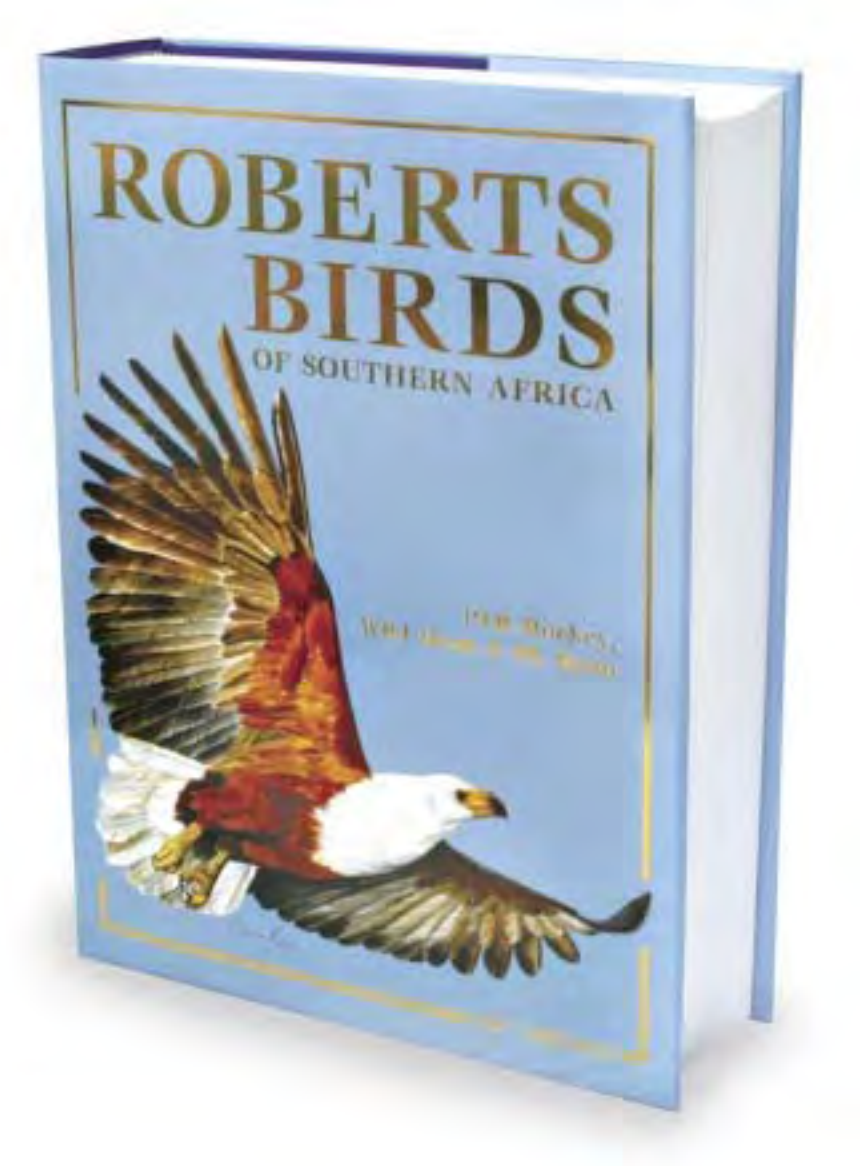
Shine, Khara: *Biogeographic patterns of demersal fauna in the south and west coast of South Africa: Implications for conservation* (provisional title). Supervisor: J.K. Turpie

Stephen, Vanessa: *Harmful algal blooms: A potential conservation problem in the Benguela upwelling system.* Supervisor: P.A.R. Hockey

Suinyuy, Terence: *The taxonomic status and phylogenetic affinities of some Cameroon phasianoid gallinaceous birds.* Supervisor: T.M. Crowe

Vickers, Karen: *Assessing the relative contribution of conservation areas to the protection of key biodiversity features in Mpumalanga, South Africa.* Supervisor: M.A. du Plessis

The *Roberts VII* Project



The rewrite of Roberts was one of the single largest projects that the FitzPatrick Institute has ever tackled. Given that the text alone ran to the equivalent of more than 65 full-length PhD theses, and in total more than 200 people contributed in some way to this *magnum opus*, it is perhaps not surprising that the project ran both over time and over budget.

The preparation of the text was completed in July/August of 2005, after which pdfs were prepared and sent to Singapore for printing (on American paper!). The last few months of the project traversed a particularly rocky road, not least because the project's copy editor, Brenda Brickman, died of cancer at the end of 2004, forcing the production team to make a replacement and train a new copy editor. However, despite this we did manage to make the printing deadline and the final product (1300 pages, and weighing 5.25 kg) was officially launched at a function hosted by UCT in October 2005.

Despite the euphoria surrounding the end of this long literary pregnancy, there were still severe concerns about the budgetary overspending, both on the part of the John Voelcker Bird Book Fund (the primary funder) and the FitzPatrick Institute. For the project as a whole to break even, most of the first print run had to be sold. In our most

optimistic projections, we thought that these monies might be recouped over a three-year period. Very soon after the launch however, indications were that this may have been a pessimistic projection – many of the large book stores had sold their entire consignments within 24 hours of the book being placed on the shelves. As it turned out, the entire print run of 10 000 copies had been sold out by Christmas, barely two months after the launch, and before the end of 2005, Phil Hockey and Mary Duncan (Brenda's replacement) were back in front of the computer screens ironing out a few gremlins that had managed to work their way into the system. At the time of writing this (early January 2006), we are within two days of the entire electronic book being returned to Singapore for a second print run of 5 000 copies which will be due back in South Africa in March 2006.

The book itself is the most comprehensive compendium of what is known about the biology of southern African birds. By international handbook standards it has several unique features, including a complete reference list for each species. As a project it also adopted a unique public participation process whereby as text became available it was placed on the internet for public scrutiny and comment. This approach allowed us to fill several gaps in our knowledge by tapping into the unpublished records of the birding public. The publication of the book was tasked to Cape Town-based Africa Geographic, a company well known for its two award-winning environmental magazines, as well as several high-quality environmental books. The physical quality of the final product is more than adequate testimony to the experience and commitment residing in this company, with one Johannesburg publisher describing the book as 'instant Africana'. It seems therefore that the reputation of *Roberts* as Africa's best-selling natural history book of all time is to be continued.

Two colour plates from the new Roberts Birds of Southern Africa. The entire print run of 10 000 copies was sold out by Christmas last year, in other words, in just two months …

Niven Library

Librarian
Margaret Sandwith

Overview
The highlight of the year was the launch of the new Niven Library catalogue, firstly on the Local Area Network and subsequently on the Web. The holdings of the Niven Library are now available for staff, students and the wider ornithological community to search remotely through the FitzPatrick Institute web page. Nomgcobo Ntsham, Mentoring Programme volunteer during 2004, was successful in her application for a Librarian post at the Harry Molteno Library at SANBI. This is also a success story for the Niven Library. The library collection continued to be heavily used by the various authors and editors of *Roberts VII*, even post-publication when revisions for a reprinting began only weeks after publication. Available space for the growing collection remains a critical issue which needs to be addressed in the coming year.

Staff and staff development
Volunteer staff

Library volunteers, clockwise from top left: Des Loubser, Sally Dalgleish, Nomgcobo Ntsham and Nomonde Sotashe. Photos: Margaret Sandwith.

Des Loubser: Des Loubser has adapted admirably to the change in job description with the drop-off in reprint requests. Des is contributing to the relief of the acute space problem with his weeding of duplicates from the reprint collection - his box of duplicates is proving to be a popular browsing spot for certain researchers who use the library. Des is also helping out with the photocopying of extended research requests and interlibrary loan requests, in addition to maintaining the reprint request portfolio and keeping statistics.
Sally Dalgleish: During the year Sally worked her way through the reprint donations from Phil Hockey and Dean Fairbanks and also made time to interfile those that remained after Nomgcobo had completed her stint as volunteer. In the New Year she will tackle the task of inputting the pdf reprints and inputting any new hard copies.

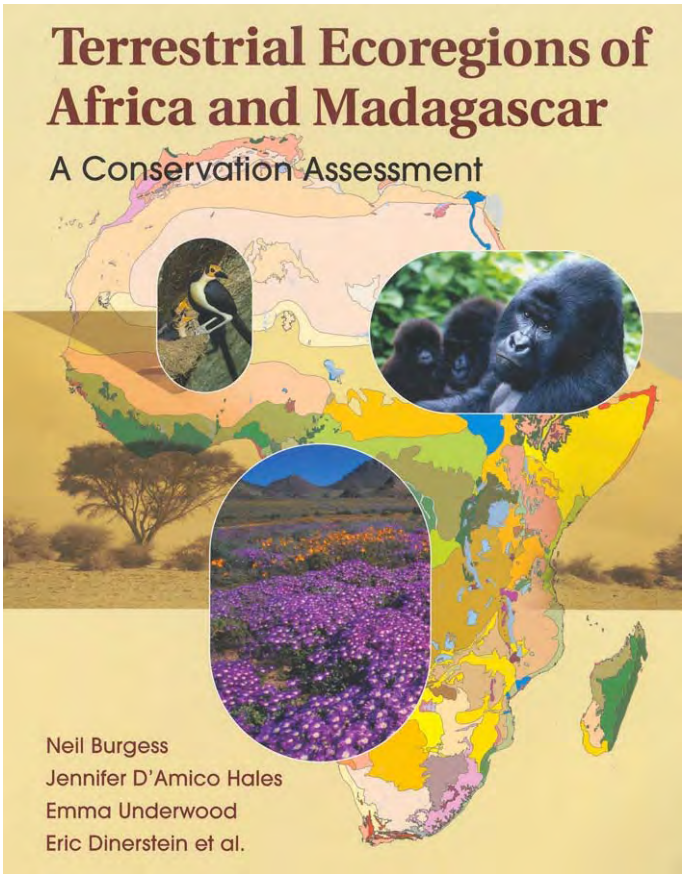
Nomgcobo Ntsham: During the first few of months of 2005 Nomgcobo was employed in the Niven Library on funds provided by the CAPE programme. Her task was to initiate the compilation of an electronic format of the Fynbos Bibliography last published in a second edition in 1989. This involved time consuming and exacting editing in order to recapture the 1989 data set in the correct format for the electronic version. The resulting dataset is available as an alternative database on the Niven Library Web Catalogue. Nomgcobo has subsequently moved on to a contract post at the SANBI Harry Molteno Library at Kirstenbosch, where we wish her every success.
Nomonde Sotashe: Nomonde started working as a volunteer at the Niven Library from October 2005 on the Mentoring Programme whilst working part-time to pay off her loan to the University of the Western Cape. She wished to gain experience while waiting for her degree to be granted. She has been involved in routine tasks such as shelving and photocopying, and in addition the professional tasks of cataloguing and classification. She is also working with the CDS/ISIS database, editing and inputting records.

Library development

Collection management

Reprints: A policy of storing pdf copies of all articles requested by staff as well as capturing relevant articles from current journal alerts has resulted in a growing collection of pdf format articles for the reprint collection. The current count of pdfs stands at 2351, which are available for the use of staff and students of the Fitztitute and Zoology on a LAN share drive.
New Books: New books acquired by donation, purchase or through book reviews during the period under review amounted to 194 titles. Some significant titles acquired during this period are:

- Roberts birds of southern Africa, 7th edition
- The history of the collections contained in the natural history department of the British Museum, 3 volumes 1904-1912
- Handbook of the birds of the world Volume 9 Cotingas to Pipits and Wagtails
- Cassell's book of birds, 4 volumes 1869-1873
- Gulls of Europe, Asia and North America
- Shorebirds, an illustrated behavioural ecology PM
- Weather and bird behaviour PM
- Important bird areas in Zambia
- Ornithology of Sabah, history, gazetteer, annotated checklist, and bibliography
- The bird atlas of Uganda
- The natural history of Madagascar PM
- A guide to the seashores of eastern Africa and the western Indian Ocean islands PM
- Atlas of Namibia, a portrait of the land and its people PM
- Terrestrial ecoregions of Africa and Madagascar, a conservation assessment
- The mammals of Australia
- Drafting a conservation blueprint, a practitioner's guide to planning for biodiversity



'Terrestrial ecoregions of Africa and Madagascar, a conservation assessment', *one of the many new books acquired by the Niven Library.*

Upgrading the Niven Library System

The proposal to migrate the Niven Library catalogue to a subset of the UCT Library Aleph system proved to be a non-starter. Unfortunately there was not the capacity within the UCT Library system to effect this migration in the foreseeable future, although this remains the solution of choice for the Niven Library. A LAN version of the open-source UNESCO CDS/ISIS database was launched at the beginning of 2005 after the migration of the book, journal and newsletter records to the new database. To date half of the reprint records have yet to be migrated to the new database. This requires many hours of editing which has the simultaneous benefit of cleaning the database and upgrading the records to match the US MARC standard used by libraries internationally. Midway through 2005 the Niven Library acquired a server to launch the catalogue on the *Fitztitute* Web Page as UCT were unable to host the database on their web server. The holdings of the Niven Library can now be searched remotely be staff and students of the *Fitztitute* from their offices and off campus.

Security

There appears to be an improvement in the completion of loan application slips by those members of staff and students who find it necessary to borrow material from the library, resulting in a slight increase in loan statistics. Since January 2005 24 hour access to the Niven Library was restricted to staff and students of the *Fitztitute* while other users were granted office hours access. This was made possible by the upgrading of access control software which also enables reporting about who has used the library after hours.

Use of the Library

An average of 76 items per month were recorded borrowed during this period.

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

	2004/05	2003/04	2002/03	2001/02
Monographs	438	519	409	537
Reprints	82	83	155	153
Theses	42			
Journals	345	278		
Audio Visual	9	7		
Total	916	887	564	690

Document Delivery

A levy for document delivery was instituted in June 2005 in an effort to raise funds for binding of the journal collections which are the property of the two NGO's, BirdLife SA and the Percy FitzPatrick Memorial Trust. The result of this levy has been two-fold, the number of requests for photocopies has dropped which has resulted in time-saving and the cost of both paper and postage. The requests which are received generate funds for binding.

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

	2004/05	2003/04	2002/03	2001/02
Photocopies requested (by staff/ students)	166	95	154	
Photocopies supplied	485	403	365	130
Requests not satisfied	35	24	13	33

Despite the imposition of interlibrary loan charges the Niven Library remains a net supplier of articles through the national inter-lending system. Cash redeemed from coupons received in payment for inter-library loans totalled R3179.45

Reprint requests

During the period 1 June 2004 to 31 December 2005 211 [275] [178] [485] requests for reprints of the Percy FitzPatrick Institute's staff publications were received by the Niven Library, many of these were e-mail requests and where possible pdfs were supplied with a consequent saving on postage.

Table 3. Requests for PFIAO Reprints

	2004/05	2003/04	2002/03	2001/02
Number reprint requests	211	275	178	485
Number of countries	21	37	38	40

These figures show a continued drop-off in reliance on the system of reprint requests in comparison to previous years. The academic reliance on electronic journals, particularly in the western world, is widespread and is not expected to diminish the influence of PFIAO research on international ornithology. Once again interlibrary loan requests have included a proportion of PFIAO articles.

In addition to the Inter-library loans and reprint requests, the Niven Library has also processed a further 158 international requests for information, amounting to the provision of 102 articles, in most cases in pdf format.

The breakdown by countries is: Argentina 11(1), Australia 4(10), Belgium 3(0), Brazil 1(11), Canada 3(1), Chile 1(0), Czech Republic 3(1), Falkland Islands 2(0), France 6(2), Germany 5(12), Hungary 2(1), India 7(8), Italy 2(2), Japan 2(0), Morocco 9(1), Namibia 10(1), Netherlands 2(3), New Zealand 1(1), Norway 3(0), Pakistan 1(1), Poland 7(5), Portugal 14(3), Reunion 1(0), Slovakia 1(0), South Africa 59(28), Spain 5(12), Sweden 1(0), United Kingdom 10(6), United States of America 24(25), Venezuela 1(1), Zambia 2(0).

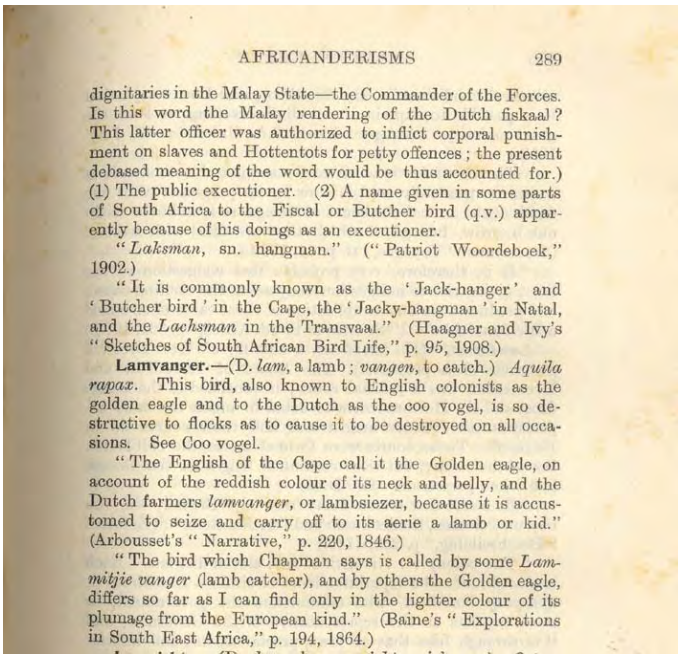
Staff members of the Percy FitzPatrick Institute continue to send reprints of their papers to workers around the world known to be interested in the topics concerned. Reprints are also given out on request to visitors to the Niven Library.

Cash photocopying

The cash photocopy facility in the library was used by persons without a photocopy code, many of these were undergraduate students or library visitors from other parts of campus or beyond. Approximately 11564 [8688] [10017] copies with a cash value of R4047.40 [R2607.19] [R2659.10] were made during the period under review. The charge for photocopying remained constant at 35c per page. The drop-off in photocopying is attributed to the availability of electronic journals which enable printing rather than photocopying of articles. A further R1770.55 [R391.20] was received for the supply of material requested from the Niven Library from users within and outside of South Africa.

Research requests

A total of 2875 requests for information were received during the period under review, with approximately 50% of these requests generated by staff and students of the *Fitztitute*. 907 pdf or jpg files were supplied by e-mail to users locally, nationally and internationally in comparison to the 133 of the previous reporting period. 889 hard copy articles were supplied, by far the greater proportion to users in the *Fitztitute*, Zoology, ADU and elsewhere on the UCT campus. In addition 358 literature searches were compiled and e-mailed to users. Other usage of the library was for verification of information, the supply of URL's and e-mail addresses and numerous other general queries. The Library received 1463 [400] [285] research requests from the staff and students of the PFIAO, 315 from Zoology staff and students and 98 from ADU staff and students. Requests for information were also received from elsewhere on the UCT campus, and both nationally and internationally (see figure 1).



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dignitaries in the Malay State—the Commander of the Forces. Is this word the Malay rendering of the Dutch fiskaal? This latter officer was authorized to inflict corporal punishment on slaves and Hottentots for petty offences; the present debased meaning of the word would be thus accounted for.) (1) The public executioner. (2) A name given in some parts of South Africa to the Fiscal or Butcher bird (q.v.) apparently because of his doings as an executioner.

"*Laksman*, sn. hangman." ("Patriot Woordeboek," 1902.)

"It is commonly known as the 'Jack-hanger' and 'Butcher bird' in the Cape, the 'Jacky-hangman' in Natal, and the *Lachsman* in the Transvaal." (Haagner and Ivy's "Sketches of South African Bird Life," p. 95, 1908.)

Lamvanger.—(D. *lam*, a lamb; *vangen*, to catch.) *Aquila rapax*. This bird, also known to English colonists as the golden eagle and to the Dutch as the coo vogel, is so destructive to flocks as to cause it to be destroyed on all occasions. See Coo vogel.

"The English of the Cape call it the Golden eagle, on account of the reddish colour of its neck and belly, and the Dutch farmers *lamvanger*, or lambsiezer, because it is accustomed to seize and carry off to its aerie a lamb or kid." (Arbousset's "Narrative," p. 220, 1846.)

"The bird which Chapman says is called by some *Lammitjie vanger* (lamb catcher), and by others the Golden eagle, differs so far as I can find only in the lighter colour of its plumage from the European kind." (Baine's "Explorations in South East Africa," p. 194, 1864.)

Staff at the Niven Library receive some interesting requests…

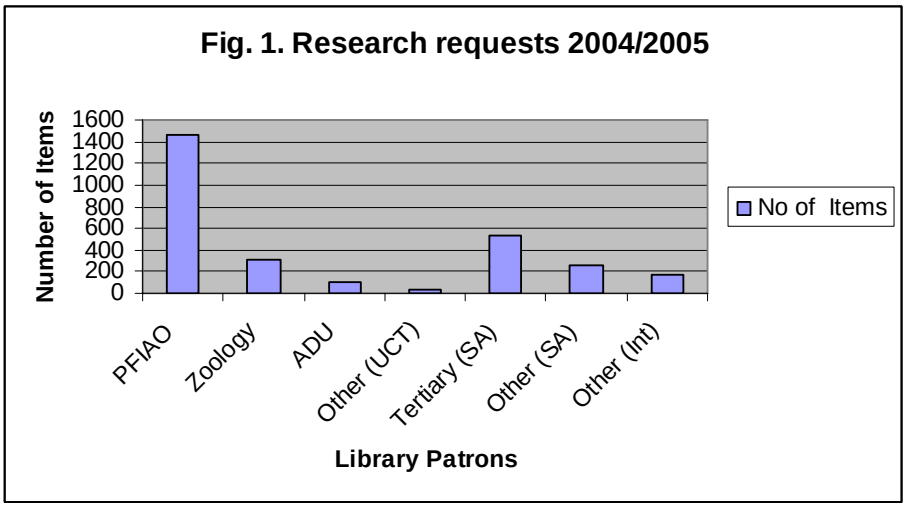
Requests for information

Requests for information over and above interlibrary loan requests were received from the following National and International organisations and individuals.

Bird NGOs: Cape Bird Club, BirdLife SA, BirdLife Eastern Cape, Hornbill Project, BirdLife Botswana, BirdLife Kenya, BirdLife Zimbabwe, Global Owl Project, RSPB, BirdLife Australia

Conservation NGOs: Marine and Coastal Management, Oceanographic Research Institute, SAIAB, SANBI, Endangered Wildlife Trust, Bushmanland Conservation Initiative, C.A.P.E., Conservation International, Centre d'Ecologie Fonctionnelle et Evolutive – France, Fraunhofer Institute of Molecular Biology and Applied Ecology – Germany.

Government affiliations: Northern Cape Department of Tourism, Environment & Conservation, Department of Agriculture – South Africa, South African Navy, Western Cape Nature Conservation Board, Western Australia Department of Agriculture.



Publishers: Struik, Brenthurst Press, Christison Rare Books, Lynx Edicions – Spain.

Private Companies: Conservation Systems, CSIR, Unicorn Conservation, Rainbow Farms, Grintek, Capricorn Fisheries Monitoring, Bohlweki Environmental, Tropical Birding, Rob Guy Expeditions, Natal Ancestry Research, Jeffares & Green Consulting Engineers, De Beers Marine Namibia, Conservation Corporation Africa, Parthenon Entertainment – UK, Kratt Brothers Be the Creature – Canada, Baker Botts – New York.

Some interesting Individual queries: Ian Macdonald – South Africa, Bob Dowsett – France, John Azzopardi – Malta, Des Jackson – New Zealand, Mustapha Fellag – Algeria

Museums: Durban Natural Science Museum, Vladimir Sotnikoff Ornithological Museum – Russia, Natural History Museum – UK, Norfolk Biological Record Centre – UK.

International Universities: University of Swaziland, University of Vigo – Spain, Brown University – USA, St. Lawrence University – USA, University of California, University of Groningen, University of Cambridge, University of Sheffield, University of Texas at Austin, Universidade Técnica de Lisboa.

International Libraries: DEC Research Library – New York , Natural History Museum Library – UK.

Acquisitions and collection building

Table 4. Niven Library acquisitions over the last four years

	2004/05	2003/04	2002/03	2001/02
Monographs	194	108	145	200
Journals	819	520	629	962
Newsletters	474	304	465	359
Reprints	2182	1078	754	514
PDFs	2351			
AudioVisual	8			

At the end of December 2005 the bibliographic records on the OPAC system totalled 44105 [41834] [40906]. The numbers of individual items received in the Niven Library are recorded in Table 4.

'Cassell's book of birds, 4 volumes 1869-1873'. *Another addition to the Niven Library's collection*.

Books added to the collection were ordered by members of the Percy FitzPatrick Institute, donated books and review books for Ostrich. Adrian Craig, Rhodes University, donated back issues of *Journal of the Bombay Natural History Society* and *Fair Isle Bird Observatory Bulletin*. The Zoology Department, SAFRING, Avian Demography Unit and the African Seabird Group continued to donate their exchange journals. Prof. Les Underhill brought back a bequest from the Netherlands from *Prof.* K.H. Voous, the main item of interest being a 7 volume set of Hellmayr & Conover's *Catalogue of Birds of the Americas.* Pat Morant donated some exceptional titles to the Niven Library during the year, including 5 of the titles listed above. The Librarian continues to open and process the Walter Stanford Bequest which was received in June 2004.

Future Development

The Table Mountain Fund, partner to the C.A.P.E. programme will fund a full-time post for an Intern in the Niven Library for 2006. The main task of the Intern will be to continue to develop the Fynbos Bibliography initiated by Nomgcobo Ntsham in 2005, under the supervision of the Niven Librarian. The Intern will also assist in the Niven Library so that a full range of experience in the running of a special library in the natural sciences field will be achieved.

It is hoped that with the extra full-time assistance many of the tasks which have had to be put on hold will see the light of day in 2006. This includes making a full list of Niven Library duplicates available for purchase or exchange on the web page; addressing the issue of space by a concentrated weeding exercise and getting quotes for compact storage; completing the migration of the reprint collection records into the Niven Library database.

Revisiting lapsed and additional ornithological journal titles, a part of the contract with NISC in the development of the Afrotropical Bird Database, also requires concentrated attention during 2006.

Donations

We acknowledge with thanks donations from the following: African Seabird Group, Mark Anderson, Avian Demography Unit, Bastian Bomhard, Andrew Balmford, Linda Birch, Grazia Borrini, George Branch, David Brunckhorst, Lindsay Christison, Conservation Corporation Africa, John Cooper, Adrian Craig, Tim Crowe, Jenny Day, Richard Dean, Department of Environment Affairs and Tourism, Morné du Plessis, Corine Eising, Endangered Wildlife Trust, John Field, Anesh Govender, Charlie Griffiths, Llwellyn Grimes, Jane Hamblin, Timm Hoffman IUCN, Andrew Jenkins, Georgina Jones, Sean Marr, Nina Marshall, Sue Milton, Ara Monadjem, Pat Morant, Norman Myers, Dieter Oschadleus, Samantha Petersen, Beau Rowlands, Peter Ryan, SAFRING, SANBI, Trevor Sandwith, Roy Siegfried, Rob Simmons, Walter Stanford Bequest, Les Underhill, University of Cape Town Library, K.H. Voous Bequest, Barry Watkins, Wetlands International, Zoology Department.

Scientific Publications 2004

Anderson, P., Hoffman,T., Holmes, P.M. 2004. The potential of *Cephalophyllum inaequale* (L. Bolus) for the restoration of degraded arid landscapes in Namaqualand, South Africa. *Restoration Ecology* 12: 343-351.

Anderson, M.D., Dean, W.R.J. & Sandwith, M.M. 2004. A selection of Dr Richard Liversidge's publications. *Ostrich* 75:xi-xii.

Balmford, A., Manica, A., Airey, L., Birkin, L., Oliver, A. & Schleicher, J. 2004. Hollywood, climate change, and the public. *Science* 305 (5691): 1713-1713.

Beresford, P., Fjeldså, J. & Kiure, J. 2004. A new species of Akalat (*Sheppardia*) narrowly endemic in the eastern arc of Tanzania*. Auk* 121:23-34.

Beresford, P., Barker, F.K., Ryan, P.G., Crowe, T.M. 2004. The role of Africa in the history of oscine passerines: molecular systematics of several 'enigmas'. *Cladistics* 20 (6): 586-586.

Bowie, R.C.K., Fjeldså, J., Hackett, S.J. & Crowe, T.M. 2004. Molecular Evolution in space and through time: mtDNA phylogeography of the Olive Sunbird (Nectarinia olivacealobscura) throughout continental Africa. *Molecular Phylogenetics and Evolution* 33:56-74.

Bowie, R.C.K., Fjeldså, J., Hackett, S.J. & Crowe, T.M. 2004. Systematics and biogeography of double-collared sunbirds from the Eastern Arc Mountains, Tanzania. *Auk* 121:660-681.

Brashares, J.S., Arcese, P., Sam, M.K., Coppolillo, P.B., Sinclair, A.R.E. & Balmford, A. 2004. Bushmeat hunting, wildlife declines, and fish supply in West Africa. *Science* 306:1180-1183.

Bruner, A.G., Gullison, R.E. & Balmford, A. 2004. Financial needs for comprehensive, functional protected area systems in developing countries. *BioScience* 54: 1119-1126. [UCT address omitted in error].

Burger, B.V., Reiter, B., Borzyk, O., Du Plessis, M.A. 2004. Avian exocrine secretions. I. Chemical characterization of the volatile fraction of the uropygial secretion of the green woodhoopoe, *Phoeniculus purpureus*. *Journal of Chemical Ecology* 30:1603-1611.

Covas, R., Brown, C.R., Anderson, M.D. & Brown, M.B. 2004. Juvenile and adult survival in the Sociable Weaver (*Philetairus socius*), a southern-temperate colonial cooperative breeder in Africa. *Auk* 121: 1199-1207.

Covas, R., Doutrelant, C. & du Plessis, M.A. 2004. Experimental evidence of a link between breeding conditions and the decision to breed or to help in a colonial cooperative bird. *Proceedings of the Royal Society London B* 271:827-832.

Covas, R., Huyser, O. & Doutrelant, C. 2004. Pygmy Falcon predation of nestlings of their obligate host, the Sociable Weaver. *Ostrich* 75:325-326.

Crowe, T.M. & Little, R.M. 2004. Francolins, partidges and spurfowls: what's in a name? *Ostrich* 75:199-203.

Curtis, O., Simmons, R. E. & Jenkins, A. R. 2004. Black Harrier *Circus maurus* of the Fynbos Biome, South Africa: a threatened specialist or an adaptable survivor? *Bird Cons. Int.* 14:233-245.

Cuthbert, R. 2004. Breeding biology of the Atlantic Petrel, *Pterodroma incerta*, and a population estimate of this and other burrowing petrels on Gough Island, South Atlantic Ocean. *Emu* 104 (3):221-228.

Cuthbert, R. 2004. Satellite (Platform Terminat Transmitters, PTT) Data Contributor: Tristan Albatross (Gough Island). In *Tracking Ocean Wanderers: the global distribution of albatrosses and petrals, results from the Global Procellariiform Tracking Workshop, 1-5*

September, 2003, Gordon's Bay, South Africa. Cambridge, BirdLife International. 13-14, 89-90.

Cuthbert, R. & Hilton, G. 2004. Introduced house mice *Mus musculus*: a significant predator of threatened and endemic birds on Gough Island, South Atlantic Ocean? *Biological Conservation* 117:483-489.

Cuthbert, R., Hilton, G., Ryan, P.G. & Tuck, G.N. 2004. At-sea distribution of breeding Tristan albatrosses *Diomedea dabbenena* and potential interactions with pelagic longline fishing in the South Atlantic Ocean. *Biological Conservation* 121:345-355.

Cuthbert, R., Sommer, E., Ryan, P.G., Cooper, J. & Hilton, G. 2004. Demography and conservation of the Tristan albatross *Diomedea* [*exulans*] *dabbenena. Biological Conservation* 117:471-481.

Dean, W.R.J. 2004. Book Review: The birds of Morocco (an annotated checklist) by Michel Thévenot, Rae Vernon and Patrick Bergier. *Ostrich* 75:184-185.

Dean, W.R.J. 2004. In memoriam: Richard Liversidge, 1926-2003. *Auk* 121:603-603.

Dean, W.R.J. 2004. *Nomadic desert birds*. Springer, Berlin. 185 p.

Dean, W.R.J. & Milton, S.J. 2004. Pre-1950 breeding records for vultures (Accipitridae) in southern Africa. *VultureNews* 51:54-59

de Juana, E., Suárez, F. & Ryan, P.G. 2004. Family Alaudidae (Larks). In: del Hoyo, J., Elliott, A. & Christie, D. (eds). *Handbook of the Birds of the World, Vol. 9.* Lynx, Barcelona. Pp. 496-541.

Doutrelant, C., Covas, R., Caizergues, A. & du Plessis, M.A. 2004. Unexpected sex ratio adjustment in a colonial cooperative bird: pairs with helpers produce more of the helping sex whereas pairs without helpers do not. *Behavioural Ecology & Sociobiology* 56:149-154.

Evans, B.S., Sweijd, N.A. Bowie, R.C.K., Cook, P.A. and Elliott, N.G. 2004. Population genetic structure of the perlemoen *Haliotis midae* in South Africa: evidence of range expansion and founder events. *Marine Ecology Progress Series* 270:163-172.

Fairbanks, D.H.K. 2004. Regional land-use impacts affecting avian richness patterns in Southern Africa – insights from historical avian atlas data. *Agriculture, Ecosystems and Environment* 101:269-288.

Fairbanks, D.H.K., Hughes, C.J. & Turpie, J.K. 2004. Potential impact of viticulture expansion on habitat types in the Cape Floristic Region, South Africa. *Biodiversity and Conservation* 13:1075-1100.

Grémillet, D., Dell'Omo, G., Ryan, P.G., Peters, G., Ropert-Coudert, Y & Weeks, S.J. 2004. Offshore diplomacy, or how seabirds mitigate intra-specific competition: a case study based on GPS tracking of Cape gannets from neighbouring colonies. *Marine Ecology Progress Series* 268:265-279.

Herrmann, E. 2004. Common Fiscal *Lanius collaris* preying on a Cape Serotine Bat *Eptesicus capensis*. *Ostrich* 75:333.

Herrmann, E., Anderson, M.D. and Seaman, M. 2004. Occurrence and abundance of waterbirds at an ephemeral pan in the Northern Cape Province, South Africa. *Ostrich* 75:275-284.

Hockey, P.A.R. 2004. Predicting migratory behaviour in landbirds. In: R. Greenberg & P.P. Marra. (eds). *Birds of two worlds: the ecology and evolution of migration* Baltimore, John Hopkins University Press. ISBN 0801881072. 466 p.:53-62.

Hudak, A.T., Fairbanks, D.H.K. & Brockett, B.H. 2004. Trends in fire patterns in a southern African savanna under alternative land use practices. *Agriculture, Ecosystems and Environment* 101:307-325.

Lepage, D. & Lloyd, P. 2004. Avian clutch size in relation to rainfall seasonality and stochasticity along an aridity gradient across South Africa. *Ostrich* 75:259-268.

Little, R.M. & Crowe, T.M. 2004. Effects of a predator control experiment on Grey-winged Francolin (*Scleroptila africanus*) populations. *Ostrich* 75:285-287.

Lloyd, P. 2004. Comparative breeding success of Yellow Bishop *Euplectes capensis* in two adjoining habitats. *Ostrich* 75:327-328.

Lloyd, P. 2004. Eight-to ten-day incubation and nestling periods among *Eremopterix* sparrow-larks. *Ibis* 146:347-350.

Lloyd, P. 2004. Variation in nest predation among arid-zone birds. *Ostrich* 75:228-235.

Malan, G. 2004. The relative influence of prey abundance and co-breeders on the reproductive performance of polyandrous Pale Changing-Goshawks. *Ostrich* 75:44-51.

Mandiwana, T. 2004. Taxonomy, phylogenetics and biogeography of Red-wing (Scleroptila spp.) Francolins (family Phasianidae, order Galliformes). *Cladistics -The International Journal of the Willi Hennig Society* 20: 88-89.

Mills, M.S.L. 2004. Bird community responses to savanna fires: should managers be concerned? *South African Journal of Wildlife Research* 34:1-11.

Mills, M.S.L., Boix-Hinzen, C. & du Plessis, M.A. 2004. Live or let live: life-history decisions of the breeding femaile Monteiro's Hornbill *Tockus monteiri*. *Ibis Online First.*

Milton, S.J. and Dean, W.R.J. 2004. Adaptations in desert organisms: even the bad times may be good. *South African Journal of Science* 100: 405-407.

Mwangi, P.N., Milewski, A. & Wahungu, G.M. 2004. Mineral licks used by African elephants in Aberdares National Park, Kenya. *Pachyderm* 37:59-67.

Nalwanga, D., Lloyd, P., du Plessis, M.A. & Martin, T.E. 2004. The influence of nest-site characteristics on the nesting success of the

Karoo Prinia (*Prinia maculosa*). *Ostrich* 75:269-274.

Nalwanga, D., Lloyd, P., du Plessis, M. & Martin, T.E. 2004. Nest-site partitioning in a strandveld shrubland bird community. *Ostrich* 75:250-258.

Neke, K.S. & du Plessis, M.A.2004. The threat of transformation: quantifying the vulnerability of grasslands in South Africa. *Conservation Biology* 18:466-477.

Nel, D. & Ryan, P.G. 2004. Satellite (Platform Terminat Transmitters, PTT) Data Contributors: Wandering and Grey-headed Albatross (Marion Island). In *Tracking Ocean Wanderers: the global distribution of albatrosses and petrals, results from the Global Procellariiform Tracking Workshop, 1-5 September, 2003, Gordon's Bay, South Africa*. Cambridge, BirdLife International. 64-66.

Prendini, L., Crowe, T.M. & Wheeler, W.C. 2004. Burrowing scorpion phylogeny and the evolution of Paleodrainage systems in southern Africa. *Cladistics* 20:93.

Radford, A.N. 2004. Incubation feeding by helpers influences female nest attendance in the green woodhoopoe, *Phoeniculus purpureus*. *Behavioral Ecology and Sociobiology* 55:583-588.

Radford, A.N. 2004. Vocal mediation of foraging competition in the cooperatively breeding green woodhoopoe (*Phoeniculus purpureus*) Behavioral Ecology and Sociobiology 56:279-285.

Radford, A.N. 2004. Voice breaking in males results in sexual dimorphism of green woodhoopoe calls. *Behaviour* 141:555-569.

Radford, A.N. & du Plessis, M.A. 2004. Extreme sexual dimorphism in Green Woodhoopoe (*Phoeniculus purpureus*) bill length: a case of sexual selection? *Auk* 121:178-183.

Radford, A.N. & du Plessis, M.A. 2004. Green woodhoopoe *Phoeniculus purpureus* territories remain stable despite group-size fluctuations. *Journal of Avian Biology* 35:262-268.

Richardson, D.M., Cambray, J.A., Chapman, R.A., Dean, W.R.J., Griffiths, C.L., Le Maitre, D.C., Newton, D.J. & Winstanley, T.J. 2003. Vectors and pathways of biological invasions in South Africa: past, present and future. In G.M. Ruiz & J.T. Carlton *(eds). Invasive Species: vectors and management strategies* edited by, Washington, Island Press. 292-349.

Ropert-Coudert, Y., Grémillet, D., Ryan, P.G., Kato, A., Naito, Y. & Le Maho, Y. 2004. Between air and water: the plunge dive of the Cape Gannet *Morus capensis. Ibis* 146:281-290.

Ropert-Coudert, Y., Grémillet, D., Kato, A., Ryan, P.G., Naito, Y. & Le Maho, Y. 2004. A fine-scale time budget of Cape Gannets provides insights into the foraging strategies of coastal seabirds. *Animal Behaviour* 67:985-992.

Ryan, P.G. 2004. Nest sites and clutch sizes of House Sparrows at Dassen Island, South Africa. *Ostrich* 75:165-167.

Ryan, P.G. 2004. Pink-backed Pelicans feeding communally with Great White Pelicans. *Ostrich* 75:168.

Ryan, P.G., de Juana, E., Suárez, F., Alström, P. & Donald, P.F. 2004. Species accounts of Alaudidae. In: del Hoyo, J., Elliott, A. & Christie, D. (eds*) Handbook of the Birds of the World, Vol. 9.* Lynx, Barcelona. Pp. 542-601.

Ryan, P.G., Sinclair, I., Cohen, C., Mills, M.S.L., Spottiswoode, C.N. & Cassidy, R. 2004. The conservation status and vocalisations of threatened birds from the scarp forest of Cuanza Sul, Angola. *Bird Conservation International* 14:247-260.

Ryan, P.G., Petersen, S.L., Peters, G. & Grémillet, D. 2004. GPS tracking a marine predator: the effects of precision, resolution and sampling rate on foraging tracks of African Penguins. *Marine Biology* 145:215 – 223.

Ryan, P.G., Wright, D., Oatley, G., Wakeling, J., Cohen, C., Nowell, T.L., Bowie, R.C.K., Ward, V. & Crowe, T.M. 2004. Systematics of *Serinus* canaries and the status of Cape and Yellow-crowned Canaries inferred from mtDNA and morphology. *Ostrich* 75:288-294.

Sandwith, M.M. 2004. Book Review: Whose Bird? Men and women commemorated in the common names of birds by Beolens, B. & Watkins, M. *Ostrich* 75:78.

Simmons, R.E., Barnard, P., Dean, W.R.J., Midgley, G.F., Thuiller, W., & Hughes G. 2004. Climate change and birds: perspectives and prospects from southern Africa. *Ostrich* 75:295-308.

Spottiswoode, C., Herrmann, E., Rasa, O.A.E. & Sapsford, C.W. 2004. Co-operative breeding in the Pygmy Falcon *Polihierax semitorquatus. Ostrich* 75:322-324.

Spottiswoode C. & Moller A.P. 2004. Extrapair paternity, migration, and breeding synchrony in birds. *Behavioral Ecology* 15:41-57.

Tuck, G.N., Polacheck, T., Croxall, J.P., Weimerskirch, H., Ryan, P.G., Nel, D., Wayte, S. & Bulman, C.M. 2004. Modelling the impact of fishery incidental mortality on three populations of Wandering Albatross. In: G.N. Tuck. (ed). *A comprehensive study of the ecological impacts of the worldwide pelagic longline industry: southern hemisphere studies*. Hobart, CSIRO Marine Research, 243p. ISBN 187699679X pp. 149-223.

Turpie, J.K. 2004. The role of resource economics in the control of invasive alien plants in South Africa. *South African Journal of Science* 100:87-93.

Turpie, J.K. & Joubert, A.R. 2004. The value of flower tourism on the Bokkeveld Plateau – a botanical hotspot. *Development Southern Africa* 21(4):645-662.

Turpie, J.K., Winkler, H. & Midgley, G. 2004. Economic impacts of climate change of South Africa: a preliminary assessment of unmitigated damage costs. In: J. Blignaut & M. de Wit *(eds). Sustainable options: development lessons from applied environmental economics* Cape Town, UCT Press. 130-160.

Walker, A.L., Bowie, R.C.K., Ratcliffe, C.S. & Crowe, T.M. 2004. Fowl play: identification and management of hybridisation between wild and domestic Helmeted Guineafowl (*Numida meleagris*) in South Africa. *Ostrich* 75:195-198.

Wanless, R.M. 2003. Can the Aldabra White-Throated Rail *Dryolimnas cuvieri Aldabranus* fly? *Atoll Research Bulletin* 508:1-7.

Wichmann, M.C., Dean, W.R.J. & Jeltsch, F. 2004. Global change challenges the Tawny Eagle (*Aquila rapax*): modelling extinction risk with respect to predicted climate and land use changes. *Ostrich* 75:204-210.

Wiseman, R., Page, B.R. & O'Connor, T.G. 2004. Woody vegetation change in response to browsing in Ithala Game Reserve, South Africa. *South African Journal of Wildlife Management* 34:25-37.

Witt, A.B.R. & Samways, M.J. 2004. Influence of agricultural land transformation and pest management practices on the arthropod diversity of a biodiversity hotspot, the Cape Floristic Region, South Africa. *African Entomology* 12:89-95.

Scientific Publications 2005

Archibald, S., Bond, W.J., Stock, W.D. & Fairbanks, D.H.K. 2005. Shaping the landscape: Fire-grazer interactions in an African savanna. *Ecological Applications* 15: 96-109.

Balmford, A., Bennun, L., ten Brink, B., Cooper, D., Côté, I.M., Crane, P.,Dobson, A., Dudley, N., Dutton, I., Green, R.E., Gregory,R., Harrison, J., Kennedy, E.T., Kremen, C., Leader-Williams, N., Lovejoy, T., Mace, G., May, R., Mayaux, P., Phillips, J., Redford, K., Ricketts, T.H., Rodriguez, J.P., Sanjayan, M., Schei, P., van Jaarsveld, A. & Walther, B.A. 2005. Science and the Convention on Biological Diversity's 2010 target. *Science* 307: 212-213.

Balmford, A. & Bond, W. 2005. Trends in the state of nature and implications for human well-being. *Ecology Letters*. 8: 1218-1234.

Balmford A., Green R.E. & Scharlemann, J.P.W. 2005. Sparing land for nature: exploring the potential impact of changes in agricultural yield on the area needed for crop production. *Global Change Biology* 11 (10): 1594-1605.

Balmford, A., Crane, P., Dobson, A., Green, R.E. & Mace, G.M. 2005 The 2010 challenge: Data availability, information needs and extraterrestrial insights. *Philosophical Transactions of the Royal Society B-Biological Sciences* 360: 221-228 .

Beresford, P., Barker, F.K., Ryan, P.G. & Crowe, T.M. 2005. African endemics span the tree of songbirds (Passeri): molecular systematics of several evolutionary 'enigmas'. *Proceedings of the Royal Society B* 272:849-858.

Bomhard, B., Richardson, D.M., Donaldson, J.S., Hughes, G.O., Midgley, G.F., Raimondo, D.C., Rebelo, A.G., Rouget, M. & Thuiller, W. 2005. Potential impacts of future land use and climate change on the Red List status of the Proteaceae in the Cape Floristic Region, South Africa. *Global Change Biology* 11:1452-1468.

Bowie, R.C.K., Voelker, G., Fjeldså, J. Lens, L., Hackett, S.J. and Crowe, T.M. 2005. Systematics of the olive thrush *Turdus olivaceus* species complex with reference to the taxonomic status of the endangerd Taita thrush *T. helleri. Journal of Avian Biology* 36:391-404.

Bragg, C.J., Donaldson, J.D. & Ryan, P.G. 2005. Density of Cape porcupines in a semi-arid environment and their impact on soil turnover and related ecosystem processes. *Journal of Arid Environments* 61:261-275.

Covas, R. and du Plessis, M.A. 2005. The effect of helpers on artificially increased brood size in sociable weavers *(Philetairus*

socius). Behavioural Ecology and Sociobiology 57:631-363.

Curtis, O., Malan, G., Jenkins, A. & Myburgh, N. 2005. Multiple-brooding in birds of prey: South African Black Sparrowhawks Accipiter melanoleucus extend the boundaries. *Ibis* 147:11-16.

Cuthbert, R., Hilton, G., Ryan, P. & Tuck, G.N. 2005. At-sea distribution of breeding Tristan albatrosses *Diomedea dabbenena* and potential interactions with pelagic longline fishing in the South Atlantic Ocean. *Biological Conservation* 121:345-355.

Danielsen, F., Burgess, N.D. & Balmford, A. 2005. Monitoring Matters: Examining the Potential of Locally-based Approaches. *Biodiversity & Conservation* 14:2507-2542.

Dean, W.R.J. 2005. The type locality of the Hadeda Ibis *Bostrychia hagedash* (Latham) Bulletin of the British Ornithologists' Club 125:42-43.

Dean, W.R.J. & Milton, S.J. 2005. Stomach contents of birds (Aves) in The Natural History Museum, Tring, United Kingdom, collected in southern Africa, northern Mozambique and Angola. *Durban Museum Novitates* 30:15-23.

Dean, W.R. & Williams. J.B. 2005. Adaptations of birds for life in deserts with particular reference to Larks (Alaudidae). *Transactions of the Royal Society of South Africa* 59:79-51.

De Villiers, M.S., Cooper, J. & Ryan, P.G. 2005. Individual variability of behavioural responses by Wandering Albatrosses (*Diomedea exulans*) to human disturbance*. Polar Biology* 28:255-260.

Du Plessis, M.A. & Sandwith, M.M. 2005. Book review: The Birds of Africa Vol 7, Sparrows to Buntings. *Ostrich* 76:95.

Green, R.E., Cornell,.SJ., Scharlemann, J.P.W. & Balmford, A. 2005 Farming and the fate of wild nature *Science* 307: 550-555 .

Green, R.E., Cornell, S.J., Scharlemann, J.P.W. & Balmford, A. 2005. The future of farming and conservation. Response. *Science* 308: 1257-1258.

Hockey, P.A.R. 2005. Predicting migratory behavior in landbirds. In Birds of two worlds edited by R. Greenberg & P.P. Marra. Baltimore, The Johns Hopkins University Press. Pp 53-62.

Jansen, R. & Crowe, T.M. 2005. Relationships between breeding activity and rainfall for Swainson's Suprfowl, Pternistis swainsonii, within southern Africa, with specific reference to the Springbok Flats, Limpopo Province, South Africa. *Ostrich* 76:190-194.

Jenkins, A.R. & van Zyl, A.J. 2005. Conservation status and community structure of cliff-nesting raptors and ravens on the Cape Peninsula, South Africa. *Ostrich* 76:175-184.

Little, I.T., Little, R.M., Jansen, R. & Crowe, T.M. 2005. Winter bird assemblages, species richness and relative abundance at a re-vegetated coal mine in the Middelburg district, Mpumalanga province, South Africa. *South African Journal of Wildlife Management* 35:13-22

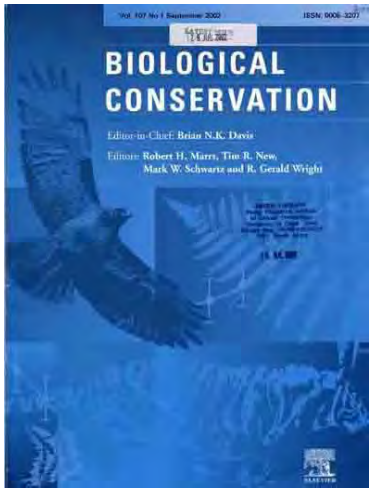
Lloyd, P., Martin, T.E., Redmond, R.L., Langner, U. & Hart, M.M. 2005. Linking demographic effects of habitat fragmentation across landscapes to continental source-sink dynamics. *Ecological Applications* 15:1504-1514.

Machange, R.W., Jenkins, A.R. and Navarro, R.A. 2005. Eagles as indicators of ecosystem health: Is the distribution of Martial Eagle nests in the Karoo, South Africa, influenced by variations in land-use and rangeland quality? *Journal of Arid Environments* 63:*223-243* .

Malan, G. 2005. Reproductive partitioning among polyandrous alpha and beta pale chanting-goshawk males. *African Zoology* 40:213-222.

Mills, M.S.L., Boix-Hinzen, C. & du Plessis, M.A. 2005. Live or let live: life-history decisions of the breeding female Monteiro's Hornbill *tockus monteiri. Ibis* 147:48-56.

Mills, M.S.L. & Ryan, P.G. 2005. Modelling impacts of long-line fishing: what are the effects of pair-bond disruption and sex-biased mortality on albatross fecundity? *Animal Conservation* 8:359-367.

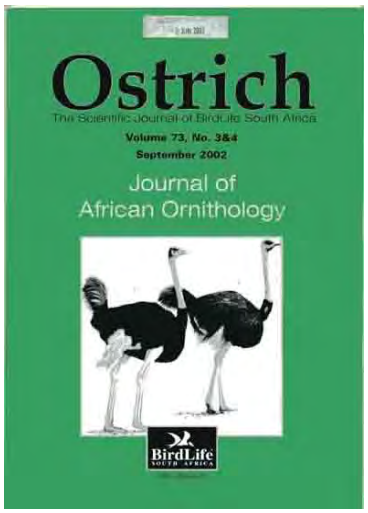


Milton, S.J., Dean, W.R.J. & Leuteritz, Th.E.J. 2005. Opportunistic and multiple breeding attempts in plants and vertebrates of semi-deserts with unpredictable rainfall events through the year. *Transactions of the Royal Society of South Africa* 59:43-53.

Muchai, M. & du Plessis, M.A. 2005. Nest predation of grassland bird species increases with parental activity at the nest. *Journal of Avian Biology* 36(2): 110-116.

Prinsloo, H.C., Harley, V., Reilly, B.K. & Crowe, T.M. 2005. Sex-related variation in morphology of helmeted guineafowl (*Numida meleagris*) from the Riemland of the northeastern Free State, South Africa. *South African Journal of Wildlife Research* 35:98-96.

Radford, A.N. 2005. Group-specific vocal signatures and neighbour-stranger discrimination in the cooperatively breeding green woodhoopoe. *Animal Behaviour* 70:1227-1234.



Roupert-Coudert, Y., Grémillet, D., Gachot-Neveu, H., Lewis, S. & Ryan, P.G. 2005. Seeking dimorphism in monomorphic species: the lure of the Gannet's mask. *Ostrich* 76:212-214.

Roxburgh, L. and Nicolson, S. W. 2005 Patterns of host use in two African mistletoes: the importance of mistletoe–host compatibility and avian disperser behaviour. *Functional Ecology* 19:865–873.

Ryan, P.G. and Marshall, H.K. 2005. Variation in the wing-clapping display of Clapper Larks. *Ostrich* 76:73-77.

Ryan, P.G. and Sinclair, I. 2005. Mussulo – an important shorebird wintering site in Angola. Wader Study Group Bulletin 108:1.

Simmons, R.E. 2005. Declining coastal avifauna at a diamond mining site in Namibia: comparisons and causes. *Ostrich* 76:97-103.

Simmons, R.E., Du Plessis, M.A. & Hedderson, T.A.J. 2005. Seeing the Woodhoopoe for the trees: should we abandon Namibia's Violet Woodhoopoe as a species? *Ibis* 147 222-224.

Semi-popular Publications 2004

Bomhard, B. & Jack, K. 2004. Caves under fire! *African Wildlife* 58:18-19.

Cohen, C., Mills, M.S.L. & Spottiswoode, C. 2004. Angola's mountain endemics emerge. *Africa Birds and Birding* 9(2):16-17.

Curtis, O. & Koeslag, A. 2004. Forest enigma. *Africa Birds and Birding* 9(2):46-52.

Du Plessis, M. 2004. Penvere. Pretoria, Protea Boekhuis..

Jenkins, A. 2004. Comment: Tern on Falcon Menu. *Promerops* 260:16.

Jenkins, A. 2004. Focus on birds – Burchell's Starling. *Africa Birds and Birding* 9(1):26.

Jenkins, A. 2004. Future prospects for the continent's birds of prey. *Africa Birds and Birding* 9(5):42.

Jenkins, A. 2004/5. Raptors in the firing line. *Africa Birds and Birding* 9(6)24.

Jenkins, A., de Goede, K. & van Rooyen, C. 2004. Managing problem Eagles and solving Eagle's problems. *Promerops* 260:8-9

Milewski, A.V. & Kennedy, M.E. 2004. A myth in focus: does the biggest bird really have the biggest eye? *African Wildlife* 58:8-9.

Milewski, A. 2004. Supersize Moa. *Australian Sc*ience 25:17-20.

Milewski, A. 2004. Why no termite bird? Wingspan 14:16-19

Mills, M.S.L. & Cohen, C. 2004. Birding Cameroon, part 2. Southern Cameroon: forests, low to lofty. *Bulletin of the African Bird Club* 11:51-58.

Mills, M.S.L., Cohen, C. & Spottiswoode, C. 2004. Little-known African bird: Gabela Akalat, Angola's long-neglected *Gabelatrix. Bulletin of the African Bird Club* 11:149-151.

PFIAO. 2004. The Black Harrier Research Project. *Africa Birds and Birding* 9(1):15.

PFIAO. 2004. Mining for birds. *Africa Birds and Birding* 9(2):12.

PFIAO. 2004. Why more eggs can mean fewer descendants. *Africa Birds and Birding* 9(3):12

PFIAO. 2004. A feather in the Fitztitute's cap. *Africa Birds and Birding* 9(4):12

PFIAO. 2004. Cranes in the field. *Africa Birds and Birding* 9(5):19.

PFIAO. 2004. What are wood-hoopoes shouting about? *Africa Birds and Birding* 9(6):19.

Ryan, P.G. 2004. Current threats: conserving albatrosses. *Africa Birds and Birding* 9(1):38-45.

Ryan, P.G. 2004. Love conquers all: Big Bird Race update. *Africa Birds and Birding* 9(4):21.

Sandwith, M.M. 2004. A tail of a tale. *Promerops* 257:13.

Simmons, R.E. 2004. Blood brothers: the mystery of killing kin in the nest. *Africa Birds and Birding* 9(3):43-48

Simmons, R.E. 2004. The last grasp: death by cartwheeling. *Africa Birds and Birding* 9(5):16.

Simmons, R.E. 2004. Namaqualand – Black Harrier country. *Promerops* 260:15.

Simmons, R.E. 2004. Red Data Book draft – Martial Eagle. *Lanioturdus* 37(2):27-32.

Simmons, R.E. 2004. Red Data Book draft – Tawny Eagle. *Lanioturdus* 37(3/4):19-25.

Sinclair, I., Spottiswoode, C., Cohen, C., Mills, M.S.L., Cassidy, R. vaz Pinto, P. & Ryan, P.G. 2004. Birding western Angola. *Bulletin of the African Bird Club* 11:152-160.

Spottiswoode, C. 2004. Sociable-lising in Namibia. *Lanioturdus* 37(2):25-26.

Underhill, L., du Plessis, M.A. & Cohen, C. 2004. Flaws in bird report for proposed toll road. *Africa Birds and Birding* 9(4):10.

Underhill, L., du Plessis, M.A. & Cohen, C. 2004. R300 bird report flawed. *Promerops* 260:6.

Semi-popular Publications 2005

Anderson, S. & Cohen, C. 2005. The western Cape: an 'essential birding' destination. *BirdLife South Africa News*, April/May: 6-8 & *Africa Birds and Birding* 10(2):76-78.

Anderson, S. & Cohen, C. 2005. The western Cape: an 'essential birding' destination, part 2. *BirdLife South Africa News,* June/July: 6-7 & *Africa Birds and Birding* 10(3):76-77.

Angua, M. 2005. The story of the old man saltbush in the Karoo. *African Wildlife* 59:38-39.

Biggs, D. 2005. Bird- and ecotourism-based participatory biodiversity conservation in Africa. *BirdLife South Africa Research Series No. 2.* BirdLife South Africa, Johannesburg.

Biggs, D. 2005. Birding and touring Argentina. http://www.birdtours.co.uk/tripreports/argentina/arg11/argentina-feb-05.htm.

Cohen, C., Spottiswoode, C., Mills, M. & Murison, G. 2005. Kirsten Louw: 20 February 1979 – 12 May 2005 *Promerops* 263:4-5.

Crowe, T.M. 2005. DNA and taxonomy? *Quest* 1:37.

Du Plessis, M.A. 2005. Eggs over easy: comment. *Africa Birds and Birding* 10(3):32.

Du Plessis, M.A. 2005. Red-winged Starlings that breed in the urban environment. *Promerops* 263:16.

Du Plessis, M.A. 2005. Jakkalsvoël straal positiewe gesindheid uit. *Beeld* 6 August 2005.

Du Plessis, M.A. 2005. Kamoefleervere nodig ná seisoen van plesier. *Beeld* 5 November 2005.

Du Plessis, M.A. 2005. Miskien kan ons 'n les by dié voëls leer? *Beeld* 3 December 2005

Du Plessis, M.A. 2005. Venynige liefdespel. *Die Burger* 28 June 2005.

Du Plessis, M.A. 2005. Mylpaal vir SA voëlkennis. *Die Burger* 23 August 2005

Du Plessis, M.A. 2005. Om 'n hadeda te wees is beslis nie vir sissies. *Die Burger* 30 August 2005.

Du Plessis, M.A. 2005. Rooivink-manewales. *Die Burger* 27 September 2005.

Du Plessis, M.A. 2005. Voëls met 'n sin vir humor. *Die Burger* 29 November 2005.

Ebrahim, I., von Witt, C. & Cohen, C. 2005. Peacocks, ploughs and porcupines: the plight of the peacock moraeas. *Veld & Flora* 91:185-187.

Hockey, P. 2005. All birds have them … feathers. *Africa Birds and Birding* 10(5):30-39.

Hockey, P. 2005. Birders … a case for selective breeding? *Africa Birds and Birding* 10(6):56-57.

Hockey, P. 2005. Report KZN African Black Oystercatcher sightings. *Africa Birds and Birding* 10(6):79.

Hockey, P. & du Toit, R. 2005. In their element. *Africa Birds and Birding* 10(5):41-45.

Hockey, P. 2005. Righting the wrongs: the apostrophe and hyphenation confusion in birds' names. *Africa Birds and*

Birding 10(4):18.

Hockey, P. 2005. Book Review: Shorebirds of North America – the photographic guide. *Africa Birds and Birding* 10(4):22

Jenkins, A. 2005. Book Review: Soutpansberg-Limpopo birding. *Africa Birds and Birding* 10(4):23

Jenkins, A. 2005. Change can be a good thing. *Africa Birds and Birding* 10(3):40.

Jenkins, A. 2005. Food and shelter. *Africa Birds and Birding* 10(1):42.

Jenkins, A. 2005. The price of perfect produce. Africa Birds and Birding 10(1):38.

Jenkins, A. 2005. Raptors going forward. *Africa Birds and Birding* 10(4):52.

Jenkins, A. 2005. Update on the Eskom Electric Eagle Project. *Africa Birds and Birding* 10(6):30.

Jenkins, A. and Davies, R. 2005. Dying for a drink: running the raptor gauntlet at Kalahari waterholes. *Africa Birds and Birding* 10(4):34-45.

Milewski, A. 2005. The point of the clitoris. *Australasian Science* (January/ February):36-37.

Milewski, A. 2005. "A flower is a leaf, mad with love": the sex organs that are flowers. *Veld & Flora* June:80-81.

Milewski, A. 2005. When is an Impala hot to trot? *African Wildlife* 59:26-27

PFIAO. 2005. Birds and land-use in the southern Kalahari. *Africa Birds and Birding* 10(2):21.

PFIAO. 2005. Keeping tabby off the rails. *Africa Birds and Birding* 10(5):20.

PFIAO. 2005. Landing rights: crane conservation conundrums on South African farmland. *Africa Birds and Birding* 10(4):62-64.

PFIAO. 2005. The lo ng & the short of it. *Africa Birds and Birding* 10(1):23.

PFIAO. 2005. Raptor responses to habitat fragmentation. *Africa Birds and Birding* 10(4):19.

PFIAO. 2005. Running for cover: small birds as big players in South Africa's grassland conservation game. *Africa Birds and Birding* 10(5):50-51.

PFIAO. 2005. Shrinking papyrus swamps in Kenya. *Africa Birds and Birding* 10(3):23.

PFIAO. 2005. Top of the heap: eagle perspectives on farming practices in the Karoo. *Africa Birds and Birding* 10(6):28-30

PFIAO. 2005. Tracking threatened albatrosses off southern Africa. *Africa Birds and Birding* 10(6):19

Ryan, P.G. 2005. AZE Region Profile: Oceanic Islands. Spectacled petrol photograph.

Bird Conservation: December:18.

Ryan, P.G. 2005. Do birds migrate because they're stupid? *Africa Birds and Birding* 10(6):12.

Ryan, P.G. 2005. Inaccessible Conservation Projects. *Tristan da Cunha Newsletter*. March:10-11.

Ryan, P.G. 2005. The long & the short of it: are flamingos modified grebes? *Africa Birds and Birding* 10(6):11.

Ryan, P.G. 2005. On a wing and a prayer: birds at risk. *African Wildlife* 59:28-31.

Ryan, P.G. 2005. Ringeyes: the inaccessible petrel. *Africa Birds and Birding* 10(5):62-69.

Ryan, P.G. 2005. Southern Giant-Petrel (Macronectes giganteus). *Africa Birds and Birding* 10(1): Cover photo.

Ryan, P.G. 2005. Toughing it out: birding Sierra Leone. *Africa Birds and Birding* 10(6):32-38.

Ryan, P. 2005. Why Penguins no longer follow Ostriches: the new world order. *Africa Birds and Birding* 10(4):66-70.

Sandwith, M.M. 2005. Cape White-eye hosts Klaas's Cuckoo. *Promerops* 261:15.

Simmons R.E. 2005. A rare encounter with a Fisk's House Snake. *Africa Geographic* 13:20.

Simmons R.E. & Barnard P.E. 2005. Too hot to handle? The impact of climate change on African birds. *Africa Birds & Birding* 10(5):52-60.

Wanless, R. 2005. Don't judge a bird by its colour. *Africa Birds and Birding* 10(4):15.

Welz, A. & Jenkins, A. 2005. How green is the valley? Monitoring fish eagles along the Breede River. *Africa Birds and Birding* 10(1):30-37.

Seminars: July 1, 2004 - December 31, 2005

July 22, 2004
Eladio Garcia, Universidad Antononia de Madrid
Conserving bustards in an agricultural matrix: ongoing studies of little bustards Tetrax tetrax in Spain

August 6, 2004
Dr Graeme Cumming, University of Florida
A simple conceptual framework for conservation ecology

August 26, 2004
F.P.D. (Woody) Cotterill, University of Stellenbosch
Discovery of an Afrotropical Hotspot: combining data from natural science specimens and geomorphology to characterize biodiversity in evolving landscapes

September 21, 2004
Dr Rita Covas, University of Edinburgh
Life histories and immunocompetence in mainland and island birds from the gulf of Guinea
Anna Chalfoun, University of Montana
The influence of spatial context on nest predation risk

October 14, 2004
Dr Mandy Ridley, Cambridge University
Group/drongo interactions in the cooperatively breeding Pied Babbler

October 15, 2004
Dr Corine Eising, University of Groningen
Mother knows best: costs and benefits of maternal androgen allocation in birds

October 27, 2004 – AGM Seminars
Prof. Tim Crowe, PFIAO
A molecular perspective on the origins of some of southern Africa's most bizarre passerine birds.
Dr Rauri Bowie, University of Stellenbosch
Unravelling African biogeography: birds as a model system.
A/Prof. Paulette Bloomer, University of Pretoria
Molecular evolution of birds: from populations through to lineages.
Dr Andrew Balmford, Visiting Pasvolsky Professor of Conservation Biology
Linking people and conservation
Colleen Seymour, PFIAO
Landuse-induced changes to bird habitat in the Kalahari: Who's affected?
Ross Wanless, PFIAO
Introduced mammals at odds with seabird conservation on Gough Island
Kirsten Louw, PFIAO
Ecological correlates of migratory behaviours in Afrotropical birds
Samantha Peterson, PFIAO
Catch fish, not seabirds, turtles or sharks

November 10, 2004
Golo Maurer, Australian National University, Canberra
Sex-role reversal and testicular asymmetry: evolutionary clues from the Pheasant Coucal of Australia

November 23, 2004
Dr Nicole Geberzahn, Free University, Berlin
Late learning and memory activation: mechanisms of song convergence in adult nightingales (Luscina megarhynchos)

February 15, 2005
Dr Andrew Balmford, Visiting Pasvolsky Chair in Conservation Biology, PFIAO
Why conserving wild nature makes economic sense

February 28, 2005
Dr Mike Brooke, University of Cambridge
Towards prioritising the world's islands for the eradication of alien vertebrates … and more

February 28, 2005
Dr Phoebe Barnard, SANBI
Global environmental change and the future of African conservation biology

March 1, 2005
Dr Jon Hutton, Flora and Fauna International
Conservation and society: what will make our work relevant in modern South Africa

March 4, 2005
Helen Booker, RSPB
Restoring seabird populations on Lundy Island, UK

March 11, 2005
Dr Ben Hatchwell, Sheffield University
Kin selection and the evolution of cooperative breeding in long tailed tits

March 14, 2005
Dr Graeme Cumming, University of Florida
Conservation in theory and practice: paradigms, problems and people

March 18, 2005
Angua Mao, PFIAO
Freshwater conservation planning, where to from here
Philip Osano, PFIAO
Unravelling the hidden costs of biodiversity conservation: a case study of the Western Cape, South Africa
Sebataolo Rahlao, PFIAO
Long term vegetation changes in the succulent Karoo

April 5, 2005
Duan Biggs, PFIAO
Understanding the institutions, impacts and dynamics of community based aivtourism initiatives

April 12, 2005
Dr Richard Cuthbert, RSPB
The vulture conservation crisis in Asia and its relevance to Africa

May 11, 2005
Dr Lizanne Roxburgh, PFIAO
Infection patterns of African mistletoes: can they be predicted from bird dispersal behaviour

June 8, 2005
Markus Metz, University of Oldenburg, Denmark
Adaptative value of nestbuilding in Red Bishops Euplectes orix

July 11, 2005
Prof. Pat Monaghan, Glasgow University
Individual, cohort and area effects on population dynamics: implications for the conservation of rare birds

September 20, 2005
Anteneh Shemilis, University of Addis Abbaba
Predator-prey relationships in the Bale Mountains, Ethiopia

September 21, 2005
Martha Nelson, University of British Columbia
A shattered genome: exploring alternate genome organisation in the dinoflagellates

October 14, 2005
Dr John Bates, Field Museum, Chicago
PBEATRA: A collaboration between museums and research stations in the eastern Democratic Republic of Congo

Financial Report

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