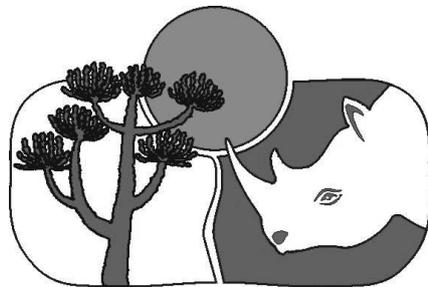


# TERRESTRIAL ECOLOGY RESEARCH UNIT

## ANNUAL REPORT 2002

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 eleventh Annual Report and deals with the activities of TERU during 2002.

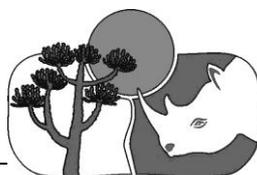
### VISION

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.



The year 2002 marks an important milestone, as TERU has now been operational for a full decade. A brief review of some of the main achievements is presented later in this Annual Report.

It gives me great pleasure to be able to report that this has been another highly productive year for TERU, with 8 refereed papers, 7 book chapters, 7 reports, 3 popular articles and a book being produced. In addition, TERU staff and students made 36 presentations at scientific conferences. Two honours, 9 MSc and 3 PhD students conducted their research projects under the auspices of TERU. Congratulations go to Sharon Wilson, Justin Watson and Steve Henley, who all received their doctorates in 2002.

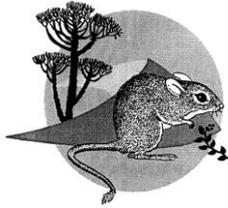
This year also marks the appointment of our first Research Associate, Anna Whitehouse, who is well known for her groundbreaking research on the conservation biology of the famous Addo elephants. This appointment gives expression to TERU's commitment to expand its resource and expertise base by establishing collaborative relationships with individuals and institutions. On a less formal basis, TERU is privileged to continue to have the opportunity to work closely with Dr Jack Skead, the doyen of Eastern Cape natural history. Ruth Hannah joined our staff as a Research Assistant in the black rhinoceros programme, and we welcome her to TERU's team. We are sad to be losing Rebecca Sims-Castley (BioMap) and Louise Visagie (Conservation Farming), whose contracts ended in December. We thank them for their enthusiastic contributions over the years, and wish them well with their PhD studies. Fortunately, Rebecca will be continuing her studies within TERU, and so we will be able to call upon her valuable expertise.

In order to maintain its profile and productivity, TERU is highly dependent on a sound funding base, and here I am very pleased to be able to report that in 2002 it was able to once again increase its level of financial support, this again being in excess of R3.3 million. The challenge for the future is for TERU to consistently raise funding to support its research and training programmes and projects. To this end, new avenues of funding are continuously being explored.

I would like to express my appreciation to the staff and students, not only those of 2002, but also those of the past ten years, who have all contributed to making TERU the success that it is. Once again, André Boshoff, Richard Cowling, Rebecca Sims-Castley and Sharon Wilson have more than willingly gone beyond the call of duty in enabling TERU to operate smoothly. 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 activities. The support from the Mazda Wildlife Fund continues to make a significant contribution to TERU's activities.

TERU is proud of what it has achieved over the past ten years, and it looks forward to the challenge of the next ten years.

**Prof. G I H KERLEY**  
**DIRECTOR: TERRESTRIAL ECOLOGY RESEARCH UNIT**



**1992 - 2000**

## TERU'S FIRST TEN YEARS



**2001 - 2002**

TERU started operating in 1992, having been established by the Council of the University of Port Elizabeth, in response to requests from conservation agencies for a research and training unit to serve the needs of the Eastern Cape. TERU now operates within the Faculty of Science, but students associated with TERU remain full members of their parent academic departments. Its activities are directed by a comprehensive Strategic Framework ([www.zoo.upe.ac.za/teru](http://www.zoo.upe.ac.za/teru)), which inter alia describes TERU's research, training, community service and consultancy operations. An Advisory Board, comprising representatives from a wide range of stakeholders, provides guidance to TERU.

When TERU started it had virtually no facilities, but it now boasts a suite of well-equipped offices, including a computer room and resource room, and has its own research accommodation in the Addo Elephant National Park. In addition, TERU operates a fleet of six research vehicles. The Unit is thus very well equipped to carry out its mandate.

During its first 10 years of existence, TERU has accessed R11 828 206 of funding, of which R1 046 246 was in the form of student bursaries. Over this period, a high level of productivity was maintained, with no fewer than 87 refereed scientific papers, 21 book chapters, 17 contributions in published conference proceedings, 59 reports, 47 popular articles and 1 book being produced. A further 15 refereed scientific papers have been accepted for publication. In addition, TERU staff and students have made 178 presentations at national and international scientific conferences. A total of 24 honours, 17 MSc and 5 PhD students have conducted their research projects under the auspices of TERU.

TERU is well on its way to achieving its vision of gaining, by 2006, national and international recognition as a terrestrial ecology research and post-graduate training unit of excellence. TERU enters its second decade with enthusiasm, commitment and confidence.

## AWARDS

- Marietjie Landman was awarded a grant by Cambridge University to attend the 3<sup>rd</sup> International Student Conference on Conservation Science, in Cambridge, UK.
- Mpumzi Mayekiso was awarded a scholarship by the Israeli Government to attend the "Conservation of Desert Biodiversity" course in Israel. This is the fourth year that one or more TERU students have received this award.
- Richard Cowling was appointed Scientific Advisor, Southern African Hotspots Program, Conservation International.
- Richard Cowling was appointed an Invited Fellow: World Innovation Foundation, United Kingdom.
- Richard Cowling was invited to present an invited plenary presentation at the 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK, in July.
- Graham Kerley was invited to present a special plenary presentation at the Third International Conference, International Academy of African Business and Development, Port Elizabeth in April.

## 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 has been appointed a Research Associate, and continues to publish the findings of her PhD on the conservation biology of the Addo elephants. Together with Mike Knight of SANParks, Graham Kerley and Anna convened a workshop on elephant conservation and management in the Eastern Cape, which was well attended and valuable in terms of facilitating interaction between interested stakeholders. The proceedings of this workshop, representing the current state of understanding on the issue, will serve as a valuable reference work for stakeholders. One of the outcomes of Anna's research, that was further highlighted at the workshop, was the decision by SANParks to introduce additional genetic material to Addo in the form of four bulls from Kruger National Park. This introduction also provided the opportunity for Sonette du Preez to carry out her Hons project on the behaviour of these introduced bulls. Anna and Graham have successfully applied for funding to continue their research on elephants, with a new IFAW funded programme starting in 2003.

**Black rhinoceros:** Two major initiatives are aimed at black rhinoceros conservation biology. Wayne Linklater is continuing his postdoctoral research on the implications of black rhino communication behaviour for the conservation management of this species. He and his team have established research studies

on a number of recently introduced populations in Namibia and the South African Lowveld. They have applied radio-transmitters to 21 rhinos and have logged up hundreds of hours of observations of rhino response to social and chemical stimuli. They have also been able to conduct numerous experiments in captivity of rhino responses to chemical cues present in the urine and faeces of conspecifics, and are now starting to extend this experimental approach to the field. Wayne has had two papers accepted in *Conservation Biology*, and has produced a number of popular articles.

Marietjie Landman's MSc focuses on the implications of rhino foraging behaviour on their conservation and management. She has shown that black rhino have a relatively varied diet in different areas of thicket, and that they graze more than previously thought. In addition, she has shown that overgrazing by goats leads to a substantial decline in rhino forage availability, thereby reducing the potential of an area to support rhinos. She was invited to present her findings at the 3<sup>rd</sup> International Student Conference on Conservation Science in Cambridge, UK, and will be applying to upgrade her study to PhD status.

**STEP (Subtropical Thicket Ecosystem Planning) project:** This three-year Project, co-financed by the Global Environment Facility through the World Bank, and managed by TERU, commenced on 1 July 2000. It aims to promote the conservation of globally significant biodiversity in the Thicket Biome by (a) conducting a strategic and systematic conservation planning exercise, and (b) working closely with key stakeholders to ensure the implementation of its outcomes.

All tasks associated with the spatial analysis project activity were completed during the year under review. This includes the mapping of the vegetation in the project planning domain (with associated plant checklists), the mapping of the patterns of transformation and degradation, and the production of the final GIS report; the latter contains data and metadata relating to the land classes, land cover and protected areas, and to the various spatial analyses involving these coverages.

In order to mainstream the outcomes of the spatial conservation plan into local and district municipal-level decision making, a conceptual and methodological basis for interpreting the outcomes of the plan for municipal-level land-use decision making was researched by the STEP conservation planning team. Attention was given to identifying a metric that will highlight the conservation status of land-classes - in order to ensure that land-use decisions minimize the loss of habitat in priority land classes.

The major ecological and evolutionary processes are aligned along major gradients (the river valleys, the Great Escarpment, the coast), and these are the areas where most formal and informal conservation areas are located. Consequently, there exists an opportunity to establish "mega-conservancy corridors" in these areas, and the STEP team has developed a novel GIS technique to locate these corridors along axes that will (a) maximize the achievement of biodiversity pattern and process targets, (b) incorporate existing formal and informal reserves, and (c) minimize the incorporation of transformed habitat.

Funding was secured, and a consultant appointed, for the compilation of a land-use planner's handbook. This will make the spatial outputs of the conservation plan accessible to municipal-level planners and decision-makers. Reports dealing with the financial value of thicket and with changing land-use trends (pastoralism to game-farming) were produced by STEP researchers. Implementation expert Andrew Knight (MSc) joined the STEP team and produced a preliminary draft of an implementation strategy and action plan. The first capacity building workshop with the "inheritors" of the implementation plan, focusing on establishing the planning requirements of agencies responsible for making decisions around land-use, was held.

The successful completion of the activities scheduled for 2002 paved the way for the finalisation of the STEP conservation and implementation plans, and for the conducting of capacity building workshops, in 2003.

**Implementation of STEP:** This component of STEP seeks to provide a conceptual but practical foundation for developing and translating conservation and biodiversity research into action and management strategies and plans. This component has gathered momentum, with several key pieces to the implementation puzzle now secured. The Draft Implementation Framework is currently being finalised, and is on track to be completed by the end of January 2003. This will provide a foundation for the development of implementation-focused initiatives. The initial development of a Conservation Strategy for the STEP planning domain has begun, with preparations for a Strategy Workshop now underway. A collaborative approach to identifying and manifesting land management goals is being adopted, which aims to further secure key stakeholder 'buy-in' through the development of a joint vision for landscape management across the STEP planning domain. This exciting initiative promises to build a secure foundation for the implementation process, given the strong support and enthusiasm of the key stakeholders for this process. The final Conservation Strategy will be drafted during April and May 2003.

**Local government decision-makers handbook:** This project, funded in part by the Development Bank of South Africa, aims to produce a handbook to support capacity building in local government by guiding decision-makers to make wise land-use choices. The handbook will serve as a textbook for training courses and as a reference book for use in local government. End-users will be informed about the value of the green environment and its provision of natural services, such as clean water. Non-technical explanations of relevant environmental legislation will be introduced. The importance of international, national and provincial agreements about the conservation of biodiversity will be covered. In particular, the Handbook will describe to local government decision-makers how to apply the spatial recommendations of conservation planning, that will result from the Subtropical Thicket Ecosystem (STEP) Programme

**Baviaanskloof Conservation Area:** Excellent progress was made in launching a major project to develop the Baviaanskloof Conservation Area as a mega-reserve, as part of CAPE (Cape Action for People and the Environment). This is a joint initiative between the Wilderness Foundation, the Department of Economic Affairs, Environment & Tourism of the Eastern Cape Provincial Government, CAPE, Conservation International and the Table Mountain Fund. TERU continued to play a significant supporting role, through the provision of advice on a wide range of matters related to this initiative. In this regard, TERU

was regularly consulted by the Wilderness Foundation, the NGO that is coordinating the overall project.

**GANP: The Greater Addo Elephant National Park Project:** TERU continued to support SANParks, which is tasked with the implementation of this project, specifically through the conservation planning process that was undertaken as a contract for SANParks. A significant finding of the conservation planning was that the planning domain was too small to reliably conserve many of the biodiversity features in the proposed park. One journal paper and two book chapters on GAENP were published in 2002.

**Systematic conservation planning: a new vision for the marine environment.** Mariette Wheeler's MSc project represents an expression of TERU's commitment to making its expertise available wherever possible. In this instance Richard Cowling and Rebecca Sims-Castley are assisting Dave Schoeman and Mariette in applying the concepts of systematic conservation planning, which have largely been developed in terrestrial ecosystems, to the marine environment. The specific focus of this project is on reef fish (family Sparidae), and the initial efforts have been on identifying and obtaining appropriate data.

**CAPE: Cape Action for People and the Environment: A strategic plan for the conservation of the terrestrial biodiversity of the Cape Floristic Kingdom:** This project is an extension of the scientific outcomes of the highly successful CAPE Project. Sixteen papers have been prepared for a special double issue of *Biological Conservation* that Richard Cowling and Bob Pressey (New South Wales National Parks and Wildlife, Australia) are co-editing. TERU members (principally Richard Cowling) are author/co-author of nine of these papers. All papers have been accepted for publication and will appear before September 2003, in time for distributing the special issue at the World Parks Congress in Durban (Sept 8-17).

**The Nelson Mandela Metropolitan Open Space System: A strategic conservation plan:** Warwick Stewart (MSc), an employee of the Wildlife and Environmental Society of South Africa, is undertaking this project. It aims to identify a system of conservation areas for the Metropole that will achieve explicit targets for the conservation of biodiversity patterns and processes. This will be the first time that systematic conservation planning approaches have been used in an urban and peri-urban context. Excellent progress has been made with the conservation planning component. The outcomes were presented at eight public meetings for stakeholders in September 2002.

**The design and development of an ecologically, economically and socially sustainable nature reserve system in the Greater Cape St Francis area:** This project forms part of a larger project that is being funded by the Table Mountain Fund of WWF: SA. The main focus of the project is the restoration, via removal of alien plants, of the threatened St Francis Fynbos/Thicket Mosaic vegetation on proclaimed protected areas in and adjacent to Cape St Francis and St Francis Bay. Richard Cowling is developing a strategic conservation plan for the coastal strip between Aston Bay and Oyster Bay. This plan will guide further interventions in the area. All data have now been collated and/or digitised. Brian Reeves of WESSA will register for an MSc in early 2003.

**Spatial dynamics of current, and future threats to, biodiversity on Reunion Island:** Funded by the Joint France/RSA Science and Technology Agreement of the NRF, this project seeks identify land classes on Reunion that are most vulnerable to future transformation. Ultimately, these data will be used in devising a conservation plan for the island. M Rouget (PhD UCT) spent two weeks on Reunion in November 2002 and completed a map of land classes. Conservation planning will started in 2003.

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## **ANIMAL-PLANT INTERACTIONS**

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*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 was awarded her PhD in 2002, and is currently preparing her work for publication. She has had two papers accepted this year. Her work has clearly demonstrated evidence of forage resource partitioning among thicket browsers, and extensive overlap in goat foraging behaviour with that of a range of thicket browsers. An important product of her work has been the opportunity to assess forage availability for indigenous thicket browsers and goats. Ziggi Schlebusch completed her Hons project, describing the diet of eland and red hartebeest in the Addo Elephant National Park, showing that they do not use the pasture grasses planted for oldfield rehabilitation.

**Comparative feeding behaviour of domestic animals (sheep and goats):** Mpumzi Mayekiso (MSc) is investigating the role of body size on the foraging behaviour of Angora and Boer goats and of Merino and Dorper sheep. Using experimental foraging trials, he aims to determine whether the foraging ability of these herbivores is a simple function of metabolic weight, as assumed by the National Grazing Strategy, or whether there are significant species- or breed-specific differences. This work will also allow an assessment of the consequences of shifts in animal breeds occurring in some pastoral areas. Furthermore, he is investigating the effects of social interactions and overnight kraaling on foraging rates of the animals. His project is progressing well and he has completed trials with Angora goats, and has also used this breed to assess kraaling and social effects.

**Habitat models for mammals in the Eastern Karoo:** An van Cauter (MSc) is developing and testing models on habitat use by mammals on Samara Private Nature Reserve, Graaff Reinet district. She has completed her vegetation mapping, and is in the process of developing a forage based community level model for the medium- and large sized mammals that potentially occur on this reserve. She will later test this model using observations of habitat use.

**Ecology of desert small mammals:** Graham continued his collaboration with Walt Whitford on the role of small mammals in desertification. He visited Walt in New Mexico, USA, and they completed two manuscripts on the impacts of desert small mammals on plant communities.

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## **RESOURCE ECOLOGY**

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*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.

**A preliminary review of the gross financial incomes generated by industries dependent on thicket vegetation:** Rebecca Sims-Castley undertook a survey to highlight the potential financial value of thicket in terms of existing economic activities, which include eco-tourism, hunting, horticulture, medicinal plant trade and the mohair and aloe sap industries. Results indicated that the mohair industry (in the STEP planning domain) generated a gross income of R192 million during 2000. Wildlife-based industries contributed significantly, with gross annual incomes of R30 - R40 million and R44 million, being reported for eco-tourism and professional hunting, respectively. The report highlights the fact that although all the above economic activities generate significant incomes, it is important that they are seen in terms of their ecological sustainability.

**Changing land use trends in the Thicket Biome - pastoralism to game farming:** A survey was undertaken by Nadia Smith to determine the spatial extent and distribution of privately owned game farms, as well as conservancies, in the STEP Project planning domain. The results indicated that the post-1996 period experienced an unprecedented increase in game based operations, and that currently 2.5% of the 116 500 km<sup>2</sup> study area has been converted from stock to game farming. A total of 41 game species, of which 13 are extra-limital, were recorded on the 63 game farms surveyed.

**Angora goat physiology and the risk of abortion:** Graham Kerley is collaborating with Helen Laburn, Duncan Mitchell and Alida Faurie (Wits Medical School) in a project that seeks to develop a predictive understanding of the factors that influence fetal and maternal body temperatures in Angora goats, in order to assess the role of thermoregulatory breakdown in goat abortions. Data loggers were recovered from the second cohort of kids and their mothers in 2002, and the group now has to analyse the voluminous thermoregulatory data for these animals.

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## **TRANSFORMATION AND RESTORATION ECOLOGY**

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*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 (PhD) is finalising his study on the processes affecting seed dynamics in transformed thicket; this work is supported by the National Botanical Institute's Conservation Farming project. He has shown that indigenous herbivores disperse more seeds and a greater diversity of seeds than domestic herbivores; that seed predation by ants and rodents is reduced in transformed thickets, but that by birds is elevated; that the seedbank in thicket habitats is limited, possibly reflecting seed longevity and that seedlings are restricted to specific microhabitats, and do not appear to be vulnerable to mammal herbivory. This work is going to be invaluable in

developing an understanding of the options for rehabilitation of transformed thicket.

**The effects of transformation on ecosystem services within transformed thicket:** Richard Lechmere-Oertel (PhD) is completing his study, supported by the National Botanical Institute's Conservation Farming project, on the effects of transformation on ecological processes in thicket. He has shown that, contrary to expectations, rainfall runoff is not elevated in transformed areas, possibly due to the high cover of ephemeral grasses and forbs in these areas; litter production is high in relation to rainfall in thicket, possibly due to the key role played by spekboom in litter production and that it is likely that transformed areas of thicket will continue to lose perennial trees until all the thicket species are lost.

**Effects of mining on Bontveld:** Justin Watson was awarded his PhD on the functional ecology of bontveld and implications for postmining rehabilitation, and is preparing manuscripts for publication.

**Nama Karoo: Effects of agricultural transformation on bird prey availability:** Adri Barkhuysen (MSc) has been investigating the effects of agricultural transformation (croplands) on the prey availability for raptors and other large birds. He demonstrated that prey availability is higher in croplands, providing a mechanistic explanation of the observations of increased powerline bird mortalities associated with croplands. This information will be valuable to Eskom for planning mitigation measures. He has submitted his MSc study for examination.

**Impacts of introduced species on Subtropical Thicket:** Evert Jacobs (MSc) has initiated a project investigating the consequences of introducing extralimital herbivores to the Subtropical Thicket. He is using giraffe as a model, primarily because this species large body size and specific feeding behaviour suggests that it will have significant impacts on the vegetation on which it feeds. In addition, giraffe have been introduced onto the properties of a number of wildlife based ventures in the region. Evert has been collected dietary material at five sites representing a gradient of increasing aridity, and has also set up a number of enclosure experiments at two sites.

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## **BIODIVERSITY**

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

**National biodiversity - BIOMAP:** The year started with Rebecca Sims-Castley giving a talk and on-line demonstration of the SA-ISIS website at the South African Society of Systematic Biologists (SASSB) conference held in Grahamstown. In March a presentation was delivered to DACST (Dept of Arts Culture Science & Technology), the funders of the SA-ISIS project, to demonstrate proof-of-concept of the functionality of the SA-ISIS platform on the Internet. DACST were impressed with the products shown to them and committed a further R3 million over 3 years to the project for the next phase of project development, namely that of market appraisal and development. This task has been out-sourced to private consultants, OSI. As coordinator of the UPE node of BioMAP, Rebecca demonstrated the BioMAP portion of the website to OSI to illustrate its functional components to identify its market potential. In

August she also presented a poster at the Fynbos Forum held in Worcester. During the course of the year, Rebecca provided on-going technical advice to BioMAP data contributors, GIS guidance to students within TERU, and continued work on the National Protected Areas Database, due to be completed early in 2003. In her BioMAP capacity, Rebecca also participated in conservation planning exercises and workshops associated with projects such as CAPE, GAENP, STEP and SKEP. This project is now completed as far as TERU's responsibilities are concerned, and it has been a valuable exercise for TERU.

**Hierarchical floristic structure of abiotically derived land classes in Namaqualand:** Progress was interrupted owing to Mr Desmet's (PhD UCT) involvement in the conservation planning component of the Succulent Karoo Ecosystem Planning (SKEP) Project between January and September 2002. However, much of the data compiled, and analyses undertaken for SKEP will be used for Desmet's thesis. A thesis structure has been finalized and the first of many papers has been published. Another paper, on the use of phytosociological data for setting targets for land classes, is in draft form. Desmet's thesis will be submitted in May 2003.

**Biodiversity and rarity in South Africa's south-eastern temperate (upland) grasslands:** The objective of this project is to use the comprehensive phytosociological database that exists for this portion of the grassland biome to develop a predictive understanding of the patterns of independent diversity components. The data will also be used to model the biological and habitat aspects of rarity. In addition the results will also be used to identify land classes as biodiversity entitles for conservation planning. Dave Hoare, who is currently employed by the Range and Forage Institute of the ARC, registered for a PhD in 2002. One paper has been submitted and several others are in preparation.

**Weevil-plant diversity relationships:** This project is being undertaken by Serban Proches, a postdoctoral student. The research addresses two questions: 1) How and why does weevil (Curculionidae) diversity vary across different vegetation types? 2) What is the relationship between weevil and plant diversity? Sampling is being undertaken in four vegetation types in and around the Baviaanskloof Conservation Area. Excellent progress is being made, with many undescribed species found and interesting patterns observed. Sampling will continue into early 2003 when core areas of vegetation types will also be sampled.

**Geophyte diversity, bulb size, and environmental factors in the winter rainfall region of southern Africa:** This project is also being undertaken by Serban Proches as part of his postdoctoral studies. The research aims to quantify patterns of geophyte diversity at the Quarter Degree Scale and model these in terms of environmental and biological attributes. Excellent progress is being made and three papers are currently in preparation.

**Population age structure and distribution models for tree euphorbias in subtropical thicket:** Abigail Kamineth's MSc project has two components: (i) describing and interpreting the population age structure of three species of tree euphorbias, and (ii) modelling the distribution of these species using phytosociological data and generalised linear models. Owing to their reliance on sexual reproduction, and their vulnerability to megaherbivore impacts, tree euphorbias are useful indicators of thicket integrity. Good progress has been

made with the collection and compilation of data.

**Developing habitat suitability indices for mammalian herbivores at Augrabies Falls National Park:** This project seeks to develop behaviourally based habitat suitability indices for a range of herbivores, focusing on the animal's assessment of foraging opportunities and predation risk information inherent in marginal values of resources remaining in a habitat patch used by the animal. Caroline Reid (MSc) is focusing her study on springbok within the Augrabies Falls National Park, while David Druce (PhD at University of Natal) is focusing on hyrax and klipspringer. This represents a collaborative project between Graham Kerley and Joel Brown (University of Illinois, Chicago), Burt Kotler (Ben Gurion University of the Negev), Mike Knight (SANParks) and Rob Slotow (University of Natal). Caroline and David have both developed their study proposals, and have undertaken initial field trips to their study site.

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## **FUNDAMENTAL RESEARCH**

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

**Temperature-induced petal movements in Namaqualand wildflowers protects pollen from moisture damage:** Richard Cowling has been working on this project in Collaboration with A Ellis and A van Hause, and seeks to test hypotheses regarding patterns of petal movement and sensitivity of pollen to moisture. This project is now complete and a paper was submitted to American Journal of Botany in December.

**The role of rainfall variability in explaining post-fire regeneration traits and diversification processes in Mediterranean-climate ecosystems:** Richard Cowling is collaborating with BB Lamont, F Ojeda, PW Rundel on this project, the focus of which is a comparison of indices of rainfall reliability and plant regeneration traits across all five Mediterranean-climate rainfall regions. Rainfall statistics have now been compiled for all regions. Preliminary analyses show the following hierarchy in reliability of winter rainfall: SW Australia > SW Cape >> Spain/California > Chile. The abundance in local floras of traits linked to obligate post-fire reproduction (serotiny, fire-stimulated germination, non-sprouting etc.) appears to show a similar hierarchy, although analyses must still be carried out. This suggests that the incidence of obligate post-fire reproductive traits may be a consequence of the interactions between fire regime and the reliability of post-fire soil moisture conditions, rather than of fire regime *per se*. Progress has been slow, owing to other commitments during 2002. However, it is hoped to produce a draft manuscript in the first half of 2003.

<h2><b>CONTRACT RESEARCH</b></h2>
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The contract for the conservation planning in the Greater Addo Elephant National Park, carried out on behalf of SA National Parks and in partnership with the CSIR, was completed. One publication on this work has already been published and further papers are planned.

## SCIENCE MANAGEMENT

- Graham Kerley served on the Council of the Zoological Society of Southern Africa as Past-President. He served on the University of Port Elizabeth Safety, Health and Environment Committee, and as Chairman of the University of Port Elizabeth Nature Reserve Committee. Graham is a member of the Organising Committee of the VIIth International Rangelands Congress (to be held in Durban in Sept 2003), serving in the portfolios of Scientific Programme and as one of the Scientific Editors of the Proceedings.
- Richard Cowling served as a member of the Board and chaired the Scientific Advisory Committee of the National Botanical Institute, and served on three Center for Applied Biodiversity Science (Conservation International) Working Groups, and is an elected member of the Academy of Science of South Africa.
- Richard Cowling served as a Member of the Editorial Boards of *South African Journal of Environmental Law and Policy*, *Global Ecology & Biogeography Letters*, *Ecological Economic* and *Oryx*; and as Associate Editor for *Plant Ecology* and *South African Journal of Botany*. Richard is also co-editing 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 reflects 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*, *Annals of Tourism Research*, *Austral Ecology*, *Biological Conservation*, *Biological Journal of the Linnaean Society*, *Biological Reviews*, *Bothalia*, *Conservation Ecology*, *Conservation Biology*, *Diversity and Distributions*, *Environmental Conservation*, *Ecography*, *Ecological Economics*, *Journal of Arid Environments*, *Journal of Ecology*, *Journal of Tropical Ecology*, *Journal of Vegetation Science*, *Journal of Zoology, London*, *Ostrich*, *Proceedings International Rangeland Congress*, *Science*, *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, University of Stellenbosch, National Research Foundation, National Geographic Society, National Science Foundation, University of Pretoria.
- 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 continued to act as manager of the Grysbok Environmental Education Trail on the UPE Campus: over 5500 school children have now participated in this trail since its inception in 1996.
- Public presentations by TERU members included talks to the Friends of the Karoo Nature Reserve, Friends of the Baviaanskloof Association, 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, Jansenville Farmers Association and Eastern Cape's Department of Agriculture (Western Region).
- André Boshoff and Graham Kerley both participated, by invitation, in Opinion Leader Trails, involving diverse and influential trailists, in the Baviaanskloof Conservation area.
- TERU staff and students provided specialist advice to Samara Private Nature Reserve, St Francis Coastal Open Space System, Rebels Rus Private Nature Reserve, Walker Bay Conservancy and Amatole District Municipality.
- TERU is represented as an *ex officio* member of the Steering Committee of the Baviaanskloof Mega-reserve Project.
- 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 Wildlife and Environment Society of South Africa (Eastern Cape Branch) Conservation Committee.



## 2002 PRODUCTS

### REFEREED SCIENTIFIC PUBLICATIONS

1. BEUKES, P.C., COWLING, R.M.C. & HIGGINS, S.I. 2002. An ecological economic stimulation model of a non-selective grazing system in the Nama Karoo, South Africa. *Ecol. Econ.* 42:221-242.
2. BOSHOFF, A.F., KERLEY, G.I.H., COWLING, R.M. & WILSON, S.L. 2002. The potential distributions, and estimated spatial requirements, and population size, of the medium- to large-sized mammals in the planning domain of the Greater Addo National Park Project. *Koedoe* 45:85-116.
3. BOSHOFF, AF, KERLEY, GIH & COWLING, RM. 2002. Estimated spatial requirements of the medium- to large-sized mammals according to Broad Habitat Units in the Cape Floristic Region. *Afr. J. Range Forage Sci* 19:29-44.
4. COWLING, R.M. & LOMBARD, A.T. 2002. Heterogeneity, speciation/extinction history and climate: explaining regional plant diversity patterns in the Cape Floristic Region. *Div. Dist.* 8:163-179.
5. DESMET, P.G., COWLING, R.M., ELLIS, A.G. & PRESSEY, R.L. 2002. Integrating biosystematic data into conservation planning: perspectives from southern Africa's succulent karoo. *Syst. Biol.* 51:317-330.
6. LAMONT, B.B., GROOM, P.K. & COWLING, R.M. 2002. High leaf mass per area of related species assemblages may reflect low rainfall and carbon isotope discrimination rather than low phosphorous and nitrogen concentrations. *Funct. Ecol.* 16:403-412.
7. WHITEHOUSE, A.M. & KERLEY, G.I.H. 2002. Retrospective assessment of long-term conservation management: recovery from near extinction of the elephants in Addo Elephant National Park, South Africa *Oryx* 36:243-248.
8. WHITEHOUSE, A.M. 2002. Tusklessness in the elephant population of the Addo Elephant National Park, South Africa. *J. Zool., Lond.* 257:249-254.

### BOOK CHAPTERS

1. COWLING, R.M., PIERCE, S.M. & SANDWICH, T. 2002. Conclusions: the fundamentals of mainstreaming biodiversity. In: Mainstreaming biodiversity in development: case studies from South Africa. Eds. PIERCE, S.M., COWLING, R.M., SANDWICH, T. & MACKINNON, K. The World Bank, Washington, DC.
2. KERLEY, G.I.H., & BOSHOFF, AF 2002. The Greater Addo National Park Initiative: linking biodiversity conservation to socio-economic development. In: Mainstreaming biodiversity in development: case studies from South Africa. Eds. PIERCE, S.M., COWLING, R.M., SANDWICH, T. & MACKINNON, K. The World Bank, Washington, DC. Pp 57-66.
3. KERLEY, G.I.H., BOSHOFF, AF & KNIGHT, MH. 2002. 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.
4. PRIVETT, S.D., HEYDENRYCH, B.J. & COWLING, R.M. 2002. Putting biodiversity to business on the Agulhas Plain. In: Mainstreaming biodiversity in development: case studies from South Africa. Eds. PIERCE, S.M., COWLING, R.M., SANDWICH, T. & MACKINNON, K. The World Bank, Washington, DC.

## **BOOKS**

1. PIERCE, S.M., COWLING, R.M., SANDWITH, T. & MACKINNON, K. (eds). 2002. Mainstreaming biodiversity in development: case studies from South Africa. The World Bank, Washington, DC.

## **PUBLISHED CONFERENCE PROCEEDINGS**

1. BOSHOFF, A.F., SKEAD, C.J. & KERLEY, G.I.H. 2002. Elephants in the broader Eastern Cape – an historical overview. In: KERLEY G, WILSON S & MASSEY A (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:3-15.
2. COWLING RM and KERLEY, G.I.H. 2002. Impacts of elephants on the flora and vegetation of subtropical thicket in the Eastern Cape. In: KERLEY G, WILSON S & MASSEY A (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:55-72.
3. KERLEY, G.I.H. 2002. Introduction. In: KERLEY, G., WILSON, S. & MASSEY, A. (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:1-2.
4. WHITEHOUSE, A.M. 2002. The Addo population: population history and present status. In: KERLEY G, WILSON S & MASSEY A (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:16-19.
5. WHITEHOUSE, A.M. 2002. Managing small elephant populations: lessons from genetic studies. In: KERLEY G, WILSON S & MASSEY A (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:41-48.
6. WHITEHOUSE, A.M. 2002. Managing elephant: lessons from behavioural studies. In: KERLEY G, WILSON S & MASSEY A (eds), *Elephant conservation and management in the eastern Cape. Workshop proceedings*, Terrestrial Ecological Research Unit Report No. 35:49-54.

## **REPORTS**

1. KERLEY, G.I.H., WILSON, S.L. & MASSEY, A. 2002. Elephant conservation and management in the Eastern Cape: Workshop Proceedings. *Terrestrial Ecology Research Unit Report 35: 88 pp.*
2. COWLING, R.M. & KERLEY, G.I.H. 2002. Subtropical Thicket Ecosystem Planning (STEP) project: identity, spatial components, and estimation of irreplaceability of processes required to sustain biodiversity. *Terrestrial Ecology Research Unit Report 36: 17 pp.*
3. SIMS-CASTLEY, R. 2002. A preliminary review of gross financial incomes generated by industries dependent on thicket vegetation. *Terrestrial Ecology Research Unit Report 37: 19 pp.*
4. SMITH, N., & WILSON, S.L. 2002. Changing land use trends in the thicket biome: pastoralism to game farming. *Terrestrial Ecology Research Unit Report 38: 22 pp.*
5. LLOYD, J.W., VAN DEN BERG, E.C. & PALMER A.R. 2002. Patterns of transformation and degradation in the Thicket Biome, South Africa. *Terrestrial Ecology Research Unit Report 39: 86 pp.*
6. VLOK, J.H.J. & EUSTON-BROWN, D.I.W. 2002. The patterns within, and the ecological processes that sustain, the subtropical thicket vegetation in the

planning domain for the Subtropical Thicket Ecosystem Planning (STEP) project. *Terrestrial Ecology Research Report* 40: 142pp.

7. DEAN, W.R.J. 2002. Distribution patterns and habitat of avifauna in the Thicket Biome. *Terrestrial Ecology Research Report* 41: 32pp.

### POPULAR ARTICLES

1. COWLING RM 2002. Review of *Eastern Cape. South African Wildflower Guide 11* by John Manning, Illustrations by Auriol Batten and Hertha Bokelmann. *Veld & Flora* 88, 33.
2. COWLING RM 2002. Our surprising forests. New perspectives on the tree richness of South Africa's forests. *Veld & Flora* 88, 48-49.
3. COWLING RM 2002 Conserving the fynbos. In: Kotze J & Huysen H (compilers), *Fynbos. African and European early and contemporary music*. Afrimusik, Stellenbosch.

### CONFERENCE PRESENTATIONS

1. LECHMERE-OERTEL, R., KERLEY, G.I.H., COWLING, R.M. A mechanistic explanation of goat-induced transformation of Succulent Thicket. Oral presentation, 28th Annual Conf. South African Association of Botanists, Grahamstown, January.
2. TODKILL, W. B., KERLEY, G.I.H., & CAMPBELL, E.E. The experimental rehabilitation of degraded succulent Thicket. Oral presentation, 28th Annual Conf. South African Association of Botanists, Grahamstown, January.
3. SIGWELA, A.M., KERLEY, G.I.H., COWLING, R.M. Seedling establishment in Succulent Thicket. Oral presentation, 28th Annual Conf. South African Association of Botanists, Grahamstown, January.
4. LANDMAN, M. & KERLEY, GIH. Assessing the costs of habitat transformation on black rhinoceros foraging and conservation opportunities. Oral presentation, 3<sup>rd</sup> International Student Conference on Conservation Science, Cambridge, UK, March.
5. KERLEY, GIH. Ecotourism: the potential for African Business Development – the case of the Greater Addo National Park. **Invited Special Plenary presentation**, Third International Conference, International Academy of African Business and Development, Port Elizabeth, April 2002.
6. LANDMAN, M. & KERLEY, GIH. Black rhinoceros dietary shift in the Thicket Biome, Eastern Cape. Oral Presentation, Joint Grassland Society of Southern Africa/South African Society for Animal Science Conference, Christiana, May.
7. SIGWELA, AM, KERLEY, G.I.H., COWLING, R.M. Seed dispersal in the Thicket Biome: implications of faunal replacements. Oral Presentation, Joint Grassland Society of Southern Africa/South African Society for Animal Science Conference, Christiana, May.
8. LECHMERE-OERTEL, KERLEY, G.I.H., COWLING, R.M. R., Do run-off and erosion behave predictably across a degradation gradient in Succulent Thicket? Oral Presentation, Joint Grassland Society of Southern Africa/South African Society for Animal Science Conference, Christiana, May.
9. LECHMERE-OERTEL, R., KERLEY, G.I.H., COWLING, R.M. The implications of a radically altered microclimate across a degradation gradient in Succulent Thicket. Oral Presentation, Joint Grassland Society of Southern Africa/South African Society for Animal Science Conference, Christiana, May.
10. COWLING, R.M. Planning for multiple biodiversity targets: a case study from the Cape Floristic Region. **Invited Plenary Presentation**, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.

11. LOMBARD, A.T., COWLING, R.M., PRESSEY, R.L., REBELO, A.G. & COLE, N.S. Efficiency of land class versus species locality data in conservation planning for the Cape Floristic Region. Oral presentation, **Invited presentation**, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.
12. RICHARDSON, D.M., ROUGET, M., COWLING, R.M. & LLOYD, J.W. Current patterns of habitat transformation and future threats to biodiversity in terrestrial ecosystems of the Cape Floristic Region. Oral presentation, **Invited presentation**, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.
13. PRESSEY, R.L., COWLING, R.M. & ROUGET, M. Formulating conservation targets for biodiversity pattern and process in the Cape Floristic Region. Oral presentation, **Invited presentation**, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.
14. KERLEY, G.I.H., PRESSEY, R.L., COWLING, R.M., BOSHOFF, A.F., SIMS-CASTLEY, R. Options for the conservation of large- and medium-sized mammals in the Cape Floristic Region. Oral presentation, **Invited presentation**, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.
15. MAZE, K., VON HASE, A., FAIRBANKS, D. & COWLING, R.M. Cape Lowlands Project: a fine scale conservation planning study in the Cape Floristic Region, South Africa. Oral presentation, 16<sup>th</sup> Annual Meeting, Society for Conservation Biology, Canterbury, UK. 14-19 July.
16. KERLEY, G.I.H. & WHITFORD, W.G. Does Kangaroo rat graminivory contribute to the persistence of desertified shrublands? Oral presentation, Ecological Society of America 87<sup>th</sup> Annual Meeting, Tuscon, Arizona, August.
17. SILANDER, J.A., A.M. SCHMIDT, A. LATIMER, S. WU, A.E. GELFAND, T.G. REBELO & R.M. COWLING. Spatial patterns of species richness and geographic ranges in African Proteaceae: Bayesian hierarchical models paper. Oral presentation, Ecological Society of America 87<sup>th</sup> Annual Meeting, Tuscon, Arizona, August.
18. STEWART, W. Nelson Mandela MOSS strategic conservation planning project. Oral presentation. Fynbos Forum, Rawsonville, 14-16 Aug.
19. KNIGHT, A.T., COWLING, R.M., BOSHOFF, A.F. & KERLEY, G.I.H. On the road to persistence: an interim framework for implementing conservation action in the Subtropical Thicket Biome. Oral presentation. Fynbos Forum, Rawsonville, 14-16 Aug.
20. VLOK, J.H.J., EUSTON-BROWN, D.I.W. & COWLING, R.M. A new perspective of subtropical thicket. Poster presentation. Fynbos Forum, Rawsonville, 14-16 Aug.
21. SIMS-CASTLEY, R. SA-ISIS BioMap: a demonstration of on-line access to biodiversity data. Poster presentation. Fynbos Forum, Rawsonville, 14-16 Aug.
22. BOSHOFF, A.F., WILSON, S.L. & SMITH, N. On with the game: landuse changes and conservation of Thicket biodiversity. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
23. KNIGHT, A.T., COWLING, R.M., BOSHOFF, A.F. & KERLEY, G.I.H. information, integration and involvement: an interim framework for implementing conservation action in the subtropical thicket biome. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
24. JAMES, I., HOFFMAN, M.T. & COWLING, R.M. The economic valuation of different landuse practices in Namaqualand. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.

25. KERLEY, G.I.H. & WHITFORD, W.G. Can kangaroo rats contribute to the persistence of desertified shrublands. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
26. SIGWELA, A.M., KERLEY, G.I.H. & COWLING, R.M. Is seed production important to the effective maintenance of Thicket vegetation. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
27. LECHMERE-OERTEL, R., KERLEY, G.I.H. & COWLING, R.M. The importance of soil chemical and physical properties in understanding degradation of xeric succulent thicket. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
28. BOSHOFF, A.F., COWLING, R.M., KERLEY, G.I.H & WILSON, S.L. The STEP project: a conservation plan for the Thicket Biome. Poster presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
29. JACOBS, E.M., KERLEY, G.I.H. & COWLING, R.M. Understanding the impacts of introduced herbivores in the arid zone. Poster presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
30. VAN CAUTER, A., KERLEY, G.I.H. & COWLING, R.M. Modelling mammal communities in the eastern Karoo as a resource for private nature reserve management. Poster presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
31. WILSON, S.L. & KERLEY, G.I.H. Boergoat foraging efficiency – a possible threat to indigenous thicket browsers. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
32. LANDMAN, M. & KERLEY, G.I.H. impact of goat overgrazing on potential black rhinoceros forage. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
33. KAMINETH, A., CAMPBELL, E.E. & COWLING, R.M. Population age structure of tree euphorbias in Thicket – whats going on? Poster presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
34. BARKHUYSEN, A., BOSHOFF, A.F. & KERLEY, G.I.H. Understanding mortality patterns of large birds across the arid zone: the link between habitat transformation and prey. Oral presentation, Arid Zone Ecology Forum, Middelburg, 27-31 Aug.
35. SNOW, B. & KERLEY, G.I.H. The contribution of the University of Port Elizabeth to sustainable management: lessons at a range of scales. Oral presentation, Environmental Management for Sustainable Universities International Conference, Grahamstown, 11-13 Sept.
36. WHEELER, M., SCHOEMAN, D.S., COWLING, R.M. & R. SIMS- CASTLEY - Systematic conservation planning: A new vision for the marine environment?; Oral presentation, Southern African Wildlife Management Association's annual symposium; " Pretoria; 25-26 Sept.

## **POST-GRADUATE TRAINING**

### **Honours Projects**

1. DU PREEZ, S. 2002. Range use and interactions by introduced elephant bulls in the Addo Elephant National Park. BSc(Hons) project, Univ. Port Elizabeth
2. SCHLEBUSH, Z. 2002. Diet of eland and red hartebeest in the Addo Elephant National Park. BSc(Hons) project, Univ. Port Elizabeth

### **Postgraduate degrees completed**

1. HENLEY, S.R. 2002. The predictive value of habitat models: comparing subtropical thicket herbivores. PhD thesis, Univ. Port Elizabeth.

2. WATSON, J.J. 2002. Dynamics of Bontveld and rehabilitation implications. PhD thesis, Univ. Port Elizabeth
3. WILSON S.L. 2002. The influence of body size on the foraging behaviour of Thicket Biome browsers. PhD thesis, Univ. Port Elizabeth.

### **Postgraduate degrees in progress**

1. BARKHUYSEN, A. Habitat transformation and prey availability. MSc thesis, Univ. Port Elizabeth.
2. LECHMERE-OERTEL, R. Quantifying the ecological costs of livestock ranching in Xeric Subtropical Thicket. PhD thesis, Univ. Port Elizabeth.
3. LANDMAN, M. Foraging behaviour of the black rhinoceros (*Diceros bicornis bicornis*) in the Thicket vegetation of the Eastern Cape. MSc. thesis, Univ. Port Elizabeth.
4. 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.
5. SIMELANE, T.S. The role of National Parks in conserving traditional natural resources. PhD thesis, Univ. Port Elizabeth.
6. STEWART, W.I. The Nelson Mandela Metropolitan Open Space System: A strategic conservation planning project. MSc thesis, Univ. Port Elizabeth.
7. VAN CAUTER, A. Modelling large mammal distribution and abundance in the Eastern Karoo. MSc thesis, Univ. Port Elizabeth
8. MAYEKISO, MH. Foraging impacts of different breeds of domestic herbivores – implications for desertification. MSc thesis, Univ. Port Elizabeth.
9. JACOBS, EP The impact of giraffe as an introduced herbivore in the Thicket Biome. MSc thesis, Univ. Port Elizabeth.
10. KNIGHT, A. On the road to persistence: on implementing conservation action in the Subtropical Thicket Biome. MSc thesis, Univ. Port Elizabeth.
11. KAMINETH, A. Autecology of Euphorbias in the Eastern Cape. MSc thesis, Univ. Port Elizabeth.
12. REID, C. Developing habitat suitability indices for springbok (*Antidorcas marsupialis*) at Augrabies Falls National Park, South Africa. MSc thesis, Univ. Port Elizabeth.

A delegation of TERU staff and students attended the Arid Zone Ecology Forum held at Grootfontein Agricultural College, Middleburg, from the 27 – 31 August 2002.



## FINANCIAL SUPPORT 2002

Research Grants	Programme	Amount
National Research Foundation (G Kerley)		<b>173 000</b>
(R Cowling)		<b>77 000</b>
Global Environment Facility: STEP	Conservation Planning	<b>1 998 601</b>
National Botanical Institute	Conservation Farming	<b>128 912</b>
SA-ISIS	BioMap	<b>199 500</b>
Zoological Society of San Diego	Black rhino conservation biology	<b>313 590</b>
Eskom	Birds & Powerlines	<b>39 750</b>
Development vBank of SA	Handbook	<b>81 525</b>
Samara Private Nature Reserve	Mammal habitats	<b>39 000</b>
University of Port Elizabeth	Research Committee grant to G Kerley & R Cowling	<b>89 713</b>
<b>Contracts</b>		<b>78 455</b>
<b>Donations</b>		<b>10 000</b>
<b>Bursaries*</b>		
University of Port Elizabeth		
Jacobs, E	10 500	
Kamineth, A	10 500	
Landman, M	10 500	
Mayekiso, M	10 500	
Proches, S	50 000	
Sigwela, A	3 500	
Van Cauter, A	10 500	
Israeli Government Scholarship (M Mayekiso)	20 000	
University of Cambridge (M Landman)	3 800	
	<b>Bursary subtotal</b>	<b>129 800</b>
	<b>TOTAL</b>	<b>3 358 846</b>

\*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 Mazda Wildlife Fund represents a saving of about R20 000 on transport expenses.

Gentyre donated two sets of Continental tyres for the vehicles, valued at R10 000.

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

## ADVISORY BOARD, STAFF AND ASSOCIATED STUDENTS 2002

### Advisory Board

Dr M. H. Knight, South African National Parks (Chairman)  
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)  
Mr F. Hobson, Department of Agriculture (Eastern Cape)  
Dr R. Little, WorldWide Fund for Nature-South Africa  
Dr A. R. Palmer, Agricultural Research Council  
Mr J. Pauw, National Research Foundation  
Prof A. van Jaarsveld (Center for Environment Studies, University of Pretoria)  
Ms S. Frazee (Conservation International)  
Mr I. Gush (Eastern Cape Private Nature Reserves Association)

### Staff

Prof. G. I. H. Kerley, Director	Ms R. Sims-Castley
Dr A. F. Boshoff	Ms L. Visagie
Prof. R. M. Cowling	Ms R. Hannah
Dr S. L. Wilson	

### Research Associate

Dr A. M. Whitehouse

### Scientific Collaborator

Dr C. J. Skead

### Postdoctoral Researchers

Dr W. Linklater	Dr S. Proches
-----------------	---------------

### Visiting Scientists

Ms S. Vetter, University of Cape Town	Dr S. Andelman, NCEAS, University of California at Santa Barbara
Dr J. Silander, University of Connecticut	
Dr Laco Mucina, University of the North	

### Postgraduate students (and their academic departments)

Mr A. Barkhuysen (MSc)	Zoology
Mr E.P. Jacobs (MSc)	Zoology & Botany
Ms A. I. Kamineth (MSc)	Botany
Mr A. Knight (MSc)	Botany & Zoology
Ms M. Landman (MSc)	Zoology
Mr M. H. Mayekiso (MSc)	Zoology
Ms C. Reid	Zoology
Mr W. Stewart (MSc)	Botany
Ms A. van Cauter (MSc)	Zoology & Botany
Mr R. Lechmere-Oertel (PhD)	Zoology & Botany
Mr A. Sigwela (PhD)	Zoology & Botany
Mr T. S. Simelane (PhD)	Zoology

### Function of the Advisory Board

The function of this Board is to review and advise on the activities of the Terrestrial Ecology Research Unit, and to report back to the Council of the University of Port Elizabeth via the Faculty of Science.