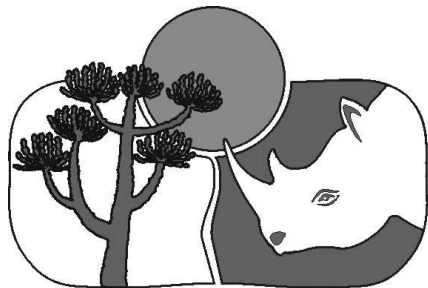


TERRESTRIAL ECOLOGY RESEARCH UNIT

ANNUAL REPORT 2003

University of Port Elizabeth



**TERRESTRIAL ECOLOGY
RESEARCH UNIT**



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INTRODUCTION

The formation of the Terrestrial Ecology Research Unit (TERU) was approved by the Council of the University of Port Elizabeth in 1991, in response to a need for terrestrial ecology training opportunities for postgraduate students and for terrestrial ecological research by conservation and environmental management agencies. TERU began operating in 1992, within the Zoology Department, and in 1997 it received Council recognition as a research unit within the Faculty of Science.

TERU comprises staff and postgraduate students of the Zoology and Botany Departments, with an Advisory Board comprising representatives of State, NGO and private conservation and environmental management interests.

This is the twelfth Annual Report and deals with the activities of TERU during 2003.

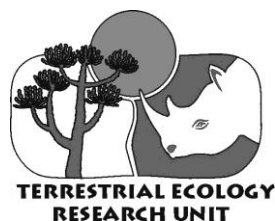
VISION

The Vision of TERU is to achieve, by 2006, national and international recognition as a terrestrial ecology research and postgraduate training unit of excellence.

MISSION

The Mission of TERU is to develop scientific knowledge of the ecology and conservation of terrestrial ecosystems, especially in the Eastern Cape and adjacent regions of high biodiversity, which will enable communities to make wise environmental management decisions. In achieving its Mission TERU will build human capacity through postgraduate training.

The mission and vision of the Terrestrial Ecology Research Unit were formulated in the context of the University of Port Elizabeth's mission and strategic directions, which the Unit is committed to the achievement of, in the context of the fields in which TERU operates.



DIRECTOR' S REPORT

The year 2003 was another bumper year for TERU in terms of outputs. A total of 22 refereed scientific articles, a book chapter, 3 contributions in conference proceedings, 13 reports, and 6 popular articles were published, and 33 conferences presentations were delivered. Furthermore, 2 honours students, 10 MSc students and 4 PhD students participated in TERU research programmes during 2003. In addition, Adri Barkhuysen (MSc) graduated in 2003 and Richard Lechmere-Oertel's PhD was approved. These levels of productivity are very high for such a small research unit, and reflect the quality and commitment of our staff and students. Although everyone in TERU has more than pulled their weight, I would like to recognize in particular the contribution by Richard Cowling to TERU's productivity.

For the first time in a number of years, TERU's funding base has declined, although it is still in excess of R2.5 million, a very respectable amount. This decline reflects the reduced input of the two Global Environment Facility/World Bank projects, with the Conservation Farming project finishing off in 2003, while the STEP project will be finishing in 2004 – thus the decline in funding is a reflection of normal funding cycles. It is therefore appropriate that new projects be identified and funding obtained. A number of such initiatives are underway, and I am pleased to report that the International Fund for Animal Welfare is funding a new project on elephant conservation biology. TERU is therefore committed to maintaining its profile and productivity through a sound funding base.

A highlight (albeit noisy and dusty) of the year has been the building operations, through which the redundant space in the Plant Room adjacent to TERU has been renovated. This provides a suite of five new offices for TERU, as well as an open working area. In addition, the University built four new garages for TERU's vehicles. These developments represents a major investment by the University in TERU, and I would like to thank the Vice-Chancellor, Dr Rolf Stumpf, and the Head of Technical Services, Mr. Stuart Blignaut, for the roles that they played in making this all happen. We look forward to putting these resources to good use.

The recruiting of postdoctoral staff is a relatively recent development for TERU, but is starting to pay off very well. In 2003, three postdocs (Serban Proches, Wayne Linklater and Matt Hayward) were based in TERU, and their enthusiasm, commitment and research expertise significantly boosted not only TERU's ability to do science and train postgraduates, but they also played an important role in terms of outputs. We are sad to be losing Zoe Brocklehurst and Lawrence Wahlberg, whose contracts for the black rhino project end in December, and I would like to thank them for their contribution to this project.

Although TERU has been able to increase our research outputs, this has not been without a cost to staff and students, due to the lack of administrative support for the Unit's activities. It is therefore apparent that the lack of such support is a severe obstacle to the future growth of the Unit, particularly in the light of the new facilities. Obtaining such support must be a priority for TERU.

It remains for me to thank the staff and students most sincerely for their hard work, enthusiasm and commitment to achieving TERU's goals. In particular I would like to thank André Boshoff, Richard Cowling and Sharon Wilson for their hard work, leadership roles and willingness to provide support and advice to myself and the Unit. André Boshoff served as Acting-Director for the first semester of 2003 while I was on sabbatical, and I am truly appreciative of his willingness to do so, as well as the outstanding way he kept the Unit focused and productive in this period. In addition, a special word of thanks goes to all the funding agencies, particularly the University of Port Elizabeth, that support TERU's training and research facilities.

Prof. Graham I H KERLEY
DIRECTOR: TERRESTRIAL ECOLOGY RESEARCH UNIT

AWARDS

- Andrew Knight was awarded a grant by Cambridge University to attend the 4th International Student Conference on Conservation Science, in Cambridge, UK.
- Mariette Bause, Marietjie Landman and Rebecca Sims-Castley were all awarded Prestige National Research Foundation Bursaries.
- Richard Cowling maintained his A rating with the National Research Foundation, being clear recognition of his international leadership.
- Richard Cowling was awarded the Wildlife and Environment Society of South Africa Gold Medal and was awarded the Silver Medal of the South African Association of Botanists.
- Graham Kerley and Richard Cowling were recognized as being in the "Top Twenty Researchers" at the University of Port Elizabeth.

STEP: A FLAGSHIP PROJECT FOR TERU

Subtropical thicket vegetation (also known as valley bushveld), is a prominent feature of the Eastern Cape. It is a critically important resource for the angora and boergoat farming industries in the region, as well as for the growing number of ventures associated with the non-consumptive and consumptive use of game, for example ecotourism, trophy and meat hunting and game breeding. These industries are worth many millions of rands annually, and they provide direct or indirect jobs for many thousands of people. Thicket also contains plant and animal biodiversity that is of national and global importance.

There has been increasing concern that, owing to a range of factors, especially unsustainable management practices, the plant cover provided by thicket is decreasing significantly, leading to desertification and loss of production potential in many areas.

Funding was obtained by TERU to research the causes and extent of the decline of thicket, and to compile a plan to promote the conservation of this valuable resource. This led to the Subtropical Thicket Ecosystem Planning (STEP) project, funded by the Global Environment Facility in Washington, USA, and implemented through the World Bank. The project, which commenced in July 2000 and will end in June 2004, covers an area of 105 500 km².

The STEP team – comprising leading specialists in the biological, ecological, conservation planning and social fields – worked closely with key stakeholders from local, regional and national government, conservation parastatals, NGOs and representatives of the formal and informal agricultural sectors.

Key outcomes and products from STEP include the following (all products available at <http://cpu.uwc.ac.za>).

- A detailed map of 112 types of thicket vegetation; previously only 5 types were recognised.
- 1558 types of plants recorded, of which some 20% are endemic (i.e. occur here and nowhere else in the world), and a highly diverse (48 species) array of the medium- to large-sized terrestrial mammals (both herbivores and carnivores), occur.
- Agriculture, urbanisation, afforestation and alien invasive plants have transformed 16% of the land in the STEP area, and a further 12% has been severely degraded by overgrazing.
- A Conservation Priority Map that depicts areas where sustainable and biodiversity-friendly land-use practices are essential if thicket is to survive into the future.
- A Handbook, and associated Mapbook, that presents the Conservation Priority Map in a user-friendly format to municipalities, where sophisticated planning capacity is often lacking. The Handbook promotes integration of the natural environment into land-use decisions at local government level, through incorporation into the Spatial Development Frameworks of municipal Integrated Development Plans.
- A Framework and Co-operative Strategy for conserving landscapes and enhancing livelihoods. This product straddles the conservation assessment

phase of STEP and the ensuing implementation phase; the latter is being co-ordinated by the National Botanical Institute.

By employing highly innovative concepts, principles and techniques, the STEP team has delivered a set of products that are widely regarded as being of world class. For the first time, biodiversity information has been produced in a format that can be easily incorporated into spatial planning frameworks. This has given planners in the STEP region a huge advantage in complying with the terms of South Africa's new Biodiversity Bill. The STEP products have significant implications for the maintenance of a sustainable biodiversity-based economy, that offers many opportunities for socio-economic development.

The STEP project represents a significant contribution by TERU and UPE to civil society.

RESEARCH ACTIVITIES

Research activities are grouped into themes, and are reported within these on a biome or project specific basis.

CONSERVATION BIOLOGY

This theme seeks to identify priorities in terms of areas and implementation options for the efficient and effective long-term conservation of populations, species, habitats, and the ecological and evolutionary processes that maintain them.

Elephant: Anna Whitehouse continues to play a role, as a research associate, in the elephant research programme and has now published all the papers arising from her PhD research. The IFAW-funded programme on "Elephants as keystone species" was initiated this year, and Katie Gough joined the programme as an MSc candidate. She has developed a research proposal dealing with association patterns of elephants in relation to their degree of relatedness and has commenced fieldwork. An exciting outcome of this programme is the development, in collaboration with "Just Blue" (a software company), of an identification key and database management software programme, and Katie has been populating and testing this programme. The vision is to develop a user-friendly laptop-based system that can be used by researchers and laypeople to identify all the Addo elephants. The opportunity to apply this software to other species also exists.

Black rhinoceros: Wayne Linklater's post-doctoral research programme on black rhino translocation biology and olfactory communication continued into its 3rd year, with ongoing support from the Center for the Reproduction of Endangered Species (San Diego Zoological Society - CRES/ZSSD). The programme consists of three concomitant projects: post-release, donor population dynamics, and captive/boma studies. Post-release studies were completed at four game ranches in Namibia, continued at Mauricedale Game Ranch, and started at four new sites last year; Kleinvlakte and Nyati (AENP), and Maremani and Thaba Tholo Game Ranches. Studies of donor population dynamics began in earnest last year with the field programme establishing itself in Hluhluwe-iMfolozi Park

(HiP). Vegetation and browser community measurements have begun in the park and are proceeding in tandem with an analysis of the park's historical sightings, removals and patrol database to explore temporal and spatial relationships between black rhino, other browsers, vegetation change, and the rhino removal regime. Boma studies of olfactory discrimination by the six black rhino housed at HiP bomas in 2003 continued to slowly build a workable sample size. The research programme also participated in three ancillary, but related, collaborations in 2003; white rhino capture stress and reproduction (with Nancy Czekala – CRES/ZSSD), white rhino scent discrimination (with Ron Swaisgood, CRES/ZSSD), and an analysis of post-translocation survival and fecundity with the Rhino Management Group (with Keryn Adcock, Richard Emslie and Martin Brooks), that will be completed in 2004.

Marietjie Landman successfully upgraded her MSc project to PhD level, allowing her the opportunity to extend her study on the foraging ecology of the black rhinos. She has been focusing largely on the interactions between elephants and black rhino in terms of forage availability. Her research shows that in the Addo Elephant National Park the cumulative impact of elephants has contrasting effects on forage availability for rhinos, these being facilitation and competition. Thus elephants initially increase forage availability, through opening up the vegetation, but subsequently the elephants decrease forage availability. Marietjie was invited to the 3rd International Wildlife Management Conference in New Zealand to present these findings.

STEP (Subtropical Thicket Ecosystem Planning) project: This is one of TERU's flagship projects, and has been reported separately. TERU members of the STEP team are: André Boshoff (Project Co-ordinator), Sharon Wilson (Project administrator), Richard Cowling (Conservation Planning Co-ordinator), Graham Kerley (Mammal Specialist), Andrew Knight (Implementation Specialist), Rebecca Sims-Castley (GIS Specialist). André, Richard and Graham also served on the STEP Technical Committee.

Taking the Next STEP: Towards Opportunities for the Conservation of Subtropical Thicket in the Fish River Catchment: Providing the foundation for his MSc research into the successful implementation of conservation action from regional planning projects, Andrew Knight delivered several components of the implementation component of the STEP Project. These included a revised Conservation Planning Framework to better integrate the conservation assessment and implementation components of STEP, the Implementation Strategy developed co-operatively with over 60 stakeholders at a workshop in April 2003, and the development of a model of ecologically sustainable land management known as the Megaconservancy Network concept. The second half of his research programme has begun to develop and critique the implementation of STEP through the scheduling and implementation of the Fish-Kowie Megaconservancy Network in the Great Fish River Catchment. Andrew was invited to present his approach to planning for implementation at the Vth World Parks Congress held in Durban in September 2003.

Baviaanskloof Conservation Area: The project is now being undertaken by the Baviaanskloof Project Management Unit of the Wilderness Foundation, and TERU has been supporting the project through the provision of advice and data.

In addition TERU is represented on the Baviaanskloof Steering Committee, which oversees this project.

GAENP (Greater Addo Elephant National Park) Project: TERU continued to support SANParks, in the development of the Greater Addo Elephant National Park, serving on the Addo Planning Forum.

Systematic conservation planning: a new vision for the marine environment. Mariette Bause (née (Wheeler) has made excellent progress with her MSc project, which aims to apply the principles and practices of systematic conservation planning to identify zones suitable for small protected areas for population growth of reef fishes. Mariette has used novel approaches to data collection, focusing largely on expert knowledge. She has thereby overcome many of the traditional limitations to accessing spatially explicit data for marine conservation planning. She intends submitting her MSc thesis in early 2004.

CAPE (Cape Action for People and the Environment): A strategic plan for the conservation of the terrestrial biodiversity of the Cape Floristic Kingdom: A highlight of the year was the publication of a special double issue of Biological Conservation, edited by Richard Cowling and Bob Pressey, and with nine papers credited to TERU. This collection of papers serves as an invaluable reference work on one of the most comprehensive conservation planning exercises undertaken anywhere, and Richard is congratulated for his major role in this outstanding product.

The Nelson Mandela Metropolitan Open Space System: A strategic conservation plan: Warrick Stewart's MSc project on the identification of a system of conservation areas for the metropole that will achieve conservation of biodiversity and process, is making good progress. He has shown that this urban area is unique as it includes areas of five biomes. His thesis will be submitted early in 2004.

The design and development of an ecologically, economically and socially sustainable nature reserve system in the Greater Cape St Francis area: Brian Reeves has now registered for an MSc and has been making significant progress with this project, which is being supported by the Critical Ecosystem Partnership fund.

Spatial dynamics of current, and future threats to, biodiversity on Reunion Island: Mathieu Rouget and Richard Cowling's research on conservation planning and transformation processes on Reunion has been completed, and a paper has been accepted for publication.

Namaqualand: Philip Desmet (registered for a PhD at the University of Cape Town) and Richard Cowling's project on conservation planning in Namaqualand is nearing completion. Philip will submit his PhD in early 2004. So far one paper has been submitted for publication and a further two papers are in preparation.

ANIMAL-PLANT INTERACTIONS

This theme seeks to develop an understanding of the nature of the interactions between animals and plants, and a predictive understanding of

perturbations associated with animal impacts on communities and ecosystems.

Foraging behaviour of Thicket Biome browsers: Sharon Wilson has had a further two papers on the foraging behaviour of thicket browsers published.

Comparative feeding behaviour of domestic animals (sheep and goats): Mpumzi Mayekiso (MSc) is comparing the foraging behaviour of Angora goats, boer goats and and dorper sheep, in an attempt to develop an understanding of the effects of body size, breed and social interactions on their feeding behaviour. He has completed his data collection and should submit his MSc thesis in 2004.

Habitat models for mammals in the Eastern Karoo: An van Cauter (MSc) has completed the development of community level habitat models for Samara Private Game Reserve, and has tested her models against distribution and abundance data of the extant community on the property. These tests provided support for her models, and she will submit her MSc thesis early in 2004.

RESOURCE ECOLOGY

This theme seeks to develop a predictive understanding of the responses of biota to different forms of utilization, and of how these natural resources are utilized.

Many of the projects listed under other themes also contribute towards the goals of this theme.

Changing land use trends in the Thicket Biome - pastoralism to game farming: Rebecca Sims-Castley and Graham Kerley have been undertaking a survey of the major private reserves in the Eastern Cape in order to quantify the socio-economic benefits of these operations. Initial data analysis shows considerable employment benefits associated with these operations. This project, supported by the Wilderness Foundation, should be completed early in 2004.

Angora goat physiology and the risk of abortion: This project, in collaboration with Helen Laburn and Duncan Mitchell of the Wits Medical School' seeks to understand the factors influencing faetal and maternal body temperatures in angora goats. Data analysis has been progressing well, and interesting contrasts in thermoregulatory strategies before and after birth are emerging. Draft publications are being prepared.

TRANSFORMATION AND RESTORATION ECOLOGY

This theme seeks to understand the causes and consequences of ecosystem transformation across all levels of integration, to provide guidelines for the restoration of biodiversity and ecosystem function.

Seed dynamics in transformed thicket: Ayanda Sigwela's writeup of his PhD thesis on the processes influencing seed dynamics in thicket, and the consequences of transformation, was slowed down considerably by his appointment as an ecologist with South African National Parks. He is however on

track to submit his thesis in early 2004. Ayanda was invited to present his work at the International Rangeland Congress in Durban.

The effects of transformation on ecosystem services within thicket:

Richard Lechmere-Oertel completed his PhD study on the effects transformation on ecological processes and successfully submitted it for examination. Congratulations are thus due to him as he will graduate in April 2004. Richard has also had three papers accepted subject to revision.

The effects of transformation on forage availability for thicket browsers:

Graham Kerley and Marietjie Landman, together with Dave Schoeman, investigated the effects of overgrazing by domestic herbivores on forage availability for indigenous thicket browsers, specifically common duiker, bushbuck, kudu and black rhinoceros. This project was supported by the National Botanical Institute as part of the Conservation Farming project. The data show a clear loss of forage availability, and that this was not symmetrical across the species. These findings have considerable value in explaining the response of indigenous herbivores to overgrazing, as well as for evaluating the costs of overgrazing in terms of lost conservation opportunities. Two papers are in preparation.

Transformation of biodiversity and critical natural capital in the Little

Karoo: Rebecca Sims-Castley embarked on a new project for a PhD that aims to map patterns of transformation and evaluate the impacts on biodiversity and ecosystem services within the Little Karoo, and which will be funded by the Critical Ecosystem Partnership Fund. Owing to the birth of a healthy boy, Rebecca's progress has been understandably slow.

Impacts of introduced species on Subtropical Thicket: Evert Jacobs has been investigating diet and feeding impacts of giraffe in thicket vegetation as part of his MSc. He has made good progress in data collection, but unfortunately has elected to continue with his studies on a part time basis. This is expected to slow this project down considerably.

Alien species introductions: extent, motivation and consequences: In an exciting initiative with Riverbend Private Game Reserve (north of Addo village), Andrew Taylor of Riverbend and Graham Kerley have started to develop a major research programme on the extent of alien species introductions, what motivates these introductions and what the consequences of these introductions are. This project was initiated in October, and the first phase will be an extensive literature survey which is hoped to generate one or more review papers, and which will form the basis for the research phase of this project.

Carbon sequestration in the Thicket Biome: The opportunity of using the rehabilitation of thicket vegetation as an opportunity for C-sequestration is a concept that has emerged from the Conservation Farming project. It would appear that thicket, and in particular spekboom (*Portulacaria afra*), may provide exceptionally high C-sequestration opportunities. This project also provides the opportunity of using C-Market funds to support the rehabilitation of transformed thicket. A publication to this effect has been prepared, and Richard Cowling and Graham Kerley participate in a project conducted in the Baviaanskloof, that is

aimed at developing these concepts, and will be participating on a workshop on this early in 2004.

BIODIVERSITY

This theme seeks to gain a predictive understanding of the patterns, determinants and functions of biodiversity.

Biodiversity and rarity in South Africa's south-eastern temperate (upland) grasslands: The objective of this project is to develop a predictive understanding of the patterns of various components of biodiversity within grasslands. Dave Hoare (PhD) is making good progress and will submit his thesis in 2004.

Insect-plant diversity relationships: As part of his postdoctoral research, Serban Proches is investigating cross-scale patterns of species diversity and turnover in plants and insects in several vegetation types in the Cape. A database of over 700 insect species and 400 plant species was compiled for plots in the Baviaanskloof and elsewhere, and two papers are in preparation.

Geophyte diversity, bulb size, and environmental factors in the winter rainfall region of southern Africa: A further aspect of Serban Proches's postdoctoral research is his study of species diversity in the world's foremost geophyte hotspot: the winter rainfall region of southern Africa. Three papers are in preparation.

Population age structure and distribution models for tree euphorbias in subtropical thicket: Abigail Kamineth's MSc study on the population age structure and distribution modeling of three species of tree euphorbias in thicket vegetation has progressed well. Data analysis has been completed, and she has identified some intriguing patterns that she will interpret in her thesis. She will submit her thesis in early 2004.

Developing habitat suitability indices for mammalian herbivores at Augrabies National Park: This project is using the animal's assessment of patch specific opportunities and risks, based on optimal foraging theory, to develop habitat suitability indices. This is being undertaken for springbok by Caroline Reid (MSc) and for klipspringer and rock hyrax by David Druce (PhD, registered at the University of Natal), and they are both doing fieldwork at the Augrabies National Park. Caroline has completed her fieldwork, and will now start her writeup, while David still has another season of fieldwork. They both benefited enormously from an opportunity to work with Dr Joel Brown (University of Illinois, Chicago) who spent three months in the field with them.

The role of predators in thicket ecosystems: This project aims to develop predictive understanding of the role of predators in thicket ecosystems, focusing to a large extent on the response of herbivore resource use to predators. The initial focus will be on the lions that were reintroduced into the Addo Elephant National Park in September, and the changes in habitat suitability for ungulates. Matt Hayward joined TERU in October as a Postdoctoral Researcher and will be running this project.

FUNDAMENTAL RESEARCH

This theme seeks to encourage research on any intellectually interesting ecological or evolutionary question.

The role of rainfall variability in explaining post-fire regeneration traits and diversification processes in Mediterranean-climate ecosystems: This project of Richard Cowling's, which has been comparing indices of rainfall reliability and plant regeneration traits in all five Mediterranean-climate rainfall regimes, is essentially complete. A paper has been completed and will be submitted in early 2004. This will form the basis of an invited keynote address at the X MEDECOS conference in Greece in April 2004.

Changes in community structure and composition of monkey beetle (Scarabaeidae: Hopliini) communities along floristic gradients in Namaqualand Richard Cowling is co-supervising JF Colville's PhD project (registered at UCT), together with Mike Picker and Simon Ferrier. Slow but steady progress is being made and one paper has thus far been published.

Pollination ecology of *Satyrium* orchids: Christo Botes (Hons) has been looking at three species of this diverse orchid genus, revealing interesting aspects of population structure, and the potential hybrid status of some populations around Port Elizabeth.

Population ecology of non-sprouting Proteaceae in the eastern fynbos: Steffen Heeleman (Hons, registered with both UPE and Rostik University, Germany) has been collecting data on Proteaceae seedling performance in relation to canopy cover, competitors, and season of burn. One paper is in preparation.

<h2>CONTRACT RESEARCH</h2>

Limited contract activities were carried out this year, these being focused on ecological management plans for two private reserve developments.

SCIENCE MANAGEMENT

- Graham Kerley served on the Council of the Zoological Society of Southern Africa as Past-President. Graham served as a member of the Organising Committee of the VIIth International Rangelands Congress that was successfully held in Durban in September. He also served in the portfolios of Scientific Programme and as one of the Scientific Editors of the Proceedings.
- Richard Cowling chaired the Scientific Advisory Committee of the National Botanical Institute, and served on three Center for Applied Biodiversity Science (Conservation International) Working Groups, as well as the Succulent Karoo Ecosystem Planning Project: Technical Committee and Advisory Committee. He was also appointed as a member of the Scientific and Technical Advisory Panel (STAP) for the Global Environment Facility (GEF): World Bank. In addition, he acted as a leader for the South African Workshop Stream: "Building comprehensive protected area systems – gaps in the system." for the World Parks Congress 2003.
- Richard Cowling served as a member of the editorial boards of *South African Journal of Environmental Law and Policy*, *Global Ecology & Biogeography Letters*, *Ecological Economics*, *Oryx*; *Conservation Biology*, *Plant Ecology* and *South African Journal of Botany*. Richard also co-edited special issues of the *South African Journal of Botany* and *Biological Conservation*.
- Graham Kerley served on the editorial board of the *Journal of Arid Environments* and as Associate Editor of *African Zoology* and *African Journal of Range and Forage Science*.
- TERU members are actively involved in the review of scientific papers, this being critical to the maintenance of high standards of science, and also reflecting the recognition of the members of TERU by these journals. To this end TERU members provided one or more reviews for the following journals: *African Journal of Range and Forage Science*, *African Zoology*, *Austral Ecology*, *Biological Conservation*, *Conservation Biology*, *Diversity and Distributions*, *Journal of Applied Ecology*, *Journal of Arid Environments*, *Journal of Tropical Ecology*, *Journal of Vegetation Science*, *Oryx*, *Plant Ecology*, *Proceedings of the VIIth International Rangeland Congress*, *South African Journal of Botany*, *South African Journal of Science*, *South African Journal of Wildlife Research*.
- TERU members provided project, proposal and personnel reviews to the following organizations: Critical Ecosystem Partnership Fund, Rhodes University, Port Elizabeth Technikon, National Research Foundation, Wilderness Foundation, WorldWide Fund for Nature –South Africa, Cambridge University Press, Imperial College, London, Table Mountain Fund.
- TERU staff and students participated in over 40 workshops and working group meetings, and made presentations and provided advice on a wide range of scientific and related matters.

COMMUNITY SERVICE

- Graham Kerley served on the University of Port Elizabeth Safety, Health and Environment Committee, Financial Aid Committee and as Chairman of the University of Port Elizabeth Nature Reserve Committee. He continued to act as manager of the Grysbok Environmental Education Trail on the UPE Campus: over 6000 school children have now participated in this trail since its

inception in 1996. The Trail was the sole UPE representation at the 2003 Sasol Scifest.

- Richard Cowling served as Strategic Advisor and chaired the Strategic Advisory Committee of the Cape Conservation Unit (Botanical Society of South Africa), and served as Strategic Advisor and chaired the Strategic Advisory Committee of the Biodiversity Conservation Unit (Wildlife and Environment Society of South Africa). In addition, he continues to serve on the Board of the National Botanical Institute.
- Public presentations by TERU members included talks to the Friends of the St Francis Nature Areas: Cape St Francis, Wildlife and Environment Society of South Africa (Eastern Cape Branch), Eastern Cape Private Nature Reserves Association, Mazda Wildlife Fund.
- TERU staff and students provided specialist advice or contributed to capacity building for Samara Private Nature Reserve, Vrede Private Reserve, St Francis Coastal Open Space System, Thula Moya Coastal Reserve, Riverbend Game Reserve, Rocky Coast Farm, Grootbos Private Nature Reserve, Kamanassie Nature Reserve.
- TERU is represented as an *ex officio* member of the Steering Committee of the Baviaanskloof Mega-reserve Project and on the Addo Planning Forum and the Advisory Committee of the Wildlife and Environment Society of South Africa's Biodiversity Conservation Unit.
- TERU members served on a number of statutory and civil committees, including the Cape Conservation Unit (Botanical Society of South Africa), Cape St Francis Ratepayers Association, Friends of the Greater Addo Elephant National Park and the Wildlife and Environment Society of South Africa (Eastern Cape Branch) Conservation Committee and Biodiversity Conservation Unit.

EXTERNAL STUDENT SUPERVISION

TERU members served as supervisors for students registered at universities besides the University of Port Elizabeth, reflecting the levels of collaboration being achieved. These students are:

- COLVILLE, J.F. Changes in community structure and composition of monkey beetle (Scarabaeidae: Hopliini) communities along floristic gradients in Namaqualand. PhD thesis, University of Cape Town, with co-supervision by Richard Cowling.
- DESMET, P. Conservation planning in Namaqualand. PhD thesis, University of Cape Town, with supervision by Richard Cowling.
- DRUCE, D. Developing habitat suitability indices for klipspringer and hyrax in the Augrabies Falls National Park: contrasting patch uses by syntopic browsers. PhD thesis, University of Natal (Durban), with co-supervision by Graham Kerley.

2003 PRODUCTS

REFEREED SCIENTIFIC PUBLICATIONS

1. BEUKES, P. & COWLING, R.M. 2003. An evaluation of some restoration techniques for the Succulent Karoo, South Africa. *Rest. Ecol.* 11:308-316.
2. BEUKES, P. & COWLING, R.M. 2003. The impacts of non-selective grazing on soil properties of the Nama Karoo. *J. Range Manage.* 56:547-552.
3. COWLING, R.M. & PRESSEY, R.L. 2003. Introduction to systematic conservation planning in the Cape Floristic Region. *Biol. Cons* 122:1-13.
4. COWLING, R.M., PRESSEY, R.L., ROUGET, M. & LOMBARD, A.T. 2003. A conservation plan for a global biodiversity hotspot - the Cape Floristic Region, South Africa. *Biol. Cons.* 112:191-216.
5. COWLING, R.M., PRESSEY, R.L., SIMS-CASTLEY, R., BAARD, E., BURGERS, C., LE ROUX, A. & PALMER, G. 2003. The expert or the algorithm? - comparison of priority conservation areas identified by park managers and reserve selection software *Biol. Cons.* 112:147-167.
6. FRAZEE, S., COWLING, R.M., PRESSEY, R.L., LINDENBERG, N. & TURPIE, J.K. 2003. Estimating the costs of conserving a biodiversity hotspot: a case-study of the Cape Floristic Region, South Africa. *Biol. Cons.* 112:275-290.
7. HALL, A.R., DU PREEZ, D.R. & CAMPBELL, E.E. 2003. Recovery of thicket in a revegetated limestone mine. *S. Afr. J. Bot.* 69: 434-445.
8. HOFFMAN, M.T. & COWLING, R.M.C. I 2003. "Enough to be considered useful": John Acocks' contribution to South African Botany. *S. Afr. J. Bot.* 69:1-6.
9. KERLEY, G.I.H., GEACH, B.G.S. & VAIL, C. 2003. Jumbos or bust: do tourists' perceptions lead to an under-appreciation of biodiversity? *S. Afr. J. Wildl. Res.* 33:13-21.
10. KERLEY, G.I.H., PRESSEY, R.L., COWLING, R.M., BOSHOFF, A.F., & SIMS-CASTLEY, R. 2003. Options for the conservation of large and medium-sized mammals in the Cape Floristic Region hotspot, South Africa. *Biol. Cons.* 112:169-190.
11. LINKLATER, W. 2003. A novel application of the Trivers-Willard Model to the problem of genetic rescue *Cons. Biol.* 17:906-909.
12. LINKLATER, W. 2003. Science and management in a conservation crisis: a case study with rhinoceros. *Cons. Biol.* 17:968-975.
13. LOMBARD, A.T., PRESSEY, R.L., COWLING, R.M. & REBELO, A.G. 2003. Effectiveness of land classes as surrogates for species in conservation planning for the Cape Floristic Region. *Biol. Cons.* 112:45-62.
14. PRESSEY, R.L., COWLING, R.M. & ROUGET, M. 2003. Formulation of conservation targets for biodiversity pattern and process in the Cape Floristic Region, South Africa. *Biol. Cons.* 112:99-127.
15. PROCHES, S., COWLING, R.M. & MUCINA, L. 2003. Species-areas curves based on relevé data for the Cape Floristic Region. *S. Afr. J. Sci.* 99:474-476.
16. ROUGET, M., COWLING, R.M., PRESSEY, R.L. & RICHARDSON, D.M. 2003. Identifying spatial components of ecological and evolutionary processes for regional conservation planning in the Cape Floristic Region, South Africa. *Div. Distr.* 9:191-210.
17. ROUGET, M., RICHARDSON, D.M. & COWLING, R.M. 2003. The current configuration of protected areas in the Cape Floristic Region – reservation bias and representation of biodiversity patterns and processes. *Biol. Cons.* 112:129-145.
18. ROUGET, M., RICHARDSON, D.M., COWLING, R.M., LLOYD J.W. & LOMBARD, A.T. 2003. Current patterns of habitat transformation and future threats to biodiversity in terrestrial ecosystems of the Cape Floristic Region. *Biol. Cons.* 112:63-85.
19. VLOK, J.H.J., EUSTON-BROWN, D.I.W. & COWLING, R.M. 2003. Acocks' Valley Bushveld 50 years on: new perspectives on the delimitation, characterisation and origin of thicket vegetation. *S. Afr. J. Bot.* 69:27-51.
20. WHITEHOUSE, A.M. & SCHOEMAN, D.S. 2003. Ranging behaviour of elephants within a small fenced area in Addo Elephant National Park. *Afr. Zool.* 38:95-108.
21. WILSON, S.L. & KERLEY, G.I.H. 2003. The effect of spinescence on the forage intake rates of bushbuck and Boer goats, browsers of similar body size. *J. Arid Environ.* 55:150-158.
22. WILSON, S.L. & KERLEY, G.I.H. 2003. Bite diameter selection by thicket browsers: the effect of body size and plant morphology on forage intake and quality. *Forest Ecol. Manag.* 181:51-65.

BOOK CHAPTERS

1. KERLEY, G.I.H., BOSHOFF, A.F. & KNIGHT, M.H. 2003. The Greater Addo National Park, South Africa: Biodiversity conservation as the basis for a healthy ecosystem and human development opportunities. In: *Managing for Healthy Ecosystems*. D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset & A.B. Damania (eds). Lewis Publishers, Boca Raton, Florida.

PUBLISHED CONFERENCE PROCEEDINGS

1. ALLSOPP, N., PALMER, A.R., MILTON, S.J., KIRKMAN, K.P., KERLEY, G.I.H., HURT, C.R. & BROWN, C.J. 2003. (eds) Proceedings of the VIIth International Rangeland Congress. Durban, South Africa.
2. MILLS, A., O'CONNOR, T., SKOWNO, A., BOSENBERG, D., DONALDSON, J., LECHMERE-OERTEL, R. & SIGWELA, A.M. 2003. Farming for carbon credits: implications for land use decisions in South African rangelands. In: Allsopp, N., Palmer, A.R., Milton, S.J., Kirkman, K.P., Kerley, G.I.H., Hurt, C.R. & Brown, C.J. (eds) *Proceedings of the VIIth International Rangeland Congress*.
3. SIGWELA, A.M., LECHMERE-OERTEL, R., KERLEY, G.I.H. & COWLING, R.M. 2003. Quantifying the costs of unsustainable domestic herbivory for biodiversity and ecosystem functioning in succulent thicket, Eastern Cape, South Africa. In: Allsopp, N., Palmer, A.R., Milton, S.J., Kirkman, K.P., Kerley, G.I.H., Hurt, C.R. & Brown, C.J. (eds) *Proceedings of the VIIth International Rangeland Congress*.

REPORTS

1. COWLING, R.M. 2003. A remarkable flora, expertly described and beautifully illustrated. Review of Van Wyk AE & Smith GF 2001. Regions of floristic endemism in southern Africa. Umdaus Press. *Diversity and Distributions* 9, 412-413.
2. COWLING, R.M., DRIVER, A., LOMBARD, A.T., GOODMAN, P.S. & BOTHA, M.A. 2003. Building comprehensive protected area systems: experience with systematic conservation assessments. In: Cowan GI, Yawitch J & Swift M (eds), *Strategic innovations in biodiversity conservation – the South African experience*. Department of Environmental Affairs and Tourism, Pretoria.
3. COWLING, R.M., LOMBARD, A.T., ROUGET, M., KERLEY, G.I.H., WOLF, T., SIMS-CASTLEY, R., KNIGHT, A., VLOK, J.H.J., PIERCE, S.M., BOSHOFF, A.F. & WILSON, S.L. 2003. A conservation assessment for the Subtropical Thicket Biome. *Terrestrial Ecology Research Unit Rep.* 43:1-106.
4. DRIVER, A., COWLING, R.M. & MAZE, K. 2003. Planning for Living Landscapes: Perspectives and Lessons from South Africa. Center for Applied Biodiversity Science at Conservation International, Washington, DC and Botanical Society of South Africa, Cape Town
5. DRIVER, A., DESMET, P.G., ROUGET, M., COWLING, R.M. & MAZE, K. 2003. Succulent Karoo Ecosystem Plan: Biodiversity component technical report. *Cape Conservation Unit Report No CCU 1/03, Botanical Society of South Africa*.
6. KERLEY, G.I.H. & VAN CAUTER, A. 2003. Cheetah management plan for Samara Private Game Reserve. *Terrestrial Ecology Research Unit Rep.* 48: 29 pp.
7. KNIGHT, A.T. & COWLING, R.M. 2003. The Megaconservancy Network concept: "Keeping people on the land in living landscapes". *Terrestrial Ecology Research Unit Report No. 45*.
8. KNIGHT, A.T., BOSHOFF, A.F., COWLING, R.M. & WILSON, S.L. 2003. Keeping people on the land in living landscapes: a co-operative strategy for conserving landscapes and enhancing livelihoods in the Subtropical Thicket Biome. *Terrestrial Ecology Research Unit Report No. 46*.
9. LINKLATER, W.L. 2003. Trans-continental black rhino conservation. *Center for Reproduction of Endangered Species, Zoological Society of San Diego, 2002 Annual Report. P 24*
10. LOMBARD, A.T.; WOLF, T.; & COLE, N, 2003. GIS coverages and spatial analyses for the Subtropical Thicket Ecosystem Planning (STEP) project. *Terrestrial Ecology Research Unit Rep* 42.

11. PIERCE, S.M. 2003. The STEP Handbook. Guidelines for conserving biodiversity. A prerequisite for sustainable development in the south-eastern Cape region. Terrestrial Ecology Research Unit Report No. 47.
12. RODRIGUES, A.S.L., ANDELMAN, S.J., BAKARR, M.I., BOITANI, L., BROOKS, T.M., COWLING, R.M., FISHPOOL, L.D.C., FONSECA, G.A.B., GASTON, K.J., HOFFMAN, M., LONG, J., MARQUET, P.A., PILGRIM, J.D., PRESSEY, R.L., SCHIPPER, J., SECHRESTS, W., STUART, S.N., UNDERHILL, L.G., WALLER, R.W., WATTS, M.E.J., & XIE, Y. 2003. Global Gap Analysis; towards a representative network of protected areas. *Advances in Applied Biodiversity Science* 5. Conservation International: Washington DC.
13. STEWART, W.I., COWLING, R.M., MARTIN, A.P., DU PREEZ, D. & LOMBARD, A.T. 2003. Framework for a conservation plan for the Nelson Mandela Metropole (the Five Biome City), Cape Floristic Region, South Africa. *Terrestrial Ecology Research Unit No. 49*.

POPULAR ARTICLES

1. BAUSE, M., SCHOEMAN, D.S., SIMS-CASTLEY, R. & COWLING, R.M. 2003. Diving into conservation or vice versa? *Divestyle Magazine* September/October pp 78-79.
2. BAUSE, M., SCHOEMAN, D.S., SIMS-CASTLEY, R. & COWLING, R.M. 2003. Where are the Sparids? Your fishing stories matter to us. *Ski Boat Magazine* 19(4): 81-82.
3. COWLING, R.M. 2003. The world's smallest hotspot – endemic plants of the Cape Floristic Kingdom. In: Hall-Martin AJ and Carruthers J (eds). 2003. *South African National Parks: A celebration commemorating the World Parks Congress 2003*. Horst Klemn Publications, Auckland Park, South Africa.
4. LINKLATER, W. L., SWAISGOOD, R. R. & HANNON, R. L., 2003. Match-fixing rhino fights: Improving the odds on successful black rhino transfer to game reserves. *Game & Hunt* 9(4): 47-49.
5. PROCHES, S. 2003. Every plant has its weevil. *Veld & Flora* 89: 118-120.
6. STEWART, W., COWLING, R.M., LOMBARD, M. & REEVES, B. 2003. A plan for the protection of the SE Cape's natural heritage. *African Wildlife* 57 (3), 64-65.

CONFERENCE PRESENTATIONS

1. BAUSE, M, SCHOEMAN, D.S., COWLING, R.M. & SIMS-CASTLEY, R. From expert knowledge to paper to systematic conservation planning. Oral presentation, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.
2. BAUSE, M, SCHOEMAN, D.S., COWLING, R.M. & SIMS-CASTLEY, R. People as data loggers in marine science. Poster, Coastal & Ocean Exploration Conference, East London.
3. BOSHOFF, A.F. Brief background to the STEP project, Oral presentation, Closing Conference of the Subtropical Thicket Ecosystem Planning (STEP) Project, PE Technikon, October.
4. COWLING, R.M. The role of species data in regional conservation plans: case studies from South Africa. Invited oral presentation, Vth World Parks Congress, Durban, September.
5. COWLING, R.M. & PROCHES, S. Patterns and evolution of plant diversity in the Cape Floristic Region. Symposium on plant diversity and complexity patterns – local, regional and global dimensions. Invited oral presentation, the Royal Danish Academy of Sciences and Letters, Copenhagen.
6. COWLING, R.M., LOMBARD, A.T., PIERCE, S.M., KNIGHT, A.T. DRIVER, A. BOTHA, M. & MAZE, K. Mainstreaming the outcomes of systematic conservation planning for implementation: examples from ecoregional conservation assessments in South Africa. Invited oral presentation, Vth World Parks Congress, Durban, September.
7. COWLING, R.M., ROUGET, M., KNIGHT, A.T. & LOMBARD, A.T. Planning for implementation: designing megaconservancy networks. Keynote address, Fynbos Forum, Hartenbos, August.

8. COWLING, R.M. Why a systematic conservation assessment for thicket? Oral presentation, Closing Conference of the Subtropical Thicket Ecosystem Planning (STEP) Project, PE Technikon, October.
9. DESMET, P. & COWLING, R.M. Using species-area relations to identify biodiversity-based targets for land classes. Invited oral presentation, Vth World Parks Congress, Durban, September.
10. DRIVER, A. & COWLING, R.M. Lessons learnt from southern African ecoregional conservation planning projects. Invited oral presentation, Vth World Parks Congress, Durban, September.
11. DRUCE, D. SLOTOW, R., KERLEY, G.I.H. & BROWN, J. Hyrax habitat preferences determined using giving-up densities in artificial food patches. ? Poster, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.
12. JACOBS, E.P., KERLEY, G.I.H. & COWLING, R.M. Feeding resources of introduced giraffe (*Giraffa camelopardalis*) in Subtropical Thicket. Oral presentation, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.
13. KAMINAETH, A.I., CAMPBELL, E.E. & COWLING, R.M. Preliminary insights into the population age structure of tree euphorbia species in the Eastern Cape. Oral presentation, SA Assoc Bot & ISE Joint International Conference, Pretoria, January.
14. KAMINETH, A. CAMPBELL, E.E., COWLING, R.M. & DU PREEZ, D. The use of generalised linear models (GLMs) and geographical information systems to identify environmental predictors of the occurrence of tree euphorbia species in Subtropical Thicket. Fynbos Forum, Hartenbos, August.
15. KERLEY, G.I.H. Thicket - a treasure trove of larger mammals, and opportunities, Oral presentation, Closing Conference of the Subtropical Thicket Ecosystem Planning (STEP) Project, PE Technikon, October.
16. KERLEY, G.I.H., LANDMAN, M. & SCHOEMAN, D.S. Asymmetrical effects of overgrazing on forage availability for herbivores of different body size. Oral presentation, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.
17. KERLEY, G.I.H., PRESSEY, R.L., BOSHOFF, A.F., SIMS-CASTLEY, R. & WILSON, S.L. Accommodating megaherbivores and predators in conservation plans: a new approach. Invited oral presentation, Vth World Parks Congress, Durban, September.
18. KNIGHT, A.T. Planning for Implementation: A Role for Planning Tools in Securing Effective Conservation Action. Invited oral presentation, Vth World Parks Congress, Durban, September.
19. KNIGHT, A.T. & COWLING, R.M. Devising a framework for effective conservation implementation: generic issues and an example from South Africa's subtropical thicket biome. Invited oral presentation, Vth World Parks Congress, Durban, September.
20. KNIGHT, A.T. From planning to implementation - the road ahead, Oral presentation, Closing Conference of the Subtropical Thicket Ecosystem Planning (STEP) Project, PE Technikon, October.
21. KNIGHT, A.T. Conservation Planning and the Implementation Crisis: Towards Realising Opportunities and Dissolving Constraints. Oral presentation, 4th International Student Conference on Conservation Science, Cambridge, UK, March.
22. LANDMAN, M. & KERLEY, G.I.H. Are conservation opportunities constrained by diet in black rhinoceros? Oral presentation, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.
23. LANDMAN, M. & KERLEY, G.I.H. Assessing the costs of conservation management on black rhinoceros foraging opportunities: competition for the conservation of megaherbivores? Oral presentation, 3rd International Wildlife Management Conference, Christchurch, New Zealand, Dec.
24. LOMBARD, A.T. & COWLING, R.M. Systematic conservation planning: the South African experience. Invited oral presentation, Vth World Parks Congress, Durban, September.
25. LINKLATER, WL & BAGGALLAY, T. The productivity of Hluhluwe-iMfolozi's black rhino population: source-sink dynamics, communication biology and the influence of

- removals. Ezemvelo KwaZulu-Natal Wildlife Annual Biodiversity Conservation Symposium. Queen Elizabeth II Park, Pietermaritzburg, November.
26. LINKLATER WL & BAGGALLAY, T. Black rhino olfactory signals: a possible tool for re-populating vacuum zones. Hluhluwe-iMfolozi Research Forum. Centenary Centre, Hluhluwe-iMfolozi Park, November.
 27. MILLS, A., O'CONNOR, T., SKOWNO, A., BOSENBERG, D., DONALDSON, J., LECHMERE-OERTEL, R. & SIGWELA, A.M. Farming for carbon credits: implications for land use decisions in South African rangelands. Invited oral presentation, VIIth International Rangeland Congress, Durban, July.
 28. PRESSEY, R.L., NICHOLSON, E. & KERLEY, G.I.H. Conservation planning for biodiversity processes: five ways of keeping time in space. Oral presentation, Ecological Society of Australia Ecology 2003 Conference, Armidale NSW, Australia, Dec.
 29. PROCHE, S. & COWLING, R.M. 2003. Patterns of geophyte diversity in the Winter Rainfall Region of southern Africa. Hyacinthaceae Guild Symposium. September, Kirstenbosch.
 30. REID, C., KERLEY, G.I.H., SLOTOW, R. & BROWN, J.S. Using behaviour as a measure of habitat suitability? Poster, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July
 31. ROUGET, M. & COWLING, R.M. Integrating ecological and evolutionary processes into conservation plans: examples from three southern African ecoregions. Invited oral presentation, VIIth World Parks Congress, Durban, September.
 32. SIGWELA, A.M., LECHMERE-OERTEL, R., KERLEY, G.I.H. & COWLING, R.M. Quantifying the costs of unsustainable domestic herbivory for biodiversity and ecosystem functioning in succulent thicket, Eastern Cape, South Africa. Invited oral presentation, VIIth International Rangeland Congress, Durban, July.
 33. VAN CAUTER, A., KERLEY, G.I.H. & COWLING, R.M. Habitat use by indigenous herbivores as a basis for understanding of resource partitioning. Oral presentation, Joint Conference of the South African Society of Aquatic Scientists and the Zoological Society of Southern Africa, Cape Town, July.

POST-GRADUATE TRAINING

Honours Projects

1. BOTES, C. 2003. Pollination ecology and coexistence of three closely related *Satyrium* (Orchidaceae) species. BSc(Hons) project, University of Port Elizabeth.
2. HEELEMAN, S. 2003. What limits the distribution of seed regenerating proteas in eastern fynbos: season of burn or understory interactions? BSc(Hons) project, University of Port Elizabeth.

Postgraduate degrees completed

1. LECHMERE-OERTEL, R. 2003. The effects of goat browsing on ecosystem patterns and processes in Succulent Thicket, South Africa. PhD, Univ. Port Elizabeth.

Postgraduate degrees in progress

1. LANDMAN, M. Foraging behaviour of the black rhinoceros (*Diceros bicornis bicornis*) in the Thicket vegetation of the Eastern Cape. PhD. thesis, Univ. Port Elizabeth.
2. SIGWELA, A.M. Animal-seed interactions in the Thicket Biome: consequences of faunal replacement and land use on seed dynamics. PhD thesis, Univ. Port Elizabeth.
3. SIMELANE, T.S. The role of national parks in conserving traditional natural resources. PhD thesis, Univ. Port Elizabeth.
4. BAUSE, M. The challenge of applying systematic conservation planning to the marine environment; using expert knowledge (focus: Sparidae) MSc thesis, University of Port Elizabeth.
5. GOUGH, K. Association patterns of elephants: do behavioural patterns reflect genetic relationships? MSc thesis, University of Port Elizabeth.
6. HOARE, D. Patterns and determinants of plant biodiversity in temperate, mesic grasslands of South Africa. PhD thesis, Univ. Port Elizabeth.

7. JACOBS, EP The impact of giraffe as an introduced herbivore in the Thicket Biome. MSc thesis, University of Port Elizabeth.
8. KAMINETH, A. The population-age structure and distribution of tree euphorbias in subtropical thicket. MSc thesis, University of Port Elizabeth.
9. KNIGHT, A. On the road to persistence: on implementing conservation action in the Subtropical Thicket Biome. MSc thesis, University of Port Elizabeth.
10. MAYEKISO, M.H. Foraging behaviour of different breeds of domestic herbivores. MSc thesis, University of Port Elizabeth.
11. REEVES, B. Designing and implementing a conservancy in a vulnerable priority region of the Cape Floristic Region. MSc thesis, University of Port Elizabeth.
12. REID, C. Developing habitat suitability indices for springbok (*Antidorcas marsupialis*) at Augrabies Falls National Park, South Africa. MSc thesis, University of Port Elizabeth.
13. STEWART, W.I. The Nelson Mandela Metropolitan Open Space System: A strategic conservation planning project. MSc thesis, University of Port Elizabeth.
14. VAN CAUTER, A. Modeling large mammal distribution and abundance in the Eastern Karoo. MSc thesis, University of Port Elizabeth

FINANCIAL SUPPORT 2003

Research Grants	Programme	Amount (R)
National Research Foundation		
(G Kerley)		77 500
(R Cowling)		92 000
Global Environment Facility: STEP	Conservation Planning	865 088
Development Bank of SA	Handbook	254 776
National Botanical Institute	Conservation Farming	18 912
Zoological Society of San Diego	Black rhino conservation biology	374 500
Southern African Hotspots Program: Conservation International:		15 000
International Fund for Animal Welfare	Elephants as keystone species	400 000
CNRS/NRF:		40 000
South African National Parks	Habitat modelling	74 727
Samara Private Nature Reserve	Mammal habitats	27 702
University of Port Elizabeth	Research Committee grant to G Kerley & R Cowling	75 281
International Wildlife Conference	Travel grant: M. Landman	14 000
University of Cambridge	Travel grant: A Knight	3 200
Bursaries*		
National Research Foundation*		
Bause, M.	50 000	
Landman, M.	55 000	
Sims-Castley, R.	50 000	
University of Port Elizabeth		
Jacobs, E		R12 500
Kamineth, A		R12 500
Landman, M		R12 500
Mayekiso, M		R12 500
Bause, M.		R17 500
Van Cauter, A		R12 500
Bursary subtotal		235 000
TOTAL		2 567 686

*Note that National Research Foundation Grant-Holder Bursaries are included within the NRF Programme amounts listed above.

In Kind Contributions

The loan and maintenance of the 4x4 pickup by the Mazda Wildlife Fund represents a saving of about R25 000 on transport expenses.

Gentyre donated a set of Continental tyres for the vehicles, valued at R5 000.

South African National Parks provides access and accommodation for TERU research in the Addo Elephant National Park.

The International Fund for Animal Welfare donated a Toyota 4x4 pickup valued at R71 000.

ADVISORY BOARD, STAFF AND ASSOCIATED STUDENTS 2003

Advisory Board

Prof. B.L. Robertson, Director: Research, University of Port Elizabeth (Chair)
 Dr M. H. Knight, South African National Parks
 Prof. D. Baird, Zoology Department, University of Port Elizabeth
 Dr D. Du Preez, Botany Department, University of Port Elizabeth
 Mr L. Els, Department of Economic Affairs, Environment & Tourism (Eastern Cape)
 Ms S. Frazee, Conservation International
 Mr R. Gush, Indalo - Eastern Cape Private Nature Reserves Association
 Mr F. Hobson, Department of Agriculture (Eastern Cape)
 Mr D Langman, Nelson Mandela Metropolitan Municipality
 Dr R. Little, WorldWide Fund for Nature-South Africa
 Dr A. R. Palmer, Agricultural Research Council
 Ms R Le Roux, National Research Foundation
 Prof A. van Jaarsveld, University of Stellenbosch

Staff

Prof. G. I. H. Kerley, Director	Dr. S. L. Wilson
Prof. R. M. Cowling	Ms R. L. Hannah
Dr. A. F. Boshoff	Ms Z. A. Brocklehurst
Dr. E. E. Campbell	Mr. L. G. Wahlberg

Research Associate

Dr A. M. Whitehouse

Scientific Collaborator

Dr C. J. Skead

Postdoctoral Researchers

Dr M Hayward	Dr S. Proches
Dr W. Linklater	

Visiting Scientists

Prof F. Medail, Institut Méditerranéen d'Ecologie et de Paléocologie: CNRS Université d'Aix-Marseille - January	Dr A. Gelfand, Duke University - June
Dr J.S. Brown, University of Illinois, Chicago - April	Dr S. Ferrier, New South Wales National Parks & Wildlife Service - September
Dr J. Silander, University of Connecticut - May & June	

Postgraduate students (and their academic departments)

MSc		PhD	
Ms M. Bause	Zoology & Botany	Mr D Hoare	Botany
Mr E.P. Jacobs	Zoology & Botany	Ms M. Landman	Zoology
Ms K Gough	Zoology	Mr R. Lechmere-Oertel	Zoology & Botany
Ms A. I. Kamineth	Botany	Mr A. Sigwela	Zoology & Botany
Mr A. Knight	Botany	Mr T. S. Simelane	Zoology
Mr M. H. Mayekiso	Zoology	External Students (all PhD)	
Mr B Reeves	Botany	Mr. J. F Colville	University of Cape Town
Ms C. Reid	Zoology	Mr. P. Desmet	University of Cape Town
Mr W. Stewart	Botany	Mr. D. Druce	University of Natal (Durban)
Ms A. van Cauter	Zoology		