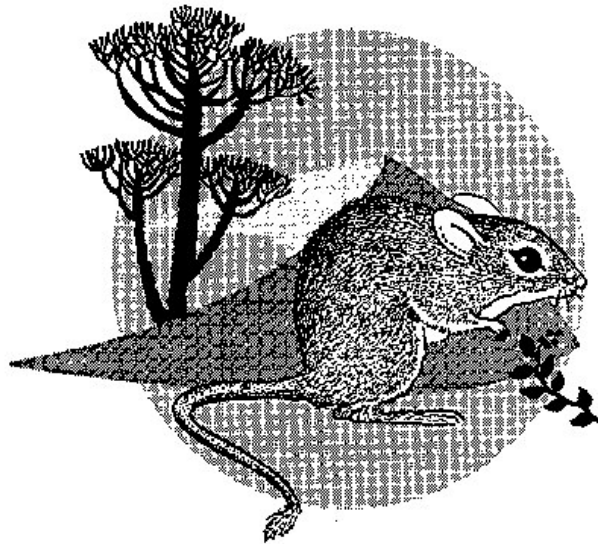


# TERRESTRIAL ECOLOGY RESEARCH UNIT

## ANNUAL REPORT

1996

Department of Zoology, University of Port Elizabeth



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Department of Zoology, University of Port Elizabeth, P O Box 1600, Port Elizabeth 6000

Tel: (041) 504 2308

Fax: (041) 504 2317

E-mail: ZLAGIK@zoo.upe.ac.za

## **DIRECTOR'S REPORT**

Like all institutions in the current environment of financial and organizational uncertainty, the Terrestrial Ecology Research Unit has had to deal with a number of issues. It is gratifying to report that TERU is continuing to achieve its objectives.

A highlight of the year has been the donation of a Mazda Wildlife Fund 4x4 Twincab Pickup for TERU's research. This vehicle, valued at R140 000, is crucial to TERU's productivity as it provides safe, rugged and reliable transport at an economical rate. It is estimated that the previous Mazda Wildlife Fund pickup represented a saving in transport costs of about R50 000 over the last four years we had the vehicle.

Research funding for 1996 was slightly down on the previous years. Not reflected here, however is the fact that the Director's salary is now provided by the University of Port Elizabeth, representing a considerable saving of research funding. In addition, most FRD bursaries are now provided as part of research grants, so the income accruing to students is reflected in a different way.

Despite the apparent drop in funding, productivity has continued to increase, with TERU staff and students generating seventeen scientific publications, five technical reports, four popular articles and seven conference presentations. The number of publications has more than doubled, as predicted last year, and this is expected to continue to increase as more and more material is prepared for publication.

Student training continued to be a strong point, with four MSc students graduating during 1996. Congratulations are due to Bronwyn and Vincent Egan, Bridget Elliott and Thokozane Simelane. It is particularly satisfying to report that these graduates are all employed in their chosen field, with Bronwyn and Vincent working at the Port Elizabeth Museum, Bridget with the University of Cape Town and Thokozane with the National Parks Board. In addition, two honours students successfully participated in TERU research programmes for their student projects. There are currently four MSc and three PhD students working on TERU research programmes.

TERU has always been fortunate to have good staff. Angela Gaylard continued in her role of research associate until the end of September, when she left to further her PhD studies. André Boshoff subsequently joined TERU, and his extensive experience in ecology and conservation management will definitely expand TERU's capacity to fulfill its objectives.

An issue that needs to be addressed is the recognition within the Zoology Department of TERU's role and contribution. This is particularly important in view of the wide support that TERU continues to receive from its various stakeholders.

The successes of 1996 again reflect a team effort, and I am indebted to the Advisory Committee and Prof J.F.K Marais and Dr A.F. Boshoff for their guidance and support. The financial support of various agencies is also crucial (see later). The enthusiastic support of a vibrant team of students is the backbone of TERU's success, and they all need to be congratulated on a job well-done.

**DR G I H KERLEY**

**DIRECTOR: TERRESTRIAL ECOLOGY RESEARCH UNIT**

## **RESEARCH ACTIVITIES**

### **FOREST PROGRAMME**

The forest programme completed a major phase in 1995, and research funds were considerably reduced during 1996. Monitoring of the experimental grazing exclosures has continued, and clear evidence of the impact of domestic herbivores on forest habitat structure and small mammal communities are emerging. This information has proved useful to SAFCOL, who have incorporated it into their forest management policy. The focus for the Forest Programme has therefore been on synthesizing data, and Thokozane Simelane completed his MSc dissertation, while Guy Castley should complete his PhD early in 1997. In addition, Guy had two scientific papers on his forest research published.

### **DUNE PROGRAMME**

The research on succession in coastal dunes, focusing on the prograding dunes at Mtunzini in Natal, is continuing. Vertebrate and insect patterns and associated processes do not support the general models of increasing biotic structure and function across the gradient from primary to climax seres. In contrast, meiofauna do conform to the general models. This information was incorporated into a dune management guide, published by the Kwazulu-Natal Regional and Town Planning Commission. A new programme on coastal dunes, funded by FRD and run in collaboration with Ted Avis and Roy Lubke (Rhodes University), has been initiated, but has not yet attracted any students at UPE.

In terms of output, the Dunes programme was highly productive, with four scientific papers and a technical report being produced. The Mtunzini work should also soon start bearing fruit, with data been analysed and papers planned. In addition, Olivia Brazzale's MSc should be completed early in 1997.

### **VALLEY BUSHVELD PROGRAMME**

The Valley Bushveld programme, funded mainly by the FRD and National Parks Board, is growing rapidly. The focus is on sustainable landuse, ranging from tortoise ecology to tourism economics. Mervyn Mason's project on tortoises has shown that tortoise biomass is very high in Valley Bushveld and that they are important as herbivores and seed dispersers, and he will be completing his MSc early in 1997. Sharon Haschick has initiated a PhD project on the implications of herbivore body size on resource use and availability in thickets, and has been submitting her MSc contents for publication. Sharon has been awarded an FRD Prestige Bursary, the only PhD candidate to get this recognition at any of the Eastern Cape universities.

From a broader perspective, Graham Kerley's collaborative work using Landscape Functional Analysis to assess degradation of Valley Bushveld with Dave Tongway and John Ludwig (CSIRO, Australia) is continuing, with the chemical analyses of soil samples currently underway. Graham was invited to give a talk on this work at the Annual Symposium of the Zoological Society of Southern Africa. Complimentary to this work is the recently initiated collaboration with Jayne Belnap (National Biological Service, USA) on the effects of elephants and goats on soil crusting organisms.

The potential for conservation/ecotourism as a sustainable landuse option is being addressed through Bev Geach's project on the economic value of the Addo Elephant National Park, and the results of this will be available early in 1997 when Bev's MSc is completed. Additional input for this has come from our foreign visiting students, Claire Vial, Jackie Brice and Kathy Moseby, who investigated just what

aspects of biodiversity tourists actually experience. This is now being expanded to investigate the potential for increasing tourist's exposure to biodiversity, through guided trails, etc.

### **GENERAL PROGRAMME**

The work on sustainable utilization of quail continues, and to date we have clearly demonstrated that the current hunting season coincides with the breeding season of the quail. In addition, another year's sampling has confirmed that quail numbers vary markedly between years, further complicating the management of this species. A scientific article and conference presentation on quail ecology and management were produced during 1996.

Collaboration between Graham Kerley and Walt Whitford (United States Environmental Protection Agency, Las Cruces, New Mexico) continued, with Graham visiting Walt for two weeks in December, in which time two manuscripts based on earlier work were completed. Walt Whitford's Rangeland Health research team are keen to visit UPE and opportunities to do this are being explored.

### **PUBLICATIONS 1996**

#### **Scientific Publications**

- ADAMS, N J & KERLEY, GIH, 1996. Domestic and indigenous herbivores: their water use efficiencies and rangeland impacts, a hypothesis to address Valley Bushveld degradation. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 52.
- BADENHORST, A. & KERLEY, GIH. 1996. Seasonal variation in the diet of common quail *Coturnix coturnix* in the Eastern Cape. *S. Afr. J. Zool.* 31:159-161.
- BERNARD, RTF, KERLEY, GIH, DOUBELL, T & DAVISON, A. 1996. Reproduction in the round-eared elephant shrew (*Macroscelides proboscideus*) in the southern Karoo, South Africa. *J. Zool., Lond.* 240: 233-243.
- CASTLEY, JG & KERLEY, GIH. 1996. The paradox of forest conservation in South Africa. *Forest Ecol. Managemt.* 85:35-46.
- CASTLEY, JG & KERLEY, GIH. 1996. Afromontane forests in the Eastern Cape, South Africa: the effects of grazing. *Proc. Symposium supporting capacity building in Forestry Research in Africa* pp 267 - 275.
- ELS, LM & KERLEY, GIH. 1996. Biotic and abiotic correlates of small mammal community structure in the Groendal Wilderness Area, Eastern Cape, South Africa. *Koedoe.* 39:121-130.
- GEACH, B, KERLEY, GIH, AND HOSKING, S. 1996. A proposed cost-benefit analysis of ecotourism vs pastoralism in Valley Bushveld. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 53.
- HASCHICK, S L & KERLEY, GIH, 1996. Boergoats - a threat to indigenous herbivores and vegetation in Valley Bushveld areas. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 49-51.
- HASCHICK, S. L. & KERLEY, G.I.H. 1996. Experimentally determined foraging heights of bushbuck (*Tragelaphus scriptus*) and boergoats (*Capra hircus*). *S. Afr. J. Wildl. Res.* 26:64-65.
- KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). 1996. Proceedings of the Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 1-84.
- KERLEY, GIH, McLACHLAN, A & CASTLEY, JG. 1996. Diversity and dynamics of bushpockets in the Alexandria Dunefield, South Africa. *Landscape Urban Plann.* 34:255-266.

- KERLEY, GIH, 1996. Desertification of Subtropical Thicket in the Eastern Cape. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 5-7.
- KERLEY, GIH, KNIGHT, M H & DE KOCK, M. 1996. Wildlife and ecotourism as alternative landuse options for Valley Bushveld. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 32-34.
- MacLEOD, SB, KERLEY, GIH, & GAYLARD, A. 1996. Habitat and diet of bushbuck *Tragelaphus scriptus* in the Woody Cape Nature Reserve: observations from faecal analysis. *S. Afr. J. Wild. Res.* 26:19-25.
- MASON, MC & WEATHERBY, CA. 1996. Tortoises in a sustainable Valley Bushveld System. In: KERLEY, GIH, HASCHICK, SL, FABRICIUS, C & LA COCK, G. (Eds). Proc. Second Valley Bushveld Symposium. *Grassland Soc. S. Afr. Special Publ.* 54
- McLACHLAN, A, KERLEY, GIH & RICKARD, CA. 1996. Ecology and energetics of slacks in the Alexandria Coastal Dunefield. *Landscape Urban Plann.* 34:267-276.
- WATSON, JJ, KERLEY, GIH & McLACHLAN, A. 1996. Human activity in the Alexandria Coastal Dunefield. *Landscape Urban Plann.* 34:315-322.

### Reports

- SIMELANE, TS. 1996. A preliminary survey of the traditional natural resources in the Addo Elephant National Park. *Terrestrial Ecology Research Unit Report* 5:1-12.
- McGWYNNE, LE, DE RUYCK, AMC, KERLEY, GIH & McLACHLAN, A. 1996. KwaZulu-Natal coastal dunes: ecological dynamics, human impacts and guidelines for planners - a pilot study for sites at Mtunzini and Richards Bay. *Natal Town & Regional Planning Report.* 43:1-98.
- VIAL, C. 1996. Levels of expectation, requirements and satisfaction of visitors viewing wildlife at Addo Elephant National Park, South Africa. *Terrestrial Ecology Research Unit Report* 6:1-22.
- KERLEY, GIH & WATSON, JJ. 1996. Quail as a renewable resource in the Eastern Cape. *Terrestrial Ecology Research Unit Report* 7:1-13.
- BOSHOF, AF. 1996. Roberts' Birds of Southern Africa: the "Millennium edition", a synthesis of opinions on options for a seventh edition. *Terrestrial Ecology Research Unit Report* 8:1-37.

### Popular Articles

- KERLEY, GIH. 1996. Revised species accounts for *Otomys unisulcatus*, *O. irroratus*, *O. saundersiae*, *O. laminatus*, *O. angoniensis*, *O. sloggetti*, *Parotomys brantsii* and *P. littledalei*, in Smithers Land Mammals of Southern Africa: a field guide, Third edition. Ed: APPS, P. Southern Books, Halfway House.
- GAYLARD, A. & CASTLEY, JG. 1996. The giant golden mole: facts and fallacies. *The Naturalist.* 40:3-9.
- VIAL, C. 1996. Biodiversity and wildlife viewing in the Addo Elephant National Park. *The Naturalist.* 40: 22-27.
- CASTLEY, J.G 1996. Golden moles of the Eastern Cape. *The Naturalist.* 40:6-8.

### Conference Presentations

- KERLEY, GIH, WATSON, JJ, BOSHOF, AF & BERTONI, A. Quail hunting in the Eastern Cape: a management conundrum. Oral presentation, S A Wildlife Management Association Symposium on the Sustainable use of Wildlife, Cape Town, April.
- SIMELANE, TS, & KERLEY, GIH. The traditional use of vertebrates. Oral presentation, S A Wildlife Management Association Symposium on the Sustainable use of Wildlife, Cape Town, April.
- GEACH, B, KERLEY, GIH & HOSKING, S. Recreational value of the Addo Elephant National Park as determined by the Travel Cost Method. Oral presentation, S A Wildlife Management Association Symposium on the Sustainable use of Wildlife, Cape Town, April.

- GAYLARD, A & KERLEY, GIH. Is there room for autecology in the new South Africa? Poster, S A Wildlife Management Association Symposium on the Sustainable use of Wildlife, Cape Town, April.
- KERLEY, GIH, TONGWAY, D, & LUDWIG, J. Intergrating animal/plant/soil interactions to understand irreversible degradation of Valley Bushveld. **Invited** oral presentation, Zoological Society of Southern Africa Annual Symposium, Pretoria, July.
- WATSON, JJ, CAMPBELL, EE & KERLEY, GIH. Bontveld rehabilitation: revegetation after opencast mining. Poster presentation. Arid Zone Ecology Forum, Kalahari, September.
- CAMPBELL, E & KERLEY, GIH. Soil as determinant in Bontveld. Poster presentation. Arid Zone Ecology Forum, Kalahari, September.

## **POST-GRADUATE TRAINING**

### **Honours Projects**

- HOGGINS, J. 1996. Thermal characteristics and vertebrate use of termitaria. Unpubl. BSc(Hons) project, University of Port Elizabeth.
- KIGOZI, F. 1996. Diet of the Cape Grysbok in the UPE Nature Reserve. Unpubl. BSc(Hons) project, University of Port Elizabeth.

### **Postgraduate students in training**

- CASTLEY, JG. Vertebrate diversity in Afromontane forests. PhD thesis, Univ. Port Elizabeth.
- BRAZZALE, OV. Meiofauna communities in Natal dune successional sequences. M.Sc. thesis, Univ. Port Elizabeth.
- MASON, M. Ecology of sympatric tortoises in Valley Bushveld. M.Sc. thesis, Univ. Port Elizabeth
- GEACH, B. Ecological and economic implications of land use in Valley Bushveld. M.Sc. thesis, Univ. Port Elizabeth.
- WATSON, JJ. Dynamics of Bontveld and rehabilitation implications. PhD thesis, Univ. Port Elizabeth.
- HASCHICK, SL. Resource partitioning by herbivores in Valley Bushveld. PhD thesis, Univ. Port Elizabeth.
- SIMELANE, TS. The role of National Parks in conserving traditional natural resources. PhD thesis, Univ. Port Elizabeth.

### **Postgraduate degrees completed**

- ELLIOTT, B. Dune hummocks in the Alexandria dunefield: patterns of development and succession. M.Sc. thesis, Univ. Port Elizabeth.
- EGAN, V. Foraging behaviour in snakes, with special reference to the puffadder *Bitis arietans*. M.Sc. thesis, Univ. Port Elizabeth.
- SIMELANE, TS. The traditional use of indigenous vertebrates. M.Sc. thesis, Univ. Port Elizabeth.
- EGAN, B. Ecology of *Labidura riparia* (Pallas) (Dermaptera: Labiduridae) in the Alexandria Coastal Dunefield. M.Sc. thesis, Univ. Port Elizabeth.

## FINANCIAL SUPPORT 1996

Funding agency	Programme	Amount
Worldwide Fund for Nature	Forests	R 4 650
Foundation for Research Development (with T Avis & R Lubke, Rhodes)	Dunes	R30 000
Department of Environment Affairs & Tourism (via Institute for Coastal Research)	Dunes	R 46 000
National Parks Board	Valley Bushveld	R 4 000
Foundation for Research Development (Resource Economics)	Valley Bushveld	R15 000
(Sustainable use)	Valley Bushveld	R 37 500
PPC Cement (Mine rehabilitation - joint project with EE Campbell, Botany Department)	Valley Bushveld	R25 000
University of Port Elizabeth Research Committee Grant to G. Kerley	General	R 5 864
<b>Bursaries</b>		
Foundation for Research Development Mason, M.C.		R10 000
University of Port Elizabeth Castley, J.G.		R 2 150
Haschick, S.L.		R 2 800
Mason, M.C.		R 2 300
Geach, B		R 2 800
Watson, J.J		R3 000
	Subtotals	R23 050
<b>Total</b>		<b>R168 014</b>

### Capital Contributions

Mazda Wildlife Fund provided a 4x4 Twincab pickup for research purposes, valued at **R140 000**, which replaced the previous vehicle that had been available for the last four years.

### In Kind Contributions

The loan and maintenance of the 4x4 pickup by Mazda Wildlife Fund represents a saving of about **R12 000** on transport expenses.

Gentyre donated specialist off-road tyres to the value of **R3 500**

National Parks Board provides access and accommodation for TERU research in the Addo Elephant National Park

## **ADVISORY COMMITTEE, STAFF AND STUDENTS 1996**

### **Advisory Committee**

Dr P M Norton, Eastern Cape Nature Conservation (Chairman)  
Dr A F Boshoff, Eastern Cape Nature Conservation (until September 1996)  
Dr J Danckwerts, Agricultural Research Council  
Dr E E Campbell, Botany Department, University of Port Elizabeth  
Mr P W Coetzee, Algoa Regional Services Council  
Mr P Niven, Amanzi Estates  
Mr F Hobson, Department of Agriculture (Eastern Cape)  
Mr H Bezuidenhout, National Parks Board  
Mr R Krohn, Foundation for Research Development  
Dr N Fairall, (Private Consultant)

### **Staff**

Dr G I H Kerley, Director  
Prof J F K Marais  
Ms A Gaylard (until September 1996)  
Dr A F Boshoff (from September 1996)

### **Postgraduate students**

Ms O V Brazzale  
Mr J G Castley  
Ms B Geach  
Mr M Mason  
Mr J J Watson  
Mr T S Simelane  
Ms S L Haschick

### **Visiting Students**

Ms C Vial, University of Otago, New Zealand  
Ms J Brice, University of South Australia, Adelaide  
Ms K Moseby, University of South Australia, Adelaide

### **Function of the Advisory Committee**

The function of this committee 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 Zoology Department.