South African Red Data Book — Reptiles and Amphibians

W.R. Branch (Ed.)

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National Programme for Ecosystem Research

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ABSTRACT

This multi-authored volume provides red data sheets for 93 species of threatened reptiles and amphibians, found within South Africa (including the National States of Venda, Bophuthatswana, Ciskei and Transkei, and the adjacent contries of Lesotho and Swaziland). Species are grouped according to established IUCN criteria into extinct, endangered, vulnerable, rare, and indeterminate categories. Additional categories of restricted and peripheral are included to identify potentially sensitive groups. Each data sheet summarises knowledge of the species' biology and conservation status, and is accompanied by a distribution map and a list of published sources. Where possible, species in the important categories of endangered, vulnerable and rare are also illustrated as an aid to identification.

Of the 93 species, one is judged to be extinct and six are considered to be endangered. Fifteen species are placed in the vulnerable category, whilst an additional twelve species are rare. Thirty five and twenty two species are placed in the categories of restricted and peripheral, respectively. The status of two enigmatic species, one of questionable provenance, remains indeterminate.

Appendices include: 1, a checklist of the endemic reptiles and amphibians of South Africa and their presence in the provinces, Lesotho and Swaziland; 2, a systematic synopsis of the total and endemic herpetofauna of the region; and 3, a summary of legislation affecting reptiles and amphibians in South Africa.

Analysis of the species sheets indicates a number of sensitive areas, the most important being Maputaland and the Cape peninsula and adjacent lowlying regions, the latter containg 4 of the 6 endangered species included in the RDB. Other sensitive areas include; Little Namaqualand and the Richtersveld; the Soutpansberg and adjacent lowveld, Woodbush/De Hoek Forest, the Natal Drakensberg, and the Elandsberg near Port Elizabeth.

SAMEVATTING

Hierdie volume verskaf rooi data vorms vir 93 bedreigde reptiel en amfibieë, spesies, van Suid Afrika (met inbegrip van die nasionale state Venda, Bophuthatswana, Ciskei en Transkei asook buurstate Lesotho en Swaziland). Spesies is volgens bestaande IUCN kriteria gekategoriseer as uitgestorwe, bedreig, kwesbaar, seldsaam en onbepaald. Die bykomende kategorieë beperk en grensgebiede is ingesluit om potensieel sensitiewe groepe te bepaal. Elke datavel som huidige kennis van die biologie en bewaringstatus van die spesie op en verskaf 'n verspreidingskaart en bronnelys. So ver moontlik is illustrasies vir die uitkenning van spesies in die kategorieë bedreig, kwesbaar en seldsaam ingesluit.

Een van die 93 spesies word beskou as uitgestorwe en ses is bedreig. Vyftien spesies is kwesbaar en nog twaalf reeds seldsaam. Vyf-en-dertig spesies en twee-en-twintig spesies is respektiewelik in die kategorieë beperk en grensgebiede geplaas. Die status van twee uitsonderlike spesies, een van twyfelagtige herkoms, is nog onbepaald.

Bylae ingesluit: 1, oorsiglys van endemiese reptiele en amfibieë soos hulle in die provinsies van Suid Afrika, Lesotho en Swaziland voorkom; 2, 'n sistematiese sinopsis van die algehele asook endemiese herpetofauna van die gebied; en 3, 'n opsomming van Suid-Afrikaanse wetgewing met betrekking tot reptiele en amfibieë.

'n Analise van data dui op 'n aantal sensitiewe gebiede waarvan onderstaande die belangrikste is Maputaland en die Kaapse skiereiland en omliggende laaglande, laasgenoemde wat 4 van die 6 bedreigde spesies in die RDB insluit. Ander sensitiewe gebiede sluit in: Klein Namakwaland en die Richtersveld, die Soutpansberg en aangrensende laeveld, Woodbush/De Hoek Woud, die Natalse Drakensberge, en die Elandsberge naby Port Elizabeth.

PREFACE

The National Programme for Ecosystem Research (NPER) is one of several national scientific programmes administered by the CSIR. This book is produced under the auspices of one of the sectional committees of the National Programme, namely the Committee for Nature Conservation Research. The National Programme is a coordinated multidisplinary undertaking of scientific research, concerned with problems in the environment. It includes research designed to meet purely local needs as well as projects undertaken in southern Africa as contributions to international scientific activities.

The ever increasing threat to Africa's native ecosystems and their component animal and plant species, poses enormous conservation problems. The need for development, together with man-induced modification and destruction of natural habitats that so often accompanies it, provides conservation managers with their most taxing dilemma.

The purpose of the NPER is to obtain knowledge on current and future environmental problems sufficient to conserve and manage ecosystems most effectively. The collation of information on rare and threatened species is a vital part of this effort. The volumes of the **Red Data Book** series are intended to provide and analyse that data base. They contribute directly, not only to the monitoring and management of rare species, but to the protection and sustenance of their consituent natural habitats.

To date, including this volume, the NPER has produced 10 **Red Data Books** in the National Scientific Programmes Report series published by the CSIR (No 7 in 1976; 11 in 1976; 14 and 18 in 1977; 23 in 1978; 97 in 1984; 117 in 1985, 125 in 1986 and 137 in 1987), covering the groups: birds; small mammals; fishes; large mammals; reptiles and amphibians and plants in the fynbos and karoo biomes. These volumes, which were all explicitly provisional, were based on the best available information. This was often embarrassingly sparse, such that some sections contained little more than annotated lists of species about which little was known.

This volume represents a comprehensive revision of the earlier **Red Data Book - Reptiles and Amphibians (RDB-RA)** (McLachlan, 1978). It provides a measure of the change, both in the status of our herpetofauna and in our knowledge of it. In the last decade there has been a renaissance in herpetological research in the subcontinent, and this is reflected not only in the increased thickness of this volume, but in the number and expertise of its contributors. Unlike most other South African Red Data Books, this publication is multi-authored with individual species accounts prepared by researchers familiar with, and/or involved in studies on, the particular species. Reference to specific accounts should be given as (eg.):

> **Haacke, W. D.** 1988. *Prosymna janii*: species account. p 189-190. In *South African Red Data Book - Reptiles and Amphibians*. W. R. Branch (ed.), *S. Afr. Nat. Sci. Prog. Rpt.* **151.**

Reference to the general work, discussion, and conclusions, etc. should be given as:

> **Branch, W. R. (ed.)** 1988. *South African Red Data Book - Reptiles and Amphibians. S. Afr. Nat. Sci. Prog. Rpt.* **151,** *iv*, 242p.

There remains a tremendous amount of research to be carried out on the region's herpetofauna. This volume contains 8 species and 5 subspecies not discovered at the time of the last **RDB-RA** as well as 4 old taxa now recognised as valid. In addition, at least another 7 new taxa will soon be described, some of which are candidates for this volume.

Recent publications on particular groups (eg. frogs - Passmore and Carruthers, 1978; snakes - Broadley, 1983; chelonians - Boycott and Bouquin, 1988; and southern African reptiles - Branch, 1988) have synthesised much of the recent research. However, many groups are still in taxonomic turmoil, whilst basic ecological and physiological studies on all reptiles and amphibians in the subcontinent are still in their infancy. Nonetheless, it is hoped that this revised **RDB-RA** will provide a more thorough assessment of the threatened status of our herpetofauna, and indicate where future conservation and research effort should be concentrated. The text, references and distribution maps were completed in June 1988.

ACKNOWLEDGEMENTS

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Finally, I would like to thank all the contributors for their expert, speedy and willing preparation of the species accounts. The following members of the region's herpetological community also offerred comment on initial drafts of the provisional checklist and **RDB-RA** candiate species, or commented on individual species accounts: G. Alexander, H. Berger-Dell'mour, T. Bodbijl, D. G. Broadley, D. Frost, J. Greig, M. Griffin, G. V. Haagner, C. Leonard, L. Raw, S. Spawls, and E. D. van Dijk.

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INTRODUCTION

Red Data Books (RDBs) were initiated in the early 1960s with the International Union for the Conservation of Nature and Natural Resources (IUCN) series dealing initially with the vertebrate classes. They have subsequently blossomed with national and lower taxonomic texts in abundance (see the list in *Oryx* 18: 61-64, 1984). The concept was adopted on a national level in the Republic of South Africa by the South African National Programme for Ecosystem Research (NPER), Council for Scientific and Industrial Research, in the mid-1970s, resulting in the publication of the initial series of SA RDBs.

The first South African **RDB-RA** was prepared in 1978 by Dr G. McLachlan of the South African Museum. It included 46 species, of which 2 species were considered endangered, ten vulnerable, 21 rare, 12 rare (peripheral) and one indeterminate. Since then the taxonomic and conservation status of a number of species has changed, and numerous new species and subspecies have been described. In addition many aspects of international, national and provincial legislation affecting the herpetofauna of the region have been amended.

In June 1986 a meeting of interested herpetologists was convened in Stellenbosch under the auspices of the CSIR to discuss the proposed revision of the **RDB-RA**. A difficulty, obvious at the outset, was the absence of a checklist of the subcontinent's herpetofauna. It was decided that the revision should involve three phases; the preparation of a provisional checklist of the herpetofauna of the subcontinent; followed by the nomination of candidate species for inclusion in the revised **RDB-RA**; and finally the selection of species to be included in the revision and the preparation of detailed species accounts by individual contributors.

An editor was selected to overview the preparation of these projects and the formal publication of the resulting documents. Subeditors for the four main groups (i.e., amphibians, chelonians, lizards and snakes) were chosen to prepare provisional checklists. These were collated into a provisional checklist of the subcontinent's herpetofauna, that was then circulated to the herpetological community in South Africa for comments and ammendments. At the same time correspondents were asked to nominate candidate species for inclusion in the **RDB-RA**. From the resulting returns an initial list of **RDB-RA** species was prepared and circulated for additional comment at the First Symposium of the Herpetological Association of Africa, Stellenbosch, April 1987. Individual contributors were then chosen to prepare accounts for the final list of **RDB-RA** species. The companion volume, "A provisional checklist of the herpetofauna of southern Africa", will appear in a forthcoming issue of the *Journal of the Herpetological Association of Africa.*

The area covered in this publication includes: The Republic of South Africa, including the offshore coastal islands; the enclosed Independent States of the Transkei, Ciskei, Venda and Bophuthatswana; and the adjacent countries of Lesotho and Swaziland (Map 1). It excludes the oceanic Prince Edward Islands as these lack a herpetofauna, and South West Africa/Namibia as this country has already started to compile its own RDBs. The small South African Walvis Bay enclave is also excluded here as this area will be covered by the proposed Namibia RDBs.

Species considered for inclusion are those recorded within the above area. Two species of sea turtle that breed on the beaches of northern Maputaland (*Caretta caretta* and *Dermochelys coriacea*), and three others (*Eretmochelys imbricata, Chelonia mydas* and *Lepidochelys olivacea*) that have been recorded from the coastal waters of the region, have been included due to their international plight. The main distribution of the yellowbellied seasnake (*Pelamis platurus*) is peripheral to the region's coastal waters, and the few specimens recorded from the east and southern coast are vagrant, non-breeders. Internationally the species is not threatened and it has therefore not been included in this account.

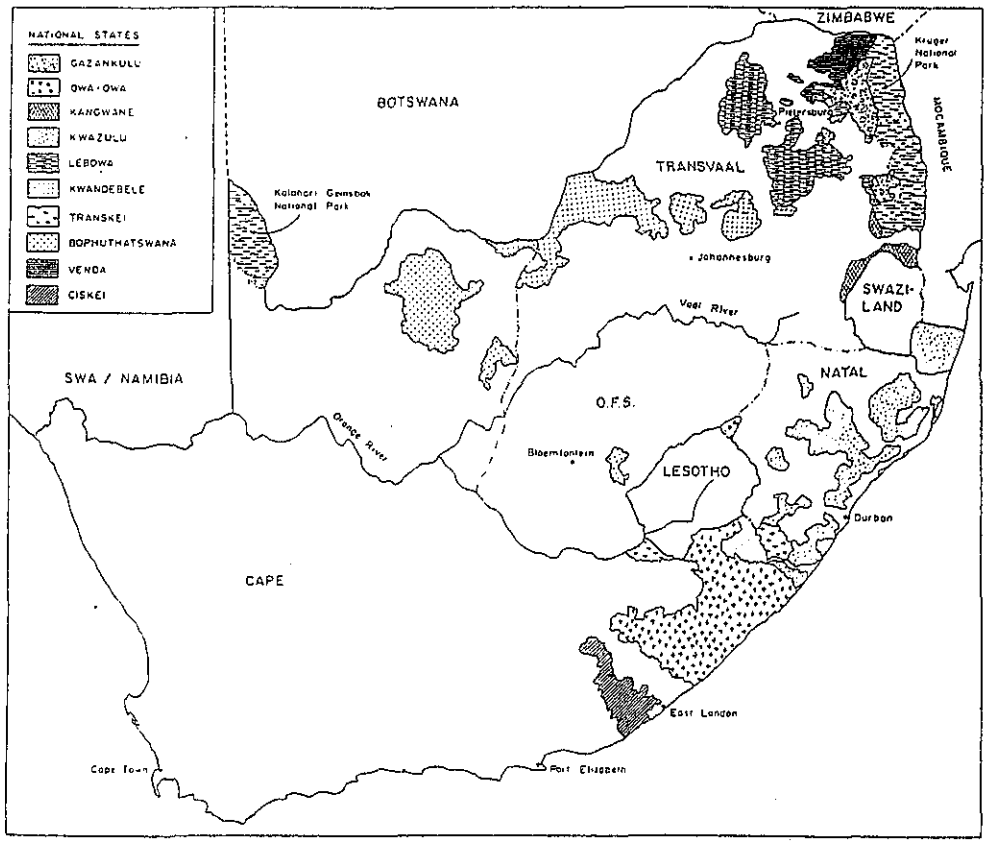
The revised **RDB-RA** has adopted a number of modifications from the previous edition (McLachlan, 1978), and from many other South African RDBs. The most obvious differences are the formal recognition of the parochial nature of this RDB, and awareness of its predictive, as well as its prescriptive, value. As Collar (1986) has noted "...if Red Data Books are to form a basis of national conservation strategy development, they ought not to rest at merely identifying threatened species and

prescribing the measures to save them." As well as treating globally threatened species whose range enters the region, they should go further and "...list and preferably provide status notes on all species, however widespread and abundant, that are endemic to the country".

The awareness that species may be locally endangered but internationally common, or vice versa, has often led to conflict. Smithers (1986) noted this problem when discussing the African elephant and Black rhinoceros. The latter was categorised only as Vulnerable in South Africa, whereas it is endangered throughout the rest of its range. To accomodate this conflict both the local and international status of a species have been listed in the revised **RDB-RA.**

Adoption of the concept of "ultimate responsibility" has led to the recognition of restricted and peripheral categories (defined below). Species in these categories may not be threatened at the moment, but they have very restricted distributions and could be rapidly and seriously endangered by relatively local threats. The extinction of local populations of peripheral species may not affect their conservation status internationally. However, their loss does reflect deterioration of the South African environment, and is as much cause for concern as the extinction of endemics. Similarly, localised races (subspecies) have also been included in this revision due to their importance in highlighting regional endemicity. They reflect genetic diversity and their loss is potentially as disastrous as the loss of species or higher taxa.

Appendices to this revision list: 1. All the endemic reptiles and amphibians occurring in the region, with notes on their distribution in the different provinces and countries; 2. Tabular summaries of the total and endemic herpetofaunal diversity within the region; and 3. International, National and Provincial legislation affecting the region's herpetofauna.



Map 1. **Map of Southern Africa showing political boundaries, the two largest national parks and some principal towns and rivers.**

CATEGORIES AND TERMINOLOGY

CATEGORIES

The conservation categories listed below are in agreement with those in the 1986 IUCN Red List of Threatened Animals (Anon, 1986), and are defined as follows:

Extinct: Taxa not definitely located in the wild during the last 50 years (as used in the Convention on International Trade in Endangered Species - CITES).

Endangered: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Vulnerable: Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Included are taxa of which all or most of the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations which have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat throughout their range.

N.B. In practice, Endangered and Vulnerable categories may include, temporarily, taxa whose populations are beginning to recover as a result of remedial action, but whose recovery is insufficient to justify their transfer to another category.

Indeterminate: Taxa that are suspected of being endangered, vulnerable or rare but for which insufficient information is currently available.

The following categories are slightly modified to meet local requirements, or are additional to those in the international 1986 IUCN Red List of Threatened Animals (Anon, 1986). They are defined as follows:

Rare: Taxa with small populations which are not presently endangered or vulnerable, but which are potentially at risk. These species are thinly scattered over an extensive range. These may be species which are seldom recorded but may be more common than supposed, although there is evidence that their numbers are low.

Restricted: Taxa endemic to South Africa and localized within limited geographical areas. They could easily be threatened and their status should be monitored. South Africa is their sole guardian, and their loss would result in the extinction of the taxa.

Peripheral: Taxa with a restricted distribution in South Africa, but whose main distribution falls outside the political boundaries of the area. The local populations could easily be threatened and their status should be monitored. South Africa is not their sole guardian and their loss would not result in the extinction of the taxa, but would reflect deterioration of the South African environment.

Out of Danger: Taxa formerly included in one of the threatened categories and which are now considered to be relatively secure because effective conservation measures have been taken, or the previous threat to their survival has been removed, or new information is available to show that the species is not threatened.

TERMINOLOGY

Endemic: Native, restricted or found only in a particular locality or area.

Environment: All of the physical, chemical and biological factors impinging on a living organism.

Habitat: The place where an organism naturally and normally lives.

Indigenous: Found or living naturally in a particular locality or area.

Population: A self-sustaining group of individuals of a species. In this work it generally applies to discreet geographical groups separated physically from other such groups of the same species, e.g. on isolated mountain ranges, rock outcrops or forests.

Threatened: The status of a taxon which has deteriorated through natural or unnatural causes to the point where it may be considered as rare, vulnerable or endangered.

AN OVERVIEW OF CURRENT CONSERVATION STATUS

The South African region has a rich and diverse herpetofauna with 23 families, including at least 115 genera. No less than 301 species of reptiles and 95 amphibian species, containing a total of 488 recognised taxa, have been recorded from the region (Branch *et al.*, 1988; Appendix 2). Of these, 256 taxa are endemic (ie. have more than 90% of their range in the region). The high level of endemicity (52.46%) is partly due to the low mobility of many amphibians and rock-living and burrowing reptiles. Endemicity in the more mobile southern African avifauna is lower (12.7%) and concentrated mainly in the southwestern arid zone (Clancey, 1986).

Ninety three taxa (19.06%) have been included in the present **RDB-RA**, but only 34 (36.56%) of these are threatened species that fall into the extinct, endangered, vulnerable and rare categories.

Changes to the list of threatened species

The previous **RDB-RA** (McLachlan, 1978) contained 46 threatened species; two being endangered, ten vulnerable, 21 rare, 12 rare (peripheral) and one indeterminate. Due to changes in the definition of categories and the different underlying philosophies of the current and previous **RDB-RA**, the two species lists (Table 1) are difficult to compare. The majority of additions to the present **RDB-RA** occur in the restricted and peripheral categories, which now include potentially sensitive species that are not necessarily threatened at the moment.

The following 13 taxa were unknown at the time of the original **RDB-RA**, and have only been described during the intervening decade:

Heleophryne hewitti	Endangered
Afrixalus aureus	Rare
Hyperolius pickersgilli	Rare
Amblyodipsas microphthalama nigra	Restricted
Homopholis mulleri	Restricted
Afroedura pondolia haackei	Restricted
Afroedura hawequensis	Restricted
Typhlosaurus lomii	Restricted
Typhlosaurus lineatus richardi	Restricted
Scelotes limpopoensis albiventris	Restricted
Cordylus mclachlani	Restricted
Chirindia langi occidentalis	Restricted
Cacosternum poyntoni	Indeterminate

A further four taxa have also recently been rediscovered or recognised as distinct:

Bradypodion taeniabronchum	Endangered
Kinixys natalensis	Rare
Homopus signatus cafer	Restricted
Bitis inornata	Restricted

Species whose status has deteriorated further

Eastwood's longtailed seps (*Tetradactylus eastwoodae*) is a small serpentiform lizard, known from only 2 specimens collected at the type locality (Woodbush, Transvaal). It has not been re-collected in the last 50 years, despite several searches, and must be considered extinct (in agreement with criterion used by CITES). It is hoped that a small colony may yet be found on the adjacent Wolkberg. The type locality has been extensively changed by exotic pine plantations, and frequent fires.

Two amphibians, the Cape platanna (*Xenopus gilli*) and the micro frog (*Microbatrachella capensis*) are endemic to the the Cape Flats and adjacent regions, whilst the Table Mountain ghost frog (*Heleophryne rosei*) is restricted to Table Mountain. They are now considered endangered due to threats associated with extensive urban development in the region. All were treated as rare (restricted) in the previous **RDB-RA**.

Bouton's skink (*Cryptoblepharus boutonii africanus*) and the Namaqua dwarf adder (*Bitis schneideri*) are two species with restricted distributions in coastal regions. Both are now considered vulnerable, the former by virtue of the minute size of the local colony (<150 individuals), and the latter due to the development of alluvial diamond mining in its specialised habitat.

Species whose threatened status has recently been recognised

In addition to the recently described and re-validated threatened taxa, a number of additional species are also known to be threatened, including:

Lygodactylus methueni	Vulnerable
Psammophis l. leightoni	Vulnerable
Scelotes guentheri	Rare
Tetradactylus breyeri	Rare
Gerrhosaurus typicus	Rare
Lamprophis fuscus	Rare
Homoroselaps dorsalis	Rare
Naja nigricollis woodi	Rare

Two additional non-breeding sea turtles (*Chelonia mydas* and *Eretmochelys imbricata*) have also been included in the revised **RDB-RA.**

Species whose threatened status has improved

Three rock-living lizards (*Lacerta australis, Lacerta rupicola* and *Phyllodactylus microlepidotus*) and a terrestrial montane frog (*Leptopelis xenodactylus*), previously known from only very few specimens, are now known to be relatively common but to have very restricted habitats. They are treated as restricted in the revised **RDB-RA.**

Although the giant leatherback sea turtle (*Dermochelys coriacea*) is still endangered internationally, the locally breeding population is not threatened and is, in fact, rapidly increasing in numbers. It is treated as vulnerable in the revised **RDB-RA.**

Out of danger

The two monitors (*Varanus niloticus* and *V. exanthematicus*) were included in the previous **RDB-RA** but are not included in this revision. Both are common and widely distributed in the region. They have been recorded from numerous conserved areas (Greyling and Huntley, 1984) and are also well-protected by existing legislation. Although monitor skin is still used in the fashion trade, there is no evidence that any commercial trade emanates from the subcontinent, or that specimens are killed or captured for commercial reasons.

Undescribed species and problem taxa

A number of taxa are difficult to assess following recent discoveries of numerous populations, particularly in the Transvaal, that do not easily fit into currently recognised taxa (eg. Jacobsen *et al.*, 1986; Branch, 1988). Particularly confusing are the genera *Afroedura, Lygodactylus* (Gekkonidae) and *Bradypodion* (Chamaeleonidae). Current studies indicate that several new, highly restricted endemic species occur in each genus, some of which may be candidates for inclusion in future revisions of the **RDB-RA.**

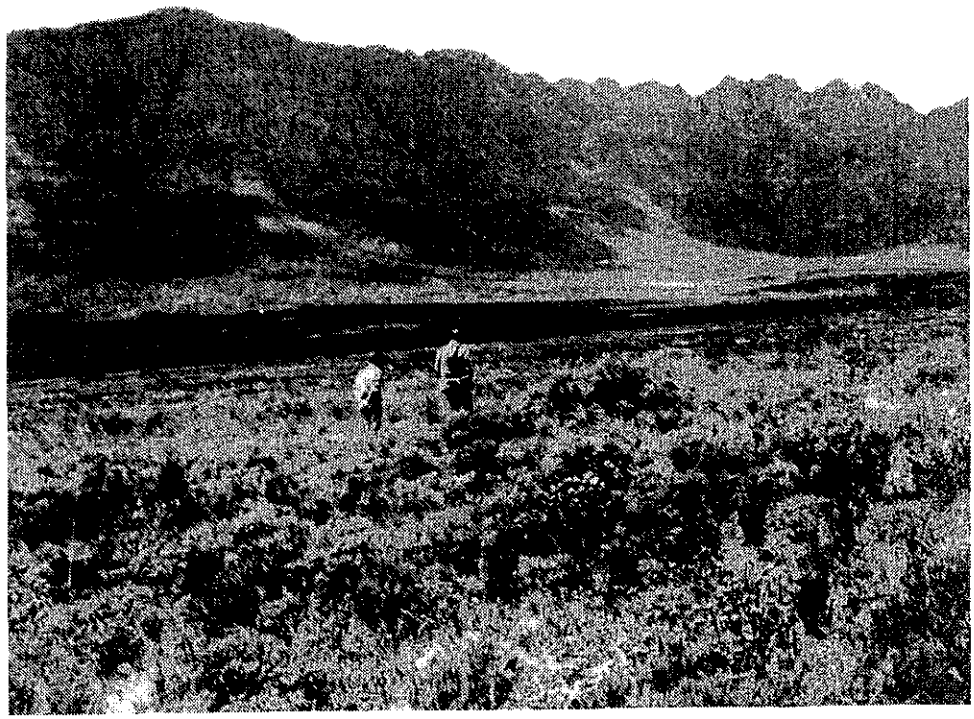


Fig. 1. **Elandsberg private nature reserve in the southwestern Cape. Home of the largest remaining population of the endangered geometric tortoise** (*Psammobates geometricus*)

TABLE 1. COMPARATIVE SUMMARY OF CONSERVATION STATUS

SPECIES	STATUS 1988	STATUS 1978
AMPHIBIA		
Xenopodidae		
Xenopus gilli	Endangered	Rare (Restricted)
Heleophrynidae		
Heleophryne hewitti	Endangered	
Heleophryne rosei	Endangered	Rare (Restricted)
Microhylidae		
Breviceps gibbosus	Vulnerable	Vulnerable
Breviceps macrops	Restricted	
Phrynomerus annectens	Peripheral	Rare (Peripheral)
Bufonidae		
Bufo amatolica	Restricted	Rare (Restricted)
Capensibufo rosei	Restricted	
Hyperoliidae		
Afrixalus aureus	Rare	
Hyperolius pickersgilli	Rare	
Leptopelis xenodactylus	Restricted	Rare
Ranidae		
Anhydrophryne rattrayi	Restricted	
Rana dracomontana	Restricted	
Rana vertebralis	Restricted	
Cacosternum capense	Restricted	Rare (Restricted)
Cacosternum poyntoni	Indeterminate	
Microbatrachella capensis	Endangered	Rare (Restricted)
REPTILIA		
Chelonii		
Testudinidae		
Psammobates geometricus	Endangered	Endangered
Kinixys natalensis	Rare	
Homopus signatus cafer	Restricted	
Cheloniidae		
Caretta caretta	Vulnerable	Vulnerable
Chelonia mydas	Vulnerable	
Eretmochelys imbricata	Vulnerable	
Lepidochelys olivacea	Vulnerable	Rare (Peripheral)
Dermochelidae		
Dermochelys coriacea	Vulnerable	Endangered
Pleurodira		
Pelomedusidae		
Pelusios castanoides castanoides	Peripheral	
Pelusios rhodesianus	Peripheral	

TABLE 1. (cont.)

SPECIES	STATUS 1988	STATUS 1978
Squamata		
Serpentes		
Typhlopidae		
Typhlops schinzi	Peripheral	
Leptotyphlopidae		
Leptotyphlops occidentalis	Peripheral	Rare (Peripheral)
Boidae		
Python sebae natalensis	Vulnerable	Vulnerable
Colubridae		
Lamprophis fiskii	Rare	Rare
Lamprophis fuscus	Rare	
Lamprophis swazicus	Rare	Rare (Peripheral)
Lycodonomorphus whytii obscuriventris	Peripheral	
Lycophidion semiannule	Peripheral	Rare (Peripheral)
Lycophidion variegatum	Peripheral	
Natriciteres variegata sylvatica	Peripheral	Rare (Peripheral)
Homoroselaps dorsalis	Rare	
Xenocalamus transvaalensis	Rare	Rare (Restricted)
Amblyodipsas microphthalma nigra	Restricted	
Amblyodipsas microphthalma microphthalma	Peripheral	
Psammophis jallae	Peripheral	
Psammophis leightoni leightoni	Vulnerable	
Prosymna frontalis	Peripheral	Rare (Peripheral)
Prosymna janii	Peripheral	
Meizodon semiornatus	Peripheral	
Philothamnus angolensis	Peripheral	
Dasypeltis medici medici	Peripheral	Rare (Peripheral)
Elapidae		
Naja nigricollis woodi	Rare	
Naja melanoleuca	Peripheral	
Viperidae		
Bitis schneideri	Vulnerable	Rare (Restricted)
Bitis gabonica gabonica	Vulnerable	Vulnerable
Bitis inornata	Restricted	
Bitis xeropaga	Peripheral	Rare (Peripheral)
Sauria		
Gekkonidae		
Lygodactylus methueni	Vulnerable	
Phelsuma ocellata	Restricted	Rare (Restricted)
Afroedura hawequensis	Restricted	
Afroedura pondolia haackei	Restricted	
Afroedura pondolia multiporis	Restricted	
Phyllodactylus microlepidotus	Restricted	Rare
Phyllodactylus peringueyi	Indeterminate	Indeterminate

TABLE 1. (cont.)

SPECIES	STATUS 1988	STATUS 1978
Homopholis mulleri	Restricted	
Palmatogecko rangei	Peripheral	Rare (Peripheral)
Scincidae		
Cryptoblepharus boutonii africanus	Vulnerable	Rare (Peripheral)
Scelotes guentheri	Rare	
Scelotes kasneri	Restricted	Rare (Restricted)
Scelotes gronovii	Restricted	Rare (Restricted)
Scelotes limpopoensis albiventris	Restricted	
Acontophiops lineatus	Restricted	Rare (Restricted)
Typhlosaurus lineatus subtaeniatus	Restricted	
Typhlosaurus lineatus richardi	Restricted	
Typhlosaurus lomii	Restricted	
Cordylidae		
Tetradactylus eastwoodae	Extinct	Rare (Restricted)
Tetradactylus breyeri	Rare	
Gerrhosaurus typicus	Rare	
Cordylus lawrencei	Rare	Rare (Restricted)
Cordylus giganteus	Vulnerable	Vulnerable
Cordylus cataphractus	Vulnerable	Vulnerable
Cordylus mclachlani	Restricted	
Pseudocordylus langi	Restricted	
Pseudocordylus spinosus	Restricted	
Platysaurus relictus	Restricted	Rare (Restricted)
Lacertidae		
Lacerta australis	Restricted	Rare (Restricted)
Lacerta rupicola	Restricted	Rare (Restricted)
Nucras caesicaudata	Peripheral	
Chamaeleonidae		
Bradypodion taeniabronchum	Endangered	
Bradypodion setaroi	Restricted	Vulnerable (Restricted)
Bradypodion nemorale	Restricted	
Bradypodion thamnobates	Restricted	Vulnerable (Restricted)
Amphisbaenia		
Amphisbaenidae		
Chirindia langi langi	Restricted	
Chirindia langi occidentalis	Restricted	
Monopeltis leonhardi	Peripheral	
Dalophia pistillum	Peripheral	
Crocodylia		
Crocodylus niloticus	Vulnerable	Vulnerable

SENSITIVE AREAS

The distribution of threatened herpetofauna in South Africa is not random, and they group into a few highly sensitive areas. Only 18 of the 93 species included in the revised **RDB-RA** do not fall into one of seven sensitive areas. These sites (Map 2.), and the species found in them, are listed in Table 2. They are discussed below in order of importance.

1. Maputaland. No less than 25 taxa, including nine vulnerable, three rare, one restricted and 12 peripheral, are recorded from the region. A number of researchers (eg., Poynton, 1964; Poynton and Broadley, 1978; Bruton and Haacke, 1980; Bruton 1980) have stressed the importance of this region as a transition zone for tropical and temperate herpetofaunas. The large species diversity in the region, but the lack of any endangered species, is a reflection of the little urbanisation or industrial development in the region. There are numerous conserved areas (Greyling and Huntley, 1984) and these, and the fauna and flora, have recently been reviewed (Bruton and Cooper, 1980). Bruton (1980) has elegantly discussed the conflicting themes of conservation and development for the region.

2. The Cape peninsula and adjacent lowlands. Although this region contains only nine threatened species, it contains a high proportion of endangered (four) and vulnerable (two) taxa, as well as six restricted species. The herpetofauna, like the flora (Taylor, 1978) and ichthyofauna (Skelton, 1987), has a high degree of endemicity. This is exemplified by the amphibians, none of which occur both in the south-western Cape and Maputaland (Poynton and Broadley, 1978). Skelton (1987) has noted that the south-western Cape freshwater ichthyofauna exhibits "typical characteristics of old, well established mountain faunas viz a high degree of endemicity, isolated and geographically restricted ranges, relatively inflexible life history styles and a low resilience to disturbance." Similar comments could be made for the herpetofauna.

The precarious conservation status of the area has been noted in many reports (eg. Taylor, 1978; Parker, 1982; Greig, 1982; Hall and Veldhuis, 1985; Low and McKenzie, 1988, etc.). Boycott and De Villiers (1986) have discussed the status of the Table Mountain ghost frog, whilst Simmonds (1985b) has noted the plight of the other endangered endemic frogs. The threats facing the geometric tortoise have been highlighted in articles with emotive, but nonetheless very accurate, titles (eg."Plight of the geometric tortoise" , De Villiers, 1985; "The geometric tortoise - symptom of a dying ecosystem" , Greig and De Villiers, 1982). A recent public appeal by the SA Nature Foundation and Wildlife Society raised donations towards the purchase of another geometric tortoise reserve (9 ha) near the Strand.

Numerous threats affect the region, although the most obvious is habitat destruction. The better drained areas of low-lying renosterveld have been almost completely converted to wheat and grape production, and less than 10% of the original veld remains (Parker, 1982). Similarly, the poor, sandy soils of the Cape Flats are now under increasing pressure for low-cost housing development. Low and McKenzie (1988) discuss the immediate conflict of priority land use in the political and economic climate of the region. The conservation of suitable and sizeable areas of indigenous habitats in the region is imperative, but time, money and opportunity may now have passed.

3. Soutpansberg and adjacent region. This region contains few threatened species, and only two vulnerable (the Nile crocodile and African rock python) and one rare species (Transvaal quillsnout snake) have been recorded from the area. However, the region has a very high, and as yet unexplained, level of endemicity (eight restricted taxa). A number of conserved areas occur in the region (Greyling and Huntley, 1984) from which many of the endemic and threatened species have been recorded (Jacobsen *et al.*, 1986).

4. Little Namaqualand and the Richtersveld. The extensive arid wastes of Little Namaqualand are famed for their seasonal floral splendour. Herpetologists find the many indigenous reptiles and amphibians no less impressive. The coastal dunefields have a surprising diversity of fossorial skinks, whilst a number of other lizards are separated from cogeners by many thousands of kilometers (eg *Platysaurus capensis* and *Phelsuma ocellata*). These intriguing distributions must reflect a long evolutionary history in the region. Two vulnerable, three rare and four restricted species occur in the region, as well as four peripheral and one indeterminate species.

There are few threats. The main concern is habitat destruction caused by opencast mining of alluvial diamonds. This affects fossorial skinks (eg.

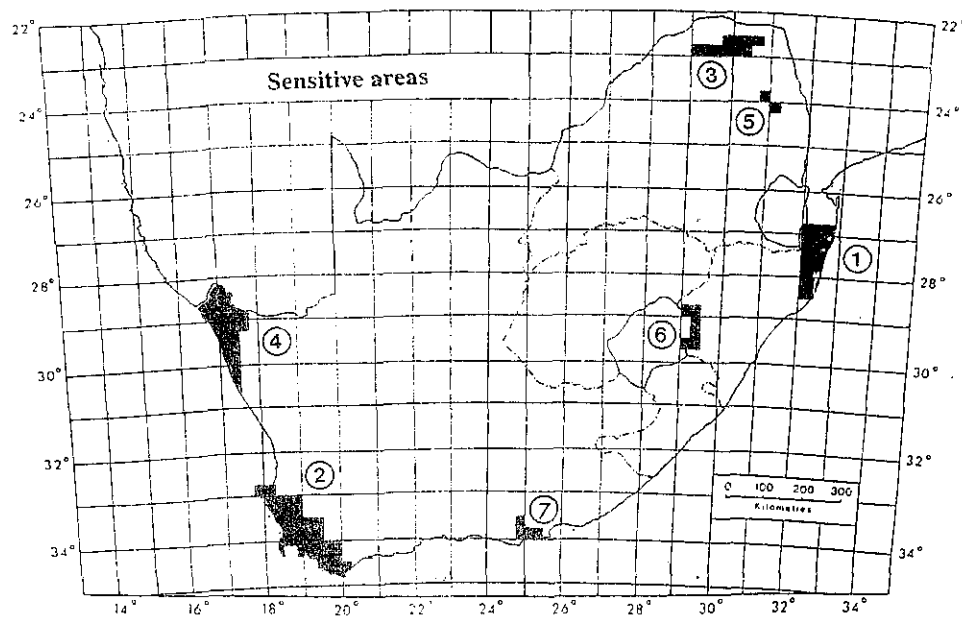
Typhlosaurus lomii) and frogs *(Breviceps macrops)* in particular. However, mining development can alleviate long-term damage by allowing sufficient adjacent habitat to remain undisturbed, thus permitting migration and recruitment from neighbouring populations. A number of species, eg. *Cordylus cataphractus, Lamprophis fiskii* and *Bitis schneideri* are still illegally collected, although the extent and effect of this is difficult to determine. There are few conserved areas in the region (Greyling and Huntley, 1984) although the proposed Richtersveld National Park will offer additional protection. Prohibited public access to areas covered by diamond mining concessions also affords a limited protection to the herpetofauna.

5. Woodbush Forest This small relict patch of montane evergreen high forest (the largest remaining in the Transvaal) and adjacent montane grassland, has an unusual endemic herpetofauna. It also has the dubious distinction of being once the home of Eastwood's longtailed seps *(Tetradactylus eastwoodae)*, the only extinct South African reptile. Two other species recorded in the region are vulnerable (the African rock python and Methuen's dwarf day gecko) and another rare (the Swazi rock snake). Two other species (the Woodbush flat gecko and Woodbush legless skink) were once considered endemic to the region, and would now be treated as vulnerable had they not been recently discovered on the nearby Wolkberg. The forest is conserved in the Woodbush/De Hoek State Forest (Greyling and Huntley, 1984), but adjacent regions have been planted with extensive exotic plantations. A population of the Woodbush flat gecko *(Afroedura pondolia multiporis)* was probably extirpated following construction of the Ebenezer Dam.

6. Natal Drakensberg The rocky escarpment of the Natal Drakensberg, with its associated montane grassland and relict afromontane forest, contains a number of restricted endemics but only one rare species (the yellowbellied house snake, *Lamprophis fuscus)*. The area is very well protected (15% of the bioclimatic region, Grimsdell and Raw, 1984) and its herpetofauna is well-documented (Bourquin and Channing, 1980).

7. Elandsberg This small range contains the most easterly patch of true fynbos vegetation. It is now under extensive exotic pine plantation, and only a relatively small summit area of natural veld remains. Two endangered species (Smith's dwarf chamaeleon, *Bradypodion taeniabronchum* and Hewitt's ghost frog, *Heleophryne hewitti*) are endemic to the region.

A number of other regions, eg. the Amatola mountains in the Eastern Cape and the Cape fold mountains of the southern and south-western Cape, also contain species with restricted ranges. Both regions are relatively well conserved (Greyling and Huntley, 1984).



Map 2. Sensitive sites containing the majority of the threatened herpetofauna in the South African region.

Fig. 2. **Habitat degredation by pine plantation of the Geelhoutboom River on the Elandsberg near Port Elizabeth, the type locality of Hewitt's ghost frog (*Heleophryne hewitti*). Remnant patches of fynbos surrounding the pine plantations are the only known habitat of Smith's dwarf chamaeleon (*Bradypodion taeniabronchum*).**

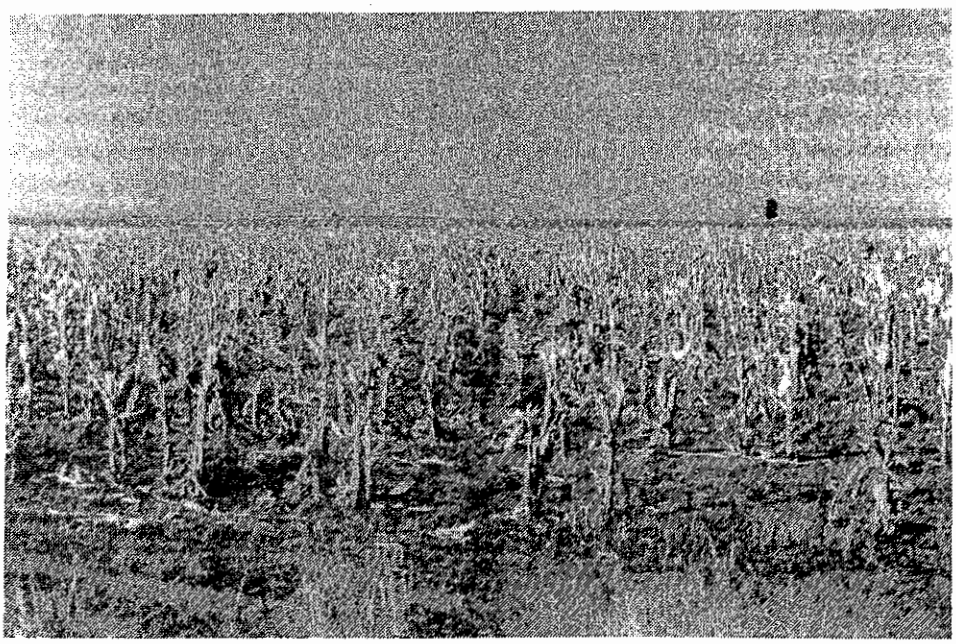


Fig. 3. **The fertile plains of the northern Orange Free State, once the habitat of the giant girdled lizard (*Cordylus giganteus*) but now a maize monoculture.**

TABLE 2. AREAS SENSITIVE TO LOSS OF SPECIES DIVERSITY

The relative sensitivity (RS) of an area is assessed by totalling its scores for taxa according to the following formula; endangered 5; vulnerable 4; rare 3; restricted 2; peripheral 1; extinct and indeterminate 0.

1. Maputaland		**Total: 25 taxa (RS 59)**
Vulnerable	Loggerhead sea turtle	*Caretta caretta*
Vulnerable	Green sea turtle	*Chelonia mydas*
Vulnerable	Hawksbill sea turtle	*Eretmochelys imbricata*
Vulnerable	Olive ridley sea turtle	*Lepidochelys olivacea*
Vulnerable	Leatherback sea turtle	*Dermochelys coriacea*
Vulnerable	African rock python	*Python sebae natalensis*
Vulnerable	Gaboon adder	*Bitis gabonica gabonica*
Vulnerable	Bouton's skink	*Cryptoblepharus boutonii africanus*
Vulnerable	Nile crocodile	*Crocodylus niloticus*
Rare	Transvaal quillsnout snake	*Xenocalamus transvaalensis*
Rare	Golden dwarf reed frog	*Afrixalus aureus*
Rare	Pickersgill's reed frog	*Hyperolius pickersgilli*
Restricted	Setaro's dwarf chameleon	*Bradypodion setaroi*
Peripheral	Eastern hinged terrapin	*Pelusios castanoides castanoides*
Peripheral	Mashona hinged terrapin	*Pelusios rhodesianus*
Peripheral	Whyte's water snake	*Lycodonomorphus w. obscuriventris*
Peripheral	Eastern wolf snake	*Lycophidion semiannule*
Peripheral	Variegated wolf snake	*Lycophidion variegatum*
Peripheral	Forest marsh snake	*Natriciteres variegata sylvatica*
Peripheral	Whitelipped snake	*Amblyodipsas m. microphthalma*
Peripheral	Mocambique shovelsnout snake	*Prosymna janii*
Peripheral	Semiornate snake	*Meizodon semiornatus*
Peripheral	Western green snake	*Philothamnus angolensis*
Peripheral	East African eggeater	*Dasypeltis medici medici*
Peripheral	Forest cobra	*Naja melanoleuca*
2. Cape peninsula and adjacent lowlands.		**Total: 15 taxa (RS 49)**
Endangered	Cape platanna	*Xenopus gilli*
Endangered	Micro frog	*Microbatrachella capensis*
Endangered	Table Mountain ghost frog	*Heleophryne rosei*
Endangered	Geometric tortoise	*Psammobates geometricus*
Vulnerable	Cape rain frog	*Breviceps gibbosus*
Vulnerable	Cape sand snake	*Psammophis leightoni leightoni*
Rare	Yellowbellied house snake	*Lamprophis fuscus*
Rare	Fisk's house snake	*Lamprophis fiskii*
Rare	Namaqua plated lizard	*Gerrhosaurus typicus*
Restricted	Cape caco	*Cacosternum capense*
Restricted	Cape mountain toad	*Capensibufo rosei*
Restricted	Southern speckled padloper	*Homopus signatus cafer*
Restricted	Hawaqua flat gecko	*Afroedura hawequensis*
Restricted	Kasner's dwarf burrowing skink	*Scelotes kasneri*
Restricted	Gronovi's dwarf burrowing skink	*Scelotes gronovii*

TABLE 2. (cont.)

3. Soutpansberg and adjacent region		**Total: 13 taxa (RS 29)**
Vulnerable	African rock python	*Python sebae natalensis*
Vulnerable	Nile crocodile	*Crocodylus niloticus*
Rare	Transvaal quillsnout snake	*Xenocalamus transvaalensis*
Restricted	Black whitelipped snake	*Amblyodipsas microphthalma nigra*
Restricted	Muller's velvet gecko	*Homopholis mulleri*
Restricted	Richard's blind legless skink	*Typhlosaurus lineatus richardi*
Restricted	Stripebellied blind legless skink	*Typhlosaurus lineatus subtaeniatus*
Restricted	Whitebellied Limpopo dwarf burrowing skink	*Scelotes limpopoensis albiventris*
Restricted	Soutpansberg rock lizard	*Lacerta rupicola*
Restricted	Soutpansberg flat lizard	*Platysaurus relictus*
Restricted	Lang's pink roundheaded wormlizard	*Chirindia langi occidentalis*
Peripheral	Variegated wolf snake	*Lycophidion variegatum*
Peripheral	Jalla's sand snake	*Psammophis jallae*
4. Little Namaqualand and Richtersveld		**Total: 14 taxa (RS 29)**
Vulnerable	Namaqua dwarf adder	*Bitis schneideri*
Vulnerable	Armadillo girdled lizard	*Cordylus cataphractus*
Rare	Fisk's house snake	*Lamprophis fiskii*
Rare	Black spitting cobra	*Naja nigricollis woodi*
Rare	Namaqua plated lizard	*Gerrhosaurus typicus*
Restricted	Desert rain frog	*Breviceps macrops*
Restricted	Namaqua day gecko	*Phelsuma ocellata*
Restricted	Lomi's blind legless skink	*Typhlosaurus lomii*
Restricted	Lawrence's girdled lizard	*Cordylus lawrencei*
Peripheral	Marbled rubber frog	*Phrynomerus annectens*
Peripheral	Western thread snake	*Leptotyphlops occidentalis*
Peripheral	Desert mountain adder	*Bitis xeropaga*
Peripheral	Webfooted gecko	*Palmatogecko rangei*
Indeterminate	Peringuey's leaftoed gecko	*Phyllodactylus peringueyi* (?)
5. Woodbush forest		**Total: 6 taxa (RS 15)**
Extinct	Eastwood's longtailed seps	*Tetradactylus eastwoodae*
Vulnerable	African rock python	*Python sebae natalensis*
Vulnerable	Methuen's dwarf gecko	*Lygodactylus methueni*
Rare	Swazi rock snake	*Lamprophis swazicus*
Restricted	Woodbush flat gecko	*Afroedura pondolia multiporis*
Restricted	Woodbush legless skink	*Acontophiops lineatus*
6. Natal Drakensberg		**Total: 6 taxa (RS 13)**
Rare	Yellowbellied house snake	*Lamprophis fuscus*
Restricted	Drakensberg frog	*Rana dracomontana*
Restricted	Water frog	*Rana vertebralis*
Restricted	Longtoed tree frog	*Leptopelis xenodactylus*
Restricted	Lang's crag lizard	*Pseudocordylus langi*
Restricted	Spiny crag lizard	*Pseudocordylus spinosus*
7. Elandsberg		**Total: 2 taxa (RS 10)**
Endangered	Hewitt's ghost frog	*Heleophryne hewitti*
Endangered	Smith's dwarf chamaeleon	*Bradypodion taeniabronchum*

THREATS

The threats facing the herpetofauna of the South African region can be best considered in terms of the broad categories recognised in the IUCN *World Conservation Strategy* (1980). In the following discussion, the number of species affected by a threat is indicated in brackets (some species are affected by more than one threat).

Habitat destruction:

This category covers a wide range of problems and is, in its many guises, the main threat facing the local herpetofauna. It includes such actions as urban and agricultural development (13), dam and road construction (11), pollution (8), afforestation (13), and mining (5), etc.

Urbanisation

In one of the few studies of the effects of urbanisation on the local herpetofauna, Alexander (1987) found that 20 (27.8%) of the 72 reptiles and amphibians recorded in the municipal Durban region had undergone a documented reduction in range and/or number (eg. *Schismaderma carens, Python sebae natalensis, Afroedura pondolia,* etc), whilst a further seven (9.7%) were locally extinct, or nearly so (eg. *Crocodylus niloticus* and *Mehelya capensis*, etc.). Poynton (1985) has also discussed the local extinction of populations of *Hyperolius argus* at the southern limit of its range near Durban, following the drainage of suitable lily-pad covered vleis and the introduction of alien fish.

Low and McKenzie (1988) have discussed the conflict between ongoing urban development and the threatened habitats of the Cape Flats. Out of a total of 381 rare plants recorded for the Greater Cape Town region, 161 (42%) are restricted to the Cape Flats. This area is also the home of a number of endangered amphibians, including the micro frog (*Microbatrachella capensis*), Cape platanna (*Xenopus gilli*) and Cape caco (*Cacosternum capense*).

Agricultural development

Parker (1982) has noted that the extensive agricultural development of wheatfields and vineyards in the south-western Cape has resulted in the loss of over 90% of renosterveld. This is the main habitat of the geometric tortoise (Greig and De Villiers, 1982; De Villiers, 1985) and its loss is the main cause driving this species to extinction.

The extensive maize farming in the northern OFS - southern Transvaal region has destroyed much of the habitat of the giant girdled lizard, whilst the monoculture of large tracts of sugarcane in Natal is believed to have destroyed much of the habitat of many reptiles and amphibians in the region (although Johnston and Raw, 1988, have shown that many fossorial species were more numerous than expected). Olivier (1986) has warned of the rapid loss of Valley Bushveld in the Eastern Cape following land clearance for cattle pasture.

The felling of indigenous forests and their replacement with exotic plantations has also threatened many species (12, eg. *Bradypodion taeniabronchum*, *Lygodactylus methueni*, etc). Changes in the flow of small perennial streams, following the growth of exotic pine plantations, can also have drastic consequences for the recruitment of indigenous frogs (eg. *Heleophryne hewitti*). The apparent extinction of the unique Australian gastric-brooding frog (*Rheobatrachus silus*) should be a timely warning (Ehmann and Cogger, 1985).

Industrial development

Petersen *et al.* (1985) reported the translocation of two small colonies of giant girdled lizards (*Cordylus giganteus*) threatened by the construction of the Majuba Power Station site on the southern Transvaal coal fields. At least 2-3000 of these lizards are affected by the proposed development of the power station and its associated structures. A series of 10 other power stations in the region are planned, many of which will be sited in areas where the giant girdled lizard occurs. In co-operation with ESCOM's Environmental Impact Control Section, the Transvaal Nature Conservation Division plan to relocate other threatened colonies to undisturbed areas.

The construction of dams has led to the inundation of sensitive habitats and threatening certain species (eg. *Afroedura pondolia multiporis)*, whilst changes to the normal seasonal flow rates of some rivers has affected crocodile breeding. Open-cast mining can cause local extinctions, and its effects on the fauna and flora of the Orange River mouth and adjacent coastal region have not been studied. The proposed

development of titanium mining in the sensitive dune fields of Maputaland has been subject to more rigorous assessment (Macdevette and Bainbridge, 1985). The necessity of implementing viable environmental impact studies *before* proceeding with industrial developments cannot be stressed too highly. Too many organisations, in both the public and private sector, pay only lip service to the need for environmental impact studies.

Road mortalities

There are few estimates of the impact of road casualties on the indigenous herpetofauna. Knutson (1987) has given a light-hearted review of American studies. There is little recent data. Scott (1938) gave annual mortalities of nearly 40 animals per mile throughout the State of Iowa. Road traffic densities have greatly increased in the intervening 50 years. Ehmann and Cogger (1985), in a stimulating analysis of threats facing the Australian herpetofauna, calculate an annual loss of nearly 5,5 million reptiles and frogs on sealed roads (i.e. excluding dirt and gravel roads). Off-road vehicle use in American deserts has also been shown to have a serious impact on reptiles (Busack and Bury, 1974; Bury, 1987; Bury, *et al.,* 1977). South African figures are likely to be lower, but must still form a significant overall mortality. Petersen (1982) records 36 snake species dead on Transvaal roads, including the vulnerable African rock python.

However, road casualties occur in a diffuse fashion, and probably rarely become a significant threat to specific populations. An exception is the high, seasonal mortality that faces some amphibians as they migrate to their breeding sites. Recognition of this danger in Britain and other European countries, has prompted 'toad patrols' and the construction of 'toad tunnels' in sensitive areas (Langton, 1987). Branch (1980a) recorded 113 road casualties of *Bufo pardalis* on an 8 km stretch of road near Port Elizabeth following a night of torrential rain. The success of *Breviceps gibbosus* in Cape Town suburbs may be due, in part, to its terrestrial breeding, as its does not have to undertake dangerous spawning migrations to breeding sites.

Overexploitation

There is little indication of overexploitation of any species of reptile or amphibian in the South African region. Auerbach (1987) and Petersen *et al.* (1985) have noted the occasional use for 'muti' of dried skins of the giant girdled lizard (a vulnerable species) by tribal witchdoctors. Python fat is also used medicinally by natives, and the flesh is occasionally eaten (see picture in Patterson and Bannister, 1987). Bushmen in Botswana have traditionally used the shells of the Kalahari tent tortoise (*Psammobates oculifer*) in making 'buccu' pouches, and this is increasing as 'artifacts' are manufactured for the tourist trade.

There is ample archaeological evidence of the past consumption of local tortoises, particularly *Chersina angulata* (eg. Klein and Cruz-Uribe, 1983), but the present day exploitation of this food resource is, at most, sporadic. Early protection of the Maputaland beaches prevented the mass destruction of sea turtles whilst breeding that has occurred elsewhere.

Pet trade

By its nature, the illegal trade in reptiles and amphibians is difficult to monitor. A number of rare and threatened species are known to be collected illegally, but the impact of this on their status is hard to assess. Both the giant girdled lizard and armadillo girdled lizard are protected by Provincial ordinances, and are listed, along with all other *Cordylus* and *Pseudocordylus* spp., on CITES Appendix 2 (since 1981). Permits for their capture and export are therefore issued in only exceptional circumstances. A total of 16 *Cordylus cataphractus* and 36 *C. giganteus* were listed as originating from South Africa in annual reports submitted by CITES party states from 1981 to 1985, compared with 50 and 26 specimens, respectively, for the years 1977-1978 (Inskipp, *pers. comm.* to Baard, 1987). Despite this, they continue to be illegally smuggled abroad and to appear on reptile dealer's pricelists in Europe and North America. Due to their rarity, they may be offered at prices of over R150 each.

Impact of introduced species and local translocations

Overseas introductions

South Africa has suffered only minor problems from introduced reptiles. These include:

Ramphotyphlops braminus

This small blindsnake was introduced early in the settlement of the Cape colony and has recently been discovered in Durban (Alexander, 1987). Its parthenogenetic ability has allowed it to spread rapidly around the Indo-Pacific region. It is not known to be a threat to any indigenous

species, although it may compete for the same niche as some local thread snakes (*Leptotyphlops* spp) and the small blind snake *Typhlops fornasini.*

Trachemys scripta

The American red-eared terrapin has been distributed widely throughout the world, via the aquarist trade. It soon outgrows small aquaria, and large individuals are then often released into the wild. Feral specimens have been collected in Durban, Pretoria, Johannesburg and Silverton (Newbery, 1984). Should it become firmly established it may compete with local terrapins (*Pelomedusa* and *Pelusios*), particularly the relict population of *Pelusios rhodesianus* in the Bluff Nature Reserve (Alexander, 1987).

The effects of other introduced alien organisms on the indigenous herpetofauna are difficult to estimate. Although no specific studies have demonstrated a direct effect, there is little doubt that, in many cases, alien introductions must be detrimental. Macdonald *et al.* (1986) have discussed the varied impacts that invasive organisms may have on indigenous ecosystems. These may occur at the level of the entire biome, via effects on such diverse aspects as sediment dynamics, hydrology, nutrient cycling, energy flow and fire regime, etc. At a more specific level, it may involve direct or indirect competition for food or habitat, or lead to increased mortality due to predation of parasitism. It has been suggested (Branch, 1988b) that the local disappearance of the berg adder (*Bitis atropos)* from the coastal fynbos around Port Elizabeth may result from the heavy infestation with sterile, fire-prone stands of rooikrans (*Acacia cyclops*) that were initially introduced to stabilize drifting sands. The local extinction of *Hyperolius argus* from certain vleis near Durban was attributed, in part, to increased predation from introduced alien fish (Poynton, 1985).

Translocations of local species

Translocations of local species may cause a variety of problems. Many tortoises are collected as pets by people, particularly when on holiday. They are subsequently released or escape, often great distances from their original localities. This can lead to spurious distribution records. At another level, the mixing of gene pools following the release of individuals to new regions may cause taxonomic difficulties, particularly in complex groups such as *Psammobates* and *Bradypodion*.

Habitat degradation in the Cape peninsula has led to increased colonization of the previously acid, blackwater vleis of the region by the common platanna (*Xenopus laevis*). Hybridization is now occurring between platannas, and the extent of this introgression on the endangered Cape platanna (*X. gilli*) is cause for concern (Picker, 1985).

The commensal tropical house gecko (*Hemidactylus mabouia)* is rapidly expanding its range in association with urban development along the coastal regions of Natal (Alexander, 1987) and inland to Pietermaritzburg (Bourquin, 1987). It is possible that the decline in numbers of the Pondo flat gecko (*Afroedura pondolia pondolia*) in the region is due to competition between these two similar, nocturnal geckos. Other recent translocations of *Hemidactylus* to the Eastern Cape have been recorded (Branch, 1987).

Loss or contamination of food supply

This section could be considered as a subsection of habitat destruction in its broadest sense. There are no local studies indicating a direct adverse effect of any action on the food supply of our reptiles or amphibians. Busack and Bury (1974) have shown that ungrazed areas in the California desert have twice the number of lizards and 3,7 times the biomass of adjacent grazed land, but whether this was due to reduced food or other factors such as increased predation, etc. was not known. The deterioration of many habitats due to over-grazing with livestock may adversely effect food supplies of the indigenous herpetofauna.

Killing to protect crops, livestock or prey

The few South African large, predatory reptiles (eg. the Nile crocodile and African rock python) are both killed to protect livestock. Such short-sighted actions can only be counteracted by public education campaigns, stressing the importance of such predators in controlling 'pests'. The Natal Parks Board are sympathetic to the danger to humans of crocodile attack, and have a team to capture and remove 'problem' animals.

RECOMMENDATIONS

The previous **RDB-RA** was instrumental in stimulating a number of studies on threatened reptiles and amphibians in South Africa, including the re-introduction of pythons into the Eastern Cape (Branch, 1986a) and surveys of the distribution of threatened lizards in the south-western Cape (Mouton, *et al.*, 1987). Listed below are the principal conservation studies which the preparation of this revison has shown to be necessary.

Studies on threatened species.

Very few of the region's threatened reptiles and amphibians have been adequately studied. The most comprehensive studies have been on the Nile crocodile (Ecology; Pooley, 1962, 1965, 1969, 1977, 1982a,b; Pooley and Gans, 1976. Conservation; Pooley, 1973; Blake and Loveridge, 1975; Loveridge, 1980) and the sea turtles (Hughes, 1972, 1973, 1974, 1982). A number of other species are the subject of on-going or recently completed studies: ie. the distribution and status of the Table Mountain ghost frog (Boycott and De Villiers, 1986) and geometric tortoise (Greig, 1984, De Villiers, 1985; Baard, 1988, *unpubl. obs.)*; and the ecology of the Cape platanna (Loveridge, 1980b; Simmonds, 1985a; Picker, 1985; Kobel, *et al.*, 1981) and sungazer (Petersen *et al.*, 1983, 1983/4, 1985; Van Wyk, *unpubl. obs.*).

The following studies on threatened species would give valuable insight into their conservation requirements.

1. Ecology and distribution of the endangered Smith's dwarf chamaeleon (*Bradypodion taeniabronchum).* A mark-recapture study is necessary to determine growth, recruitment rates and population dynamics of this small chamaeleon.

2. Ecology of the endangered ghost frogs (*Heleophryne hewitti* and *H. rosei).* These unusual frogs have very localised distributions and their biology is still poorly known. Studies on reproduction, growth and recruitment rates are necessary, to determine the feasibility of translocating specimens to other suitable habitats on the Elandsberg and Table Mountain.

3. Ecology of the endangered amphibians of the Cape lowlands. A number of threatened amphibians inhabit the Cape lowlands, ie. the micro frog (*Microbatrachella capensis)*, the Cape platanna (*Xenopus gilli)*, the Cape rain frog (*Breviceps gibbosus)* and the Cape caco (*Cacosternum capense)*. All would benefit from detailed studies on their habitat preferences, growth and recruitment rates, etc. Preliminary studies have been undertaken by the CDNEC (De Villiers, *unpubl. obs.)*

4. Reproductive biology of the endangered geometric tortoise (*Psammobates geometricus).* A scientifically controlled and detailed study of reproduction in this species is necessary. At the moment much of the captive breeding stock is in the hands of interested amateurs, who despite their concern and ethusiasm, lack biological training. Outdoor, predator-proof breeding enclosures should be established in suitable habitat. Reproduction could then be carefully monitored and manipulated to develop husbandry techniques that may in future be necessary if the threats and habitat destruction facing wild populations cannot be controlled.

5. Ecology of the vulnerable African rock python (*Python sebae natalensis).* Despite its acknowledged importance in controlling problem animals such as jackals, dassies and cane rats, there has been no ecological study on this giant snake anywhere in Africa. Reproduction and growth rates are well-documented in captivity, but whether these are applicable in the wild remains unknown. The size and visibility of the species lends itself to radio-telemetry studies.

6. Ecology of the vulnerable Gaboon adder (*Bitis gabonica gabonica).* Similar comments to those for the African rock python (above) could be made for this species. A captive breeding programme is in progress at the Manyeleti Game Reserve (Haagner, *pers. comm.).* Preliminary ecological studies on wild specimens have been initiated (Bodbijl, *pers. comm.).* The use of radio-telemetry may be essential in view of the species cryptic coloration and the thick vegetation of its habitat. Greene (1986) has shown that the central American bushmaster (*Lachesis muta*), a large crotalid of similar build and habits to the Gaboon adder, is very sedentary and may move only 50m in 35 days. He noted (*op. cit.*) that such a snake may need only six typical meals (large rodents) per year to

support its energetic costs of maintenance and foraging.

7. Ecology of the vulnerable armadillo girdled lizard (*Cordylus cataphractus*). This attractive cordylid is reported to live in small colonies with 'family' groups inhabiting the same rock crack. It is subject to illegal collecting for the pet trade. The extent of this threat, and reproduction, growth and recruitment rates in the species should be determined.

Protection of threatened populations

In addition to populations of the endangered species, a number of small, isolated colonies of other threatened species need to be carefully monitored. These include:

1. *Crytoblepharus boutonii africanus*. It occurs in a locally unique and minute colony (<150 individuals) at Black Rock, Maputaland. Disturbance by tourists and hikers is a threat.

2. *Lygodactylus methueni* is known only from the type locality in the Woodbush Forest Reserve. The habitat is threatened by alien plantations and frequent fires..

3. *Pelusios rhodesianus*. An isolated population of the Mashona hinged terrapin is found in the Bluff Nature Reserve in municipal Durban (Alexander, 1987). It is threatened by urban development, industrial pollution and the introduction of the alien American red-eared terrapin, *Trachemys scripta*.

4. *Bitis inornata*. The plain mountain adder is restricted to the montane grassland and fynbos of the Compassberg and Cederberg. It is potentially threatened by illegal collecting for the pet trade, and the habitat of the Compassberg population is deteriorating due to overgrazing.

5. *Cordylus mclachlani* is known only from the type locality in the Koue Bokkeveld, and is vulnerable to excessive collecting.

Surveys for poorly known or 'lost' species

A number of species are known from very few specimens and their conservation status is indeterminate. Efforts should be made to determine their true distribution and status. These include:

1. Eastwood's longtailed seps (*Tetradactylus eastwoodae*) - Known only from Woodbush, and currently considered to be extinct.

2. Poynton's caco (*Cacosternum poyntoni*) - known only from a single specimen from Pietermaritzburg.

3. Periguey's leaftoed gecko (*Phyllodactylus peringueyi*) remains the enigma of southern African herpetology. The status and identify of this small gecko is still unresolved since its description in 1910. The two types were reported from near Port Elizabeth and Little Namaqualand, but it may not be African.

4. Dwarf chamaeleons (*Bradypodion* spp). A number of isolated populations are known from Natal, Transvaal and the Cape Fold mountains. They are of problematic taxonomic status and some may be threatened. *Bradypodion kentanicum*, described from the Transkei, also needs to be investigated.

Re-introductions

Although there are dangers in ill-conceived and inappropriate translocations (see Greig, 1979, for discussion), there is no doubt that they have a function in maintaining viable populations of threatened species, particularly in urban environments where the rate of natural dispersal of most organisms is severely reduced. Alexander (1987) notes the successful re-introduction of several species of reed frog (*Hyperolius m. marmoratus, H. pusillus, H. tuberilingus*) and leaf-folding frog (*Afrixalus fornasinii*) to Pigeon valley in municipal Durban.

A number of other species may benefit from such re-introductions, including:

1. Cape platanna (*Xenopus gilli*). This species is threatened by habitat destruction and introgression with the common platanna (*Xenopus laevis*). *Xenopus gilli* prefers poor quality, acid 'blackwater' ponds characteristic of fynbos. It may benefit from reintroduction to suitable 'blackwater' ponds in the Cape Point Nature Reserve and other suitable habitats.

2. Table Mountain ghost frog (*Heleophryne rosei*). Following their survey of the distribution and status of this endangered species, Boycott and

De Villiers (1986) proposed that limited re-introductions of tadpoles be considered to other suitable streams on Table Mountain.

3. African rock python (*Python sebae natalensis*). The continued release of pythons into the Andries Vosloo Kudu Reserve, near Grahamstown, should continue in association with a detailed ecological study.

On-going taxonomic studies

Conservation is dependent upon a sound taxonomic understanding of the biota and only recognised taxa are listed in legislation such as CITES. On a number of occasions detailed taxonomic revisions have led to the recognition of endangered sibling species with restricted distributions, that were previously confused with common, wide-ranging species (eg. Smith's dwarf chamaeleon was for many years confused with the Cape dwarf chamaeleon, *Bradypodion pumilum)*. It is therefore important that funding agencies recognise the continuing need for taxonomic studies.

It is also necessary for taxonomists working on possibly threatened taxa, to publish the descriptions timeously and bring the results of their studies to the attention of conservation authorities. An important example is the recent description of *Hoplodactylus delcourtii*, a gigantic gecko (total length 622mm) that was probably collected on New Zealand between 1833 and 1869. The specimen was on public display in the Musée d'Historie Naturelle de Marseille for over 100 years before its significance was realised and it was formally described (Bauer and Russell, 1986). The species is now probably extinct. It remains a chastening lesson to museum curators that it may have been saved if it had been described earlier and conservation measures initiated.

SUCCESSES

Despite the preceeding list of essential studies, South Africa is not without its share of conservation successes, of which the continuing preparation and updating of national RDBs is but one aspect.

The Natal Parks Board have for many years placed great emphasis on the protection and conservation of the province's large aquatic reptiles. The sea turtle rookeries of the northern Maputaland beaches are very well protected and this is reflected in the increasing numbers of sea turtles, particularly the giant leatherbacks, that come ashore each year to lay their eggs. When the survey was initiated in 1963/1964 only five female leatherbacks came ashore to nest; 20 years later over 100 females nested on the protected beaches and there were isolated examples of stray females nesting on other beaches. This is one of the few success stories in sea turtle conservation, as throughout the world their numbers continue to decline.

Natal Parks Board were also one on the leaders in protecting crocodiles and instigating a captive breeding programme. The efforts of Tony Pooley and Dave Blake in protecting and breeding the Nile crocodile, and their discovery of intricate and complex crocodilian maternal care, has resulted in a renaissance in attitudes towards these remnant archosaurs. Successful captive breeding has allowed captive-reared stock to be released into Natal reserves, and has also led to a burgeoning crocodile farming industry. The latter could fully supply the fashion industry's demand for hides and reduce pressure on wild stocks from illegal poaching.

Following the recommendation by McLachlan (1978) in the previous **RDB-RA**, a number of pythons (*Python sebae natalensis*) have been re-introduced into the Andries Vosloo Kudu Reserve in the Eastern Cape, from which they were exterminated in the early part of this century. The recent discovery of a hatchling in the reserve indicates that the released pythons have successfully acclimated to their new surroundings. However, a number of adults have been needlessly killed on adjacent farms, and the continued re-introduction of pythons into the region needs to be accompanied by a public awareness campaign.

A very successful public appeal by the SA Nature Foundation, in conjunction with a Wildlife Society colour poster on the chelonians of the subcontinent, resulted in sufficient funds to purchase a small (9 ha), new geometric tortoise reserve (Harmony Flats Nature Reserve) near the Strand. However, the status of the endangered geometric tortoise in the south-west Cape is still cause for concern. The survival of the geometric tortoise depends on the acquisition of more land for its protection. The CDNEC is negotiating the acquisition of another 50 ha of suitable habitat, including the first geometric tortoise reserve in the Ceres valley.

RED DATA SHEETS

ORGANIZATION OF SPECIES ACCOUNTS

The species accounts are presented in systematic order within the conservation categories. Each account is organized under recurring headings that contain the following information:

Common name: As colloquial names may vary regionally, and as no standardised list of common names for the herpetofauna of the region has yet been adopted, the names chosen are usually those listed in the two most recent field guides to South African amphibians (Passmore and Carruthers, 1979) and reptiles (Branch, 1988). The Afrikaans common name usually translates its English equivalent, except where popular usage is maintained, eg. ouvolk for the sungazer (*Cordylus giganteus*).

International status: As listed in the 1986 IUCN Red List of Treatened Animals (Anon, 1986).
South African status: As adopted in this volume.

Current scientific name and higher taxonomic classification and original description and type locality.

SUMMARY

The first section of summarizes:
Status: The South African RDB category and a short synopsis of the species, its distribution and threats.
Research: The state of current knowledge about the species, and a list of those topics requiring the most urgent study.

SPECIES DATA

Identification: A short, but detailed description of the animal, with emphasis on the distinguishing features. Threatened species (ie. extinct, endangered, vulnerable and rare) are illustrated.
Distribution: An accurate description of the known range, with details of any evidence of historical range contractions. Each species account is accompanied by a distribution map.
Habitat and Ecology: Details of the specific habitat requirements (where known) and general ecology of the species are given Emphasis is placed on those aspects of its life style that are important in conservation management, and that may give insight into reasons for any decline in the species' status.
Breeding: Lists all known details of the reproductive biology of the species (including mode of reproduction, sexual dimorphism, breeding behaviour, nesting sites, etc) that may be important in conserving the species and assessing the potential for captive breeding programmes.
Remarks: Summarises aspects of the taxonomy, distribution or biology of the species that may be important in assisting its conservation or identification.

CONSERVATION

Status: Summarizes the conservation status of the species and factors affecting its survival.
Threats: Gives details of factors affecting the survival of the species, and that were or are responsible for its decline.
Existing Conservation Measures: Lists all legislation currently affecting the survival of the species, and any studies or activities aimed at promoting its conservation. The presence of the species in protected areas is noted.
Breeding Potential in Captivity: Assesses the probably breeding potential of the species in captivity, with consideration to current knowledge of husbandry techniques and the species reproductive biology. Cognisance is taken of the feasibility of funding, space and time for captive breeding programs, and the availability of suitable release sites for re-introductions.
Recommended Conservation Measures. Suggests ammendments to legislation or management that would assist in the conservation of the species, and identifies areas of scientific research that are necessary to assist the species conservation.
Remarks: Discusses any factors that have general significance to the conservation of the species. The previous Red Data Book status of the species is noted.

BIBLIOGRAPHY

Abbreviated citations relevant to the species account are listed, full references being provided at the back under **References.**

Account prepared by: Gives the name and address of the author(s) responsible for the species account, and who should be acknowledged when referring to specific accounts in the Red Data Book.

SUMMARY LIST OF SPECIES AND AUTHORS

	Common name	Scientific name	Account prepared by
Extinct			
1	Eastwood's longtailed seps	*Tetradactylus eastwoodae*	Niels Jacobsen
Endangered			
2	Cape platanna	*Xenopus gilli*	Mike Picker & A. de Villiers
3	Micro frog	*Microbatrachella capensis*	Atherton de Villiers
4	Hewitt's ghost frog	*Heleophryne hewitti*	R. Boycott & Bill Branch
5	Table Mountain ghost frog	*Heleophryne rosei*	Richard Boycott
6	Geometric tortoise	*Psammobates geometricus*	Ernst Baard
7	Smith's dwarf chameleon	*Bradypodion taeniabronchum*	Bill Branch
Vulnerable			
8	Cape rain frog	*Breviceps gibbosus*	Atherton de Villiers
9	Loggerhead sea turtle	*Caretta caretta*	George Hughes
10	Green sea turtle	*Chelonia mydas*	George Hughes
11	Hawksbill sea turtle	*Eretmochelys imbricata*	George Hughes
12	Olive ridley sea turtle	*Lepidochelys olivacea*	George Hughes
13	Leatherback sea turtle	*Dermochelys coriacea*	George Hughes
14	Southern African rock python	*Python sebae natalensis*	Bill Branch
15	Cape sand snake	*Psammophis leightoni leightoni*	Bill Branch
16	Namaqua dwarf adder	*Bitis schneideri*	Bill Branch
17	Gaboon adder	*Bitis gabonica gabonica*	Bill Branch
18	Methuen's dwarf gecko	*Lygodactylus methueni*	Niels Jacobsen
19	Bouton's skink	*Cryptoblepharus boutonii africanus*	Wulf Haacke
20	Sungazer or giant girdled lizard	*Cordylus giganteus*	Attie van Wyk
21	Armadillo girdled lizard	*Cordylus cataphractus*	LeFras Mouton
22	Nile crocodile	*Crocodylus niloticus*	Niels Jacobsen
Rare			
23	Golden dwarf reed frog	*Afrixalus aureus*	Angelo Lambiris
24	Pickersgill's reed frog	*Hyperolius pickersgilli*	Angelo Lambiris
25	Natal hinged tortoise	*Kinixys natalensis*	Richard Boycott
26	Fisk's house snake	*Lamprophis fiskii*	Bill Branch
27	Yellowbellied house snake	*Lamprophis fuscus*	Bill Branch
28	Swazi rock snake	*Lamprophis swazicus*	Bill Branch
29	Striped harlequin snake	*Homoroselaps dorsalis*	Bill Branch
30	Transvaal quillsnout snake	*Xenocalamus transvaalensis*	Niels Jacobsen
31	Black spitting cobra	*Naja nigricollis woodi*	Richard Boycott
32	Günther's dwarf burrowing skink	*Scelotes guentheri*	Orty Bourquin
33	Breyer's longtailed seps	*Tetradactylus breyeri*	Niels Jacobsen
34	Namaqua plated lizard	*Gerrhosaurus typicus*	Geoff McLachlan
Restricted			
35	Amatola toad	*Bufo amatolica*	Richard Boycott
36	Cape mountain toad	*Capensibufo rosei*	Richard Boycott
37	Desert rain frog	*Breviceps macrops*	Atherton de Villiers
38	Hogsback frog	*Anhydrophryne rattrayi*	Angelo Lambiris
39	Drakensberg frog	*Rana dracomontana*	Angelo Lambiris
40	Water frog	*Rana vertebralis*	Angelo Lambiris
41	Cape caco	*Cacosternum capense*	Atherton de Villiers
42	Longtoed tree frog	*Leptopelis xenodactylus*	Angelo Lambiris
43	Southern speckled padloper	*Homopus signatus cafer*	Richard Boycott

	Common name	Scientific name	Account prepared by
44	Black whitelipped snake	*Amblyodipsas microphthalma nigra*	Niels Jacobsen
45	Plain mountain adder	*Bitis inornata*	Bill Branch
46	Muller's velvet gecko	*Homopholis mulleri*	Bill Branch
47	Namaqua day gecko	*Phelsuma ocellata*	Geoff McLachlan
48	Smallscaled leaftoed gecko	*Phyllodactylus microlepidotus*	LeFras Mouton
49	Haacke's flat gecko	*Afroedura pondolia haackei*	Niels Jacobsen
50	Woodbush flat gecko	*Afroedura pondolia multiporis*	Niels Jacobsen
51	Hawaque flat gecko	*Afroedura hawequensis*	LeFras Mouton
52	Setaro's dwarf chameleon	*Bradypodion setaroi*	Colin Tilbury
53	Zululand dwarf chameleon	*Bradypodion nemorale*	Colin Tilbury
54	Natal midland dwarf chameleon	*Bradypodion thamnobates*	Colin Tilbury
55	Lomi's blind legless skink	*Typhlosaurus lomii*	Wulf Haacke
56	Richard's blind legless skink	*Typhlosaurus lineatus richardi*	Bill Branch & N. Jacobsen
57	Stripebellied blind legless skink	*Typhlosaurus lineatus subtaeniatus*	Bill Branch & N. Jacobsen
58	Woodbush legless skink	*Acontophiops lineatus*	Niels Jacobsen
59	Kasner's dwarf burrowing skink	*Scelotes kasneri*	Ernst Baard
60	Gronovi's dwarf burrowing skink	*Scelotes gronovii*	Ernst Baard
61	Whitebellied Limpopo burrowing skink	*Scelotes limpopoensis albiventris*	Bill Branch & N. Jacobsen
62	Southern rock lizard	*Lacerta australis*	LeFras Mouton
63	Soutpansberg rock lizard	*Lacerta rupicola*	Niels Jacobsen
64	McLachlan's girdled lizard	*Cordylus mclachlani*	LeFras Mouton
65	Lawrence's girdled lizard	*Cordylus lawrencei*	LeFras Mouton
66	Lang's crag lizard	*Pseudocordylus langi*	Bill Branch
67	Spiny crag lizard	*Pseudocordylus spinosus*	Bill Branch
68	Soutpansberg flat lizard	*Platysaurus relictus*	Niels Jacobsen
69	Lang's pink roundheaded wormlizard	*Chirindia langi*	Bill Branch
Peripheral			
70	Marbled rubber frog	*Phrynomerus annectens*	Alan Channing
71	Eastern hinged terrapin	*Pelusios castanoides castanoides*	Richard Boycott
72	Mashona hinged terrapin	*Pelusios rhodesianus*	Richard Boycott
73	Beaked blind snake	*Typhlops schinzi*	Geoff McLachlan
74	Western thread snake	*Leptotyphlops occidentalis*	Bill Branch
75	Whyte's water snake	*Lycodonomorphus w. obscuriventris*	Bill Branch
76	Eastern wolf snake	*Lycophidion semiannule*	Bill Branch
77	Variegated wolf snake	*Lycophidion variegatum*	Niels Jacobsen
78	Forest marsh snake	*Natriciteres variegata sylvatica*	Bill Branch
79	Whitelipped snake	*Amblyodipsas m. microphthalma*	Niels Jacobsen
80	Jalla's sand snake	*Psammophis jallae*	Niels Jacobsen
81	Southwestern shovelsnout snake	*Prosymna frontalis*	Geoff McLachlan
82	Mocambique shovelsnout snake	*Prosymna janii*	Wulf Haacke
83	Semiornate snake	*Meizodon semiornatus*	Bill Branch
84	Western green snake	*Philothamnus angolensis*	Bill Branch
85	East African eggeater	*Dasypeltis medici medici*	Bill Branch
86	Forest cobra	*Naja melanoleuca*	Bill Branch
87	Desert mountain adder	*Bitis xeropaga*	Geoff McLachlan
88	Webfooted gecko	*Palmatogecko rangei*	Geoff McLachlan
89	Bluetailed sandveld lizard	*Nucras caesicaudata*	Niels Jacobsen
90	Leonhard's spadesnouted wormlizard	*Monopeltis leonhardi*	Niels Jacobsen
91	Blunttailed wormlizard	*Dalophia pistillum*	Niels Jacobsen
Indeterminate			
92	Poynton's caco	*Cacosternum poyntoni*	Bill Branch
93	Peringuey's leaftoed gecko	*Phyllodactylus peringueyi*	Geoff McLachlan

EASTWOOD'S LONGTAILED SEPS **International status:** NOT LISTED
Eastwoodse langstert seps **South African status:** EXTINCT ?

Tetradactylus eastwoodae Methuen & Hewitt 1913. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Tetradactylus eastwoodae Methuen & Hewitt, 1913. A list of South African Lacertilia, Ophidia and Batrachia in the McGregor Museum, Kimberley, with field notes on various species. *Trans. Roy. Soc. S. Afr.* 3: 109.
Type locality: Woodbush, Transvaal.

SUMMARY

Status: Extinct ? A small lizard known only from two specimens collected at the type locality 75 years ago. Despite several searches no additional specimens have been found. The type locality is under exotic pine plantations and it is possible that the species is extinct.

Research: Poor. More extensive surveys of the type locality and adjacent areas are essential.

SPECIES DATA

Identification: A small serpentiform lizard with tail in excess of 2 x SV length (maximum size 64,0mm SV). It is distinguished by:

1. Characteristic rectangular body scales in 12 rows;
2. forelimb tridactyle, hindlimb didactyle;
3. nostril pierced between 2 nasals;
4. three femoral pores.

Colour olive brown, uniform over back and tail, or with indistinctly marked, darker longitudinal lines or series of spots. Head spotted above.

Distribution: The species is only known from the type locality. Searches close to the type locality, at Haenertsburg and in the Wolkberg have so far proved negative.

Habitat and Ecology: Presumed to have inhabited open montane grassland but type locality now under exotic plantations. Adjacent areas include montane forest and grassland.

Breeding: No data available. Reproduction in other members of the genus is poorly known, although the shortlegged seps (*T. seps)* is oviparous, laying 2-3 large eggs.

Remarks: An endemic species from an area with a high degree of endemism. It is a local form removed from the nearest other species by the broad valley of the Olifants river and its tributaries.

CONSERVATION

Status: The species appears to have a very restricted range. Only two specimens have been collected, both prior to 1943. Since that time no further signs of this lizard have been found. The area has been extensively altered by afforestation and the grasslands on the fringes probably burnt on an annual basis. The continued existence of the species is in doubt, although it may yet be re-discovered in the Wolkberg.

Threats: Afforestation, the development of exotic pine plantations, and excessive burning of montane grassland in the vicinity of Woodbush, Haenertsburg and in the Wolkberg, may all have caused or contributed to the disappearance of this species .

Existing Conservation Measures: The species is afforded general protective status under the Transvaal Provincial Ordinance. The Wolkberg wilderness area is protected by the Department of Forestry.

Breeding Potential in Captivity: Not known; probably poor.

Recommended Conservation Measures: Until the extant status of this species is established, few additional conservation measures can be undertaken. It is vital that renewed attempts to locate the species be initiated by Conservation authorities. If a surviving population of this species can be found, then further conservation measures can be proposed.

Remarks: A high conservation priority species. Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Methuen and Hewitt, 1913; Loveridge, 1942; FitzSimons, 1943; Loveridge, 1944.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.

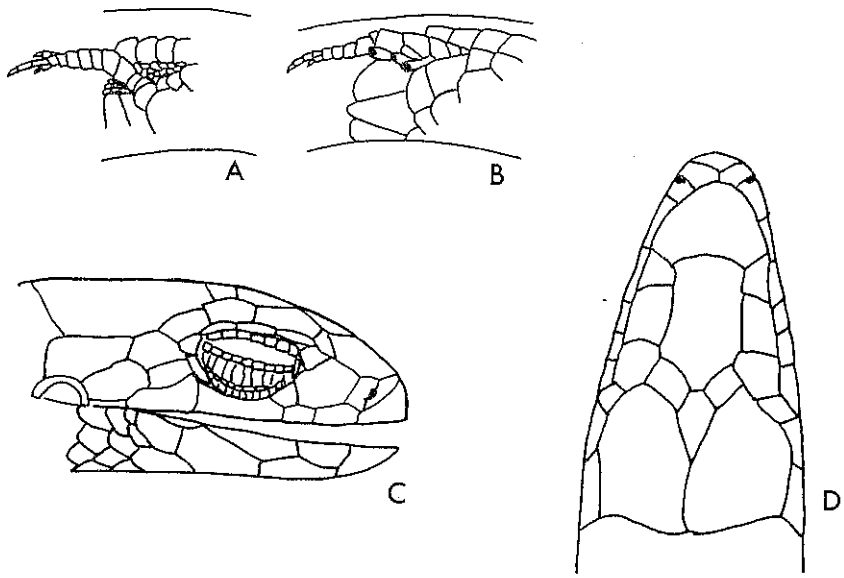
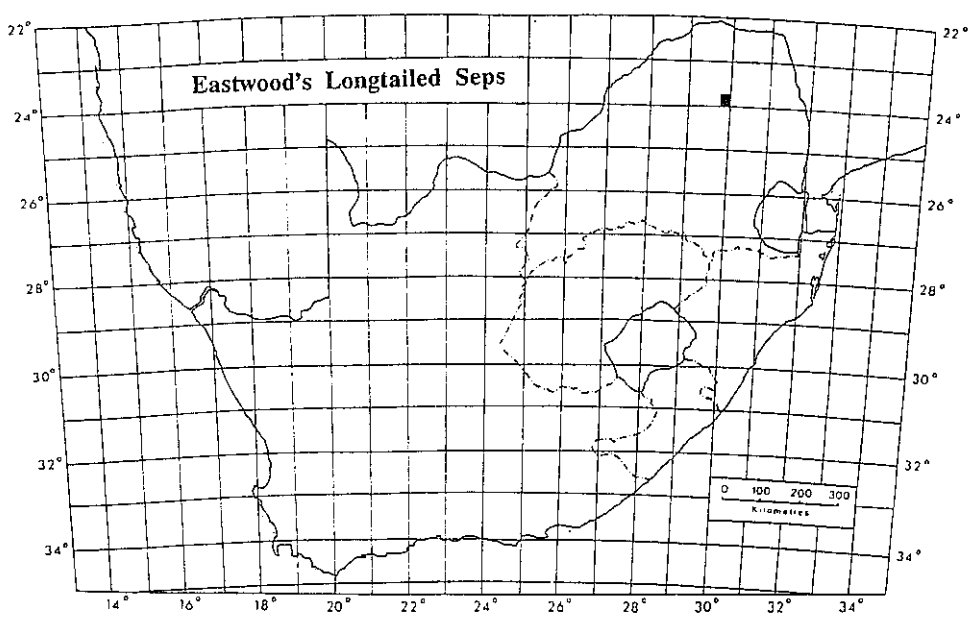


Fig. 4. Eastwood's longtailed seps *(Tetradactylus eastwoodae)* **Extinct.** *(det.* N. Jacobsen).



Map. 3. Distribution of Eastwood's longtailed seps *(Tetradactylus eastwoodae)*

CAPE PLATANNA
Kaapse platanna

International status: VULNERABLE
South African status: ENDANGERED

Xenopus gilli Rose and Hewitt 1927. **Class:** Amphibia, **Order:** Anura, **Family:** Pipidae.

Xenopus gilli Rose and Hewitt, 1927. Description of a new species of *Xenopus* from the Cape Peninsula. *Trans. R. Soc. S. Afr.* **14:** 343 - 346. **Type locality:** Either the "Sylvermyn River" near Clovelly on the Cape Peninsula or the "Cape Flats" (south-western Cape Province).

SUMMARY

Status: Endangered. A localized species with very specific habitat requirements. Most of its known area of distribution has been reduced due to urban development, the uncontrolled spread of alien vegetation, the alteration of natural drainage patterns, agricultural activities and the eutrophication of its wetland habitat. The species is also threatened by hybridization with the common platanna, *X. laevis*, in all localities. It is confined to the Mediterranean region of the south-western Cape Province where at present viable populations are only known to occur in blackwater seepages and ponds (usually acidic) in the Cape of Good Hope Nature Reserve, and in certain localities at Betty's Bay, Cape Hangklip, Kleinmond and between Gansbaai and Agulhas.

Research: Fairly thorough. The species' distribution is being studied and existing populations are monitored (ADV). The nature and extent of introgression is also under investigation (MP).

SPECIES DATA

Identification: A fully aquatic frog that can be distinguished from non-pipids by the smooth skin, absence of a tongue, and fully webbed hind feet with the three outer toes clawed. It can be distinguished from the common platanna (*X. laevis*) by:

1. Its smaller size (maximum length <60mm from tip of snout to vent);
2. acutely pointed head that is narrower than the body;
3. absence of a sub-ocular tentacle;
4. poorly developed inner metatarsal tubercle;
5. and the lateral line sense organs are not as easily discernible as in *X. laevis*.

The dorsal surface bears elongated dark brown patches which are usually situated in pairs extending from between the eyes and over the back. These patches also appear on the dorsal surface of the hindlimbs. The belly surface usually has distinctive blackish and yellow mottling, but these may be pale and indistinct in the southern coastal populations extending eastwards from Cape Hangklip. The call is described as a series of metallic buzzes emitted under water at a rate of about two per second (Passmore and Carruthers, 1979).

Distribution: The description of *X. gilli* in 1927 was based on four adult specimens collected "near Cape Town" (Rose & Hewitt 1927). There is uncertainty as to whether the type locality is the Cape Flats or Sylvermyn River (Silvermine stream) near Clovelly on the Cape Peninsula, as specimens from both these localities were referred to in the description. The Sylvermyn River locality was discovered in February 1926 when four juveniles were found amongst a sample of some 400 *X. laevis*. Later, about a dozen adult *X. gilli* were obtained from the same area but the species does not appear to have been found there since its description.

The species was first discovered on the Cape Flats in March 1925 and was later found to occur at various localities in this area. However, the species is poorly represented in museum collections and the localities of Cape Flats specimens and additional sight records are generally vague.

In spite of relatively intensive searching by Picker and De Villiers in the early 1980s, no viable populations appear to exist on the Cape Flats (except, perhaps, for an area near Kuils River) and very few *X. gilli* specimens have actually been reported in recent years. Those that are collected are often hybrids. In the late 1960s the species was discovered at the Cape of Good Hope Nature Reserve (H. Langley pers. comm.) and was found to occur in various pools in the reserve.

Since 1973 *X. gilli* has been discovered near Betty's Bay, Kleinmond, Cape Hangklip, and between Gansbaai and Agulhas. The species has also been recorded from Nieuwoudtville and Citrusdal, but both these are isolated, old records. The CDNEC CP investigated the Nieuwoudtville locality in 1984

but no specimens were obtained. It and the Citrusdal locality need further investigation.

Habitat and Ecology: This has been well documented. The species is restricted to certain temporary or permanent seepages or other water bodies in generally flat areas where mountain or coastal fynbos plant communities, usually dominated by Restionaceae, occur on acid sands. The water chemistry is characteristic of fynbos lentic systems with often a very low pH and deeply stained waters rich in polyphenols. In the Cape of Good Hope Nature Reserve where both *X. gilli* and *X. laevis* occur, these species have been shown to occupy distinct habitats, *X. gilli* being found in the water bodies mentioned earlier and *X. laevis* occurring in pale, clear water bodies with a high pH. The latter are man-made, or have suffered a change in water chemistry owing to the removal of surrounding fynbos vegetation. In water bodies of intermediate pH and water colour, the species co-exist, and it is in these areas that hybridization occurs (Picker 1985).

During the winter rains, frogs at the Cape of Good Hope Nature Reserve migrate extensively between ponds, covering distances of at least 1,5 kilometres (Picker, 1985). Food of the adult frogs consists mainly of aquatic insects during summer, but in winter and spring, tadpoles and smaller frogs appear to comprise the bulk of their diet (Picker, *pers obs.)*. Natural enemies include herons, cormorants, and water mongoose.

Breeding: The breeding cycle of *X. gilli* has been examined by Rau (1978) who also describes the larval morphology and development. The breeding season begins in July and by February the following year, most of the tadpoles have metamorphosed. Intra- and interspecific cannibalism takes a considerable portion of the larvae and froglets. Where *X. laevis* occurs with *X. gilli*, it is capable of feeding on larvae as well as on the smaller frogs. The presence of *X. laevis* in most of the known *X. gilli* sites is thus detrimental for the developing *X. gilli* as predation pressure by the larger *X. laevis* must be intense.

Remarks: The known distribution area of *X. gilli* appears to be contracting in spite of relatively intensive searching in previously known habitats during recent years.

CONSERVATION

Status: The future survival of this species is insecure. The limited distribution range of *X. gilli* makes it vulnerable to habitat alteration to which it is intolerant. While habitat alteration is known to have a negative effect on this species, such alteration has favoured the spread of *X. laevis* over South Africa and has allowed it to invade certain fynbos biome aquatic systems which before the advent of man would not have offered suitable habitat for *X. laevis*.

At some of the localities visited by Rose (1926, Rose & Hewitt 1927), both *Xenopus* species were found together, with *X. laevis* generally outnumbering *X. gilli*. This is an indication that the favoured habitat of *X. gilli* had already been disturbed and, in fact, Rose (1929) was of the opinion that *X. laevis* was gradually "displacing and absorbing" *X. gilli* which was even then only to be found in "small sporadic colonies".

From recent investigations it has been established that no viable populations of *X. gilli* appear to exist on the Cape Flats (except perhaps for an area near Kuils River). In the Betty's Bay and Kleinmond areas, the populations are situated in areas threatened by housing, road developments and alien vegetation. Even if the actual ponds remain undisturbed, disruption of the surrounds would have a negative influence on the water chemistry of ponds and this would affect interpond migration and encourage invasion by *Xenopus laevis*. The populations between Gansbaai and Agulhas are also threatened by alien vegetation and the presence of *X. laevis*.

The mechanism and extent of introgression has received attention (Kobel et al. 1981, Picker 1985, Tinsley 1981), and it is known that the F1 males are sterile. All other progeny of these interspecific crosses are fertile. All known geographic populations of *X. gilli* are hybridizing with *X. laevis* (Harrison, J., Picker, M.D. & Wallace, D. *in prep.*), so that even the extensive populations in the Cape of Good Hope Nature Reserve are threatened. Only two known ponds in the Reserve remain free of *X. laevis* and hybrids. Extensive hybridization with, and predation by *X. laevis* could seriously threaten the survival of *X. gilli*.

Population estimates for certain ponds in the Cape of Good Hope Nature Reserve have been made over a six year period since 1982. The most suitable ponds each support approximately 300 frogs, and about three such ponds exist in the reserve. Other habitats support much smaller populations (Picker 1985).

Threats: These can be summarized as follows:

1. The filling in and drainage of wetlands due to urban development and agriculture, railway and road building and damming projects.
2. The pollution and eutrophication of wetlands due to urban development and agriculture.
3 The alteration and loss of habitat due to the uncontrolled spread of alien vegetation.
4. Hybridization with and genetic swamping by the common platanna, *X. laevis*.
5. The building of any man-made reservoir or other irrigation system allows for invasion by *X. laevis* into an area from which it may otherwise have been excluded.

Existing Conservation Measures: The species is given maximum legal protection on Schedule I of the Cape Nature Conservation Ordinance of 1974 but is only conserved in the Cape of Good Hope Nature Reserve and the Rhenosterkop Private Nature Reserve near Aghulas where the species was recently discovered. A non-affiliated committee for the conservation of the Cape Platanna (The Cape Platanna Conservation Committee) was formed in 1984. It erected a precast concrete wall around a typical *X. gilli* pond in the Cape of Good Hope Nature Reserve and the existing hybrids and *X. laevis* have been removed from the pond and the Reserve over the past few years. The species is listed as vulnerable in the International Red Data Book.

Breeding Potential in Captivity: The captive breeding of *X. gilli* is possible, but is not as easily induced as in other species of *Xenopus*. European laboratory populations have been successfully maintained and bred in Geneva. Unfortunately the levels of introgression with *X. laevis* are so extensive that a morphological assessment of "purity" of the *X. gilli* genome is not a reliable indicator. Captive breeding populations should therefore be screened for genetic purity. Finding suitable release sites for re-introductions could be a problem due to the specialized habitat requirements of the species. Genetic conservation principles must also be borne in mind in this regard.

Recommended Conservation Measures: It is of critical importance to conserve as many of the remaining *X. gilli* populations as possible and to establish localized reserves around such ponds. The CDNEC CP is investigating the possibility of establishing South African Natural Heritage Sites near Kleinmond and between Gansbaai and Agulhas where large *X. gilli* populations occur. It is also planned to try and incorporate other viable *X. gilli* localities into the S.A. Natural Heritage Site programme. Work on the distribution of the species is continuing and existing populations are being monitored. It is important to assess these populations and any newly discovered populations on a regular basis in order to accurately determine true species composition, conservation priorities and management strategies. In protected *X. gilli* habitats, the regular capture and removal of hybrids and *X. laevis* is important. The filling in of atypical water bodies in fynbos areas where *X. gilli* occurs should also be seriously considered as these support infective populations of *X. laevis*.

Remarks: The presence of the endangered micro frog, *Microbatrachella capensis*, in some of the *X. gilli* localities, heightens the importance of conserving these areas. The species was listed as rare (restricted) in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Passmore and Carruthers, 1979; Poynton, 1964; Rose & Hewitt, 1927.

Distribution: Picker and De Villiers, 1988; Rose and Hewitt, 1927.

Habitat and Ecology: Picker, 1985; Rau, 1978; Simmonds, 1985.

Conservation Status: Kobel, Pasquier and Tinsley, 1981; Picker, 1985; Picker and de Villiers, 1988; Rose, 1929; Rose and Hewitt, 1927; Tinsley, 1981.

Account prepared by: M. D. Picker, University of Cape Town; and A.L. de Villiers, CDNEC CP.

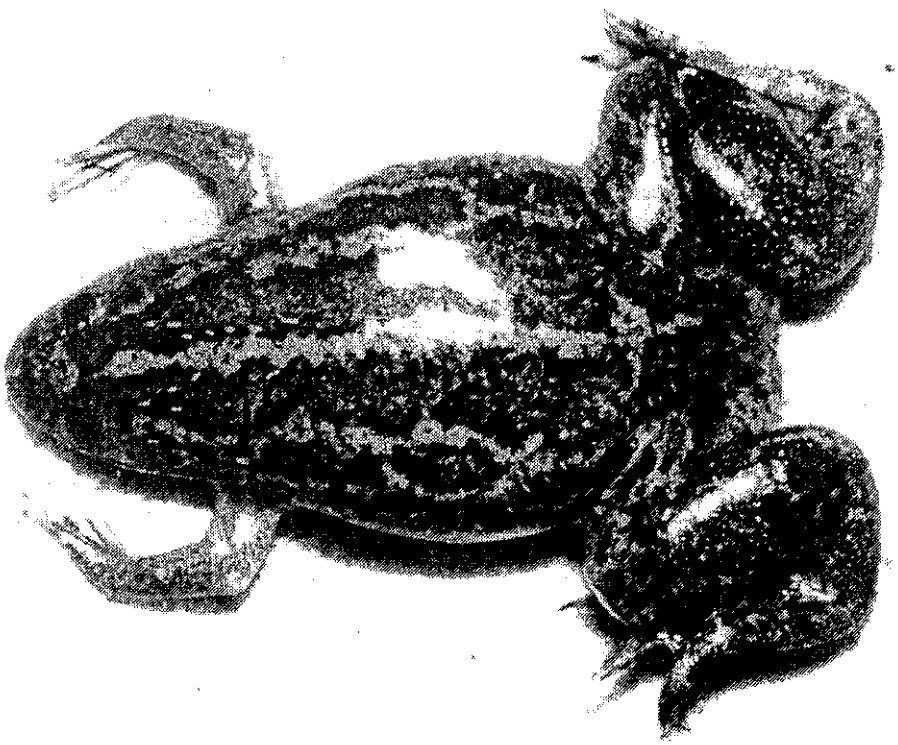
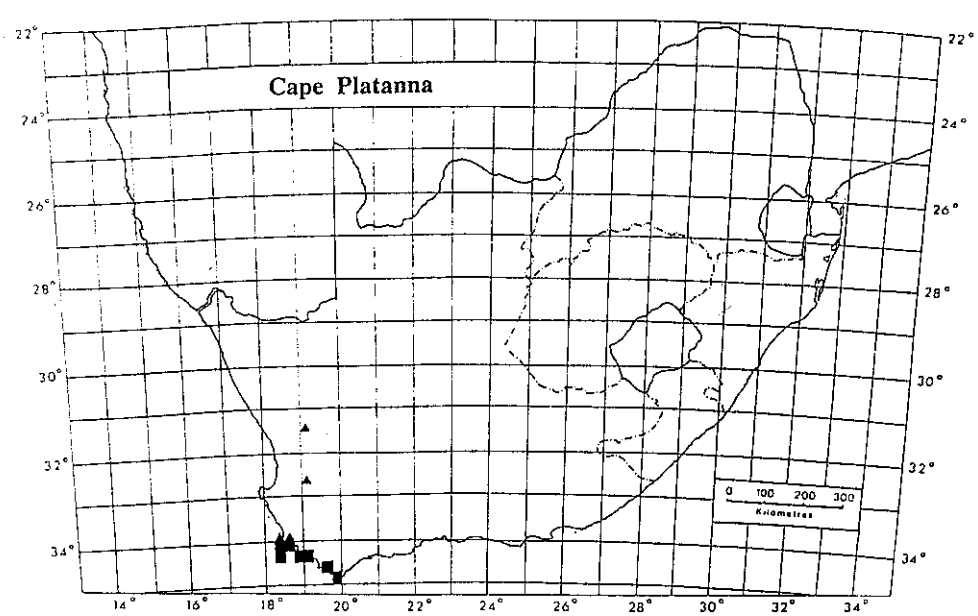


Fig. 5. Cape platanna *(Xenopus gilli)* **Endangered** (A. de Villiers)



Map 4. Distribution of the Cape platanna *(Xenopus gilli).*

■ Current distribution (new or re-confirmed localities since 1980).

▲ Previous distribution (no recent records despite surveys since 1972).

MICRO FROG
Mikropadda

International status: NOT LISTED
South African status: ENDANGERED

Microbatrachella capensis (Boulenger 1910). Class: Amphibia, Order: Anura, **Family:** Ranidae.

Phrynobatrachus capensis Boulenger, 1910. A revised list of the South African reptiles and batrachians, with synoptic tables, special reference to the specimens in the South African Museum, and descriptions of new species. *Ann. S. Afr. Mus.* **5**: 455-538. **Type locality:** The Cape Flats (south-western Cape Province).

SUMMARY

Status: Endangered. The smallest frog species in South Africa with a restricted distribution range. It is confined to the coastal lowlands in the Mediterranean region of the south-western Cape Province where most of its known area of distribution has been reduced due to the combined effects of urban development, the uncontrolled spread of alien vegetation, the alteration of natural drainage patterns, agricultural activities and the eutrophication of its wetland habitat. The species is therefore seriously threatened by habitat destruction.

Research: A fair amount of work has been done on the distribution and habitat requirements of the species (ADV). This is being continued in greater detail and includes the monitoring of known populations.

SPECIES DATA

Identification: A small frog with a maximum body length of 18 mm (measured from tip of snout to vent). The pupil is horizontal and the shank (that part of the hindlimb between the knee and the foot) is less than half the body length. The fingers lack webbing whereas the toes are webbed with 2 to 3 phalanges of the longest toe free of webbing. There is great variation in the dorsal surface. This can either be uniform or speckled and vertebral stripes are common. Dorsal colouration can consist of varying shades of green, grey, brown or black but the ground colour is generally dark. The ventral surface is smooth with variable black and white mottling which is nearly absent in some individuals. In males, the gular region is free of mottling and brown in colour with a large vocal sac. The call is described by Passmore and Carruthers (1979) as a harsh series of low-pitched scratches emitted at a rate of about one per second.

The species belongs to a monotypic genus but is very similar to a partly sympatric species, *Cacosternum boettgeri* (common caco). The easiest identifiable morphological differences between the two are that *C. boettgeri* lacks webbing between the toes and has a slightly stronger more robust build. Further details of the identification of *M. capensis* can be obtained in Poynton (1964) and Passmore and Carruthers (1979).

Distribution: The micro frog was described in 1910 from a single specimen collected on the Cape Flats (Boulenger 1910). The species was later discovered to occur at various localities in this area (Rose 1926) including some low-lying parts of the Cape Peninsula (Rose 1929, 1950, 1962). Power (1929) also referred to *M. capensis* as one of the Cape Peninsula frogs but provided no further details and failed to define the Peninsula. However, none of the other authors referred to (Hewitt 1926, FitzSimons 1947, Poynton 1964, Wager 1965, Van Dijk 1966, Du Toit 1971, McLachlan 1978, Passmore and Carruthers 1979, Visser 1979a) mention the species as occurring in this area and there are also no museum records available from the Peninsula. Furthermore Rose's son, Sidney (*pers. comm.*), does not recall any specimens being collected there. Rose (1929) defined the Cape Peninsula as including an area "up to three or four miles from the mountains" except when it is "used in contradistinction to the Cape Flats". Unfortunately, however, he provided no definition of the two when they were referred to in relationship to one another. Although the species could maybe occur on certain parts of the Peninsula, searches during recent years have been fruitless. More work is required in this regard and at this stage, it can only be presumed that Rose and Power were referring to specimens found on the western limits of the Flats.

The species has apparently not been found on the Cape Flats since the mid- 1960s (S. Rose and B. Rose *pers. comm.*), and the most recent records traced from this area date back to 1958 (i.e. T.M., N.M. and J.E. museum specimens). Although micro frog localities in this area are generally vague, the species does not appear to have been recorded from an area of more than 120 square kilometres. The following quarter of a degree map references cover

this area of distribution: 3318 CD Kaapstad/Cape Town, 3318 DC Bellville, 3418 AB Kaapse Skiereiland/Cape Peninsula, 3418 BA Mitchells Plain. In 1975 the CDNEC CP discovered the species near Betty's Bay (3418 BD Hangklip) and near Kleinmond (3419 AC Hermanus) the following year (1976). At present, the species has been recorded in these two areas from five localities situated in an area of one square kilometre to the west of Betty's Bay and from nine localities encompassing an area of four square kilometres to the east of Kleinmond. In 1980 and 1987 two additional localities were discovered between Gansbaai and Agulhas (3419 DA Baardskeerdersbos) by CDNEC CP. The species is also reported to have been found in the Kleinmond Coastal Nature Reserve (Attwell *pers. comm.*) but this requires further investigations and clarification.

Habitat and Ecology: The species is confined to the generally flat coastal lowlands where it occupies a restricted area of distribution. It obviously has very specialized habitat requirements but more work is necessary in this regard. The ideal habitat appears to be undisturbed mainly seasonal vleis situated in areas where coastal fynbos plant communities, dominated by Restionaceae, occur on acid sands.

The dark, acid, nutrient-poor water bodies usually associated with this type of habitat are very sensitive to human disturbance which could partly explain the decline of the species. However, Inger (1959) collected the species in 1951 from a "slightly brackish lake" containing "*Typha* and masses of green algae" with "wet meadows" in the surroundings (Brinck and Rudebeck, 1959). The locality was Varden Vlei (=Varkensvlei) near Ottery on the Cape Flats. This could well have been a habitat undergoing disturbance though. The area is now, in any case, largely disturbed by agricultural activities and the species does not appear to occur here anymore. *M. capensis* appears to have similar habitat requirements to the endangered Cape platanna, *Xenopus gilli*, and the two species have been found to be fairly sympatric in certain localities.

In winter, during the breeding season, micro frogs are generally found amongst the marginal and semi-submerged vegetation in their vlei habitat where the males call from positions at, or just above, water-level. During the dry summer months, Rose (1929) occasionally dug up specimens on the site of a temporary vlei.

Breeding: The possibility that there is specialization during the breeding cycle of *M. capensis* is being investigated. Breeding can commence in May (Visser 1979a) but usually takes place in June, July and August. Food availability, photoperiod, rainfall and temperature are important extrinsic factors influencing the breeding cycle with rainfall probably being the most important factor in the case of *M. capensis*. The species appears to favour seasonal vleis and it is only during the winter months that there is sufficient standing water in these vleis for the breeding cycle to commence. The eggs are laid in clusters of about 20 with each individual egg enclosed in a jelly capsule. The egg clusters are attached to vegetation a few centimetres below the surface. The tadpoles are benthonic and the newly metamorphosed frogs begin to appear early in December (Rose 1929). Rose could, however, have made these observations on the metamorphosis under captive conditions.

Remarks: There are no taxonomic problems with this species. It is a "good" species. Although new localities of *M. capensis* may still be found, the known distribution area of the species is contracting.

CONSERVATION

Status: By far the major part of the micro frog's known distribution range is situated on the Cape Flats. This area is now a vastly disturbed environment and there are few, if any, remaining natural water bodies. Many of the original vleis have been destroyed by the major threats of urban and agricultural development, and those that remain have largely been degraded by alien vegetation and eutrophication due to agricultural and horticultural runoff. Rose (1962) drew attention to the decline of the micro frog and stated that the species was becoming "something of a rarity" due to their vleis being reduced by development. The reason why the species has not been found on the Cape Flats in recent years can be attributed to the large scale increase in these activities at least during the last 20 years. *M. capensis* is fairly sympatric with the common caco, *Cacosternum boettgeri*, and, in fact, Rose (1929) found the latter to be "only one percent as numerous" as *M. capensis* which he later referred to as having been "plentiful on the Flats" (Rose 1962). This is no longer the case. *M. capensis*, with its specialized habitat requirements, may be extinct in this area while *C. boettgeri* is now widespread and common. *C. boettgeri* occurs virtually throughout South Africa and is an adaptable, aggressive species

which can tolerate (and possibly, indeed welcome) eutrophication. It has even been known to colonize agricultural land and to breed in artificial impoundments.

As regards population numbers, the species appears to be fairly abundant in prime undisturbed habitat. At a locality near Kleinmond, for instance, micro frogs have been heard calling in their thousands.

Threats: These can be summarized as follows:

1. The filling in and drainage of wetlands due to urban development and agriculture, railway and road building and damming projects.
2. The pollution and eutrophication of wetlands due to urban development and agriculture.
3. The alteration and loss of habitat due to the uncontrolled spread of alien vegetation.
4. Excessive, short interval fires during the summer months when seasonal vleis are dry. These often take place on agricultural land where the veld is burnt to improve its grazing potential. The burning cycle should, however, not take place at less than 10 yearly intervals in order to allow faunal recruitment.

Existing Conservation Measures: The species is given maximum legal protection on Schedule I of the Cape Nature Conservation Ordinance of 1974. It still has to be confirmed whether the micro frog occurs in the Kleinmond Coastal Nature Reserve but, other than this, the species does not occur in any nature reserve.

Breeding Potential in Captivity: Adults collected in peak breeding condition have been known to lay eggs in captivity under simulated conditions. The tadpoles can be successfully reared but obtaining suitable insect food for juvenile and adult frogs can be a problem. Due to the specialized habitat requirements of the species it could be difficult to find suitable release sites for re-introductions and this should only be attempted as a last resort. Genetic conservation principles must also be borne in mind in this regard. Furthermore, re-introductions can only be considered once the habitat requirements of the species have been studied in more detail and the degree of specialization has been established.

Recommended Conservation Measures: It is vitally important to conserve as many of the remaining viable populations as possible. The CDNEC,CP is investigating possible conservation measures and attempts are currently being made to register some of the localities as South African Natural Heritage Sites. As regards research priorities, studies on the distribution and habitat requirements of the species are being continued in greater detail. This includes an examination of the life cycle, the level of disturbance the species is able to tolerate and the ecological relationship between *M. capensis* and the fairly sympatric *C. boettgeri*. Furthermore, known populations of *M. capensis* are being monitored. It is important to locate all remaining populations and to check these regularly in order to determine conservation priorities and management procedures.

Remarks: The micro frog has been found to be fairly sympatric with the endangered Cape Platanna (*X. gilli*) in certain localities which increases the need to conserve these areas. The species was listed as rare (restricted) in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Boulenger, 1910; Passmore and Carruthers, 1979; Poynton, 1964.

Distribution: Brink and Rudebeck, 1959; Boulenger, 1910; Du Toit, 1971; FitzSimons 1947; Hewitt, 1926; McLachlan, 1978; Passmore and Carruthers, 1979; Power, 1929; Poynton, 1964; Rose, 1926, 1929, 1950, 1962; Van Dijk, 1966; Visser, 1979a; Wager, 1965, 1987.

Habitat and Ecology: Brink and Rudebeck, 1959; Inger, 1959; Rose, 1929; Vissera, 1979.

Conservation status: McLachlan, 1978; Rose, 1929, 1962.

Account prepared by: A. L. de Villiers, CDNEC CP, Jonkershoek.

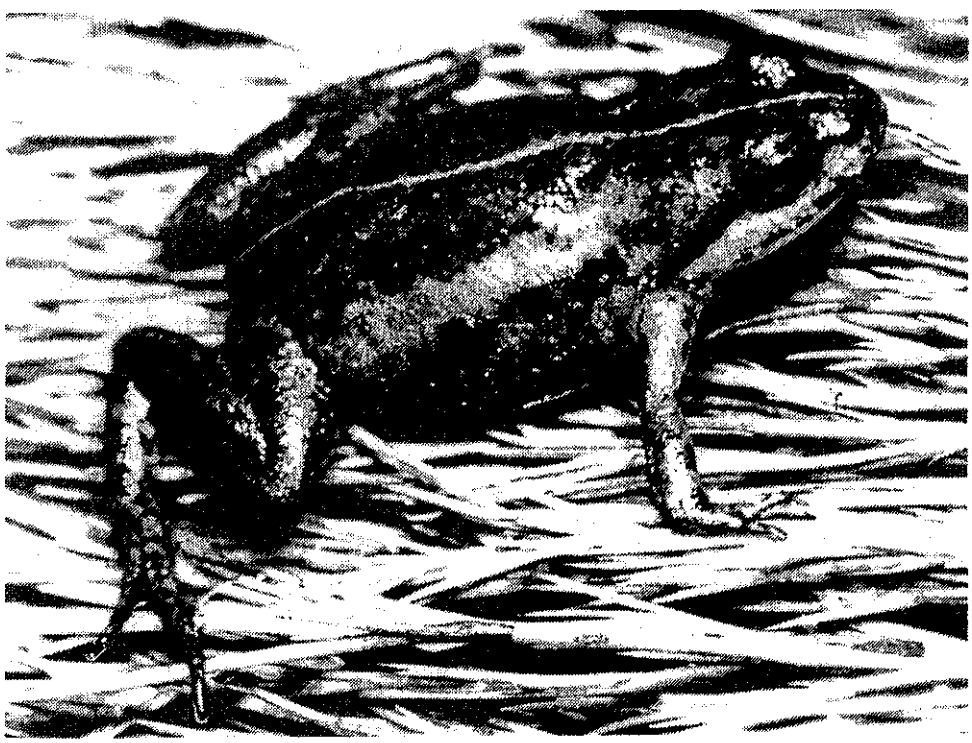
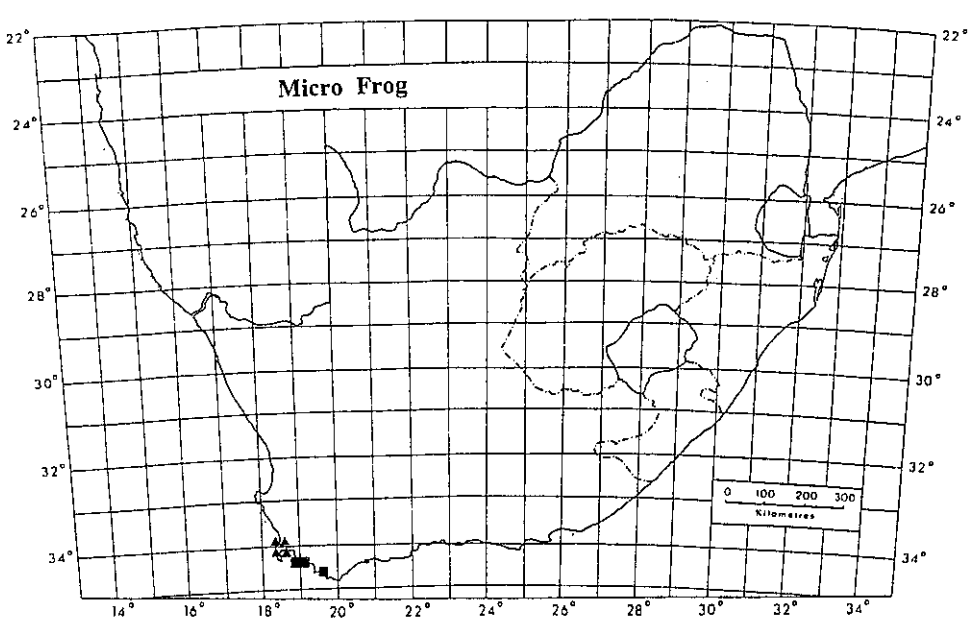


Fig. 6. Micro frog *(Microbatrachella capensis)* **Endangered.** (A. de Villiers)



Map. 5. Distribution of the Micro frog *(Microbatrachella capensis)*

■ Current distribution (new or re-confirmed localities since 1980).

▲ Previous distribution (no recent records despite surveys since the mid-1960s).

HEWITT'S GHOST FROG
Hewitt se spookpadda

International status: NOT LISTED
South African status: ENDANGERED

Heleophryne hewitti Boycott 1988. **Class:** Amphibia, **Order:** Anura, **Family:** Heleophrynidae

Heleophryne hewitti Boycott, 1988. Description of a new species of *Heleophryne* Sclater, 1899 from the Cape Province, South Africa (Anura: Heleophrynidae). *Ann. Cape Prov. Mus. (nat. Hist.)* **16(11):** 309-319.
Type locality: Geelhoutboom River, Loerie Forest Reserve, Elandsberg Mountains, Eastern Cape.

SUMMARY
Status: Endangered. A medium-sized ghost frog with a very restricted range in the Elandsberg Mountains of the Eastern Cape. The species is threatened by habitat loss as a result of over-utilization of its habitat for forestry and frequent, sometimes devastating, forest fires.

Research: Fair. Reproductive biology and distribution well known. The impact of habitat destruction on the species needs to be investigated.

SPECIES DATA
Identification: A medium-sized ghost frog (maximum snout vent length 50mm in females, 47mm in males) that can be readily identified by its squat build, long legs, enlarged, spatulate friction pads on all finger and toe tips, and distinctive call. The body is a uniform light-brown to olive brown with numerous rounded and irregularly -shaped, dark-brown spots, each marginated with a thin white line. The hindlimbs are marked with dark, irregularly-shaped transverse bands.

Distribution: The species has a very restricted range and is only known from four streams in the Loerie and Otterford Forest Reserves in the Elandsberg Mountains. No other localities are known despite extensive searches in suitable streams in the Elandsberg and adjacent ranges. Only two of the inhabited streams have perennial tributaries and the combined catchment of all known localities extends over only 10km. The species is found at altitudes of between 400m and 550m a.s.l.

Habitat and Ecology: The species is found in clear, swift-flowing, perennial mountain streams with rocky beds. Adults and tadpoles can be found beneath submerged and partially-submerged rocks in such streams and occasionally at the edge of waterfalls and cascades. Suitable habitat is only found in the upper reaches of the mountain streams.

Breeding: Males were heard calling at night in October 1979 and at night and during the day in October 1980. Six egg batches were found on the first occasion and two on the second (Boycott, 1988).

Remarks: Between 1972 and 1983 a distribution survey of *Heleophryne* in the Cape Province was undertaken and several undescribed populations were discovered (Boycott, 1982, 1988; Channing *et al.*, 1988). While there is little doubt of the specific status of *H. hewitti* (an isolated and the easternmost population within the *H. purcelli/ H. regis* complex), the taxonomic and conservation status of some of the other recently discovered, isolated populations of these ghost frogs (for example in the Kammanassie, Kouga and Baviaanskloof mountain ranges) warrents further investigation.

CONSERVATION
Status: The species is restricted to the headwaters of four rivers, the Geelhoutboom River, Martins River, Klein River and Diepkloof River. All are located in areas of extensive exotic plantations, such that only a narrow margin of indigenous false macchia vegetation is to be found along the stream banks.

Threats: These frogs are confined to the upper reaches of mountain streams, usually at high altitude, and do not survive in the larger perennial rivers at lower altitudes in the valley bottoms. Consequently the streams they inhabit are relatively small (sometimes only a metre across). Because of the region's high rainfall (1000mm p.a.) these areas are in great demand for forestry. Almost the entire upper slopes of the Elandsberg range are now under pine plantations and in the early 1980s mountain fires devastated the whole region. While clearing the area, many of the burnt trees were felled and left in the water courses. Heavy rains washed much of the felled timber into the rivers, blocking the flow and causing silting of virtually every stretch of *Heleophryne* habitat, including the type locality (compare Fig. 2 with Fig. 7).

Alien fish (black bass and rainbow trout) have been introduced into several of the Elandsberg streams and rivers on the periphery of *H. hewitti*'s range. These may pose a threat to recruitment if they

become established in the headwaters. Dam construction has also taken place, although mainly at lower altitudes. In addition, water flow along the streams may have slowed due to changes in drainage patterns caused by the extensive plantations. *Heleophryne* tadpoles usually take at least 12 months to complete metamorphosis, and are therefore dependent upon perennial streams and are very sensitive to changes in seasonal water flow.

Existing Conservation Measures: The Cape Provincial Nature Conservation Ordinance protects all amphibians in the province but does not currently provide this newly-described species with any extra protection. The type locality is situated on land under the protection of the Department of Forestry.

Breeding Potential in Captivity: Unknown, but probably poor. The greatest difficulty would be the provision of suitable breeding sites, comparable with those in their natural habitat. Captive breeding should therefore only be considered as a last resort.

Recommended Conservation Measures: The species should be classed as endangered by Cape Provincial Nature Conservation Ordinance. It is essential that all known localities for the species in the Elandsberg mountains be managed as high priority conservation areas. The establishment of alien plantations in this sensitive area should be reconsidered, and further introductions of alien fishes banned. Cognisance should be taken of the dependence of *Heleophryne* on perennial streams should any further dam construction be planned in the region. The encroachment of alien plant species, particularly after forest fires, should be monitored.

Remarks: The Van Stadensberg mountains, a south-easterly extension of the Elandsberg range, supports an endemic, endangered dwarf chamaeleon (*Bradypodion taeniabronchum*) that survives in remnants of the false macchia. Both this chamaeleon and Hewitt's ghost frog are threatened by habitat loss due to forestry development and mountain fires. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Boycott, 1988.

Ecology: Boycott, 1988; Channing, Boycott and van Hensbergen, 1988.

Conservation: Boycott, 1988.

Account prepared by: R. C. Boycott (Malolotja Nature Reserve, Swaziland) and W. R. Branch (Port Elizabeth Museum).

Fig. 7. Geelhoutboom River, the type locality of Hewitt's ghost frog *(Heleophryne hewitti)* (R. Boycott)

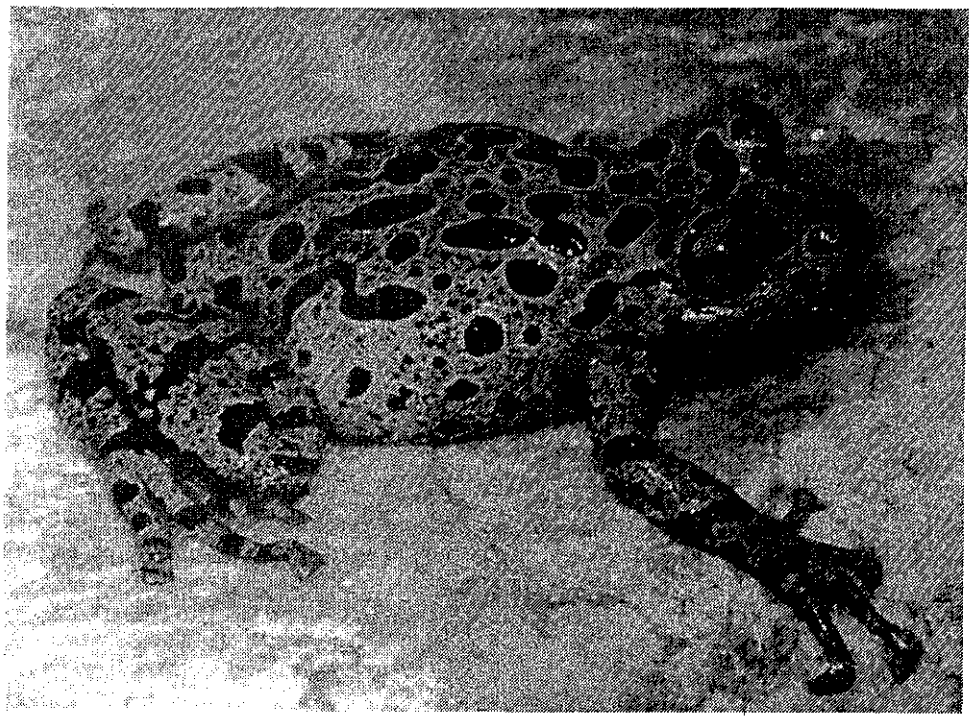
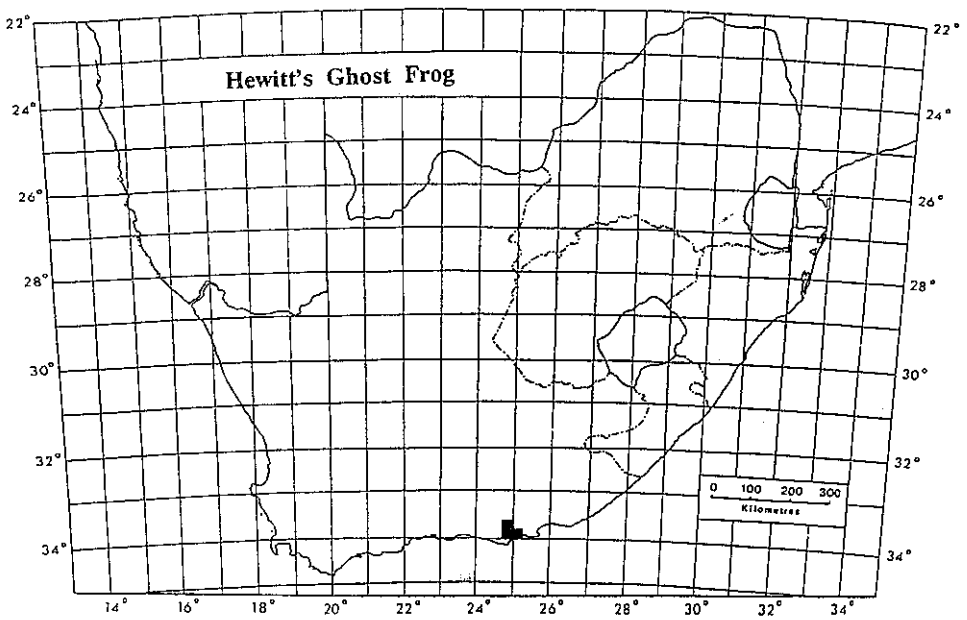


Fig. 8. Hewitt's ghost frog *(Heleophryne hewitti).* **Endangered** (R. Boycott).



Map. 6. Distribution of Hewitt's ghost frog *(Heleophryne hewitti).*

TABLE MOUNTAIN GHOST FROG **International status: NOT LISTED**
Tafelbergse spookpadda **South African status: ENDANGERED**

Heleophryne rosei Hewitt 1925. **Class:** Amphibia, **Order:** Anura, **Family:** Heleophrynidae

Heleophryne rosei Hewitt, 1925. On some new species of Reptiles and Amphibians from South Africa. *Rec. Albany Mus.* 3: 343-368, pls. xv and xix. **Type locality:** Table Mountain.

SUMMARY
Status: Endangered. A large species with a very restricted range on Table Mountain. Currently known from nine localities the population is threatened by loss of suitable habitat through the construction of reservoirs, infestation of alien vegetation and forestry. Climatic fluctuations place the species under additional pressure.

Research: Good. Ecological and environmental impact studies are a priority.

SPECIES DATA

Identification: A large species of ghost frog (maximum snout vent length 60mm in females, 50mm in males) that can be readily identified by its squat build, long legs and the possession of enlarged, spatulate friction pads on the tips of finger and toes. A further distinguishing feature is the enlarged inner metacarpal tubercle giving the impression of a vestigial "thumb". The dorsal colour-pattern is cryptic consisting of numerous irregularly-shaped, reddish-brown patches on a green background. There is no dark transverse band in the eye and the pupil is vertically elliptic.

Distribution: The species has a very restricted range on Table Mountain and is presently known from nine localities. It does not occur anywhere else on the Cape Peninsula.

Habitat and Ecology: Occurring in moist, forested gorges and ravines the species is very selective in respect of habitat and is restricted to wet mountain fynbos and mesic mountain fynbos. The adults and, perhaps more so, the tadpoles are adapted for life in fast-flowing mountain streams. Characteristically the streams are steep with many waterfalls and cascades and they are often bordered by vertical, moss-covered, rock-faces - all constituting prime *Heleophryne* habitat. The tadpoles undergo a relatively long larval development (in excess of 12 months) and are therefore confined to perennial streams. The tadpoles have only been found at seven stream localities on Table Mountain while adults have been found at some of these as well as in caves (Gow, 1963; Boycott and De Villiers, 1986). Adults are not necessarily restricted to the perennial watercourses on the mountain as during rain or misty conditions they can move overland from one ravine to the next.

Breeding: The eggs, oviposition sites and early development of tadpoles are unknown. Gravid females have been collected in October and December and voice recordings of males have been obtained in early December (Boycott and De Villiers, 1986).

Remarks: By comparison to other members of the genus very little material on *H. rosei* has been collected. Hewitt (1925) described the species from an adult male and female. After nine years the species was known from one more adult and three juveniles (Du Toit, 1934). Thirty years later Poynton (1964) examined a total of eight specimens and recently it has been reported that the species is represented in South African museums by 16 specimens (Boycott and De Villiers, 1986). The type locality of the species was given as Table Mountain by Hewitt (1925) and Poynton (1964). It is important, from a conservation point of view, that a more precise type locality be documented for the species. As the type male and female were collected in Skeleton Gorge, this locality represents a more specific type locality than "Table Mountain".

CONSERVATION

Status: *H. rosei* has one of the most restricted distribution ranges of any southern African amphibian. In 1980 the Cape Department of Nature and Environmental Conservation completed a distribution survey of *H. rosei* on Table Mountain. The findings of this survey were published recently and although no obvious decline in numbers was indicated the authors urged that the status of *H. rosei* be considered as rare and vulnerable (Boycott and De Villiers, 1986).

Threats: One of the greatest threats is the uncontrolled infestation of alien vegetation in the ravines and gorges inhabited by the species. It is also likely that the planting of alien plantations has been responsible for the local extinction of the species in Cecilia Ravine and in some of the more northern localities such as Rooielskloof, Newlands Ravine and Platteklip Gorge. At the beginning of this century five reservoirs were constructed on what must have formerly constituted suitable habitat. It is unlikely that any more will be constructed on the mountain, however, what is more important is that the streams below the existing reservoirs must not be deprived of perennial water so vital for the tadpoles.

Existing Conservation Measures: The Cape Provincial Nature Conservation Ordinance protects all amphibians in the province but does not provide *H. rosei* with any extra protection. The type locality is situated in the National Botanic Gardens, whilst Orange Kloof, which possibly supports the largest portion of the population, is on land protected by the Department of Forestry.

Breeding Potential in Captivity: Very limited. The adult frogs do not survive for long in captivity (from seven days, J. Loveridge *pers. comm.*, to three months, Rose, 1962). The greatest difficulty would be the provision of suitable breeding habitat, comparable with that of their natural habitat.

Recommended Conservation Measures: The species should be classed as endangered by Cape Provincial Nature Conservation Ordinance. It is essential that all known localities for the species, particularly Skeleton Gorge and Orange Kloof, be managed as high priority conservation areas. The establishment of alien plantations should not be allowed in any of the ravines and gorges that are inhabited by the frogs. The careful control and eradication of alien vegetation is an important prerequisite for the continued survival of *H. rosei*. To ensure that stream flow is not radically affected, the removal of alien vegetation from watercourses and the recolonisation of indigenous vegetation must be a gradual process. Strict control of the outflow (which should be continuous) from the reservoirs on the mountain is of utmost importance as the tadpoles require perennial, fast-flowing water to survive. The stocking of streams and reservoirs with alien fish species should be prohibited to prevent undue predation on the eggs and larvae of the amphibian fauna. As suggested by Boycott and De Villiers (1986) serious consideration should be given to conducting translocations of tadpoles on Table Mountain as there are other suitable streams on the mountain that could support the tadpoles.

Remarks: Table Mountain is an area of outstanding botanical and zoological interest and the protection of all its habitats would not only afford protection for its animal life, including the unique Table Mountain Ghost Frog, but also for its unique plant life.

BIBLIOGRAPHY

Taxonomy: Du Toit, 1934; Hewitt, 1925; Passmore and Carruthers, 1979; Poynton, 1964.

Ecology: Boycott and De Villiers, 1986; Gow, 1963; Passmore and Carruthers, 1979; Rose, 1926, 1929, 1962 .

Conservation: Boycott and De Villiers, 1986; McLachlan, 1978.

Account prepared by: R. C. Boycott, Transvaal Snake Park, P.O. Box 97, Halfway House 1685.

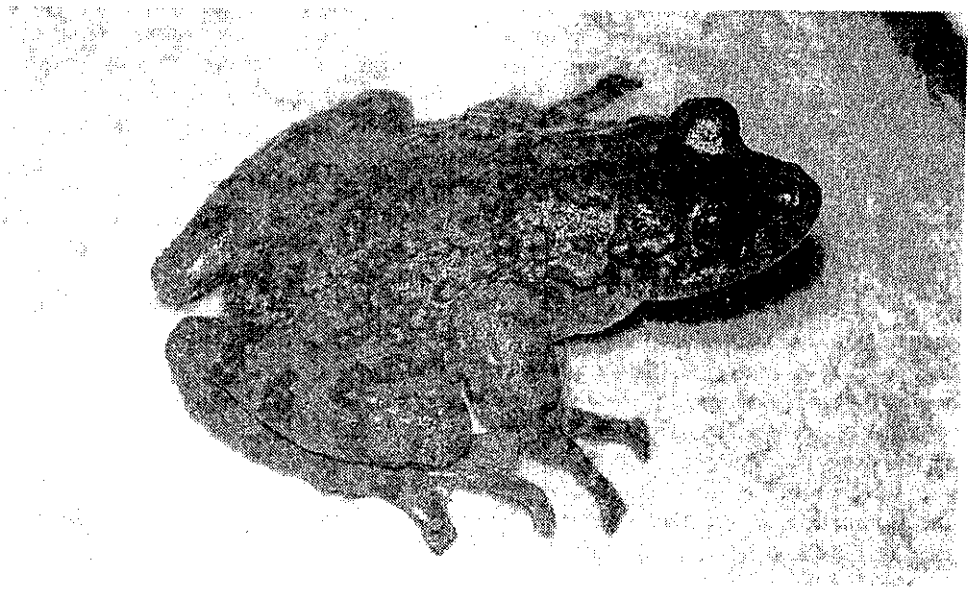
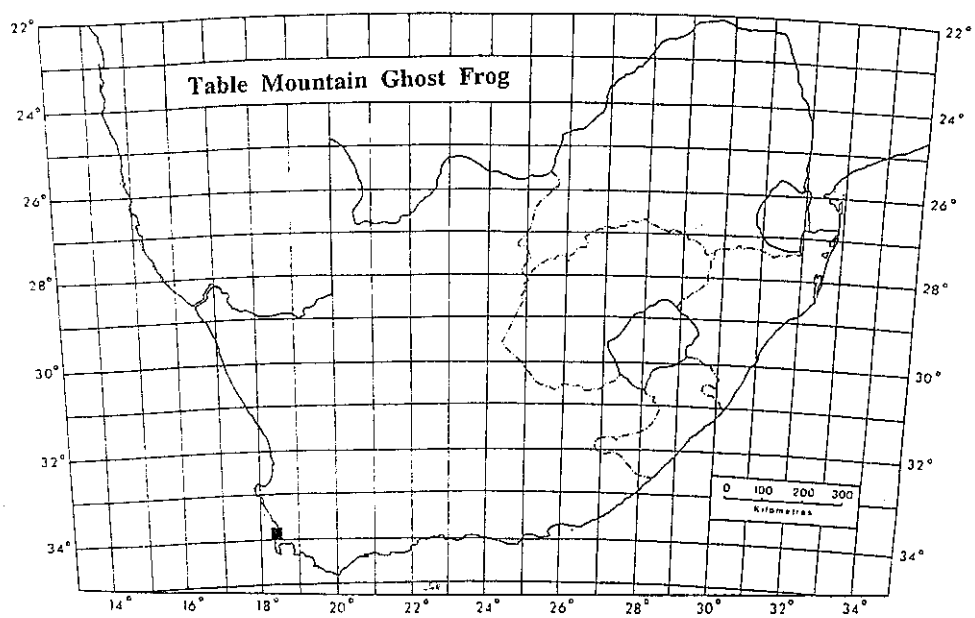


Fig. 9. Table Mountain ghost frog *(Heleophryne rosei)*. **Endangered.** (R. Boycott)



Map. 7. Distribution of the Table Mountain ghost frog *(Heleophryne rosei)*.

GEOMETRIC TORTOISE
Geometriese skilpad; suurpootjie

International status: VULNERABLE
South African status: ENDANGERED

Psammobates geometricus (Linnaeus, 1758). **Class:** Reptilia, **Order:** Chelonii, **Family:** Testudinidae

Testudo geometrica Linnaeus, 1758. *Systema Naturae.*, ed. 10, 1: 199. **Type locality:** "Asia" (in error).

SUMMARY

Status: Endangered. A small, "starred" terrestrial tortoise with a very restricted distribution in the extreme south-western Cape Province, South Africa. Less than 10% of renosterveld, its preferred habitat, remains due to extensive agricultural and urban development.

Research: Good. Various research programmes have been carried out since the late 1960s. Currently an extensive ecological project by the author is in progress, which is designed to compile a conservation strategy to ensure the long-term survival of the species.

SPECIES DATA

Identification: Carapace very convex, sides descending steeply; nuchal present; forelimbs covered anteriorly with a few large scales, separated by smaller ones, and with five toes; hindlimbs with four toes; rear of thigh without conical buttock tubercle; posterior marginals not or only slightly flared and serrated; lateral marginals higher than broad; vertebrals five, rarely four to six, usually swollen as truncate pyramids; costals four, rarely five; marginals 11 to 12. There is a marked sexual dimorphism in size; males average 100mm, females 125mm (Loveridge and Williams, 1957; Greig, 1981; Honegger, 1981; Baard, unpublished data). Carapace pattern: each shield with yellow radiating rays from yellow areolae on a dark brown to black background. A radiating pattern is always present on the plastron shields, except in old specimens with worn shells.

Distribution: This species is endemic to the low-lying parts of the Cape Province, including parts of the Worcester and Ceres valleys. Historically the distribution covered an area between Eendekuil in the north, Darling in the north-west, towards the Hottentots Holland basin in the south, and continuing northwards along the foothills of the Cape Fold Mountains to Gouda (Greig and Burdett, 1976). This species has, at least within historical times, been confined to this area (Greig, 1981). Rau (1971) reports an approximately 2000 year old (radiocarbon dated) *P. geometricus* shell from "Die Kelders", Gansbaai, found in a cave during 1969. He, however, doubts whether this specimen lived in this area and states that it might have been introduced there by means of the Strandloper -Hottentot trade, as the shell has a bowl-like appearance with scrape marks inside. He states that the historical distribution of the species includes the Breede River/Worcester valley towards Villiersdorp and Caledon in the south, and states that reports of geometric tortoises in the Bot River area might thus be reliable and accepted. McLachlan (*in litt.*) reported reliable reports of the presence of geometric tortoises from this area as well. However, these reports have still to be confirmed by voucher specimens. Although Greig and Boycott (1977) report the presence of geometric tortoises at twelve localities outside established reserves, a recent survey by Baard and De Villiers (Chief Directorate of Nature and Environmental Conservation, Cape Province, CDNEC CP) confirmed the presence of the species at only six areas outside the reserves. This survey, however, will have to be repeated to verify these results.

Habitat and Ecology: A terrestrial species occurring in the flat, low-lying renosterveld habitat of the south-western Cape, including parts of the Worcester and Ceres valleys. It is estimated that only 10% of this habitat remains (Parker, 1982), the rest having been destroyed for agricultural development and urban expansion. The remainder of the habitat comprises small "patches" of natural veld, which are under constant pressure of being ploughed (Greig, 1984). The soils of this habitat type are acidic, nutrient-poor and support a low shrub vegetation with *Restio*-elements and grasses (Greig, 1981). Parts of it may become heavily inundated in winter, but become dry in summer. Preliminary results of the present ecological project have shown that tortoises prefer relatively open habitat (Baard, in progress). Indications are that rocky substrate (on the study site) may be a limiting factor for tortoise movements towards higher ground. There is a bimodal daily activity pattern with peaks at 09h00-10h00 and 15h00-16h00. There appears to be a seasonal movement of tortoises away from inundated areas towards higher ground in winter. Rau (1976) reports tortoises feeding on sedges, leaves of *Crassula ciliata* and the iris

Romulea. Baard (*unpub. observ.*) has noted hatchlings feeding on *Oxalis sp.* Rau (1971) also reports that *Oxalis monophylla* is eaten. Faecal samples also contain grasses. Further studies on feeding are in progress.

Breeding: Sexual maturity is attained at approximately seven to eight years of age (Greig, 1981). One clutch of eggs comprising two to four eggs is laid during spring to early summer. Loveridge and Williams (1957) and Moll (1979) incorrectly state that eleven to fifteen eggs are laid. The number of eggs per clutch has repeatedly been verified either by people keeping individuals under special permit or by researchers studying reproduction. Rau (1976) reports two nests, "opened and robbed", each surrounded by the remains of two eggs. One partially opened egg contained a partly decayed embryo. He also reports a female containing two fully developed eggs on 20 December 1975. Eggs have hatched in autumn after the onset of the first winter rains, which soften the soil and permit hatchlings to exit. Longevity has not yet been established, but recently a specimen of unknown age was identified as having been in captivity for seventeen years. Greig (1981) believes that individuals may exceed thirty years of age.

Remarks: Recently Wallin (1977) and Hoogmoed and Crumly (1984) have discussed the nomenclatural status of the species. Wallin (1977) pointed out that Linnaeus' description of *P. geometricus* is based, in part, on the shell of another starred tortoise, the Indian species *Geochelone elegans*. To conserve current usage, the latter authors have designated a pre-Linnaean figure in Piso (1658) as the lectotype of *P. geometricus*.

CONSERVATION

Status: At the Eenzaamheid Nature Reserve, Paarl, 170 geometric tortoises have been marked and released (Greig, 1984), whilst at the Romans River and Hartebeest River Nature Reserves, 41 and 19 tortoises, respectively, have been recorded (data up to October, 1981). During October 1986, 42 geometric tortoises were released in the newly established Harmony Flats Nature Reserve near the Strand. The Elandsberg Private Nature Reserve has an estimated population of approximately 2000 tortoises, at a density of two per hectare (Greig, 1984). The true figure may be higher since up to four tortoises per hectare have been collected from this area (Baard, *unpubl. obser.*). It has unfortunately not been possible to determine the population numbers of areas outside the reserves.

Honegger (1970) lists *P. geometricus* as being "endangered", while it is listed as "vulnerable" in the latest IUCN International Red Data Book (Groombridge, 1982). McLachlan (1978) lists it as being "endangered". The conservation status of this species remains critical and without proper conservation measures and the preservation of natural habitat, this species may become extinct within its natural distribution range.

Threats: Habitat destruction is doubtless the main factor which threatens the survival of local geometric tortoise populations. Agricultural development in the south-western Cape, as well as urban expansion, have led to the destruction of more than 90% of renosterveld habitat (Greig and De Villiers, 1982; De Villiers, 1985). This species has proved to be intolerant of habitat modification (McLachlan, 1978) and the irreversible destruction of habitat accounts for the loss of local populations. In the past it was sought after for the pet trade, but this impact is considered to be negligible in recent times due to strict control of exports (Greig, 1981). Too frequent fires may also pose a threat to the species, especially when these occur before a generation becomes sexually mature. Because populations are generally isolated, no 'donor' populations exist nearby. This may lead to local extinction. Another major threat which is responsible for habitat alteration and eventual loss, is the spread of exotic vegetation. Predator pressures may account for the loss of individuals, but it has not yet been established if this is a major threat. Juvenile tortoises are taken by jackals, yellow mongooses, rats, secretary birds and crows. Overgrazing, alterations to drainage patterns and pesticide drift from adjacent crop-spraying, could also result in the degradation of natural habitat (De Villiers, 1985).

Existing Conservation Measures: Concern for the future of this species was first expressed in the late 1930s by Hewitt, but no action was taken by the authorities because it was felt that undue attention may hasten the extinction of the species due to unscrupulous collecting (Greig, 1984). After Rau's work on the species in the early 1970's the CDNEC CP established the first geometric tortoise reserve in 1972. This reserve was established on an 8 ha part of the farm "Eenzaamheid" near Paarl (Juvik, 1971; Rau, 1971). Since then three other reserves, solely for the preservation of the species, have been established: Romans River (30 ha) and Hartebeest River (30 ha) in the Worcester valley

(both in 1978), and the Harmony Flats Nature Reserve (9 ha) near the Strand in 1986. Another very important area, the 3000 ha Elandsberg Private Nature Reserve, with approximately 1000 ha suitable to geometric tortoises, supports the biggest (ca. 2000 - 4000 tortoises) population (McLachlan, 1978; Greig, 1984). Negotiations are currently under way to establish another two nature reserves in the Worcester and Ceres valleys.

The geometric tortoise is the only South African tortoise species which appears on the International Red Data Book for Rare and Endangered Species (Anon., 1986; listed as "vulnerable") and it is also listed in Appendix I of the CITES (Honegger, 1981). CITES Appendix I listing requires that trade in the taxon and its products is subject to strict regulation by ratifying countries, and international trade for commercial purposes is prohibited. Locally this species is protected as an "Endangered Wild Animal" under the Cape Nature Conservation Ordinance No. 19 of 1974 which implies that no individuals may be collected, transported, imported, exported or kept in captivity without appropriate special permits.

Breeding Potential in Captivity: Currently approximately 30 geometric tortoises are being kept in captivity under special permit by four tortoise keepers. Egg-laying has been recorded on at least seven occasions and successful rearing of young has taken place on five occasions (Cillie, Hagen and Nortier, *pers. comm.*). Captive conditions and suitable egg deposit sites are important to the successful breeding of this species in captivity. Captive breeding may be feasible as a last resort in saving the species from extinction, but such a program should only be embarked upon when the exact requirements for breeding have been established.

Recommended Conservation Measures: The acquisition of more natural habitat sites for the conservation of local populations is the most urgent requirement. The species is being adequately protected by both national and international conservation laws, and strict enforcement thereof is recommended.

Remarks: The geometric tortoise is a critically endangered species and is very vulnerable to habitat alteration. Although adequately conserved by law, destruction of natural habitat remains the main threat, and a full-scale information campaign should be launched to inform important target-groups, such as farmers and school children, about the conservation of this species. Listed as endangered in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Groombridge, 1982; Honegger, 1981; Hoogmoed and Crumly, 1984; Linnaeus, 1758; Loveridge and Williams, 1957; Piso, 1658; Wallin, 1977;

Distribution: Greig and Boycott, 1977; Greig and Burdett, 1976; Rau, 1971.

Habitat and Ecology: Greig, 1984; Parker, 1982; Rau, 1976.

Breeding: Loveridge and Williams, 1957; Moll, 1979; Rau, 1976.

Status: Honegger, 1970; Greig, 1984; Groombridge, 1982; McLachlan, 1978.

Threats: De Villiers, 1985; Greig and De Villiers, 1982; McLachlan, 1978.

Existing conservation measures: Greig, 1984; Honegger, 1981; Juvik, 1971; McLachlan, 1978; Rau, 1971.

Account prepared by: E. H. W. Baard, Chief Directorate of Nature and Environmental Conservation, Cape Province, Stellenbosch.

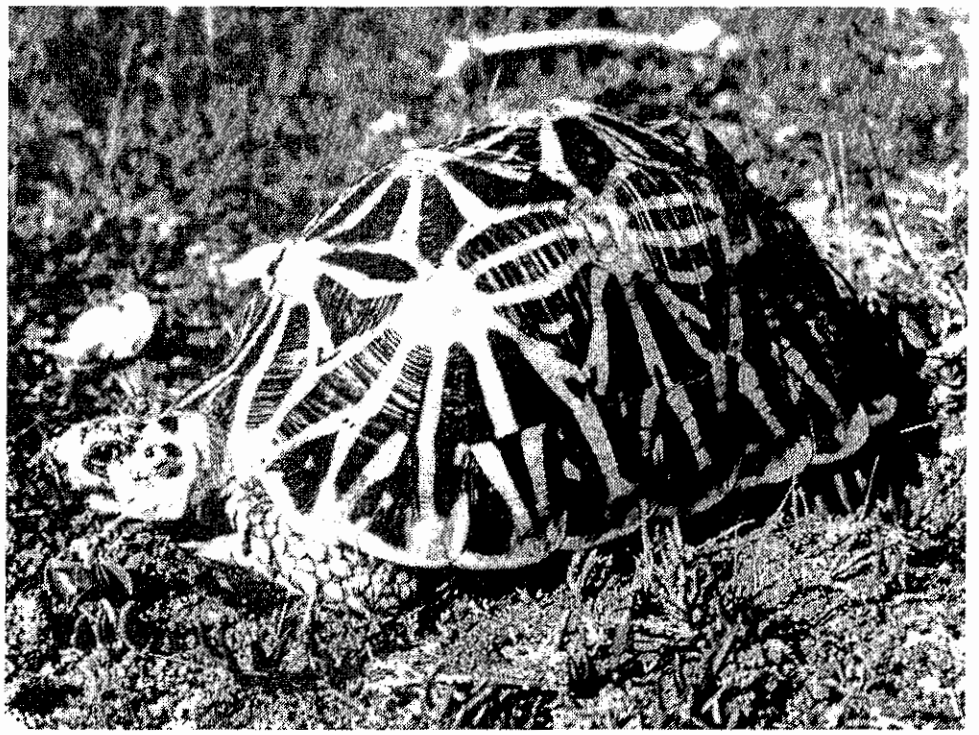
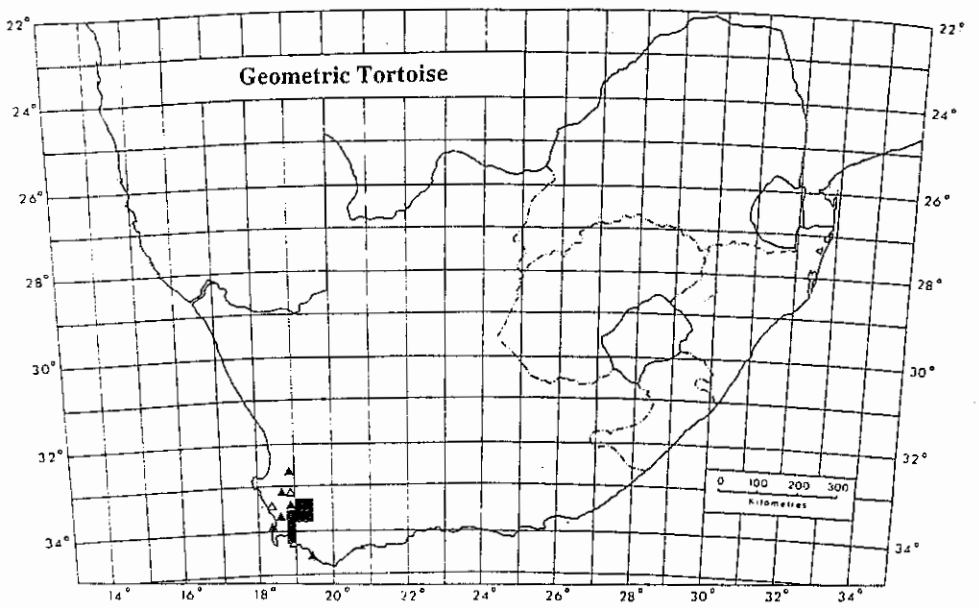


Fig. 10. Geometric tortoise *(Psammobates geometricus)* **Endangered.** (A. de Villiers)



Map. 8. Distribution of the geometric tortoise *(Psammobates geometricus).*

■ CDNEC (Baard and De Villiers 1985) confirmed present distribution.

△ Greig and Burdett, 1977; ▲ Rau, 1971.

SMITH'S DWARF CHAMAELEON
Smith se dwergverkleurmannetjie

International status: NOT LISTED
South African status: ENDANGERED

Bradypodion taeniabronchum (A. Smith, 1831). **Class:** Reptilia, **Suborder:** Sauria, **Family:** Chamaeleonidae.

Chamaeleo taeniabronchum A. Smith 1831 Contributions to the Natural History of South Africa, No 1. *S. Afr. Quart. J.* **5**: 17. **Type locality:** near Algoa Bay.

SUMMARY

Status: Endangered. A small species with a very restricted range in the Van Stadensberg, Port Elizabeth District. Currently known from a single population that is threatened by exotic plantation, urban development, and veld fires.

Research: Fair. More extensive distribution surveys are required in the adjacent mountains, in addition to an intensive study of the species' ecology. The small area of fynbos on the summit of the Van Stadensberg (the Lady Slipper) should be proclaimed a reserve, and the region protected from further plantation development and veld fires.

SPECIES DATA

Identification: A very small (maximum size 117mm TL) chamaeleon with weakly developed head casques. The body is covered with granular scales, with a few enlarged, widely-spaced tubercles on the flanks. The dorsal crest is usually distinct and composed of a continuous series of medium to small conical tubercles. The species can be distinguished from other South African dwarf chamaeleons by having:

1. A gular crest composed of continuous series of small closely-set tubercles (unlike flaps in neighbouring *B. ventrale*);
2. Two or three black grooves on either side of throat, that may fade to rust/red after death, or altogether in preservative, and that are concealed at rest but prominent during the threat display.

Body coloration is usually a uniform blue/grey, sometimes red/brown, that in vegetation can assume mottled green colours.

Distribution: The species has a very restricted range, and is presently known from only 20 sq. km of fynbos habitat on the eastern summit and upper slopes of Van Stadensberg, Port Elizabeth District. Searches for the species in adjacent mountain ranges have so far proved negative.

Habitat and Ecology: Inhabits fynbos vegetation covering the upper slopes of the mountain. It has been collected in stands of *Protea nerifolia, P. eximia* and *P. mundii* as well as on *Restio* and *Leucospermum*. It does not occur in microsympatry with *B. ventrale*, which rarely enters fynbos and is restricted to disturbed or Valley Bushveld vegetation. In windy, cold weather the chamaeleon retreats into the dead flower heads of established protea stands.

Breeding: Like all *Bradypodion*, this species is a livebearer. Only 1 record of breeding is known; a wild-caught gravid female gave birth to 13 babies in October. Other dwarf chamaeleons are known to have 2-4 litters, each of up to 20 babies per season.

Remarks: The taxonomy of dwarf chamaeleons is confused by their occurrence in isolated populations, that are characterised by the development of unique sex-linked coloration and ornamentation. Although some authors (eg. Power, 1932; Hillenius, 1959) treated *B. taeniabronchum* as a race of *B. pumilum* or *B. ventrale*, this is untenable. It is undoubtedly a good species. Its relationship to other small dwarf chamaeleons present in fynbos situations elsewhere in the Cape fold mountains (eg. Swartberg, Kammanassieberg, Groot Winterhoekberg, etc.) remains problematic, and is currently under investigation (Branch, *in prep*). The absence of black throat grooves in these other populations supports the specific status of *B. taeniabronchum*. The Van Stadensberg is isolated from fynbos habitats on adjacent mountain ranges by the deep Grootrivier gorge in the west and extensive disturbed or Valley Bushveld vegetation in the Algoa basin region. Klaver and Bohme (1986) discuss generic boundaries within the family.

CONSERVATION

Status: The species has a very restricted range. In 150 years, from its description in 1831 until 1980, only three specimens of *B. taeniabronchum* were known. All came from the Algoa Bay region but lacked habitat data. The rediscovery of the species

by W. Bond in 1980 among the fynbos vegetation on Lady's Slipper was the first indication of its exact distribution. Since then a further 12 specimens have been discovered, all restricted to the proteoid vegetation on the mountain. An old record from Schoenmakerskop may represent an extinct population occurring in coastal fynbos vegetation. This area has been extensively altered by urban development and infestation with exotic *Acacia*. If the locality is valid it may represent a considerable retraction of the species' range. At present *Protea* stands remain only in isolated patches on the upper slopes and summit of the mountain.

No estimates of population numbers exist, but they cannot be high as the species is found only rarely during harvesting of the protea flowers.

Threats: Extensive pine plantations (Longmore and Otterford forest plantations) occur to the north and west of the species' range. It is probable that much of these plantations exist on land that was formerly suitable for *B. taeniabronchum*. There is also a general encroachment of exotic *Acacia* and *Eucalyptus* around the periphery of the mountain. Extensive and localised veld fires are experienced at regular intervals. The collection of *Protea* blooms for the florist trade does not pose a threat as the 'plantations' are protected for sustainable harvesting, and thus, indirectly, form a conserved area for the chamaeleons.

Existing Conservation Measures: The species is afforded only general protected status under Cape Provincial Ordinances. The species' range is currently owned by Department of Forestry and private owners, including the Eastern Province branch of the Mountain Club of South Africa.

Breeding Potential in Captivity: Although dwarf chamaeleons are prolific breeders, the rearing of the minute young on suitable insect food is very difficult. Captive breeding is feasible as a last resort, but at relatively great expense.

Recommended Conservation Measures: It is imperative that the species by recognised as 'endangered' by Cape Provincial Ordinance, and that steps be taken to conserve as much of the remaining habitat as possible. Further efforts should be made to discover other populations in less threatened areas of fynbos in adjacent mountain ranges. Should these be found they could drastically alter the conservation status of this species. However, the discovery of a new, undescribed species of dwarf chamaeleon in fynbos vegetation on the adjacent Groot Winterhoekberg (Branch, *in prep.*), makes the discovery of additional populations of *B. taeniabronchum* less likely. Attempts could be made to introduce the species into suitable habitats, eg. the Van Stadens Wild Flower Reserve.

Remarks: A few perennial streams in the adjacent Elandsberg also support the endangered Hewitt's ghost frogs (*Heleophryne hewitti*) (Boycott, 1988). This population is also seriously threatened by the development of exotic pine plantations. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

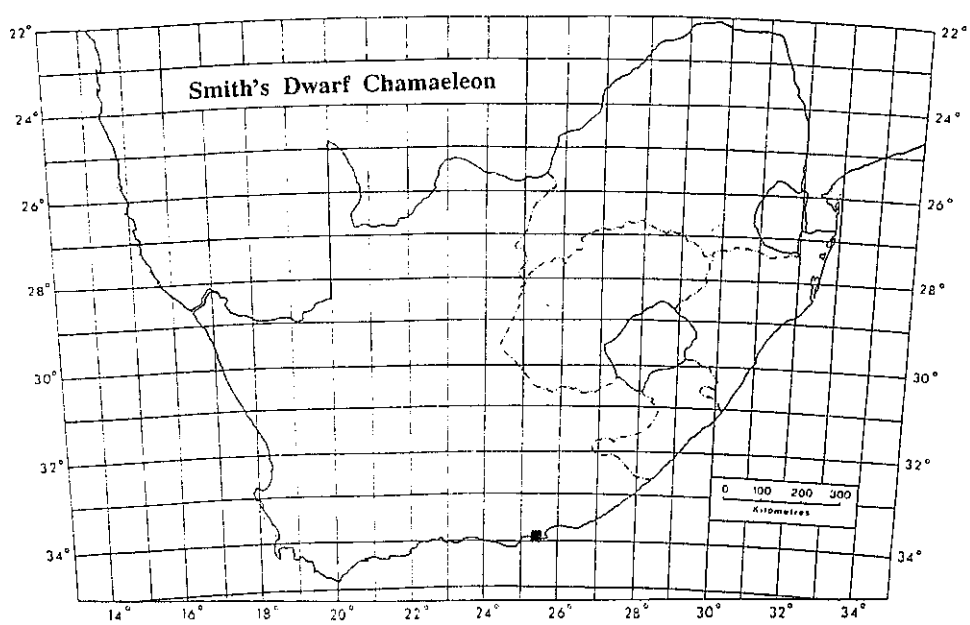
Taxonomy: FitzSimons, 1943; Hillenius, 1959; Klaver and Bohme, 1986; Power, 1932; Raw, 1976; A. Smith, 1831.

Habitat and Ecology: Branch, 1988.

Conservation: Branch, 1986b.

Account prepared by: W. R. Branch, Port Elizabeth Museum.

Fig. 11. Smith's dwarf chamaeleon *(Bradypodion taeniabronchum)* **Endangered.** (W. R. Branch)



Map. 9. Distribution of Smith's dwarf chamaeleon *(Bradypodion taeniabronchum).*

CAPE RAIN FROG
Blaasop/Kaapse reënpadda

International status: NOT LISTED
South African status: VULNERABLE

Breviceps gibbosus (Linnaeus 1758) **Class:** Amphibia, **Order:** Anura, **Family:** Microhylidae.

Rana gibbosa Linnaeus, 1758; *Systema Naturae.*, ed. 10, p 211. **Type locality:** Not stated.

SUMMARY

Status: Vulnerable. *B. gibbosus* is the largest member of a genus of fossorial and totally non-aquatic frogs. The species is restricted to the Mediterranean region of the south-western Cape Province. Although it is an adaptable species, which can survive in certain modified habitats such as suburban gardens, a fair amount of its habitat has been destroyed, mainly by urban and agricultural development. These two threats persist through most of its distribution range. At present the species appears to be relatively safe but the situation needs to be monitored.

Research: Although its distribution is fairly well-documented, more systematic surveys are required, as well as further ecological work.

SPECIES DATA

Identification: *B. gibbosus* is the largest member of the genus (maximum snout-vent length 80mm). It has a squat, rotund body with a short head and flat face. The eye is relatively small with a horizontal pupil, and the tympanum is hidden. The limbs are short and stumpy, and there is no webbing between the fingers and toes. The length of the inner toe is approximately equal to its width, while the length of the outer toe is greater than its width. On the palms of the hands, the tubercles are poorly developed and the basal subarticular tubercles are single.

The rough dorsal surface has irregular light and dark brown mottling. There is also usually either a broad cream band with deeply serrated dark edges, or two rows of cream patches running longitudinally over the dorsal surface. The rough ventral surface is creamy white with brown mottling.

The call is a burred, alto squawk, less than half a second in duration. This is repeated at short intervals of about one call per second (Passmore and Carruthers, 1979).

Distribution: *B. gibbosus* has a restricted distribution range in the Mediterranean region of the south-western Cape Province. In fact, up until 1948, the species was only known to occur on the Cape Peninsula where it has been recorded from (S = specimum record, A = auditory record): Cape Town (S) and the environs of Tamboerskloof (S), Oranjezicht (S), Signal Hill (S), Camps Bay (S), Kloof Nek (S), Newlands (S), Rondebosch (S), Claremont (S), Bishopscourt (S) and Kirstenbosch National Botanic Gardens (A) (all in 3318CD Kaapstad/Cape Town); and Little Lion's Head (S) near Hout Bay (3418AB Kaapse Skiereiland/Cape Peninsula). Besides the Cape Peninsula, the species has also been recorded from the following areas: Stellenbosch (S), and the immediate surroundings, including Devon Valley (A) and Koelenhof (A) (3318 DD Stellenbosch); Paarl (S) and Wellington (3318DB Paarl) (Viser, 1979a); Somerset West (S) (3418 BB Somerset West); Durbanville (A) (3318DC Bellville); Klipheuwel (A) (3318DA Philadelphia); Elandsberg Private Nature Reserve (A) near Hermon (3319AC Tulbagh); and Piketberg (S) (3218DC Moravia). The latter is the most northern locality for the species.

The range of the species does not appear to have reduced noticeably in size. This is despite obvious local habitat destruction and degradation due to extensive urban and agricultural developments, which must have reduced *B. gibbosus* numbers considerably in certain parts of its range.

Habitat and Ecology: *B. gibbosus* is a burrowing species which occurs in well-drained ground, especially in gently sloping areas situated along the foothills of mountains and on isolated low hills. It does not require standing water for breeding and cannot survive in permanently waterlogged or seasonally inundated habitats. It is also absent from the sandy areas of the Cape Flats and adjoining coastal regions. It shelters in burrows, usually under rocks, bushes or tree-stumps, and only emerges from these underground retreats during rainy periods.. The diet consists of both earthworms and insects and probably other invertebrate organisms. Further ecological studies are required.

Breeding: *B. gibbosus* starts calling with the onset of the first winter rains in about May. Thereafter the mating calls can be heard during rainy periods throughout the winter and spring until late in October approximately. The formation of mating pairs takes place on the surface of the ground and, while in amplexus, the frogs bury themselves backwards into the soil. The eggs are laid in special underground nests but these have only rarely been uncovered. Rose (1962) records a nest discovered 10 inches (254 mm) below the surface, in a cavity 5 inches (127 mm) across by 3 inches (77 mm) high. It contained an adult pair and about 30 eggs, but although most of the eggs had been fertilized they showed no signs of further development after being exposed. Metamorphosis takes place inside the egg capsules with the young emerging as fully formed froglets. A nest containing a pair and 19 young was unearthed in May by Gow (Wager, 1965). McLachlan (1978) records nests containing 13 and 22 young. The exact duration of metamorphosis is unknown.

CONSERVATION

Status: Although its distribution is restricted, *B. gibbosus* is a fairly adaptable species and, in fact, many of the distribution records have been obtained from suburban gardens and generally disturbed habitats. However, a fair amount of its habitat has nevertheless been destroyed by the extensive urban and agricultural developments which have taken place through most of its distribution range. Furthermore, *B. gibbosus* is a fossorial sedentary species which survives in colonies and does not congregate at water bodies for breeding. It is therefore relatively easy for a population to become fragmented into small isolated and less viable populations due to development and general habitat destruction. Further habitat disturbance within these populations can reduce or eliminate them without much hope of recolonisation. This applies particularly to apparently secure suburban garden populations. The species status needs to be monitored.

Threats: The species is threatened through most of its range by urban development and certain agricultural activities (eg. intensive ploughing).

Existing Conservation Measures: The species is given legal protection on Schedule 2 of the Cape Nature Conservation Ordinance of 1974. It has been recorded from the Elandsberg Private Nature Reserve near Hermon and probably occurs in a few other local nature reserves. This needs to be investigated further.

Breeding Potential in Captivity: Unknown, but probably poor.

Recommended conservation measures: Further studies on the distribution and ecological requirements of the species are necessary, and all known populations should be monitored. The occurrence of the species in nature reserves needs especially to be determined.

Remarks: Listed as vulnerable in the previous Red Data Book (McLachlan, 1978).

Specimen and Auditory Records: Location of specimen records; South African Museum, Cape Town; Transvaal Museum, Pretoria; Natal Museum, Pietermaritzburg; Port Elizabeth Museum; McGregor Museum, Kimberley; CDNEC CP, Jonkershoek Nature Conservation station, Stellenbosch. The latter also holds the auditory records.

BIBLIOGRAPHY

Identification: Passmore and Carruthers, 1979; Poynton, 1964.

Distribution: Poynton, 1964; Visser 1979a.

Breeding: McLachlan, 1978; Rose, 1962; Wager, 1965.

Account Prepared by: A. L. de Villiers, Chief Directorate of Nature and Environmental Conservation, Stellenbosch.

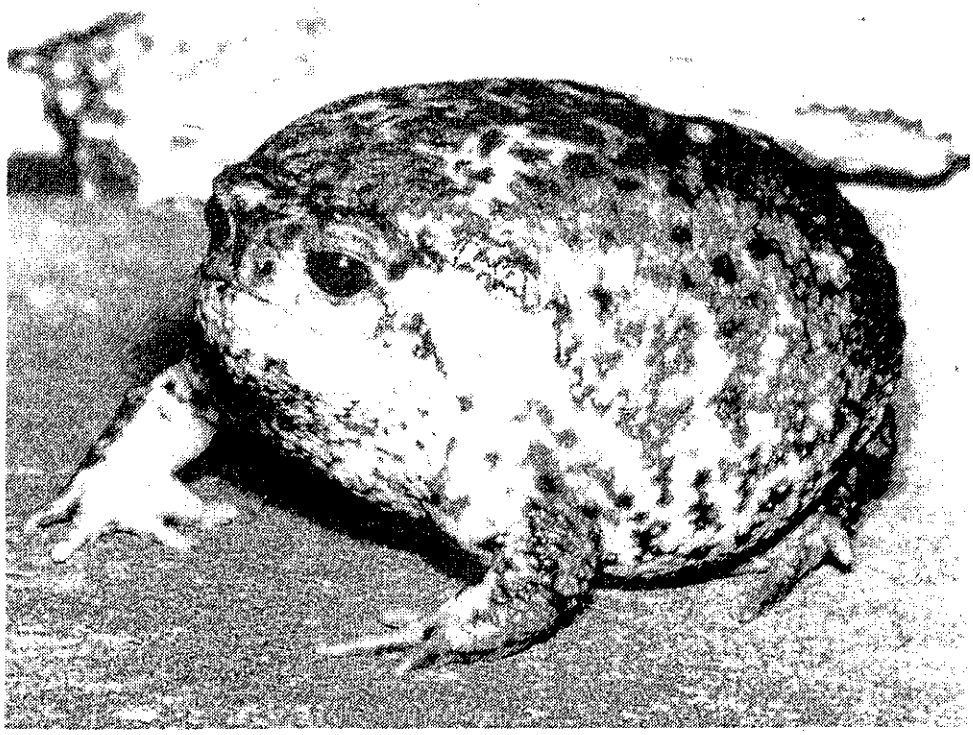
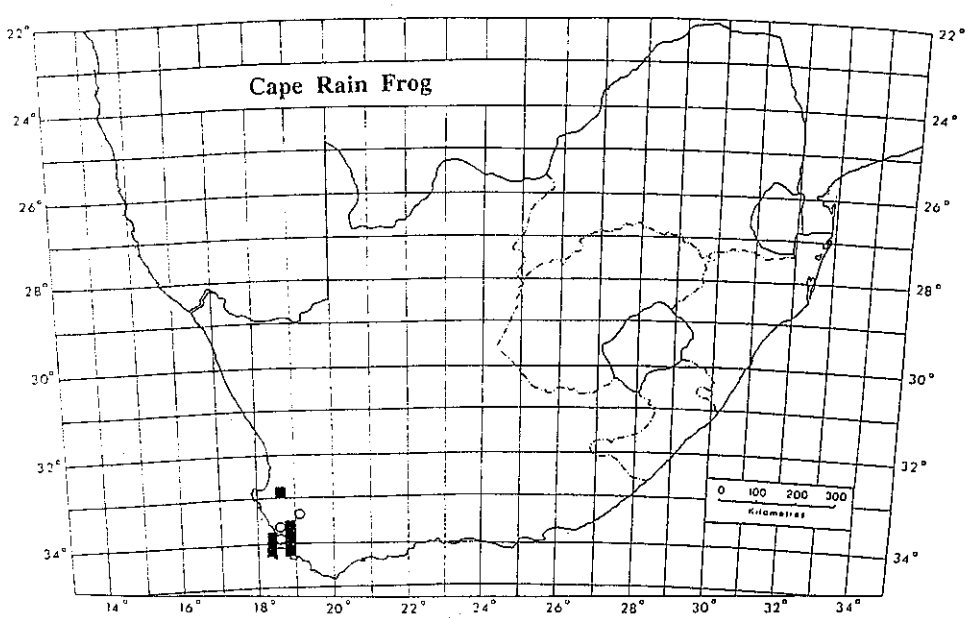


Fig. 12. Cape rain frog *(Breviceps gibbosus)* **Vulnerable.** (A. de Villiers)



Map. 10. Distribution of the Cape rain frog *(Breviceps gibbosus).*

■ Specimen records ○ Auditory records. No apparent decline in range

LOGGERHEAD SEA TURTLE **International status: VULNERABLE**
Karetseeskilpad **South African status: VULNERABLE**

Caretta caretta (Linnaeus, 1758). **Class:** Reptilia, **Suborder:** Cryptodira, **Family:** Cheloniidae.

Testudo caretta Linnaeus, 1758. *Systema Naturae.* Holmiae, ed.10 **1:** p197. **Type locality:** European waters.

SUMMARY
Status: Vulnerable. Only two known nesting grounds in region. South African nesting area intensively protected with numbers of nesting females showing upward trend. Malgache nesting population seriously threatened.

Research: Good in South Africa.

SPECIES DATA
Identification: A large sea turtle that locally may reach a maximum length of 1 m and attain a weight of 130 kg. The adult shell is an elongate heart-shape with smooth, non-overlapping shields. The hatchling carapace has three interrupted keels on the dorsal shields. Those on the costals become weaker with age, whilst the central keel on the vertebrals develops sharp spines (until the carapace length reaches 30 cm). With maturity the keels flatten, although they may still be visible as interrupted bumps at a straight carapace lengthof 65 cm. The posterior margin of the carapace is markedly serrate in sub-adults, less so in mature animals. There are 13 marginal shields on each side (including the divided supracaudal) and five pairs of costals. The bridge has three pairs of inframarginals that lack pores.

The snout is relatively short and the upper jaw is smooth and only slightly hooked. On the head two pairs of prefrontal shields occur between the beak and the top of the head. Both fore- and hindlimbs have two claws, the outermost of which become recessed and gradually reduce in size and are barely visible at maturity. The tail is short in juveniles and remains so in females; males develop a longer tail.

The shell is usually orange-brown to red-brown in adults and juveniles.

Distribution: Right along the coast of South East Africa and around all the coast of Madagascar. Very rare an adult in island groups such as the Mascarenes.

Habitat and Ecology: Inhabits off-shore benthic reefs, capable of deep dives, feeds mainly on benthic molluscs such as *Ficus spp.*, *Bufonaria spp.* and littoral bivalves such as *Perna spp.* Are opportunistic feeders and will eat many different species of pleustonic fauna eg. *Physalia*, *Janthina spp.* etc. Females come ashore only to nest, males never.

Breeding: Lays up to 700 eggs per season, can lay in up to eight separate seasons, rarely lays in consecutive years, quite commonly after two or three year intervals. Record internesting interval 16 years. Total egg production could reach 5000 plus eggs in lifetime. An active migrant capable of travelling 40km for 66 days, a total of 2640km in a single swim.

Remarks: There are no taxonomic difficulties with the loggerhead in South Africa. Differs only in being slightly smaller than the Atlantic population. Deraniyagala's (1939) description of an Indian Ocean subspecies *C. c. gigas* was rejected by Hughes (1974). This species appears to be active throughout the year in this area, with no known cases of hibernation.

CONSERVATION
Status: Widespread in littoral waters. Recorded by Andrew Smith in 1849 from Table Bay. Remains a frequent visitor to Cape waters. Nesting range diminished to its most restricted in South Africa in the fifties with nesting only found in Zululand. Numbers of nesting females averaged about 200 females per year. Since protection started in 1963 numbers have risen to be as high as 423 in 1983/84 and nesting has been recorded at many sites down coast as far as Wilderness. The Malgache population is seriously threatened.

Threats: None in South Africa, domestic exploitation in Madagascar and Mozambique. Lack of enforcement of good laws is the main problem.

Existing Conservation Measures: Intense protection in South Africa under Natal Ordinance

No. 15 of 1974. Natal Parks Board exercises strict protection of nesting grounds with assistance from KwaZulu Bureau of Natural Resources. Nesting grounds fall within the Maputaland Marine Reserve. The species is listed as vulnerable in the International Red Data Book (Groombridge, 1982), and is also listed on Appendix 1 of CITES.

Breeding Potential in Captivity: Possible, but not currently necessary.

Recommended Conservation Measures: No further measures are required in South Africa. Stricter enforcement of laws is required in Mozambique and Madagascar.

Remarks: In South Africa the trend is very positive, with an increasing nesting population. The number of remigrants from previous seasons is stable at 30-40% of any annual nesting cohort (thus 60-70% of any cohort are neophytes). Listed as Vulnerable in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Deraniyagala, 1939; Hughes, 1974; Linnaeus, 1758; Loveridge and Williams, 1957.

Conservation: Hughes, 1982.

Account prepared by: G.R. Hughes, Natal Parks Board.

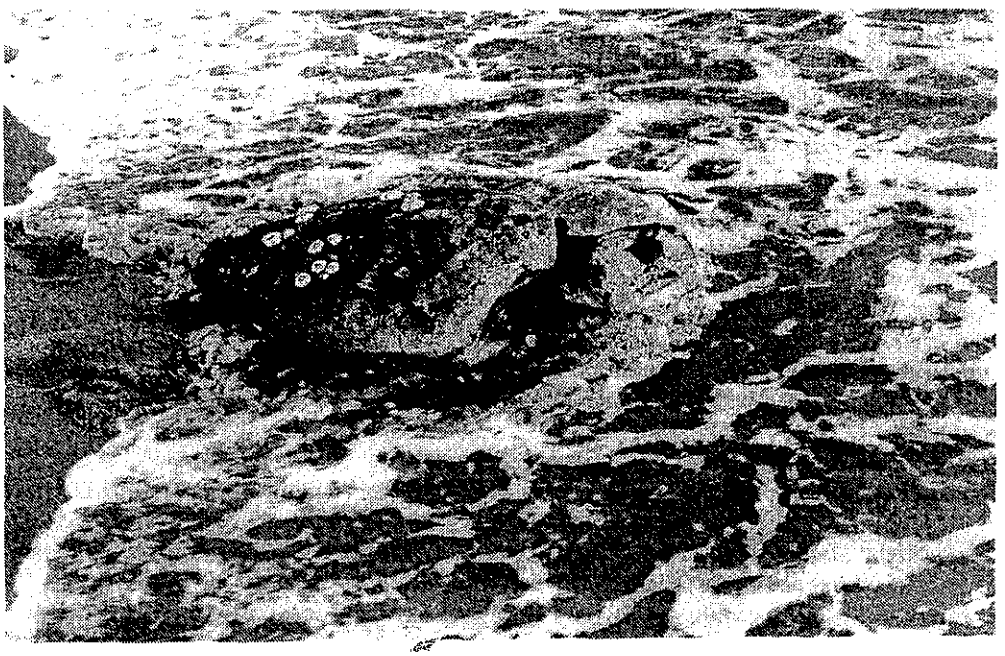
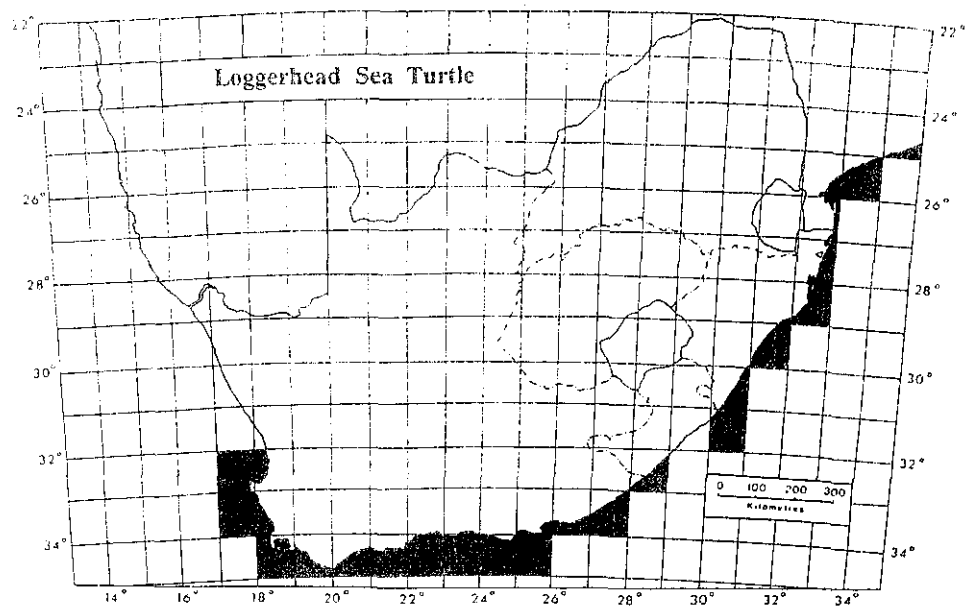
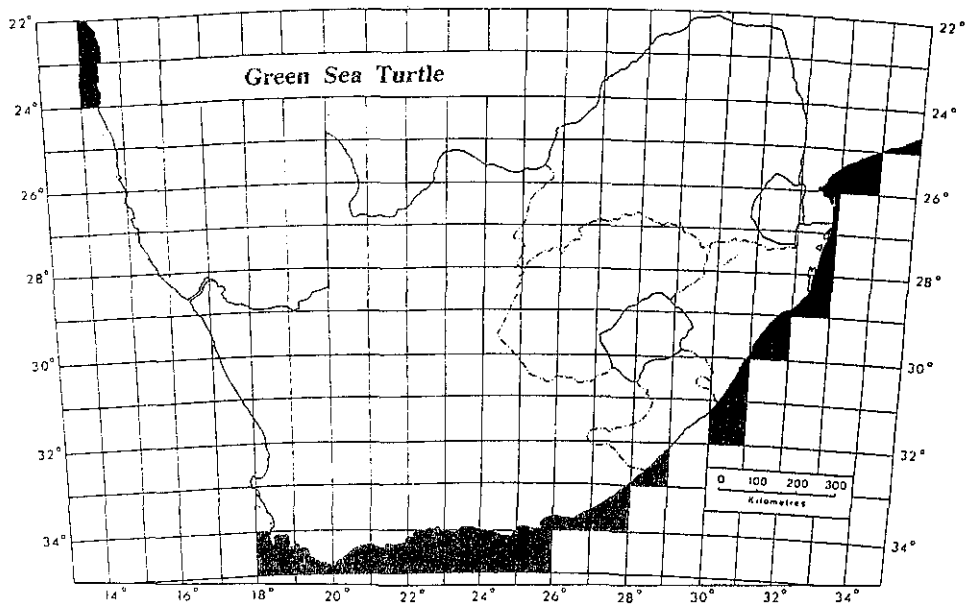


Fig. 13 Loggerhead sea turtle *(Caretta caretta)* **Vulnerable.** (G. Hughes)



Map. 11. Distribution of the loggerhead sea turtle *(Caretta caretta).*



Map. 12. Distribution of the green sea turtle *(Chelonia mydas).*

GREEN SEA TURTLE
Groenseeskilpad

International status: ENDANGERED
South African status: VULNERABLE

Chelonia mydas (Linnaeus, 1758), **Class:** Reptilia, **Suborder:** Cryptodira, **Family:** Cheloniidae.

Testudo mydas Linnaeus 1758. *Systema Natutae.* Holmiae ed.10, 1: p197. **Type locality:** Ascension Island.

SUMMARY
Status: Vulnerable. There are limited numbers of nesting areas in the region but most are well protected and have large populations.

Research: Good. Major nesting areas receiving detailed attention. More work is required in Madagascar and Mozambique.

SPECIES DATA
Identification: A large sea turtle that in South Africa may reach a length of 1,3 m and attain a weight of 230 kg. The shell is subcircular to heart-shaped, with a serrated posterior margin (less so with increasing size). The dorsal shields are smooth and do not overlap, with normally five vertebrals and four costals (4th the smallest). There are 12 marginals (with the divided supracaudal). The bridge has four inframarginals that lack pores.

The snout is short and the beak is not hooked, lacks cusps, and the horny sheath of the jaw has serrated edges. There is a single pair of elongate prefrontals between the beak and the top of the head. The fore- and hindlimbs of adults have a single claw, although two are present in hatchlings. The tail is longer in mature males.

The carapace colour of juveniles is highly variable; initially it is dark grey, with all underparts white with the exception of the flippers. Thereafter coloration is variable, including the following phases:

1. Pale red/brown, streaked with dark brown and yellow, all radiating from the medio-posterior of the shields. This is the most common colour pattern up to 50cm carapace length.
2. Dark brown heavily blotched and streaked with pale brown, yellow, gold and red/brown; rarer than phase 1.
3. Rich red/brown, medio-posterior of shields with pale brown concentration surrounded by rich red/brown with radiating streaks of dark brown gold and yellow; a rare phase.

The plastron of adults is dirty white to yellow, with the limbs greenish olive below.

Frazier (1971) found significant sexual dichromism in the Aldabra Island population; "females are richly pigmented with brown" and "males are more spotted". The latter has been supported in studies on all other major nesting grounds.

Distribution: Widely distributed throughout littoral areas of south-western Indian Ocean. Areas of optimum numbers are the west coast of Madagascar and the inshore waters of central and northern Mozambique. Strays sometimes penetrates as far as Table Bay. Commonly seen feeding offshore in Zululand and Natal.

Habitat and Ecology: Prefers warm shallow littoral areas rich in marine angiosperms such as *Cymodocea ciliata* and *Halodule uninervis*, and algae such as *Gelidium*, *Caulerpa*, etc. As far as is known active year round on these feeding grounds. No hibernation has been recorded in Southern African waters.

Breeding: Lays up to 152 eggs per clutch several times in a nesting season. Insufficient data are available for ascertaining maximum number of eggs laid per nesting season but elsewhere up to 1 400 eggs have been laid by one female in a season. Major breeding grounds are Europa Island (between 10 000 and 18 000 females/season), Tromelin (2 000 - 5 000 females/season), and the Comores (Moheli, 2 000 females/season). Females never nest in successive years, inter-season intervals are known to be four years for a few females on Europa. Reproductive lifetime unknown.

CONSERVATION
Status: Widespread. Recorded in Table Bay by Smith in 1859 and still occurs not infrequently in Cape waters. Widely exploited in south-western Indian Ocean in part and extirpated from Reunion, Mauritius and Rodriguez. Exploitation remains serious in Madagascar, Mozambique and the Comores.

Nesting populations remain substantial; Europa Island average 14 000 females per year most of

which can be regarded as new every year. Suffice to say there are probably well in excess of 100 000 adult green turtles in the south-western Indian Ocean.

Threats: Domestically exploited by local people in Mozambique, Madagascar, the Comores and Mauritius. No commercial exploitation poses a proven threat at present, although the St. Brandon population is still a matter for concern.

Existing Conservation Measures: Totally protected in South Africa and Reunion (and its dependant islands which are all declared nature reserves.) Protected by law in Mozambique, Madagascar and Mauritius but enforcement difficult.

Breeding Potential in Captivity: Successful breeding and rearing in captivity has been achieved in the Cayman Islands (Mrosovsky, 1983), but this is very expensive.

Recommended Conservation Measures: The green turtle is well-protected locally. Further protection to the south-western Indian Ocean population would be achieved if Madagascar, Mozambique, the Comores and Mauritius could enforce more effectively their adequate legislation. More direct action in the Comores is required; two marine reserves, one on Mayotte and the other on Moheli, are desirable.

Remarks: Populations in the well protected breeding grounds of Europa, Tromelin and the Glorious Islands are healthy and there are signs of improvements, with green turtle nesting having been recorded on Reunion Island in 1984. Not listed in previous Red Dat Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Hughes, 1974; Linnaeus, 1758; Loveridge and Williams, 1957.

Conservation: Frazier, 1985; Hughes, 1974, 1982.

Account prepared by: G. R. Hughes, Natal Parks Board.

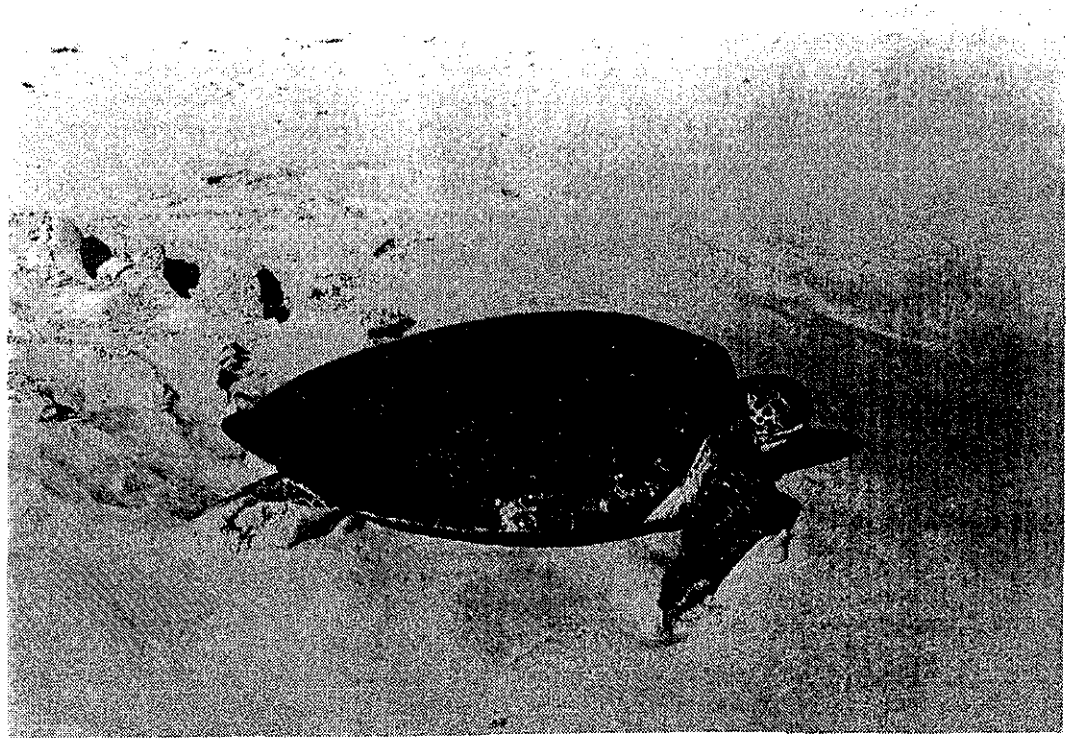


Fig. 14. Green sea turtle *(Chelonia mydas)* **Vulnerable.** (G. Hughes)

HAWKSBILL SEA TURTLE
Valkbekseeskilpad

International status: ENDANGERED
South African status: VULNERABLE

Eretmochelys imbricata (Linnaeus, 1766). **Class:** Reptilia, **Suborder:** Cryptodira, **Family:** Cheloniidae.

Testudo imbricata C. Linnaeus, 1766. *Systema Naturae.* Halae Magdeburgicae, ed. 12 1: 350.
Type locality: American and Asiatic seas.

SUMMARY
Status: Vulnerable. Widespread throughout all island waters both mainland and coastal. Nowhere adequately protected and vulnerable to exploitation for tortoiseshell.

Research: Poor in region. More surveys required to identify nesting grounds for protection. Does not nest along South African coastline.

SPECIES DATA
Identification: A medium-sized sea turtle that rarely attains a length of 1 m (or even 80 cm in South African waters) or a weight of 135 kg. The adult shell is elongate and narrowly heart-shaped, with smooth, characteristically over-lapping shields. Hatchlings have smooth shells with three interrupted keels. The posterior margin is also strongly serrated. There are usually five vertebrals, four costals (4th smallest), and 12-13 marginals on each side (including the divided supracaudal). The plastron is rounded and has two prominent lateral keels. The bridge normally has four pairs (occasionally three) of inframarginals that lack pores.

The snout is elongate and compressed with a hawk-like beak, that lacks cusps and has smooth edges. The two pairs of prefrontals, between the beak and top of the head, are not elongate. Both fore- and hindlimbs have two claws and the tail is short in females, longer in males.

Juvenile coloration is highly variable being either, more commonly, dark brown with the carapace flecked, streaked and blotched with gold and pale brown, or with the predominant colour being golden yellow with flecks and streaks of various shades of brown. The plastron is normally pale red/brown with pale patches. The head and limbs are dark-brown with all scales clearly outlined in white or creamy yellow. The carapace colouring of sub-adults and adults is mainly darker in tone, some almost black with yellow blotches. The plastron is almost uniform red/brown; the head and limbs are very dark brown, verging on black, with the scales outlined in pale brown or very dark yellow.

Distribution: Occurs in all coastal waters both mainland and island.

Habitat and Ecology: Frequents rocky outcrops and coral reefs, feeds exclusively on sponges throughout the world (Meylan, 1984). It may occasionally eat toxic sponges and become dangerous to eat (Limpus, 1987).

Breeding: There is very little data from the south-eastern African region. It is known to lay up to 200 eggs per clutch in other areas, and to be capable of laying several clutches per season. Nesting occurs on many offshore islands and in north-eastern Madagascar, but fuller details are lacking.

Remarks: There are no taxonomic problems with the hawksbill. It appears worldwide in distribution. Never known to nest in South Africa, it has always been relatively uncommon.

CONSERVATION
Status: Although widespread little is known of population numbers. The species was severely exploited in the last, and early part of this, century in Mozambique, the Indian Ocean islands and especially Madagascar (Hughes, 1973). Due to the high price of tortoiseshell it is still in demand and hundreds of juveniles are killed, stuffed and polished for sale to the tourist trade. No regional estimates of numbers are available.

Threats: There is continued exploitation of adults for tortoiseshell and juveniles for the tourist trade, but not in South Africa.

Existing Conservation Measures: Adequate laws for the protection of this species exist in all countries of the region. However, law enforcement, apart from Réunion and South Africa, requires much improvement.

Breeding Potential in Captivity: Good but expensive.

Recommended Conservation Measures: There is a need for increased law enforcement in the Indian

Ocean area and Mocambique. If a nesting concentration of sufficient density is discovered locally, this should be declared a marine reserve.

Remarks: This is probably the only potentially endangered sea turtle in the South African region and will remain so until full control over international trade in tortoiseshell is exercised, or the purchasing countries accept tortoiseshell from farmed green turtles as a substitute. The farmed green turtle tortoiseshell is of excellent quality, very thick and beautifully coloured. Not listed in previous Red Data book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Hughes, 1974; Linnaeus, 1766.

Habitat and Ecology: Limpus, 1987.

Conservation: Hughes, 1982, 1983; Meylan, 1984.

Account prepared by: G.R. Hughes, Natal Parks Board.

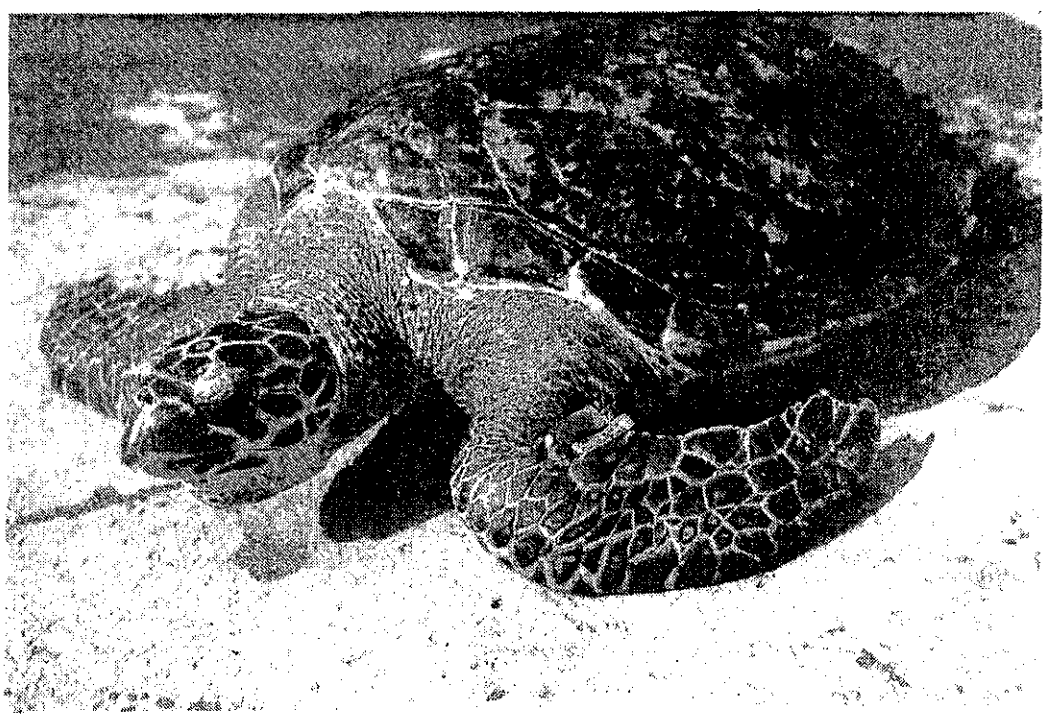
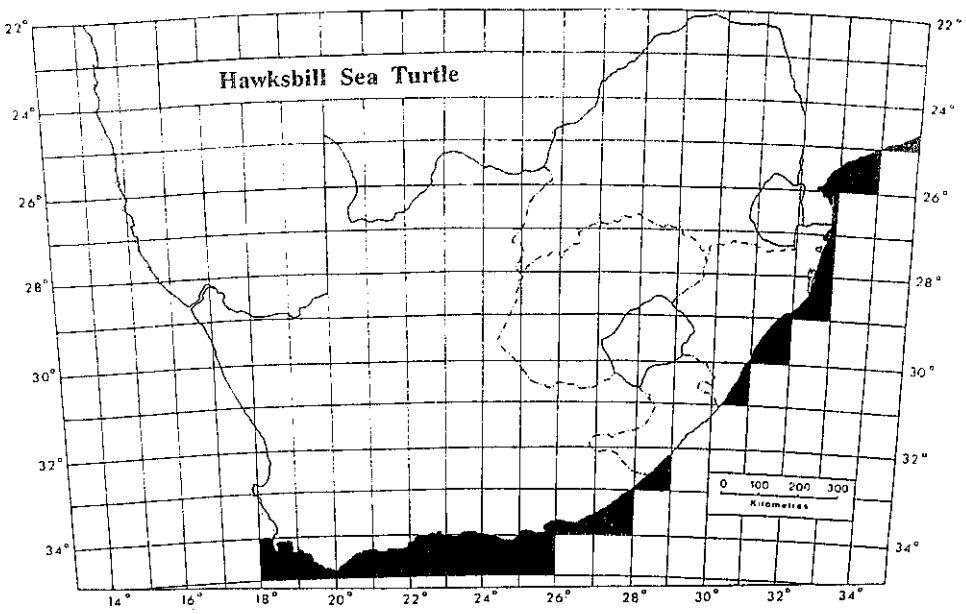
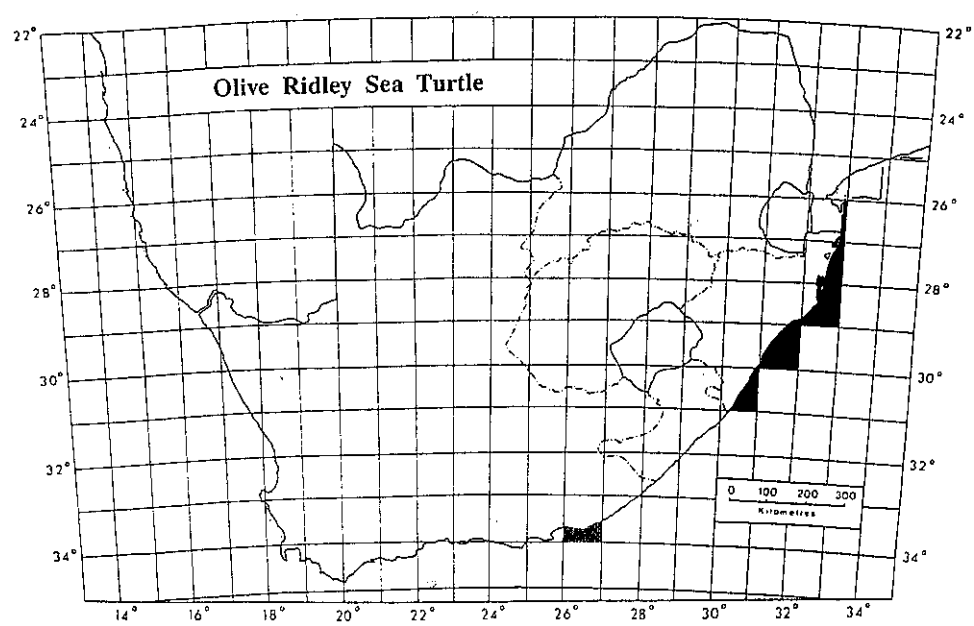


Fig. 15. Hawksbill sea turtle *(Eretmochelys imbricata)* **Vulnerable.** (G. Hughes)



Map. 13. Distribution of the hawksbill sea turtle *(Eretmochelys imbricata).*



Map. 14. Distribution of the olive ridley sea turtle *(Lepidochelys olivacea).*

OLIVE RIDLEY SEA TURTLE
Olyfkleurige Ridley-seeskilpad

International status: ENDANGERED
South African status: VULNERABLE

Lepidochelys olivacea (Eschscholtz, 1829). **Class:** Reptilia, **Suborder:** Cryptodira, Family: Cheloniidae.

Chelonia olivacea Eschscholtz, 1829. *Zoological Atlas*: 3, pl.iii. **Type locality:** Manila Bay, Philippine Islands, China Sea.

SUMMARY
Status: Vulnerable. Common in the northern Mozambique Channel. A not infrequent visitor to South African waters, but only a sporadic breeder in South Africa.

Research: Poor. More detailed surveys are required to find nesting concentrations of olive ridley turtles in Mozambique and Madagascar.

SPECIES DATA
Identification: A small sea turtle that rarely reaches 80 cm in length or exceeds 50 kg in weight. The shell is broad and heart-shaped and as broad, or broader than long. Hatchlings have three interrupted strong keels, the vertebral keel being the most pronounced, and this persists until at least a carapace length of 29 cm. The posterior margin is slightly serrate in juvenile specimens, becoming smooth with age. The dorsal shields are smooth and non-overlapping in adults. There are five vertebrals and from six to nine pairs of costals, the first being the smallest; 13-14 marginals occur on each side, including the divided supracaudal.

The snout is relatively short and not compressed, whilst the beak is scarcely or only slightly hooked. There are two pairs of prefrontals between the beak and the top of the head. The fore- and hindlimbs each bear two claws, and the tail is short in hatchlings and juveniles, longer in adult males. The plastron is anteriorly rounded with two distinct keels that persist until a carapace length of at least 29 cm. The bridge has four, occasionally three, inframarginals per side, all with pores.

The colour above is a uniform olive grey-green in mature animals, whilst juveniles are far darker, especially along the shield margins. Juveniles below are dark brown, whereas adults are whiteish.

Distribution: Pan tropical, penetrating down east Coast of Africa as far as the Cape. Areas of high concentration in the relatively shallow, lower salinity waters off northern Mozambique and north-western Madagascar.

Habitat and Ecology: Prefers waters rich in crustacea such as prawns and swimming crabs as are found off north-east Mozambique and north-west Madagascar. Can dive to great depths for a sea turtle; record depth 100m.

Breeding: Only a single nest has been described from the region. They are capable of laying 105-116 eggs per clutch, and may lay up to three times in a season. Remigration intervals can be two or three years.

Remarks: No taxonomic problems with olive ridley turtles. No differences between southern African specimens and those from the Atlantic and Pacific Oceans. Subspecies in olive ridley turtles were discussed by Deraniyagala (1943).

CONSERVATION
Status: Widespread; an infrequent but not uncommon visitor to South African waters. No major breeding grounds have been described in the region but they are common off west coast of Madagascar.

Threats: Domestic exploitation for local meat consumption occurs in west Madagascar and northern Mozambique. In these areas they are often caught accidentally in prawn trawls. No other uses are apparent, nor is there any commercialisation of this species.

Existing Conservation Measures: Legal protection is very good in all countries in the region. However, the low level of enforcement of these laws requires improvement in some regions; notably Madagascar and Mozambique.

Breeding Potential in Captivity: This appears possible as captive ridleys have bred on the turtle farm in the Cayman Islands. However it is currently unnecessary in the region.

Recommended Conservation Measures: Enforce legislation, establish marine reserves where viable

populations of olive ridleys are found to nest. All countries should enforce the use of prawn trawl nets fitted with the Turtle Excluder Device (TED) designed by the National Marine Fisheries Service of the United States (Anon., 1982).

Remarks: There are no indications of population changes in the region. Records are becoming more frequent in South Africa but this may be simply a result of improved interest and identification keys. Listed as rare (peripheral) in previous Red Data Book (McLachlan , 1978).

BIBLIOGRAPHY

Taxonomy: Deraniyagala, 1943; Hughes, 1972; Loveridge and Williams, 1957.

Conservation: Hughes, 1982.

Account prepared by: G.R. Hughes, Natal Parks Board.

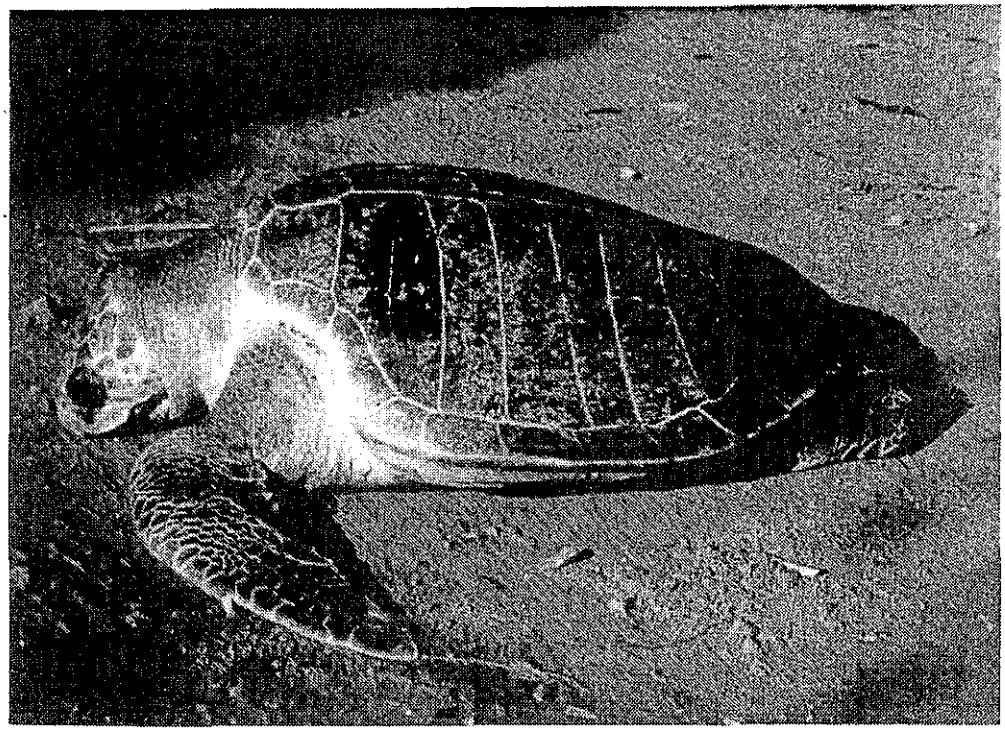


Fig. 16. Olive ridley sea turtle *(Lepidochelys olivacea)* **Vulnerable.** (G. Hughes)

LEATHERBACK SEA TURTLE
Leerrug-seeskilpad

International status: ENDANGERED
South African status: VULNERABLE

Dermochelys coriacea (Linnaeus 1766). Class: Reptilia, Suborder: Cryptodira, Family: Dermochelyidae

Testudo coriacea Linnaeus, 1766. *Systema Naturae*. Halae Magdeburgicae ed. 12 1: 350.
Type locality: Mediterranean Sea.

SUMMARY
Status: Vulnerable. A widespread, pelagic species found throughout the oceans of the region. The only known nesting beaches in the southern Indian Ocean are in Maputaland, South Africa. The population is increasing.

Research: The populations nesting in the Maputaland area are well-studied, but the species is poorly known away from these beaches.

SPECIES DATA
Identification: A very large sea turtle that in South Africa may exceptionally reach 2 m and 646 kg. The heavy carapace is narrower than long, heart-shaped and deeply indented anteriorly and posteriorly prolonged into a caudal point. There are seven clearly defined ridges (made of raised polygonal plates) on the back and five more on the belly. The shell of hatchlings and juveniles is finely beaded with small polygonal scales, whilst adults lack defined scales as the leather-like skin of the carapace is stretched over the sharply defined ridges.

The snout is elongate in hatchlings (and exaggerated by the eggtooth), blunter in adults. The beak is deeply notched in the middle and the jaw has a denticulate edge. The prefrontals, between the beak and the top of the head, are broken up into six small shields. The forelimbs are very long and wing-like and, like the hindlimbs, are clawless. The tail just projects beyond the tip of the carapace and has a sharp dorsal ridge.

The adult colour is normally black or dark brown on the upper surfaces, sparsely or densely spotted in pale blue rosettes. The underside is mottled white and pink.

Distribution: A circumglobal species that is pelagic and common around the coast of South Africa, although less commonly encountered near areas with fringing coral reefs. Penetrates into cold waters, with several records known from the Benguela Current area of the west coast.

Habitat and Ecology: Pelagic, living in the open oceans and feeding primarily on jellfish.

Breeding: Nesting season October to February; lays an average of 104 yolked eggs per clutch, capable of laying over 1 000 eggs per season. Females have never been recorded as nesting in consecutive seasons. Those that have re-nested have done so after intervals of two to five years, with shifts in inter-nesting remigration periods. There is only one main breeding ground in the region; the Maputaland coast of South Africa (with a small intrusion into Mozambique). Individuals may undertake extensive migrations to reach the breeding grounds, but the best recovery distance from South Africa was only 1000km. The known reproductive lifetime can be as much as 11 years. The success of the protected nesting beaches in Maputaland may be related to two recent reports of successful nesting by isolated leatherbacks on Eastern Cape beaches (Mullins, 1984; Branch *pers. comm.*).

Remarks: Only one species is recognized world wide. Problems relating to the type specimen are discussed by Bour and Dubois (1983) and Fretey and Bour (1980).

CONSERVATION
Status: Found throughout area in apparently increasing numbers. Provided protection continues in Maputaland its status is likely to improve further. Over 100 females (the most ever) have been handled in 1986/87 season, up from 5 females in 1966/67.

Threats: Occasionally taken in fishing nets at sea and shark nets along Natal coast. All catches incidental and of negligible impact.

Existing Conservation Measures: Fully protected in all countries in the region but enforcement requires improvement in all countries except South Africa. Intensively protected on nesting beaches in Natal.

Breeding Potential in Captivity: *Unlikely to be* feasible, due to the specialised food habits of adults and hatchlings.

Recommended Conservation Measures:
Continued protection in Natal. More detailed surveys in Mozambique to identify densest breeding ground (if any) for declaration as a reserve.

Remarks: The nesting population in Natal is small by world standards but hosts the oldest leatherback study programme in the world. There are no active threats to this population. Listed as endangered in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Bour and Dubois, 1983; Fretey and Bour, 1980; Hughes, 1974; Linnaeus, 1766; Mullins, 1984; Rhodin and Smith, 1982.

Conservation: Hughes, 1982.

Account prepared by: G.R. Hughes, Natal Parks Board.

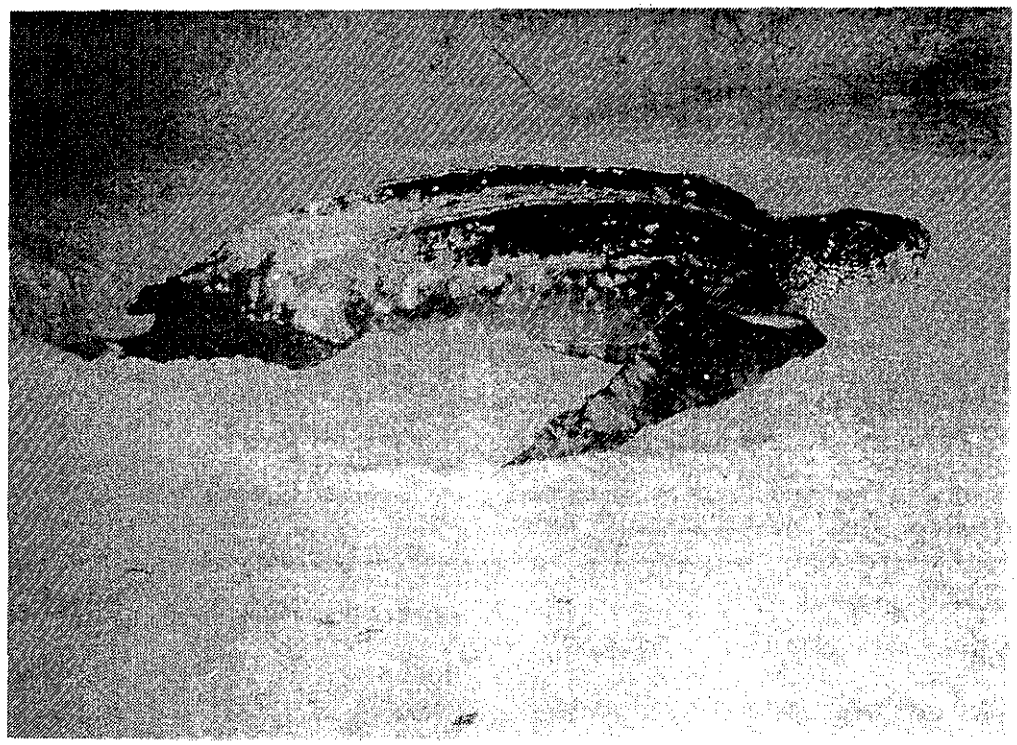
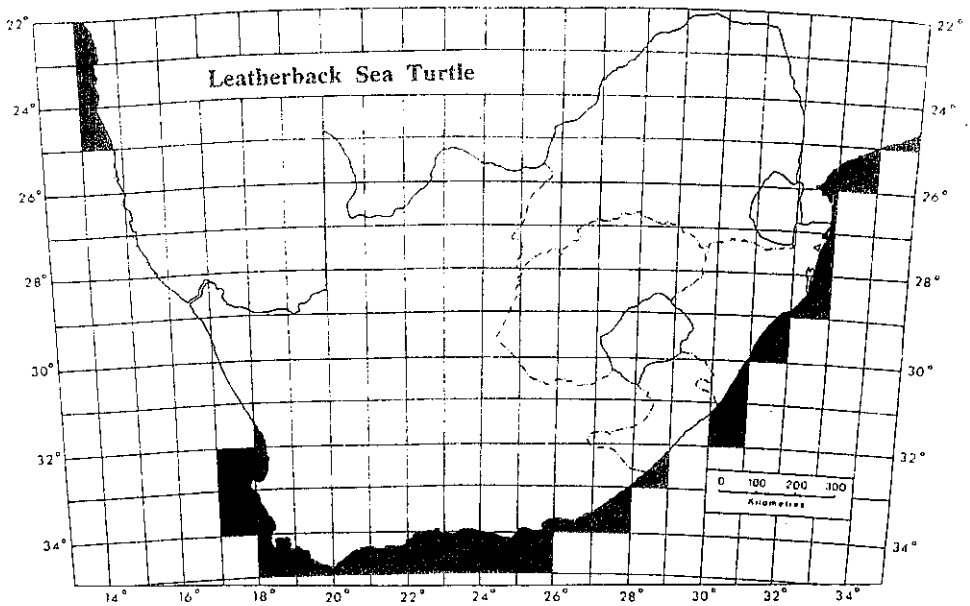
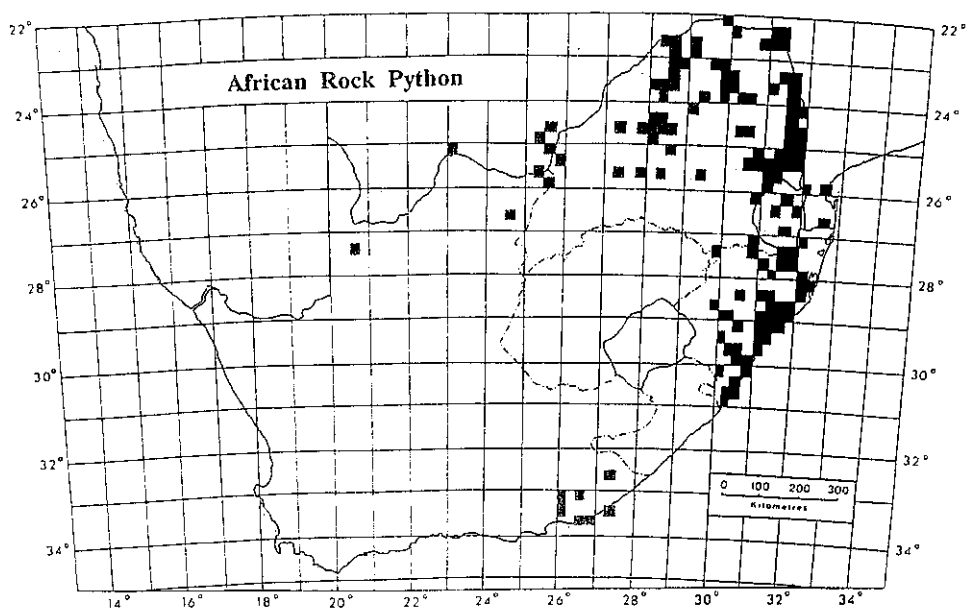


Fig. 17. Leatherback sea turtle *(Dermochelys coriacea)* **Vulnerable.** (G. Hughes)



Map. 15. Distribution of the leatherback sea turtle *(Dermochelys coriacea).*



Map. 16. Distribution of the African rock python *(Python sebae natalensis).*

AFRICAN ROCK PYTHON
Afrika rotsluislang

International status: NOT LISTED
South African status: VULNERABLE

Python sebae natalensis A. Smith 1840. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Boidae.

Python natalensis A. Smith, 1840. *Illustrations of the Zoology of South Africa...Reptilia.* London: Smith, Elder & Co. Pl. ix. **Type Locality:** "Port Natal" = Durban, Natal, South Africa.

SUMMARY
Status: Vulnerable. A large snake, that is presently well-established in preserved areas, but which, due to its great size, is easily exterminated (eg. in the Eastern Cape and municipal Durban). Threats include collecting for food, skin, 'muti' and the pet trade, and destruction due to its perceived danger to man and his livestock. Habitat destruction (eg. massive land clearance for sugar cane farming in Natal) may cause local extinction.

Research: Poor; the species taxonomy and distribution are well known, but knowledge of its biology remain restricted to anecdotal observations. A detailed ecological study of this immense snake is urgently required. A simple radio-tracking study of a few adults would give invaluable insight into their activity patterns, home-range, etc.

SPECIES DATA
Identification: The largest African snake (locally to 6 m, but reported to 9,8 m from the Ivory Coast; Branch, 1984). The python has a thick-set body with a triangular head, distinct neck and thick, prehensile tail. It can also be distinguished by:

1. Its fine body scalation (78-95 rows at mid-body);
2. fragmented, but symmetrical scales on the top of the head;
3. the presence of heat-sensitive pits on the first two upper labials and first 4-6 lower labials;
4. the vestiges of hind limbs, that are visible as claw-like spurs on either side of the vent;
5. and its great size.

Coloration is variable; the ground colour is usually a light brown to greyish olive-brown, with dark-brown, dark-edged irregular crossbars or transverse blotches, that may fuse to form a ladder-like pattern; the flanks are finely spotted with black with a series of large, irregualr, dark (often pale-centred) blotches; the belly is white, usually speckled with dark brown to black. The crown of the head has a characteristic dark-brown spearhead shape, bordered on the sides with pale brown; a pair of white stripes radiate on each side from the eye to the upper lip. Juveniles and freshly sloughed snakes are more brightly coloured, with a metalic irridescence.

Distribution: The African rock python is distributed throughout much of sub-Saharan Africa, extending along the Nile valley into Eygpt. Within the subcontinent it is restricted to the north, and is absent from most of the Cape Province, the Orange Free State, and the highveld regions of the Transvaal. It has been exterminated within historical times from the Eastern Cape. Stow (1905) and Hewitt (1937) discuss its presence in the region, and the latter notes that it was a rarity in the region - "as was always the case in historic times." The last documented specimen (5,3m) was killed on the farm Grassmere in the Bathurst District in 1927. The distribution map of Broadley (1983) records no pythons from the Transkei, although Hewitt (1937) mentions a specimen from "a forest near Umtata". Haacke (1984) records a recent specimen killed on "a farm south of Twee Rivieren" in the northern Cape, whilst at least seven large adults captured in the northern Cape (eg, between Barkley West and Kuruman, and Vryburg District) have been released in the Eastern Cape (Burdett *pers. comm.*). The recent capture of pythons in the northern Cape may reflect an expansion of the species' range, although it is more likely to indicate better collecting in the region. Alexander (1987) discusses the local extinction of the python from municipal Durban.

Habitat and Ecology: Pythons live in a wide variety of habitats, but are most common in moist, rocky, well-wooded valleys. They are frequently found in and around water, in which they bask and ambush food. They are also excellent climbers. They hunt mainly at night or in the twilight, but can also be found basking, and occasionally even hunting during the day.

The diet of juveniles consists mainly of small rodents and ground living birds, although they will also take fish and leguaans. The adults feed mainly on

medium-sized mammals, including dassies, hares, cane rats, duikers, etc. The larger specimens will take larger mammals, and there are accurate, and often graphically illustrated, reports of African pythons killing and swallowing very large prey items. The largest recorded prey item for any large constrictor is that of a 59 kg impala swallowed by a 4,88 m African python (Rose, 1955). Other records include, among many others, a 6 m python consuming 6 goats (Taylor, 1981), a 5 m python that ate a pointer watchdog and two of her puppies (Jensen, 1980), and a 4,28 m python devouring a six-month old female impala (illustrated in Branch, 1984). F. W. FitzSimons (1930) even records pythons killing leopards, and a python constricting a crocodile is illustrated in Halliday and Adler (1986).

The python is the only African snake large enough to consider humans edible, albeit very rarely. There are a number of anecdotal reports of human predation by pythons. Loveridge (1931) reported the death of an African women, possibly weakened by recent childbirth, found in the coils of a 4,5 m python on Ukerewe Island in Lake Victoria. Other reports have occurred in newspaper reports (see Branch, 1984). A well-documented case involved a 13 year-old Tswana herd-boy (1,3 m tall and 45 kg) that was killed in the Northern Transvaal (Branch and Haacke, 1980). Another possible incident involving an adult is discussed and illustrated in Haacke (1981). In addition to the dangers of constriction, pythons have a mouthful of large, recurved and needle-sharp teeth, that can deliver a powerful and lacerating bite. Adults are also irrasible, and rarely settle well into captivity.

Man is now the python's main predator, killing them for food, 'muti', skins and, short-sightedly, to rid himself of a 'pest'. Other enemies include crocodiles, ratels, mongoose and meeerkats, etc. Pienaar, *et al.* (1983) record a young python (825 mm) in the stomach of a Cape file snake. Pythons are often killed crossing roads, and when engorged with food they are especially vulnerable to attacks by packs of wild dogs and hyaenas.

Breeding: Pythons are prolific breeders, laying from 20-100 large eggs (see reviews in Branch and Erasmus, 1983; Ross, 1978). As in all snakes the number of eggs laid is directly related to the size of the female, and a female of average size (3-4 m) usually lays 30-40 eggs. Oval and soft-shelled, they measure about 100 mm diameter and weight 120-160 g. The female protects the egg mass by curling around it, but unlike the Indian python (*Python molurus*) does not become a facultative endotherm (Vinegar, *et al.*, 1970). The incubation temperature of the eggs varies with the environment. Depending upon this, development may take from 60 (30-32°C) to over 100 (25-27°C) days. The eggs may be laid in a disused termite nest or antbear hole, rock crack, hollow tree, or even haystack. The female stays with the eggs during the whole incubation period, and although she may drink, she rarely feeds. The young measure 450-550 mm and disperse and fend for themselves soon after hatching. An unusual series of photographs of three pythons in procession was taken in the Kruger National Park (illustrated in Broadley, 1961). They may depict two males trailing a female prior to mating; they are certainly not "Mama, Junior and Papa python out for a stroll together.", despite the inane editorial caption ! Females are sexually mature at 2,5 m, which can be achieved in 3-4 years in captivity, but probably takes longer in the wild. Reproduction in captivity can exceptionally take place each season, but in the wild, where food is scarcer, it probably occurs bi-annually, possibly at even longer intervals. Males can be distinguished from females by the larger spurs on either side of the vent and thicker tail base.

Remarks: Broadley (1984) has recently recognised a southern race of the African python (*P. s. natalensis*) that is distinguished from the typical race of west and central Africa by its more fragmented head shields and less contrasted head markings, particularly those on the side of the head. The recently described lesser African rock python (*P. saxuloides* Miller and Smith, 1979), which was suggested to occur in southern Africa, appears to be a synonym of *P. s. natalensis*.

CONSERVATION

Status: The python is still widely distributed in the northern regions of South Africa, but there is evidence of its decline in certain regions (eg. the Eastern Cape and municipal Durban). It is common in many preserved areas, including the Kruger National Park (Pienaar *et al.*, 1983) and Nylsvley Nature Reserve (Jacobsen, 1982) in the Transvaal, and the Lake Sibaya (Bruton, 1979), Ndumu and Mkuzi Game Reserves (Pooley, 1965) in northern Zululand.

Threats: Due to its large size, attractive skin and feeding habits the python is subject to numerous threats. Its skin has always been used in fashion and there is little doubt this demand still exists, if supplies are available. Dollinger (1982) lists over 300 *Python sebae* skins or worked items that were imported into Switzerland in that year from other African countries (Cameroon, Mali, Senegal, Sudan and Nigeria). Over 10,000 Asian python skins were exported during the same period. Engelmann and Obst (1982) include an illustration of a village tannery in Mali, West Africa, that processes the skins of African rock and royal pythons (*P. regius*).

Many African tribes prize python fat and skin for use in tribal medicines and witchdoctor's 'muti', whilst a large python represents a tasty and substantial food item (see photograph in Patterson and Bannister, 1987). All pythons, but particularly juveniles, are desired by the pet trade, and would find a ready market if not protected by law.

Although efforts to protect the African rock python in South Africa were first motivated by concerned farmers in Natal (Greig, 1984), not all farmers are so enlightened. Many farmers have little tolerance or understanding of the role of natural predators (eg, eagles, snakes, etc.) in the control of 'pests' such as dassies, cane rats, jackal, etc. The death of a few stock animals is viewed as direct loss, that is not obviously off-set by unseen predation on 'pests'. In the northern Cape, pythons also cause the loss of precious water due to their habit of basking in cattle water troughs and opening the ball-cock valve (Burdett, *pers. comm.*). They are therefore destroyed or removed as 'problem animals', whereas it would be more sensible to 'python-proof' the ball-cock.

Existing Conservation Measures: The African python is protected under general legislation in the Cape Province (Ordinance 19 of 1974) and Transvaal (Ordinace 12 of 1983), and is a specified protected indigenous reptile in Natal (Ordinace 15 of 1974). In addition it is listed on Appendix 2 of CITES (under all Boidae). Recorded from the following conserved areas (Greyling and Huntley, 1984): Kruger National Park; Sodwana/Cape Vidal State Forest; Itala Nature Reserve; Vernon Crooks Nature Reserve; Blyde River Nature Reserve; Loskop Dam Nature Reserve; Doorndraai Nature Reserve; Pongola Nature Reserve; Langjan Nature Reserve; Rustenberg Nature Reserve; S A Lombard Nature Reserve; Nylsvley Nature Reserve; Percy Fyfe Nature Reserve; Ohrigstad Dam Nature Reserve; Sterkspruit Nature Reserve; F. C. Erasmus Trust Forest and Mlilwane Wildlife Sanctuary. The small-scale re-introduction of pythons into the Andries Vosloo Kudu Reserve in the Eastern Cape is a commendable action. The project should be continued, in conjunction with a detailed ecological assessment of its success.

Breeding Potential in Captivty: The African python is maintained in the reptile collections of most zoos and snake parks, and in many private collections. It has been bred on numerous occasions (reviewed in Ross, 1978; Branch, 1982; and Branch and Erasmus, 1983) and the potential for its captive breeding is excellent. Mengden *et al.* (1980) have demonstrated successful artificial insemination techniques applicable to captive breeding of large boids.

Recommended Conservation Measures: The python is well-protected by legislation, although the enforcement of this protection from unenlightened farmers is difficult. Greater attempts need to be made to educate the public, and particularly farm owners, of the usefulness of pythons in controlling dassies, cane rats, etc. Basic ecological studies on these giant snakes need also to be initiated by conservation authorities.

Remarks: Following McLachlan's (1978) recommendation in the previous SA Red Data Book - Reptiles and Amphibians, a limited attempt has been made to re-introduce pythons into the Andries Vosloo Kudu Reserve (Burdett, *pers. comm.*; Joubert, 1980; Branch, 1986.). The reserve is situated in dense Fish River Scrub near Grahamstown, within the known distribution of the Eastern Cape population that became extinct earlier this century (see Distribution). Between April 1980 and January 1987, 34 pythons were released into the reserve, including adults and juveniles. The stock originated from the northern Cape (7 specimens), St Lucia, Natal (three specimens) and unknown (24 specimens, all most probably from South Africa). All are referable to the southern race, *P. s. natalensis*. Since their release a number of pythons have been sighted within the reserve, whilst a number of adults have been killed on adjacent farms, one following a series of stock losses. This latter incident underscores the necessity for a program of education for the public and farmers concerning the good that pythons do (similar to that

currently being successfully promoted for eagles and vultures). The sighting of a small hatchling (58cm) within the reserve (January 1985) suggests that reproduction has been successful.

BIBLIOGRAPHY

Taxonomy: Branch, 1980; Broadley, 1983, 1984; FitzSimons, 1962; Miller and Smith, 1979.

Distribution: Branch, 1986; Broadley, 1983; FitzSimons, 1962; Haacke, 1984; Stow, 1905.
FcHabitat and Ecology: Branch, 1982, 1984; Branch and Haacke, 1980; Broadley, 1961, 1983; F. W. FitzSimons, 1930; Halliday and Adler, 1986; Hewitt, 1937; Jensen, 1980; Loveridge, 1931; Pope, 1961; Rose, 1955; Taylor, 1981.

Breeding: Benedict, 1932; Branch, 1982, 1986; Branch and Erasmus, 1983; Branch and Patterson, 1975; F.W. FitzSimons, 1930; Mengden, *et al.*,1980, Pope, 1961; Ross, 1978, 1980; Vinegar *et. al.*, 1970.

Conservation: Dolliger, 1982; Engelmann and Obst, 1982; McLachlan, 1978; Branch, 1982, 1984, 1986; Grieg, 1984.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood.

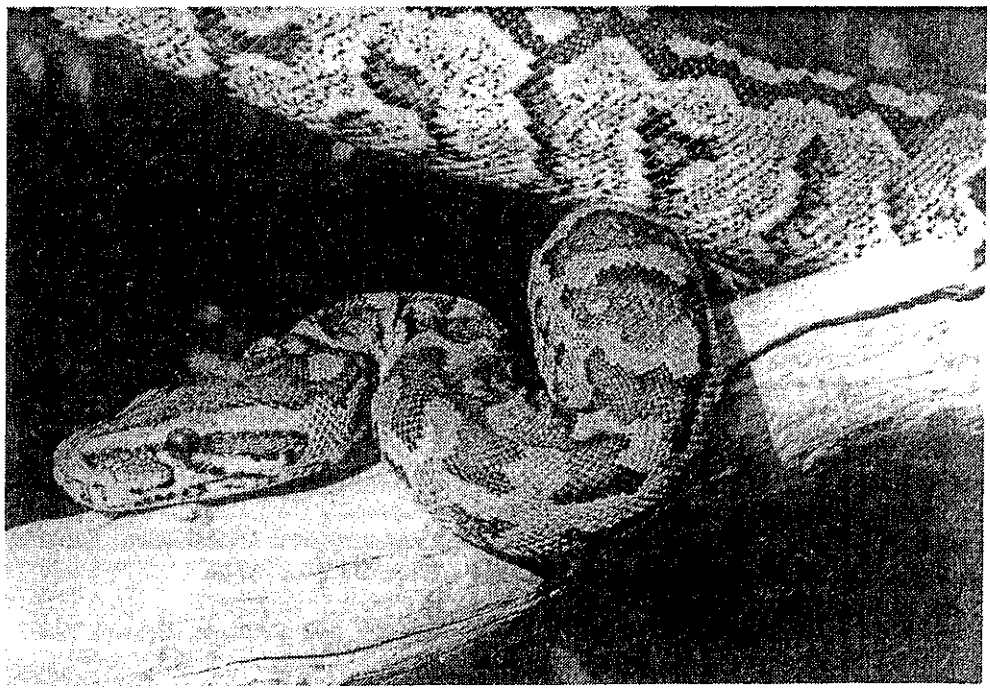


Fig. 18. African rock python *(Python sebae natalensis)* **Vulnerable.** (W. R. Branch)

CAPE SAND SNAKE
Kaapse sandslang

International status: NOT LISTED
South African status: VULNERABLE

Psammophis leightoni leightoni Boulenger 1902. Class: Reptilia, Suborder: Serpentes, Family: Colubridae.

Psammophis leightoni Boulenger 1902. Description of a new snake of the genus *Psammophis* from Cape Colony. *Proc. Zool. Soc. Lond.* 1: p126, pl. xii. Type locality: Eerste River Station, Cape Province.

SUMMARY

Status: Vulnerable. The typical race of a widely-distributed species, that is restricted to the south-western Cape, an area devastated by agricultural and urban development.

Research: Taxonomy well studied; basic biology and habitat requirements almost unknown.

SPECIES DATA

Identification: A medium-size slender snake (maximum size 1 m), with a long head and tail. It can be distinguished by the following features:

1. The presence of two large, fang-like maxillary teeth below the front of the eye;
2. posterior nasal divided, the upper portion with a distinct posterior prolongation;
3. a single preocular;
4. 155-161 ventrals and 92-97 subcaudals;
5. and smooth scales in 17 rows at mid-body.

The body is dark brown above with a fine yellow vertebral line (usually broken into a series of dashes) and a pale yellow dorsolateral stripe; the belly has a mottled grey median band; the head has a number of yellow bands across the back, and other yellow streaks on the snout and above the eyes.

Distribution: Restricted to the extreme south-western Cape Province, inhabiting coastal renosterveld, coastal fynbos and transitional strandveld.

Habitat and Ecology: A diurnal, active snake, that chases and siezes small lizards (particularly lacertids and skinks) and rodents. A small mole snake (*Pseudaspis cana*) was found in the stomach of the the conspecific fork-marked sand snake.

Breeding: Unknown. Probably oviparous like other *Psammophis* spp.

Remarks: Three subspecies are recognised. The Namib sand snake (*P. l. namibensis*) replaces the typical race in the western arid regions, whilst the fork-marked sand snake (*P. l. trinasalis*) extends through the northern Cape, western OFS and Botswana to the northern Transvaal (Broadley, 1975, 1977, 1983; De Waal, 1978).

CONSERVATION

Status: A poorly known, localised race in an area devastated by agricultural and urban development.

Threats: The south-western Cape lowlying fynbos has been almost totallly converted to agricultural land. Coastal renosterveld now covers about 9% of its former extent, having been replaced by wheatlands (Taylor, 1978). Less than 10% of this remnant is conserved (Bigalke, 1979). In addition to the loss of habitat to wheatland, the species is also threatened by extensive pesticide usage, and significant mortalities on the heavily-used and extensive roads in the urbanized areas. Once common around Zeekoevlei, Cape Flats, an area now covered in suburbia (McLachlan *pers. comm.).*

Existing Conservation Measures: All indigenous reptiles are protected in the Cape Province (Ordinace 19 of 1974).

Breeding Potential in Captivity: Poor. Although sand snakes adapt well to captivity, they are active snakes, requiring large enclosures and regular food.

Recommended Conservation Measures: Priority must be given to conserving the remaining vestiges of coastal renosterveld and fynbos habitats for the benefit of this and other locally endangered wildlife.

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1975, 1977, 1983; De Waal, 1978.

Habitat and Ecology: Branch, 1988.

Conservation: Bigalke, 1979; Day, *et al.*, 1979; Jarman, 1986.

Account prepared by: W R Branch, Port Elizabeth Museum, Humewood.

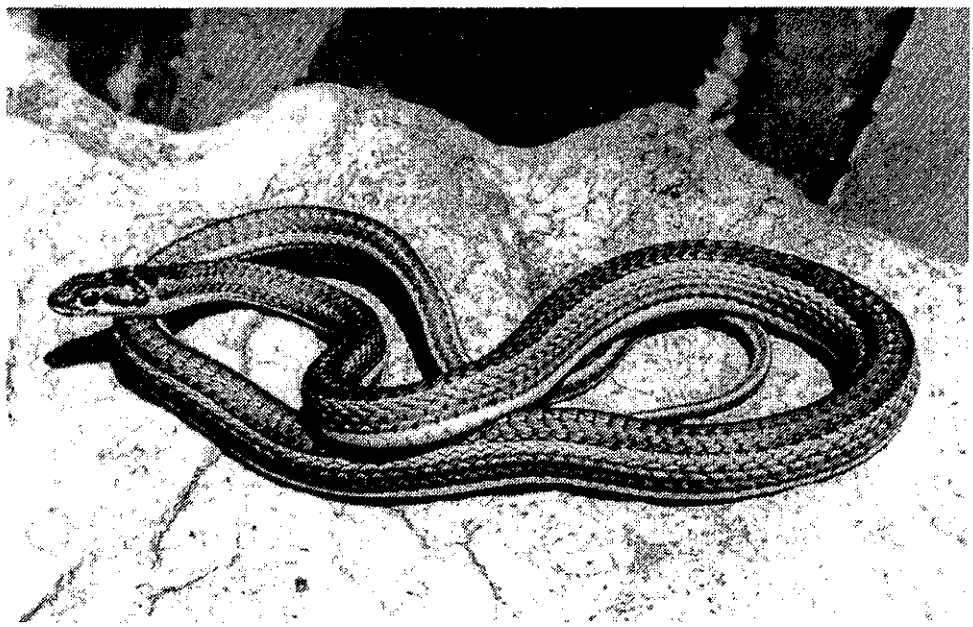
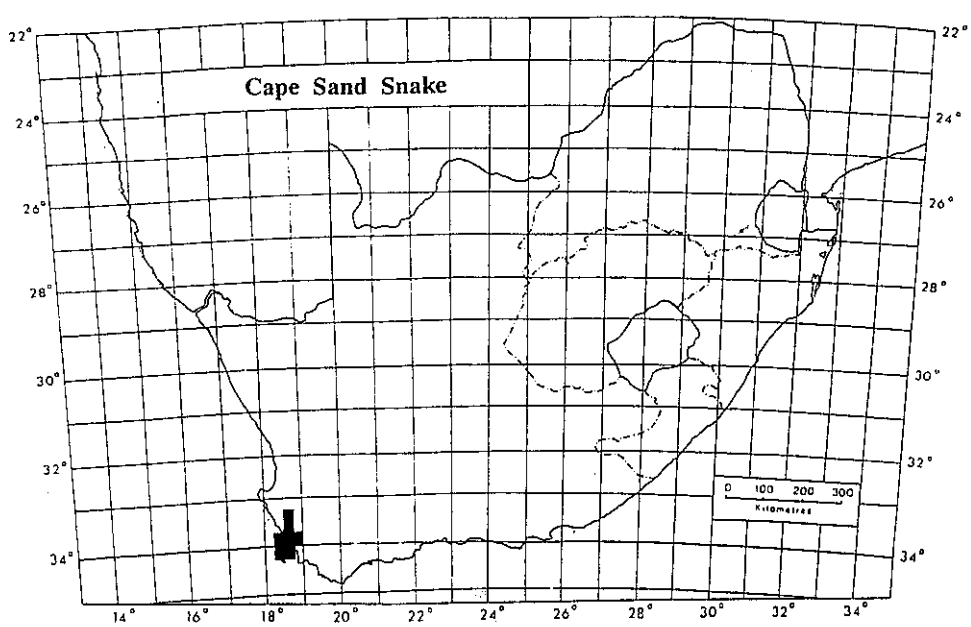


Fig. 19. Cape sand snake *(Psammophis leightoni leightoni)* **Vulnerable.** (W. R. Branch)



Map. 17. Distribution of the Cape sand snake *(Psammophis leightoni leightoni).*

NAMAQUA DWARF ADDER
Namakwa-dwergadder

International status: NOT LISTED
South African status: VULNERABLE

Bitis schneideri (Boettger, 1886). **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Viperidae.

Vipera Schneideri Boettger, 1886. Beiträge zur Herpetologie und Malakozoologie Südwest-Afrikas. I: Zur Kenntnis der Fauna van Angra Pequenia. *Ber. senckenb. naturforsch. Ges.* **1885/6:** 3-29.

SUMMARY
Status: Vulnerable. A small adder with a localised distribution. It is threatened with illegal collecting for the pet trade and habitat destruction associated with open-cast alluvial diamond mining.

Research: Taxonomy well understood. Basic biology poorly known, habitat requirements unstudied.

SPECIES DATA
Identification: The smallest known viperine (averages 20 cm, max. <30 cm) that is distinguished by:

1. Its stout body, triangular head and short tail;
2. fragmented scales on the crown of the head;
3. dorsolaterally placed eyes;
4. strongly keeled scales in 23-27 rows at mid-body.

All the scales are finely stippled in grey to brownish grey and there are three longitudinal series of squarish dark brown, pale-centred spots; the head is irregularly speckled and the belly is greyish to dirty yellowish with black speckles, particularly on the sides; the tail tip is occasionally dark.

Distribution: Restricted to the semi-stable vegetated sands of the southern transitional Namib desert from the vicinity of Lüderitz, south to Olifants river Settlement (Boycott, 1987) on the Western Cape coast.

Habitat and Ecology: Inhabiting low irregular dunes that are semi-stabilized by tussocks of coarse dune grass and small xeropytes. It is mainly crepuscular sheltering at the base of grass tussocks and ambushing small lizards, particularly geckos, and rain frogs (*Breviceps* spp.). They frequently sidewind and bury themselves with a shuffling motion into loose sand.

Breeding: Poorly known; a female contained 4 full-term young (113-123 mm).

Remarks: The species is the ecological equivalent of Peringuey's adder (*Bitis peringueyi*) of the Namib desert. It was previously treated as a subspecies of *Bitis caudalis*. *Bitis paucisquamatus* is a junior synonym (Haacke, 1975).

CONSERVATION
Status: There is no data to indicate any population decline. Although the species extends into southern Namibia, the threat of diamond mining throughout the region makes all populations vulnerable.

Threats: In recent years many specimens have been collected illegally and shipped, via Cape Town, to overseas reptile fanciers. Much of its habitat falls in an area actively mined for alluvial diamonds. Although the limited access to these areas gives the species protection from general collectors, this is more than counter-acted by the extensive habitat disruption caused by open-cast mining.

Existing Conservation Measures: Protected in the Cape Province (Ordinance 19 of 1974).

Breeding Potential in Captivity: Poor; the minute size of the young poses serious feeding problems.

Recommended Conservation Measures: Not recorded from any protected reserve, either in South Africa or Namibia. The proclamation of a reserve that includes the coastal dunes is desirable. It is essential that attempts be made to return previously mined areas to their original state so that they can be re-populated by the endemic fauna and flora.

Remarks: Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Boycott, 1987; Broadley, 1983; Haacke, 1975.

Habitat and Ecology: Branch, 1978, 1988; Broadley, 1983: Haacke, 1975.

Conservation: McLachlan, 1978.

Account prepared by: W R Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

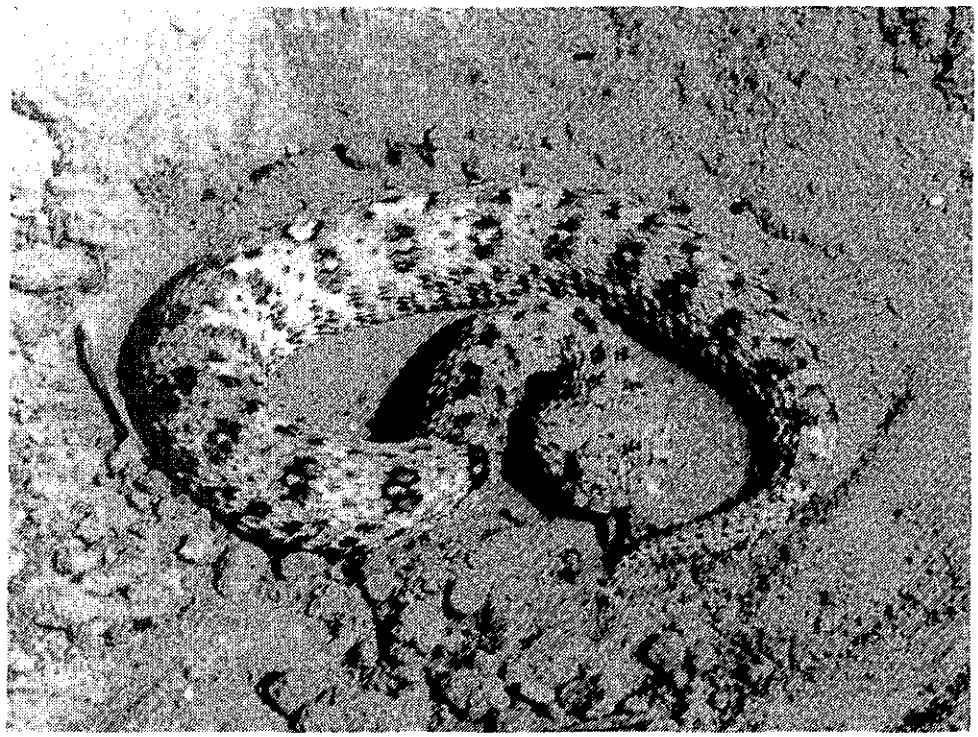
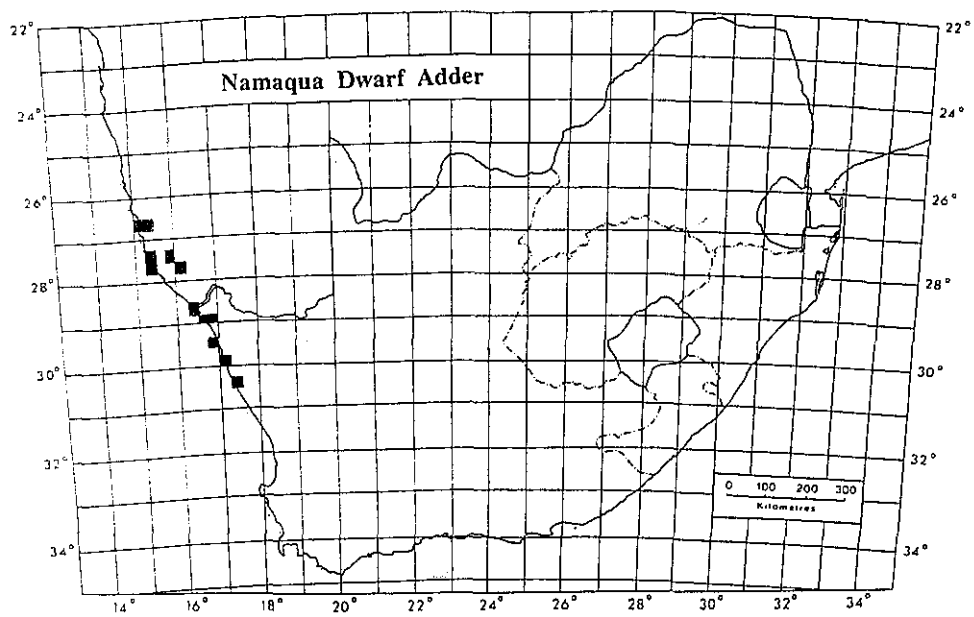


Fig. 20. **Namaqua dwarf adder** *(Bitis schneideri)* **Vulnerable.** (W. R. Branch)



Map. 18. **Distribution of the Namaqua dwarf adder** *(Bitis schneideri).*

GABOON ADDER
Gaboenadder

International status: NOT LISTED
South African status: VULNERABLE

Bitis gabonica gabonica (Duméril & Bibron, 1854) **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Viperidae.

Echidna Gabonica Duméril & Bibron, 1854. *'Erpétologie Générale ou Historie Naturelle complète des Reptiles* Paris, 7: p1428, pl. lxxx b. **Type locality:** Gabon, French Congo.

SUMMARY
Status: Vulnerable. Its distribution in South Africa is peripheral to its main range, but due to the demand for the pet trade and public displays the species is threatened by over-collecting. Other threats include afforestation, strip mining for titanium, and increased human recreational use of the restricted coastal dune forest habitat.

Research: Taxonomy well studied. Basic ecology and habitat requirements very poorly known, and restricted to anecdotal observations. Captive breeding has been successful, but is slow and best achieved in out-door enclosures.

SPECIES DATA

Identification: A massive, thick-bodied adder with a large triangular head, short tail and a beautiful and characteristic colour pattern. It can be further distinguished by:

1. The small fragmented scales on the crown of the head;
2. a pair of nasal 'horns' (that may occasionally be absent, and are never as well-developed as in the western race);
3. the relatively small, strongly-keeled body scales in 35-46 rows at midbody;
4. and its large size, that averages 1,2 m, but may exceptionally exceed 1,8 m.

Adults may become very stout and heavy (up to 8 kg), with a wide head (120 mm across the angle of the jaws) and with long, recurved fangs (that may exceed 4 cm long).

Beauty is in the eye of the beholder, but few would deny the glory of a freshly sloughed Gaboon adder. The body and sides are distinctively patterned with a series of buff rectangles that run along the back and are interspersed with hourglass markings in black, grey and pastel shades of yellow and purple. The head is pale buff with a dark brown thin, median line, and black triangular streaks that radiate from the eye to the upper lip.

Distribution: Within South Africa this species is represented by relict populations, restricted to coastal dune forest from St Lucia estuary to Kosi Bay, as well as coastal forest on the eastern shores of Lake St Lucia, and at Sodwana, Sibaya and Manguzi. It may possibly extend south to Richards Bay, although voucher specimens are as yet unavailable (Haagner *pers. comm.*). Elsewhere the species occurs in isolated montane forests of the eastern escarpment of Zimbabwe, and then extends through the rain forests of east and central Africa, to west Africa.

Habitat and Ecology: The snake's striking geometric pattern is disruptive and gives perfect camouflage among the leaf litter and dappled light of the forest floor. The diet includes ground -dwelling birds, eg. the Natal robin *C. natalensis* (Haagner, 1986) and yellowbellied bulbull *Chlorocichia flaviventris* (Haagner *pers. comm.*) and small mammals, including *Otomys* (Bodbijl, *pers. comm.), Aethomys, Mastomys* spps. and *Mus musculus* (Haagner *pers. comm.*), but also occasionally even small duiker. Prey is caught with a fast strike from ambush and, unless very large, held by the snake until death occurs. Freshly caught adults usually hiss loudly, but despite this they are of very gentle disposition and rarely strike (fortunately, as the venom is very toxic and produced in large volumes - 450-600 mg). Due to the species' restricted distribution and tolerance, bites are very rare (eg. Visser and Carpenter, 1977).

Breeding: Viviparous, like all other *Bitis* spp. From 8-43 (usually 10-20) babies are born in late summer (March-April). Litters of up to 60 have been recorded for the western race (*B. g. nasicornis).* Males engage in violent combat during autumn and early winter, during which time mating also takes place (Akester, 1979a). Mating in Zululand occurs between February and June, with a peak in March-April (Bodbijl, *pers. comm.).* Gestation is long, taking 10-12 months, and the newly-born young measure 25-32 cm and weigh 25-45 g (Huffman, 1974; Akester 1979b, 1980, 1984). Females may breed only every 3-4 years, possibly

with a cycle as long as five years (Akester, 1984). Sexual maturity in captivity takes 4-5 years and females grow larger than males.

Remarks: A distinct subspecies (*B. g. rhinoceros)*, characterised by enlarged nasal horns, occurs in West Africa, from Guinea to Ghana. The Gaboon adder is known to naturally hybridize with the puff adder (Mtubatuba, Broadley and Parker, 1976) and the rhinoceros viper (*Bitis nascicornis,* Ghana, Hughes, 1968).

CONSERVATION

Status: The Gaboon adder is a rare denizen of a restricted habitat, threatened by development and illegal collecting.

Threats: This species is much-prized by reptile fanciers and snake parks, etc, and commands high prices. For many years illegal collectors, based in Mtubatuba and Durban, shipped specimens overseas, via Cape Town. Fortunately, this appears to have declined in recent years. In addition the species is threatened by habitat destruction. Afforestation, the growth of exotic plantations, and the development of Maputaland for tourists, all threaten the unique habitat. Plans to substantially enlarge the area of titanium strip mining in the coastal region are also cause for concern (Macdevette and Bainbridge, 1985).

Existing Conservation Measures: The Gaboon adder is a specially protected indigenous reptile in Natal (Ordinance 15 0f 1974). Its habitat is protected by a number of reserves, eg; Dukuduku forest, the St Lucia Game Park and State Forest, Sodwana Bay National Park, and Kosi Bay Nature Reserve.

Breeding Potential in Captivity: Despite being kept in captivity for many years, very few snake parks or zoos have successfully bred the Gaboon adder. Large enclosures and separation of the sexes, except during the mating season, seem to be essential prerequisites for success. The breeding cycle is long, with gestation taking about 10-12 months and females only breeding every 3-4 years (possibly as long as five years). However, litter size is relatively high (10-20, up to 43) and the young adapt well to captivity. If necessary, it should prove relatively easy to supplement wild populations with captive bred young. A captive breeding project involving outdoor enclosures has been initiated at the Manyeleti Game Reserve, in co-operation with Kwazulu Conservation and Natal Parks Board (Haagner *pers. comm.*).

Recommended Conservation Measures: The species is adequately protected by existing legislation. Bruton (1980, 1982) has made an elegant plea for the preservation of Maputaland, which includes this species' habitat.

Remarks: Listed as vulnerable in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1983; Broadley and Parker, 1976; Hughes, 1968.

Habitat and Ecology: Akester, 1979a, 1979b, 1980, 1984; Bodbijl *pers. comm.*, 1988; Branch, 1978, 1988; Broadley, 1983; Bruton and Haacke, 1980; Haagner, 1986, *pers. comm.* 1988; Huffman, 1974; Marsh and Whaler, 1984.

Conservation: Bruton, 1979, 1980, 1982; Macdevette and Bainbridge, 1985: McLachlan, 1978.

Account prepared by: W R Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

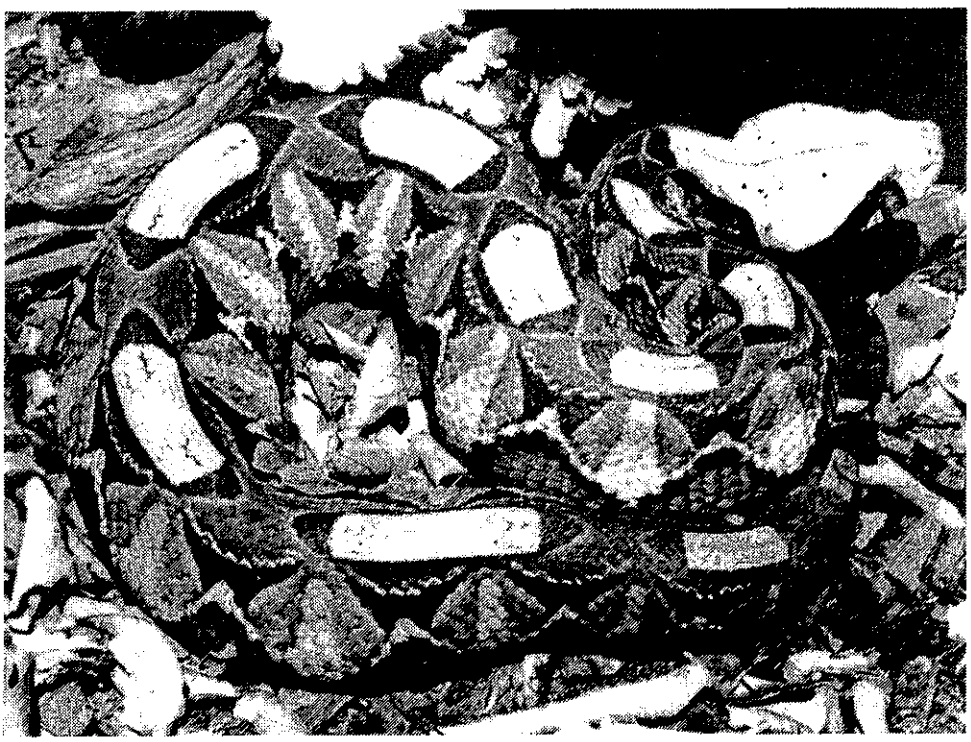
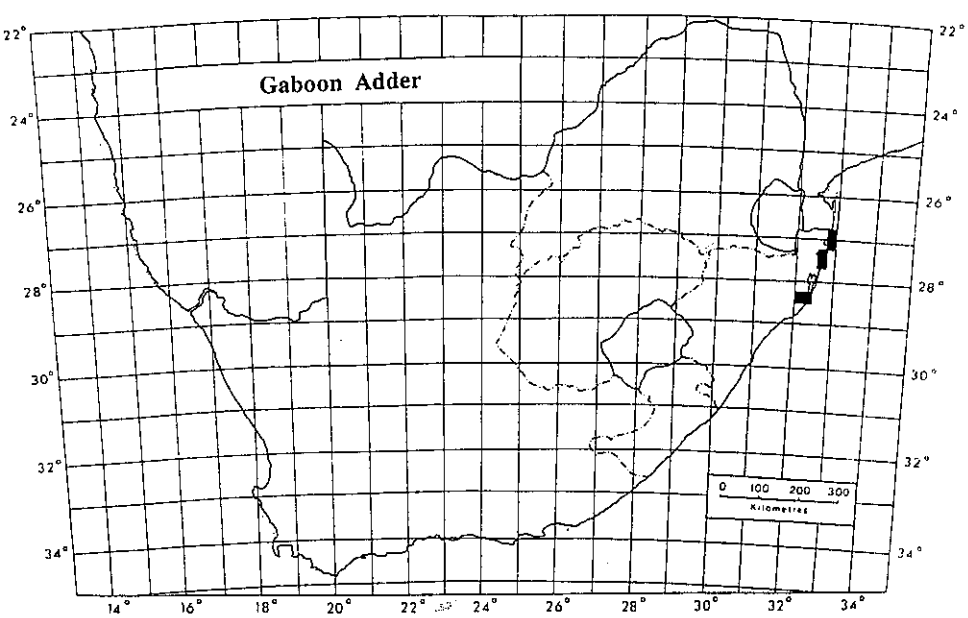


Fig. 21. Gaboon adder *(Bitis gabonica gabonica)* **Vulnerable.** (W. R. Branch)



Map. 19. Distribution of the Gaboon adder *(Bitis gabonica gabonica).*

METHUEN'S DWARF GECKO
Methuen se dwerggeitjie

International status: NOT LISTED
South African status: VULNERABLE

Lygodactylus methueni FitzSimons 1937. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Lygodactylus methueni FitzSimons, 1937. Three new lizards from South Africa. *Ann. Tvl. Mus.* 17: 276.
Type locality: Woodbush, Transvaal.

SUMMARY

Status: Vulnerable. A large dwarf gecko known only from the type locality. It occurs on the boles of large trees and on rocky outcrops fringing the forest. Even outcrops among exotic plantations and at roadsides harbour individuals. Much of its habitat is under exotic plantations.

Research: Poor. Greater detail of habitat requirements are needed to establish the viability of populations under exotic plantations.

SPECIES DATA

Identification: A large dwarf gecko (maximum 92 mm TL). Canthus rostralis not marked and eight enlarged chin shields. There are 9-11 preanal pores in males. Body colour olive to olive grey with dorsolateral and lateral rows of well defined reddish brown angular spots over the back. Each spot bearing a smaller yellowish spot in an angular recess posteriorly. Underparts olive yellow which is more intense posteriorly and under tail. Some specimens have the dorsal spots lacking and are replaced on either side of the back by a broad brownish white dorsolateral band broadly edged above and below with dark brown to black. Juveniles are yellow below with orange under the tail.

Distribution: The species has a very restricted range and is currently only known from the Woodbush Forest Reserve and exotic plantations surrounding it in the Transvaal.

Habitat and Ecology: According to FitzSimons (1943) the species is found within the forest on the boles of large trees or on rocky outcrops at the edges of open spaces and clearings. Specimens subsequently collected were only found on rocky outcrops and on the boles of trees even in exotic plantations at roadsides around such outcrops.

Breeding: Like all dwarf geckos, the species is oviparous laying two eggs at a time. Communial nesting takes place on occasions. The eggs are laid under stones or loose bark.

CONSERVATION

Status: The species has a very restricted range, with scattered small populations. Searches in the Woodbush Forest were unsuccessful. The lizards were only observed around rocky outcrops in clearings surrounded by indigenous as well as exotic forests.

Threats: Extensive afforestation shading rocky outcrops, and the effects on the gecko's food supply of pesticide usage during plantation management, are threats whose effects should be studied.

Existing Conservation Measures: The species is afforded protection under the Transvaal Provincial Ordinance. Some protection is afforded locally with the protection of the indigenous forest at Woodbush although clearings within the forest have been planted over.

Breeding Potential in Captivity: Unknown, but probably quite good. Many geckos have been successfully bred in captivity, although the young are often subject to calcium deficiency problems which can be overcome by dietary supplements.

Recommended Conservation Measures: It is necessary that the species be recognised as vulnerable and measures taken to ensure the safety of the habitat from exploitation. Further surveys to determine the number of populations is necessary.

Remarks: A high conservation priority species. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1937; Loveridge, 1947; Pasteur, 1964.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

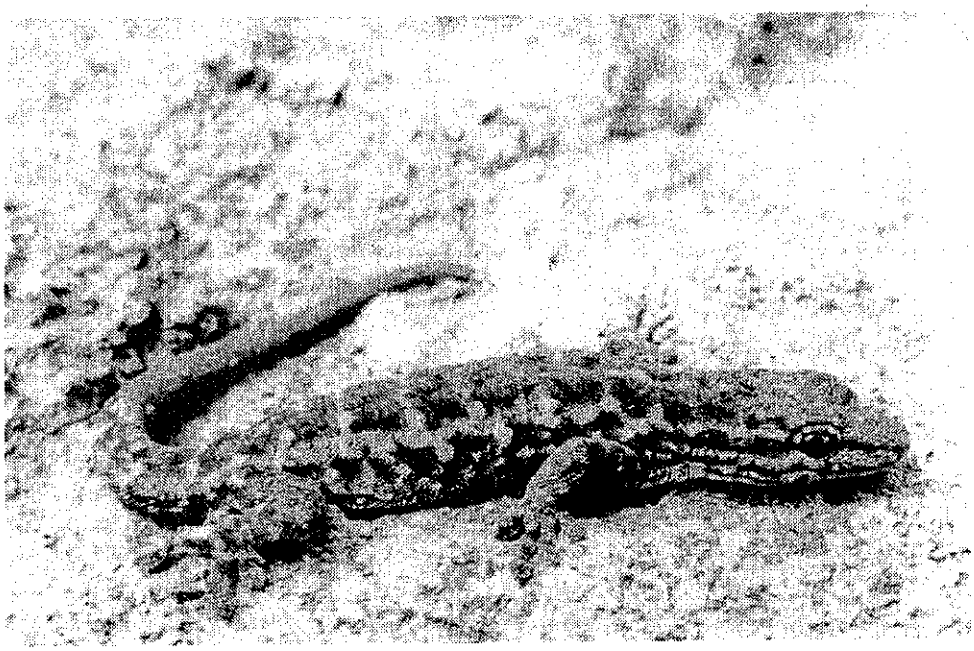
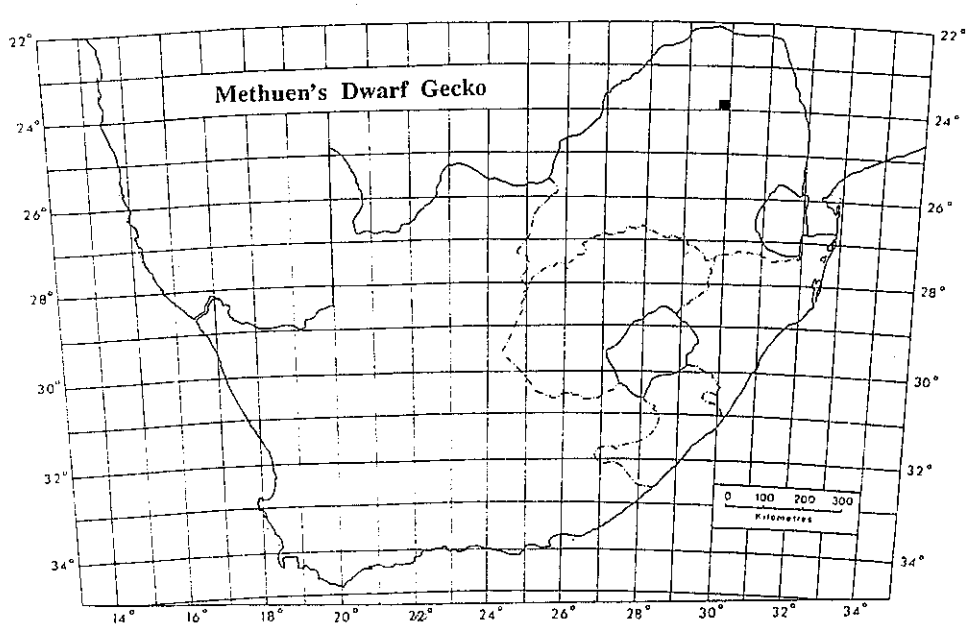


Fig. 22. Methuen's dwarf gecko *(Lygodactylus methueni)* **Vulnerable.** (N. Jacobsen)



Map. 20. Distribution of Methuen's dwarf gecko *(Lygodactylus methueni)*

BOUTON'S SKINK
Bouton se skink

International status: NOT LISTED
South African status: VULNERABLE

Cryptoblepharus boutonii africanus (Sternfeld 1918). Class: Reptilia, Suborder: Sauria, Family: Scincidae.

Ablepharus boutonii africanus Sternfeld, 1918. Zur Tiergeographie Papuasiens und der pazifischen Inselwelt. *Abhand. Senkenb. Nat. Ges.* 36: 375-436. Type locality: Manda Island, Kenya.

SUMMARY
Status: Widespread on Indian Ocean islands, and along African east coast. A small isolated population on Black Rock, on the northern Natal coast, is peripheral with respect to this species' total range but must be viewed as vulnerable in the South African context.

Research: Fair. An annual check is maintained by Natal Parks Board to monitor the population.

SPECIES DATA
Identification: A small slender skink with a maximum HB length of just under 50 mm and a total length not exceeding 115 mm. Body cylindrical, covered with 20 to 22 rows of scales, prefrontals separate or fused, frontoparietal never perfect and a separate interparietal may occur. Colour black with dark ventrum or with pale speckles and a dorsolateral dark-edged line of spots. Sexes indistinguishable.

Distribution: The total range of the species is explained under 'Status'. At present a string of coastal populations along the east coast of Africa is considered to represent a single subspecies, *C. b. africanus*. Of these, the one on Black Rock, an outcrop of porous sandstone on the northern Natal coast, about 35 km south of the Mozambique border, is the most southern population of this taxon and is separated from the nearest population on the Mozambique coast by about 550 km.

Habitat and Ecology: Restricted to an area of about 300m of cliff face, where the individuals use retreats along the top edge while descending into the oyster-barnacle zone to forage on insects, small crustacea and occasionally small fish (juvenile rockhoppers). No other reptiles or other potential predators appear to share this habitat, although in recent years *Mabuya homalocephala depressa* has been noticed on the inland edge of the cliff where it may be a potential threat to occasional individuals. Daily and seasonal activities are strongly affected by tides and weather conditions which may cause them to stay in their retreats or prevent them from utilising their favourite forage area. During spring low tides fair numbers of local tribal women cause unintentional disturbance while collecting seafood and fishermen and tourists will do the same while clambering over the rocks. In general these people do not intentionally harass these dwarf skinks.

Breeding: Sexes indistinguishable externally. A single, large, soft shelled egg is laid at a time. During December some collected females were gravid while some apparently had laid already. Dissected males had enlarged testes during May and September while during December they appeared sexually inactive. Gestation period and laying site unknown.

Remarks: Although this population shows certain specific variations, which it shares with the three most southern populations on the Mozambique coast, they are not well enough represented within each population to warrant taxonomic distinction. It has been suggested that a major dispersal event of *Cryptoblepharus* may have followed the eruption of Krakatoa with resultant huge quantities of pumice stone becoming available as rafts.

CONSERVATION
Status: This population was first noticed in 1964 and has been monitored since 1978 during seven summer seasons and the estimated population size varied by over 100% from 47 to 112 with an average of 71 individuals. Although this is a minute population, it appears to be able to maintain itself and due to its remoteness genetic reinforcement from other populations appears to be highly unlikely.

Threats: Although this lizard is extremely vulnerable in this most southern and isolated population, its small unobtrusive size and very rough habitat appears to be its best assurance of continued existence unless struck by a rampant disease or other disaster. A disconcerting aspect is the fact that in recent times a Safari company is using Bouton's skink on Black Rock as an additional incentive to

visit this area, thereby drawing attention to its presence with possible negative effect.

Existing Conservation Measures: No specific measures exist as local tribesmen have free access to the area, but non-residents are only allowed to visit the rock in limited numbers on a daily basis. This measure reduces disturbance.

Breeding Potential in Captivity: Due to their littoral lifestyle it is probably quite possible to maintain captive populations in a coastal environment.

Recommended Conservation Measures: None are required at present, but if routine observations show that the population is under pressure, specific protective measures may be required, such as prohibiting access to the area.

Remarks: As this population is only a peripheral population of a widely dispersed taxon with its presence being an 'accidental' colonisation by rafting, it is a strong possibility that it may vanish again for natural reasons as quietly as it probably arrived in the first place.

BIBLIOGRAPHY

Taxonomy: Mertens, 1931; Fuhn, 1970; Welch, 1982; Brygoo, 1986.

Conservation: Haacke, 1977; McLachlan, 1978; Bruton and Haacke, 1980.

Account prepared by: W.D. Haacke, Transvaal Museum, Pretoria.

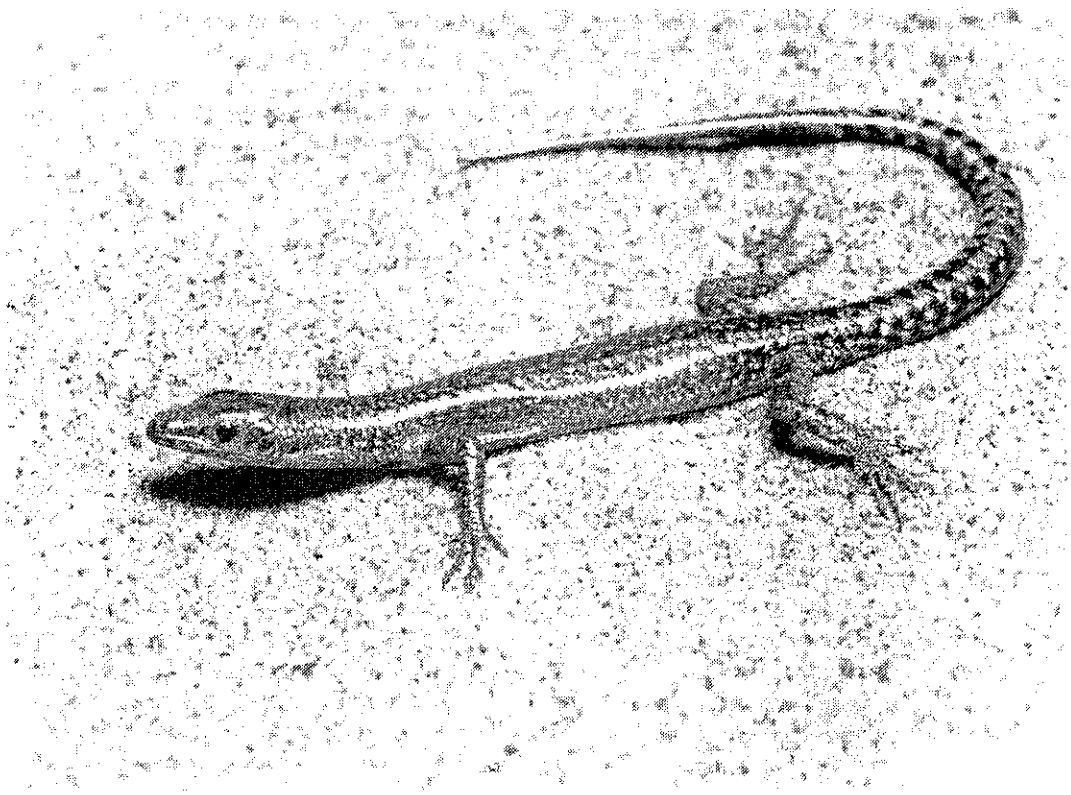
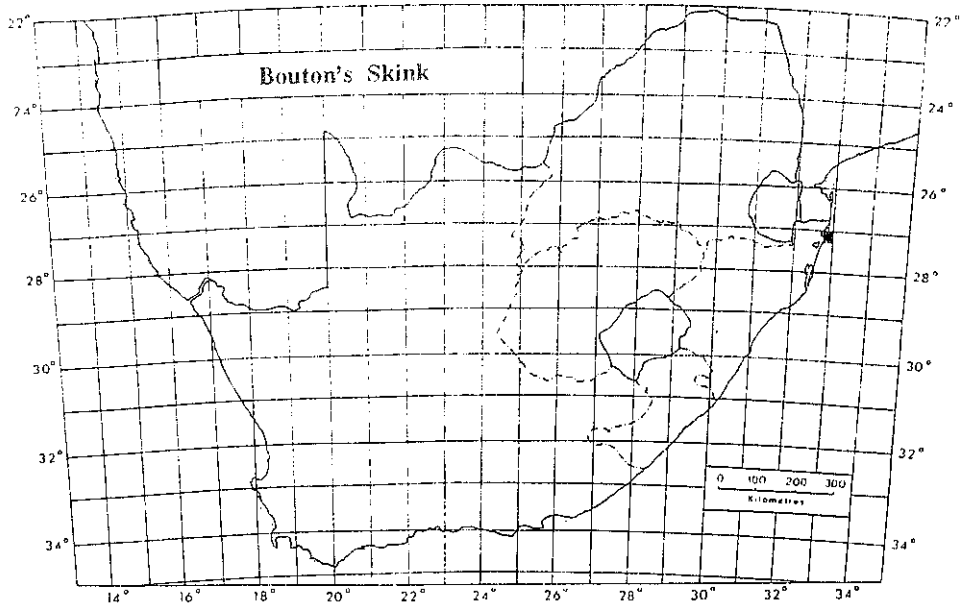
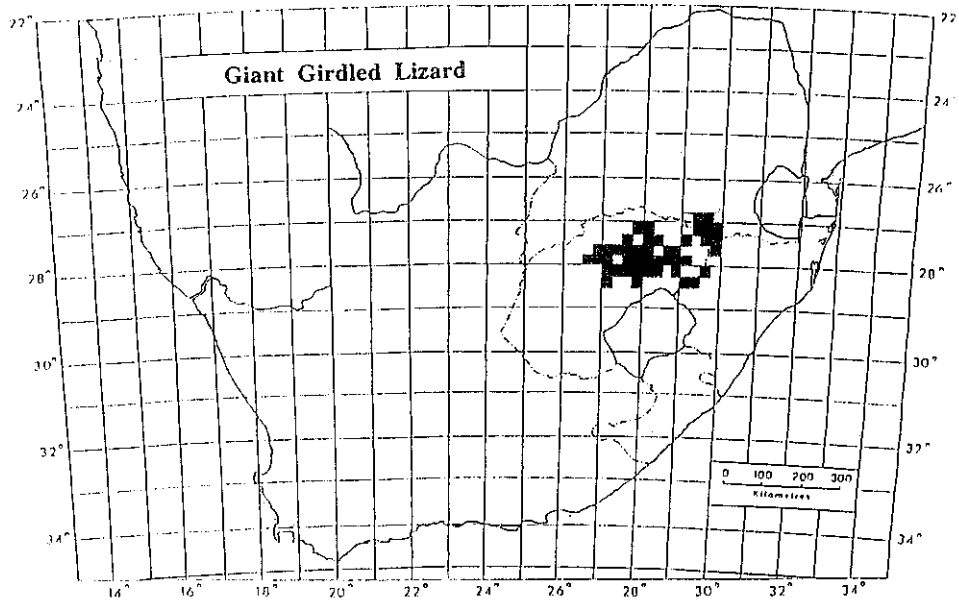


Fig. 23 Bouton's skink *(Cryptoblepharus boutonii africanus)* **Vulnerable.** (W.D. Haacke)



Map. 21. Distribution of Bouton's skink *(Cryptoblepharus boutonii africanus).*



Map. 22. Distribution of the giant girdled lizard or sungazer *(Cordylus giganteus).*

SUNGAZER or GIANT GIRDLED LIZARD
Ouvolk of Reuse gordelakkedis

International status: NOT LISTED
South African status: VULNERABLE

Cordylus giganteus A. Smith 1844. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Cordylus giganteus A. Smith, 1844. *Ill. Zool. S. Afr., Rept.*: pls. xxxv & xxxvi. **Type locality:** "Interior districts of Southern Africa on rock pinnacles of Quathlamba mountains" (in error, species not known from mountainous regions).

SUMMARY

Status: Vulnerable. This large cordylid species is heavily armoured with large keeled spiny scales. It is endemic to the grassland regions of the north-eastern Orange Free State, the western parts of Natal and the south-eastern Transvaal. The existence of this species is threatened by habitat destruction, including agriculture, mining, urban development activities, as well as increased predation as a result of possible disturbance of the ecological balance in the remaining scattered grassland areas. At the moment population numbers are not critical, however, if the numerous threats to this species' existence continue it may soon move into the endangered category.

Research: Original field research is lacking. Extensive surveys are needed. A major project concerning the "Physiological ecology of *Cordylus giganteus*" is in progress (Van Wyk).

SPECIES DATA

Identification: The largest of the cordylid species (maximum size of 40 mm), it is heavily armoured with large keeled spiny scales. Characteristic are the large, elongate occipital spines and the large spiny scales on the neck, sides and tail. The interparietal head shield is as large as the anterior parietals and the rostral and frontonasal are in contact. The dorsal part of the head, body and tail of the adult is usually dark brown to blackish. The labials and scales of the neck and body are yellow-brown, and the ventral surfaces dirty white to straw-yellow, often infused with grey. The hatchlings and juveniles are more colourful, being dark brown with yellow-orange crossbars on the legs, back, sides and tail. The ventral parts are creamy white and the tip of the tail is usually orange-red.

Distribution: The sungazer is endemic to the grassland of the north-eastern Orange Free State and the adjacent western parts of Natal and south-eastern Transvaal. The type location is given by A. Smith as the pinnacles of the Quathlamba moutains (i.e. Drakensberg mountains). FitzSimons (1965) suggested this to be unlikely, since the species is not rock living nor recognized as a montane species. In all probability Smith confused this species with crag lizards (*Pseudocordylus* sp.). Furthermore, the isolated localities reported by earlier collectors (i.e. Boshof, Bloemfontein, Hoopstad and Colesberg) seem to be doubtful recordings, possibly due to confusion with the Karoo girdled lizard (*Cordylus polyzonus*). During an extensive survey, De Waal (1978) could not verify any of these localities. McLachlan (1986) pointed out that the Hoopstad record probably came from the Odendaalsrus district. The habitat preference of sungazers does not correspond with the structural habitats available at these localities. Moreover, these areas seem to be least affected by habitat destruction and one would expect to find lizards there today if they occurred there naturally. If the doubtful localities are ignored, the distribution is not known to have changed significantly during historical times.

Habitat and Ecology: This species inhabits flat or sloping highveld grassland. The veld types represent true *Themeda triandra* grassland or transitional zones. Soils include sand, loams, black clays and solonetzic types. The lizards live in self-excavated burrows, dug to an average depth of 420 mm below soil surface and an average length of 1,8 m. No accurate representative estimates of burrow distribution and densities are available within the distribution range of *Cordylus giganteus*. Reported burrow densities range from 4-19 burrows per hectare. However, large areas were found without any burrows present. Usually a single adult will occupy a burrow. Young may stay in the same burrow as a female or a male until close to maturity. The burrow has an important thermoregulatory function, both in summer and winter. A typical bimodal activity pattern has been recorded throughout the year. It is suggested that the lizards stay in their burrows for the coldest months of the

year, but it has not been ascertained yet whether the lizards indeed hibernate. During winter, amphibians and insects share the burrow to escape the subzero surface temperatures. Occasionally lizards will temporarily occupy old small mammal burrows (mongoose and suricate). Sungazers are diurnal, mainly insectivorous, and typical sit-and-wait feeders. However, it is known that they consume large quantities of termite alates during the summer rainfall period.

Breeding: *Cordylus giganteus* is live bearing, giving birth to 1-4 young. Research indicates that not all the adult females breed annually. Preliminary evidence suggests that the majority of the adult females breed biannually. At the same time, field observations indicate that not all adult males take part in mating activities. The age at maturity is not yet determined, however evidence seems to suggest late maturation. The male to female ratio in a population usually averages at 1:1.75. Males are distinguished by enlarged femoral pores and a ventral patch of glandular scales anterior to the femoral pores. Several swollen glandular scales are also present on the front legs in males. Although females have femoral pores on the back legs, they lack the other glandular scales on the front and back legs.

Remarks: The three provincial populations are disjunct. This is probably due to natural barriers, and is not a man-induced phenomenon. Whether this isolation has affected the gene pool significantly needs further study.

CONSERVATION

Status: *Cordylus giganteus* has a very restricted range. Population numbers are not known but the fact that this species is closely associated with natural highveld grassland makes it particularly vulnerable. Habitat destruction continuously destroys complete populations or, alternatively, splits up populations to such an extent that the long term survival of the population could be affected. Evidence suggests that at least 50% of the arable grassland is already cultivated in the range of *Cordylus giganteus*. In the south-eastern Transvaal 79% of Acocks veld type 52 is already degraded. Since the lizard populations are not evenly distributed, large grassland areas were found to be without any burrows suggesting that existing population estimates are generally overestimated.

Threats: Several factors contribute to the deterioration of the status of this species. These include: Ongoing habitat destruction by agriculture; mining and other developmental activities; and the pet and muti trade. Increased predation pressure from small mammal carnivores may also be occurring. In some areas ecological data suggest that newly hatched young have dramatically low survival during their first and second years. It is also possibile that burrow fumigation during control of yellow mongooses and suricates, and the secondary poisoning of the *C. giganteus* food resources (during crop-spraying and poisoning of grass eating termites, *Hodotermes mossambicus*), may also be be affecting the remaining sungazer populations.

Existing Conservation Measures: This species has been given special protected status under both Orange Free State and Transvaal Ordinances. The Orange Free State fully applies the rules laid down by the Convention on International Trade in Endangered Species (CITES) as prescribed for animals listed in Appendix II. In the Orange Free State three burrows are known to fall within the boundaries of the Willem Pretorius Reserve and 200 in the Sterkfontein Dam Reserve. From a Bethlehem municipal reserve 15 natural and 30 relocated burrows are known. In the Transvaal ESCOM proclaimed a reserve (400 ha) adjacent to the Majuba Power station. Lizards were successfully relocated to this reserve and currently a total of 1,500 burrows are known in this reserve.

Breeding Potential in Captivity: Few records of successful breeding in captivity have been reported to date. Successful captive breeding could increase dramatically as more information concerning factors affecting breeding in nature become available. However, because of the low reproductive potential, long carrying time and slow growth rate, captive breeding programs will only be of limited use.

Recommended Conservation Measures: The survival of this species depends on the conservation of their natural habitat. Apart from legislative measures, co-ordinated efforts should be undertaken by concerned bodies to determine the status of this species. The following conservation measures are proposed:

1. Scientifically based relocation experiments are

needed. All relocation efforts should be co-ordinated on a national basis by a central committee.
2. Efforts should be made to include natural habitat containing viable breeding populations into reserve areas.
3. Specific education programs, specially aimed at developers and farming communities, are needed.
4. Detailed studies concerning the ecological balance within the fragments of natural grassland are needed in order to establish whether specific management actions need to be taken to ensure higher survival of the young lizards.
5. Legislation should continue to prohibit the removal of lizards and uncontrolled fragmentation of the natural habitat of these lizards.

Remarks: In the past, relocation of lizards has been attempted by Nature Conservation Departments, in co-operation with private organizations. Although such activities have been successful in the short term, long term follow up studies are required. In the future, care should be taken to ensure that such factors as seasonality, territoriality and carrying capacity are taken into consideration, before proceeding with such operations. The species was listed as vulnerable in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: De Waal, 1978; FitzSimons, 1943; Loveridge, 1944; Smith, 1844.

Ecology: Adolphs and Troger, 1987; Branch, 1988; Branch and Paterson, 1975; De Waal, 1978; Marais, 1984.

Conservation: Branch, 1987; De Waal, 1978; Petersen *et al.*, 1983, 1984, 1985; Stols and Blom, 1985.

Account prepared by: J.H. van Wyk, University of Stellenbosch.

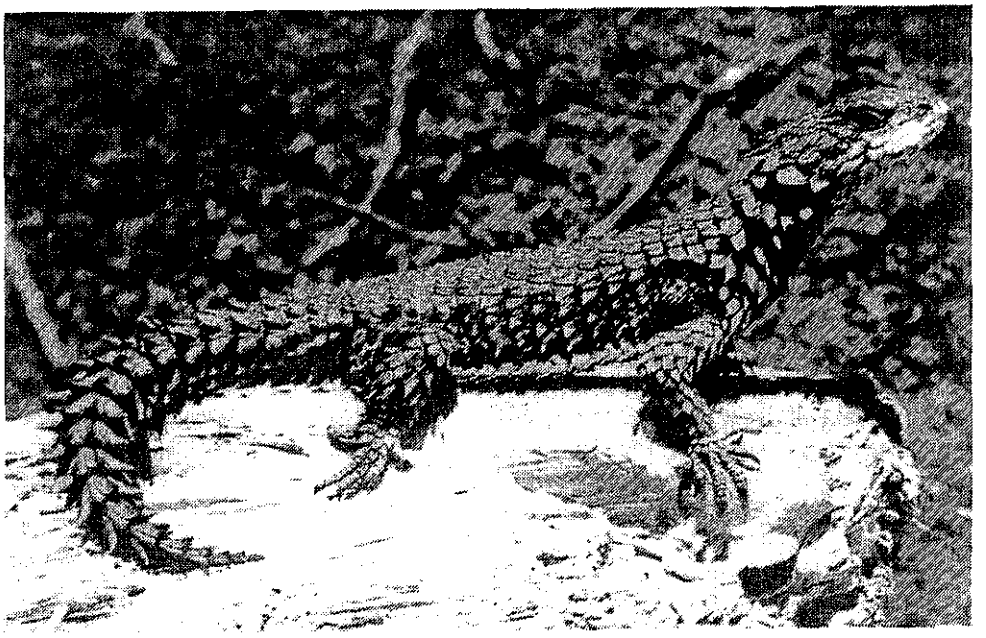


Fig. 24. Giant girdled lizard or sungazer *(Cordylus giganteus)* **Vulnerable.** (W. R. Branch)

ARMADILLO GIRDLED LIZARD
Blinkogie of Pantster gordelakkedis

International status: NOT LISTED
South African status: VULNERABLE

Cordylus cataphractus Boie 1828. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Cordylus cataphractus Boie, 1828. *Nova Acta Acad. Caes. Leop-Carol.* 14: 139 - 142. **Type locality:** unknown.

SUMMARY

Status: Vulnerable. An attractive very spiny girdled lizard from the Western Cape Province, suspected to suffer from illegal collecting for the pet trade.

Research: Fair. Studies on the species' ecology, as well as more information on the extent of the overseas pet trade are needed.

SPECIES DATA

Identification: A medium-sized *Cordylus* with a squat and very heavily armoured form. It can be further distinguished by:

1. Squat and heavily armoured body;
2. frontonasal well-separated from loreals by suture of prefrontals and nasals.

Body colour usually a dirty yellowish-brown to straw colour, the chin and throat yellow or lilac infused with dark brown blotchy reticulations.

Distribution: This species occurs all over Little Namaqualand from immediately south of the Orange River, south-eastwards to Matjiesfontein in the Karoo.

Habitat and Ecology: These lizards live in rock cracks and crevices which they occupy continuously for long periods. They are gregarious and family parties of 8-10 are often found sheltering together in the same cleft. When handled they display a peculiar habit of gripping their heavily armoured tails in their jaws, thus curling up and protecting their soft underparts. They are relatively slow moving and are extremely easy to catch. The tail plays such an important roll in the lizard's defence that it is not easily detatched as in most other *Cordylus* species. Their diet consists mainly of termites, beetles and grasshoppers, but they are known to take smaller lizard species as well.

Breeding: The young, usually two in number are born during late summer.

CONSERVATION

Status: Although this species occurs over large parts of the Western Cape, and is fairly common within its distributional area, it is considered vulnerable owing to its popularity as a pet. Its attractive appearance, the fact that it occurs in family groups and that it is easily captured and tamed, makes it particularly vulnerable.

Threats: This species occurs over a comparatively large distributional area in diverse habitats and is probably not threatened by agricultural and other similar activities of man or veld fires. The only real threat seems to be the pet trade.

Existing Conservation Measures: This species is protected by Cape Provincial Ordinance. It is also listed in CITES (Appendix 2).

Breeding Potential in Captivity: The armadillo lizard keeps well in captivity and breeding potential is probably good if kept in suitable surroundings.

Recommended Conservation Measures: It is important that the international trade in this species be stopped by improved control by local customs officials.

Remarks: Listed as vulnerable in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Boie, 1828; FitzSimons, 1943; Loveridge, 1944.

Habitat and Ecology: Branch, 1988; Peers, 1930.

Conservation: McLachlan, 1978; Mouton, Oelofsen and Mostert, 1987.

Account prepared by: P. LeF. Mouton. J. Ellerman Museum, University of Stellenbosch, Stellenbosch.

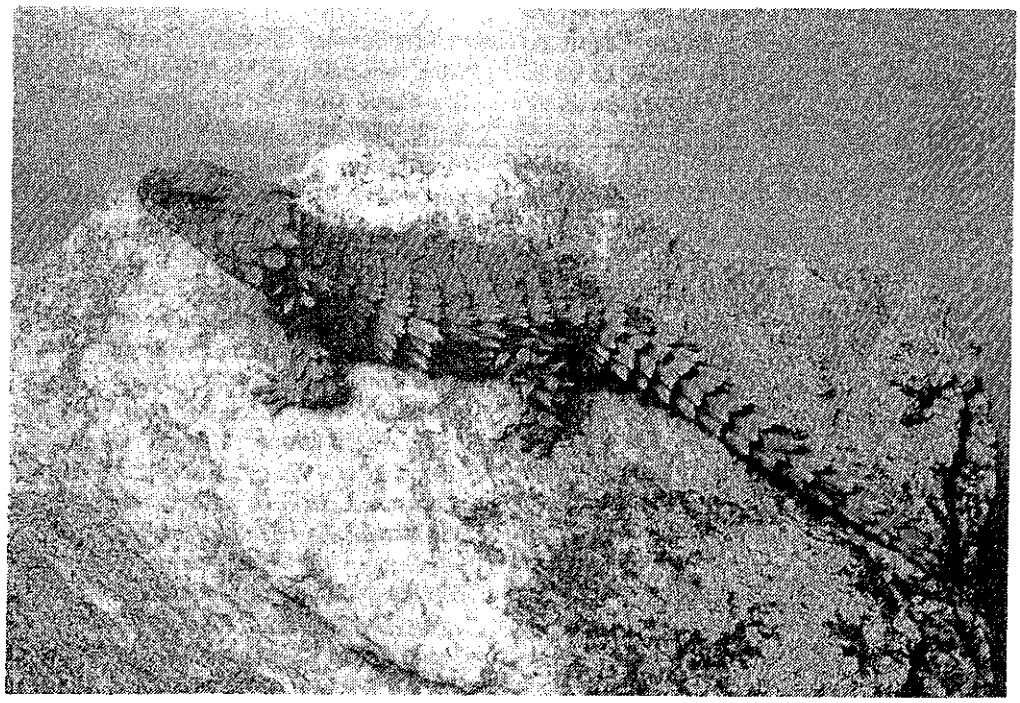
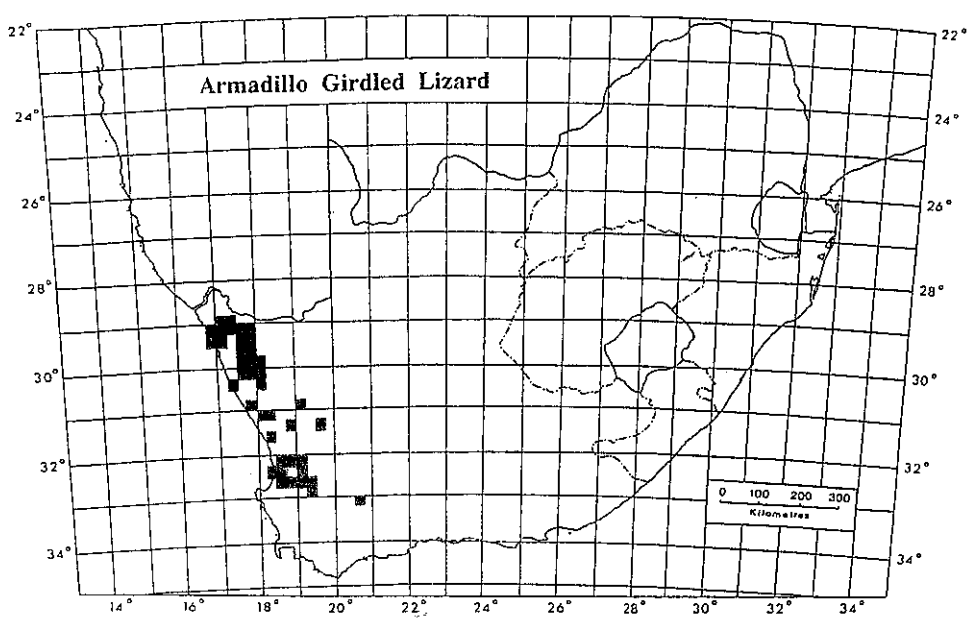


Fig. 25. Armadillo girdled lizard *(Cordylus cataphractus)* **Vulnerable.** (P. leF. Mouton)



Map. 23. Distribution of the armadillo girdled lizard *(Cordylus cataphractus).*

NILE CROCODILE
Nylkrokodil

International status: VULNERABLE
South African status: VULNERABLE

Crocodylus niloticus Laurenti 1768. **Class:** Reptilia, **Order:** Crocodylia, **Family:** Crocodylidae.

Crocodylus niloticus Laurenti, 1768. *Synops. Rept.*: 53. **Type locality:** Egypt.

SUMMARY

Status: Vulnerable. A large reptile restricted to north-eastern and eastern South Africa. Found in most east-flowing rivers north of latitude 29°S. Seriously depleted over most of its former range with populations widely scattered. Extinct in the Eastern Cape over the past 150 years. Over most of its range it is considered incompatible with farming or ranching ventures.

Research: Good. The development of crocodile ranching and farming has promoted considerable research into the biology of the species.

SPECIES DATA

Identification: The only crocodile occurring in our rivers, ir reaches a possible maximum size of 6 m. Body covered dorsally with bony, ridged plates. Two rows of enlarged triangular scutes at base of tail merging to a single row for the distal 2/3 portion.

Distribution: Widespread in the Transvaal from Brits and Rust de Winter northwards and eastwards extending into Natal as far as the Tugela River. Former range extending into the Transkei and into the Eastern Cape possibly as far as the Great Fish River (McLachlan, 1978). Occurs in most substantial rivers and also farm dams in areas where they are common.

Habitat and Ecology: Inhabits rivers in more tropical areas of the country. Although occurring as far as Brits and Rust de Winter, it is probable that breeding populations were restricted to more climatically favourable areas. Seasonal movement appears to take place with males moving upstream to the headwaters of the rivers. It will move across land to occupy farm dams and other suitable impoundments. It is noteworthy that the construction of weirs and dams on some of the rivers in the Transvaal has promoted the establishment of breeding populations. Other such constructions have decreased water availability particularly in the dry season as a result of irrigation practices.

Young crocodiles shelter in burrows for the first 4-5 years of life. They spend a lot of time out of water and eat small prey, including insects. Subadults take up residence in swamps and backwaters, eating fish, terrapins, birds and small mammals. Adults feed regularly on fish, particularly catfish (*Clarias* spp.), but also ambush game coming to drink. Various species of small antelope are usually taken, but even zebra and buffalo may be overcome by large crocodiles. Man is considered fair game; attacks (and fatalities) are still relatively common in some areas. Carrion is readily taken. Cooperative behaviour in feeding and breaking up prey is known. The valved nostrils and gular flap at the back of the mouth enable them to feed underwater. They have lived for up to 60 years in captivity, and very large wild specimens may live to 100 years.

Breeding: Crocodilians are attentive parents, and nest construction and care of the young is well-developed. Sexual maturity is reached in 12-15 years at about 2-3 m (70-100 kg). At the start of the breeding season (May) males fight and form a dominance hierarchy. Courtship is elaborate. Mating takes place in the water in July to August. The female selects a sunny sandbank that is above floodwater level and which has good drainage and cover nearby. She will use it, unless disturbed for the rest of her life. At night, usually in November, she digs a hole with her hindfeet and lays 16-80 (usually 40-50) hard-shelled eggs. These hatch in 84-95 days. The female carefully opens the nest and takes all the young into her mouth. The hatchlings (28-32 cm) are taken to a quiet backwater and washed. They remain close together in a 'creche' area for 6-8 weeks, during which time they are protected by the mother. The sex of hatchlings is dependent upon the egg incubation temperature, with males being produced at higher temperatures.

Remarks: The large-scale reduction in habitat created by irrigation practices and the construction of dams is one of the main factors leading to the fragmentation of populations. Many dams are unsuitable for the establishment of populations either because of unsuitable terrain or because of competition with man for the same resource.

CONSERVATION

Status: Although the species still has a large distribution range, actual breeding populations are limited to a few areas where permanent undisturbed aquatic habitat is available. In the Transvaal this includes part of the Limpopo River, the Olifants River near Marble Hall and the lower reaches of most of the rivers in the lowveld. Large populations occur in the Kruger National Park and smaller breeding populations exist in Zululand particularly the Ndumu, Mkuze and St Lucia reserves. The decline of a substantial population in the Loskop Dam Nature Reserve over the past 30 years is cause for concern. This appears to be the result of pollution from higher up the Olifants River although direct evidence is lacking. If this is the case the population in the lowveld could in time also decline as all rivers have their headwaters in more inhabited regions. All development should be closely monitored. At the present time there are only about 1 000 crocodiles in the Transvaal outside of the KNP. Estimates for the park are in the order of 5 000 with another approximately 2 000 in Natal (Blake, *pers. comm.).*

Threats: Habitat destruction and competition with man for the same resources. Alleged incompatibility with livestock production. The unseasonal release of large volumes of water from major dams may flood the nesting banks. Exploitation for skins was a threat in the past.

Existing Conservation Measures: The species is protected throughout its range and may only be hunted under cover of a permit or in defence of humans and livestock. Crocodiles are protected in provincial nature and game reserves as well as in the Kruger National Park. They have been recorded from the following conserved areas (Greyling and Huntley, 1984): Kruger National Park; Sodwana/Cape Vidal State Forest; Umfolozi Game Reserve; St Lucia Game Reserve; Itala Nature Reserve; Mkuzi Game Reserve; St Lucia Park; Ndumu Game Reserve; False Bay Nature Reserve; Loskop Dam Nature Reserve; Pongola Nature Reserve; Hans Merensky Nature Reserve; Mkhaya Nature Reserve. A small number were re-introduced into the Dweza Forest Reserve in the Transkei which is a praiseworthy effort.

Breeding Potential in Captivity: Very good. It may provide a reservoir for the re-establishment of the species in suitable habitat.

Recommended Conservation Measures: The large number of crocodile farms in South Africa is a potential source of animals for re-establishment should such measures become necessary and the causal factors of decline be removed. Such ventures should be encouraged by conservation authorities. It is also proposed that sections of selected rivers be protected either by purchase or by agreement with landowners on both banks. This may permit breeding populations to establish themselves as well as protecting a very threatened habitat.

Remarks: Listed as vulnerable in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Laurenti, 1768.

Habitat and Ecology: Pooley, 1962, 1969, 1974, 1977, 1982a,b.

Conservation: Blake and Loveridge, 1975; Cott and Pooley, 1972; Guggisberg, 1972; Groombridge, 1982; Jacobsen, 1984; Jacobsen, Newbery and Petersen, 1986; Loveridge, 1980a; McLachlan, 1978; Pooley, 1973.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

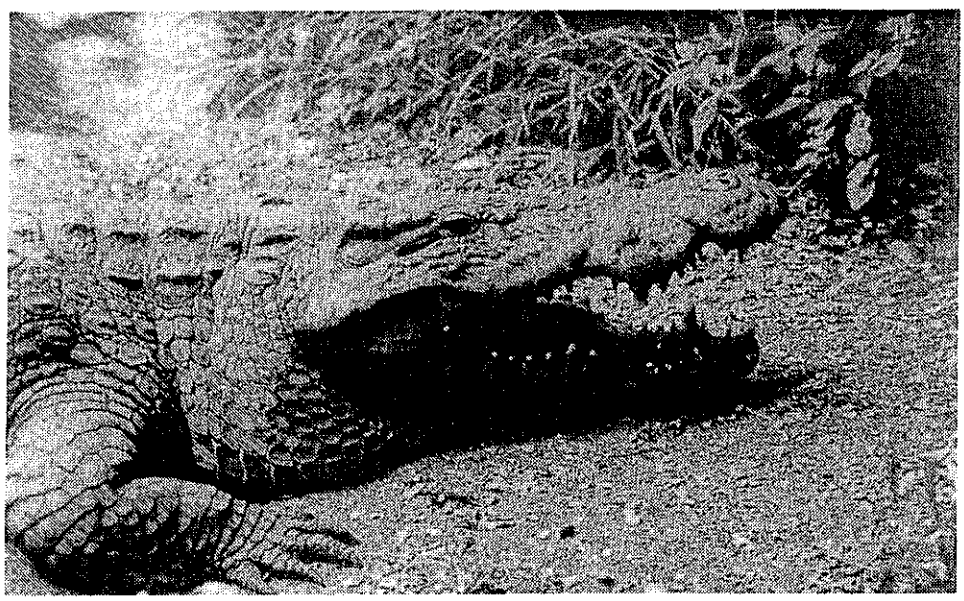
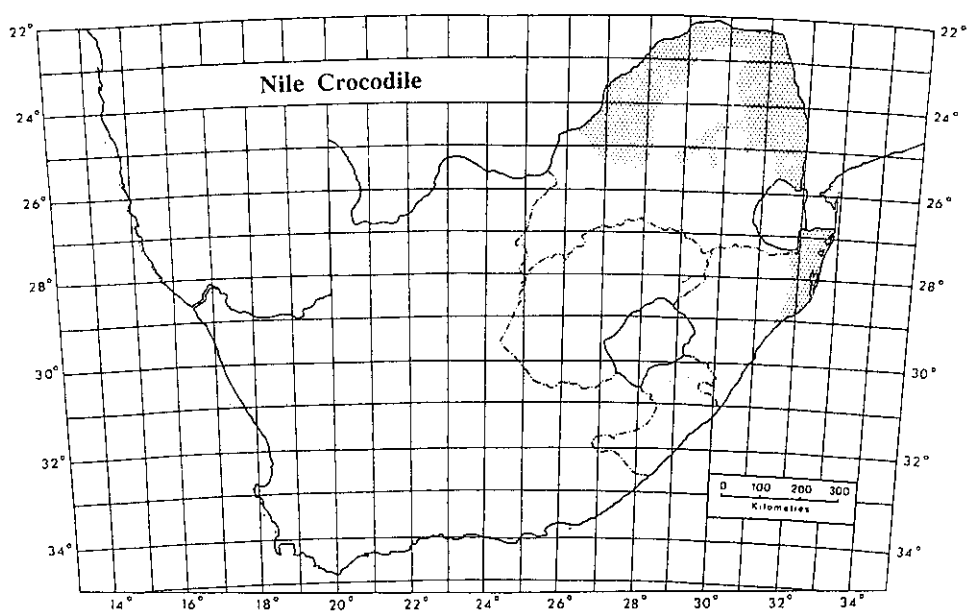


Fig. 26. Nile crocodile *(Crocodylus niloticus)* **Vulnerable.** (N. Jacobsen)



Map. 24. Distribution of the Nile crocodile *(Crocodylus niloticus).*

GOLDEN DWARF REED FROG
Goue Dwerg Riet Padda

International status: NOT LISTED
South African status: RARE

Afrixalus aureus Pickersgill 1984. **Class:** Amphibia, **Order:** Anura, **Family:** Hyperoliidae.

Afrixalus aureus Pickersgill 1984. Three new *Afrixalus* (Anura: Hyperoliidae) from south-eastern Africa. *Durb. Mus. Nov.* 13(17): 206, fig. 1. **Type locality:** Mhlatuze River valley 6km north of Eshowe on the Melmoth road, Natal.

SUMMARY

Status: Rare. A small species, ranging from the Mhlatuze Valley in Natal northwards through the Eastern Transvaal, into Swaziland and southern Mozambique. Available evidence does not indicate any threat to known populations at present.

Research: Surveys in Transvaal (Jacobsen) and Natal (Lambiris) are in progress; a review of dwarf *Afrixalus* spp. is in press (Pickersgill).

SPECIES DATA

Identification: A small (up to 23 mm) frog, light brown to golden yellow dorsally, rarely with a darker blotch on the head and faint vertebral or paravertebral lines; with a broad dark brown lateral band from snout to groin, sometimes extending onto the lateral borders of the upper eye-lids, poorly to well defined, with or without included light speckling; and with a pair of lumbar patches continous with a broad oblique dark brown tibial band on the folded hind leg. Distinguished, with some difficulty, from *Afrixalus delicatus* by the absence of minute spines on the ventral surfaces, apart from scattered spines on the gular disc of males.

Distribution: From the Mhlatuze Valley in Natal northwards into Swaziland, the Eastern Transvaal and southern Mozambique.

Habitat and Ecology: Confined to dry bushveld and grassland at low altitudes. It appears to have less tolerance for wetter regions than most other dwarf *Afrixalus* spp. (Pickersgill, *in press*), but occurs sympatrically with *A. delicatus* in the Ndumu Game Reserve, northern Natal. Breeds in ephemeral pans and small dams, the eggs being laid 4-6 cm above water level in vertically folded blades of grass growing in water.

Breeding: Observed mating in January; about 50 eggs appear to be laid by each female (Lambiris, *unpubl. obser.*).

Remarks: The taxonomy of dwarf *Afrixalus* spp. is in a state of uncertainty and confusion, despite recent work by Pickersgill (1984). Several of the forms recognised by Pickersgill can be distinguished only with great difficulty and, at Ndumu at least, the calls of *A. aureus* and *A. delicatus* appear identical, as are the call and oviposition sites; these taxa may prove to be inseparable from *A. brachycnemis*.

CONSERVATION

Status: Although occurring over a considerable area geographically, only some 45 specimens have been collected to date. No estimates of population numbers exist, but the small number collected, compared with the far greater numbers of specimens of related taxa in museum collections, suggests that this species is not particularly abundant.

Threats: There appears to be little threat to the species at present, especially in northern Zululand (Ndumu Game Reserve is a particularly important area for studies of interspecific variation and possible hybridisation, if Pickersgill's species are valid).

Existing Conservation Measures: Protected in Natal only in game reserves; in the Transvaal, afforded only general protected status under the Provincial Ordinances.

Breeding Potential in Captivity: Unknown. The specialised requirements for oviposition could make captive breeding difficult. The newly metamorphosed froglets are extremely difficult to feed in terraria.

Recommended Conservation Measures:
Protection in existing reserves appears to be adequate. Areas where the species is known to occur in large numbers should be maintained with as little change to the vegetation as possible.

Remarks: If this species is a valid taxon (and not

simply conspecific with *A. brachycnemis*) existing protection within reserves is presently adequate.

BIBLIOGRAPHY

Taxonomy: Poynton, 1964; Pickersgill, 1984; Pickersgill, *in prep.*.

Conservation: Pickersgill, 1984.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.

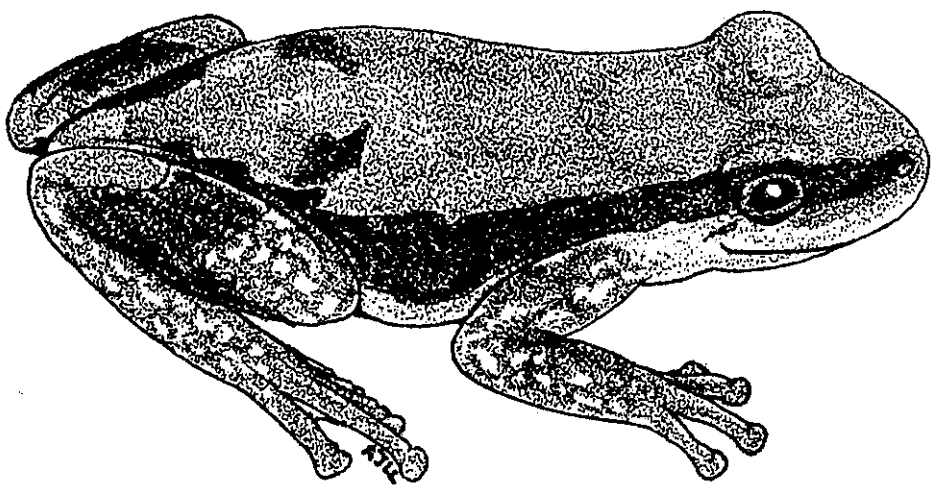
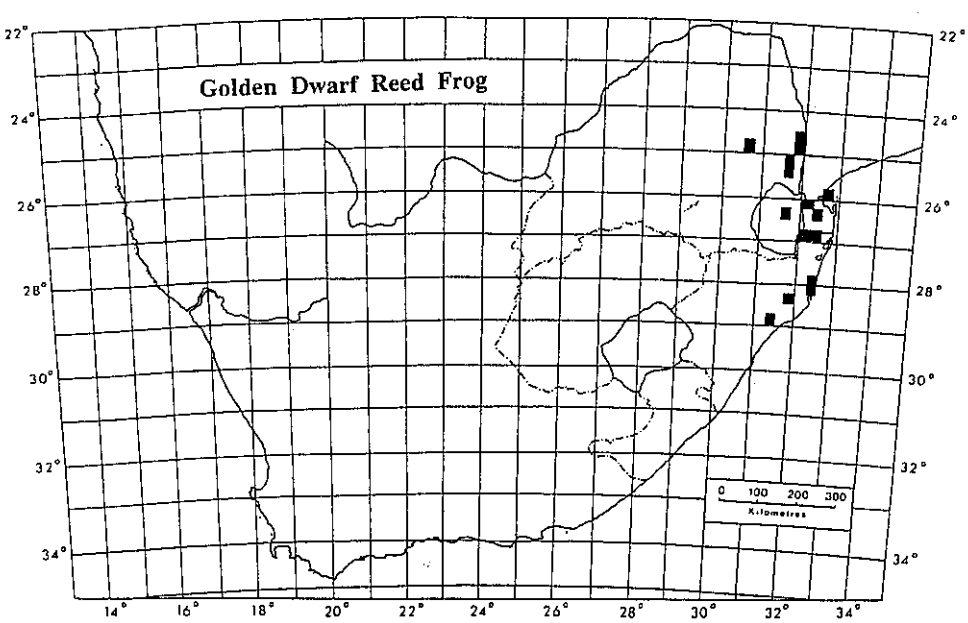


Fig. 27. Golden dwarf reed frog *(Afrixalus aureus)* **Rare.** (A. Lambiris)



Map. 25. Distribution of the golden dwarf reed frog *(Afrixalus aureus).*

PICKERSGILL'S REED FROG **International status:** **NOT LISTED**
Pickersgill se Riet Padda **South African status:** **RARE**

Hyperolius pickersgilli Raw 1982. **Class:** Amphibia, **Order:** Anura, **Family:** Hyperoliidae.

Hyperolius pickersgilli Raw 1982. A new species of Reed Frog (Amphibia: Hyperoliidae) from the coastal lowlands of Natal, South Africa. *Durban Mus. Nov.* 13(9): 117, pl. 1, figs. 1-3. **Type locality:** Avoca, north of Durban, Natal, South Africa.

SUMMARY

Status: Rare. Apparently endemic to the Natal and Zululand coastal lowlands (Raw, 1982). There appears to be little threat to known populations at present.

Research: Little work on this species is being carried out at present, and more needs to be done on distribution, habitat requirements and breeding.

SPECIES DATA

Identification: A small frog showing marked sexual dimorphism. Males (up to 22mm long) and juveniles of both sexes are light to dark brown above, with a bold white to silvery white line, edged blackish brown, from nostril, above upper eyelid, dorsolaterally along body, to groin; concealed portions of legs and feet yellow; ventrum yellowish white to white. Females (up to 30 mm) bright yellowish green on dorsum of head and body, fore-arms and tibiae; a brown canthal mark sometimes present; sides of body, and remaining parts of limbs, yellowish to pale brownish yellow, sharply demarcated from the dorsal colouring by an irregular boundary. Males are very similar to *H. argus* but may be distinguished by the much longer, slower call of *H. pickersgilli*. Females are distinguishable from *H. tuberilinguis* by the sharp, irregular demarcation between dorsal and lateral colouration of *H. pickersgilli*.

Distribution: The Natal and Zululand coastal lowlands, from Warner Beach northwards to St. Lucia Estuary. Currently known from some eight localities.

Habitat and Ecology: Occurs in stagnant, moderately shallow waters, in dense stands of *Cyperus immensus* and reeds. Little is known of its ecology.

Breeding: Males call from August to March. Raw's suggestion (1982) that eggs are laid on vegetation a short distance above water level has been confirmed (Lambiris, *unpub obser.)* although other details of breeding behaviour are still unknown. The consistent preference for breeding in stagnant waters seems to be a point of some significance.

CONSERVATION

Status: Raw (1982) remarks that only a very small proportion of the area covered by the widely scattered recorded localities would include habitats suitable for this species, an observation that has, so far, been supported by current field work. Population estimates are extremely difficult to make in view of the cryptic colouring of these frogs and their tendency to hide in very dense vegetation. On the basis of calling males, it would appear that the species is nowhere common.

Threats: Drainage of stagnant wetlands, especially in canefield areas, could destroy suitable habitats or existing populations not yet discovered. The locality at Avoca could especially be at risk if the swampy patch from which some of the type specimens were taken, is developed for housing.

Existing Conservation Measures: Not protected in Natal, except for any populations that might be found in reserve areas.

Recommended Conservation Measures:
Protection in existing reserve areas (St. Lucia, and possibly in Harold Johnson Nature Reserve) is insufficient, most known populations occurring in areas where protection by Ordinance is not offered. Conservation would be most profitably effected by finding existing populations and encouraging landowners to maintain the environment. The extreme difficulty in finding these cryptic little animals affords considerable protection from collectors.

BIBLIOGRAPHY

Taxonomy: Raw, 1982.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.

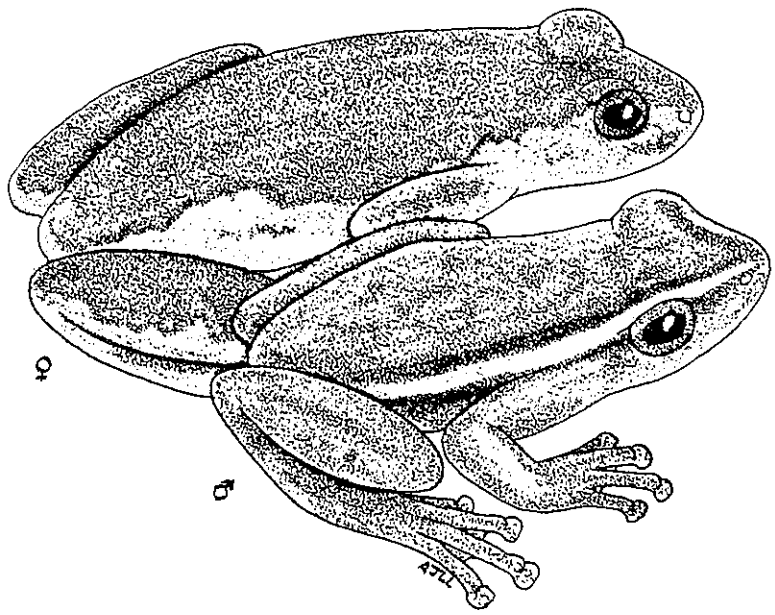
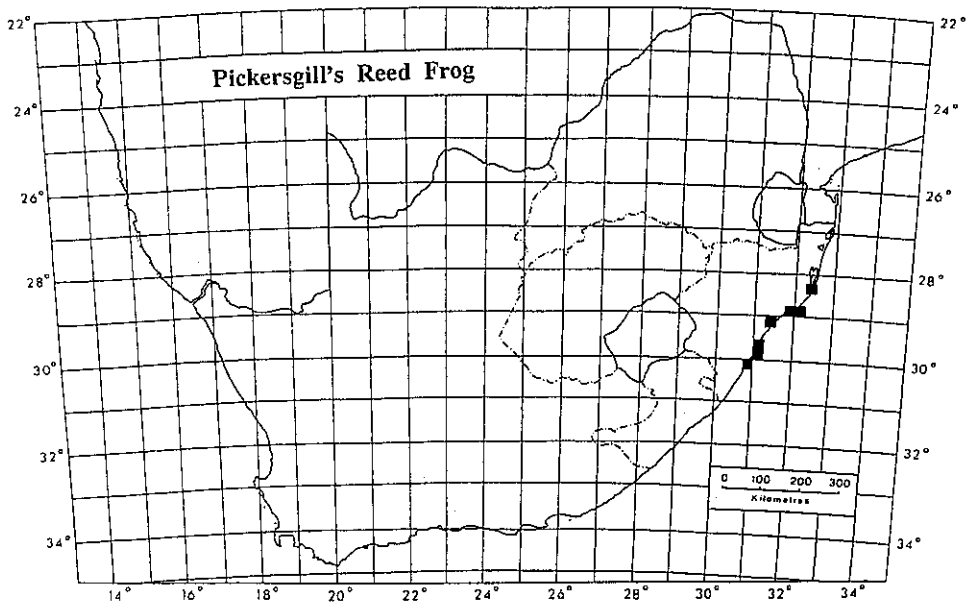


Fig. 28. Pickersgill's reed frog *(Hyperolius pickersgilli)* **Rare.** (A. Lambiris)



Map. 26. Distribution of Pickersgill's reed frog *(Hyperolius pickersgilli).*

NATAL HINGED TORTOISE
Natalse skarnierskilpad

International status: NOT LISTED
South African status: RARE

Kinixys natalensis Hewitt 1935. Class: Reptilia, **Order:** Chelonii, **Family:** Testudinidae.

Kinixys natalensis Hewitt 1935. Some new forms of Batrachians and Reptiles from South Africa. *Rec. Albany Mus.* **4**: 283-357, pl. xxvii-xxxvi. **Type locality:** Jameson Drift and Dimane Stream, Tugela River valley.

SUMMARY

Status: Uncommon. A medium-sized tortoise occurring at high altitude in the Natal Midlands, Zululand, Swaziland and the Eastern Transvaal. Possibly threatened by habitat degradation over parts of its range as a result of human pressure and over utilisation by stock animals.

Research: Fair. Distribution and ecology poorly known.

SPECIES DATA

Identification: A medium-sized tortoise (maximum carapace length 150 mm in females, 120 mm in males). It may be identified from other southern African *Kinixys* by:

1. Its tricuspid beak;
2. broader than long gulars (each gular shield is wider than its length);
3. frequent, partial or total division of the supracaudal shield.

The colour-pattern is of a concentric type, with each shield having alternating dark and light rings, except in old specimens where the pattern becomes less contrasting and more uniform. The plastron in adults (with the exception of very old specimens) has light yellow or pale brown bands along the central and transverse seams between the plastral shields. This can be likened to a tree with laterally extending branches. A characteristic black ring is present on each of the abdominal shields and this tends to be more vivid in females.

Distribution: The species is restricted to the mountainous terrain of the Natal Midlands and Zululand and the Lebombo range along the Swaziland/Mozambique border (Broadley, 1981b). It also occurs in the south-eastern Transvaal, in the vicinity of Piet Retief, and in the Eastern Transvaal from the Komatipoort district northwards to Manyeleti near Hoedspruit (Boycott and Jacobsen, *in press).*

Habitat and Ecology: In Natal and Swaziland the species occurs in valley and mountain bushveld and in mountain thornveld. Its distribution in the Transvaal is associated with granitic outcrops and ridges with tropical arid bushveld vegetation (Boycott and Jacobsen, *in press*). During the day tortoises have been found under rocks on top of the Lebombo range in Swaziland. Captive specimens have been observed eating snails.

Breeding: Nothing known but likely to be similar to other *Kinixys*. On one occasion in captivity, mating behaviour was observed in February.

Remarks: The species was described from sixteen specimens collected in the Tugela river valley (Hewitt, 1935). Loveridge and Williams (1957) recognised only one species of *Kinixys* in southern Africa and placed *K. natalensis* in the synonymy of *K. belliana*. Broadley (1981b) reviewed the *Kinixys* populations in south-eastern Africa and reinstated *K. natalensis* as a valid species. *K. natalensis* is shown as occurring sympatrically with *K. b. belliana* at Manaba and Otobotini, and with *K. b. spekii* near Ressano Garcia (Mozambique) and in Weenen Nature Reserve (Broadley, 1981b). The locality record of *K. b. spekii* from Weenen (Broadley, 1981b) has subsequently been shown to have been based on a mis-labelled specimen and is therefore invalid (Boycott and Jacobsen, *in press*). However, *K. natalensis* does occur sympatrically with *K. b. spekii* further south than Ressano Garcia in the Lebombo range at Mbuluzi Game Reserve and Mlawula Nature Reserve, Swaziland (J. Culverwell, *pers. comm.).*

CONSERVATION

Status: The species is endemic to south-eastern Africa and is probably more common than previously believed.

Threats: At this stage, because of its submergence in the synonymy of *K. b. belliana* for 30 years, not much is known about the ecology of *K. natalensis*. The species is threatened by habitat degradation over parts of its range, such as the Tugela River

valley and the Ubombo District, as a result of human pressure. In parts of its range shifting cultivation is practiced with disastrous consequences to the habitat. In other areas sylviculture is also responsible for loss of habitat. Throughout its range the species is threatened by uncontrolled veld fires which in many areas occur with monotonous regularity.

Existing Conservation Measures: Under Natal and Transvaal Provincial Ordinances the species is afforded general protected status only. In Natal and Swaziland the species occurs in a few game and nature reserves.

Breeding Potential in Captivity: Unknown but probably good. Captive specimens, under the guise of *K. belliana*, have probably been bred in captivity without their true identity being known.

Recommended Conservation Measures: Additional reserves should be proclaimed throughout the species' distribution range and the type locality or portions of it should be incorporated in a conservation area. Consideration should be given to the establishment of captive breeding groups. Initially this should involve specimens of unknown origin (homeless 'pets', escapees and confiscated animals) so that some aspects of the species' ecology can be obtained. Then, if need be, at a later stage 'pure' breeding groups could be established with the purpose of reintroducing the species to former habitats.

Remarks: The species has only recently been recognised as valid (Broadley, 1981b) and there is much to be learned in respect of its habitat, distribution and ecology. Research into these and related fields, and into the captive propagation of this species, should be fully supported.

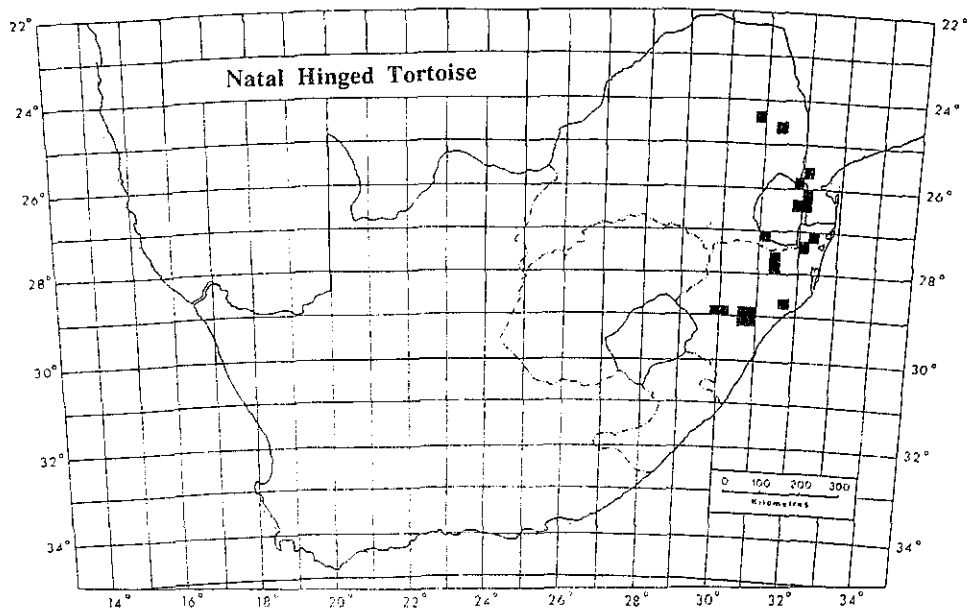
BIBLIOGRAPHY

Taxonomy: Broadley, 1981b; Hewitt, 1935; Loveridge and Williams, 1957.

Distribution: Boycott and Jacobsen, *in press;* Broadley, 1981b.

General: Boycott and Bourquin, 1988; Boycott and Jacobsen, *in press*; Branch, 1988.

Account prepared by: R.C. Boycott, Malolotja Game Reserve, Swaziland.



Map. 27. Distribution of the Natal hinged tortoise *(Kinixys natalensis).*

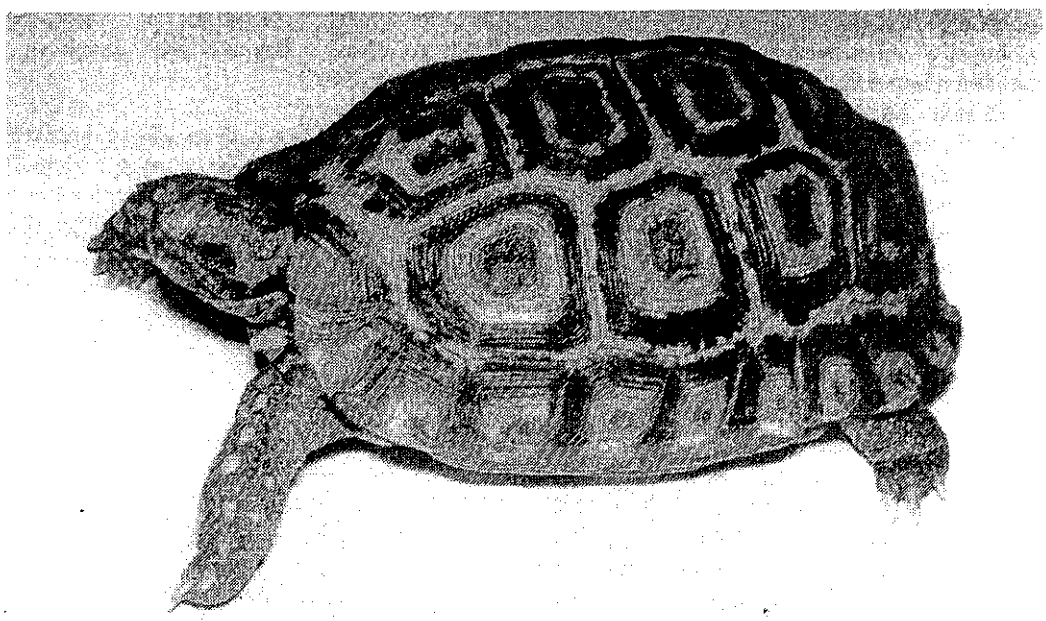


Fig. 29. Natal hinged tortoise *(Kinixys natalensis)* **Rare.** (R. Boycott)

FISK'S HOUSE SNAKE
Fisk se huisslang

International status: NOT LISTED
South African status: RARE

Lamprophis fiskii Boulenger 1887. **Class:** Reptilia, **Suborder:** Serpenetes, **Family:** Colubridae.

Lamprophis fiskii Boulenger, 1887. On a new snake of the genus *Lamprophis* now living in the Society's Gardens. *Proc. Zool. Soc. Lond.* p 318-319, pl. xxxvi. **Type locality:** Touws River, Cape Province.

SUMMARY
Status: A rare, endemic species, threatened by illegal collecting and not recorded from any protected reserve.

Research: A well-defined, distinctive species whose distribution and biology are poorly known.

SPECIES DATA
Identification: A small, thick-bodied house snake with a small head, without a distinct neck, and with a beautiful colour pattern. It can be distinguished by having:

1. No enlarged grooved fangs in the upper jaw;
2. body scales smooth, without apical pits, and in 21-23 rows at midbody;
3. a shortish tail (28-34 subcaudals);
4. a divided anal scale and vertical, elliptical pupil.

The colour pattern is very distinctive, and consists of a lemon yellow back with a double series of alternating large dark brown blotches (that may fuse to form a zigzag pattern). The head is also lemon yellow with symmetrical dark brown markings, and the belly is creamy white.

Distribution: Known from a few, widely-separated localities; central Karoo (Hutchinson), Little Namaqualand (near Steinkopf and Springbok), and south-western Cape (Touws River and Worcester).

Habitat and Ecology: A nocturnal, terrestrial species that feeds on lizards; a wild specimen contained a Burchell's sand lizard (*Pedioplanis burchelli*), whilst captive specimens have taken marbled leaftoed geckos (*Phyllodactylus porphyreus*). Its secretive, nocturnal habits indicate that it may occupy a similar niche to wolf snakes (which are not sympatric), ie. that it specializes on capturing sleeping, diurnal lizards (eg. lacertids and skinks) in their nightime retreats. When disturbed they rapidly coil and uncoil the forebody and tail, similar to some shovelsnout snakes (*Prosymna* spps).

Breeding: Poorly known; a captive specimen from Little Namaqualand laid eight eggs.

CONSERVATION
Status: A rare, endemic species that is not recorded from any protected reserve.

Threats: The effect on the indigenous hepetofauna of the general deterioation of karroid veld from over-grazing is unknown. Many recent specimens, particularly from the central Karoo, have been illegally exported for sale.

Existing Conservation Measures: Protected by Cape Ordinance, but not yet recorded from any protected reserve.

Breeding potential in captivity: Probably poor; most captive specimens have refused to eat or have only taken lizards. Rearing of the small young may require a plentiful supply of small lizards.

Recommended Conservation Measures: The illegal collecting of this beautiful species should be carefully monitored.

Remarks: Treated as rare in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1969, 1983; Marais, 1981; Visser, 1979b.

Habitat and Ecology: Branch, 1984b; Branch, 1988; Visser, 1978.

Conservation: McLachlan, 1978.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

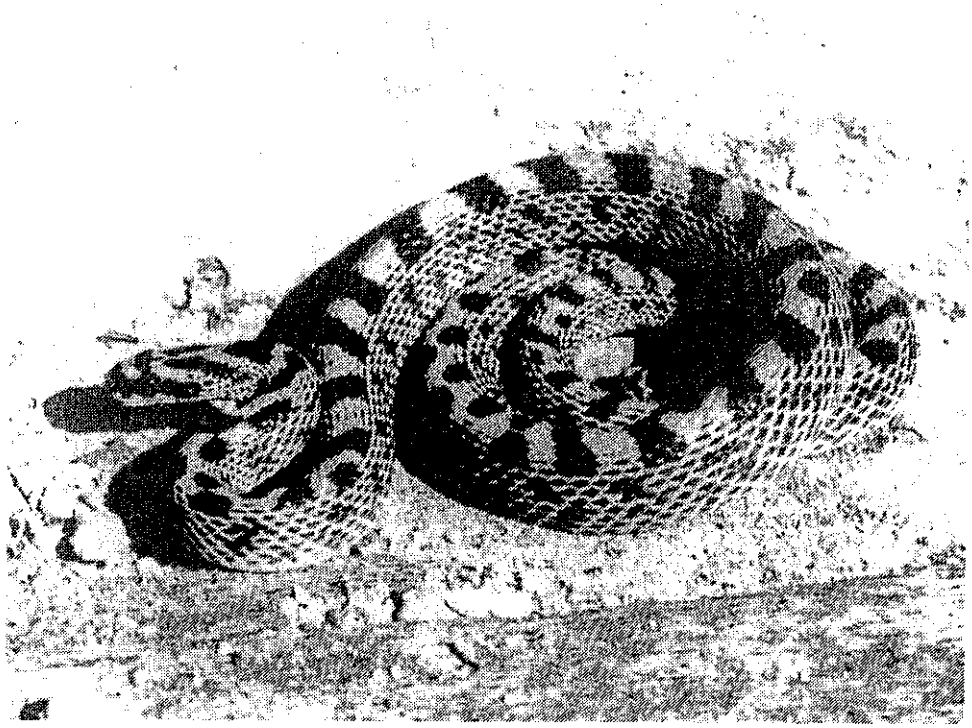
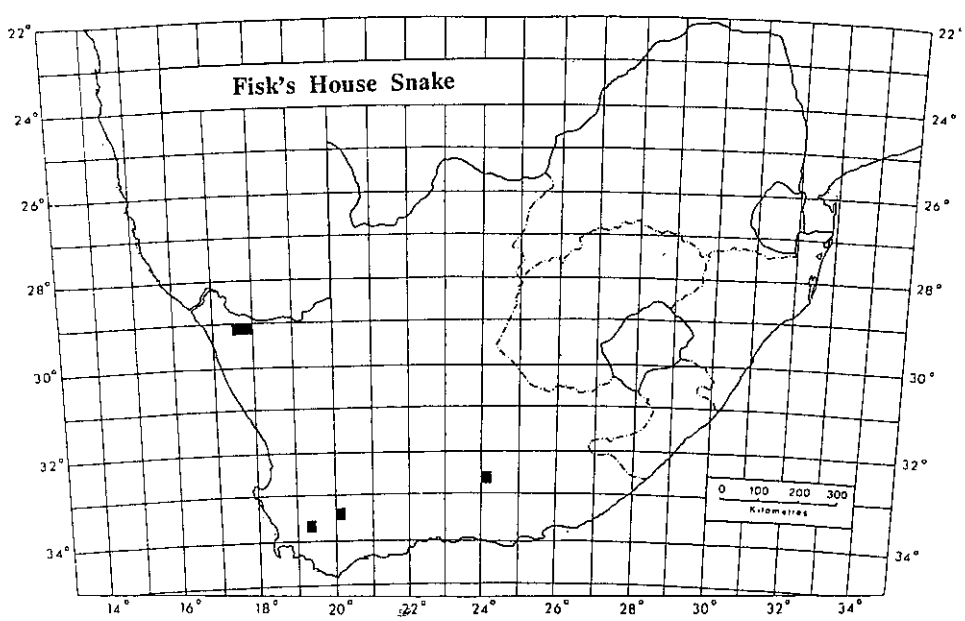


Fig. 30. Fisk's house snake *(Lamprophis fiskii)* **Rare.** (W. R. Branch)



Map. 28. Distribution of Fisk's house snake *(Lamprophis fiskii).*

YELLOWBELLIED HOUSE SNAKE
Geelpens-huisslang

International status: NOT LISTED
South African status: RARE

Lamprophis fuscus Boulenger 1893. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Lamprophis fuscus Boulenger 1893. *Catalogue of the Snakes in the British Museum (Natural History).* **1:** p 322, pl. xx,f.4. **Type locality:** 'Cape of Good Hope'.

SUMMARY

Status: A rare, endemic species known from widely scattered, and varied habitats; but not known to be specifically threatened.

Research: A well defined, distinctive species, whose biology is very poorly known.

SPECIES DATA

Identification: A small (maximum length 60 cm), slender house snake, with a small head without a distinct neck, and a longish tail that tapers to a fine point. It can be distinguished by having:

1. No enlarged fangs in the upper jaw;
2. smooth body scales, without apical pits, in 19 rows at midbody;
3. 56-74 subcaudals;
4. a divided anal scale and vertically ellipical pupil.

The body is a uniform pale olive colour, with the upper lip, two outer body scale rows and belly light yellow, that is brighter on the sides.

Distribution: From the Cape Peninsula, through the Cape Fold mountains, to the grasslands of the Eastern Cape, Transkei, Orange Free State and southern Transvaal.

Habitat and Ecology: A secretive, nocturnal species, that has been collected in old termitaria and under stones. A southern Cape specimen had a common mountain lizard (*Tropidosaura montana*) in its gut.

Breeding: No data; probably oviparous, laying a small clutch of eggs, like other *Lamprophis* spp.

CONSERVATION

Status: Included in the current volume as there are indications that this secretive species is only regionally common, often in grassland areas subject to agricultural use.

Threats: No specific threats are known. The destruction of old termitaria during land clearance and collecting is a threat to this species' favoured habitat.

Existing Conservation Measures: Protected by general legislation in the Cape and Transvaal. Recorded from a number of protected areas, including Table Mountain, the Suurberg National Park, and Giant's Castle Game Reserve.

Breeding Potential in Captivity: Poor; the species rarely settles in captivity and usually refuses to feed.

Recommended Conservation Measures:
Preservation of grassland habitat, including its old termitaria.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1983; De Waal, 1978; Lambiris, 1987; Visser, 1979a.

Habitat and Ecology: Branch, 1984b, 1988.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

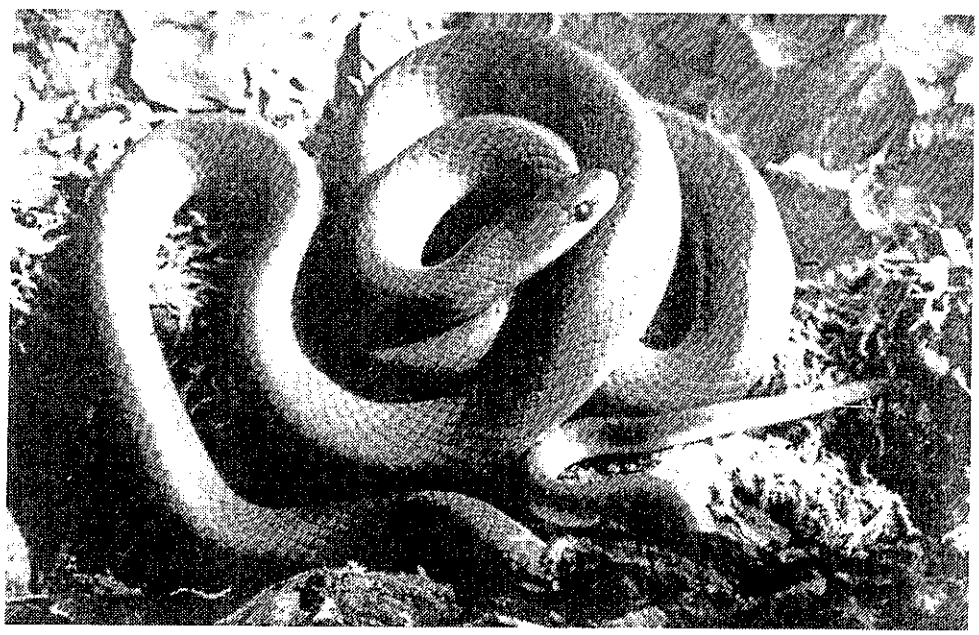
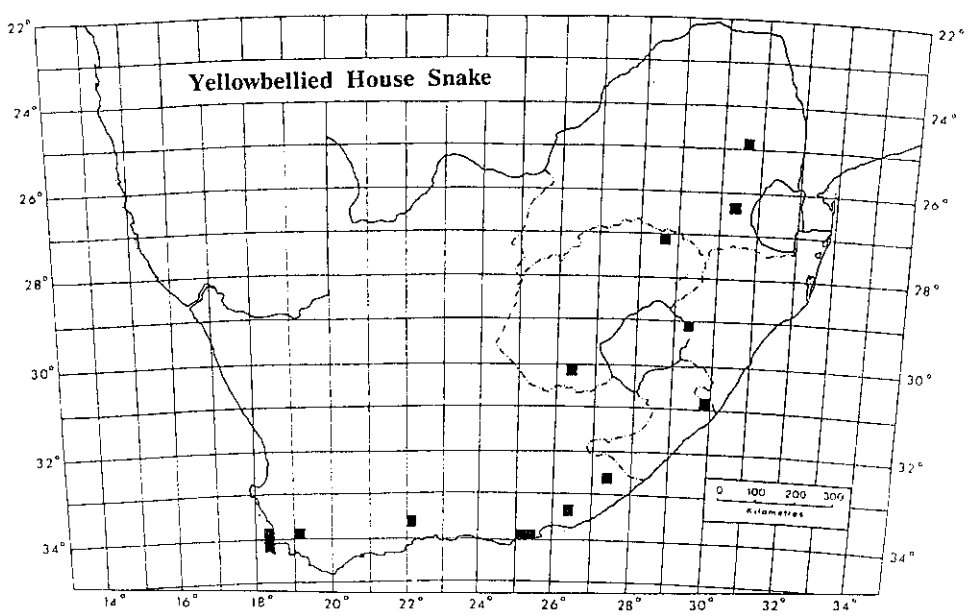


Fig. 31. Yellowbellied house snake *(Lamprophis fuscus)* **Rare.** (W. R. Branch)



Map. 29. Distribution of the yellowbellied house snake *(Lamprophis fuscus).*

SWAZI ROCK SNAKE — **International status:** NOT LISTED
Swazi-rotsslang — **South African status:** RARE

Lamprophis swazicus Schaefer 1970. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Lamprophis swazicus Schaefer, 1970. A new species of House snake from Swaziland, with notes on the status of the two genera *Lamprophis* and *Boaedon*. *Ann. Cape Prov. Mus. (Nat. Hist.)* **8:** 205-208. **Type locality:** Forbes Reef, Swaziland.

SUMMARY

Status: Rare. A poorly known species restricted to the eastern escarpment of the Transvaal and Swaziland.

Research: Its taxonomy and biology are both poorly known, and require extra studies.

SPECIES DATA

Identification: A thin, medium-size (maximum length 84 cm) snake with a small, flat head, distinct neck and long tail. It can further be distinguished by having:

1. Smooth body scales, with a single apical pit, and in 17 rows at midbody;
2. large eyes with vertical pupils;
3. and no enlarged fangs in the mouth.

The body and head are uniform beige to dark red-brown, fading to creamy white on the belly.

Distribution: Restricted to the eastern escarpment of the Transvaal and western Swaziland.

Habitat and Ecology: The few specimens collected have been found under rock slabs on rock outcrops. Its slender build and prominent eyes suggest nocturnal habits. Captive specimens climb readily, are nocturnal and have taken geckos. A wild specimen had a bird feather in its gut.

Breeding: A large female (84 cm total length) collected in October contained seven elongate eggs (29-36 mm x 10-13 mm).

Remarks: The generic relationships of this species are uncertain. Although placed in the genus *Lamprophis*, its build is somewhat atypical for a house snake and is more reminiscent of some boigines (eg. *Telescopus* and *Dipsadoboa*). However, hemipenial and chromosomal morphology confirm its boaedontine affinities (Branch, *unpub. obser.*).

CONSERVATION

Status: A rare, endemic species, not currently threatened.

Threats: No specific threats have been identified. The development of exotic plantations along the eastern Transvaal escarpment may cause local problems.

Existing Conservation Measures: Protected by recent Transvaal Ordinance (1983). Recorded from Malolotja Nature Reserve (Greyling and Huntley, 1984).

Breeding Potential in Captivity: Poor; although probably ammenable to captive husbandry, its low fecundity and small hatchling size may limit the availability of captive-bred progeny.

Recommended Conservation Measures: Not currently threatened. Protection of areas of pristine habitat is necessary.

Remarks: Treated as rare (Peripheral) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Schaefer, 1970; Broadley, 1983.

Habitat and Ecology: Branch, 1984b; Branch, 1988; Visser, 1979b.

Conservation: McLachlan, 1978.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

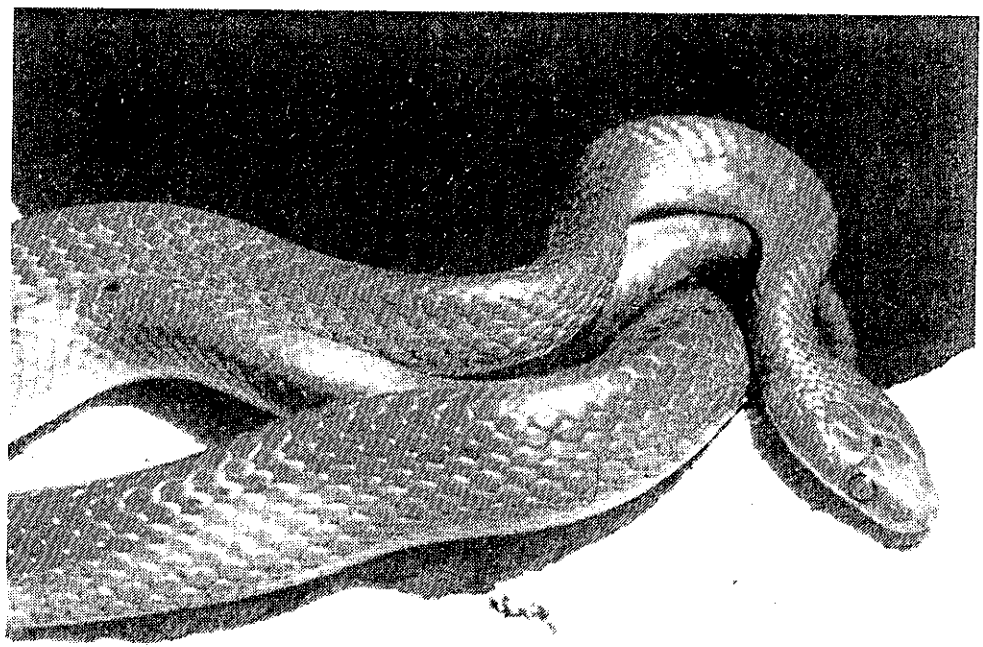
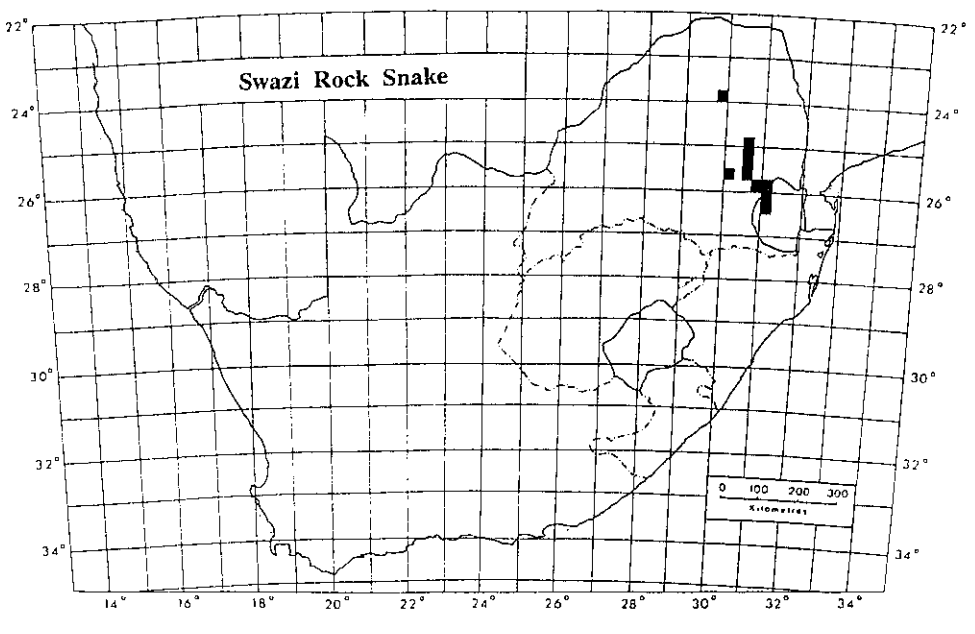


Fig. 32 Swazi rock snake *(Lamprophis swazicus)* **Rare.** (W. R. Branch)



Map. 30. Distribution of the Swazi rock snake *(Lamprophis swazicus).*

STRIPED HARLEQUIN SNAKE **International status:** NOT LISTED
Streep-kousbandjie **South African status:** RARE

Homosorelaps dorsalis (A. Smith 1849) **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Elaps dorsalis A. Smith, 1849. *Illustrations of the Zoology of South Africa. Reptiles*. Appendix p 21. **Type locality:** 'Kaffirland and the country towards Port Natal'.

SUMMARY

Status: Rare. Endemic to South Africa and recorded from a number of widely-scattered localities. Much of its habitat is in areas of extensive agricultural usage, but there is no evidence of population declines.

Research: Taxonomy, distribution, biology and habitat requirements are all poorly known and require further study.

SPECIES DATA

Identification: A minute (maximum length 31 cm), slender snake with small head that is hardly distinct from the neck, a short tail, and a characterisic colour pattern. It can also be distinguished by:

1. Presence of small, fixed fangs at the front of the upper jaw;
2. absence of a loreal scale;
3. smooth body scales, without apical pits and in 15 rows at midbody;
4. ventrals 210-239, subcaudals 22-33.

The body is black above with a conspicuous yellow vertebral stripe, extending from the tip of the snout to the tip of the tail. The chin and throat are white to pale yellow passing to bright yellow on the belly and underside of the tail.

Distribution: Through the grasslands of the Transvaal and Orange Free State, extending into western Swaziland and Natal.

Habitat and Ecology: Usually collected in old termitaria or under stones in grassveld. Diet unknown, but possibly consisting of thread snakes (*Leptotyphlops* spp.).

Breeding: No details, but they probably lay small clutches of eggs like the majority of atractaspines (or elapines, see remarks).

Remarks: This genus, which contains one other endemic South African species , *H. lacteus*, is of problematic taxonomic affinity. Previously allied with cobras and mambas and placed in the genus *Elaps* (type genus of the Family Elapidae), they have recently been allied with a number of other African burrowing snakes, including *Atractaspis, Aparallactus, Amblyodipsas, Xenocalamus,* etc. This is not universally accepted (see Kochva and Wollberg, 1970, and a fuller discussion in Branch, 1979, 1982; Savitsky, 1979 and McCartney, 1985).

CONSERVATION

Status: A rare, poorly-known species, recorded from a number of protected reserves.

Threats: No specific threats identified, although the extensive clearance of land for agricultural use in much of its range may pose a threat.

Existing Conservation Measures: Protected by provincial ordinances, and recorded from a number of protected reserves (eg. Hluhluwe Game Reserve, Suikerbosrand Nature Reserve, Percy Fyfe Nature Reserve, Abe Bailey Nature Reserve and Willem Pretorius Game Reserve.

Breeding Potential in Captivity: Very poor due to minute size and specialised diet.

Recommended Conservation Measures: None required at the moment. Attempts should be made to identify local populations and to determine basic aspects of the species' biology.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Branch, 1979, 1982b; Broadley, 1983; Hitchins. 1972; Kochva and Wollberg, 1970; McCartney, 1985; McDowell, 1968; Savitsky, 1979.

Habitat and Ecology: Branch, 1988; Broadley, 1983; De Waal, 1978.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood.

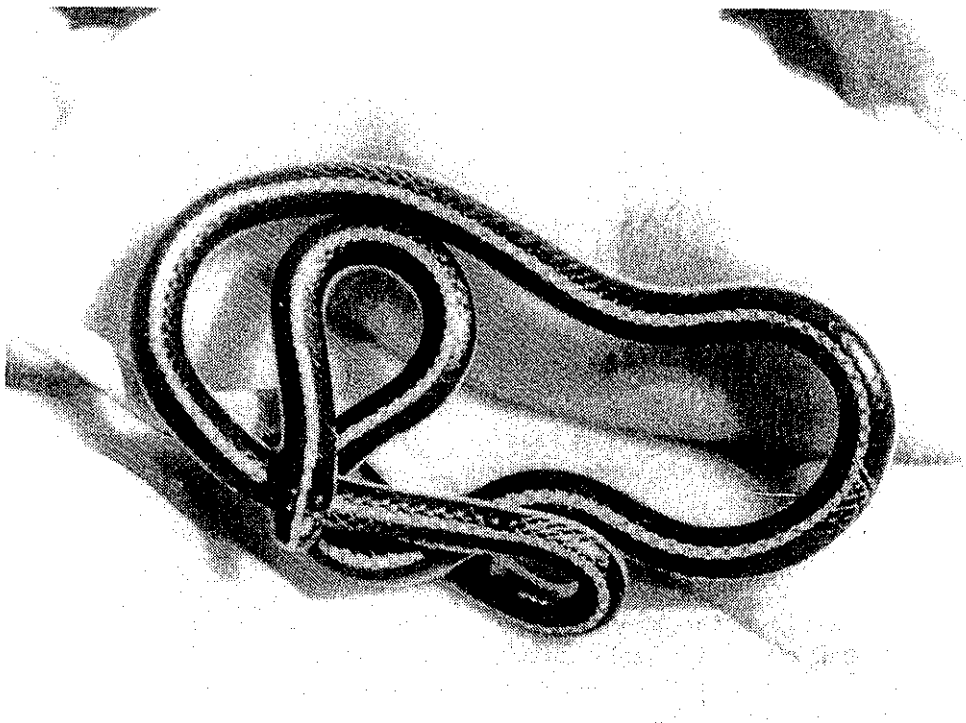
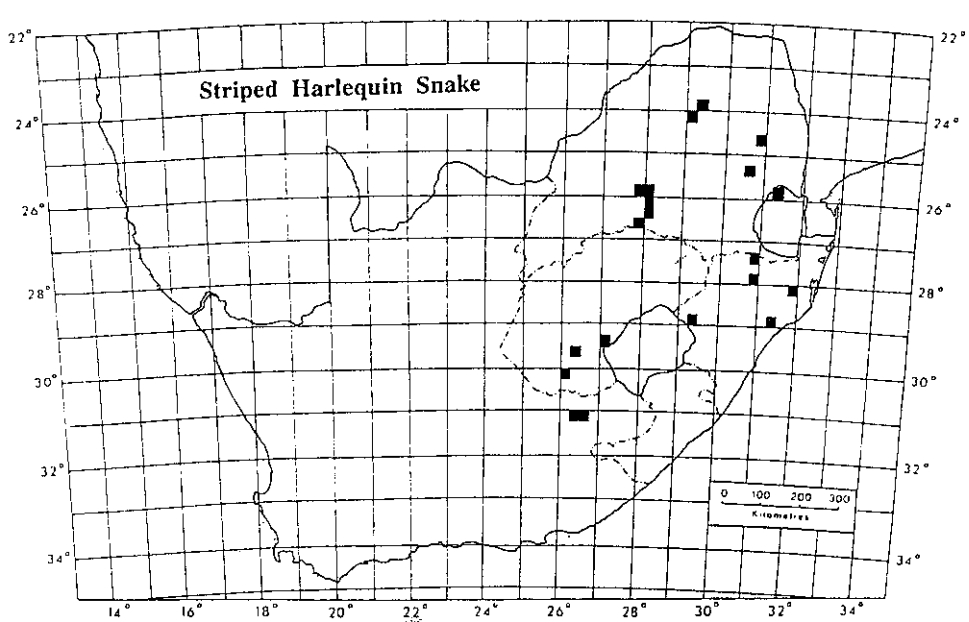


Fig. 33. Striped harlequin snake *(Homoroselaps dorsalis)* **Rare.** (W. R. Branch)



Map. 31. Distribution of the striped harlequin snake *(Homoroselaps dorsalis).*

TRANSVAAL QUILLSNOUT SNAKE **International status:** NOT LISTED
Transvaalse spitsneusslang **South African status:** RARE

Xenocalamus transvaalensis Methuen 1919. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** olubridae.

Xenocalamus transvaalensis Methuen, 1919. Description of a new snake from the Transvaal, together with a diagnosis and key to the genus *Xenocalamus* and of some batrachia from Madagascar. *Proc. Zool. Soc. London*: 350. **Type locality:** Njelele river within 25 miles of Limpopo river, N. Transvaal.

SUMMARY

Status: Rare. A slender fossorial species occurring in the northern Transvaal, southern Mozambique and northern Zululand. Known from a few specimens mostly recorded from Zululand.

Research: Poor. More extensive surveys needed to establish the species habitat requirements and total range.

SPECIES DATA

Identification: A small slender (maximum size 414 mm TL) snake characterised by slender pointed head and snout. Colour variable with Mozambique forms having a black dorsal band 9-13 scales wide with ventrum white, blotched with black (Zululand) or heavily infuscated with brown (Transvaal). A photograph of a living specimen from Zululand (W.D. Haacke) shows the dorsal scales to be edged with yellow giving a checkered appearance. Ventrally the specimen is yellow. It appears therefore that the colour description in FitzSimon's Snakes of Southern Africa is based on specimens in which the original colour may have faded.

Distribution: Northern Transvaal through southern Mozambique and northern Zululand. Sandy soil appears to be a prerequisite for the species.

Breeding: Oviparous; one female contained two eggs.

Remarks: A poorly known species.

CONSERVATION

Status: Although widespread less than 10 specimens have been collected. This could be a reflection of its fossorial habits, although considerable modification of its habitat has also taken place particularly along the Limpopo River where large stretches of land are used for agriculture. No estimates of population numbers are possible.

Threats: Conversion of land for agriculture appears to be the only known threat. Until more is known of its habitat requirements little can be said.

Existing Conservation Measures: The species is afforded general protected status under the Transvaal Provincial Ordinance. It is protected in the Ndumu Game Reserve and may well occur in the Messina Nature Reserve (Greyling and Huntley, 1984).

Breeding Potential in Captivity: Not known but probably poor.

Recommended Conservation Measures: It is necessary for additional surveys to be conducted in order to determine the full range of the species and its specific habitat requirements in order to make management recommendations.

Remarks: A high priority species. Listed as Rare (restricted) in previous Red Data Book (McLachlan, 1978)

BIBLIOGRAPHY

Taxonomy: Methuen, 1919; FitzSimons, 1962; Broadley, 1971; Broadley, 1983.

Conservation: McLachlan, 1978; Jacobsen and Haacke, 1980; Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

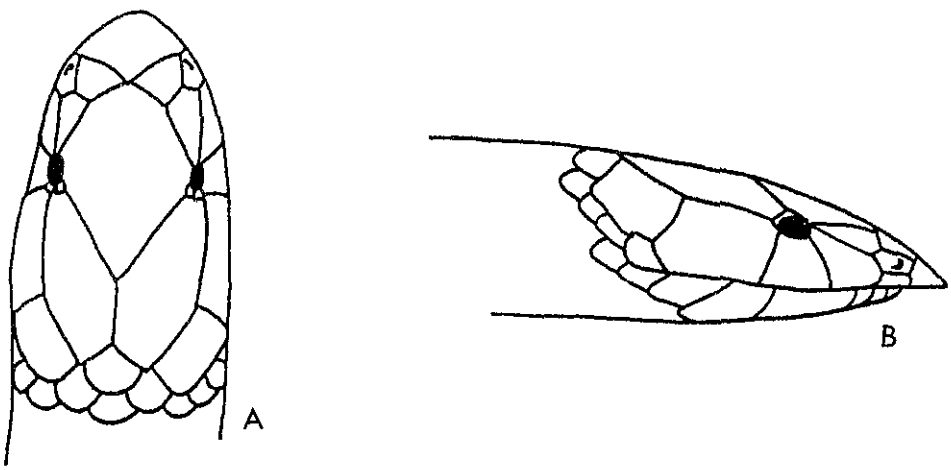
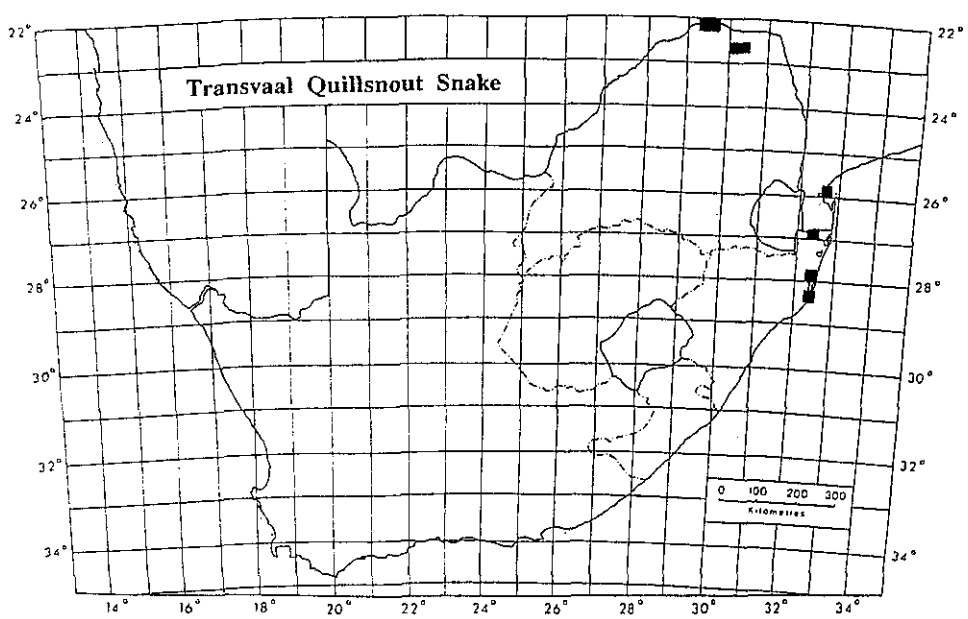


Fig. 34. Transvaal quillsnout snake *(Xenocalamus transvaalensis)* **Rare.** (det. N. Jacobsen)
A, top of head; **B,** side view of head.



Map. 32. Distribution of the Transvaal quillsnout snake *(Xenocalamus transvaalensis).*

BLACK SPITTING COBRA **International status:** NOT LISTED
Swart-spoegkobra **South African status:** RARE

Naja nigricollis woodi Pringle 1955. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Elapidae

Naja nigricollis woodi Pringle 1955. A new subspecies of the spitting Cobra *Naja nigricollis* Reinhardt from the Cape Province. *Ann. Natal Mus.* **13:** 253-254. **Type locality:** Citrusdal, Cape Province (amended as "Keerom, 29km south of Citrusdal, western Cape Province" by Boycott and Haacke, 1979).

SUMMARY
Status: Rare. The subspecies is quite widespread in southern Africa, its range extends from southern central Namibia to Porterville in the south-western Cape. These snakes are not plentiful in any particular area and are not often seen.

Research: Fair. Its distribution is fairly well known while its ecology is poorly known.

SPECIES DATA
Identification: A large spitting cobra (attaining a maximum total length of 1,8 m) that can be distinguished from all other South African cobras by its uniform black coloration above and below. Juveniles are grey with the head and neck and the entire ventral surface black.

Distribution: The black spitting cobra occurs in southern Namibia from the vicinity of the Namib Desert Park southwards through Great and Little Namaqualand, extending as far east as Prieska, to Porterville in the south-western Cape (Boycott and Haacke, 1979).

Habitat and Ecology: The subspecies occurs in the semi-arid regions of the western Cape and favours rocky terrain. Several sightings of these snakes were made over a three year period in Aninauspas where the main road between Steinkopf and Port Nolloth passes through mountainous terrain (I. Fairbrother, *pers. comm.*). They have also been found along dry, rocky watercourses in parts of Little Namaqualand and in some low-lying valleys in the Cedarberg mountains (*pers. obs.*). The species is often active during the day. Diet includes amphibians (*Bufo sp.*) and rodents (Boycott and Haacke, 1979).

Breeding: Nothing recorded. At Transvaal Snake Park and in other collections *Naja mossambica* has been known to hybridise with *Naja nigricollis nigricincta* (Marais and Liebenberg, 1980; R. Patterson, *pers. comm.*).

Remarks: *Naja nigricollis woodi* was described from three specimens (Pringle, 1955) and together with *N. mossambica* was considered a subspecies of *N. nigricollis* by FitzSimons (1962). Broadley (1968) separated *N. mossambica* and *N. nigricollis* and provisionally placed *woodi* and *nigricincta* as subspecies of *N. mossambica*. Later Broadley (1974) placed *woodi* and *nigricincta* as subspecies of *N. nigricollis*.

The type locality of *N. n. woodi* "Citrusdal" (Pringle, 1955; FitzSimons, 1962) was amended to "Keerom, 29km south of Citrusdal, on the upper reaches of the Olifants River, western Cape Province" by Boycott and Haacke (1979). Despite being known to science for more than thirty years this subspecies is poorly known and is represented in South African museums by less than 20 specimens (Boycott and Haacke, 1979; Broadley, 1983).

CONSERVATION
Status: The subspecies is widespread in southern Africa but only occasionally encountered.

Threats: Apart from the usual human tendency to destroy snakes on sight it is unlikely that these snakes are threatened by anything else.

Existing Conservation Measures: None. Cape Provincial Nature Conservation Ordinance only affords non-venomous snakes general protection. This subspecies probably occurs in the Hester Malan Provincial Nature Reserve and in parts of the Cedarberg Wilderness Area.

Breeding Potential in Captivity: Unknown but probably poor under current southern African reptile management techniques. The confinement in captivity of such large snakes is bound to induce considerable stress in captives and will undoubtedly affect breeding success. Although there are exceptions, these snakes generally do not do well in captivity (*pers. obs.* and J. Wood, *pers. comm.*).

Recommended Conservation Measures: It should be afforded general protected status under Cape Provincial Nature Conservation Ordinance.

Remarks: Ecological studies on this subspecies should be encouraged. The species was not included in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Broadley, 1968, 1974; FitzSimons, 1962; Pringle, 1955.

Distribution: Boycott and Haacke, 1979; Broadley, 1983; FitzSimons, 1962.

Habitat and Ecology: Boycott and Haacke, 1979; Branch, 1988; Marais and Liebenberg, 1980.

Account prepared by: R.C. Boycott, Malolotja Game Reserve, Swaziland.

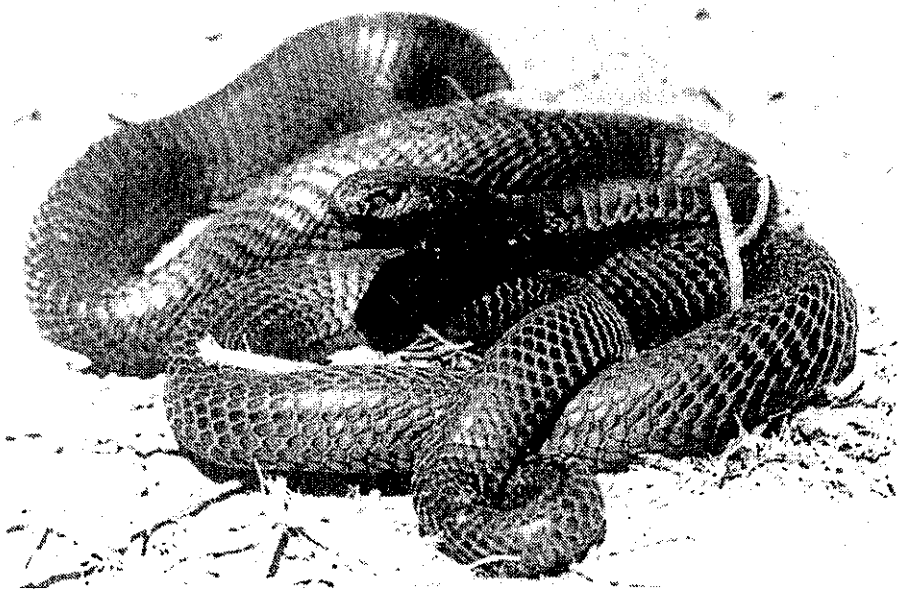
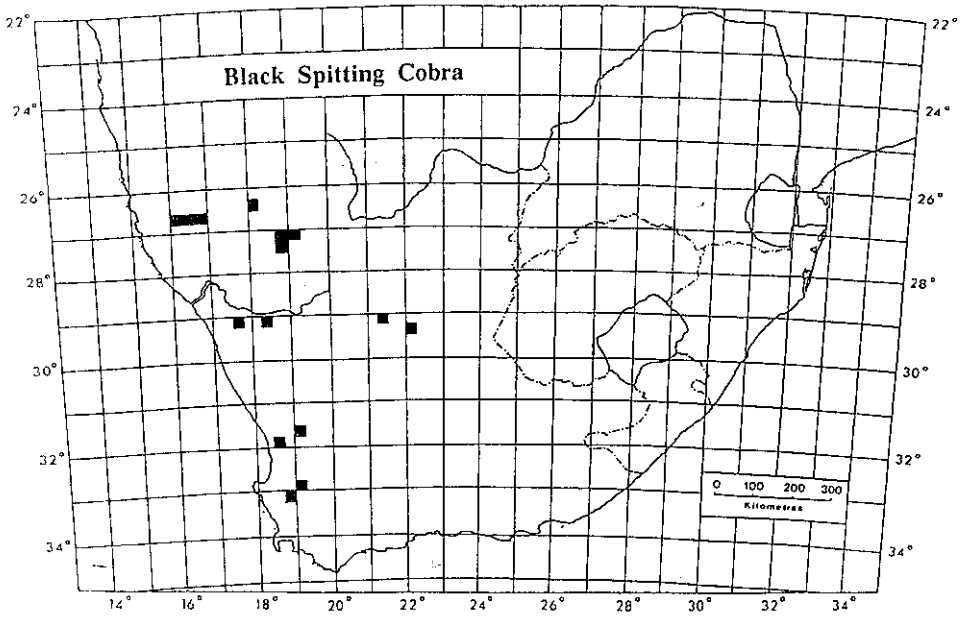


Fig. 35. Black spitting cobra *(Naja nigricollis woodi)* **Rare.** (R. Boycott)



Map. 33. Distribution of the black spitting cobra *(Naja nigricollis woodi).*

GÜNTHER'S DWARF BURROWING SKINK
Günther se dwerg-grawende skink

International status: NOT LISTED
South African status: RARE

Scelotes guentheri Boulenger 1887. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Scelotes guentheri Boulenger, 1887. *Catalogue of the Lizards in the British Museum (natural History).* 3: 414. **Type locality:** "Port Natal".

SUMMARY
Status: Rare. A small species endemic to Natal and probably restricted to the Natal Midlands. Habitat threatened by urban development, plantations of alien species and habitat-destructive agricultural practices.

Research: Poor. More extensive distribution surveys are necessary; its taxonomic status should be reviewed, and life cycle data are required.

SPECIES DATA
Identification : A small (maximum size 210 mm TL) burrowing skink distinguished by having:

1. No forelimbs and only minute budlike monodactyle hindlimbs;
2. four supraoculars;
3. and 20 scales around the mid-body.

Dorsal colour is pale brown to greyish-brown with a darker spot on each scale. Ventral colour immaculate whitish, with brown spots on each caudal scale.

Distribution: Apparently restricted to an area of about 2 250 sq km, from Karkloof in the north, Howick in the east, Nottingham Road in the west and Dargle in the south. The species has not been found in the type locality (Port Natal = Durban) since its discovery there over 100 years ago, and there are doubts as to the validity of the locality.

Habitat and Ecology: Inhabits primary and secondary grasslands at altitudes of 950 to 1 250 m above sea level, under rocks and logs, usually near water bodies, and probably requires damp, or soft soils in which to burrow. Uses burrows in which to escape danger, and sheds its tail fairly readily when handled roughly. The diet is unknown, but probably consists of small invertebrates.

Breeding: Only one record of five developing embryos, 3-5 mm in diameter, being found on 7 June 1969.

Remarks: Research is required to clarify the taxonomic status of the species, which has been confused with *Scelotes brevipes* Hewitt 1925 on several occasions. Raw (1973) considered that certain features noted by FitzSimons (1943) as being characteristic of *S. guentheri* (e.g. absence of enlarged preanal scales, presence of small postnasal) may not be characteristic of the species. An examination of the known specimens in South Africa is being carried out (Haacke, *pers. comm.).*

CONSERVATION
Status: The species has a restricted range in Natal, and is known from 12 specimens, including the type. One of these specimens is in a private collection. No estimates of population numbers exist.

Threats: Within the species' known range the grassland habitat has been disturbed or destroyed to some degree. However, the remaining areas do not appear to be greatly threatened at present. Sylviculture, ploughing, road building, dam building and urbanisation have all contributed to the destruction of grasslands. Changes to grassland (e.g. from climax secondary grassland and from indigenous to alien grasslands) may not make too much difference to the distribution provided adequate microhabitats exist. Specimens have been found in both alien and secondary grasslands.

Existing Conservation Measures: The species is protected in one Natal Parks Board nature reserve (Midmar), but is otherwise not afforded legislative protection.

Breeding Potential in Captivity: Unknown, but probably poor.

Recommended Conservation Measures:
Deliberate establishment of suitable cover in the Midmar Reserve should be undertaken. Further searches for the species should be undertaken in other protected areas of suitable habitats, and also to establish possible range extensions. Where possible known localities should not be disturbed.

Remarks: An examination of existing specimens of *Scelotes* from the Natal Midlands should be pooled to establish taxonomic status. Two specimens of *Scelotes brevipes* have been recorded adjacent to the known range of *S. guentheri*, but as yet sympatry has not been proven. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Boulenger, 1887; FitzSimons, 1943; Raw, 1973.

Account prepared by: O. Bourquin, Natal Parks Board.

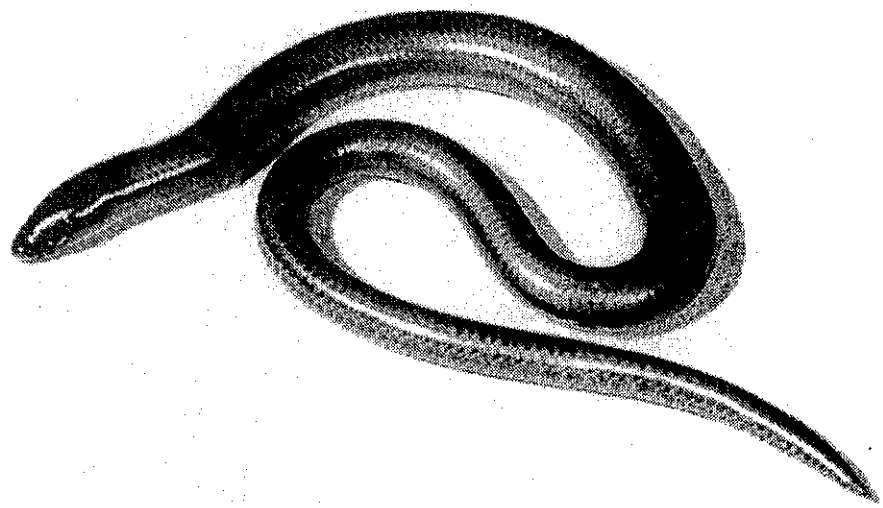
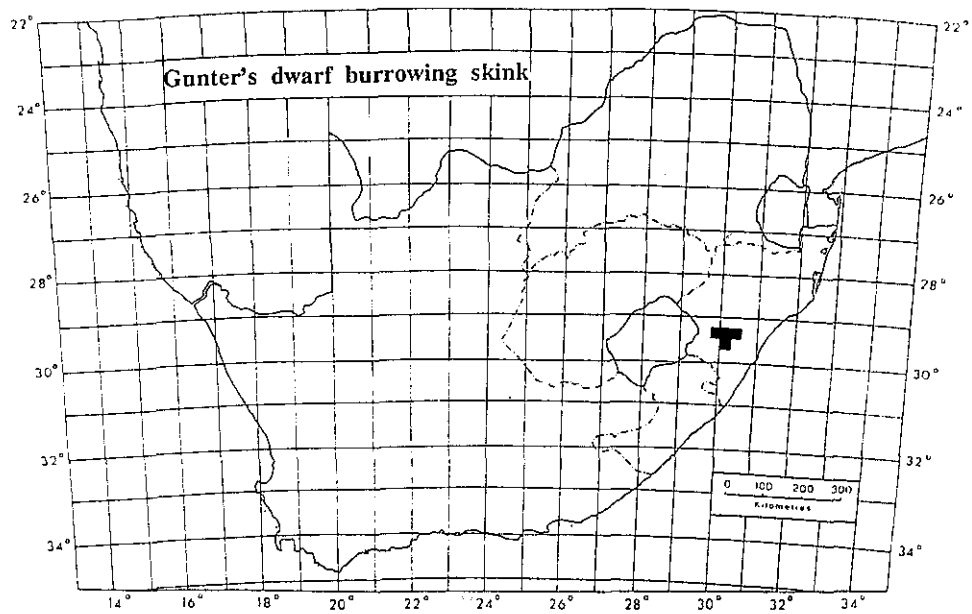


Fig. 36. Günter's dwarf burrowing skink *(Scelotes guentheri)* **Rare.** (W. Haacke)



Map. 34. Distribution of Günter's dwarf burrowing skink *(Scelotes guentheri).*

BREYER'S LONGTAILED SEPS
Breyer se langstertseps

International status: NOT LISTED
South African status: RARE

Tetradactylus breyeri Roux 1907. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Tetradactylus breyeri Roux, 1907. Beiträge zur Kenntnis der Fauna von Süd-Afrika. Ergebnisse einer Reise von Prof. Max Weber im Jahre 1894. VII Lacertilia (Eidechsen). *Zool. Jahrb. Syst.* 25: 430. **Type locality:** Transvaal.

SUMMARY

Status: Rare. A slender lizard occurring in grassland areas from the Eastern Transvaal into northern and central Natal. Rarely seen and probably adversely affected by habitat destruction and recurrent veldfires.

Research: Poor. More extensive surveys are needed to establish habitat requirements and the effects of frequent burning and grazing.

SPECIES DATA

Identification: A slender serpentiform lizard with minute limbs. Forelimbs didactyle. Hindlimbs monodactyle. Colour: Olive brown above with darker longitudinal stripes along vertebral rows of scales and also a marked dorsolateral dark brown streak from nape to base of tail. Head dark spotted above with a series of dark brown to black vertical bars on the side of the neck. Below olive-green to olive-yellow.

Distribution: The species occurs in the grasslands of the Eastern Transvaal and northern and central Natal. Has also been recorded in the north-eastern Orange Free State.

Habitat and Ecology: Probably requires extensive stands of grass. One specimen was found under a stone in short, grazed grassland with intermittent stands of taller species.

Breeding: Probably oviparous. Other species have been recorded as laying two eggs at a time.

Remarks: A poorly known species. The single specimen from Zwartkoppies in the Orange Free State appears to be aberrant, differing in several respects from the typical form. This may represent a new subspecies (De Waal, 1978).

CONSERVATION

Status: The species has an extensive range. Despite this there are relatively few specimens in museums. This may be a result of specialised habitat requirements. The highveld of the Transvaal and the middleveld of Natal have been subjected to large scale modification. Extensive areas of maize lands as well as other crops are in existence. Coupled with heavy grazing of the remaining areas which leaves little shelter for these lizards, extensive population reduction must have resulted. Added to this are the annual and bi-annual veldfires used by the farmers to provide green forage for their livestock. It is therefore not surprising that this species is considered rare. J. Hurter has located a population on the Mt. Sheba Nature Reserve which is promising.

Threats: See previous section. Extensive habitat destruction, livestock and uncontrolled burning are a threat to the species.

Existing Conservation Measures: The species is protected under the Transvaal Provincial Ordinance. It may occur on several provincial nature reserves such as Ohrigstad Dam, Blyde, Sterkspruit and Pilgrims Rest as it has been found on the Mount Sheba Nature Reserve.

Breeding Potential in Captivity : Probably difficult.

Recommended Conservation Measures: More detailed surveys with details of habitat preferences are very necessary. The effect of fires on the species needs to be evaluated.

Remarks: A high priority species. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Roux, 1907; FitzSimons, 1943; De Waal, 1978.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

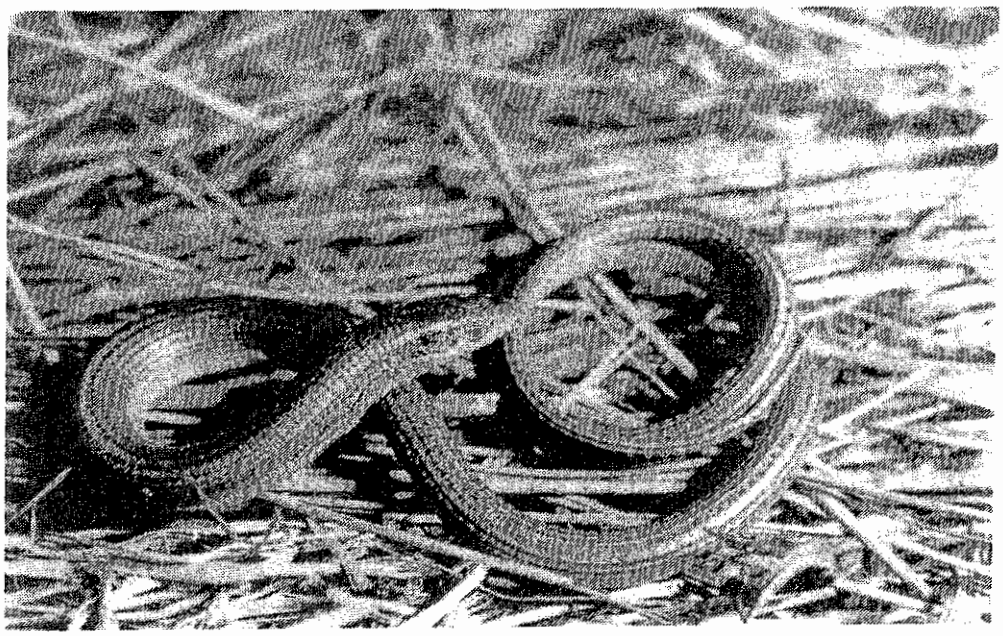
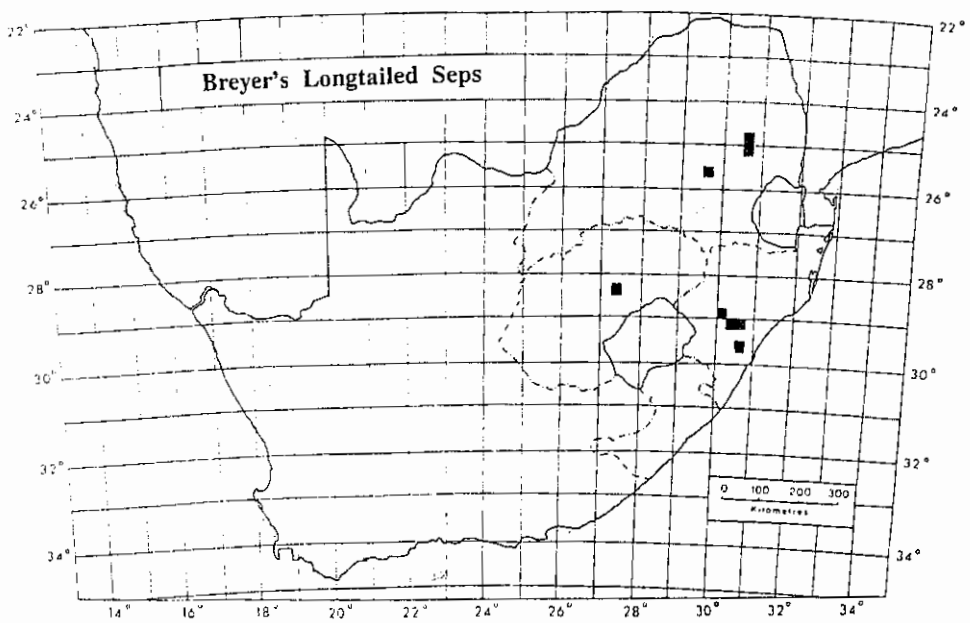


Fig. 37. Breyer's longtailed seps *(Tetradactylus breyeri)* **Rare.** (N. Jacobsen)



Map. 35. Distribution of Breyer's longtailed seps *(Tetradactylus breyeri).*

NAMAQUA PLATED LIZARD
Namakwa-pantserakkedis

International status: NOT LISTED
South African status: RARE

Gerrhosaurus typicus (A. Smith 1836). **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Pleurotuchus typicus A. Smith, 1836. The characters of two new genera of South African reptiles with descriptions of species belonging to each. *Mag. Zool. Bot. (Jardine)*, 1837 **1**: 143. **Type locality:** Dry sandy flats of Little Namaqualand.

SUMMARY

Status: Rare. Although occurring over a wide range, few specimens have been collected.

Research: None.

SPECIES DATA

Identification: A medium-sized *Gerrhosaurus* with only 10 rows of ventrals. Tympanic shield large and crescentic. Dorsolateral streak white (dark-edged above), upper body fawn to olive-brown, usually with a few scatted dark spots; sides of body dark brown with a double series of white, vertically elongated white spots. Breeding males with tail carrot red below.

Distribution: From Piquetberg northwards to the Richtersveld; and along the inland escarpment to the Karoo National Park at Beaufort West, the farm Dunedin between Beaufort West and Loxton, and the Karoo Nature Reserve, Graaff Reinet.

Habitat and Ecology: Little recorded. Inhabits dry sandy areas, bare rocky hillsides, and *Acacia* scrub in False Karroid Broken Veld.

Breeding: Little known, but probably oviparous; a gravid female from Graaff Reinet contained five eggs in December.

Remarks: This species may be commoner than collected specimens suggest. All *Gerrhosaurus* are very keen-eyed and retreat to their burrows at the least sign of danger so that it may well have been overlooked, particularly as the central Karoo region is poorly-collected.

CONSERVATION

Status: The species occupies an extensive range but appears to be scarce. Further collecting is needed to establish its range and exact abundance.

Threats: Open-cast mining, diamond mining and copper mining would all destroy the lizard's habitat. However, much of its range is virtually uninhabited, where no mining takes place.

Existing Conservation Measures: None, but it enjoys general protected status under the Cape Provincial Ordinance, and is more specifically protected in a number of reserves (eg. the Hester Malan Nature Reserve, Springbok, the Karoo National Park, Beaufort West, and Karoo Nature Reserve, Graaff Reinet).

Breeding Potential in Captivity: Probably fair.

Recommended Conservation Measures: None necessary but more collecting is necessary to determine its exact range of distribution and abundance.

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1943; Loveridge, 1942.

Distribution: Baard, 1987; Burger, 1988; FitzSimons, 1943.

Habitat and Ecology: Branch, 1988.

Account prepared by: G. R. McLachlan, South African Museum, Cape Town.

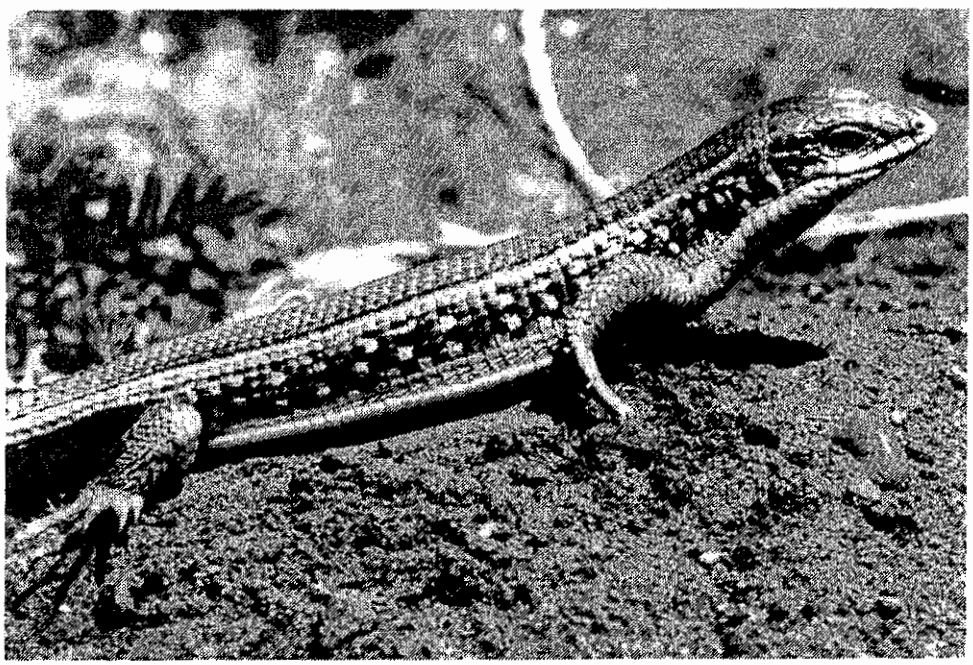
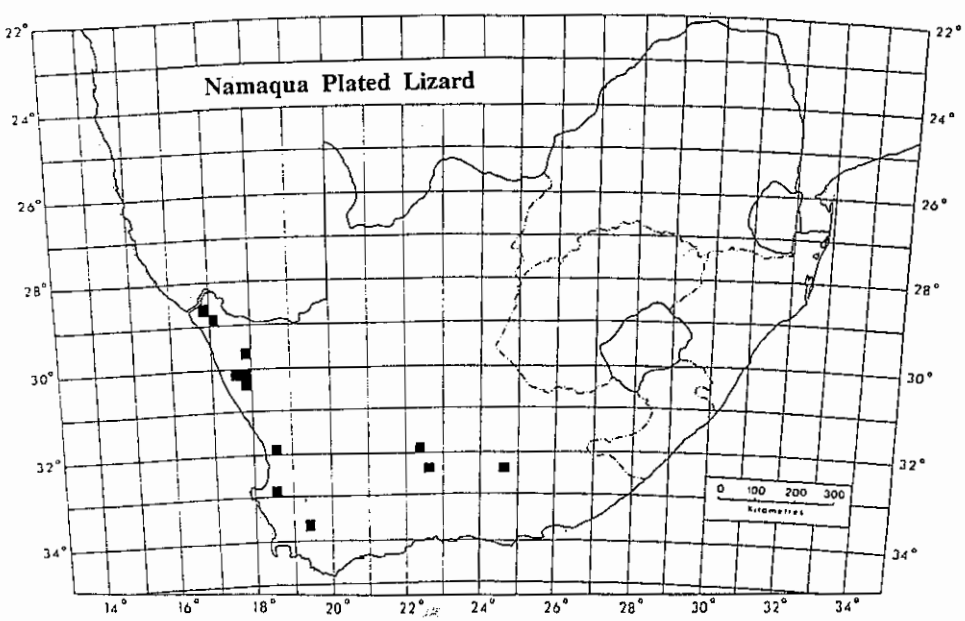


Fig. 38. Namaqua plated lizard *(Gerrhosaurus typicus)* **Rare.** (W. R. Branch)



Map. 36. Distribution of the Namaqua plated lizard *(Gerrhosaurus typicus).*

AMATOLA TOAD
Amatola-skurwepadda

International status: NOT LISTED
South African status: RESTRICTED

Bufo amatolica Hewitt 1925. **Class:** Amphibia, **Order:** Anura, **Family:** Bufonidae.

Bufo angusticeps amatolica Hewitt 1925. On some new species of Reptiles and Amphibians from South Africa. *Rec. Albany Mus.* 3: 343-368, pls. xv-xix. **Type locality:** Amatola Range, near Hogsback.

SUMMARY

Status: Restricted and vulnerable. A medium-sized toad with a very restricted range in the Amatola mountains of the Eastern Cape. The species is threatened by habitat degradation and destruction through the infestation of alien vegetation and forestry.

Research: Poor. Although the distribution has received some attention not much work has been done on the ecology and life history of these toads.

SPECIES DATA

Identification: A medium-sized toad (maximum snout-vent length 35 mm) with well developed parotid glands and numerous small flattened warts on the dorsal surface. The species can be further distinguished by its uniform grey or olive-brown colouration with a distinct pale vertebral line extending down the middle of the back.

Distribution: *Bufo amatolica* has a very restricted range in the Amatola mountains of the Eastern Cape between Katberg and Keiskammahoek. They have been found on the northern and southern slopes of the Amatola Mountains and on top of the range. Recorded localities include the Katberg Pass, Gaika's Kop, Hogsback mountain and the Hogsback settlement. Specimens collected from Fenella Falls, on the western border of the Winterberg suggest that the species may extend over the whole of the grassland plateau of the Winterberg (Branch, *pers. comm.)*

Habitat and Ecology: The species inhabits high altitude grassveld and occurs on the summit of the range at an altitude of 1 800 m where they can be found beneath rocks and logs in rolling grassland. Specimens have been found in and around Hobbiton-on-Hogsback and in the vicinity of the Hogsback Inn (at an altitude of 1 400 m) where they were found under rocks, logs and other debris in patches of open country surrounded by indigenous forest and alien plantations. They are absent from indigenous forest and afforested areas. On the Devil's Bellows of the Katberg they can be found sheltering under the same rocks as *Bufo gariepensis* (Branch, *pers. comm.).*

Breeding: After rain large numbers of toads congregate to breed in temporary pools and in seepage zones on mountain slopes. The eggs, a few hundred per female, are laid at a time in single strings in shallow pools (Wager, 1965).

Remarks: This toad, which superficially resembles *Bufo angusticeps*, was originally described as a subspecies of *B. angusticeps* by Hewitt (1925). Poynton (1964) afforded it specific status and subsequently it has been similarly treated by others (Wager, 1965; Tandy & Keith, 1972; Passmore & Carruthers, 1979). There is little doubt that they are specifically distinct as on call difference alone they can be separated (*pers. obs.*). A population of small grey toads, similar in appearance to *B. amatolica*, occur sympatrically with *Capensibufo tradouwi* on the Kammanassie mountains (Boycott and Branch, *pers. obs.).* Toads resembling *B. angusticeps* have been found at the top of Robinson's Pass between Oudtshoorn and Mossel Bay and on top of the Swartberg Pass (Branch, *pers. comm.*). There is clearly a need for detailed work to be done on the smaller toads occurring in the southern Cape Province, particularly in respect of those occurring on mountain ranges, before their relationship can be fully understood.

CONSERVATION

Status: The species is restricted to the vicinity of the Amatola and Katberg mountains of the Winterberg in the Eastern Cape. Despite its limited distribution, the species is locally quite common and congregates in large numbers to breed.

Threats: These toads are confined to high altitude grassveld and appear to be intolerant of other veld types, including indigenous forest. Forestry poses the greatest threat to their continued survival as it

involves the degradation and destruction of their specific habitat type. One can only speculate about how much of their former habitat has been used for the establishment of alien plantations.

Existing Conservation Measures: The Cape Provincial Nature Conservation Ordinance protects all amphibians in the province but does not provide *B. amatolica* with any extra protection. The species occurs on land controlled by the Department of Forestry and provided the habitat is preserved in a pristine condition the species' future will be more secure.

Breeding Potential in Captivity: Unknown but probably not very good. This should only be considered as a last resort.

Recommended Conservation Measures: The species should be classed as an endangered species under Cape Provincial Nature Conservation Ordinance. At present the species does not occur in any game or nature reserves. Reserves should be proclaimed at suitable locations throughout the Amatola mountain range. Steps should be taken to protect the remaining habitat, whether on State or private land. The encroachment of alien vegetation should also be checked.

Remarks: There seems to be a tendency for greater concern to be shown for the protection of indigenous forest habitats than for anything else. However, the case for *Bufo amatolica* clearly indicates the importance of protecting other habitat types as well. Another endemic frog species, *Anhydrophryne rattrayi*, occurs in the forested habitat of the Amatola mountain range between Katberg and Keiskammahoek, so it is imperative that both habitat types be preserved in as pristine a condition as possible.

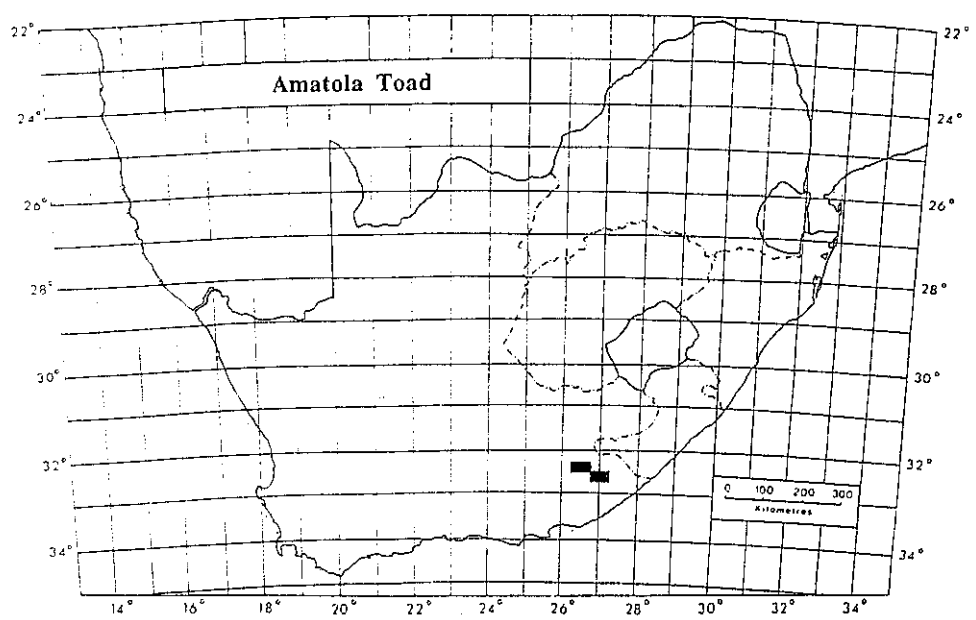
BIBLIOGRAPHY

Taxonomy: Hewitt, 1925; Poynton, 1964; Tandy and Keith, 1972.

Ecology: Wager, 1965, 1986.

General: Passmore and Carruthers, 1979; Wager, 1965, 1986.

Account prepared by: R.C. Boycott, Malolotja Game Reserve, Swaziland.



Map 37. Distribution of the Amatola toad *(Bufo amatolica)*.

CAPE MOUNTAIN TOAD | **International status:** **NOT LISTED**
Kaapse bergskurwepadda | **South African status:** **RESTRICTED**

Capensibufo rosei (Hewitt 1926). **Class:** Amphibia, **Order:** Anura, **Family:** Bufonidae.

Bufo rosei Hewitt, 1926. Descriptions of new and little known lizards and batrachians from South Africa. *Ann. S. Afr. Mus.* 20(6): 413-431, pls. xxxv-xxxvii. **Type locality:** Muizenberg Mountain, Cape Peninsula.

SUMMARY

Status: Restricted and potentially vulnerable. A small toad with a restricted distribution range in the Cape Fold mountains of the south-western Cape. It is threatened by habitat degradation and destruction due to the frequent occurrence of mountain fires, the subsequent encroachment of alien vegetation, and the construction of roads, particularly on the Cape Peninsula.

Research: Good. Taxonomy is stable and ecology is quite well known. More extensive distribution surveys and ecological impact studies are required.

SPECIES DATA

Identification: A small toad (maximum snout-vent length 32 mm in females, 28 mm in males), the body elongate, with the head projecting quite far forward, giving the impression of a long neck. It can be distinguished by having:

1. Parotid glands prominent and elongate, more than twice as long as broad;
2. no tympanum;
3. short hindlimbs, developed more for walking and running than for jumping;
4. unwebbed hindfeet.

The dorsal surface is smooth or granular, and many specimens have irregularly shaped wart-like protuberances scattered over the back and sides, that are usually more conspicuous on the sides.

The body is dark grey or black in colour, with three pale stripes (one vertebral, extending from the snout to the vent; and two lateral). In dark specimens the stripes are ill-defined, although they can become more discernible under dark lighting conditions. The parotid glands are tinged orange-red or red-brown. Some specimens are more attractively mottled in orange, red, grey, white, dark brown and black, often with a thin, bright orange vertebral stripe. The belly is dirty white or pale grey; the eyes are golden brown with a black, oval pupil.

Distribution: Restricted to the Cape Peninsula and a few mountain ranges south and south-west of the Breede River valley. The range shown in Poynton (1964) is a composite of those of *C. rosei* and *C. tradouwi*.

C. rosei was initially described from "Muizenberg Mountain" , although the exact locality has never been determined. Various other, similarly non-specific, localities, including "plateau above Muizenberg", "above Muizenberg" and "above Kalk Bay", have appeared in the literature. During more than a decade of walking in the Kalk Bay and Muizenberg mountains, the author has found suitable habitat at three localities, one in the vicinity of Nellie's Pool (not far from the Muizenberg Cave), and two on the Silvermine plateau (one east of, one west of, Old Cape Road). Due to the frequent occurrence of mountain fires, the encroachment of alien vegetation and the construction of roads and tracks (providing access to a defence force base), which inevitably bring in alien plant seed, none of these localities are suitable any more.

Some earlier *C. rosei* Cape Peninsula records (South African Museum), include "Silvermine Valley" and "Chapman's Peak". It is most unlikely that they still have viable populations as both regions, particularly the former, have been invaded by dense thickets of alien vegetation. Possible indications of population declines can be derived from collecting records. Power and Rose (1929) while discussing adult sizes made mention of "some hundred specimens from Muizenberg plateau". At the locality east of Old Cape Road visited by the author on 29 August 1971 twenty adults, together with spawn, were collected, and at the western locality on 13 August 1972 four or five adults were collected. Two additional adults were found under *Restio* mats in September 1979 (Branch pers. comm.), but these records possibly represent some of the last of the species on Silvermine Plateau. During subsequent visits is has been noticed that the habitat has become seriously degraded and no trace of *C. rosei* could be found.

Habitat and Ecology: *C. rosei* is a fynbos endemic occurring in marshy seepage zones and shallow

seasonal pools in mountainous terrain, that receive between 1500-3000 mm of rain per annum. The species is restricted for the most part to high altitude (500-1500 m a.s.l.), although it has also been recorded from some low lying areas on the southern Cape Peninsula (200 m a.s.l). It is often found in association with *Arthroleptella lightfooti, Strongylopus bonaespei, S. grayii* and *Rana fuscigula.*

Breeding: After diligent searches, Rose (1929) discovered the spawn of *C. rosei* in August 1927 on the summit of Table Mountain. The oviposition site was described as ".... a small pool of rain water, 4 x 2 feet and 4 inches deep, devoid of weeds or plants with a mud substrate.." (Power and Rose, 1929). At other localities clumps of spawn have been found in small, shallow rock pools with a peaty substrate (*pers. obs.*). There are indications that the species is a communal breeder, with scores of males and females gathering to breed. The environmental triggers for breeding are unknown, although Power and Rose (1929) suggest that heavy rain and the formation of temporary pools are partly responsible. A detailed description of the eggs, tadpoles and metamorphosis of *C. rosei* is provided by Power and Rose (1929).

Although *C. rosei* has been collected virtually throughout the year (only March and October are outstanding at this stage), there is little doubt that it is a winter breeder. Breeding adults and spawn have only been obtained in August (Rose, 1929, 1950, 1962; Power and Rose, 1929) and July (Grandison, 1980). Spawn has also been collected on 29 August (*pers. obs.*) so it is possible that the species may also breed in September.

Breeding males have been collected on various occasions, but no calls have been heard. Grandison (1980) has demonstrated a reduction in the ear elements of *C. rosei*, and it is now generally accepted that the species is voiceless. The call described by Passmore and Carruthers (1979) as a "creaking squawk" was recorded in the Cedarberg and is that of *C. tradouwi* and not *C. rosei.* Large mating aggregations are characteristic of earless species, and those of *C. rosei* are considered amongst the densest known (Tandy and Keith, 1972).

Remarks: *Capensibufo rosei* and *C. tradouwi* are allopatric montane bufonids endemic to the Cape Floral Kingdom, both occupying very specific habitats. Aspects of their comparative morphology (Grandison, 1980) suggest that they are early derivatives from the stock that gave rise to certain west and central African montane forest bufonid genera, including *Nectophrynoides*, a viviparous species. *Capensibufo* is therefore not closely related to any of the other South African bufonids, and this emphasizes the importance of safeguarding the species. Dubois (1986) has recently placed *Capensibufo* (along with *Nectophrynoides* and *Didynamipus),* in a separate tribe (Tornieriobatini) within the subfamily Tornieriobatinae.

CONSERVATION

Status: Restricted to the Cape Peninsula and mountains south and west of the Breede River valley and subject to a number of general threats.

Threats: The species occurs in marshy, seepage zones and temporary rain pools, mostly at high altitude, and has not been recorded from other habitats. No specific threats have been identified. General threats include mountain fires, the encroachment of alien vegetation, and road and track construction, all of which interfere with drainage systems and adversely affect marshy areas and seepage zones.

Existing Conservation Measures: The Cape Provincial Nature Conservation Ordinance protects all amphibians, but does not afford any extra protection to *C. rosei.* The species has been recorded from a number of protected areas, including the Cape of Good Hope Nature Reserve, and Table Mountain Nature Reserve in the Cape Peninsula. It possibly occurs in the Silvermine Nature Reserve. Elsewhere, it occurs in the Orothamnus Flower Reserve in the Klein River Mountains and at other localities previously controlled by the Department of Forestry.

Breeding Potential in Captivity: Unknown, but probably good if the correct natural conditions can be simulated. Raising the tadpoles presents few difficulties and has been achieved quite easily (Power and Rose, 1929; Rose, 1929; *pers. obs.*).

Recommended Conservation Measures: Detailed distribution surveys should be conducted throughout the Cape Peninsula to determine the status of the species. The few known localities in the region should be managed as high priority conservation

areas and, where possible, additional nature reserves should be proclaimed. These should be selected in areas that also afford protection to rare and endangered plant species, as has happened, albeit accidentally, with the marsh rose (*Orothamnus zeyheri*) and *Capensibufo rosei* in the Klein River Mountains. Another locality that could afford dual protection is in the vicinity of Franschoek Pass and Villiersdorp, the only known locality for *Erica chrysocodon*.

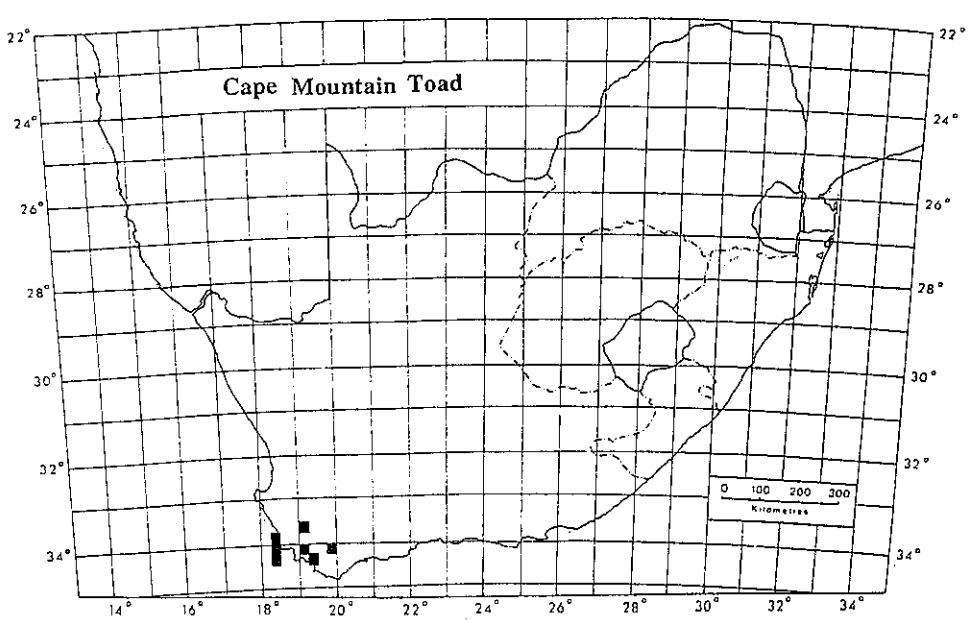
Remarks: Not listed in the previous Red Data Book (McLachlan, 1978). *Capensibufo* is an endemic montane genus, with closest affinities to a few montane forest relict genera in west and central Africa. The urgency for protecting these habitats is emphasised by the imminent description of another new genus and species of ranid frog from the same restricted habitat type in the south-western Cape (Boycott *et al., in prep).*

BIBLIOGRAPHY

Taxonomy and Distribution: Dubois, 1986; Grandison, 1980; Hewitt, 1926a, 1926b; Inger, 1959; Rose, 1926b, 1929; Power, 1929; Poynton, 1964; Tandy and Keith, 1972.

Habitat and Ecology: Grandison, 1980; Rose, 1929, 1950, 1962; Passmore and Carruthers, 1979; Power and Rose, 1929; Tandy and Keith, 1972; Wager, 1965, 1986.

Account prepared by: R. C. Boycott, Malolotja Game Reserve, Swaziland.



Map 38. Distribution of the Cape mountain toad *(Capensibufo rosei).*

DESERT RAIN FROG
Melkpadda

International status: **NOT LISTED**
South African status: **RESTRICTED**

Breviceps macrops Boulenger 1907. **Class:** Amphibia, **Order:** Anura, **Family:** Microhylidae.

Breviceps macrops Boulenger, 1907. Description of a new Engystomatid from of the genus *Breviceps* from Namaqualand. *Ann. Mag. nat. Hist.* Series 7, **20:** 46-47. **Type locality:** None listed, although the specimens were mentioned as coming from Namaqualand.

SUMMARY

Status: Restricted. *B. macrops* displays the typical characteristics of the genus. It is a squat, rotund, short-legged, burrowing frog which is totally independent of free-standing water. The species has a restricted distribution range in the scrub-covered coastal sand-dune strip of arid north-western Namaqualand. The reported presence of *B. macrops* north of the Orange River between Oranjemund and Luderitz in the south-western coastal region of Namibia requires confirmation (Berger Dell'mour, 1987). *B. macrops* is threatened by strip-mining for diamonds through nearly its entire recorded area of distribution but the extent of this threat and the exact conservation status of the species is unknown at this stage. This is to be investigated.

Research: Various observations have been made on this species but little information is available on certain aspects, especially breeding ecology. Further ecological studies and systematic distribution surveys are required.

SPECIES DATA

Identification: A maximum body length of 48,5 mm (measured from tip of snout to vent) has been recorded for the species. It has a squat, rotund body with a short head and flat face and limbs which are short and stumpy. The eye has a horizontal pupil and is large with the interorbital distance being about half the horizontal diameter of the eye. The tympanum is hidden. There is fleshy webbing between the fingers and toes. On the palms of the hands, tubercles are absent. The entire body covering is generally smooth but there is variation as regards colour and markings. Dark brown speckling or more extensive mottling covers the cream to fawn coloured dorsal surface, while the ventral surface is white with a large translucent patch which extends from the region of the forelimbs posteriorly to the hindlimbs. The call (heard in May 1982 and July 1987) can be described as a subdued chirp. Further descriptions of *B. macrops* can be found in Poynton (1964) and Passmore and Curruthers (1979).

Distribution: *B. macrops* has a restricted distribution range along the coastal strip of north-western Namaqualand where specimen records are available from the following localities: Port Nolloth and vicinity situated on quarter of a degree map reference (locus) 2916 BD Port Nolloth and locus 2916 BB Cliffs; Daberas, in the dunes alongside the Holgat river, situated on locus 2816 DD Holgat; and Alexander Bay situated, according to Poynton (1964), on locus 2816 DA Grootderm. The most southerly locality for *B. macrops* is at Kleinsee situated on locus 2917 CA Kleinsee. This was discovered by Channing and Van Wyk (1987) but no specimen records are apparently available. The presence of the species in the south-western coastal region of Namibia requires further investigation and confirmation. A specimen apparently identified as *B. macrops* was discovered north of Oranjemund on locus 2715 DD (Berger-Dell'mour 1987) and Haacke (1975) referred to finding the remains of "presumably *Breviceps macrops*" in the stomach of a *Bitis schneideri* in the Luderitz area.

It is difficult to establish whether the recorded distribution area of the species has reduced noticeably in size through habitat destruction. This is partly due to its remote geographical setting and the fact that it is mostly situated within diamond mining property where access is strictly controlled and not easily obtained.

Habitat and Ecology: The species inhabits scrub-covered coastal sand dunes in the veld type classified as West Coast Strandveld (Acocks 1975). Furthermore, it has mainly been found in white dunes although the dunes at the Daberas locality for instance are reddish in colour. *B. macrops* successfully survives in an environment known for its strong winds and an annual precipitation which seldom exceeds 60 mm. Most of the precipitation comes in the form of regular coastal mists which

are obviously an important source of moisture for the species. During dry and unsuitable conditions, *B. macrops* prevents dessication by burrowing below the surface where the sand retains a certain amount of moisture. The burrowing depth ranges from 50 mm to 200 mm and appears to vary according to weather conditions and the situation of the burrowing site. This is based on both personal observations and those of Carruthers and Passmore (1978). At night when conditions are favourable, the species emerges and forages over fairly wide areas. The distinctive tracks of *B. macrops* were noticed by Carruthers and Passmore (1978) to be abundant around dung heaps and they suggested that these were used as feeding sites. The diet has been found to include beetles (at least four species being recorded) and ants based on an analysis of scat samples (Channing and Van Wyk, 1987)

Breeding: The mating calls have been heard in May and July but other than this nothing has been recorded on the specific breeding habits of the species. The typical breeding pattern of the *Breviceps* genus basically consists of the eggs being laid in special underground nests or burrows. Metamorphosis then takes place inside the egg capsules with the young emerging as fully formed froglets.

Remarks: Poynton (1964) incorrectly concluded that Boulenger (1910) had subsequently given the type locality as "Kolbe". However, Boulenger was referring to Kolbe as the collector of the type specimens and not as the type locality.

CONSERVATION

Status: There is uncertainty regarding the status of *B. macrops*. The species has a restricted distribution range and most of this falls within diamond mining territory where highly destructive strip-mining is widespread. The seriousness and exact extent of this threat is difficult to establish because of lack of information. This is partly due to the remote setting of the species' distribution range and the problems involved in gaining access to diamond mining property. The much more widespread Namaqua rain frog, *B. namaquensis,* has occasionally been misidentified as *B. macrops.*

Threats: The species is threatened by strip-mining for diamonds, coastal township developments and perhaps over-grazing due to stock farming. The diamond mining threat is present through nearly its entire recorded area of distribution.

Existing Conservation Measures: The species is given legal protection on Schedule 2 of the Cape Nature Conservation Ordinance of 1974. It does not occur in any nature reserve at present.

Breeding Potential in Captivity: Unknown at this stage.

Recommended Conservation Measures:
Systematic distribution surveys and further ecological studies are required before the conservation status of the species can be more accurately determined. It is especially important to establish to what extent the diamond mining industry threatens the survival of *B. macrops* and this will influence any conservation recommendations. This is to be investigated.

Remarks: Not included in previous Red Data Book (McLachlan, 1978).

SPECIMEN RECORDS: The following institutions contain specimens of *B. macrops:* South African Museum, Cape Town; Transvaal Museum, Pretoria; Durban Natural History Museum; Natal Museum, Pietermaritzburg; State Museum, Windhoek; CDNEC CP, Jonkershoek Research Station.

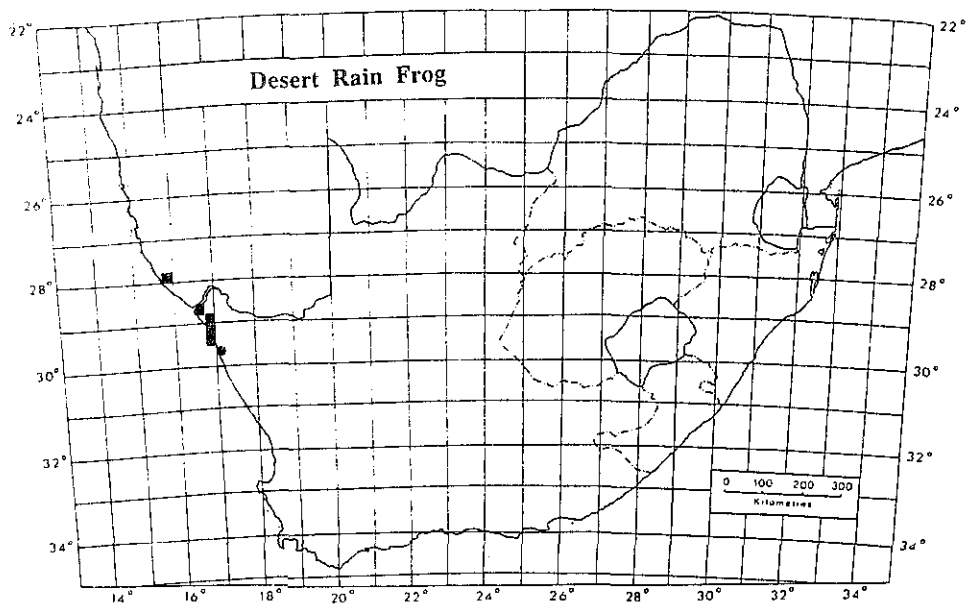
BIBLIOGRAPHY

Taxonomy and Distribution: Berger-Dell'Mour, 1987; Boulenger, 1907, 1910; Channing and Van Wyk, 1987; Haacke, 1975; Passmore and Carruthers, 1979; Poynton, 1964.

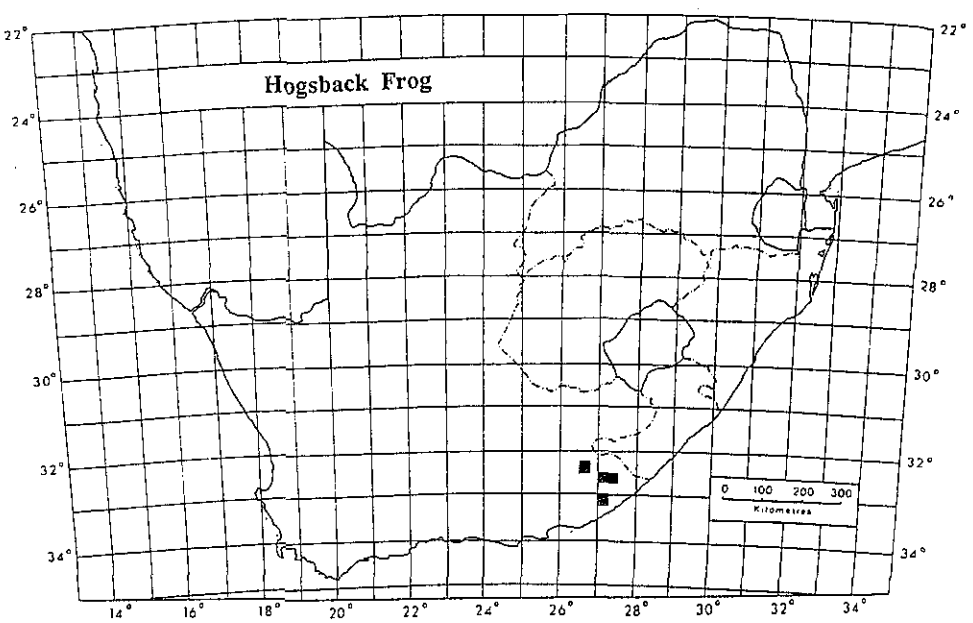
Habitat and Ecology: Acocks, 1975; Carruthers and Passmore, 1978; Channing and Van Wyk, 1987.

Conservation: McLachlan, 1978.

Account prepared by: A. de Villiers, Chief Directorate Nature and Environmental Conservation, Jonkershoek.



Map 39. Distribution of the desert rain frog *(Breviceps macrops).*
■ Specimen records ● Sight records. It is unknown whether its range has declined.



Map 40. Distribution of the Hogsback frog *(Anhydrophryne rattrayi).*

HOGSBACK FROG
Hogsback Padda

International status: NOT LISTED
South African status: RESTRICTED

Anhydrophryne rattrayi Hewitt 1919. **Class:** Amphibia, **Order:** Anura, **Family:** Ranidae.

Anhydrophryne rattrayi Hewitt 1919. *Anhydrophryne rattrayi*, a remarkable new frog from Cape Colony. *Rec. Albany Mus.* 3: 182-189. **Type locality:** Hogsback, Amatola Mountains [Eastern Cape Province].

SUMMARY

Status: Restricted. A small species restricted to a small area centred on the Amatola Mountains, Eastern Cape. Available evidence does not indicate any threat to known populations.

Research: Little work is being done on this species at present. Reviewed by Poynton (1964).

SPECIES DATA

Identification: A small (up to 22 mm) frog, coppery brown to almost blackish brown above, often with a thin, light-coloured vertebral line, and with a few scattered, irregular darker dorsal mottlings; a dark mask is invariably present. Ventrally, white with a variable amount of dark mottling on the abdomen. Toes lack webbing. Distinguished from the superficially similar *Cacosternum n. nanum* by:

1. Lack of heavy dark blotching on throat;
2. Feeble, inconspicuous subarticular tubercles.

Distribution: Forested areas of the Amatola range, Eastern Cape, in the vicinity of the Hogsback mountains (Poynton, 1964: 156); has also been recorded from Katberg and Keiskammahoek (Wager, 1986: 112).

Habitat and Ecology: More or less confined to forest above 1 100 m, occurring in damp leaf litter on the forest floor, near streams; or in small patches of open, short grassy wetlands within forested areas. Although adults are often found in rather wet situations, eggs are laid in areas where waterlogging is unlikely to occur. Appears to be somewhat specialised in feeding behaviour, cryptic arthropods such as *Collembola* appearing to be a major part of the diet (Lambiris, *unpub. obser.).*

Breeding: Up to 19 eggs are laid in underground chambers beneath wet, fallen leaves in shaded areas on wet ground, development being encapsular and taking about 26 days (Wager, 1986).

Remarks: Although there are few morphological characters to distinguish *Anhydrophryne* from *Arthroleptella*, as noted by Poynton (1964: 155), the marked ecological differences appear to warrant generic separation.

CONSERVATION

Status: Restricted. Initially considered rare, it has since been found to be common in forested areas within a small part of the Eastern Cape. No estimates of population numbers appear to have been published; the present author counted over 70 in a grassland/forest ecotone area of about 25 m square near Hogsback Inn, in December 1974; all were found within 30 min. on a cool sunny morning.

Threats: Replacement of indigenous forest with pine plantations could be a potential threat to the species, which appears to prefer excavating its nests under the litter of broad-leaf vegetation.

Existing Conservation Measures: The species is afforded only general protection under the Cape Provincial Ordinances.

Breeding Potential in Captivity: Captive breeding is possible, provided a suitable nesting/oviposition environment is provided (Wager, 1986), but the provision of suitable food, especially for the newly metamorphosed froglets, would be a major practical difficulty.

Recommended Conservation Measures: Although common where found, there are few recorded localities and natural forest on suitably wet ground within these areas should be carefully conserved.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Hewitt, 1919; Poynton, 1964.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.

DRAKENSBERG FROG
Drakensbergse padda

International status: NOT LISTED
South African status: RESTRICTED

Rana dracomontana Channing 1978. **Class:** Amphibia, **Order:** Anura, **Family:** Ranidae.

Rana dracomontana Channing 1978. A new *Rana* from the Lesotho plateau (Amphibia: Anura). *Ann. Natal Mus.* 23(2): 361. **Type locality:** Top of Sani Pass, 2872 metres, Lesotho.

SUMMARY

Status: Restricted. So far collected only from the top of Sani Pass, Lesotho, and the immediate vicinity. Known populations do not appear to be threatened.

Research: A study of the distribution and ecology of this species is in progress, as part of an ongoing survey of western Natal/Lesotho border amphibians (Lambiris, *in prep.*).

SPECIES DATA

Identification: Snout-vent length up to 65 mm; similar to both *Rana angolensis* and *R. fuscigula* in general appearance, being green to brownish green above, with rounded dark brown blotches, about the size of the eye, scattered over the back; a light green mid-dorsal line; and white ventrally, with grey marbling on the throat; backs of thighs motled grey on a pale, but never yellow, background; toes extensively webbed. Separable from the above two species by having:

1. Two phalanges on outer, 1,5 on inner side, of 4th toe free of web (two phalanges on both sides of 4th toe in *R. angolensis*, one on both sides of 4th toe in *R. fuscigula*);
2. width of head 58-66% of tibia length (42-62% in *R. angolensis*, 66-85% in *R. fuscigula*).
3. Slight differences in mating call.

Distribution: Known so far only from the top of Sani Pass and the nearby Manaung [=Mangaun] River and tributaries, Lesotho, but might occur in nearby streams within the Natal border.

Habitat and Ecology: Found in pools and rivers of the Lesotho Plateau at altitudes of nearly 3 000 metres. Details of biology are still incompletely known but appear to be similar in broad outline to those of *R. fuscigula*, although restricted to a much narrower range of microhabitats.

Breeding: Breeding occurs between October and February; about 150 eggs are laid singly, in shallow, quiet water.

CONSERVATION

Status: The true range of this species still needs to be elucidated by further collecting and by careful re-examination of museum specimens from adjacent areas labelled as *R. angolensis* or *R. fuscigula*. No estimates of population numbers exist; the small number collected so far reflects the inaccessibility of the area rather than the paucity of animals.

Threats: There appears to be little threat to the species.

Existing Conservation Measures: No special conservation measures for this species have been taken.

Breeding Potential in Captivity: Unknown, but no difficulties are envisaged.

Recommended Conservation Measures: The relative remoteness of the region and the low human population and activities in the area are unlikely to pose any threat to the species; special measures do not appear to be necessary.

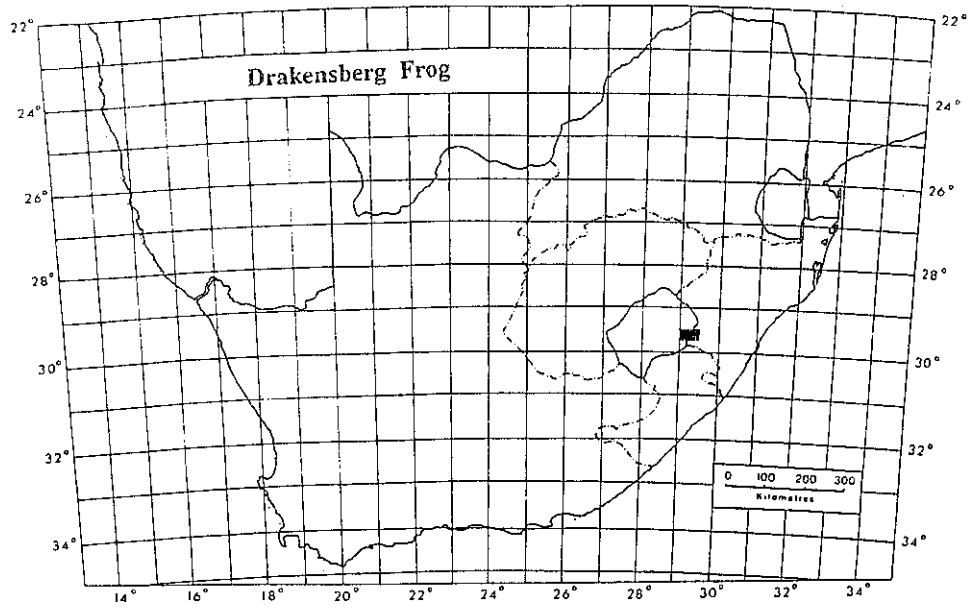
Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

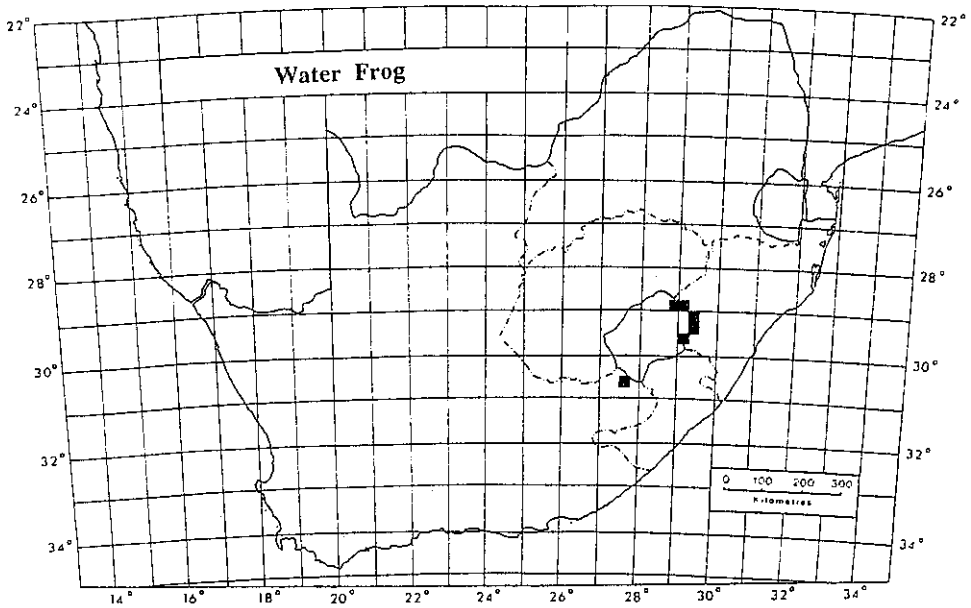
Taxonomy: Channing, 1978, 1979.

Conservation: Channing, 1979.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.



Map 41. Distribution of the Drakensberg frog *(Rana dracomontana).*



Map 42. Distribution of the water frog *(Rana vertebralis).*

WATER FROG
Water padda

International status: NOT LISTED
South African status: RESTRICTED

Rana vertebralis Hewitt 1927, **Class:** Amphibiaa, **Order:** Anura, **Family:** Ranidae.

Rana vertebralis Hewitt, 1927. Further descriptions of reptiles and batrachians from South Africa. *Rec. Albany Mus.* 3: 404, pl. 24, fig. 2, text-fig. 2. **Type locality:** Summit of Mont-aux-Sources.

SUMMARY

Status: Restricted. Confined to the Drakensberg and Lesotho plateau highlands. No threat to known populations at present.

Research: Studies on taxonomy, biogeography and ecology are being undertaken as part of a survey of the amphibians of Natal; the status of *R. umbraculata* is being investigated (Lambiris, *in prep.).*

SPECIES DATA

Identification: A large (140 mm), rather flattened frog with a large, broad head; prominent eyes with a pupillary umbraculum; lower jaw with tricuspid symphysial prominences; and powerful limbs, the hind feet being fully webbed. Dorsum greenish grey to brown, with indistinct spotting, blotches or mottling; ventrally, white with dark grey vermiculations, especially on the throat and chest. Distinguished by:

1. Broad, flat head;
2. large prominent eyes with pupillary umbraculum;
3. fully webbed toes;
4. tricuspid lower jaw.

Distribution: Drakensberg and Lesotho plateau highlands, from Rhodes in the south, to Mont-aux-Sources in the north.

Habitat and Ecology: Alpine streams, at altitudes up to 3 000 m. Predominantly aquatic, rarely emerging from water, where it may remain submerged for days at a time. Prey includes gastropods and small crustacea, which may be consumed underwater. Juveniles are less aquatic, foraging in water margins (Branch, *pers. comm.)*

Breeding: Breeds from mid-September to February, the eggs being attached to submerged vegetation in quiet pools or shallow, very slow-moving streams. Tadpoles require cold, well-oxygenated water and considerable quantities of animal matter in their diet (infusoria initially, and scavenged debris in later stages of development) for successful metamorphosis; they show signs of hyperthermic distress at temperatures approaching 8°C (Lambiris, *unpub. obser.).*

Remarks: Poynton's relegation of *Rana umbraculata* Bush, 1952, to the synonymy of *R. vertebralis* appears to be justified on morphological grounds, but Van Dijk (1966: 259) separated tadpoles of "*umbraculata*?" from those of *vertebralis* on the basis of keratodont, spiracular opening and neuromast organ characters; these differences appear to be valid as far as tadpole populations are concerned, and the status of *R. umbraculata* requires further investigation. Dubois (1986) has placed *R. vertebralis* and *R. umbraculata* in a separate subgenus *Amietia.*

CONSERVATION

Status: The species seems to be widely distributed along the Drakensberg/Lesotho plateau highlands. The few squares from which it has been recorded reflects lack of field work and relatively inaccessible sites rather than rarity, the species being quite easy to find in some numbers, in areas where it is known to occur.

Threats: The species does not seem to be threatened in any way, although locally it may be affected by possible hydroelectric dams.

Existing Conservation Measures: Protected in Natal only where it occurs within reserves, and within the Cape by Provincial legislation.

Breeding Potential in Captivity: The ease with which mating and oviposition may be induced in captivity is not known. Tadpoles may be collected fairly easily from the wild, but captive rearing requires maintenance at low temperatures (2-6°C) and a suitably balanced diet, without which tadpoles may adjust to altered conditions but fail to metamorphose; metamorphosis in captivity may take almost two years, and is only infrequently successful (Lambiris, *unpub. obser.).*

Recommended Conservation Measures:
Protection in existing reserves appears to be adequate. While the remoteness of the species preferred habitat tends to keep human impact to a minimum. Visitors to these areas should be constantly reminded not to litter stream banks or to pollute the waters - evidence of which seems to be increasing rapidly in some areas.

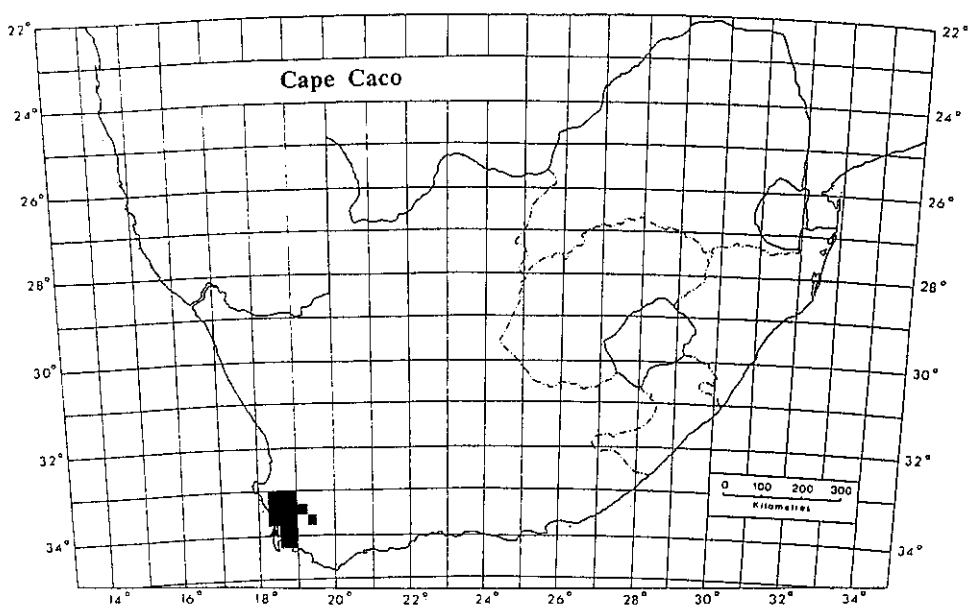
Remarks: Not listed in previous Red Data Book (Mclachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Bush, 1952; Dubois, 1986; Poynton, 1964; Van Dijk, 1966;.

Ecology: Channing, 1979.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.



Map 43. Distribution of the Cape caco *(Cacosternum capense).*
■ Current distribution (new or re-confirmed localities since mid-1976).
▲ Previous distribution (only recorded from type locality where it is now extinct; Rose, 1950).

CAPE CACO
Kaapse blikslanertjie of Kaapse caco

International status: NOT LISTED
South African status: RESTRICTED

Cacosternum capense Hewitt, 1925. **Class:** Amphibia, **Order:** Anura, **Family:** Ranidae

Cacosternum capense Hewitt, J. 1925. On some new species of Reptiles and Amphibians from South Africa. *Rec. Albany Mus.* 3(4): 367-369. **Type locality:** A former golf links on Rondebosch Common within six kilometres of central Cape Town.

SUMMARY

Status: Restricted. A species with a restricted distribution range in the Mediterranean region of the south-western Cape Province. It is confined to certain generally flat low-lying areas threatened by urban development.

Research: Aspects of the distribution and habitat requirements of *C. capense* have been studied (De Villiers, *unpub. obs*). Populations surviving in disturbed habitat are being monitored.

SPECIES DATA

Identification: *C. capense* is the largest member of the genus (maximum body length of 39 mm from tip of snout to vent). The body is elongate, the head. relatively small, and pupil horizontal. The fingers and toes lack webbing. The tubercles on the palms of the hands are poorly developed while on the hindfeet, the inner metatarsal tubercle is prominent and the outer metatarsal tubercle absent. There is a pair of large sacral glands on the back and another pair on the flanks. The generally grey dorsal surface is covered in dark freckles and spots and orange or green patches. The creamy white ventral surface is distinctively marked with large irregularly shaped olive to black blotches. The call is described by Passmore and Carruthers (1979) as a harsh creak uttered repeatedly at a rate of about two per second.

Distribution: The species was described by Hewitt (1925) based on two specimens collected by Rose in July 1924. The type locality is a former golf links on Rondebosch Common about six kilometres south-east of central Cape Town (Rose 1926, 1929). Many additional localities were obtained in 1976, during a survey of *C. capense* by the Cape Department of Nature and Environmental Conservation, and the species is known to be confined to the Mediterranean region of the south-western Cape Province, where it only occurs in certain generally flat low-lying areas.

Habitat and Ecology: *C. capense* is confined to generally flat low-lying areas, where it mainly occurs in either renosterveld or in cultivated lands formerly covered by this veld type. It favours heavy, poorly drained clay and loamy soils and has not been recorded from the sandy Cape Flats and adjoining coastal regions. It spends most of the year buried underground but emerges in the wet winter to breed in shallow temporary pools.

Breeding: This occurs in June, July and August. The eggs are laid in jelly clusters of 30-40 eggs, with each egg enclosed in a capsule. Rose (1926) records a single pair laying up to 400 eggs. The egg clusters are attached to submerged vegetation and the tadpoles are benthonic. In captivity, tadpoles laid in June completed metamorphosis early in September (Rose 1926). The start of the breeding cycle is influenced by extrinsic factors such as food availability, photoperiod, rainfall and temperature with rainfall and the formation of standing water probably being the most important factor.

CONSERVATION

Status: Uncertain. It has a similar distribution range to the endangered geometric tortoise (*Psammobates geometricus)* but is more adaptable and can tolerate some disturbance. Most of the known population shave been found in cultivated areas (eg. wheatfields and vineyards). It is extinct at the type locality (Rose 1950) which was filled in and is covered in exotic kikuyu grass (McLachlan 1978).

Threats: *C. capense* occurs in a restricted area subject to urban development, and the associated threat of alien pest plant infestations. Agricultural development may also pose a threat, but this needs further investigation. The species has been found breeding in wheatfields and vineyards but intensive and regular ploughing and the use of fertilizers, pesticides, etc., may affect long-term survival.

Existing Conservation Measures: The species is given maximum legal protection on Schedule 1 of the Cape Nature Conservation Ordinance of 1974. This may be unwarranted, but at the time it was only

known from a few localities and was thought to be critically endangered. It has been recorded from the Elandsberg Private Nature Reserve near Hermon and the Romans River Provincial Tortoise Reserve near Wolseley.

Breeding Potential in Captivity: Probably good but more work is required. Adults have laid eggs in captivity under simulated conditions, and the tadpoles have been successfully reared (Rose, 1926; De Villiers, 1929). Finding suitable insect food to rear newly metamorphosed frogs to adults may be difficult.

Recommended Conservation Measures: It is important to establish in how many nature reserves *C. capense* occurs. Additional studies on the habitat requirements of the species are needed to determine factors threatening the long-term survival of the species in disturbed habitat.

Remarks: Listed as rare (restricted) in the previous Red Data Book (McLachlan, 1978).

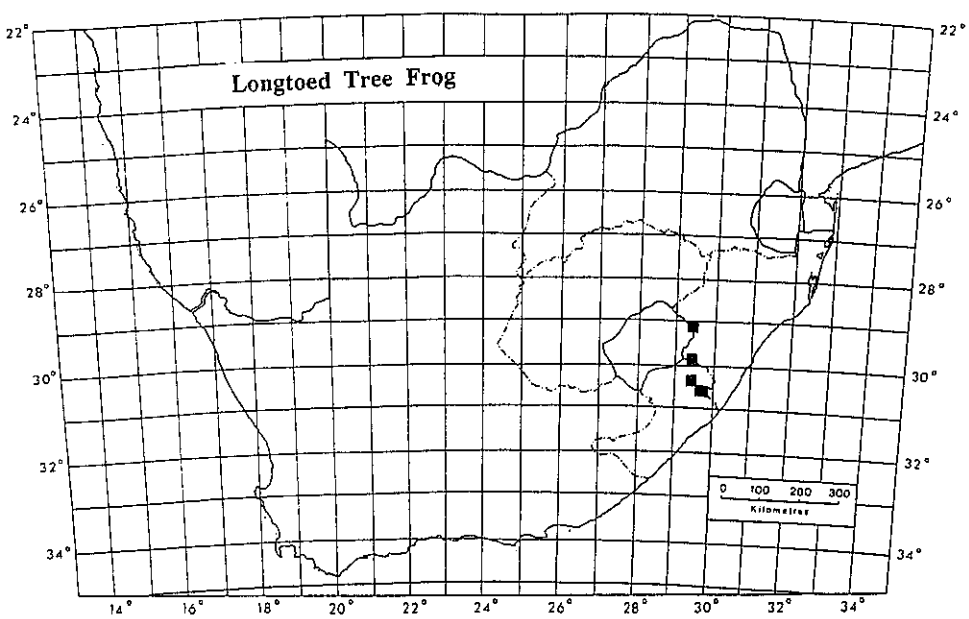
BIBLIOGRAPHY

Taxonomy and Distribution: Hewitt, 1925; Passmore and Carruthers, 1979; Poynton, 1964; Rose, 1926, 1929, 1950; Visser, 1979a.

Habitat and Ecology: de Villiers, 1929; Rose, 1926, 1929.

Conservation: McLachlan, 1978; Rose, 1950.

Account prepared by: A. L. de Villiers, CDNEC CP, Jonkershoek Research Station.



Map 44. Distribution of the longtoed tree frog *(Leptopelis xenodactylus).*

LONG-TOED TREE FROG
Langtoon-boompadda

International status: NOT LISTED
South African status: RESTRICTED

Leptopelis xenodactylus Poynton 1963. **Class:** Amphibia, **Order:** Anura, **Family:** Hyperoliidae.

Leptopelis xenodactylus Poynton, 1963. Descriptions of southern African amphibians. *Ann. Natal Mus.* **15:** 328. **Type locality:** Underberg, Natal.

SUMMARY

Status: Restricted. An elusive, probably uncommon species, known only from the upper plateau slopes of western Natal, from Franklin north to Giant's Castle Game Reserve. Some of the few known populations are threatened by afforestation and veld fires.

Research: Poorly known. Studies on its ecology and distribution are in progress (Lambiris, *in prep.*).

SPECIES DATA

Identification: A medium-sized (50 mm) ground-living species; dorsum smooth-skinned and light, uniform emerald to grassy green; ventrum granular and creamy white; fingers and toes long, slender, with small but distinct terminal discs; webbing very reduced. Distinguished by:

1. Uniform green coloration with absence of any dark marks on the sides of the face;
2. long, slender digits and very reduced webbing.

Distribution: The upper plateau slopes of western Natal, from Franklin in the south, to Injasuthi (Giant's Castle Game Reserve) in the north.

Habitat and Ecology: Grassy wetlands. A terrestrial species, which appears to spend the day in burrows or concealed under vegetation. Van Dijk (1978), reports that it climbs actively at night and feeds on moths in captivity. Calls from the base of grass tussocks at night.

Breeding: Details unknown; it may be similar to *L. bocagii*, which breeds in shallow puddles in inundated grassland areas (Lambiris, *unpub. obser.*).

CONSERVATION

Status: Restricted. Formerly considered rare, but a few specimens have recently been found, although it is nowhere common. No estimates of numbers exist.

Threats: Some populations (e.g. those in Weza Forest Reserve) may be threatened by afforestation and lumbering, and elsewhere by veld burning and possibly by destruction of grassy wetland habitats. The species appears to have specialised habitat requirements and may be unable to adapt to the rapid environmental changes brought about by human activities, or to disperse to other areas.

Existing Conservation Measures: Protected in Natal only in reserve areas (Weza Forest Reserve, Giant's Castle). The Giant's Castle locality has been protected from veld burning since 1986 in an attempt to maintain the habitat in a stable condition.

Breeding Potential in Captivity: Unknown. If it is similar to *L. bocagii*, then captive breeding is unlikely to prove viable (Lambiris, *unpub. obser.*).

Recommended Conservation Measures: The habitats of known populations should be clearly demarcated and kept strictly free of any activity that may influence drainage, water table levels, vegetation changes, and insect population structure. Very small areas of seasonally inundated open grassland within forested areas are utilised, and care should be taken to protect such habitats. Repeated veld burning on a regular basis appears to have a particularly disastrous effect on higher-altitude reptiles and amphibians, and their biotic and abiotic environments and prey species. When necessary, veld burning should be kept to a minimum and be carried out at irregular intervals in seasons when these animals are aestivating.

Remarks: Listed as rare in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Poynton, 1963.

Distribution: Raw, *pers. comm.;* Van Dijk, 1978.

Account prepared by: A. J. L. Lambiris, Natal Parks Board.

SOUTHERN SPECKLED PADLOPER
Gespikkelde padloper

International status: NOT LISTED
South African status: RESTRICTED

Homopus signatus cafer (Daudin 1801). **Class:** Reptilia, **Order:** Chelonii, **Family:** Testudinidae.

Testudo cafer Daudin, 1801. Histoire naturelle, generale et particuliere, des Reptiles II. *F. Dufart. Paris*: 1 - 432, pls. xvi - xxviii. **Type locality:** Cafrerie (amended as "Drainage of the Olifants River, Cape Province, South Africa" by Bour, 1988.)

SUMMARY

Status: Restricted and vulnerable. One of the smallest tortoises in the world, it is confined to the Western Cape between the Cedarberg mountains and the coast. Possibly threatened by habitat degradation as a result of over-utilisation by stock animals. Other threats include veld fires and occasional exploitation for the pet trade.

Research: Fair. Distribution and ecology poorly known.

SPECIES DATA

Identification: One of the smallest tortoises in South Africa (maximum carapace length 95 mm females, 80 mm males) that may be distinguished from the closely related *H. s. signatus* on its dorsal colour-pattern which consists of numerous, fine, black stipples on an orange, yellow or pink background. Other diagnostic features are the dorsal surface of the shell (far smoother than in *signatus*), the shape of the posterior marginal shields (strongly serrate in *signatus*, smooth in *cafer*) and the shape of the nuchal shield (usually wider than long in *signatus*, narrower than long in *cafer*) (Boycott, 1986).

Distribution : This subspecies has a far more restricted distribution than the Namaqualand form (*H. s. signatus*), and occurs in the broken country between the Cedarberg mountains and the coast, from Piketberg northwards to Klawer (Boycott, 1986). Although more distribution records are required, it appears as if this subspecies intergrades with typical *signatus* in the western Great Karoo between Loeriesfontein and Clanwilliam. The subspecies *cafer* is at its most distinctive west of the Cedarberg mountains and occurs in an area that, from our present knowledge, is smaller than the area of intergradation between it and *signatus*.

Habitat and Ecology: These tortoises favour rocky outcrops and ridges in regions of relatively low rainfall and occur in the northern limit of the macchia (fynbos) where it merges with succulent karoo and western mountain karoo. During the winter months these tortoises appear to be active and may be found sheltering under quite small stones while in the summer months they seek out shelter from the high midday temperatures in deep crevices under large outcrops of rock that are usually well vegetated and that provide a substantial amount of shade.

Breeding: Nothing known but likely to be similar to *H. s. signatus* which has been recorded as laying a clutch of a single egg in the summer.

Remarks: The description of the subspecies *Pseudomopus signatus peersi* by Hewitt (1935) was based on three specimens collected by Mr. Bertie Peers in the Klawer district of the Western Cape. Later Hewitt (1937) referred it to the genus *Chersobius*. However, Loveridge and Williams (1957) rejected the subspecies without discussion and placed it in the synonymy of *H. signatus*. Boycott (1986) has shown that the species *H. signatus* consists of two distinct subspecies and made a bid to reinstate *H. signatus peersi*. However, Bour (1988) has drawn attention to the fact that this form was described as *Testudo cafer* by Daudin (1801). Daudin's (1801) description therefore has priority over Hewitt's (1935) description of the same taxon which means that the southern speckled padloper must henceforth be known as *Homopus signatus cafer* (Daudin, 1801). The type locality of *peersi*, i.e. Klawer, near Van Rhynsdorp is therefore invalid and Bour (1988) has amended Daudin's type locality of *cafer* "Cafrerie" to "Drainage of the Olifants River, Cape Province, South Africa".

CONSERVATION

Status: The subspecies is endemic to the Western Cape and has one of the most restricted distribution ranges of any South African tortoise. It is at present known from just five localities excluding intergrade populations while the typical form is far more

widespread in the north-western Cape.

Threats: It is likely that the subspecies is threatened by habitat degradation as a result of over utilisation by stock animals. Being among the most attractive of South African tortoises, exploitation for the pet trade is potentially one of the greatest threats to their continued survival. Uncontrolled veld fires constitute an additional threat.

Existing Conservation Measures: All tortoises in the Cape Province are afforded general protection under Cape Provincial Nature Conservation Ordinance.

Breeding Potential in Captivity: Unknown but probably good.

Recommended Conservation Measures: Consideration should be given to affording additional protection under Cape Provincial Ordinance. At present this subspecies does not occur in any game or nature reserves or conservation areas with the possible exception of the Cedarberg Wilderness Area. However, specimens from this region are likely to represent intergrades between *cafer* and *signatus*. Nature reserves for these tortoises should be proclaimed at suitable sites between the Cedarberg mountains and the coast. Investigations into the captive propagation of these tortoises should be initiated.

Remarks: *Homopus signatus signatus* has been kept in captivity with some success and the same might apply to *H. s. cafer*. Further research into the distribution and ecology of these tortoises is necessary. Not listed in previous Red Data Book (McLachlan, 1978).

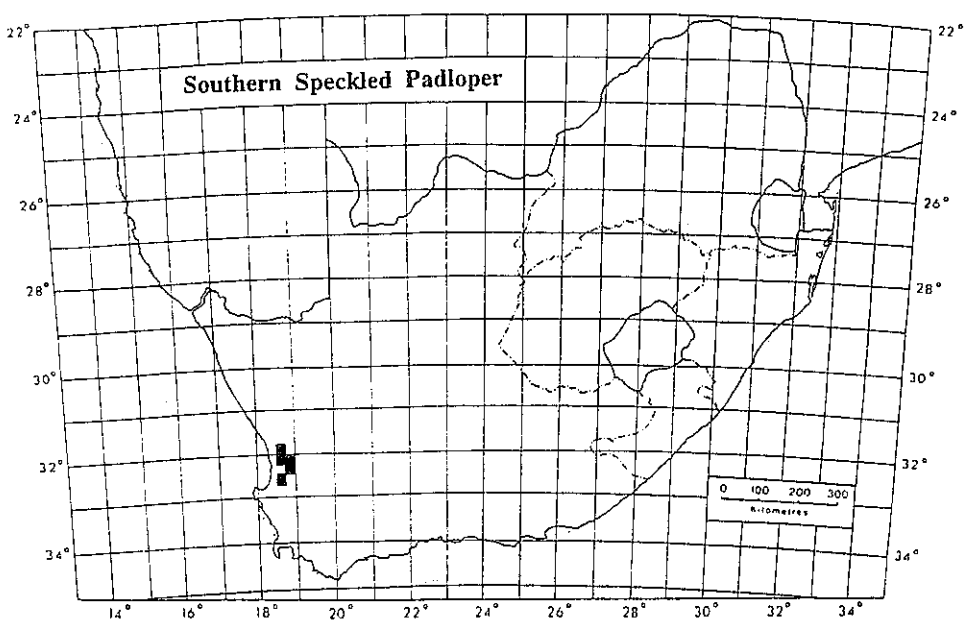
BIBLIOGRAPHY

Taxonomy: Daudin, 1801; Hewitt, 1935; Loveridge and Williams, 1957; Boycott, 1986; Bour, 1988.

Distribution: Greig and Burdett, 1976; Boycott, 1986.

General: Greig and Boycott, 1978; Boycott and Bourquin, 1988; Branch, 1988.

Account prepared by: R.C. Boycott, Transvaal Snake Park.



Map 45. Distribution of the southern speckled padloper *(Homopus signatus cafer)*.

BLACK WHITELIPPED SNAKE
Swart-witlipslang

International status: NOT LISTED
South African status: RESTRICTED

Amblyodipsas microphthalma nigra Jacobsen 1986. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Amblyodipsas microphthalma nigra Jacobsen, 1986. A new subspecies of *Amblyodipsas microphthalma* (Bianconi, 1850) (Serpentes: Colubridae) from the Transvaal. *Ann. Tvl. Mus.* 34(5): 123-127. **Type locality:** Farm Harnham 793 MS, Soutpansberg.

SUMMARY

Status: Restricted. A small snake known from the Soutpansberg range east of Waterpoort. A fossorial species, it is rarely seen and less than 10 specimens are known.

Research: Poor. More extensive surveys are needed to establish habitat requirements.

SPECIES DATA

Identification: A small totally black snake (maximum size 350 mm TL) with pale edged scales giving a chequered appearance. The head is depressed and snout rounded. Without a spiky tail tip.

Distribution: The Soutpansberg east of Waterpoort. Occurs parapatric with the nominate form at Saselondonga on the eastern boundary of the Kruger National Park (KNP). May in time be found along the whole Soutpansberg range.

Habitat and Ecology: The species inhabits rocky areas along the Soutpansberg. Specimens were obtained under rocks and dead on the road (DOR) indicating that during the rainy season these animals move on the surface at night. A fossorial species it is uncommon throughout its range.

Breeding: Not known, presumably oviparous, although cogeners have been described as laying eggs and possibly being viviparous.

Remarks: An ecologically well defined subspecies occupying a habitat very different from that of the typical form.

CONSERVATION

Status: The species has a restricted range. It is a fossorial or semi-fossorial species and because of its habits rarely encountered. Specimens were found in the KNP during fence building operations. Other specimens have been collected DOR. Human encroachment on its habitat is evident particularly in the Republic of Venda.

Threats: Some farming activity along the Soutpansberg is present but probably have not seriously affected its habitat. More serious is continued population expansion in the Republic of Venda.

Existing Conservation Measures: The species is afforded some protection under the Transvaal Provincial Ordinance. The species occurs in the KNP and probably also in the Happy Rest Nature Reserve west of Louis Trichardt.

Breeding Potential in Captivity: Not known. May be difficult on account of its small size and possibly specialised diet.

Recommended Conservation Measures:
Additional surveys to establish its total range and its presence on the Happy Rest Nature Reserve.

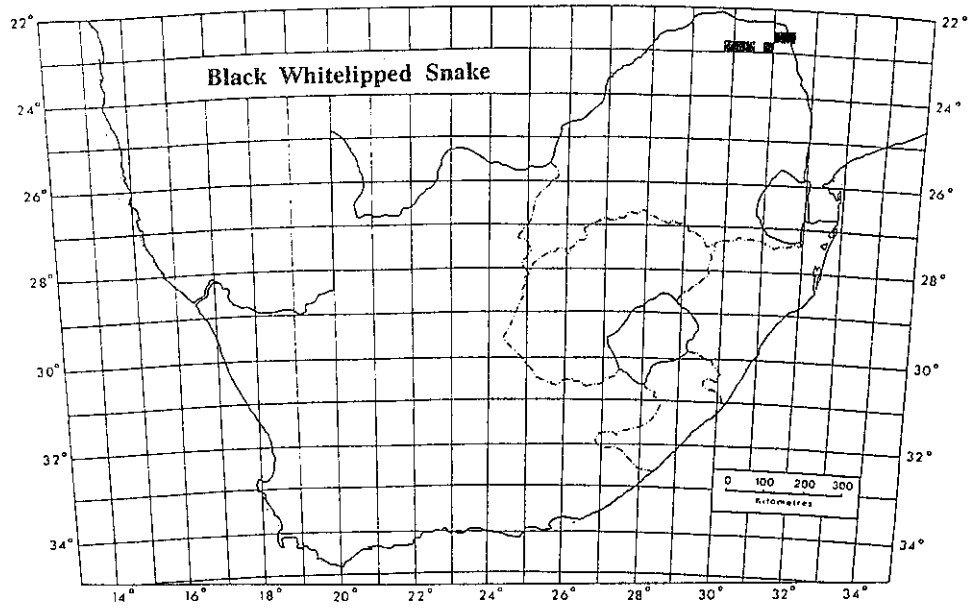
Remarks: An endemic species from the Soutpansberg. Conservation of larger areas in the Soutpansberg is necessary. Recently described and thus not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

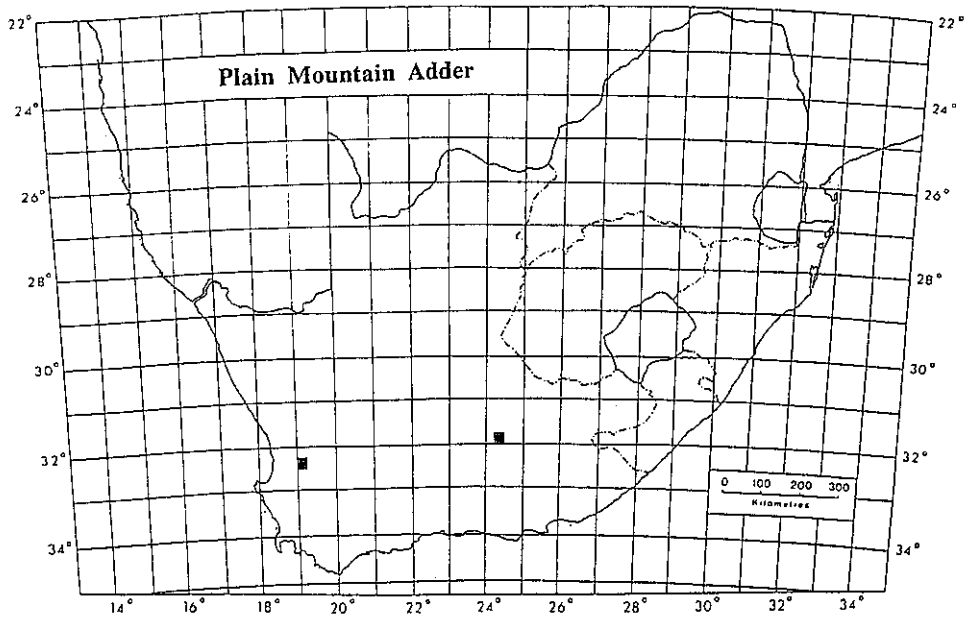
Taxonomy: Jacobsen, 1986.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.



Map 46. Distribution of the black whitelipped snake *(Amblyodipsas microphthalma nigra).*



Map 47. Distribution of the plain mountain adder *(Bitis inornata).*

PLAIN MOUNTAIN ADDER | **International status:** **NOT LISTED**
Ongemerkte bergadder | **South African status:** **RESTRICTED**

Bitis inornata (A. Smith, 1838) **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Viperidae.

Echidna inornata A. Smith, 1838. *Illustration of the Zoology of South Africa, Reptiles.* pl. iv, **Type locality:** Sneeubergen, near Graaff Reinet, Cape Province.

SUMMARY

Status: Restricted. Known from a small area of montane grassland that is subject to habitat deterioration due to overgrazing, and occasionally collected illegally for the pet trade.

Research: Knowledge of taxonomy and basic biology poor.

SPECIES DATA

Identification: A small (maximum size 34 cm), squat adder that can be distinguished by:

1. The absence of horns or enlarged scales above the eyes;
2. strongly keeled scales in 27-31 rows at midbody;
3. 126-138 ventrals;
4. and a drab colour pattern.

The body is dull brown to red-brown with vague, dark dorsal blotches. The belly is light brown, heavily speckled with dark brown on the sides.

Distribution: Restricted to high grassland west of the Compassberg (the highest peak in the Cape Province), with a disjunct, possible relict and taxonomically distinct, population on the Cederberg.

Habitat and Ecology: It inhabits montane grassland (alt. 1600-1800 m), where it shelters among grass tussocks or beneath rock slabs. It is active during the early morning and evening and feeds on lizards (mainly skinks and lacertids) and small mammals. During winter the veld is regularly blanketed with snow, and severe frosts occur. The western population on the plateau of the Cederberg inhabits mountain fynbos.

Breeding: Viviparous, giving birth to 6-8 babies, 125-152 mm long, in late summer.

Remarks: . The taxonomy of this species is confused. For over 100 years it was known only from a few, isolated specimens. Underwood (1968), on the basis of a few additional specimens, some of dubious provinence, treated it as an eastern race of the many horned adder (*B. comuta*) of the Western Cape and southern Namibia. The recent discovery of another population of *B. inornata* on the summit of the Cederberg, that lives in sympatry with *B. comuta*, indicates that *B. inornata* is a good species. The relationship of the two disjunct populations assigned to *B. inornata* are currently being investigated (Branch, 1987 and *in prep.*).

CONSERVATION

Status: Rare, with a restricted distribution.

Threats: The area around the Compassberg is farmed extensively for sheep and there is evidence of overgrazing. Whether this affects the species is unknown. Farmers in the region have reported cases of illegal collecting since the species was 'rediscovered'.

Existing Conservation Measures: Protected by Cape Ordinance. Not definitely recorded from any protected reserve, although a single specimen collected in the Mountain Zebra National Park may be referable to this species.

Breeding potential in captivity: Good. Limited experience of the species in captivity has shown that it settles well, but that it is sensitive to high temperatures (which is to be expected in view of its relatively cool montane habitat).

Recommended Conservation Measures: The illegal capture of this species for the local and overseas pet trade should be carefully monitored.

Remarks: Only recently revalidated as a separate species and thus not included in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Branch, 1987; Broadley, 1983; FitzSimons, 1962; Underwood, 1968.

Habitat and Ecology: Branch, 1987; Branch 1988.

Account prepared by: W. R. Branch, Port Elizabeth Museum, Humewood 6013.

MULLER'S VELVET GECKO
Muller se fluweelgeitjie

International status: NOT LISTED
South African status: RESTRICTED

Homopholis mulleri Visser, 1987. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Homopholis mulleri Visser, 1987. A new *Homopholis* (Sauria, Gekkonidae) from the northern Transvaal with a discussion on some generic characteristics. *S. Afr. J. Zool.*, 22(2): 110-114. **Type locality:** Farm Command, No. 588 Messina District, northern Transvaal.

SUMMARY

Status: Restricted. Although not known to be threatened, it has a very restricted range and is not known from any protected reserve.

Research: A poorly known, recently described species.

SPECIES DATA

Identification: A small (maximum body size <70 mm) velvet gecko that is distinguished by:

1. Subimbrication of the dorsal scales;
2. with 18-20 small scales between the eye and the anterior border of the ear;
3. 65-72 scales rows at midbody;
4. and males with large pre-anal pore-bearing scales, either meeting or separated by a single, much smaller scale.

The coloration is distinctive. The top of the head is white with black suffusion and minute spotting, with 1-2 light, silvery lines on each side. The upper labials and rostral are pure white, bordered by a wide black band that encircles the snout and continues behind the eyes. The back is dark grey to light brown, with three large silvery white blotches anteriorly, followed by four large, silvery white, black margined chevrons; the belly is creamy white with small dark spots and reticulations.

Distribution: Presently known from only a few localities in the northern Transvaal in an area of high endemicity.

Habitat and Ecology: Taken from under bark and from holes in marula (*Sclerocarya caffra*) and knob-thorn (*Acacia nigrescens*) trees in open, mixed mopane veld. Not as likely to enter rock cracks as the cogener *H. wahlbergii*.

Breeding: Not known. Probably similar to Wahlberg's velvet gecko (*Homopholis wahlbergii*); i.e., laying two hard-shelled eggs beneath tree bark, or in other suitable crevices.

CONSERVATION

Status: Known from an area of high endemicity, and presently not recorded from any protected reserve.

Threats: None known, except possible collecting for sale to the overseas pet trade.

Existing Conservation Measures: Protected under general Transvaal legislation (Ordinance 12 of 1983).

Breeding Potential in Captivity: Probably good.

Recommended Conservation Measures: None are required at the moment, although the true extent of its range should be determined.

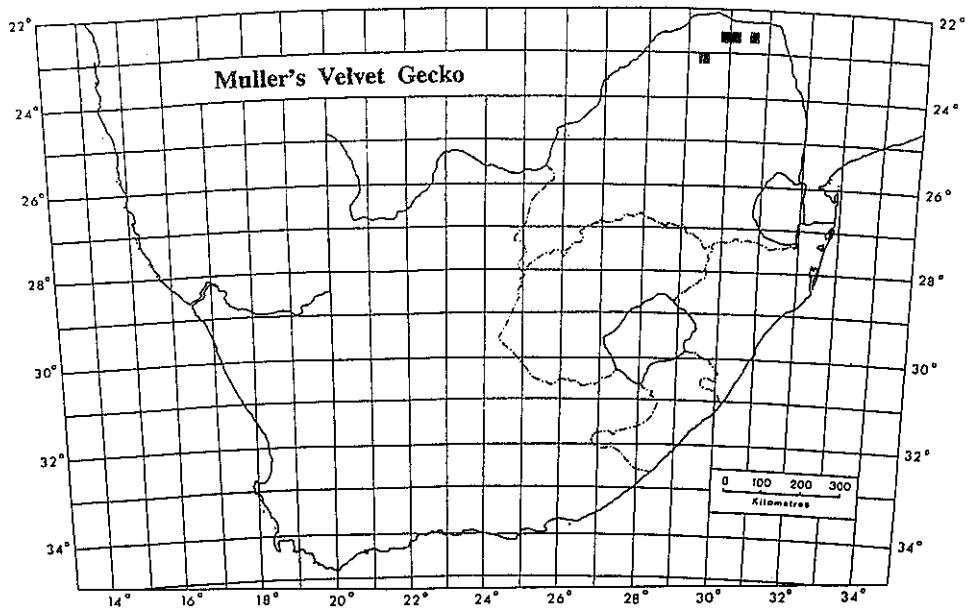
Remarks: Only recently described and therefore not included in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

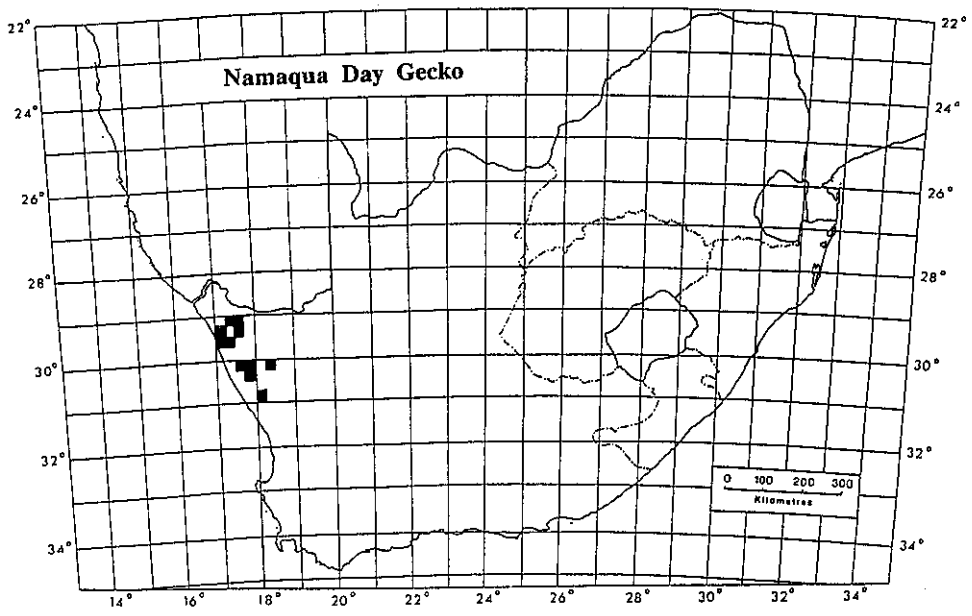
Taxonomy: Visser, 1987.

Habitat and Ecology: Branch, 1988; Visser, 1987.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 48. Distribution of Muller's velvet gecko *(Homopholis mulleri).*



Map 49. Distribution of the Namaqua day gecko *(Phelsuma ocellata).*

NAMAQUA DAY GECKO
Namakwa-daggeitjie

International status: NOT LISTED
South African status: RESTRICTED

Phelsuma ocellata (Boulenger 1885). **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Rhotropus ocellatus Boulenger, 1885. Descriptions of three new species of geckos. *Ann. Mag. Nat. Hist.* (5)16: 473-475. **Type locality:** Cape Town (in error, species restricted to Little Namaqualand.)

SUMMARY

Status: Restricted. A small diurnal gecko with a restricted range in Little Namaqualand and southern Namibia.

Research: Fair.

SPECIES DATA

Identification: A small gecko (maximum body size 38 mm) immediately recognizable by having:

1. The inner digit rudimentary;
2. 7-8 undivided transverse adhesive lamellae under the digits;
3. femoral pores in a long uninterrupted series across the preanal region.

The back is light brown to greyish brown with a series of pale, round spots (sometimes absent) that extend on to the tail and limbs. The belly is creamy-white often tinged with pink. The base of the tail and adjacent regions may be orangy-brown in large adults.

Distribution: From Molsvlei (3018Cc) northwards to Port Nolloth-Steinkopf and again in Namibia at Sud Witputz no. 31.

Habitat and Ecology: Usually found on granitic and gneissic rocks, but also on trees particularly *Ficus cordata*. Diurnal and extremely quick and agile, darting across rock-faces in short spurts and jumping from rock to rock with ease. If disturbed on trees it retreats to the upper branches and is at all times very difficult to catch.

Breeding: Eggs are laid in pairs probably several times during the summer.

Remarks: Previously placed in a monotypic genus (*Rhotropella*). The recent transfer of the species to *Phelsuma* (Russell, 1977), which is distributed throughout the islands of the Indian Ocean and adjacent east African coast, creates a zoogeographic enigma.

CONSERVATION

Status: The species has a restricted range in a region of high endemicity.

Threats: Mining and the destruction of the few larger trees for firewood etc. could pose a threat. However, most of the area involved has been heavily prospected over the years and the appearance of extensive mines in the granite areas is unlikely.

Existing Conservation Measures: The species is protected by Provincial Ordinance and may not be caught or exported without a permit. Its transfer to *Phelsuma* means that it is placed on Appendix 2 of CITES.

Breeding Potential in Captivity: Fair; many *Phelsuma* from Madagascar and the Indian Ocean Islands are regularly bred in captivity.

Recommended Conservation Measures: None required at the moment.

Remarks: Listed as rare (distribution limited) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1943; Russell, 1977.

Habitat and Ecology: Branch, 1988; McLachlan, 1979; Visser, 1979.

Conservation: McLachlan, 1978.

Account prepared by: G. R. McLachlan, South African Museum, Cape Town.

SMALLSCALED LEAFTOED GECKO
Kleinskub-blaartoongeitjie

International status: NOT LISTED
South African status: RESTRICTED

Phyllodactylus microlepidotus FitzSimons 1939. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae

Phyllodactylus microlepidotus FitzSimons 1939. Descriptions of some new species and subspecies of lizards from South Africa. *Ann. Tvl. Mus.* **20:** 5 - 16. **Type locality:** Pakhuis Pass near Clanwilliam, Cape Province, South Africa.

SUMMARY

Status: Restricted. A large species with a restricted range in the south-western Cape, from Pakhuis Pass in the north to Ceres in the south.

Research: Fair. More ecological studies are required.

SPECIES DATA

Identification: A large gecko (maximum size 67 mm SVL), that is much larger and more robust than the common *P. lineatus*, and with the head and body moderately depressed. Body colour usually grey to slate above with blackish reticulate markings, and a greyish-white below. Distinguished by:

1. The absence of chinshields;
2. the back covered with small, flattened, subimbricate scales, equal to or larger than scales on snout.

Distribution: This species is now known to occur all along the Cape fold mountains, from Pakhuis Pass in the north to Ceres in the south.

Habitat and Ecology: This species is clearly montane, occurring high up in the mountains only. Although most individuals inhabit cracks in rocks, some are also to be found under the bark of rotting Clanwilliam cedar logs. The vegetation all along its range is typically mesic mountain fynbos. Very often this species is found sharing its retreat with other gekkonid species, and also with members of its own kind.

Breeding: No information available but probably produce two eggs during early summer.

Remarks: This gecko was as recently as 1980 only known from the type locality but intensive collecting in the south-western Cape has extended its range dramatically.

CONSERVATION

Status: Although this species has a restricted range it is fairly common within its distribution area.

Threats: The species inhabits rugged, mountainous terrain totally unsuitable for general agricultural exploitation. Although veld fires and afforestation may have locally detrimental effects, the chances are probably remote that this gecko will be adversely affected by man over its total range.

Existing Conservation Measures: The species enjoys general protected status under Cape Provincial Ordinances.

Breeding Potential in Captivity: The species does well in captivity.

Recommended Conservation Measures: None are at present required. Much of the species habitat is already protected.

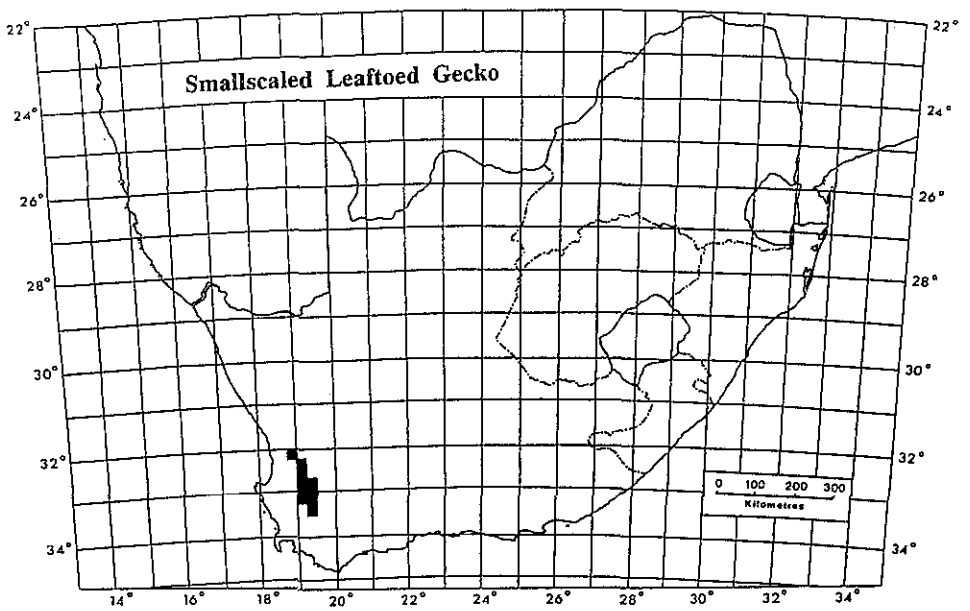
BIBLIOGRAPHY

Taxonomy: FitzSimons (1939); McLachlan (1979).

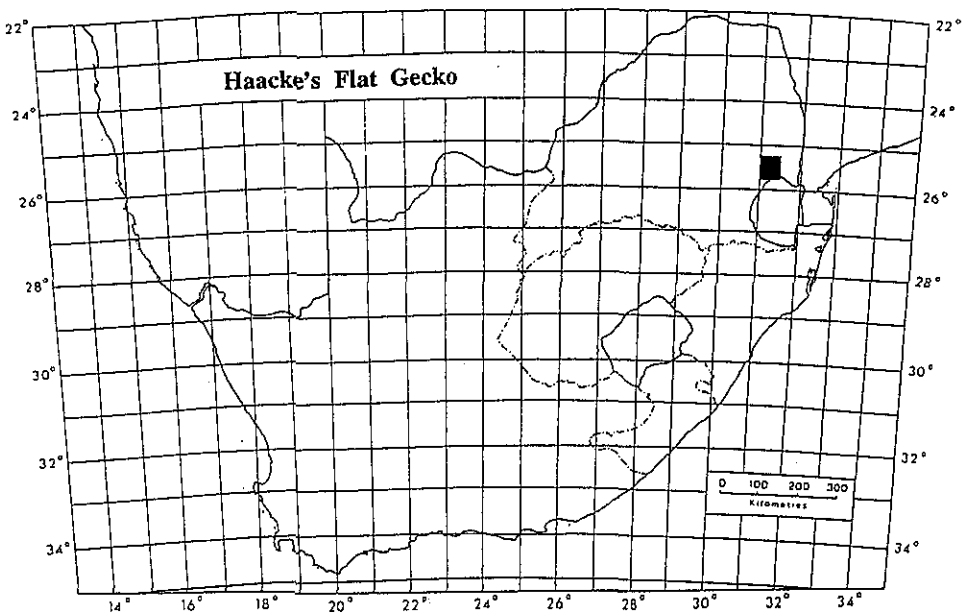
Distribution: Visser (1979); Mouton and Van Wyk (1981); Botha (1983); Mouton, Oelofsen and Mostert (1987).

Conservation: McLachlan (1978); Mouton, Oelofsen and Mostert (1987).

Account prepared by: P. LeF. Mouton, J. Ellerman Museum, University of Stellenbosch, Stellenbosch.



Map 50. Distribution of the smallscaled leaftoed gecko *(Phyllodactylus microlepidotus).*



Map 51. Distribution of Haacke's flat gecko *(Afroedura pondolia haackei).*

HAACKE'S FLAT GECKO
Haacke se platgeitjie

International status: NOT LISTED
South African status: RESTRICTED

Afroedura pondolia haackei Onderstall 1984. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Afroedura pondolia haackei Onderstall, 1984. Descriptions of two new subspecies of *Afroedura pondolia* (Hewitt) and a discussion of species groups within the genus (Reptilia: Gekkonidae). *Ann. Tvl. Mus.* 33(30): 497-509. **Type locality:** Nelspruit, Transvaal.

SUMMARY

Status: Restricted. A small to medium sized gecko with a restricted range from Barberton to Nelspruit and eastward to the western Kruger National Park south of the Sabi River. Probably locally common in areas of suitable habitat.

Research: Poor. More surveys needed to determine the extent of its range.

SPECIES DATA

Identification: A slender small to medium sized flat gecko (maximum size 100 mm TL). Two pairs lamellae on each toe. Head and body depressed 20-27 femoral pores in males. Colour: Pinkish grey with variable dark grey to black bars down the back. Underside pink.

Distribution: The species is restricted to the southern lowveld of the Transvaal in an area between the Sabi River in the north and the Makonjwa range in the south. The Drakensberg escarpment and the Lebombo mountains limit its distribution to the west and the east respectively.

Habitat and Ecology: Inhabits granite outcrops in the lowveld as well as occasionally utilizing man-made structures. It lives in crevices formed by exfoliating rock usually on the underside of boulders with the entrance of the crevice facing downwards so that no moisture can penetrate. It lives singly or in pairs in suitable shelter.

Breeding: Two eggs are laid at a time which adhere to the undersurface of the rock. The eggshells become brittle once they are in contact with the air. Some communal nesting takes place in favourable sites.

Remarks: Although this species has been placed as a subspecies of *A. p. pondolia*, these geckos occur as allopatric populations throughout the Transvaal, each population differing from its nearest neighbour. Whether these are all subspecies or species in their own right still remains to be determined. There are great variations in the number of femoral pores ranging from 4-5 to 35 within the different populations of *A. pondolia*..

CONSERVATION

Status: The conservation status of the species is currently secure. As these lizards inhabit rocky outcrops its habitat is safe. The only influence could be the removal of the vegetation around such outcrops by grazing, burning or woodcutting. It is probably locally common in some areas.

Threats: None is known at present with the exception of the removal of vegetation in the more settled areas.

Existing Conservation Measures: The species is protected under the Transvaal Provincial Ordinance although this does not apply to the National States. It occurs in the Kruger National Park and in the Barberton Nature Reserve.

Breeding Potential in Captivity: Probably good. Juveniles rear easily in captivity.

Recommended Conservation Measures: More distribution data is needed but the future of the species is currently secure.

Remarks: Endemic to the Transvaal. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Onderstall, 1984.

Conservation: Jacobsen and Pienaar, 1983; Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.

WOODBUSH FLAT GECKO
Woodbush se platgeitjie

International status: NOT LISTED
South African status: RESTRICTED

Afroedura pondolia multiporis Hewitt 1925. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Afroedura pondolia multiporis Hewitt, 1925.On some new species of reptiles and amphibians from South Africa. *Rec. Albany Mus.* **3:** 348. **Type locality:** 'Clearwaters', Haenertsburg, Transvaal.

SUMMARY

Status: Restricted. A rare lizard with a very restricted distribution at Woodbush and also at Serala in the Wolkberg. Possibly locally common at Serala.

Research: Poor. Additional research into relationship to other *Afroedura* forms necessary. It is also necessary to determine whether specimens from Woodbush and from Serala are indeed the same taxon.

SPECIES DATA

Identification: A medium sized gecko (maximum size 135 mm TL) with 16-17 femoral pores in males. Those specimens from Serala have feebly keeled dorsal scales although the type from Woodbush appears to be smooth, this could be due to its long immersion in alcohol. Colour pale grey above with irregular crossbands of brown to blackish on the back. Ventrally off-white or greyish white.

Distribution: Only known from the type locality at Woodbush and unconfirmed report from a waterfall now under Ebenezer dam. Another population which can be attributed to this species was found at Serala in the Wolkberg.

Habitat and Ecology: Although found under exfoliating granite at Woodbush, the population at Serala is found in crevices in the Black Reef quartzites which lie on the highest crests of the escarpment. The geckos live singly in crevices and under rock on rock. No additional specimens were located at Woodbush. Nocturnal.

Breeding: As with the previous species, two eggs are laid at a time. These are soft-shelled and adhere to the rock surface before becoming hard and brittle.

Remarks: Similar to that of the preceding species.

CONSERVATION

Status: The conservation status of the species is secure although ideally other populations from and around the type locality are needed for comparative material. The species is rare and one population has so far not been located. The afforestration of large areas could affect such populations negatively.

Threats: The planting up of the area of the type locality with exotics appears to have caused the decline of the species. A dam built along a tributary of the Letaba River also destroyed another known site of this gecko.

Existing Conservation Measures: The species is protected by the Transvaal Provincial Ordinance. Serala also falls within the Wolkenberg Wilderness Area.

Breeding Potential in Captivity: Probably good.

Recommended Conservation Measures: Additional distribution records needed particularly at Woodbush and its environs for comparative purposes. The future of the species appears secure.

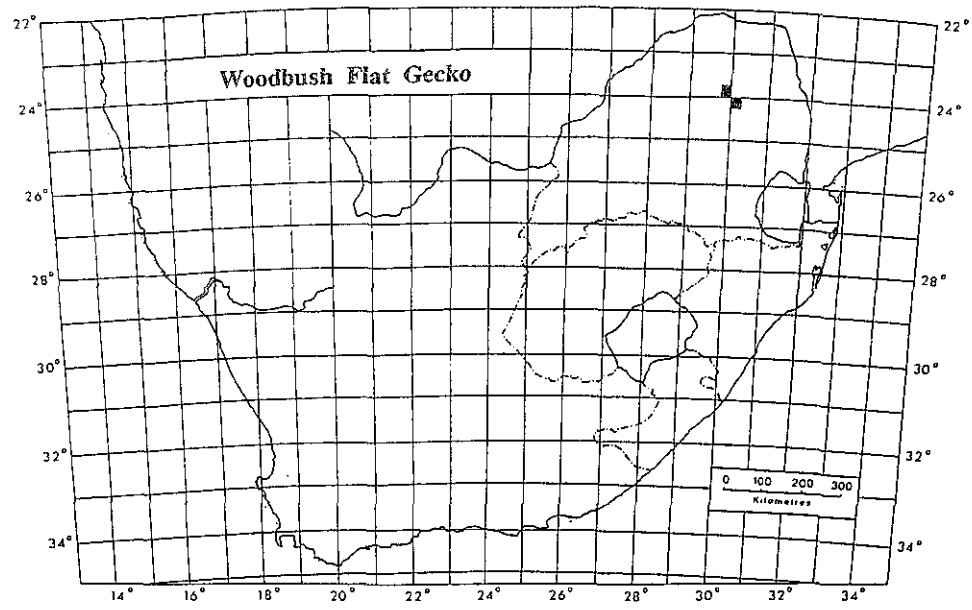
Remarks: Endemic to the north-eastern Transvaal, a centre of endemism. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

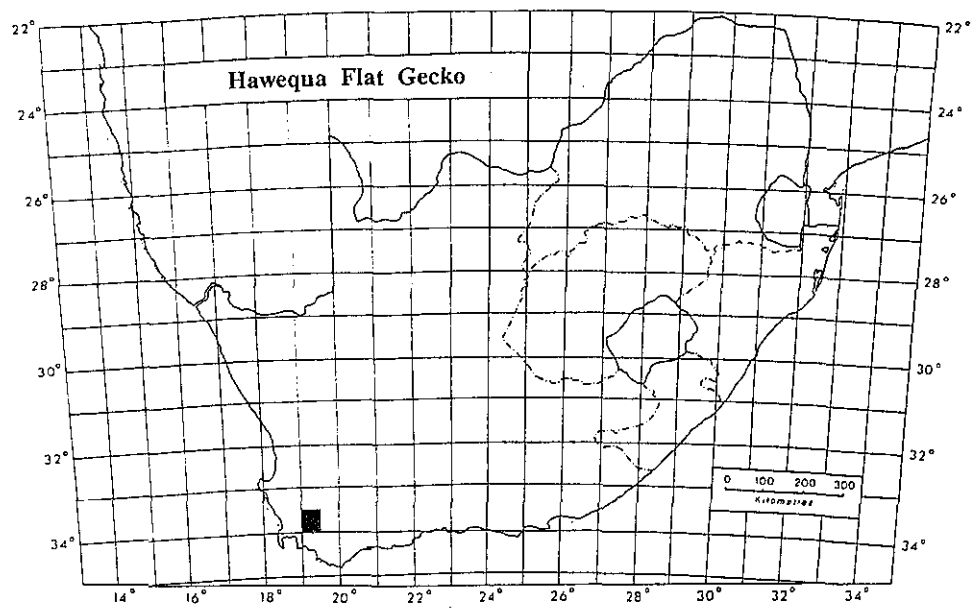
Taxonomy: FitzSimons, 1943; Hewitt, 1925; Loveridge, 1947; Onderstall, 1984.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.



Map 52. Distribution of the Woodbush flat gecko *(Afroedura pondolia multiporis).*



Map 53. Distribution of the Hawequa flat gecko *(Afroedura hawequensis).*

HAWEQUA FLAT GECKO **International status:** **NOT LISTED**
Hawekwa platgeitjie **South African status:** **RESTRICTED**

Afroedura hawequensis Mouton and Mostert 1985. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Afroedura hawequensis Mouton and Mostert 1985. Description of a new species of *Afroedura* Loveridge (Reptilia: Gekkonidae) from the south-western Cape. *S. Afr. J. Zool.* **20:** 246-249. **Type locality:** Hawekwa Mountains near Paarl, Cape Province.

SUMMARY

Status: Restricted. A large and attractive gecko with a restricted range in the Cape fold mountains in the south-western Cape.

Research: Only recently discovered. Taxonomy well defined; biology and habitat preferences require further study.

SPECIES DATA

Identification: A rupicolous, montane species of large body size (maximum SVL 83 mm) and with the head and body strongly depressed. It is further distinguished by:

1. Three pairs of adhesive pads on all digits but the first of each hand and foot where the second and third pairs are reduced;
2. males have an exceptionally large number of preanal-femoral pores (30-32) which extend in a continuous arc across the femoral region;
3. tail much flattened (regenerated tails broad and leaf-like).

Dorsally the body is covered with six irregular transverse bands of dark brown over a light greyish brown background. Yellow spots occur at the edges of the transverse bands and along the sides of the body. The underparts are creamy white.

Distribution: Centred around the Haweka mountains, extending to Bainskloof in the north and to the mountains at Villiersdorp and Franschhoek to the south.

Habitat and Ecology: These nocturnal geckos are rupicolous and occupy narrow cracks in sandstone boulders, preferring shady conditions. Individuals may share suitable cracks, and it is not uncommon to find up to 5 individuals in a single crack. The vegetation throughout its range is typically mesic montane fynbos.

Breeding: Two eggs with hard, calcareous shells are produced during early summer.

Remarks: To date the Cape fold mountains have been very poorly sampled and it is suspected that this species has a wider distribution than is presently known along these mountains.

CONSERVATION

Status: At present this species is only known from a very restricted geographical area, but within its range population density seems to be fairly high.

Threats: Its rupicolous nature and the ruggedness of the terrain where it occurs offers some natural protection against the exploitation of this attractive gecko for the pet trade. The area over which it occurs is furthermore totally unsuitable for agricultural purposes. Afforestation and frequent veld fires may, however, have adverse effects on the species.

Existing Conservation Measures: Protected by general Cape Ordinances, and recorded from protected mountain catchment reserves.

Breeding potential in captivity: The species does exceptionally well in captivity and should be relatively easy to breed.

Recommended Conservation Measures: Further attempts should be made to determine the full range of the species.

Remarks: Only recently described and therefore not included in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Mouton and Mostert, 1985.

Habitat and Ecology: Branch, 1988.

Conservation: Mouton, Oelofsen and Mostert, 1987.

Account prepared by: P. LeF. Mouton, J. Ellerman Museum, University of Stellenbosch, Stellenbosch.

SETARO'S DWARF CHAMAELEON
Setaro se dwergverkleurmannetjie

International status: NOT LISTED
South African status: RESTRICTED

Bradypodi(n setaroi Raw 1976. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Chamaeleonidae.

Bradypodion setaroi Raw 1976. A survey of the dwarf chameleons of Natal, South Africa, with descriptions of three new species (Sauria: Chamaeleonidae). *Durban Mus. Nov.* **11(7):** 139-161. **Type locality:** St Lucia Estuary, Zululand.

SUMMARY

Status: Restricted. A small species of chamaeleon restricted to the coastal and dune forests of northern Zululand.

Research: The taxonomy of Natal dwarf chamaeleons is confused (Raw *in prep.)* and knowledge of their basic ecology is limited.

SPECIES DATA

Identification: A small species growing to a maximum size of 130 mm TL. Casque distinctly elevated posteriorly, somewhat narrow and pointed. Scalation granular and strongly heterogeneous. Dorsal crest feebly developed, composed of 10-18 well-separated low tubercles, diminishing in size caudally and not usually reaching the sacral area. Gular crest also feebly developed, lobes longer than broad. Tail length greater than snout/vent length in males, less in females.

Colour - Adult male; light brown background; a conspicuous orange to russet flash on the flanks encloses 2-3 lighter blotches and is bordered above and below with blue/grey venation; a white temporal patch bordered above and below with brown, extends from the orbit posteriorly to the edge of the casque; interstitial skin of gular bluish white.

Distribution: Coastal and dune forest from Richards Bay northwards (Acocks veld type No. 1), at altitudes up to 100 m. These forests occupy a thin strip along the coast. Records of specimens collected from Mtubatuba may indicate that the Dukuduku Forest Reserve is populated with this species.

Habitat and Ecology: Arboreal. The holotype was collected in the undergrowth of disturbed dune forest. They tend to inhabit the lower bushes, shrubs and secondary undergrowth in the forest and along its edges. The sexually mature male is very territorial. Bright yellow buccal membranes are displayed when alarmed. Sometimes when escaping from capture, these chamelaeons would launch themselves into the air and drop out of sight into the undergrowth. They are active throughout the year.

Breeding: Dwarf chamaeleons are viviparous. Minimal data is available for this species; there is one record of eight babies born in late April, average length 40-41 mm (Bruton and Haacke, 1980). It is possible that several clutches are born each year, as in other species of *Bradypodion.*

Remarks: In the coastal vegetation south of the Sinkwazi River, this taxon is replaced by the closely related *B. melanocephalum* (Raw, *pers.comm.*). Sympatry is unknown. Although the coastal Zululand dwarf chamaeleons have in the past been referred to *B. melanocephalum* (Power, 1932; FitzSimons, 1943; Bruton and Haacke, 1975), constant morphological, hemipenial and colour differences make *B. setaroi* a good species.

CONSERVATION

Status: Restricted. Although the stretch of coastline encompassing the range of this species is quite long, the area involved is not large in total, the dune forest covering an area of +/- 6 300 ha between Richards Bay and Sodwana Bay (Weisser, 1978, 1980). The forests themselves constitute a specialized and vulnerable ecosystem. Populations of chamaeleons appear to be sporadic, but where they occur they are quite common locally. Population data is unknown.

Threats: From Richards Bay northwards to the Lighthouse, the discovery of heavy minerals in the dunes poses a special threat to the forests, since dune mining necessitates the complete removal of covering vegetation. However, even before mining started, there was very little of the original dune forest cover remaining (Weisser, 1978). The effects of the destruction of the original forest on the distribution and population structure of the

chamaeleons in this area has not been assessed.

Existing Conservation Measures: Most of the range of this chamaeleon is under the protection of the Natal Parks Board and the Forestry Department. North of the lighthouse, all dune forests and the Dukuduku Forest fall under the jurisdiction of the NPB and Dept. Forestry, either as NPB resorts, reserves or the Coastal Forest Reserve.

Breeding Potential in Captivity: Good.

Recommended Conservation Measures: More information on the biology, ecology, and population structure of this species (and most of the other members of the genus) is needed. Companies engaged in dune mining operations are generally sympathetic to conservation priorities and make an effort to limit their impact on the remaining pristine forest.

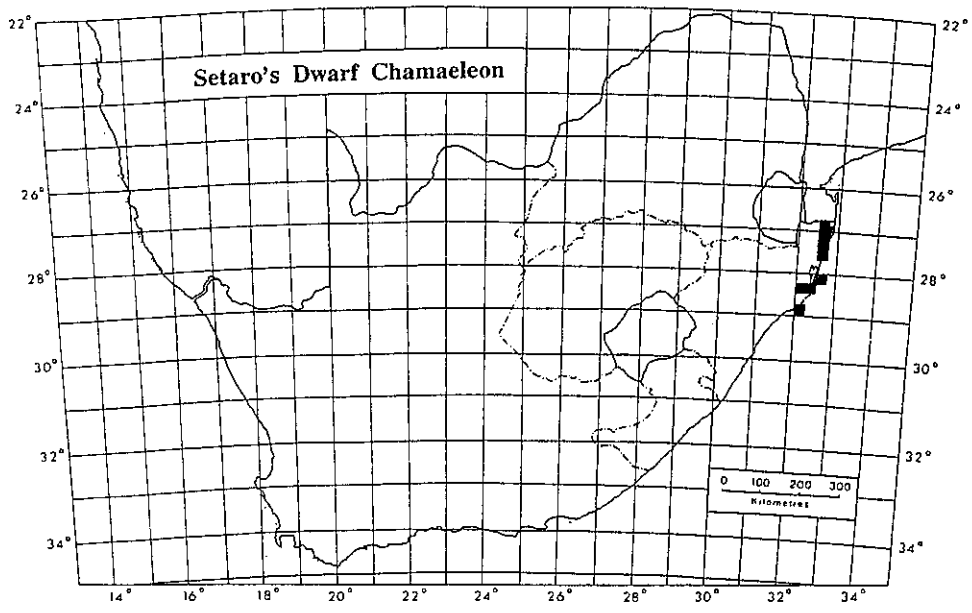
Remarks: Not listed specifically in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Bruton and Haacke, 1975, 1980; FitzSimons, 1943; Power, 1932; Raw, 1976.

Conservation: Acocks, 1975; Weisser, 1978, 1980.

Account prepared by: C.R. Tilbury, Bishop's Stortford, United Kingdom.



Map 54. Distribution of Setaro's dwarf chameleon *(Bradypodion setaroi).*

ZULULAND DWARF CHAMAELEON
Zoeloelandse dwergverkleurmannetjie

International status: NOT LISTED
South African status: RESTRICTED

Bradypodion nemorale Raw 1978. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Chamaeleonidae

Bradypodion nemorale Raw 1978. A further new dwarf chameleon from Natal, South Africa (Sauria: Chamaeleonidae). *Durban Mus. Nov.* **11(15):** pp 265-269. **Type locality:** Qudeni Forest.

SUMMARY

Status: Restricted. A small to moderate sized chamaeleon restricted to remnant montane forests near Eshowe, Zululand.

Research: Ongoing distribution and taxonomic studies on Natal chamaeleons are in progress (Raw *in prep.*), but basic studies on their ecology are still required.

SPECIES DATA

Identification: A small to moderate sized chamaeleon (maximum size 145 mm TL) with a moderately elevated, posteriorly projecting and recurved casque. Scalation finely heterogeneous. Dorsal crest well developed and usually extending onto the proximal part of the tail. Gular crest moderately developed, lobes longer than broad. Tail shorter than snout/vent length.

Colour - Body light brown with rust-coloured flanks split by 2 lime bars that extend vertically from the mid-flank; a horizontal network of orange/russet skin grooves occurs on the flanks; the tubercles on the limbs, flanks and tail are orange to chocolate, those on the dorsal crest orange.

Distribution: Found in remnant midland/montane forests between altitudes of 500-1500 m, on the slopes of the coastal plateau escarpment corresponding to 'Ngongoni veld' (Acocks veld type No. 5). Originally discovered in the Qudeni Forest in 1953, no further specimens were collected until 1977, when it was found in the Nkandla Forest by Raw and co-workers. Since then it has been discovered in the garden environs of Eshowe and the adjoining Hlinza Forest.

Habitat and Ecology: Arboreal. Usually found in low bushes and undergrowth. In Eshowe, a town with well established gardens and a forest 'flavour', these chamaeleons have adapted well and are common in hedgerows and shaded garden undergrowth. They are active throughout the year.

Breeding: Viviparous. No data available on clutch size, but a wild female was observed in a bush together with six newborn in late September. Like other species of dwarf chamaeleons they may have more than one litter a year.

Remarks: This species is taxonomically closely related to *B. setaroi* and *B. melanocephalum*. The relationships of these and other, as yet undescribed populations of dwarf chamaeleons in Natal is currently under investigation (Raw *in prep.*).

CONSERVATION

Status: Restricted to a few small remnant montane forests on the coastal plateau escarpment of south eastern Zululand. No population figures exist, but where they occur, these chamaeleons are fairly common.

Threats: Habitat destruction/deforestation occurs at a low grade at Qudeni, but is unlikely to pose a serious threat (Garland *pers.comm.*).

Existing Conservation Measures: The species' known range is secured under the protection of the Natal Parks Board (Hlinza), and the Department of Forestry (Qudeni and Nkandla).

Breeding Potential in Captivity: Good.

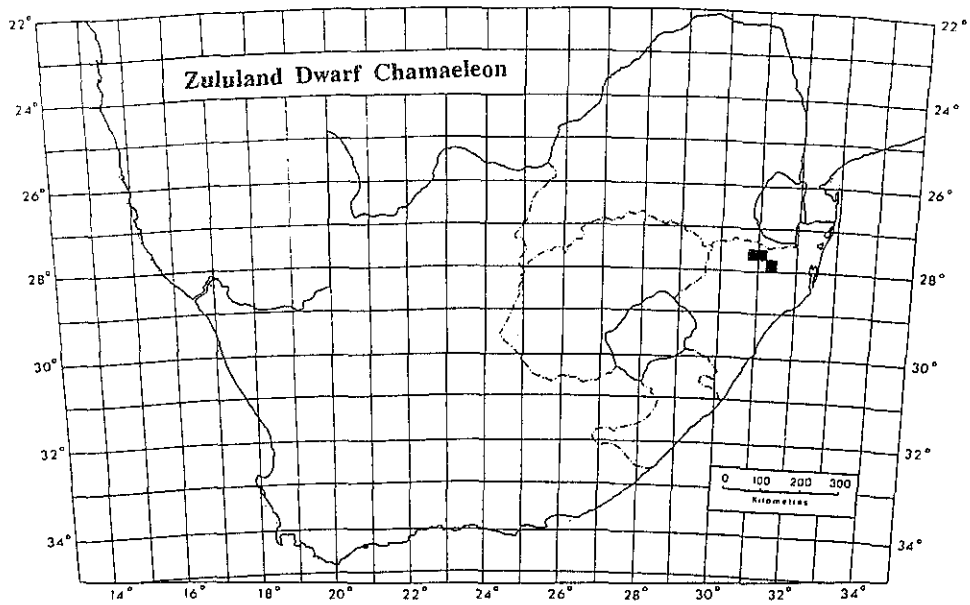
Recommended Conservation Measures: None required at the moment.

Remarks: Not specifically listed in the previous Red Data Book (McLachlan, 1978).

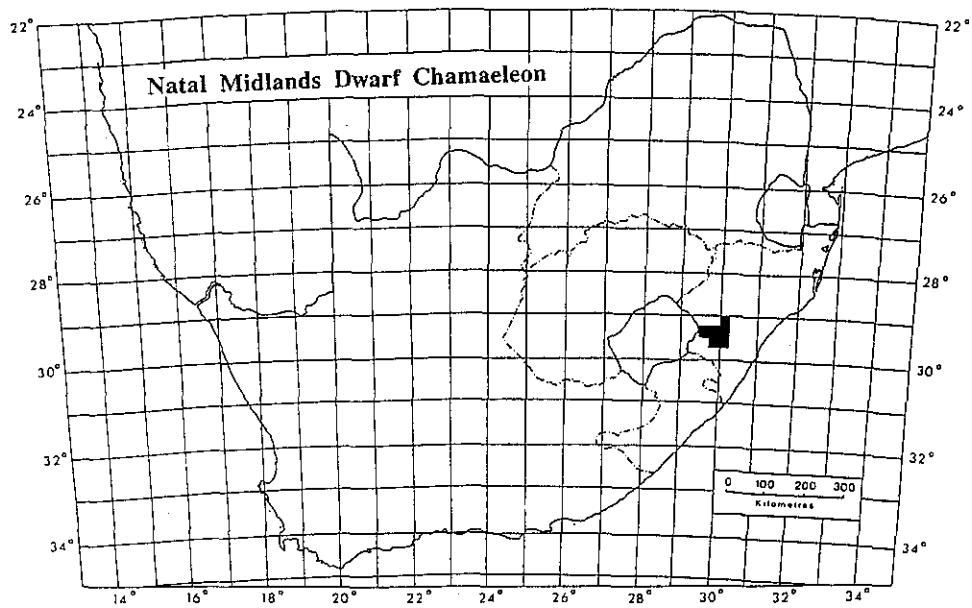
BIBLIOGRAPHY

Taxonomy and Distribution: Acocks, 1975; Raw, 1976, 1978.

Account prepared by: C. R. Tilbury, Bishop's Stortford, U.K.



Map 55. Distribution of the Zululand dwarf chamaeleon *(Bradypodion nemorale).*



Map 56. Distribution of the Natal Midlands dwarf chamaeleon *(Bradypodion thamnobates).*

NATAL MIDLAND DWARF CHAMAELEON
Natalse middelveld dwergverkleurmannetjie

International status: NOT LISTED
South African status: RESTRICTED

Bradypodion thamnobates Raw 1976. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Chamaeleonidae.

Bradypodion thamnobates Raw 1976. A survey of the dwarf chameleons of Natal, South Africa, with descriptions of three new species (Sauria: Chamaeleonidae). *Durb. Mus. Nov.* 11(7): 139-161. **Type locality:** Nottingham Road, Natal.

SUMMARY

Status: Restricted to the Natal Midlands east of the Drakensberg between altitudes of 850-1 400 m. None are currently located within any proclaimed protected areas.

Research: Poor. Basic ecological and distribution data are required.

SPECIES DATA

Identification: A moderately large dwarf chamaeleon (maximum size 200 mm TL), characterised by a prominent sharply elevated and recurved casque with strongly developed cranial crests. Scalation markedly heterogenous with enlarged convex tubercles scattered on upper and lower flanks, tail and limbs. A few large plate-like tubercles form irregular rows mid-flank. Dorsal and gular crests strongly developed. Tail longer than snout-vent length in males, less in females.

Colour - variable. In males a dark blue/green band extends subvertebrally from the head to tail, superior to a russet/red to brownish yellow mid-lateral flash; the belly is light to dark green; the cranial crests are horn-coloured, the dorsal crests and enlarged tubercles may be shades of red or yellow to ivory; chin and throat off-white, with white gular interstitium.

Distribution: The Natal Midlands, between Bulwer, Howick and Mooi River, between altitudes of 850-1 600 m.

Habitat and Ecology: Arboreal. Inhabits montane forest and bush (Acocks veld type No. 44). Adults may be found in the tops of trees, juveniles often sleep on grasses (Bourquin, *in litt.)*

Breeding: Viviparous. One record of 12 babies born late November. Two females were found to have 24 and 30 embryos (Bourquin, *pers. comm.).*

Remarks: Closely related to *B. transvaalense*; further evidence to clarify their taxonomic relationship is needed.

CONSERVATION

Status: With a restricted distribution in the Natal Midlands, but locally common.

Threats: The Natal Midlands is a highly productive agricultural and stock farming area, and little original montane forest still exists. The species has adapted well to urban situations but is at risk from human ignorance and predation by domestic animals, eg. cats (O. Bourquin, *pers. comm.).*

Existing Conservation Measures: Chamaeleons are not specifically protected in Natal and the species is not recorded from any protected reserve.

Breeding Potential in Captivity: Probably good.

Recommended Conservation Measures: General studies on the species biology and distribution are needed. A survey of the remaining areas of natural habitat should be undertaken to determine areas in its range suitable for proclaimed reserve status. Failing this, the species could be introduced to nearby protected areas with suitable habitat.

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1943; Power, 1932; Raw, 1976.

Conservation: Acocks, 1975.

Account prepared by: C. R. Tilbury, Bishop's Stortford, U.K.

LOMI'S BLIND LEGLESS SKINK
Lomi se blinde pootlose skink

International status: NOT LISTED
South African status: RESTRICTED

Typhlosaurus lomii Haacke 1986 **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Typhlosaurus lomii Haacke, 1986. Description of a new species of *Typhlosaurus* Weigmann, 1834 (Reptilia: Scincidae) from the west coast of southern Africa, with records of related species. *Ann. Transvaal Mus.* 34(9): 227-235, 2 figs.. **Type locality:** Farm Schulpfontein, Namaqualand district, Cape Province, South Africa.

SUMMARY

Status: Restricted. A small blind limbless fossorial skink with an apparently restricted range in coastal sands of the Western Cape.

Research: Taxonomy well defined; biology and habitat preferences unknown.

SPECIES DATA

Identification: A short, gracile limbless lizard (maximum length 141 mm; diameter into SV 35.6). It can be further distinguished by:

1. Low ventral counts (average 155, 60 less than that of other west coast *Typhlosaurus);*
2. longish tail (20% body length; 24,4% of ventrals);
3. twelve scale rows at midbody;
4. few head shields (only rostral, two loreals and two parietals in normal configuration);
5. ocular present or fused with first upper labial; one or two postoculars; three upper and two lower labials.

Colour in life unpigmented pink except for bright orange dorsal stripe which is widest over the first quarter of the body and then becomes restricted to the two middorsal scale rows towards the back of the body before breaking up on the tail into fine speckles and infusions. A fine line of brown vermiculations extends from the nostril to ocular area.

Distribution: Known only from an area of 25 x 5km along the Cape west coast near Hondeklipbaai.

Habitat and Ecology: Found in sandy terrain in the substrate and leaf litter under succulent shrubs. May be found in mole-rat hills.

Breeding: Unknown; probably viviparous, producing 1-2 young, as other species in the genus.

CONSERVATION

Status: Known from only a very restricted range, mostly within a potentially diamondiferous area with limited public access.

Threats: Habitat destruction following diamond mining activities.

Existing Conservation Measures: Protected by general Cape Ordinances. Access of public to habitat restricted due to diamond concessions. Not recorded from any protected reserve.

Breeding potential in captivity: Fair. The genus is easily maintained in captivity on a diet of termites.

Recommended Conservation Measures: It is essential to monitor the impact of diamond mining on the species habitat, and to determine the full range of the species.

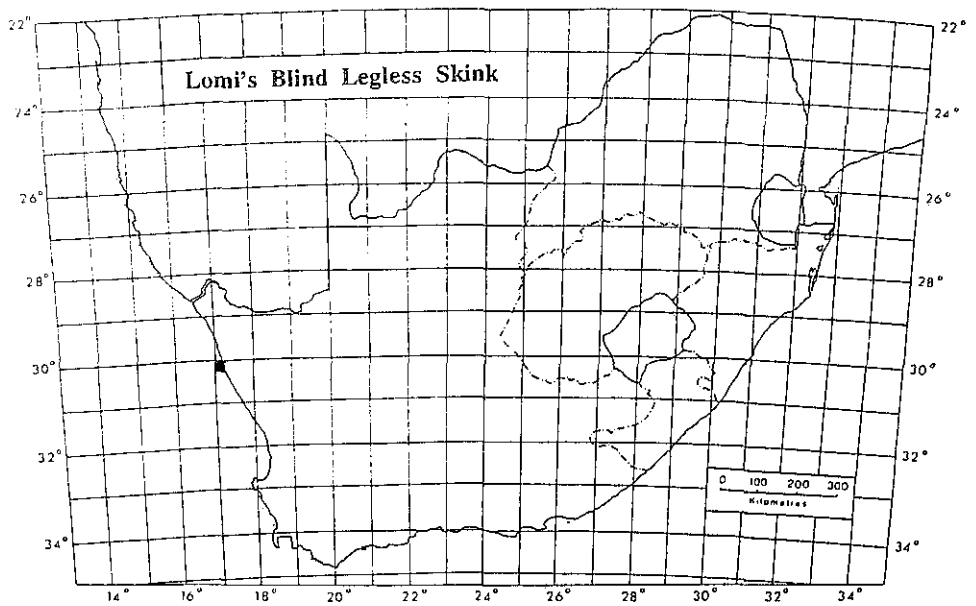
Remarks: Only recently described and therefore not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

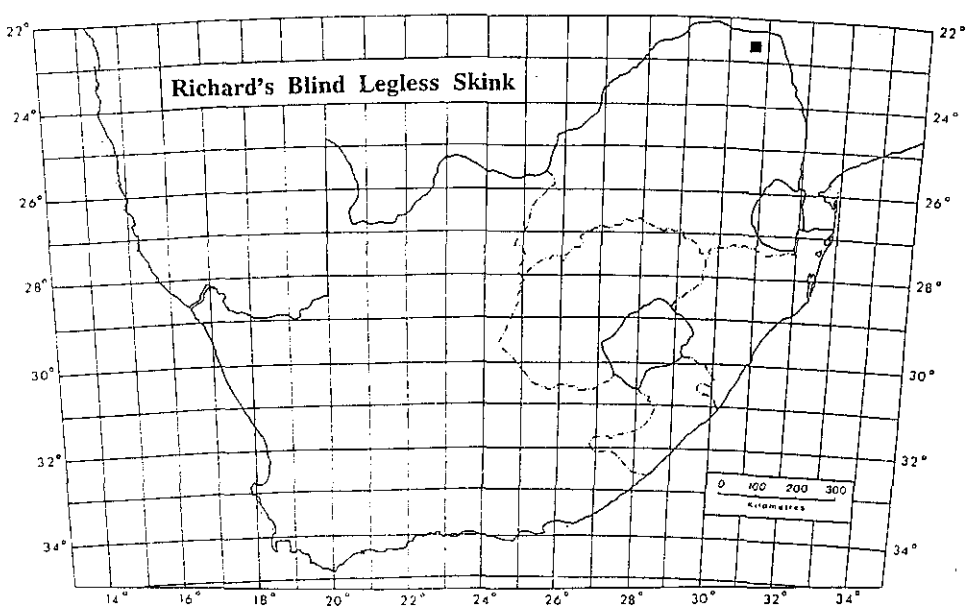
Taxonomy: Haacke, 1986.

Habitat and Ecology: Branch, 1988.

Account prepared by: W. D. Haacke, Transvaal Museum, Pretoria.



Map 57. Distribution of Lomi's blind legless skink *(Typhlosaurus lomii).*



Map 58. Distribution of Richard's blind legless skink *(Typhlosaurus lineatus richardi).*

RICHARD'S BLIND LEGLESS SKINK
Richard se blinde pootlose skink

International status: NOT LISTED
South African status: RESTRICTED

Typhlosaurus lineatus richardi Jacobsen, 1987. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Typhlosaurus lineatus richardi Jacobsen, 1987. A new subspecies of *Typhlosaurus lineatus* Boulenger 1887 (Reptilia: Scincidae) from Venda, Southern Africa. *S. Afr. J. Zool.* 22(4): p318. **Type locality:** 4-5 km north Tshamavhudzi peak, Venda, South Africa.

SUMMARY

Status: Restricted. A race with a very restricted distribution in a region of high endemicity. There are no known threats and it is protected by provincial ordinance.

Research: A well-defined race whose biology and habitat requirements are poorly known.

SPECIES DATA

Identification: A small (maximum length 16 cm), thin legless skink that also lacks eyes (represented only by dark spots beneath the head shields). It can be further distinguished by:

1. Back and flanks striped, belly immaculate white;
2. one supracilary;
3. 160-168 ventrals.

The body is golden yellow with four distinct longitudinal stripes extending the full length of the body to the tail tip, while the lateral stripes, one on each side, are distinct and end near the vent. The belly is white.

Distribution: A possible relict population, known only from a small area in northern Venda.

Habitat and Ecology: Found under rotting logs in deep aeolian sand on the northern slopes of the eastern Soutpansberg.

Breeding: No details, but likely to be the same as the other races which give birth to 1-2 live young in late summer.

CONSERVATION

Status: A well-defined race with a very restricted distribution in a region of high endemicity.

Threats: None identified.

Existing Conservation Measures: Protected by provincial Ordinance, but not reported from any protected reserve.

Breeding potential in captivity: Probably poor due to difficulty of rearing young.

Recommended Conservation Measures: The area should be monitored for possible habitat deterioation.

Remarks: Only recently described and therefore not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Broadley, 1968b; Jacobsen, 1987b.

Habitat and Ecology: Branch, 1988; Jacobsen, 1987b.

Account prepared by: W. R. Branch (Port Elizabeth Museum) and N. H. G. Jacobsen (Transvaal Divison of Nature Conservation).

STRIPEBELLIED BLIND LEGLESS SKINK **International status:** NOT LISTED
Gestreepte blinde pootlose skink **South African status:** RESTRICTED

Typhlosaurus lineatus subtaeniatus Broadley, 1968. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Typhlosaurus lineatus subtaeniatus Broadley, 1968. A revision of the African genus *Typhlosaurus* Wiegmann (Sauria: Scincidae). *Arnoldia Rhodesia* 3(36): p12. **Type locality:** Great Saltpan, Waterpoort, N. Transvaal.

SUMMARY

Status: Restricted. A race with a very restricted distribution in a region of high endemicity. There are no known threats and it is protected by provincial ordinance and recorded from a protected reserve.

Research: A welldefined race whose biology and habitat requirements are poorly known.

SPECIES DATA

Identification: A small (maximum length 16 cm), thin legless skink that also lacks eyes (represented only by dark spots beneath the head shields). It can be further distinguished by:

1. Back and belly striped (albeit ill-defined below);
2. two supracilaries;
3. 162-179 ventrals.

The body is golden yellow (paler on the belly) with a dark longitudinal stripe on each scale. Some specimens may be melanistic.

Distribution: Recorded only from a small area around the Geat Saltpan in the Soutpansberg district of the northern Transvaal.

Habitat and Ecology: Found under rotting logs in deep aeolian sand in woodland dominated by larger *Spirostachys africana*.

Breeding: No details, but likely to be the same as the other races which give birth to 1-2 live young in late summer.

CONSERVATION

Status: A well-defined race with a very restricted distribution in a region of high endemicity.

Threats: None identified.

Existing Conservation Measures: Protected by provincial Ordinance and reported from the Langjan Nature Reserve.

Breeding potential in captivity: Probably poor.

Recommended Conservation Measures: This area of high endemicity (see also whitebellied burrowing skink) should be monitored for possible habitat deterioation.

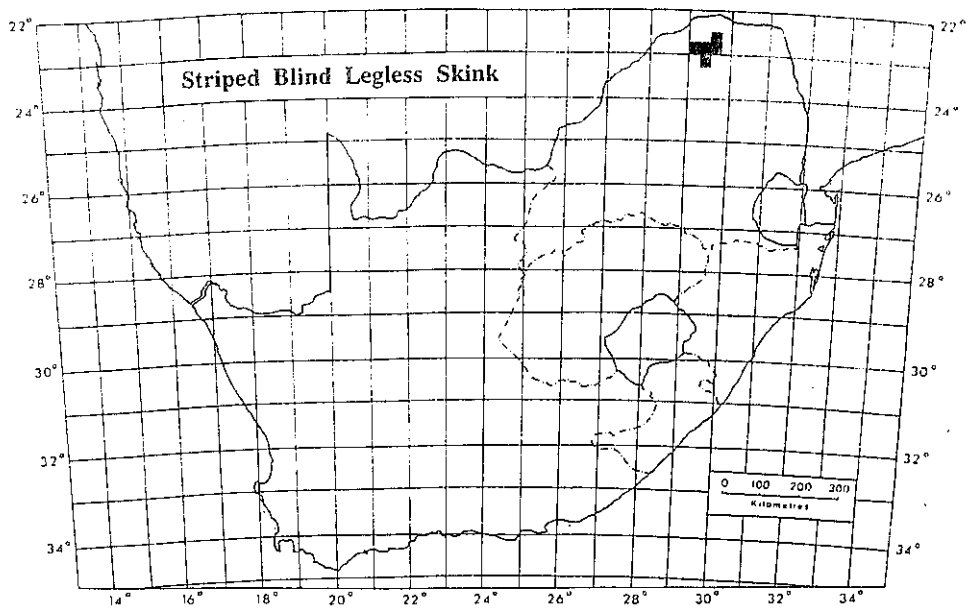
Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

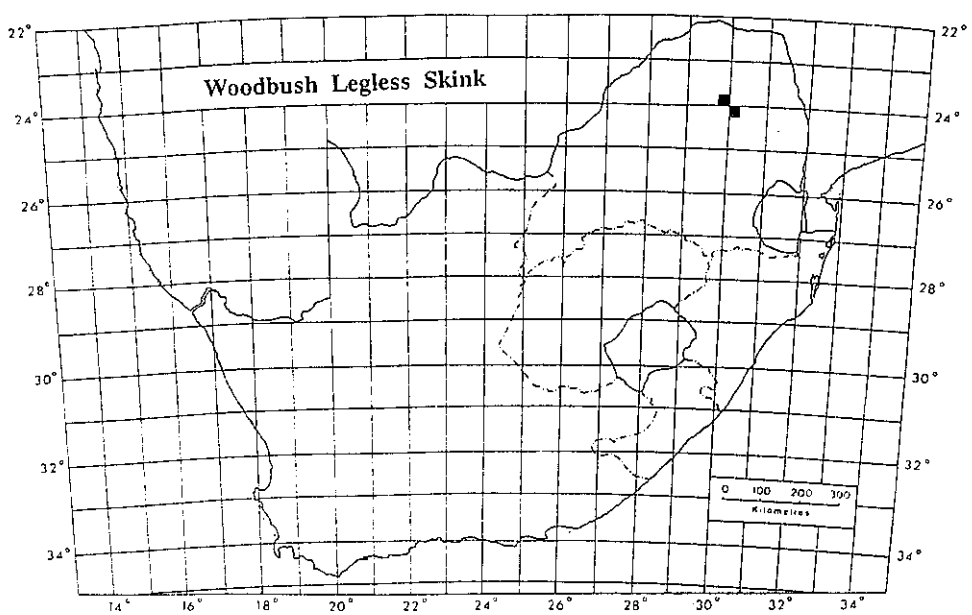
Taxonomy: Broadley, 1968; Jacobsen, 1987b.

Habitat and Ecology: Branch, 1988; Broadley, 1968.

Account prepared by: W. R. Branch (Port Elizabeth Museum) and N. H. G. Jacobsen (Transvaal Divison of Nature Conservation).



Map 59. Distribution of stripebellied blind legless skink *(Typhlosaurus lineatus subtaeniatus).*



Map 60. Distribution of the Woodbush legless skink *(Acontophiops lineatus).*

WOODBUSH LEGLESS SKINK
Woodbush se pootlose skink

International status: NOT LISTED
South African status: RESTRICTED

Acontophiops lineatus Sternfeld 1911. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Acontophiops lineatus Sternfeld, 1911. Zur reptilienfauna Deutsch-Ostafrikas. *Sitzb. Ges. Naturf. Freunde* **1911:** 248. **Type locality:** Mphome, Transvaal.

SUMMARY

Status: Restricted. A localised species, endemic to the north-eastern Transvaal from Woodbush to the Wolkberg. Populations at Serala are healthy and the species is safe.

Research: Poor/Fair. Ecological data lacking, most research being conducted on phyletic affinity.

SPECIES DATA

Identification: A stout limbless lizard (maximum size 190 mm TL), with movable lower eyelid. In colour very similar to *Typhlosaurus cregoi* Boulenger but differs in the tail being blunt and blackish. The body is yellow-white to creamy-white with dark brown to black longitudinal stripes. Head usually darker than body.

Distribution: Restricted to Woodbush and the Wolkberg, north-eastern Transvaal.

Habitat and Ecology: A fossorial species found mostly under stones on rocky hillsides in montane grassland and scrub. Has not been found inside the forest proper. The lizards occupy shallow tunnels with the rock as a roof. Usually found singly.

Breeding: Live bearing, two young being born in summer.

Remarks: A monotypic genus that appears intermediate between *Acontias* and *Typhlosaurus*, although it is most closely related to *Typhlosaurus c. cregoi* (Rieppel, 1982).

CONSERVATION

Status: The finding of populations in the Wolkberg has resulted in the downgrading of this species to a restricted category. Although populations exist at Woodbush, much of this habitat has been planted over with exotic plantations and few specimens were found. This contrasts with the healthy populations reported from several localities in the Wolkberg.

Threats: Afforestation appears to have a negative effect on the species based on survey results.

Existing Conservation Measures: Protected under the Transvaal Provincial Ordinance. The species is also protected in the Wolkberg wilderness area.

Breeding Potential in Captivity: Not known but probably reasonable.

Recommended Conservation Measures: Protection throughout its range. Rocky outcrops within plantations should be left unplanted. Monitoring of Woodbush populations should be considered.

Remarks: Endemic to the north-eastern Transvaal and has a high priority rating. Listed as rare (restricted) in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1943; Rieppel, 1982; Sternfeld, 1911.

Conservation: Jacobsen, Newbery and Petersen, 1986; McLachlan, 1978.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

KASNER'S DWARF BURROWING SKINK
Kasner se dwerg-grawende skink

International status: NOT LISTED
South African status: RESTRICTED

Scelotes kasneri FitzSimons 1939. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Scelotes kasneri FitzSimons, 1939. Descriptions of some new species and subspecies of lizards from South Africa. *Ann. Transvaal. Mus.* **20:** 13, text-figs. 11-13. **Type locality:** Lambert's Bay, Clanwilliam Dist., C.P.

SUMMARY
Status: Restricted. A bipedal, burrowing skink with didactyle hindlimbs and a restricted distribution range from Lambert's Bay to Vredenburg.

Research: Fair. Further extensive distribution surveys are required to determine the full extent of the distribution range. Ecological research identifying limiting factors is required as well.

SPECIES DATA
Identification: Head flattened, lower eyelid opaque but not scaly. Ear opening visible, very small. Three supraoculars, first at least twice as long as broad, longer than second and third together. Five upper labials, fourth longest, lying below eye. Three lower labials. Twenty-two scales round mid-body. Forelimbs absent. Hindlimbs didactyle, each digit terminating in a distinct curved claw. Outer digit approximately twice length of inner. A pair of enlarged preanal scales present. Type in the Transvaal Museum, Pretoria. Dimensions: Head + body + tail = 198 mm (tail partly regenerated) (FitzSimons, 1943).

Distribution: This species is presently known to occur only in the coastal dune areas from Lambert's Bay in the north to Vredenburg in the south. Specimens are deposited in the Transvaal, South African and Port Elizabeth Museums. Additional material from Lambert's Bay and Eland's Bay collected during December, 1983 is housed in the herpetological collection of the Jonkershoek Nature Conservation Research Station, as well as in the J. Ellerman Museum, University of Stellenbosch.

Habitat and Ecology: Inhabits coastal dune areas where it is often found under flat stones, as well as at rubbish dumps (Eland's Bay) under litter scattered among dunes. Virtually nothing is known about its ecology but it has frequently been found in close association with *Pachydactylus austeni* and *Scelotes caffer* (Baard, *pers. obs.*).

Breeding: No breeding recorded, but expected to produce live young like other *Scelotes spp. Scelotes bipes* produces two young at a time during March (Rose, 1926), and *S. gronovii* 1-2 babies (45-50 mm long) in March-April (Branch, 1988).

Remarks: Although this species has been recorded only from its known restricted distribution range, more extensive surveys along the west coast of the Cape Province are required to establish the exact extent thereof. Inland surveys and intensive ecological research will determine limiting factors, thus establishing reasons for its limited distribution.

CONSERVATION
Status: FitzSimons (1939) described the type specimen (TM 3856) collected during October, 1917 by J.H. Kasner from Lambert's Bay, Clanwilliam district, Cape Province. In his monograph (1943), FitzSimons states that the species is still known from only the type locality. FitzSimons (1950) lists three specimens (two juveniles and one adult - TM 22026-8) from Eland's Bay. McLachlan (1978) presents the distribution range of this species as extending from Lambert's Bay in the north to Eland's Bay in the south and states that it is known from only five specimens, four in the Transvaal Museum and one in the Port Elizabeth Museum. Since then, more specimens have been collected, three of which are housed in the herpetological collection of the Jonkershoek Nature Conservation Research Station collected from Lambert's Bay and Eland's Bay during December, 1983 (CDNEC 5435, 5462-3). At present *Scelotes kasneri* is known to occur from Lambert's Bay in the north to Vredenburg (TM 46867) in the south. No estimates of population numbers exist. The conservation status of this species is regarded as "rare" by McLachlan (1978), but with evidence that it is more abundant, it is treated as "restricted".

Threats: McLachlan (1978) indicates no decline in numbers, and this seems reasonable to accept since *Scelotes kasneri* may be coping with a certain degree of disturbance for instance at the rubbish dumps at

Eland's Bay. The main threat which may, however, lead to a decline is degradation of the sand-dune habitat. Excessive use of this habitat for seaside holiday resorts and/or parking lots, as well as diamond mining, as occurs north of the Olifants river estuary, will lead to the irreversible destruction of this sensitive habitat. Off-road vehicle use on the sand dunes may also cause extensive damage.

Existing Conservation Measures: This species is currently protected under the Cape Nature Conservation's Ordinance No. 19 of 1974 as a "wild animal" which implies that no material may be collected, transported, kept in captivity, imported or exported without the appropriate permits.

Breeding Potential in Captivity: Captive breeding under correctly simulated conditions should be feasible. The establishment of a subterrestrial invertebrate population with larvae-producing potential in the same breeding enclosure could act as a food resource for young.

Recommended Conservation Measures: Development of the coastal zone between Lambert's Bay and the southern limit of the species' distribution range should be closely assessed and recommendations towards the preservation of natural habitat should be included in environmental impact assessments. Off-road vehicle use on the dunes should be prohibited.

Remarks: This species is in no immediate danger, but as in many other cases, it is important that natural habitat should be preserved as far as possible. Mouton *et al.* (1987) state that research should be concentrated on this species.

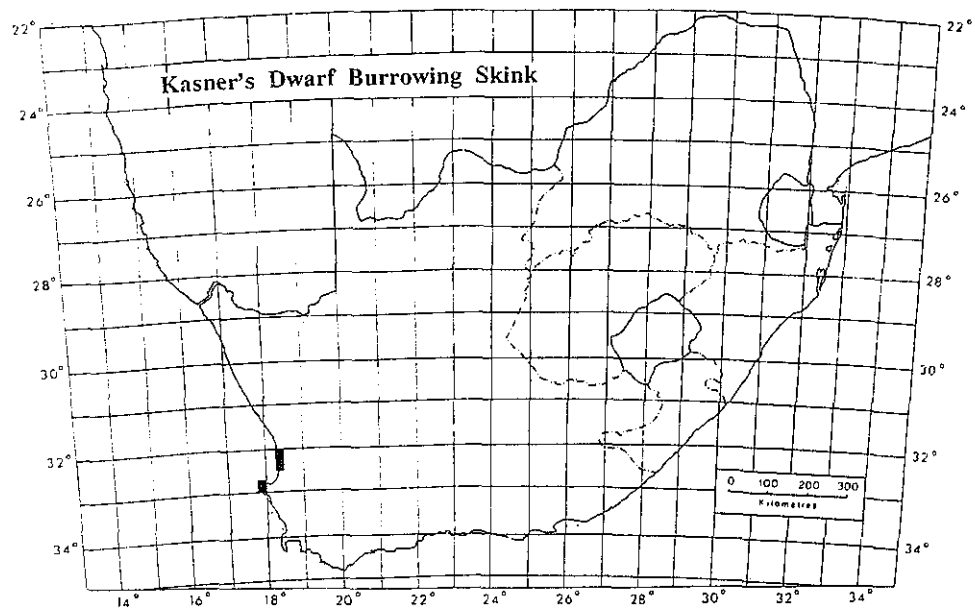
BIBLIOGRAPHY

Taxonomy: FitzSimons, 1939, 1943.

Breeding: Branch, 1988; Rose, 1926.

Conservation: FitzSimons, 1950; McLachlan, 1978; Mouton, Oelofsen and Mostert, 1987.

Account prepared by: E.H.W. Baard, CDNEC CP Jonkershoek Research Station.



Map 61. Distribution of Kasner's dwarf burrowing skink *(Scelotes kasneri)*.

GRONOVI'S DWARF BURROWING SKINK **International status:** **NOT LISTED**
Gronovi se dwerg-grawende skink **South African status:** **RESTRICTED**

Scelotes gronovii (Daudin 1802), **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Seps gronovii Daudin, 1802. *Histoire naturelle, générale et particulère, des reptiles.* Paris. **4:** 354. **Type locality:** "Cape of Good Hope".

SUMMARY

Status: Restricted. A bipedal burrowing skink with monodactyle hindlimbs. It has a restricted distribution range from Doringbaai (Vredendal district) in the north to Robben Island in the south.

Research: Fair. Further distribution surveys are required to establish the full extent of its range. Research on the ecological requirements of the species is far from complete as well.

SPECIES DATA

Identification: Snout somewhat depressed. Lower eyelid scaly. Ear-opening minute and just discernible. Three supraoculars, first as large as second and third together. Five upper labials, third and sometimes also part of fourth below eye. Four lower labials. Eighteen scales round mid-body. Preanal scales not or feebly enlarged. Forelimbs absent. Hindlimbs represented by small, monodactyle, clawed or pointed rudiments. Tail shorter than head and body (FitzSimons, 1943).

Distribution: This species is known to occur along the west coast of the Cape Province from Doringbaai (Vredendal district) in the north to Robben Island in the south. The only inland record is from Graafwater. Material is housed in the herpetological collections of the Transvaal, South African and Port Elizabeth Museums as well as the J. Ellerman Museum, University of Stellenbosch.

Habitat and Ecology: Inhabits coastal areas along the West Coast and is usually found under flat rocks in sandy areas such as coastal dunes as well as under loose litter scattered among dunes. The inland record from Graafwater unfortunately lacks habitat data. Mouton *et al.* (1987) states that "a few specimens were collected in recently ploughed fields" which may indicate that agricultural activities probably have little impact on the occurrence of the species.

Breeding: 1-2 live babies (45-50 mm long) are born in March-April (Branch, 1988).

Remarks: Due to the few distribution records available, more intensive surveys along the coast as well as inland are required to determine the exact extent of the true distribution range. Research establishing the ecological requirements of the species is still inadequate as well.

CONSERVATION

Status: The type specimen of *Scelotes gronovii* was described by Daudin (1802) as *Seps gronovii*. The type locality is unfortunately very vague and given as "Cape of Good Hope". Boulenger (1898) first described it as *Scelotes gronovii*. Boulenger (1910) gives Dassen Island as locality while FitzSimons (1943) indicates that the distribution range incorporates the coastal strip of the south-western Cape Province with recorded localities as Dassen Island, Saldanha Bay and Lambert's Bay. Additional localities are: Graafwater (FitzSimons, 1950); Robben Island (TM 35741); Doringbaai (TM 56061); Duikereiland (TM 63804); Cape Columbine (TM 63808); Dassen Island (TM 65844); Schaapen Island, Langebaan (PEM 554, 556-7, 561-4, 566-8); Langebaan (PEM 559); Sand Bay, Soetlandskop and Swartriet (Vredenburg) (JEFB 360, 84, 512-3 respectively) and Plankies Bay, Langebaan (JEFB 253-4). With this new evidence of the species occurring at these various localities, the "rare" status has been changed to "restricted", and the distribution range of *Scelotes gronovii* now incorporates the coastal areas from Doringbaai in the north to Robben Island in the south. Although no population number estimates exist, McLachlan (1978) states that the species is common where it occurs.

Threats: McLachlan (1978) indicates no decline in numbers, but Mouton *et al.* (1987) regard the species as vulnerable due to its restricted distribution and terrestrial nature and recommend that its well-being be closely monitored. As in the case of *Scelotes kasneri*, the main threat that

remains is the degradation of natural habitat. Coastal sand dune habitat is generally regarded as sensitive and development of any kind should be closely monitored for detrimental impact.

Existing Conservation Measures: This species is currently protected under the Cape Ordinance no. 19 of 1974.

Breeding Potential in Captivity: Captive breeding under correctly simulated environmental conditions should be feasible. The establishment of a subterrestrial invertebrate population with larvae-producing potential in the same breeding enclosure could act as food resource for young.

Recommended Conservation Measures: Similar to measures proposed for *Scelotes kasneri*. The development of the coastal zone between Doringbaai and the southern limit of the species' distribution range should be closely assessed and recommendations towards the preservation of natural habitat should be included in any environmental impact assessments. Developments include new coastal recreation facilities, townships, as well as diamond mining in the northern parts of the range (as is the case in the region of the Olifant's river estuary). Excessive off-road vehicle use on the sand dunes should be prohibited as well.

Remarks: From the evidence produced, it is clear that *Scelotes gronovii* occurs commonly throughout its distribution range, thus being in no immediate danger. It is, however, important that preservation of natural habitat should be the priority in the conservation of the species. Mouton *et al.* (1987) calls for concentrated research on this species. Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

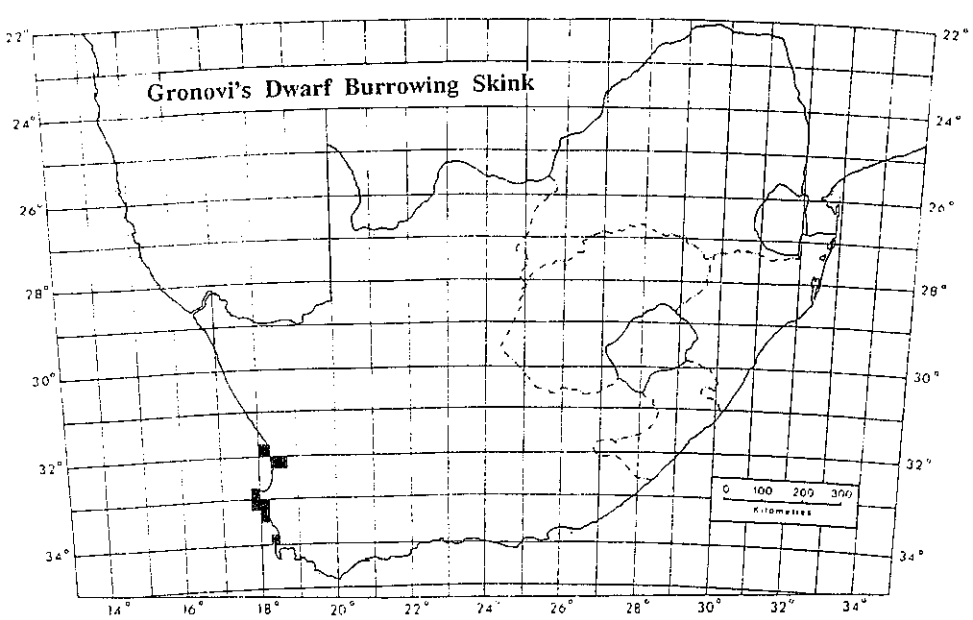
BIBLIOGRAPHY

Taxonomy: Daudin, 1802; FitzSimons, 1943.

Conservation: Boulenger, 1898, 1910; FitzSimons, 1950; McLachlan, 1978; Mouton, Oelofsen and Mostert, 1987.

Habitat and Ecology: Branch, 1988; Mouton, Oelofsen and Mostert, 1987.

Account prepared by: E.H.W. Baard, Chief Directorate of Nature and Environmental Conservation, Private Bag 5014, Stellenbosch.



Map 62. Distribution of Gronovi's dwarf burrowing skink *(Scelotes gronovii)*.

WHITEBELLIED LIMPOPO DWARF BURROWING SKINK
Witpens Limpopo dwerg-grawende skink

International status: NOT LISTED
South African status: RESTRICTED

Scelotes limpopoensis albiventris Jacobsen 1987. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Scincidae.

Scelotes limpopoensis albiventris Jacobsen 1987. A new subspecies of *Scelotes limpopoensis* FitzSimons, 1930 (Sauria: Scincidae), with notes on the distribution of the genus *Scelotes* in the Transvaal. *Ann. Transvaal Mus.* 34(17): p371, fig. 1. **Type locality:** Langjan Nature Reserve, Soutpansberg District, N. Transvaal.

SUMMARY

Status: Restricted. A recently described race, with a very restricted distribution in a region of high endemicity. There are no known threats and the species is protected by provincial ordinance and recorded from a protected reserve.

Research: A well-defined race whose biology and habitat requirements are poorly known.

SPECIES DATA

Identification: A small burrowing skink with welldeveloped, lidded eyes, minute fore- and hindlimbs, and a tail equal to or slightly longer than the head and body. It can be further distinguished by having:

1. A uniform white belly;
2. six supraciliaries;
3. and usually only two toes on the forelimbs.

The head and body are sepia above with a broad dark brown vertebral stripe that extends from the rostral to approximately threequaters of the length of the tail. A welldefined buffy dorsolateral streak extends on either side from behind the nostril onto three-quarters of the tail. This is flanked laterally by a broad dark brown stripe, extending from the first upper labials through the eye to the tail tip. The belly is immaculate white.

Distribution: Recorded only from four farms in the Soutpansberg district of the northern Transvaal.

Habitat and Ecology: Found under rotting logs in deep aeolian sand in woodland dominated by larger *Spirostachys africana*.

Breeding: No details, but likely to be the same as the nominate race which gives birth to two live young in late summer.

CONSERVATION

Status: A well-defined race with a very restricted distribution in a region of high endemicity.

Threats: None identified.

Existing Conservation Measures: Protected by provincial Ordinance and reported from the Langjan Nature Reserve.

Breeding potential in captivity: Probably poor.

Recommended Conservation Measures: This area of high endemicity (see also stripebellied blind legless skink and black whitelipped snake) should be monitored for possible habitat deterioration.

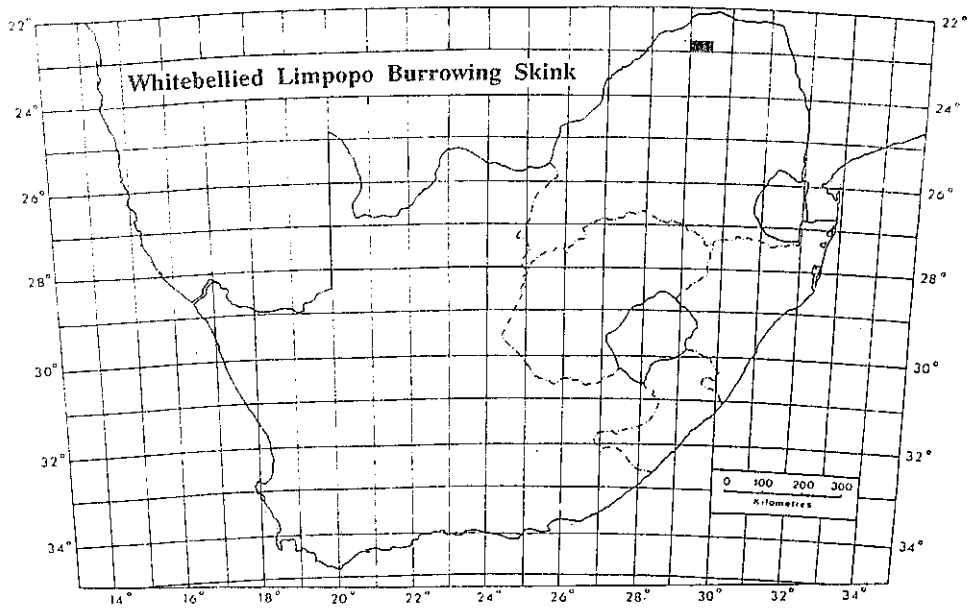
Remarks: Only recently described and therefore not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

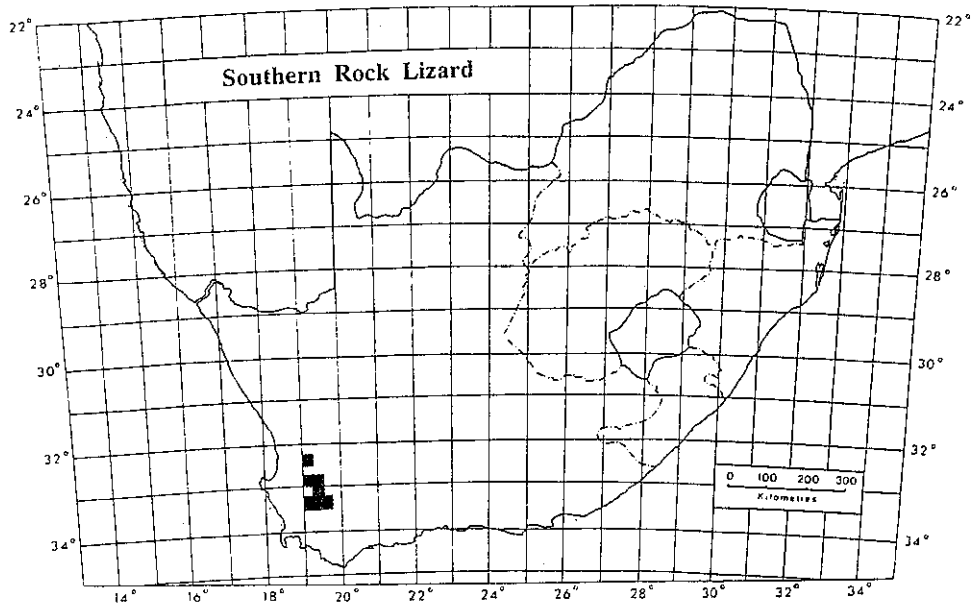
Taxonomy: Jacobsen, 1987.

Habitat and Ecology: Jacobsen, 1987.

Account prepared by: W. R. Branch (Port Elizabeth Museum) and N. H. G. Jacobsen (Transvaal Divison of Nature Conservation).



Map 63. Distribution of the whitebellied Limpopo dwarf burrowing skink *(Scelotes limpopoensis albiventris).*



Map 64. Distribution of the southern rock lizard *(Lacerta australis).*

SOUTHERN ROCK LIZARD
Suidelike rotsakkedis

International status: NOT LISTED
South African status: RESTRICTED

Lacerta australis Hewitt 1926. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Lacertidae.

Lacerta australis Hewitt 1926. Some new or little known Lizards and Batrachians from South Africa. *Ann. S. Afr. Mus.* **20(6)**: 473-490. **Type locality:** Matroosberg, Ceres district.

SUMMARY
Status: Restricted. A montane species with a restricted range in the south-western Cape, from the Hex River Mountains in the south to the Cedarberg Wilderness area in the north.

Research: Fair. More ecological studies are needed.

SPECIES DATA

Identification: A lacertid of medium size (maximum size 77 mm SVL). Body covered with very small granular scales. Body colour usually dark brown to blackish above with numerous pale green and orange spots which are arranged in more or less regular longitudinal series. Distinguished by:

1. Very small granular dorsal scales;
2. and four upper labials anterior to the subocular.

Distribution: This species ranges along the Cape fold mountains from the Hex River Mountains in the south to the Cedarberg Wilderness area in the north.

Habitat and Ecology: The species seems to be mainly rupicolous but is not confined to the rock faces at high altitudes as was previously suspected. At several places specimens were collected on the lower mountain slopes. These lizards have their retreats in cracks in rocks or under large boulders, sometimes in association with other species but never members of its own species.

Breeding: No information is available, but it is probable that the species is oviparous as viviparity is exceptionally rare in lacertids.

Remarks: The generic status of the South African *Lacerta* taxa is a point of dispute. Arnold (1978) has suggested that the South African forms are not congeneric with Palaearctic *Lacerta* sensu stricta. In all probability a new genus will have to be erected to accomodate them.

CONSERVATION

Status: Although this species has a restricted distribution it is fairly common within its range.

Threats: The species occurs in rugged, mountainous areas which are largely unsuitable for agricultural purposes. It therefore seems highly unlikely that it will ever be adversely influenced by man's activities, either directly or indirectly. Its elusive nature and the ruggedness of the terrain it inhabits will furthermore effectively prevent the pet trade from having an impact on this species. Veld fires and afforestation may have locally deterimental effects.

Existing Conservation Measures: The species is protected by Cape Provincial Ordinances.

Breeding Potential in Captivity: The species keeps well in captivity and will probably breed too.

Recommended Conservation Measures: None necessary at this stage.

Remarks: Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Arnold, 1973; Haacke, 1982; Hewitt, 1926.

Distribution: De Villiers, Baard and Branch, 1983; Haacke, 1982; Mouton, Oelofsen and Mostert, 1987.

Habitat and Ecology: Branch, 1988.

Conservation: McLachlan, 1978; Mouton, Oelofsen and Mostert, 1987.

Account prepared by: P. le F. Mouton, J. Ellerman Museum, University of Stellenbosch, Stellenbosch.

SOUTPANSBERG ROCK LIZARD
Soutpansberg rotsakkedis

International status: NOT LISTED
South African status: RESTRICTED

Lacerta rupicola FitzSimons 1933. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Lacertidae.

Lacerta rupicola FitzSimons, 1933. Description of five new lizards from the Transvaal and Southern Rhodesia. *Ann. Tvl. Mus.* **15**: 278. **Type locality:** Lake Fundusi, Soutpansberg mountains, N. Transvaal.

SUMMARY

Status: Restricted. A small lizard occurring along the Soutpansberg from Waterpoort to Lake Fundusi. A secretive lizard its status is secure.

Research: Poor. More surveys needed as well as ecological information.

SPECIES DATA

Identification: A small (maximum size 55 mm SV) lizard with five upper labials anterior to the subocular, nostril pierced between 2-4 nasals and 1st upper labial. Subdigital lamellae smooth or tubercular; 36 scales across middle of body. Colour: Reddish brown to dark brown above with a white dorsolateral band on each side from behind eye to base of tail. Also a thin pale lateral line from behind eye to the arm and continuing faintly along sides of body to groin. Below bluish with speckling of dark blue to blackish.

Distribution: This lizard is known only from the Soutpansberg between Waterpoort in the west and Lake Fundusi in the east.

Habitat and Ecology: A diurnal lizard occurring in boulder scree as well as among rocky outcrops with extensive bedrock exposure. A tame lizard, it forages in short bursts of movement, but is very quick off the mark if disturbed.

Breeding: Oviparous, a female contained two ova.

Remarks: Arnold (1973) has discussed the zoogeographic anomoly of having representatives of the Palaerctic genus *Lacerta* in southern Africa. He has questioned the generic affinities of the southern African representatives (cf. also *Lacerta australis),* and has suggested that a new genus may be required. Although restricted to the Soutpansberg, its range and choice of habitat make it secure. It is likely that it will be found west of Waterpoort and possibly east of Lake Fundusi.

CONSERVATION

Status: The species has a restricted range and is nowhere common. It is also endemic to the Soutpansberg. Its current status is secure.

Threats: None known, although collectors should be monitored.

Existing Conservation Measures: It is afforded protection under the Transvaal Provincial Ordinance and it is found in the Happy Rest Nature Reserve. It is also indirectly protected at the type locality of Lake Fundusi as people are not allowed unaccompanied access.

Breeding Potential in Captivity: Not known, probably poor.

Recommended Conservation Measures: This species has a restricted range and is relatively rare. It is important that further surveys of its distribution as well as ecological data be obtained. The protection of larger areas of the Soutpansberg is paramount.

Remarks: An endemic species, restricted to the Soutpansberg, and with a high conservation rating. Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

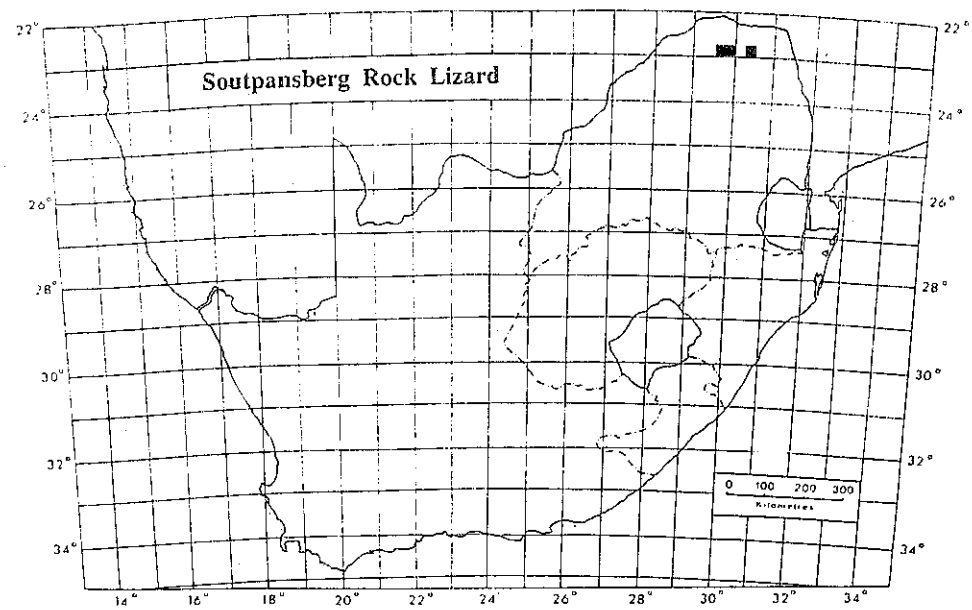
BIBLIOGRAPHY

Taxonomy: Arnold, 1973; FitzSimons, 1933, 1943.

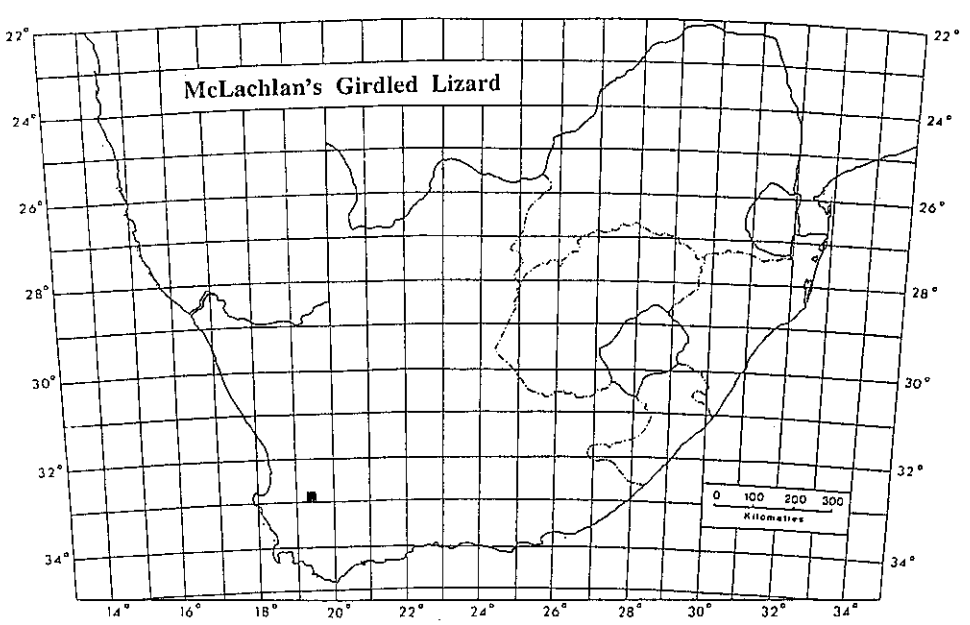
Habitat and Ecology: Branch, 1988.

Conservation: Jacobsen, Newbery and Peterson, 1986; McLachlan, 1978.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.



Map 65. Distribution of the Soutpansberg rock lizard *(Lacerta rupicola).*



Map 66. Distribution of McLachlan's girdled lizard *(Cordylus mclachlani).*

McLACHLAN'S GIRDLED LIZARD
McLachlan se gordelakkedis

International status: NOT LISTED
South African status: RESTRICTED

Cordylus mclachlani Mouton 1986. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Cordylus mclachlani Mouton 1986. Description of a new species of *Cordylus* Laurenti (Reptilia: Cordylidae) from the south-western Cape, South Africa. *S. Afr. J. Zool.* 21: 319-324. **Type locality:** The farm Zonder Water in the Koue Bokkeveld.

SUMMARY

Status: Restricted. A small species with a very restricted range in the Koue Bokkeveld district north of Ceres in the south-western Cape.

Research: Only recently discovered. Extensive distribution surveys in the region of the type locality are required to establish the true range.

SPECIES DATA

Identification: A rupicolous cordylid with the head and body strongly depressed and of small body size (maximum SVL 73 mm). Further distinguished by:

1. Only two supraciliaries per side;
2. posterior parietals usually separated by a post-interparietal scale
3. supranasals swollen.

Body colour usually olive brown with numerous black markings and few yellow specks above; sides of body and the limbs and tail underneath, as well as the upper and lower jaw, a lighter reddish brown; the head and body below a creamy white and the head above dark brown to blackish with lighter brown markings and a faint dark line from nostril through eye to occiput.

Distribution: Presently known only from the type locality, where it is only occurs 5 km along a low ridge of the Witteberg Formation. Numerous searches in adjacent areas proved fruitless.

Habitat and Ecology: Rupicolous, occupying narrow cracks in sandstone outcrops. In all cases only one individual occupied a specific crack. It seems to prefer low rock outcrops, and is absent on adjacent large Skurweberg and Cedarberg mountains ridges. The vegetation is karroid shrublands. The tail is very easily detatched and a high percentage of lizards have incomplete tails.

Breeding: No information is available but like other members of the genus would probably give birth to 2-3 live babies during late summer.

Remarks: Very similar looking cordylids have been collected at Nieuwouldtville and Klaver (Visser *unpub. obs.)*. They are probably closely related to *C. mclachlani*, and may represent a valid northern race.

CONSERVATION

Status: The late discovery (1986) of this species indicates that it probably has a very restricted range. The population density seems fairly high as several specimens were collected during a very short time.

Threats: The species' habitat is unsuitable for agricultural purposes. The only real threat may be over-collecting by scientists unaware of the species' very restricted distribution.

Existing Conservation Measures: Protected by general Cape Provincial Ordinances. The genus *Cordylus* is also listed on CITES Appendix 2.

Breeding Potential in Captivity: Unlike most cordylids it does not fare well in captivity and all animals kept in captivity so far died within a month.

Recommended Conservation Measures: It is imperative that the full range of this species is determined. The area to the east of the type locality, the Swartruggens mountains and the Ceres Karoo, have not been surveyed. The species may have a larger distribution in these areas. In the interim the status of the present population should be closely monitored and un-necessary collecting prevented.

Remarks: Recently described and thus not included in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Mouton, 1986.

Conservation: Mouton, Oelofsen and Mostert, 1987.

Account prepared by: P. le F. Mouton, J. Ellerman Museum, University of Stellenbosch, Stellenbosch.

LAWRENCE'S GIRDLED LIZARD
Lawrence se gordelakkedis

International status: NOT LISTED
South African status: RESTRICTED

Cordylus lawrencei FitzSimons 1939. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Cordylus lawrencei FitzSimons 1939. Descriptions of some new species and subspecies of lizards from South Africa. *Ann. Tvl. Mus.* **20:** 5 - 16. **Type locality:** Lekkersing in the Richtersveld, Little Namaqualand.

SUMMARY
Status: Restricted. A small, strongly depressed girdled lizard known only from a few isolated localities in the Richtersveld.

Research: Fair. Further collecting is required to see if the range is not more extensive.

SPECIES DATA
Identification: A small girdled lizard (maximum size 70 mm SVL) with the head and body depressed. Further distinguished by:

1. Sixteen longitudinal series of dorsal scales;
2. median occipitals projecting behind.

Body colour dark brown, spotted with yellow above; belly greyish white. The colour of the head is black, speckled with dull yellow posteriorly.

Distribution: This species is known only from Lekkersing and from Port Nolloth in Little Namaqualand.

Habitat and Ecology: A rupicolous form occurring on high hills where it has its retreat in crevices between low rocks which form ridges on the hill sides that are covered in sparse karroid shrubland.

Breeding: No information; probably like other members of the genus and giving birth to 2-3 live babies during late summer.

Remarks: Typical of several other cordylid species in the western and south-western districts of South Africa the distribution of this species is very patchy and restricted. This indicates a former (or still continuing) contraction of range, probably linked to global climatic occillations.

CONSERVATION
Status: Restricted. Although having a very restricted range this lizard is fairly common within its range.

Threats: Except for possible over-exploitation of the known localities by scientists no immediate dangers are foreseen.

Existing Conservation Measures: The species receives general protection under the Cape Provincial Ordinances and is also listed on CITES (Appendix 2).

Breeding Potential in Captivity: Not known, but probably good.

Recommended Conservation Measures: None presently required.

Remarks: Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

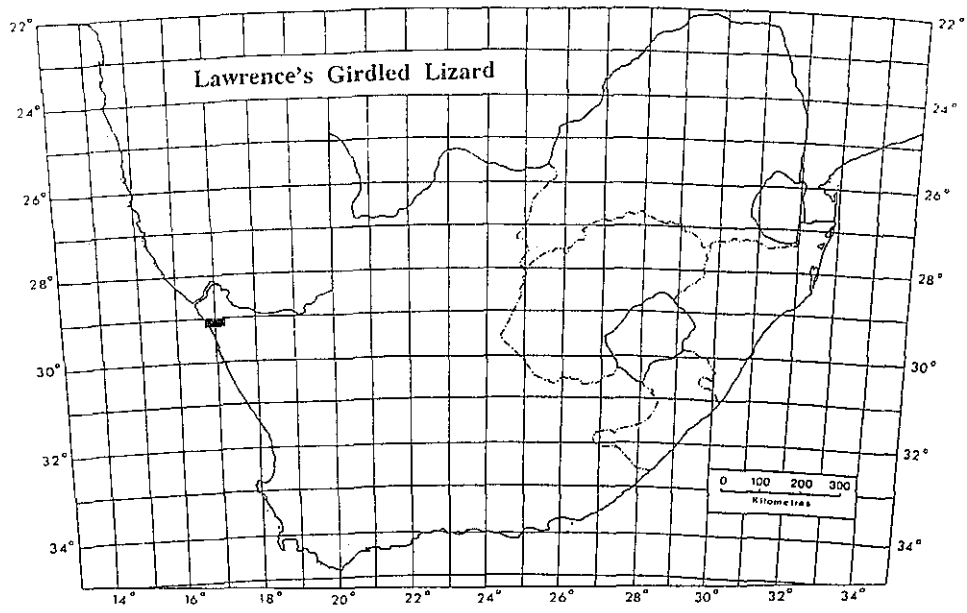
BIBLIOGRAPHY

Taxonomy and Distribution:: FitzSimons, 1939; Visser, 1979.

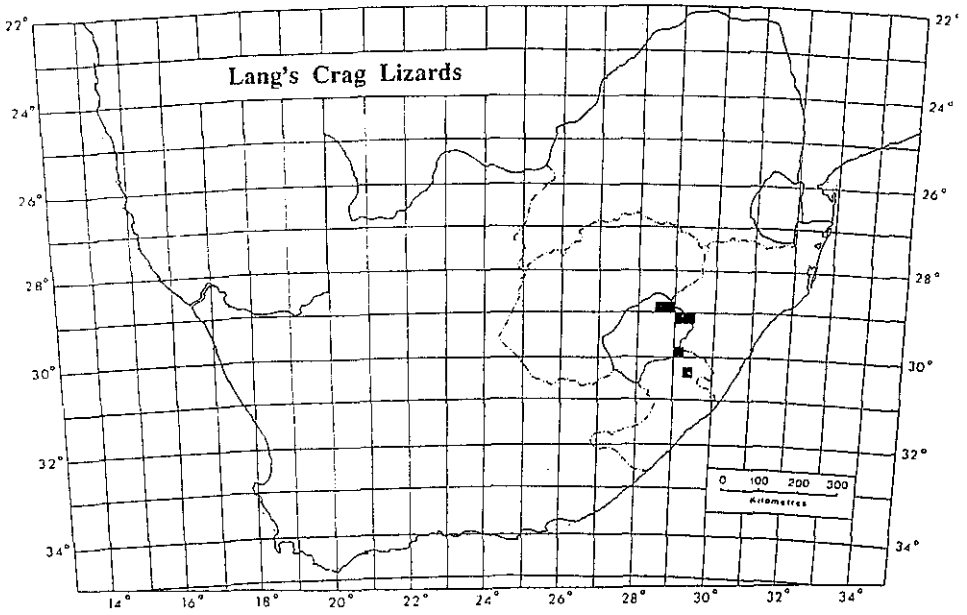
Habitat and Ecology: Branch, 1988.

Conservation: McLachlan, 1978.

Account prepared by: P. le F. Mouton, J. Ellerman Museum, University of Stellenbosch, Stellenbosch.



Map 67. Distribution of Lawrence's girdled lizard *(Cordylus lawrencei).*



Map 68. Distribution of Lang's crag lizard *(Pseudocordylus langi).*

LANG'S CRAG LIZARD
Lang se kransakkedis

International status: NOT LISTED
South African status: RESTRICTED

Pseudocordylus langi Loveridge 1944. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Pseudocordylus langi Loveridge 1944. Revision of the African lizards of the Family Cordylidae. *Bull. Mus. Comp. Zool. Harv.* 95:p73. **Type locality:** Mont-aux-Sources, Drakensberg.

SUMMARY
Status: Restricted, but inhabiting an inaccesible and well-protected region. Known threats include illegal collecting.

Research: Taxonomy wellknown; distribution and basic biology still require further studies.

SPECIES DATA
Identification: A medium size crag lizard with welldeveloped head and limbs. It can be distinguished from other crag lizards by:

1. The large frontonasal, that makes good contact with the anterior loreals;
2. the smooth, granular scales on the flanks;
3. having only five lower labials;
4. and 11-17 femoral pores.

The head and back are olive grey, heavily blotched and streaked with black. There are numerous pale grey-green blotches on the back, that tend to form crossbands. Two large black patches occur on the side of the neck, and the flanks have a series of 1-6 bright sky-blue spots. The chin and throat are white with a large dark brown patch on the throat, flanked by three parallel narrow brown lines; the belly is slate grey and darkly spotted; in males the anal region may be suffused with orange.

Distribution: Restricted to the summit and upper slopes of the Natal Drakensberg, extending into Lesotho.

Habitat and Ecology: Lives in small colonies in rock fissures at high altitudes (2 500-3 000 m). Like other crag lizards the diet is composed mainly of small invertebrates, although some plant matter is also eaten, including the petals of ever-lasting flowers (*Helichrysum* sp.).

Breeding: Viviparous, giving birth to 1-3 babies.

CONSERVATION
Status: Restricted to an inaccesible and well-protected region, and not currently threatened.

Threats: Illegal collecting for the pet trade may form an irregular and minor threat (see spiny crag lizard)

Existing Conservation Measures: Protected in the Natal by provincial Ordinance, and reported from a number of reserves, including Mont-aux-Sources and Cathedral Peak.

Breeding potential in captivity: Good, although large outdoor enclosures will probably be required.

Recommended Conservation Measures: Only regular monitoring of illegal collecting required at the moment.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Loveridge, 1944; Broadley, 1964.

Habitat and Ecology: Branch, 1988: Broadley, 1964.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

SPINY CRAG LIZARD
Stekelrige kransakkedis

International status: NOT LISTED
South African status: RESTRICTED

Pseudocordylus spinosus FitzSimons 1947. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Cordylidae.

Pseudocordylus spinosus FitzSimons 1947. Descriptions of some new species and subspecies of reptiles and amphibians from Natal together with notes on some other little known species. *Ann. Natal Mus.* 11(1): p 116, fig. 1, Pl. I, figs. 5 and 6. **Type locality:** Cathkin Peak area, Drakensberg, Natal.

SUMMARY

Status: Restricted. An endemic lizard, with a localised distribution, but recorded from a number of protected reserves. The only threat is illegal collecting for the pet trade.

Research: Taxonomy well known. Distibution and basic biology in need of further studies.

SPECIES DATA

Identification: A medium size (maximum length 22 cm) crag lizard with well-developed legs and a large, triangular head. It can be distinguished by:

1. Strongly keeled, spinose, juxtaposed lateral scales;
2. small number of femoral pores (3-5);
3. small frontonasal, that is longer than broad and well separated from the loreals.

The body is dark brown above with pale yellow elongate spots forming irregular longitudinal rows. The belly is pale white-grey with a pair of parallel grey stripes on the throat. In sexually mature males the flanks become suffused with orange.

Distribution: Lower slopes of the Natal Drakensberg, extending into the adjacent OFS.

Habitat and Ecology: A rupicolous species, living in rock cracks and under shattered boulders on the lower slopes (1 500-2 500 m) of the rugged Drakensberg escarpment. It feeds on small invertebrates, including beetles, cockroachs, lepidopterous larvae, crickets, ants and millipedes.

Breeding: Viviparous, giving birth to 1-3 young in late summer. The sexually mature males develop bright coloration and maintain exclusive territories.

CONSERVATION

Status: Restricted, but much of its range is inaccessible and well protected.

Threats: It has been reported that recent attempts have been made to export, under the pretext of 'research', large numbers of *Pseudocordylus* sps. from Lesotho, via Cape Town.

Existing Conservation Measures: Protected in Natal and OFS by provincial Ordinances. Listed on Appendix 2 of CITES, of which South Africa and Lesotho are signatories. Recorded from a number of protected reserves, including most of the Natal Drakensberg reserves and the Golden Gate National Park in the OFS.

Breeding potential in captivity: Good; crag lizards settle well in captivity, although successful large scale breeding would probably require large outdoor enclosures.

Recommended Conservation Measures:
Rigourous monitoring of illegal collecting for the overseas pet trade.

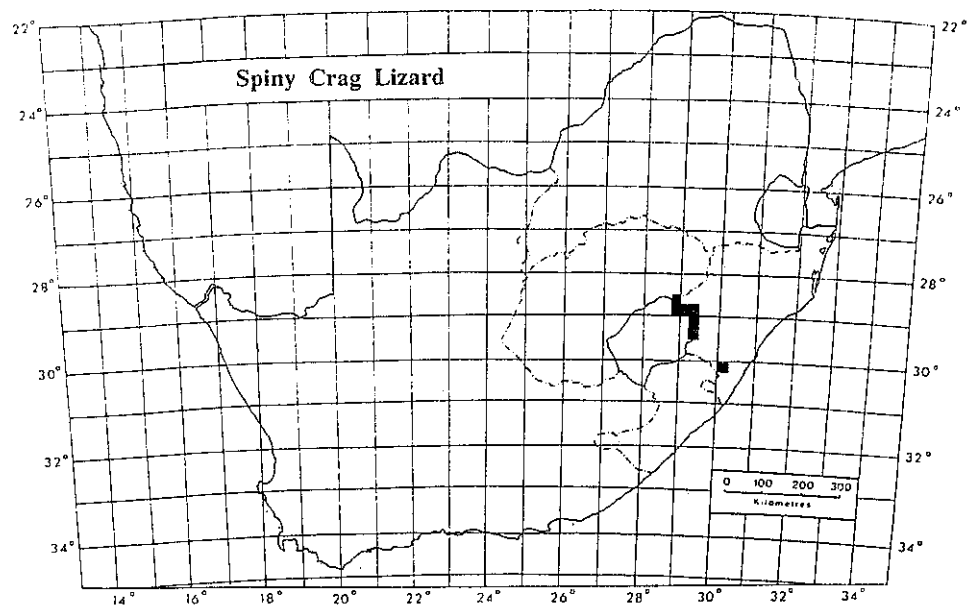
Remarks: Not included in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

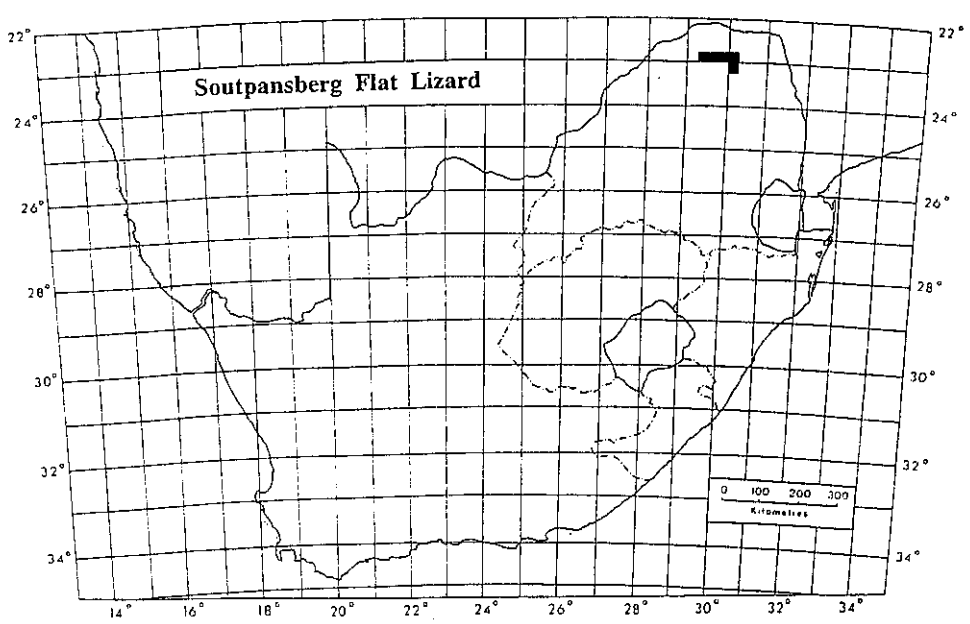
Taxonomy and Distribution: FitzSimons, 1947; Broadley, 1964; De Waal, 1978.

Habitat and Ecology: Broadley, 1964; Branch, 1988.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 69. Distribution of the spiny crag lizard *(Pseudocordylus spinosus).*



Map 70. Distribution of the Soutpansberg flat lizard *(Platysaurus relictus).*

SOUTPANSBERG FLAT LIZARD
Relik of Soutpansberg se platakkedis

International status: NOT LISTED
South African status: RESTRICTED

Platysaurus relictus Broadley 1976. **Class:** Reptilia, **Suborder:** Sauria, Family: Cordylidae.

Platysaurus relictus Broadley, 1976. Two new forms of *Platysaurus* from the northern Transvaal (Sauria: Cordylidae). *Arnoldia Rhod.* 8(8): 1. **Type locality:** Waterpoort, N. Transvaal.

SUMMARY

Status: Restricted. Widespread along the Soutpansberg from Vivo eastwards to Entabeni including the southern and northern ranges. Populations appear safe.

Research: Fair, although little is known of the biology of the species.

SPECIES DATA

Identification: A small to medium sized flat lizard (maximum size 83 mm SV length). Distinguished by the lack of enlarged scales laterally and flattened enlarged neck scales. Colour in males blue to green above and blue below with a black collar.

Distribution: Restricted to the Soutpansberg from Vivo in the west to Entabeni in the east. The species is found on the southern, central and northern ranges.

Habitat and Ecology: A rupicolous lizard found mainly in areas where there are large sheets of bedrock with numerous loose boulders on north facing slopes. It lives in colonies with several males, females and juveniles in the same area.

Breeding: Oviparous - two eggs laid in early summer.

Remarks: A distinct form although not all specimens have flattened scales on the neck. Distribution is much wider than originally considered.

CONSERVATION

Status: An endemic Soutpansberg species, its distribution is extensive along the various ranges of this mountain chain. Population are therefore secure and under no immediate threat.

Threats: In the past wholesale capture for the overseas pet trade, particularly of the males, was a real threat to many populations in the vicinity of Waterpoort. Since the new Transvaal Provincial Ordinance came into effect in 1983, collecting has been reduced.

Existing Conservation Measures: The species is protected under the Transvaal Provincial Ordinance while it is found in the Happy Rest Nature Reserve and also in the Forestry Reserve at Entabeni.

Breeding Potential in Captivity: Not known but probably reasonable in outdoor enclosures.

Recommended Conservation Measures:
Monitoring of illegal trade and the establishment of a meaningful protected area in the Soutpansberg are necessary.

Remarks: An endemic species with high conservation value. Listed as rare (restricted) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Broadley, 1976, 1978.

Conservation: Jacobsen, Newbery and Petersen, 1986; McLachlan, 1978.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.

LANG'S PINK ROUNDHEADED WORMLIZARD
Lang se pienk rondekop wurmakkedis

International status: NOT LISTED
South African status: RESTRICTED

Chirindia langi FitzSimons 1939. **Class:** Reptilia, **Suborder:** Amphisbaenia, **Family:** Amphisbaenidae.

Chirindia langi FitzSimons 1939. Descriptions of some new species and subspecies of lizards from South Africa. *Ann. Transvaal Mus.* **29**: 5-16. **Type locality:** Punda Maria, northeastern Transvaal.

SUMMARY
Status: Restricted. A small amphisbaenid with two recognised races, both restricted to a small area of the northern Transvaal. No identified threats.

Research: Taxonomy recently reviewed; biology and habitat preferences poorly known.

SPECIES DATA
Identification: A small, pink, roundheaded wormlizard with fused head shields. It can be distinguished by:

1. Body pink and worm-like, with regular rings of squarish, non-overlapping scales;
2. segments of the pectoral region not enlarged into elongate shields;
3. snout rounded and without a spade-like horizontal cutting edge;
4. nasals, prefrontals, preocular, ocular and 1st upper labial fused into a single shield.

Body flesh pink in colour, tinged with mauve on the back.

Distribution: Restricted to the northern Transvaal, with the western race (*C. l. occidentalis)* occurring along the northern slopes of the Soutpansberg, and the nominate eastern race *(C. l. langi*) found in the northen Kruger National Park and probably also in adjacent Mocambique.

Habitat and Ecology: Fossorial, burrowing beneath stones and rotting logs in sandy soils. They are usually solitary, although a pair (sometimes up to five) may be found under the same cover. Their diet appears to be composed entirely of termites.

Breeding: No details.

Remarks: Jacobsen (1984) has recently described the western race (*C. l. occidentalis*), characterised by its short, stock body; lower number of body annuli (242-262) with a higher number of segments at midbody (28-35, avg. 33-34); and six precloacal pores.

CONSERVATION
Status: Locally abundant; the nominate race is wellprotected in the Kruger National Park.

Threats: No serious threats identified.

Existing Conservation Measures: The nominate race, *C. l. langi*, is abundant in the northern Kruger National Park, but the western race has not been recorded from a protected reserve. The species is protected by general Transvaal Ordinances applicable to indigenous herpetofauna.

Breeding potential in captivity: Poor due to small size and specialised diet of termites. They can be maintained in moist, sandy soil on a diet of termites such as *Trinervitermes.*

Recommended Conservation Measures: The recently described western race occurs in a region of high endemicity (see Richard's blind burrowing skink, whitebellied Limpopo dwarf burrowing skink and black whitelipped snake). This habitat should be protected.

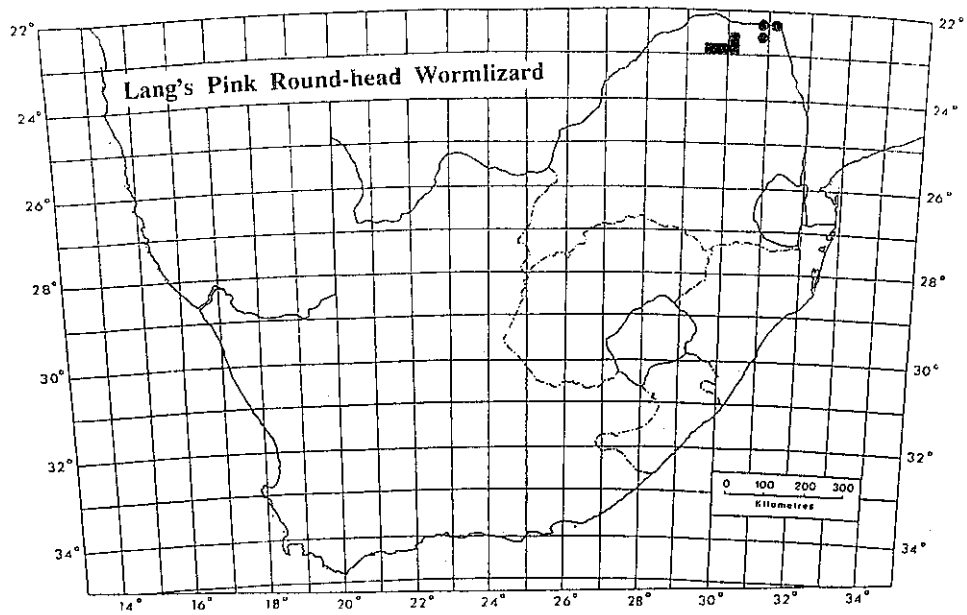
Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

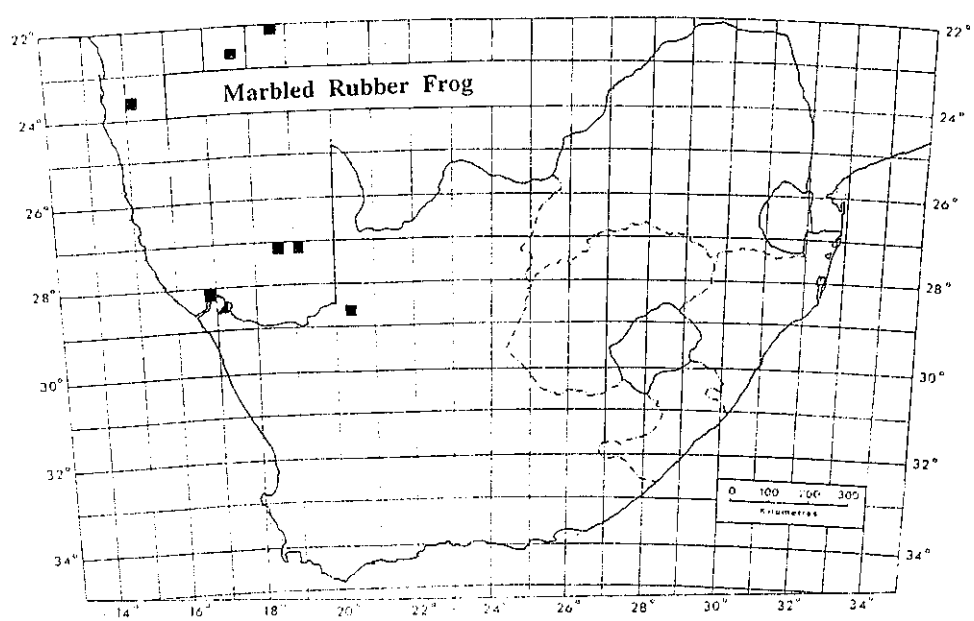
Taxonomy: Broadley and Gans, 1978; FitzSimons, 1939; Jacobsen, 1984.

Habitat and Ecology: Branch, 1988; Jacobsen, 1984; Pienaar *et al.,* 1983.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 71. Distribution of Lang's pink roundheaded wormlizard (*Chirindia langi*).
●= *C. langi langi,* ■= *C. langi occidentalis*



Map 72. Distribution of the marbled rubber frog (*Phrynomerus annectans*).
◢ = Auditory record

MARBLED RUBBER FROG **International status:** NOT LISTED
Gespikkelde rubberpadda **South African status:** PERIPHERAL

Phrynomerus annectens (Werner 1910). **Class:** Amphibia, **Order:** Anura, **Family:** Microhylidae.

Phrynomantis annectens Werner, 1910. Reptilia et Amphibia. In. Schultze, L. Zoologische und anthropologische Ergebnisse einer forschungereise im westlichen und zentralen Sudafrika. IV. *Denckschr. med. naturwiss. Ges. Jena* 16: 294. **Type locality:** The Aar River, Cape Province. This is erroneous; the Aar River is on the farm Aar, near Aus, SWA (see Jurgens, 1979).

SUMMARY

Status: Peripheral. Common and widely distributed in the Namib desert and adjacent inland areas of Namibia and Angola; just crossing Orange River.

Research: Further surveys in the Richtersveld may indicate further viable populations there.

SPECIES DATA

Identification: Colour plates of this frog may be found in Channing (1974/75) and Passmore and Carruthers (1979). Maximum size about 40 mm. The adult dorsum has red, pink, yellow or silver blotches on a black or brown background. The toes are only slightly webbed, and the fingers and toes possess small truncated discs. The body is dorsoventrally flattened. *P. annectens* is distinguished from *P. bifasciatus* by its smaller size and lack of broad dorsal stripes. The call is a long trill.

The tadpoles of *Phrynomerus* may be distinguished on their behaviour (mid- to top-water schooling), and by the lack of keratinized mouthparts (beaks and labial teeth) and a mid-ventral spiracle.

Distribution: Although widely distributed north of the area covered by this report, within our area this species is presently known only from one adult from Augrabies Falls National Park (Transvaal Museum 56231), from one batch of tadpoles from the Namasberg (Richtersveld), and from male advertisement calls heard on the Helskloof, between Kuboes and Sendelingsdrift in the Richtersveld (E. van Jaarsveld). These frogs are active only after rains, and can spend long periods between wet seasons in a dormant state.

Habitat and Ecology: This frog is appropriately sometimes called a crevice creeper. The flattened body and short legs enable it to utilize the horizontal cracks common in granite, shale and schist. They are usually found in riverbeds where these are flanked by cliffs of schist. They also occur on granite inselbergs in the Namib desert. The diet appears to be mostly ants, and other small arthropods.

Breeding: Males gather around small pools after dark, calling from concealed sites in or near the water. They attempt to displace other calling males from their call sites. If an intruder comes to within 10 cm of the established male, the latter will produce an aggression call and attack the intruder. The fight consists of face-to-face wrestling, frequently in deep water, during which both males utter the aggression call. Fights last about 6 seconds, with the established male chasing away the intruder (25 observations). Amplexus is axillary. Each female lays 80-100 eggs, deposited in small groups on submerged rock or vegetation. Tadpoles hatch within 18-36 hours, and require a further 8 weeks to reach metamorphosis.

CONSERVATION

Status: Peripheral within South Africa.

Threats: None.

Existing Conservation Measures: Protected, along with all other amphibians, under the ordinances of the Cape Province.

Breeding Potential in Captivity: Unknown; specimens in European collections have been kept alive for many years and *P. bifasciatus* has been bred in captivity.

Recommended Conservation Measures: None required at the moment.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Poynton, 1964.

Biology: Channing, 1974/75, 1976: Jurgens, 1979; Passmore and Carruthers, 1979.

Account prepared by: A. Channing, Department of Biochemistry, University of the Western Cape.

EASTERN HINGED TERRAPIN **International status:** **NOT LISTED**
Oostelike skarnierwaterskilpad **South African status:** **PERIPHERAL**

Pelusios castanoides castanoides Hewitt 1931. **Class:** Reptilia, **Order:** Chelonii, **Family:** *Pelomedusidae.*

Pelusios nigricans castanoides Hewitt 1931. Descriptions of some African tortoises. *Ann. Natal Mus.* 6: 461-506, pl xxvi-xxxviii, figs. 1-2. **Type locality:** Lake St. Lucia, Zululand (see remarks).

SUMMARY
Status: Peripheral. A medium-sized terrapin occurring in south-eastern Africa from southern Kenya to Zululand. In South Africa it is possibly threatened by habitat destruction and insecticide spraying.

Research: Fair. Distributional and ecological studies are required.

SPECIES DATA

Identification: A medium-sized terrapin (maximum carapace length 230 mm) with a welldeveloped plastral hinge. It can be distinguished from other hinged terrapins on the basis of head colouration and plastral colour-pattern. The head is dark brown with a fine yellow vermiculated pattern and the plastron is uniform yellow, with a slight darkening of the anterior region of the shields.

Distribution: The distribution of this terrapin extends from southern Kenya southwards through Tanzania, Malawi and Mozambique to northern Natal (Bour, 1983). The subspecies reaches its furthest south at Lake St. Lucia (Broadley, 1981a).

Habitat and Ecology: Occurring mostly in temporary pans, vleis and marshes they spend the dry season buried in the mud on the bottom of such water-bodies and only emerge at the onset of the rains. They are not restricted to small water-bodies as in parts of the range they occur in large perennial water-bodies such as Lake Chilwa, Malawi. Although primarily carnivorous, eating aquatic organisms including pulmonate snails (Mitchell, 1946), they also feed to a large extent on the floating water lettuce (Dudley, 1978). While spending the dry season buried, sometimes only shallowly, in the bottom of pans, these terrapins may sustain serious injury or be killed by veld fires.

Breeding: Not much is known except that large clutches of eggs (up to 25) can be laid at a time in spring or early summer.

Remarks: The subspecies *Pelusios nigricans castanoides* described by Hewitt (1931) was based on one specimen from "Richards Bay". However, Hewitt refers to it later in his paper as "this St. Lucia" form, and this locality appears in his key. It is probable that the collector was based in Richards Bay and that the specimen originated from St. Lucia. Bruton and Haacke (1975) noted that the type is labelled "St Lucia Estuary" and it is probable that this is the correct type locality. Loveridge (1941) did not recognise this subspecies and placed it in the synonymy of *Pelusios subniger*. Broadley (1981a) revived *castanoides* and treated it as a subspecies of *Pelusios castaneus*. In 1979 Bour made a bid to reserve *castaneus* for West African material and more recently (Bour, 1983) treated Hewitt's (1931) *castanoides* as a full species. The African population is currently recognised as *P. castanoides castanoides*, following Bour's (1983) description of *P. castanoides intergularis* from the Seychelles. In South Africa *P. c. castanoides* occurs sympatrically with *P. rhodesianus* in Lake St. Lucia and at other localities in southern Zululand (Raw, 1978; Broadley, 1981a; Bour, 1983).

CONSERVATION

Status: This subspecies occurs over an extensive area of south-eastern Africa and only a small portion of its range falls into South Africa. However, the importance of the southern extremity of its range is emphasised by the fact that it includes the type locality.

Threats: In South Africa its habitat has probably been reduced at the hand of man through the filling-in or drainage of swamps, marshes, pans and vleis. At some localities pollution of the habitat undoubtedly affects terrapins. The long-term effects of insecticide spraying for the control of mosquitoes is unknown and doubtlessly poses an additional threat to their survival. Veld fires in the dry season could affect hibernating terrapins if they are only shallowly buried.

Existing Conservation Measures: At present the Natal Provincial Nature Conservation Ordinance makes no provision for the protection of terrapins. The subspecies occurs at some localities that are situated in Provincial Nature Reserves, included in these is the type locality, if St. Lucia is accepted as the correct type locality.

Breeding Potential in Captivity: Not known but probably good. Two females, presumably wild-caught gravid females, each laid 25 eggs in captivity (Mitchell, 1946).

Recommended Conservation Measures: The subspecies should be afforded general protected status under Natal Provincial Nature Conservation Ordinance. Additional reserves for these terrapins should be proclaimed throughout the subspecies' South African range.

Remarks: Distribution and ecological studies should be encouraged. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

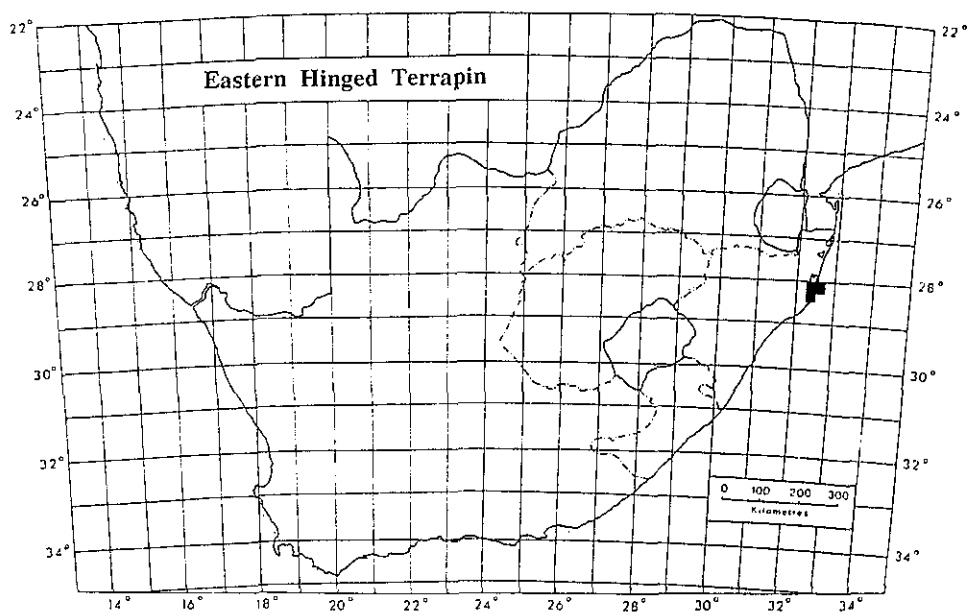
Taxonomy: Bour, 1979, 1983; Broadley, 1981a; Hewitt, 1931; Loveridge, 1941; Raw, 1978.

Distribution: Bour, 1983; Broadley, 1981a; Bruton and Haacke, 1975; Raw, 1978.

Ecology: Broadley, 1981a; Dudley, 1978; Mitchell, 1946.

General: ; Boycott and Bourquin, 1988; Branch, 1988.

Account prepared by: R. C. Boycott, Transvaal Snake Park.



Map 73. Distribution of the Eastern hinged terrapin *(Pelusios castanoides castanoides).*

MASHONA HINGED TERRAPIN **International status: NOT LISTED**
Mashona-skarnierwaterskilpad **South African status: PERIPHERAL**

Pelusios rhodesianus Hewitt 1927. **Class:** Reptilia, **Order:** Chelonii, **Family:** Pelomedusidae.

Pelusios nigricans rhodesianus Hewitt 1927. Further descriptions of Reptiles and Batrachians from South Africa. *Rec. Albany Mus.* 3: 371-415, pls. xx-xxiv. **Type locality:** Mpika District, Northern Rhodesia (= Zambia)

SUMMARY

Status: Peripheral. A medium-sized terrapin occurring throughout southern central Africa, with relict populations in south-eastern Africa in Zululand and at Durban. In South Africa it is possibly threatened by habitat destruction and insecticide spraying.

Research: Quite good. More ecological studies are required.

SPECIES DATA

Identification: A medium-sized terrapin (maximum carapace length 250 mm) with a welldeveloped plastral hinge. It can be distinguished from other hinged terrapins on the basis of head colouration and plastral colour-pattern. The head is uniform dark brown with no vermiculated pattern and the plastron is black, with or without cloudy yellow patches centrally but is never uniform yellow.

Distribution: This species is widespread throughout southern central Africa, its range extends from Uganda and the west coast of Angola in the north and west to northern Botswana and eastern Zimbabwe in the south (Bour, 1983). In South Africa relict populations occur in Zululand and at Durban (Raw, 1978; Broadley, 1981a).

Habitat and Ecology: They occur in a variety of habitats including temporary pans and vleis, extensive swamps and larger water-bodies such as lakes and dams, where they favour the quieter backwaters (Broadley, 1981a). Although primarily carnivorous they also feed on the stems, leaves and flowers of aquatic plants. Should dry conditions prevail they will remain buried in the mud of dried up pans and vleis until the onset of the rains.

Breeding: Nesting probably occurs soon after the first rains in September and may continue throughout the summer. From 10 to 15 eggs are laid at a time.

Remarks: The subspecies *Pelusios nigricans rhodesianus* was described from a series of specimens from "Mpika District, Northern Rhodesia" by Hewitt (1927). In 1935, Hewitt stated that it "...is evidently very distinct." and afforded it specific status. Loveridge (1941) rejected this and placed *rhodesianus* as a race of *P. castaneus*. However, Raw (1978) found that *rhodesianus* occurred sympatrically with *castaneus* in Zululand and raised *rhodesianus* to specific rank. The specific status of *rhodesianus* has subsequently been confirmed by Broadley (1981a) and Bour (1983).

Although the type locality of *rhodesianus* was given as Mpika District by Hewitt (1927) its precise location is not known (Broadley, 1981a). However, after some investigation Broadley (1981a) suggested that it might be in the vicinity of Lake Bangweulu or on the Chambeshi River.

CONSERVATION

Status: The species is widespread throughout southern central Africa. Isolated populations occur in South Africa on the Mozambique plain in Zululand and at Durban.

Threats: In South Africa this species may suffer from loss of habitat as a result of the filling-in or drainage of swamps, marshes, pans and vleis. At some localities pollution of the habitat undoubtedly affects terrapins. The longterm affects of insecticide spraying for the control of mosquitoes is unknown and doubtlessly poses an additional threat to their survival. Veld fires in the dry season could affect hibernating terrapins if they are only shallowly buried.

Existing Conservation Measures: At present the Natal Provincial Nature Conservation Ordinance makes no provision for the protection of terrapins. The species occurs at some localities that are

situated in Provincial nature reserves in Zululand and also occurs in the Bluff Nature Reserve in Durban.

Breeding Potential in Captivity: Not known but probably good. There is one record of a female laying eggs in captivity whereafter she died (Broadley, 1981a).

Recommended Conservation Measures: The species should be afforded general protected status under Natal Provincial Nature Conservation Ordinance. Additional reserves should be proclaimed throughout the species' South African range. The population at the Bluff Nature Reserve in municipal Durban is particularly threatened (Alexander, 1987).

Remarks: Little is known of the species' ecology and distribution in South Africa. Research into these fields should be encouraged. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

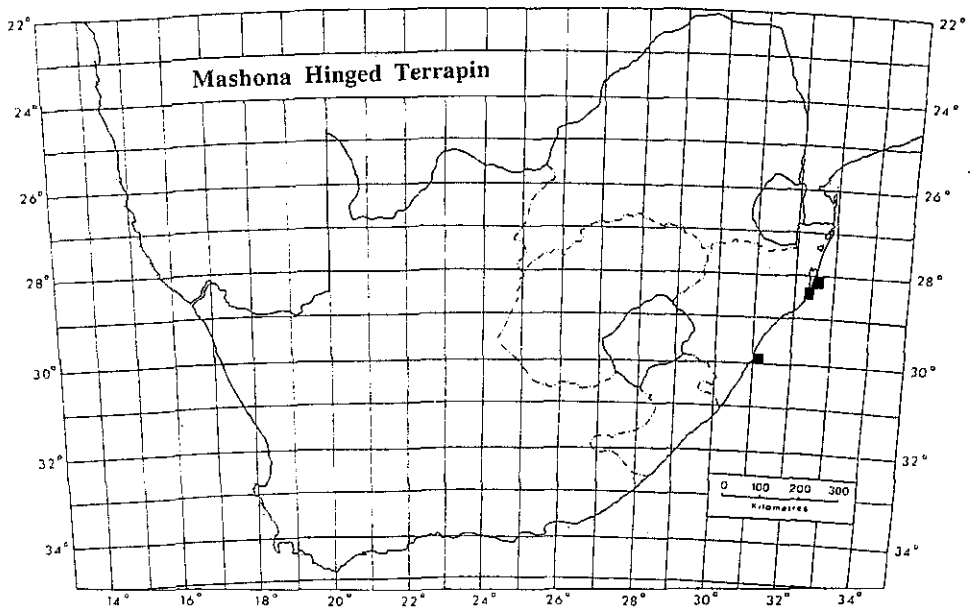
Taxonomy: Bour, 1983; Broadley, 1981a; Hewitt, 1927, 1935; Laurent, 1965; Loveridge, 1941; Raw, 1978.

Distribution: Alexander, 1987; Bour, 1983; Broadley, 1981a.

Ecology: Alexander, 1987; Broadley, 1981a.

General: Boycott and Bourquin, 1988; Branch, 1988.

Account prepared by: R.C. Boycott, Transvaal Snake Park.



Map 74. Distribution of the Mashona hinged terrapin *(Pelusios rhodesianus).*

BEAKED BLIND SNAKE
Haakneus-blindeslang

International status: NOT LISTED
South African status: PERIPHERAL

Typhlops schinzi Boettger 1887. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Typhlopidae.

Typhlops (Onycocephalus) schinzi Boettger, 1887. Zweiter Beiteg zur Herpetologie Südwest un Süd-Afrikas. *Ber. Senck. Ges.*: **154,** pl. 5, figs. 1 a-e & 2. **Type locality:** Between Aus and Keetmanshoop, Great Namaqualand, Noi Xas, Ghansi District, W. Kalahari.

SUMMARY

Status: Peripheral. Widespread in Namibia but known from only a few widely scattered localities in South Africa.

Research: Fair. More distribution surveys are required.

SPECIES DATA

Identification: A small, beaked *Typhlops* reaching a maximum length of 222 mm, and having 22-26 scales round midbody.

Distribution: Known from one locality in western Botswana and almost throughout Namibia but from the north-western Cape Province only from Steinkopf, Pofadder, Kakamas, Swartmodder, Upington, Prieska and Bakputs near Carnarvon.

Habitat and Ecology: Little recorded. Essentially a dry country species which judging by its pronounced beak burrows in hard ground and not sand.

Breeding: Nothing recorded.

CONSERVATION

Status: The species has a fairly restricted range but being fossorial it is not often collected and is probably commoner than it appears from museum collections. Further collecting is required to establish its exact range and true abundance.

Threats: Open cast mining might be a threat; little ploughing or cultivation of land occurs in its arid environment.

Existing Conservation Measures: None, but it is protected by Provincial Ordinance and occurs in the Augrabies Falls National Park.

Breeding Potential in Captivity: Probably fair, although very few studies on captive maintenance of typhlopids exist, and the provision of adequate amounts of food may be difficult.

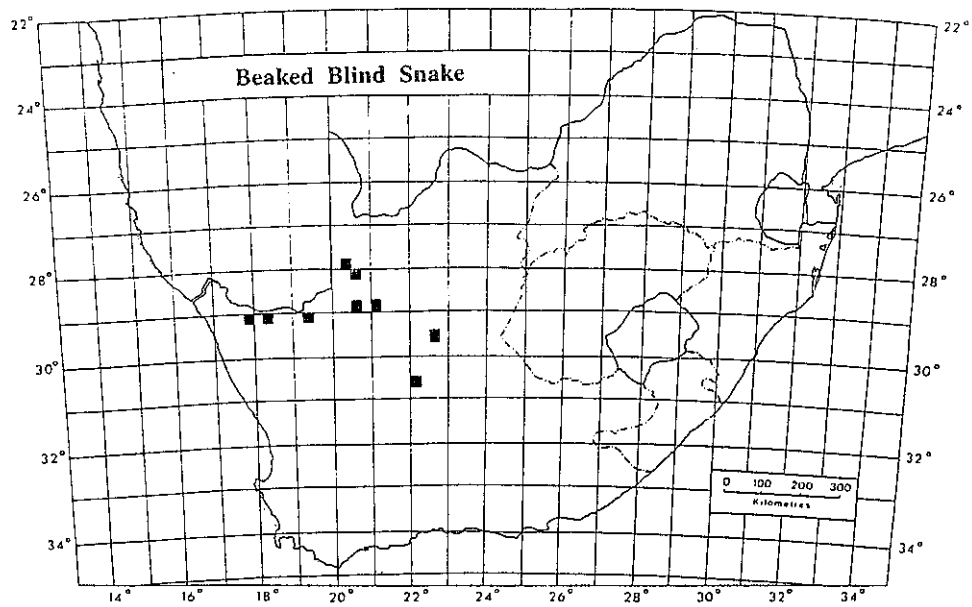
Recommended Conservation Measures: None at present until its exact status is better known.

Remarks: Not listed in the previous Red Data Book (McLachlan, 1978).

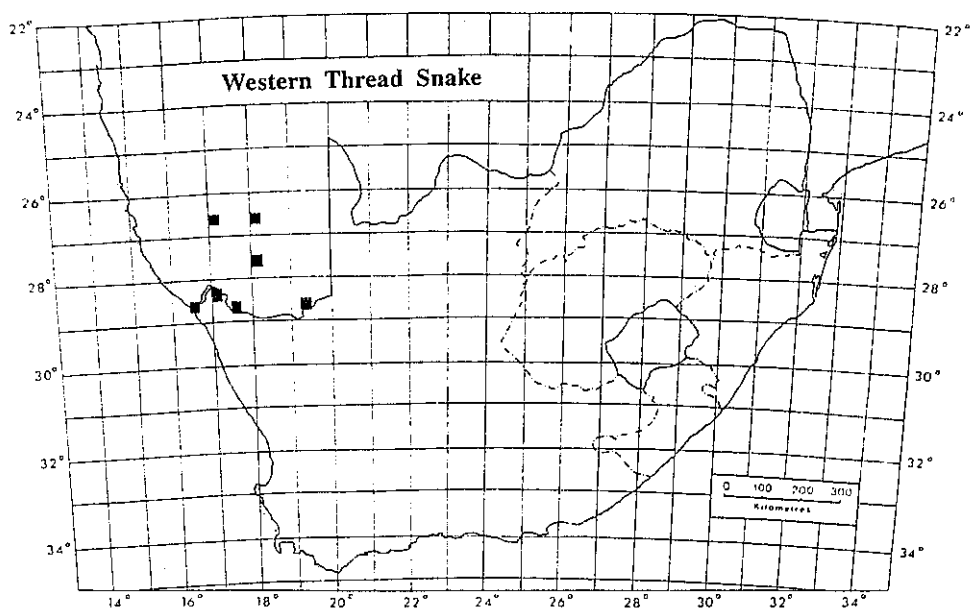
BIBLIOGRAPHY

Taxonomy: Broadley, 1983.

Account prepared by: G. R. McLachlan, South African Museum, Cape Town.



Map 75. Distribution of the beaked blind snake *(Typhlops schinzi).*



Map 76. Distribution of the western thread snake *(Leptotyphlops occidentalis).*

WESTERN THREAD SNAKE
Westelike draadslang

International status: NOT LISTED
South African status: PERIPHERAL

Leptotyphlops occidentalis FitzSimons 1962. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Leptotyphlopidae.

Leptotyphlops occidentalis FitzSimons, 1962. A new worm-snake (*Leptotyphlops*) from South West Africa. *Ann. Transvaal Mus.* **24:** 239-240. **Type locality:** Keetmanshoop, Great Namaqualand, Namibia.

SUMMARY

Status: Peripheral. The largest leptotyphlopid in the subcontinent, widely distributed in Namibia and just entering the Richtersveld and lower Orange river valley. No recognised threats.

Research: Taxonomy well defined, but biology and habitat preferences unknown.

SPECIES DATA

Identification: A small, very thin snake (maximum length 322 mm; Bauer, 1988), although it is one of the largest leptotyphlopids. It can be distinguished by:

1. Having 14 scale rows at midbody, without enlarged ventral scales;
2. a rounded head, without external eyes and with teeth only in the lower jaw;
3. twelve scale rows around the tail and 20-25 subcaudals;
4. and 292-342 scales between the rostral and caudal spine, and the body width contained from 66-116 times in the total length.

The body is light brown, geyish brown or purplish brown; each scale is pale-edged, giving the body a finely chequered appearance; underside paler.

Distribution: From the Richtersveld and Lower Orange river valley, northwards through Namibia to the Kaokoveld.

Habitat and Ecology: A fossorial species that is only found sheltering under stones or rotting vegetation, or when disturbed during earth-moving. It may be forced to the surface during flash floods. It feeds on the soft bellies of termites, and possibly on other small soil invertebrates.

Breeding: Unknown; it probably lays a few, small elongate eggs, like other leptotyphlopids. Some large American species are known to curl around their eggs and protect them, but it is not known if local species also do this.

CONSERVATION

Status: A peripheral species that is not known to be threatened.

Threats: No obvious threats are known, although opencast mining for alluvial diamonds in the Lower Orange river valley will obviously cause local extinction. Recruitment rates and the species' ability to repopulate mined areas are unknown, but are probably slow.

Existing Conservation Measures: Protected by existing Cape Ordinances. Currently not recorded from any existing conserved area, although it does occur in the Richtersveld.

Breeding potential in captivity: Very poor, due to the species specialised diet and minute size.

Recommended Conservation Measures: None required at the moment.

Remarks: Included as rare (peripheral) in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: FitzSimons, 1962; Broadley, 1983; Hoffman, 1987; Bauer, 1988.

Habitat and Ecology: Branch, 1988.

Conservation: McLachlan, 1978.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

WHYTE'S WATER SNAKE
Whyte se watersiang

International status: NOT LISTED
South African status: PERIPHERAL

Lycodonomorphus whytii obscuriventris FitzSimons 1964. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Lycodonomorphus whytii obscuriventris FitzSimons 1964. A new subspecies of water-snake from Kruger National Park. *Koedoe* 7: 26-28. **Type locality:** Ngirivane Windmill, Kruger National Park.

SUMMARY

Status: Peripheral. A southern race of a tropical species, that just enters the northeastern parts of the region. There are no known threats and it is well represented in protected reserves.

Research: Taxonomy and distribution well known; knowledge of basic biology rudimentary.

SPECIES DATA

Identification: A small (maximum length 66 cm) water snake with a small head, hardly distinct from neck, relatively slender body and shortish tail. It can be distinguished by:

1. The absence of fangs in the upper jaw;
2. smooth body scales, without apical pits and in 19 rows at midbody;
3. subcaudals less than 60 in males, and less than 50 in females;
4. anal undivided

The body is a uniform dark olive brown to blackish, with an orange-yellow belly, that is heavily infuscated with dark grey, particularly towards the tail. The upper labials are yellow with a dark stripe on the lip.

Distribution: Extending through the Mocambique coastal plain south of the Zambezi, just entering the central regions of the Kruger National Park, Swaziland and extreme northern Maputaland.

Habitat and Ecology: A nocturnal water snake that forages among vegetation around pans and vleis, feeding on frogs which it kills by constriction. It has been recorded feeding on young bullfrogs (*Pyxicephalus adspersus*), puddle frogs (*Phrynobatrachus* spp.) and the bubbling kassina (*Kassina senegalensis*).

Breeding: No specific data, but unlikly to differ from most other *Lycodonomorphus* spp., which lay small clutches of 6-10 eggs in midsummer.

CONSERVATION

Status: A peripheral species, just entering north-eastern regions, but well represented in protected reserves and not subject to any known threats.

Threats: No specific threats recorded.

Existing Conservation Measures: Protected by general legislation in Transvaal and Natal, and recorded from the Kruger National Park and Ndumu Game reserve.

Breeding potential in captivity: Probably good. Most *Lycodonomorphus* adapt well to captivity and feed well. The common olive water snake (*Lycodonomorphus rufulus*) has been bred many times in captivity.

Recommended Conservation Measures: None required.

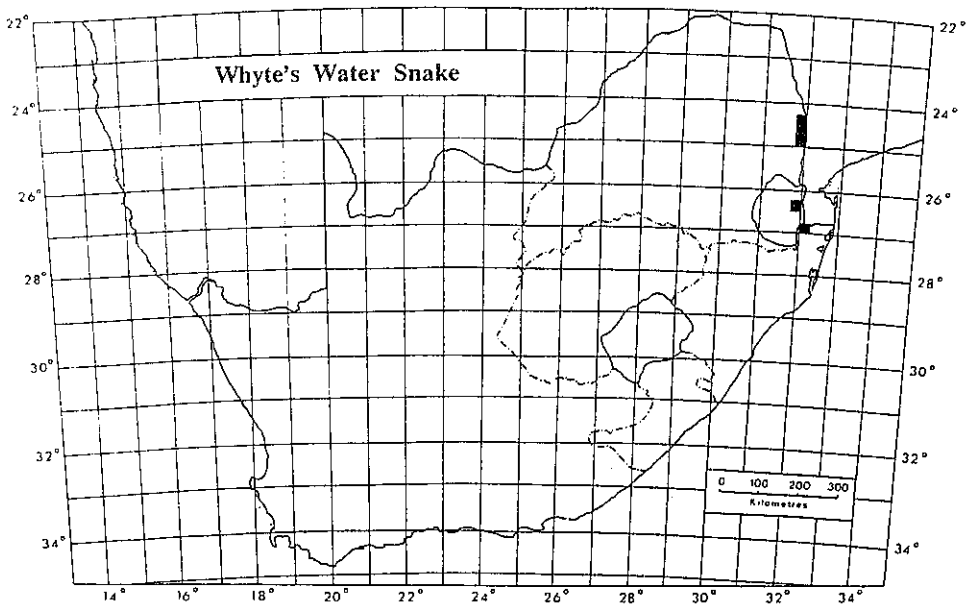
Remarks: Not listed in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1967; FitzSimons, 1964.

Habitat and Ecology: Branch, 1988; Broadley, 1983; Bruton and Haacke, 1980; FitzSimons, 1964; Pienaar *et al.*, 1983.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 77. Distribution of Whyte's water snake (*Lycodonomorphus whytii obscuriventris*).

EASTERN WOLF SNAKE **International status: NOT LISTED**
Oostelike wolfslang **South African status: PERIPHERAL**

Lycophidion semiannule Peters 1854. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Lycophidion semiannule Peters 1854. Diagnosen neuer Batrrachier, mit Uebersicht der in Mossambique gesammelten Schlangen u. Eidechsen. *Monastb. Akad. Wiss. Berlin* p 622. **Type locality:** Tete, Mocambique.

SUMMARY

Status: Peripheral. An eastern tropical species that just enters northern Maputaland. Recorded from several protected reserves. No identified threats.

Research: Taxonomy well known; basic biology almost unknown.

SPECIES DATA

Identification: A very small (maximum length 29 cm) wolf snake with a small, flat head, hardly distinct from the neck, and a short tail. Also distinguished by:

1. No enlarged, grooved fangs in the upper jaw;
2. smooth body scales, with a single apical pit and in 17 rows at midbody;
3. nostril pierced in a single large nasal and small rostral.

Specimens from Maputaland are a uniform purplish brown with a faint grey tip to each scale. The head with a broad pale yellowish edge; belly plumbeus to purplish brown with each ventral narrowly edged with greyish to yellowish-white.,

Distribution: Mocambique coastal plain, from northern Mocambique and Malawi south to Maputaland.

Habitat and Ecology: Recorded from among grass roots and under vegetable debris in open grassland and exotic pine plantation. Diet unknown, but probably of small lizards.

Breeding: No details, but unlikely to differ from other wolf snakes (i.e. small clutches of small eggs).

CONSERVATION

Status: A peripheral, unthreatened species recorded from a number of protected reserves.

Threats: No specific threats identified.

Existing Conservation Measures: Protected by general legislation in Natal, and recorded from several protected reserves (eg. Kosi Bay and Lake Sibaya).

Breeding potential in captivity: Poor, due to small size, specialised diet and low fecundity.

Recommended Conservation Measures: Continued protection of sensitive Maputaland habitats.

Remarks: Listed as rare (peripheral) in previous Red Data Book (McLachlan, 1978).

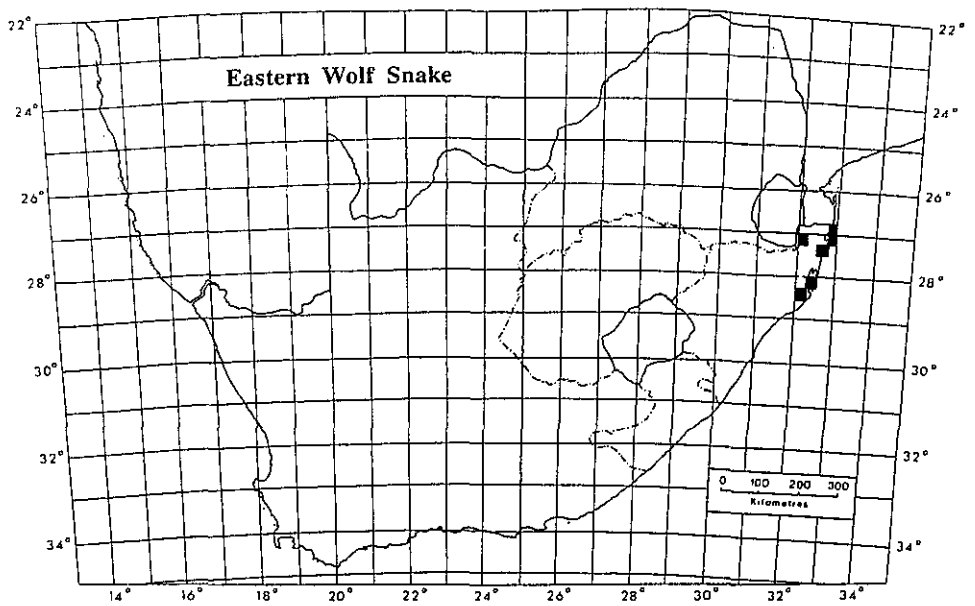
BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1983; Bruton and Haacke, 1980; Laurent, 1968.

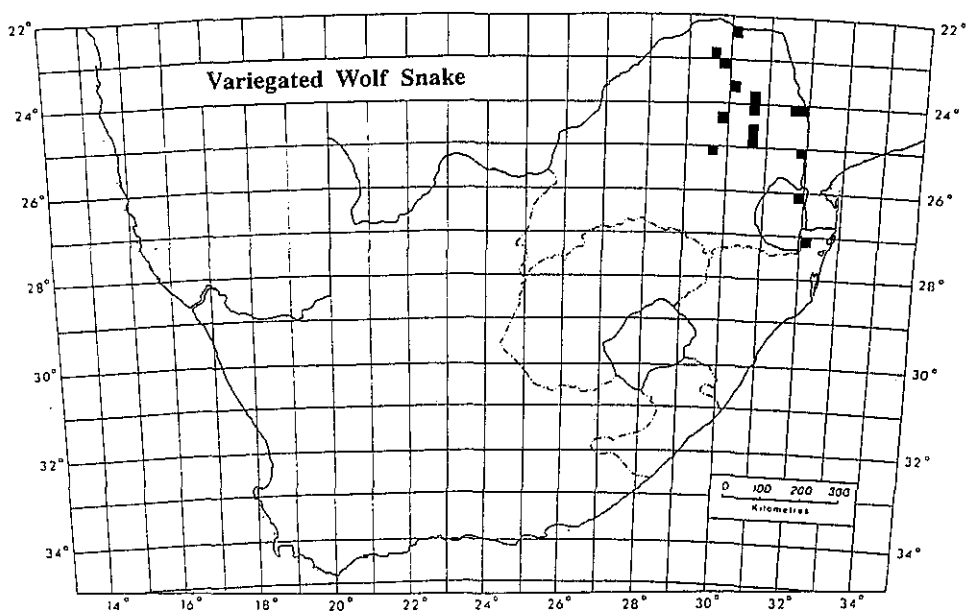
Habitat and Ecology: Branch, 1988; Broaldey, 1983.

Conservation: Bruton, 1980; McLachlan, 1978.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 78. Distribution of the eastern wolf snake *(Lycophidion semiannule).*



Map 79. Distribution of the variegated wolf snake *(Lycophidion variegatum).*

VARIEGATED WOLF SNAKE
Bont wolfslang

International status: NOT LISTED
South African status: PERIPHERAL

Lycophidion variegatum Broadley 1969. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Lycophidion variegatum Broadley, 1969b. A new species of *Lycophidion* from Rhodesia (Serpentes: Colubridae). *Arnoldia Rhod.* 4(27): 1. **Type locality:** Chitora River, Umtali District, Zimbabwe.

SUMMARY

Status: Peripheral. Widespread in the north-eastern Transvaal and lowveld extending into northern Zululand. Rarely observed, solitary and nocturnal. Main centre of distribution in Zimbabwe. Populations in South Africa probably safe.

Research: Poor. Very few specimens in museums. More detail required concerning distribution and habitat requirements.

SPECIES DATA

Identification: A small snake (maximum size 430 mm TL). Characterised by having more than 160 ventrals and the first upper labial separated from the posterior nasal. Colour: Similar to that of *L. c. capense* black to bluish black with each dorsal scale tipped with white or more extensive irregular white markings down the back and on the head. Below dark brown to black but may be blotched.

Distribution: Scattered in the eastern and north-eastern Transvaal as far west as Loskop dam and south to northern Zululand along the Lebombo mountains. Its main centre of occurrence is Zimbabwe.

Habitat and Ecology: A rare, nocturnal, solitary snake usually found under rocks, stones and logs. Feeds on lizards particularly skinks such as *Mabuya striata* and *M. varia*.

Breeding: Oviparous, laying 2-3 eggs.

Remarks: *L. variegatum* differs from *L. capense* in having a trilobed hemipenis (Branch, 1976).

CONSERVATION

Status: A rare peripheral species only recorded from about 10 localities in South Africa, since its description in 1969.

Threats: Habitat destruction and the killing of individuals by man can be considered as having the most effect on the species.

Existing Conservation Measures: The species is protected by the Transvaal Provincial Ordinance although this only pertains to the capture and keeping in captivity. May occur in several provincial nature reserves and it is found in the Kruger National Park.

Breeding Potential in Captivity: Not known but probably fair.

Recommended Conservation Measures: A more detailed survey of relevant provincial nature reserves to ascertain the presence of this species in these reserves.

Remarks: Although a peripheral species it is desirable to maintain populations of the species within its total distribution range. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Branch, 1976; Broadley, 1969b, 1983.

Habitat and Ecology: Branch, 1976, 1988.

Conservation: Jacobsen and Haacke, 1980; Jacobsen, Newbery and Petersen, 1986; Pienaar, Haacke and Jacobsen, 1983;

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.

FOREST MARSH SNAKE — International status: NOT LISTED
Woudvleislang — South African status: PERIPHERAL

Natriciteres variegata sylvatica Broadley 1966. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Natriciteres variegata sylvatica Broadley 1966. A review of the genus *Natriciteres* Loveridge (Serpentes: Colubridae). *Arnoldia Rhodesia* 2(35): 1-11. **Type locality:** Inyangani Tea Estates, Zimbabwe.

SUMMARY

Status: Peripheral. A few specimens of the southern race of this wide-ranging tropical species have been recorded from northern Maputaland.

Research: Taxonomy well known. Basic biology and habitat preferences poorly known, and restricted to anecdotal observations.

SPECIES DATA

Identification: A small harmless snake (maximum size 46 cm) with a small head and longish tail. It can distinguished by:

1. Lacking grooved fangs;
2. having smooth body scales in 17 rows at the neck, reducing to 15 at midbody;
3. a round pupil to the eye;
4. a divided anal;
5. and eight lower labials, with the first four in contact with anterior chin shields.

It is a dark olive brown or chestnut to black above, with a darker vertebral band, that may be maroon and is often bordered with minute white dots. The belly is yellow or orange, and the lip scales are yellow with black borders.

Distribution: Locally restricted to northern Maputaland. Extralimitally through eastern Zimbabwe, Mocambique and Malawi, to southern Tanzania.

Habitat and Ecology: A small, secretive snake that forages in marshy areas in montane and lowland forest. It feeds on small frogs and fish, and also the fish-eating spider (*Thalasius spenceri*). When disturbed the tail may be autotomised, much like that of a lizard, and as many as 40% of individuals have truncated tails (Broadley, 1987).

Breeding: Poorly known. It is reported to lay 5-6 small eggs.

Remarks: Four subspecies of this wide-ranging species have been described from the forests of west, central and eastern Africa (Broadley, 1966, 1983; Loveridge, 1958).

CONSERVATION

Status: Stable. No indication of population declines. Recorded from the Ndumu Game Reserve and the vicinity of Sodwana and Lake Sibaya reserves.

Threats: Any factors that lead to the deterioration of the Maputaland habitat. Bruton (1979) noted a specimen feeding on small fish killed by an ichthyocide in a sheltered backwater on Lake Sibaya.

Existing Conservation Measures: Afforded general protection under provincial ordinances (see Appendix 3).

Breeding potential in captivity: Probably good, if adequate amounts of food (i.e. small fish and frogs) can be supplied.

Recommended Conservation Measures: With continuing protection of the Maputaland habitats no specific measures are presently required.

Remarks: Treated as rare (peripheral) in the previous Red Data Book (McLachlan, 1978).

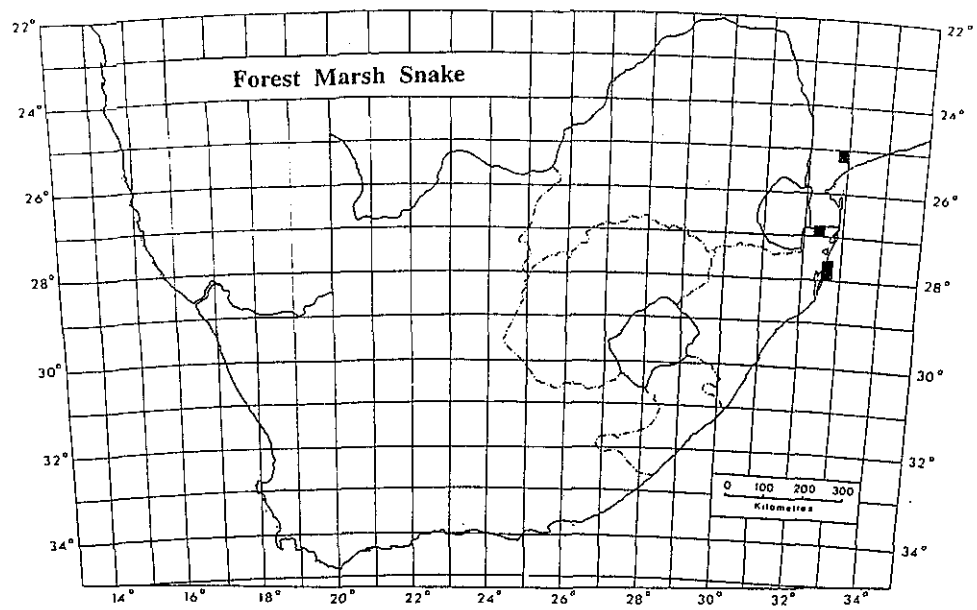
BIBLIOGRAPHY

Taxonomy: Broadley, 1966, 1983; Loveridge, 1958.

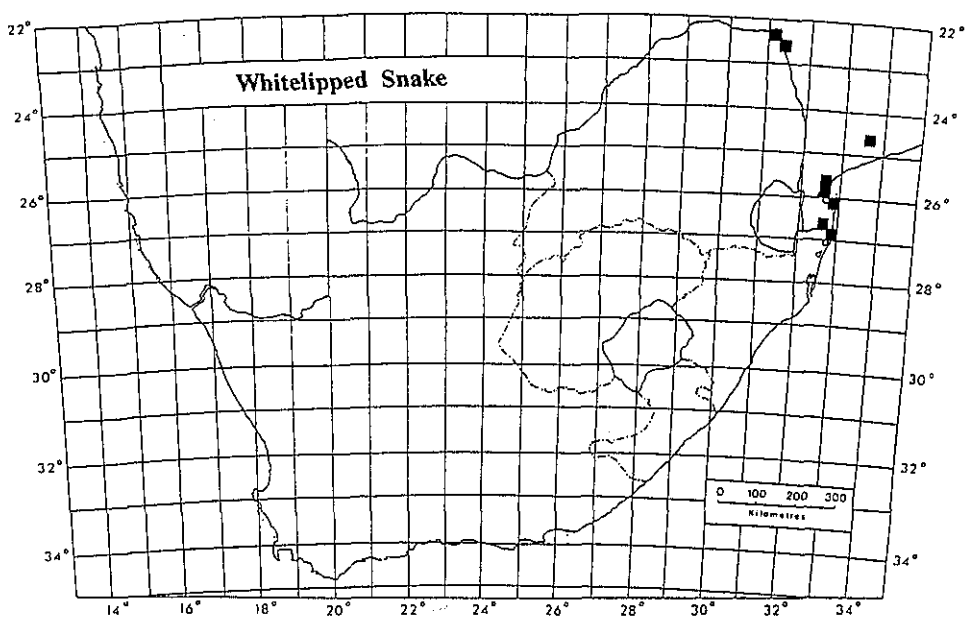
Habitat and Ecology: Branch, 1988; Broadley, 1983, 1987; Bruton and Haacke, 1980.

Conservation: McLachlan, 1978.

Account prepared by: W R Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 80. Distribution of the forest marsh snake *(Natriciteres variegata sylvatica).*



Map 81. Distribution of the whitelipped snake *(Amblyodipsas microphthalma microphthalma).*

WHITELIPPED SNAKE
Witlipslang

International status: NOT LISTED
South African status: PERIPHERAL

Amblyodipsas microphthalma microphthalma (Bianconi 1850). **Class:** Reptilia, **Suborder:** Serpentes, **Family,** Colubridae

Calamaria microphthalma Bianconi, 1850. *Specimina Zoologia Mossambicana quibus vel novae vel minus notae animalium species illustrantur. XV. - Reptilia.* Bonoiae: **94.** **Type locality:** Inhambane, Mozambique.

SUMMARY
Status: Peripheral. Only known from the extreme north-eastern border of South Africa in the Wambiya sandveld of the Kruger National Park and in northern Zululand.

Research: Poor. Our knowledge of the species is limited to collections made during fence building operations. Very little ecological data available.

SPECIES DATA
Identification: A small (maximum size 330 mm TL) burrowing snake with a blunt tail. Colour: Black above and bright yellow below this colour extending onto the upper labials.

Distribution: Limited to the sandveld of northern Zululand and the extreme north-eastern Kruger National Park, Transvaal. Elsewhere it occurs in southern Mozambique.

Habitat and Ecology: There is very little recorded about the habitats of this snake. It has been collected under logs and bulldozed out in sandy areas. Feeds on limbless skinks and probably also amphisbaenians.

Breeding: No details available.

Remarks: A rare distinct species only just entering our borders. A coastal form reaching its limits both westwards and southwards in the Republic.

CONSERVATION
Status: A rare peripheral species only just being found in the north-eastern Kruger National Park and northern Zululand.

Threats: None at present. However should development in the Kosi Bay to St. Lucia areas be initiated it would affect the species.

Existing Conservation Measures: The species is afforded protection under the Transvaal Provincial Ordinance. It is however protected in the Kruger National Park, St. Lucia and the Kosi Bay Game Reserves.

Breeding Potential in Captivity: Not known.

Recommended Conservation Measures: Study of the species habits and habitat requirements would be of value. It does not have a high priority rating as it appears adequately protected within the Republic.

Remarks: Although peripheral it does form part of our fauna and flora and its rarity should be brought to the attention of the managers of those regions in which it occurs. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY
Taxonomy: Bianconi, 1850; Broadley, 1971, 1983; FitzSimons, 1962; Jacobsen, 1986; Pienaar, 1966.

Conservation: Jacobsen and Haacke, 1980; Jacobsen, Newbery and Petersen, 1986: Pienaar, 1978.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

JALLA'S SAND SNAKE **International status:** **NOT LISTED**
Jalla se sandslang **South African status:** **PERIPHERAL**

Psammophis jallae Peracca 1896. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae

Psammophis jallae Peracca, 1896. Rettili ed anfibi raccolti a Kazungula e sulla strada de Kazungula a Buluwayo dal Rev. Luigi Galla, missionario Valdese nell'alto Zambese. *Boll. Mus. Zool. Torino* **11(255):** 2. **Type locality:** Kazungula to Bulawayo.

SUMMARY

Status: Peripheral. A rare medium sized snake with a very restricted distribution in the north-western Transvaal.

Research: Poor. More extensive surveys to determine its exact range and habitat requirements are needed.

SPECIES DATA

Identification: A medium sized (maximum size 1090 mm TL) snake characterised by having 15 scale rows at midbody and having divided posterior nasals and subcaudals in excess of 90. Colour: Two colour phases - light grey to olive brown. Broad dark dorsal band flanked on either side by narrow white to yellowish streak. Sides of body buff to reddish brown. Head with yellowish, dark edged streaks. Second colour phase uniform brown, head with or without markings.

Distribution: This species has a very restricted range in the north-western Transvaal from Thabazimbi to the Blouberg and possibly north to the Limpopo River. It reaches maximum eastward distribution at Nylstroom/ Naboomspruit. Outside our limits it occurs widely in Botswana and eastern South West Africa and across the middle of Zimbabwe.

Habitat and Ecology: The species is mostly found in sandy areas particularly those of Kalahari sand. Within this habitat which is well vegetated it feeds mostly on agamids, skinks and lacertids. Little else is known of this beautiful species.

Breeding: Nothing known.

Remarks: A rare distinct species only just entering our limits in the north-western Transvaal.

CONSERVATION

Status: A rare species with a restricted range in South Africa. About seven specimens have been recorded in the Transvaal since the description of the species.

Threats: None known to be present, but overgrazing and trampling may be important.

Existing Conservation Measures: Partially protected by the Transvaal Provincial Ordinance. It is known to occur in the Nylsvley Nature Reserve. It is however doubtful whether a viable population of this species, occurring at such low densities will be found in this comparatively limited area. It is possible that it may occur on two other reserves within the Waterberg.

Breeding Potential in Captivity: Unknown, probably fair.

Recommended Conservation Measures: Additional surveys needed to determine its habitat preference and total distribution.

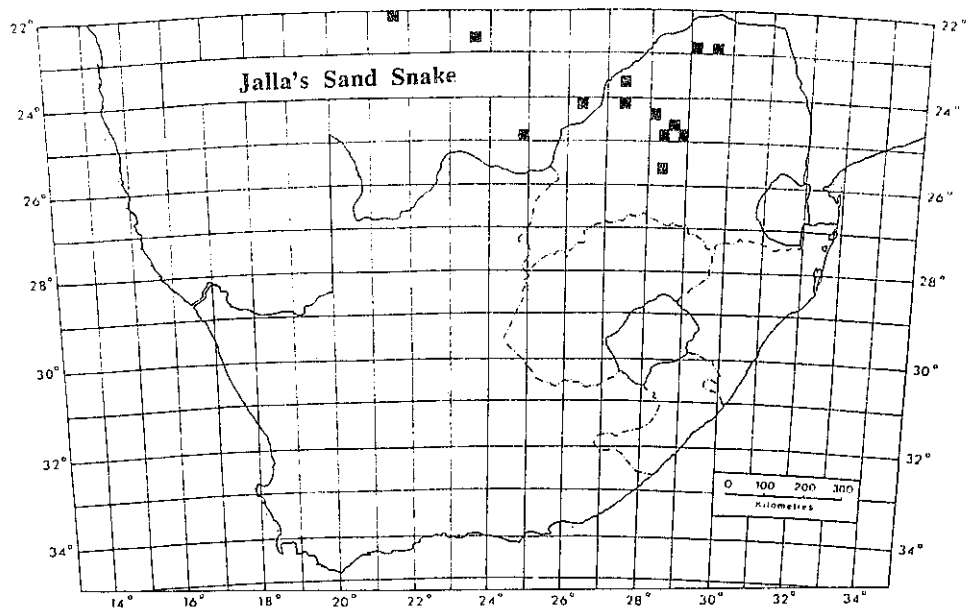
Remarks: Appears to be uncommon throughout its range although recorded more frequently in Zimbabwe. It is a secretive species and is found at very low densities. May move over considerable distances. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

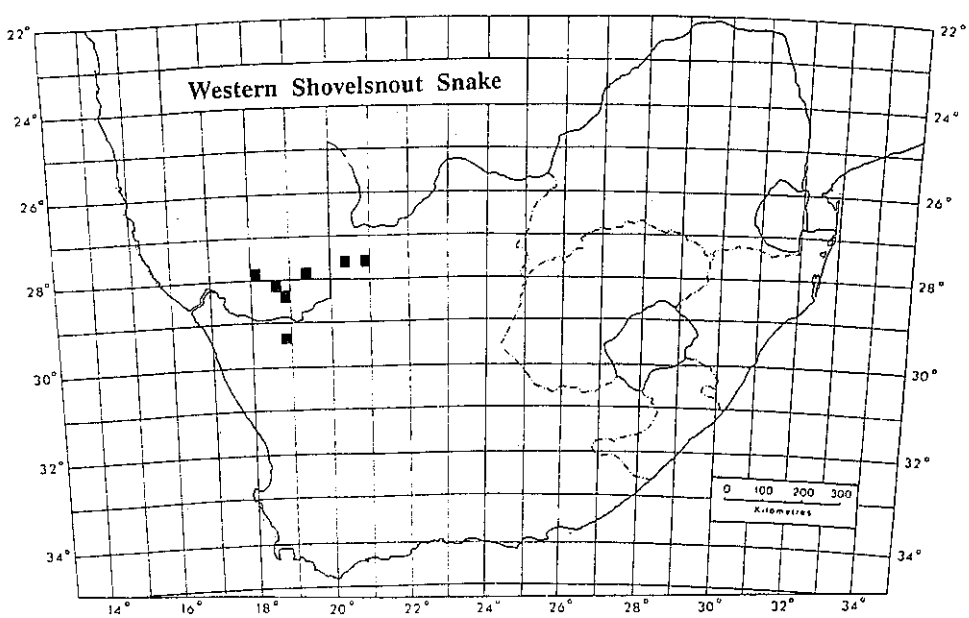
Taxonomy: Broadley, 1983: FitzSimons, 1962; Peracca, 1896.

Conservation: Jacobsen and Haacke, 1980; Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.



Map 82. Distribution of Jalla's sand snake *(Psammophis jallae).*



Map 83. Distribution of the western shovelsnout snake *(Prosymna frontalis).*

SOUTHWESTERN SHOVELSNOUT SNAKE
Suidwestelike graafneusslang

International status: NOT LISTED
South African status: PERIPHERAL

Prosymna frontalis (Peters 1867). **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Temnorhynchus frontalis Peters, 1867. Ueber eine Sammlung von Flederthieren und Amphibien aus Otjimbingue in Südwest-Afrika. *Monatsb. Akad. Wiss. Berlin*: **236 (part)**, pl. - figs. 1-1d. **Type locality:** Otjimbingue, Namibia.

SUMMARY

Status: Peripheral. A small snake, widely distributed in Namibia but in South Africa known only from widely scattered localities in the north-west Cape.

Research: Poorly known; information restricted to distributional and taxonomic data.

SPECIES DATA

Identification: A small (maximum size 440 mm) snake, but actually our largest *Prosymna*. Characterised by smooth dorsal scales, a single bandlike internasal and high ventral counts: 153-173 in males, 169-199 in females; subcaudals also high 41-54 in males, 32-43 in females.

Coloration distinctive with a dark collar, 5-6 scales wide on nape usually followed by a second band and then a series of others gradually fading away to the rear.

Distribution: Widespread in Namibia but within South Africa known only from: Garagams (Karkams), O'kiep, Steinkopf, Klipfontein, Goodhouse, Coboop, Keimoes, and Augrabies Falls.

Habitat and Ecology: Occurs in rocky localities in semidesert country. May be found abroad at night, especially after rain. Feeds on reptile eggs.

Breeding: Nothing recorded.

CONSERVATION

Status: The distribution so far as it is known at the moment is restricted. However, it may be found to extend further south and east.

Threats: There would appear to be none. These snakes live in inhospitable stony localities not used for agriculture. Mining might destroy very restricted areas of habitat.

Existing Conservation Measures: The species is protected by Provincial Ordinance and conserved in the Augrabies National Park. It also probably occurs in the Hester Malan Nature Reserve near Springbok.

Breeding Potential in Captivity: Possibly fair; the provision of adequate feeding would pose the greatest problem.

Recommended Conservation Measures: None required at the present. It is possible that when the exact distribution of the species is known, that it may be removed from the peripheral category.

Remarks: Listed as rare (peripheral) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Broadley, 1983.

General: Branch, 1988.

Account prepared by: G.R. McLachlan, South African Museum, Cape Town.

MOZAMBIQUE SHOVELSNOUT SNAKE
Mosambiekse graafneusslang

International status: NOT LISTED
South African status: PERIPHERAL

Prosymna janii Bianconi 1862. **Class:** Reptilia, **Suborder:** Ophidia, **Family:** Colubridae.

Prosymna janii Bianconi, 1862. Specimina zoologica mosambicana. *Mem. Accad. Sci. Bologna* (2)1: 470, pl. i. **Type locality:** Inhambane, Mozambique.

SUMMARY

Status: Peripheral. A small fossorial snake with an apparently restricted range in the southern parts of the tropical subtraction zone of the Mozambique coastal plain.

Research: Taxonomy well-defined; basic ecology and habitat preferences unknown.

SPECIES DATA

Identification: A small snake, rarely reaching 300 mm in total length, with a short tail of which the length in males fits 5,6 to 6,2 times and in females 6,5 times into the total length. Snout rounded and flattened forming an angular horizontal edge. Rostral followed by the usually fused and bandlike internasal as well as a single prefrontal; upper labials usually 6 with 3rd and 4th entering orbit, lower labials usually 8 and a single pair of chin shields. Scales in 15 to 17 rows at midbody, with paired apical pits and keels, especially in the middorsal area, while the nape and sides are smooth. Ventrals 107 - 129, anal undivided and 24 to 36 paired subcaudals.

Colour yellow to pale reddish brown with a series of paired spots on the back. Anteriorly behind the black parts of the head, the first couple of pairs may coalesce to form transverse bars. Posteriorly the spots decrease in size and rarely extend to the base of the tail while they may actually fade out before reaching midbody. The dark upper side of the head has a number of pale spots and the ventrum and upper lip is and two lateral scale rows are uniform off-white to yellowish.

Distribution: Within South Africa this snake is restricted to the coastal areas from St. Lucia estuary to the Mozambique border. North of the border this pattern continues to at least as far as Maputo. The few records from further north indicate its occurrence at least as far as Inhambane and suggest a wider occurrence inland and probably even further north.

Habitat and Ecology: Loose sandy soil on floor of coastal dune forest, coastal forest and woodland, both rich or poor in humus. It only becomes active at night when it moves about just below the surface, leaving regular undulating tracks similar to those left by lizards with degenerate limbs. These tracks may be observed on sandy roads, sand heaps and in ploughed lands and at times intense activity may occur at night with great numbers of fresh tracks suggesting high population densities (cf. Haacke and Bruton, 1978). The cause for this amount of activity is unknown but most likely it is just part of a general foraging activity, possibly associated with mating. This species appears to feed more or less exclusively on reptile eggs.

Breeding: Oviparous, laying less than 10 eggs per clutch. Apart from feeding activity, the sudden mass movements observed during summer nights might be related to mating activity.

Remarks: A very distinct species of burrowing snake, which, due to its fossorial nocturnal habits in mostly densely vegetated uninhabited areas in a restricted range, is very poorly known.

CONSERVATION

Status: Although this species has a very restricted range within South Africa it appears to be very common locally, where counts of fresh tracks on sandy roads at night can supply a good indication of the population density.

Threats: Except for man and his agricultural and road building practices no natural enemies are known. Large scale sand mining as practiced in coastal dune forest further south could have serious negative effects on the population, as could the development of off-road vehicle activity.

Existing Conservation Measures: No special measures exist, but as most of the South African range falls within the Coastal Forest Reserve, habitat

destruction is reduced to a minimum and conservation is assured at present.

Breeding Potential in Captivity: Unless alternative food can be identified, captive maintenance appears to be very difficult.

Recommended Conservation Measures: None required at present.

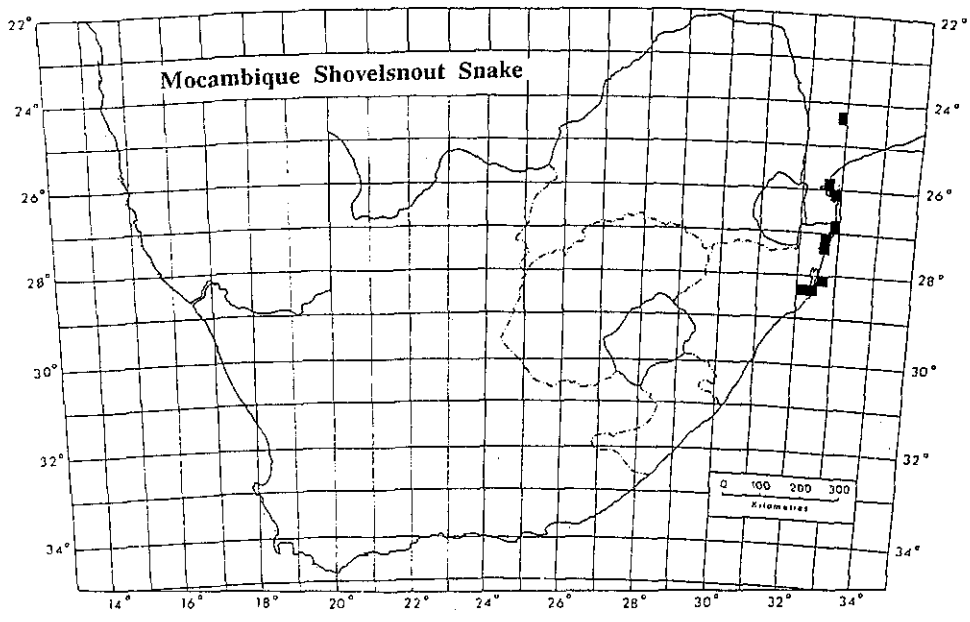
Remarks: Although this snake has a very limited range within South Africa it appears to have high population densities, at least in certain areas, and is at present not under any pressure.

BIBLIOGRAPHY

Taxonomy: Bianconi, 1862; Boulenger, 1894; FitzSimons, 1962; Broadley, 1983.

General: Bruton and Haacke 1975, 1980; Bourquin, 1977; Haacke and Bruton, 1978; Branch, 1988.

Account prepared by: W. D. Haacke, Transvaal Museum, Pretoria.



Map 84. Distribution of the Mocambique shovelsnout snake *(Prosymna janii).*

SEMIORNATE SNAKE
Halfgevlekteslang

International status: NOT LISTED
South African status: PERIPHERAL

Meizodon semiornatus (Peters, 1854) **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Coronella semiornata Peters, 1854. Diagnosen neuer Batrachier, mit Uebersicht der in Mossambique gesammelten Schlangen u. Eidechsen. *Monatsb. Akad. Wiss. Berlin* p 622. **Type locality:** Tete, Mocambique.

SUMMARY
Status: Peripheral. A wide-ranging, East African snake that just enters the region. Not recorded from any protected reserve, and not known to be threatened.

Research: Taxonomy relatively wellknown. Distribution and basic biology almost completely unknown.

SPECIES DATA
Identification: A small (maximum length 66 cm), slender snake with a narrow head hardly distinct from the neck, and a tail of moderate length. It can be distinguished by having:

1. No enlarged, grooved fangs in the upper jaw;
2. smooth body scales with apical pits and in 19-21 rows at midbody;
3. anal and subcaudals divided;
4. mandibular teeth largest in front.

The body has a complicated colour pattern, being grey to olive brown with black, transverse cross bars anteriorly, especially in young specimens. There is a distinct dark collar behind the head and the upper labials are barred in yellowish white. The belly is white to yellowish white, becoming uniformly plumbeus in many large adults.

Distribution: Extending through the eastern regions of Africa, from Uganda to Swaziland and the Lebombo mountains of Maputaland.

Habitat and Ecology: A shy snake, inhabiting well-wooded areas, and usually found among rotting vegetation and leaf litter. The diet seems to include small lizards (skinks and geckos) and frogs.

Breeding: Poorly known: a female had two elongate eggs in her oviducts.

CONSERVATION
Status: A peripheral species, recorded from a few localities in Swaziland and Maputaland. Not recorded from any protected reserve, but no specific threats have been identified.

Threats: None identified.

Existing Conservation Measures: Protected by general legislation in Natal.

Breeding potential in captivity: Not known; probably poor.

Recommended Conservation Measures: Further surveys of its distribution in the Maputaland region are required.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

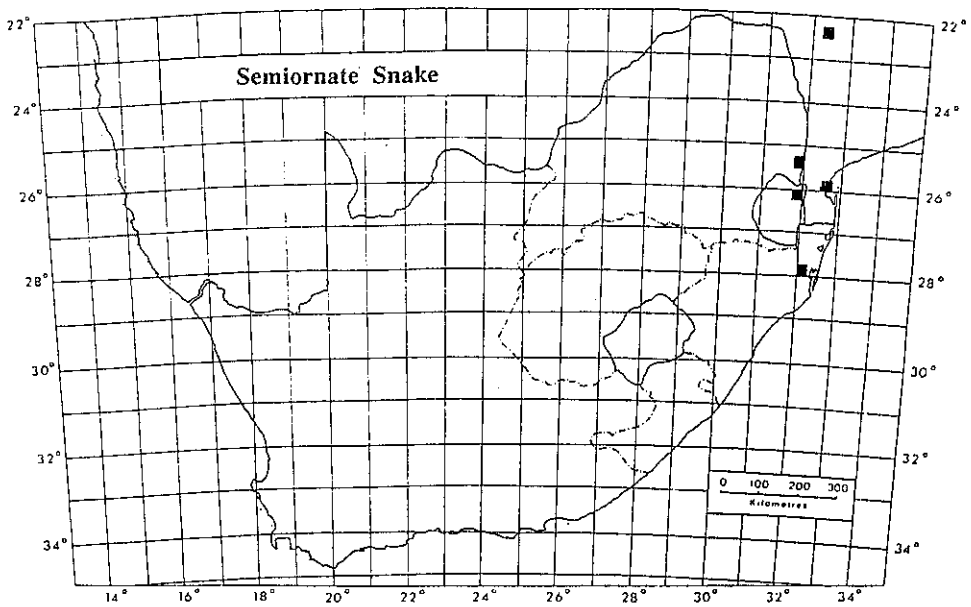
BIBLIOGRAPHY

Taxonomy: Broadley, 1983.

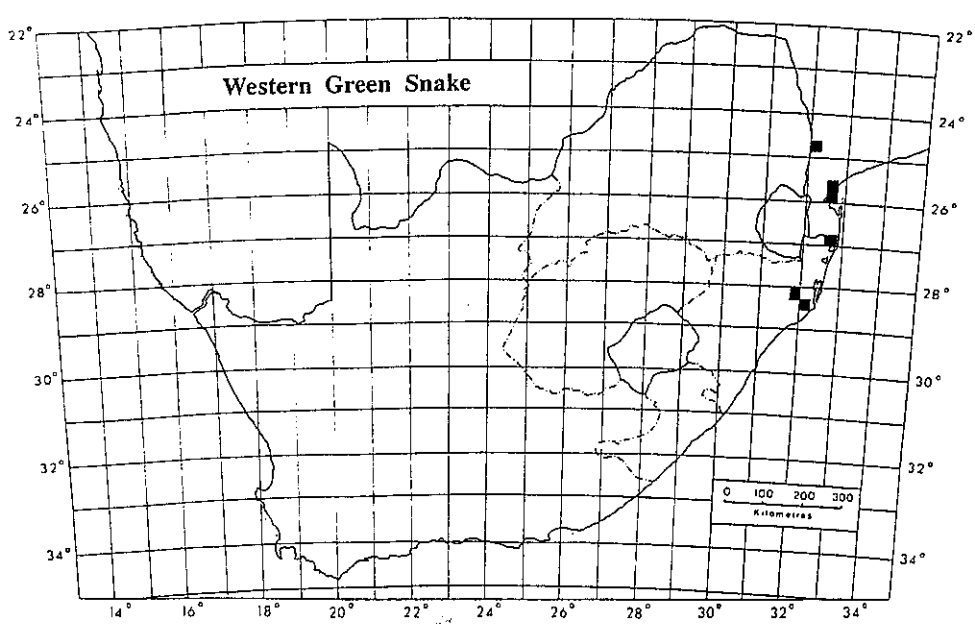
Habitat and Ecology: Branch, 1988; Broadley, 1983.

Conservation: Bruton, 1980.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 85. Distribution of the semiornate snake *(Meizodon semiornatus).*



Map 86. Distribution of the western green snake *(Philothamnus angolensis).*

WESTERN GREEN SNAKE
Westelike groenslang

International status: NOT LISTED
South African status: PERIPHERAL

Philothamnus angolensis Bocage 1882. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Philothamnus angolensis Bocage 1882. Reptiles rares ou nouveaux d'Angola. *Jorn. Sci. Lisboa (1)* 9(33): 1-19.
Type locality: Capangombe, Angola.

SUMMARY
Status: A peripheral species that ranges widely through central Africa, and just enters the region in Maputaland.

Research: Taxonomy, biology and habitat preferences poorly known.

SPECIES DATA
Identification: A large (maximum length 116 cm) slender green water snake that has a distinct head with large eye and a long tail. It can be further distinguished by:

1. Having no enlarged fangs in the upper jaw;
2. smooth body scales with apical pits and in 15 rows at midbody;
3. 149-170 ventrals, that are slightly notched and usually have a feebly to moderately developed lateral keel;
4. a divided anal and 87-120 subcaudals;
5. black interstitial skin between the body scales.

The body is a bright emerald to olive green, often with scattered scales on the forebody with blue-white spots and edged with black above. The belly is pale green to greenish-yellow becoming darker to the rear.

Distribution: A tropical African species, extending from Cameroon to central Namibia, Caprivi, eastern and central Zimbabwe, and just entering the region in Maputaland.

Habitat and Ecology: A diurnal forager in reed beds and marginal vegetation of river courses and vleis. It actively climbs into vegetation in search of the young of reed birds, lizards and frogs, etc, which consitute its main diet. It is somewhat aggressive and will inflate the neck region in a threat display and bite readily. However, it is non-poisonous.

Breeding: Usually a single clutch of five to eight (up to maximum of 16) eggs are laid in summer (December-February). They vary in size (25-43 mm x 9-18 mm) and hatch in about 2 months; the hatchlings measure 22-26 cm in length.

Remarks: Previously confused with *Philothamnus irregularis.*

CONSERVATION
Status: A wide-ranging peripheral species, that just enters Maputaland and has not been recorded from any protected reserves.

Threats: No specific threats identified.

Existing Conservation Measures: Protected by general Natal legislation.

Breeding potential in captivity: Probably reasonable if adequate enclosures and food supplies can be provided.

Recommended Conservation Measures: None required at present.

Remarks: Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1983; Hughes, 1985.

Habitat and Ecology: Branch, 1988; Broadley, 1983.

Conservation: Bruton, 1980.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.

EAST AFRICAN EGGEATER **International status:** NOT LISTED
Oos Afrikaanse eiervreter **South African status:** PERIPHERAL

Dasypeltis medici medici (Bianconi, 1859) **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Colubridae.

Dipsas Medici Bianconi 1859. Specimina Zoologia Mossambicana quibus vel novae vel minus notae animalium species illustrantur. XV. - Reptilia. Bononiae. *Mem. Acad. Sci. Bologna* **10:** p501, pl. xxvi. **Type locality:** Mocambique, probably Inhambane.

SUMMARY

Status: Peripheral. An East African coastal species extending to Maputaland; recorded from a number of protected reserves and not known to be threatened.

Research: A welldefined, but poorlyknown species. Further studies on habitat preferences and basic biology are required.

SPECIES DATA

Identification: A small (maximum length 90 cm) eggeater with a small head with large eye, and a long tail and characteristic colour pattern. It can be further distinguished by:

1. Having few and rudimentary teeth;
2. strongly keeled body scales, each with 2 apical pits and in 23-27 rows at midbody;
3. a pink lining to the mouth;
4. and no loreal scale.

The body is pinkish to reddish-brown, usually with a broad darker brown vertebral stripe interrupted with small white patches; the flanks have narrow dark vertical bars. The head and neck bear about 5 faint chevrons, and the belly is cream with brown stippling.

Distribution: Coastal regions of East Africa; the southern race extends from southern Kenya to Maputaland, and is replaced in Somalia and northern Kenya by *D. m. lamuensis.*

Habitat and Ecology: Poorly known; inhabits lowland evergreen forest and probably, like other *Dasypeltis*, feeds exclusively on bird eggs.

Breeding: No details, but probably oviparous like other eggeaters.

CONSERVATION

Status: A peripheral species just entering Maputaland and recorded from a number of protected reserves.

Threats: No specific threats identified.

Existing Conservation Measures: Protected by Natal Ordinance and recorded from Sodwana Bay and Lake Sibaya reserves or their vicinity.

Breeding potential in captivity: Poor due to specialised diet.

Recommended Conservation Measures: None required, except general protection of unique Maputaland habitats.

Remarks: Included as rare (peripheral) in previous Red Data Book (McLachlan, 1978).

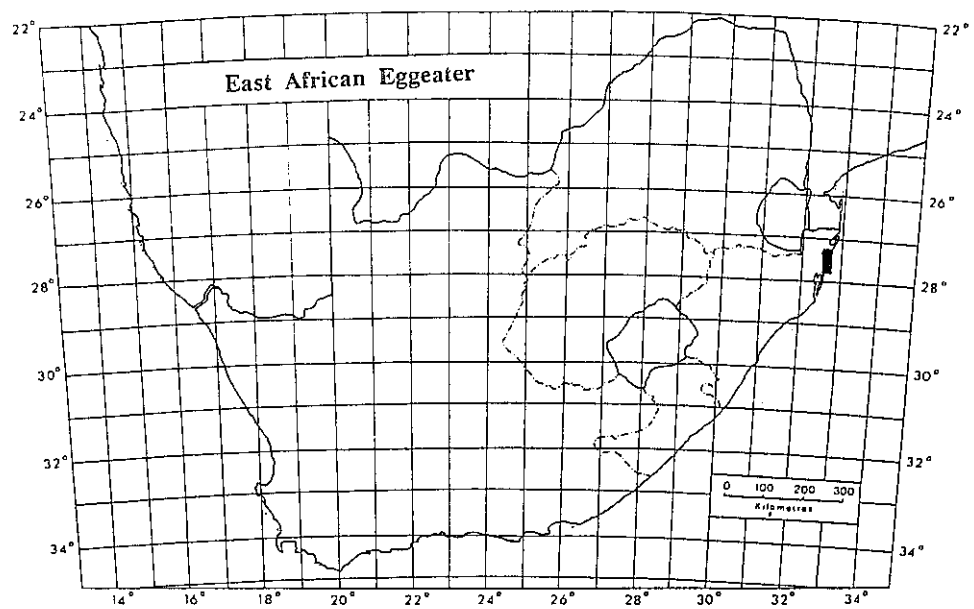
BIBLIOGRAPHY

Taxonomy and Distribution: Broadley, 1983.

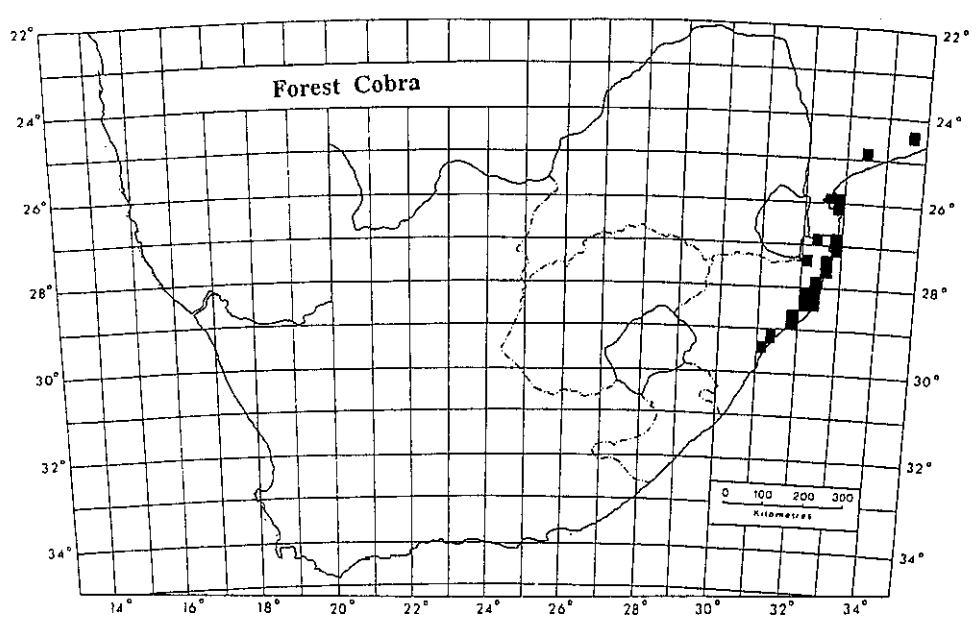
Habitat and Ecology: Branch, 1988; Broadley, 1983.

Conservation: McLachlan, 1978; Bruton, 1980.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 87. Distribution of the East African eggeater *(Dasypeltis medici medici).*



Map 88. Distribution of the forest cobra *(Naja melanoleuca).*

FOREST COBRA
Boskobra

International status: NOT LISTED
South African status: PERIPHERAL

Naja melanoleuca Hallowell, 1857. Class: Reptilia, Suborder: Serpentes, Family: Elapidae.

Naja melanoleuca Hallowell, 1857. Notice of a collection of Reptiles from Gaboon country, West Africa, recently presented to the Academy of Natural Sciences of Philadelphia by Dr. Henry A. Ford. *Proc. Acad. Nat. Sci. Philad.* p61. **Type locality:** Gabon.

SUMMARY

Status: Peripheral. Widely-distributed through the rain forests of Africa, and reaching its southern limit in northern Natal. Recorded from a number of protected reserves, and threatened only by afforestation and limited collecting for the pet trade.

Research: Taxonomy well known. Basic biology, apart from reproduction, less well documented and requires further study.

SPECIES DATA

Identification: A very large cobra (maximum length almost 2,7 m in southern Africa; recorded to 3,6 m in Uganda), with a stout body and bluntly pointed head. It can be distinguished by:

1. The presence of large, hollow fixed fangs at the front of the upper jaw;
2. the absence of a loreal shield on the side of the head;
3. smooth body scales, that lack apical pits, and are in 19 rows at midbody;
4. 3rd-4th upper labials entering the eye;
5. a single preocular.

The head and forebody are light to dark brown, flecked or spotted with black, passing to shiny black, sometimes with scattered white spots or black annuli, on the rear half of the body. The belly is creamy white to dirty yellow, often speckled with black. Some or all of the labials may be pale with black edges, although this is not as welldeveloped locally as it is in specimens from central Africa.

Distribution: Forested and cleared forest throughout Africa, from Senegal to western Ethiopia, south to Angola and Maputaland.

Habitat and Ecology: A diurnal species, that actively hunts on the forest floor and margins. They are omnivorous, feeding on a large variety of prey including small mammals, ground birds, frogs and toads, and even other reptiles (including snakes and monitor lizards). They have often been observed catching small fish in shallow swamps. In defence they rear up and spread a narrow hood, and will bite readily. The venom is highly toxic and can cause death, although bites are very rare. They settle well in captivity and have lived for 28 years.

Breeding: A clutch of 10-26 large (30 x60 mm) eggs are laid in damp leaf litter in a hollow log or other suitable spot during November to December. They take about 65 days to hatch and the young measure about 35-38 cm. Some females in captivity have constructed crude nests and coiled around the eggs to protect them.

CONSERVATION

Status: A peripheral species that is relatively common in the coastal dune forest adjacent to lakes and lagoons, and swamp forest in Maputaland.

Threats: Any factors reducing the extent of coastal dune forest and swamp forest will affect this species. It is also collected to a limited extent for the pet trade and snake parks, but this is decreasing in impact as captive breeding programs become successful.

Existing Conservation Measures: Protected by Natal Ordinance, and reported from a number of protected reserves (eg. Ndumu Game Reserve, Sodwana Bay Park, Lake Sibaya and St Lucia).

Breeding potential in captivity: Very good; a number of successful breeding programs have been reported.

Recommended Conservation Measures: No specific measures are required at the moment, other than general monitoring of illegal collecting and land usage in this sensitive area.

Remarks: Not included in the previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

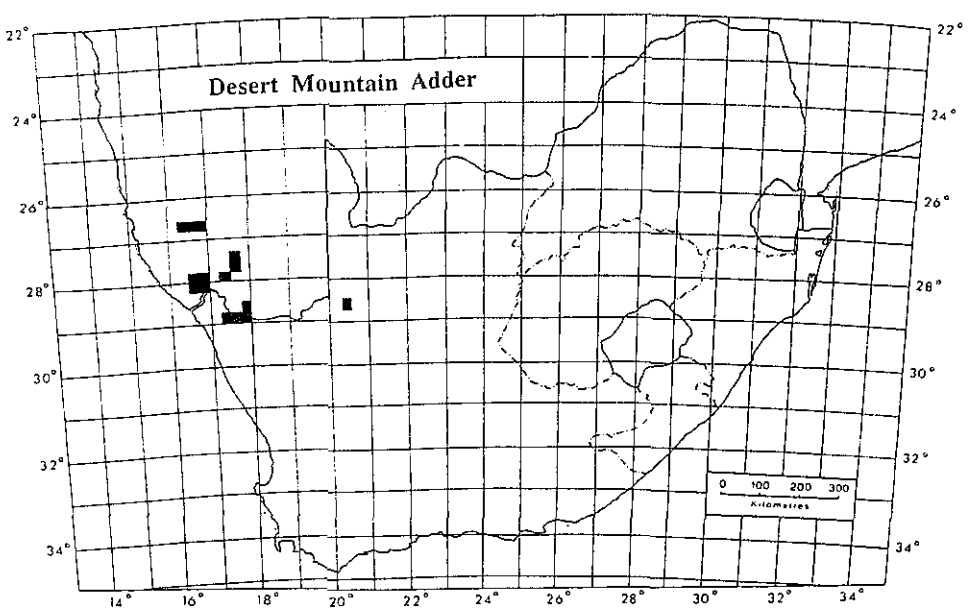
Taxonomy and Distribution: Broadley, 1968, 1983; Pooley, 1965; Bruton and Haacke, 1980..

Habitat and Ecology: Branch, 1979, 1988; Broadley, 1983.

Breeding: Haagner and Carpenter, 1988; Tyron, 1979; Wilson, 1959.

Conservation: Bruton, 1980.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 89. Distribution of the desert mountain adder *(Bitis xeropaga).*

DESERT MOUNTAIN ADDER **International status:** **NOT LISTED**
Woestyn bergadder **South African status:** **PERIPHERAL**

Bitis xeropaga Haacke 1975. **Class:** Reptilia, **Suborder:** Serpentes, **Family:** Viperidae.

Bitis xeropaga Haacke, 1975. *Cimbebasia Ser.A* 4(5): 115. **Type locality:** Dreikammerberg on north bank of Orange River, Luderitz district, South West Africa, Namibia.

SUMMARY

Status: Peripheral. A small species which for many years was confused with *Bitis caudalis*. It has a restricted range in South Africa, from Augrabies Falls to the mouth of the Orange River.

Research: Taxonomic status well defined (Haacke 1975), but biology poorly known.

SPECIES DATA

Identification: A small adder, maximum length 610 mm, somewhat more slender than the horned adder, *B. caudalis*, and with a subtriangular head with slightly squared-off snout. It is further distinguished by:

1. Having the same number of dorsal scale rows round the neck as at mid-body.

2. and a distinctive dorsal colour-pattern and a spotted or dusky belly.

The body is ash to dark grey with 16-34 crossbars composed of a median dark-brown to blackish, rectangular bar, flanked by whitish dorsolateral spots, which usually boaders a pale triangular mark adjacent to the ventrals. The head is usually without a distinct pattern, except for a light patch on the supraorbital ride and a dark patch posterior to it.

Distribution: From Augrabies Falls westward to Hells Kloof, northwards to the Fish River Canyon, the Rosh Pinah area, Aus, and Kuibis.

Habitat and Ecology: Inhabits only the very driest areas and is associated with bare, rocky hillsides and mountain slopes. It does not sidewind or attempt to bury itself in sandy soil. Captive specimens eat mice and skinks.

Breeding: Four to five young are recorded being born, the former number being produced in April.

CONSERVATION

Status: The species has a very restricted range. However, it occupies almost uninhabited, desolate country so that it is unlikely to come under threat from human activities except possibly mining.

Threats: None at present but extensive mining might pose a threat.

Existing Conservation Measures: The species is afforded protected status under the Cape Provincial Ordinance to the extent that it may not be kept in captivity without a permit nor may it be exported without a permit.

Breeding Potential in Captivity: Probably good; all species of *Bitis* are viviparous, with the small species giving birth to from 6-16 babies.

Recommended Conservation Measures: None required at the present.

Remarks: Considered rare (peripheral) in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Haacke, 1975.

Habitat and Ecology: Branch, 1978, 1988.

Conservation: McLachlan (1978).

Account prepared by: G.R. McLachlan, South African Museum, Cape Town.

WEB-FOOTED GECKO
Webvoetgeitjie

International status: NOT LISTED
South African status: PERIPHERAL

Palmatogecko rangei Andersson 1908. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Palmatogecko rangei Andersson, 1908. A remarkable new gecko from South Africa and a new *Sternocerus* species from South America in the Natural History Museum in Weisbaden. *Jb. nass. Ver. Naturk.* 61: 299, pl. 3: 1a-c. **Type locality:** Luderitzbucht, Namibia.

SUMMARY

Status: Peripheral. A widespread species in Namibia and southern Angola just entering our limits in the western Richtersveld as far south as the upper Holgat River.

Research: Good.

SPECIES DATA

Identification: A slender, medium-sized gecko, immediately identifiable by its webbed feet.

Distribution: Although widely distributed from south-western Angola along the coast of Namibia, it only just enters the Republic in the northern Richtersveld, from Bloeddrif to the mouth of the Orange River, south to the Holgat River.

Habitat and Ecology: An inhabitant of dunes, wind-blown sand and the silt or sand of riverbeds. Odd populations occur quite far inland on isolated patches of sand. The geckos dig burrows with their webbed feet and spend the daylight hours in them.

Breeding: Two eggs are developed and are laid during the summer months from November to May and take about three months to hatch.

CONSERVATION

Status: Although occupying only a small area within our limits, the species is very widespread and common in Namibia and Angola. Vast areas of its habitat are in diamond areas of limited access to the public or in areas so remote that they are seldom visited by anyone. No estimates of population numbers have been made.

Threats: Mining along the lower Orange River and the coast north of Port Nolloth may present a threat but is unlikely in the region of the upper Holgat River.

Existing Conservation Measures: The species is afforded complete protection by the Cape Provincial Ordinance.

Breeding Potential in Captivity: Geckos are relatively easy to maintain in captivity, and the species has been kept for long periods and has been bred in captivity.

Recommended Conservation Measures: None are required at the present, although the situation should be watched for possible threat to the habitat by mining or farming. Conversely, poor farming practises, including overgrazing, probably increases the habitat available due to desertification.

Remarks: Listed as rare (peripheral) in previous Red Data Book (McLachlan, 1978).

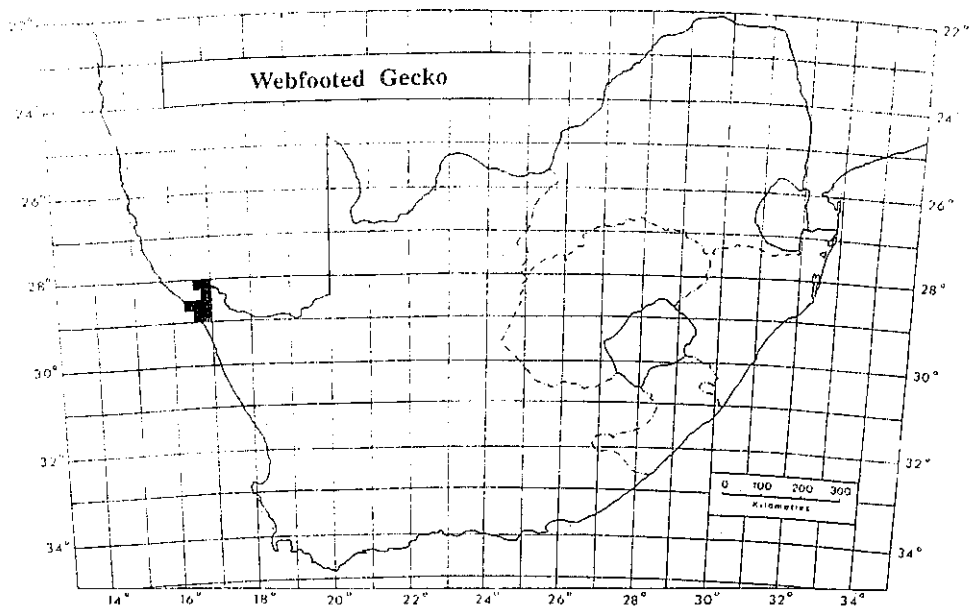
BIBLIOGRAPHY

Taxonomy: Haacke, 1976.

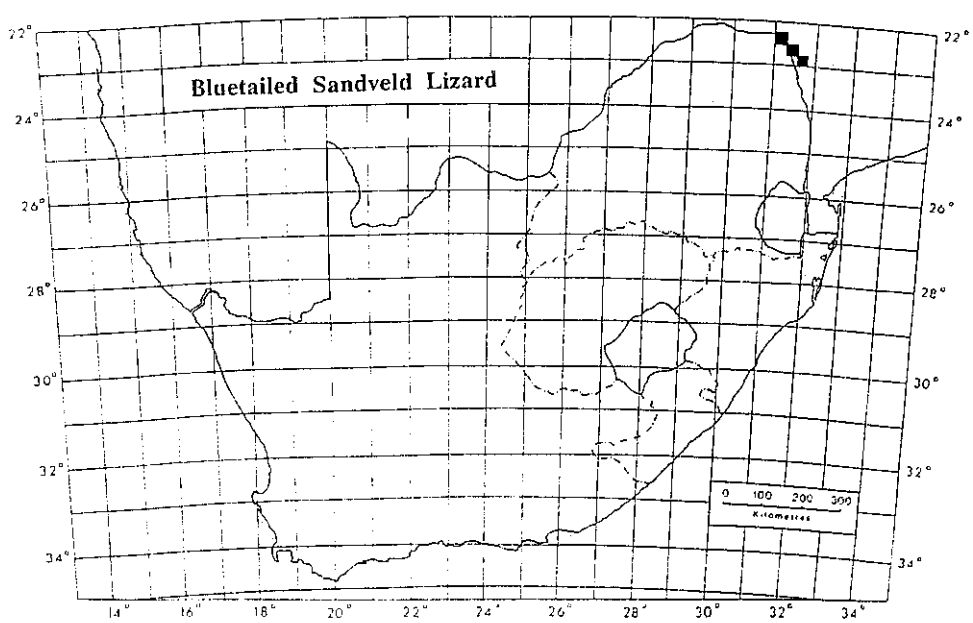
Habitat and Ecology: Branch, 1988, Haacke, 1976.

Conservation: Kuhnelt, 1982; McLachlan, 1978.

Account prepared by: G.R. McLachlan, South African Museum, Cape Town.



Map 90. Distribution of the webfooted gecko *(Palmatogecko rangei).*



Map 91. Distribution of the bluetailed sandveld lizard *(Nucras caesicaudata).*

BLUETAILED SANDVELD LIZARD
Bloustert-sandveldakkedis

Internationalstatus: NOT LISTED
South African status: PERIPHERAL

Nucras caesicaudata Broadley 1972 **Class:** Reptilia, **Suborder:** Sauria, **Family:** Lacertidae

Nucras caesicaudata Broadley, 1972. A review of the *Nucras tesselata* group (Sauria: Lacertidae). *Arnoldia Rhod.* 5(20): 21. **Type locality:** Sazale pan, Gona-re-zhou, south-eastern Zimbabwe.

SUMMARY
Status: Peripheral. A small lizard only found within our limits in the sandveld of the north-eastern Kruger National Park.

Research: Poor. A study of its habits and habitat requirements should be considered.

SPECIES DATA
Identification: A small *Nucras* (maximum size 202 mm TL) with transversely enlarged plates under the forearm. Colour: Characteristically seven pale longitudinal stripes down the back. Tail powder blue.

Distribution: The species only occurs in the sandveld of the north-eastern Kruger National Park. Outside our limits it occurs in south-eastern Zimbabwe and more extensively along the Mozambique plain.

Habitat and Ecology: This species is found in areas with deep sand and has been observed feeding on termites (Pienaar *et al.*, 1983).

Breeding: No data available - presumably oviparous.

Remarks: A little known species.

CONSERVATION
Status: The species occupies a very limited distribution in South Africa. No details of the population are known. Its main range appears to be in Mozambique.

Threats: None known as it is found in remote areas where human disturbance is minimal.

Existing Conservation Measures: It is offered some protection under the Transvaal Provincial Ordinance and its total distribution in South Africa is within the borders of the Kruger National Park.

Breeding Potential in Captivity: Not known. None in captivity.

Recommended Conservation Measures: More detail of its habitat and habits needed.

Remarks: A rare peripheral species with a very restricted range in South Africa. Status appears assured. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Broadley, 1972; Pienaar, 1966; Pienaar *et al.*, 1983.

Conservation: Pienaar, 1966; Pienaar *et al.*, 1983.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.

LEONHARD'S SPADESNOUTED WORMLIZARD
Leohnard se graafneus-wurmakkedis

International status: NOT LISTED
South African status: PERIPHERAL

Monopeltis leonhardi Werner 1910. **Class:** Reptilia, **Suborder:** Amphisbaenia, **Family:** Amphisbaenidae

Monopeltis leonhardi Werner, 1910. Reptilia et Amphibia. In Schultze, L. Zoologische und antropologische Ergebnisse einer forschungereise im westlichen und zentralen Südafrika. *Denkschr. Med. Nat. Ges.* Jena. **16:** 328. **Type locality:** Between Kgokong and Kang, Botswana.

SUMMARY

Status: Peripheral. A rare fossorial species, probably poorly collected because of this. Known in South Africa only from specimens collected in the Kruger and Kalahari Gemsbok National Parks.

Research: Poor. More intensive surveys needed outside the K.N.P.

SPECIES DATA

Identification: A robust species (maximum size 300 mm TL), characterised by two azygous head shields. Colour: Grey to purplish brown above, darker on tail. Below a uniform fleshy-pink to vinaceous pink.

Distribution: Has been recorded from Tierkop and the Kalahari Gemsbok National Park in the Cape Province and from the north-western boundary of the Kruger National Park. Occurs more widespread in Botswana and Zimbabwe.

Habitat and Ecology: Specimens collected in the Kruger National Park were only recorded in sandveld where they were bulldozed out of deep sandy soils during the construction of firebreaks. A specimen from the Waterberg, Namibia, was found under a stone.

Breeding: No data available.

Remarks: It is likely that additional localities will come to light with more intensive surveys particularly where large scale earth moving in suitable areas takes place.

CONSERVATION

Status: A rare peripheral species, which has only been recorded in the Kruger National Park and the northern Cape Province. It is in no danger provided the habitat in which it lives is sustained.

Threats: None known.

Existing Conservation Measures: Protected under the Cape and Transvaal Provincial Ordinances and is known to occur within the boundaries of the Kruger and Kalahari Gemsbok National Parks.

Breeding Potential in Captivity: Not known, probably poor.

Recommended Conservation Measures: More detailed surveys in suitable habitat need to be done.

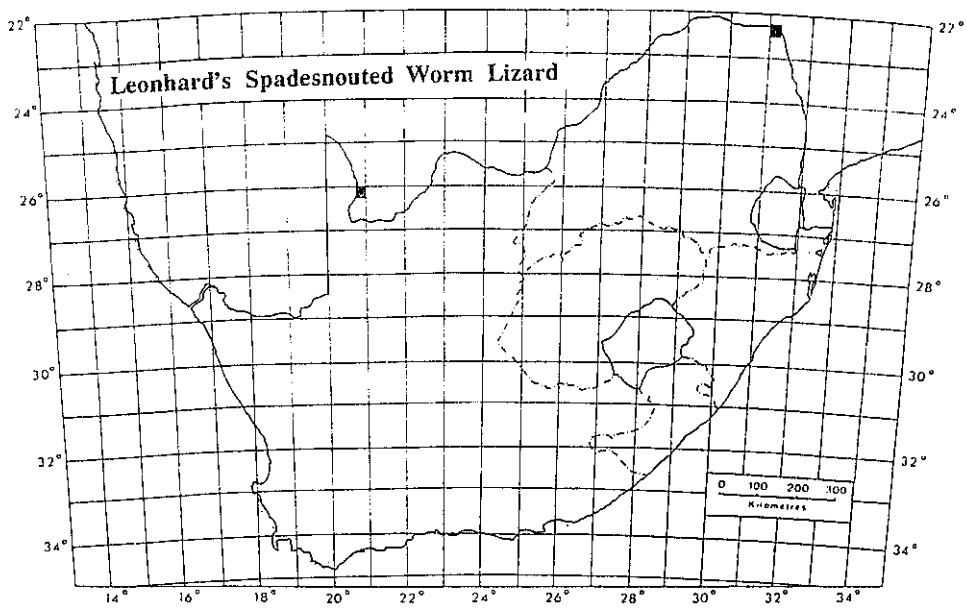
Remarks: Additional populations are likely to be found in suitable habitat linking the Botswana and Kruger National Park populations. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

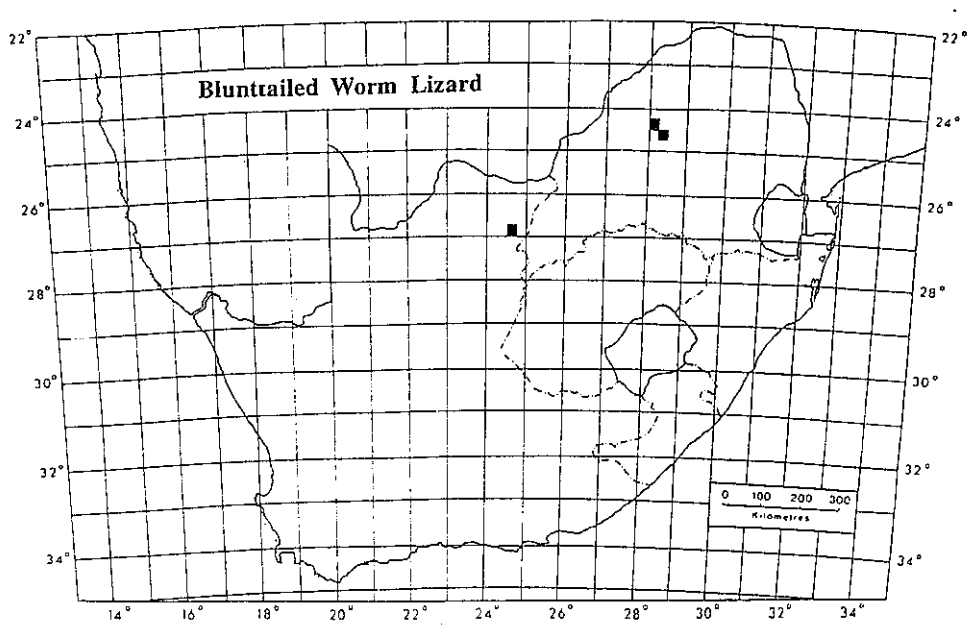
Taxonomy: Broadley, Gans and Visser, 1976; Werner, 1910.

Conservation: Jacobsen, Newbery and Petersen, 1986; Pienaar, Haacke and Jacobsen, 1983.

Account prepared by: N. H. G. Jacobsen, Transvaal Nature Conservation Division.



Map 92. Distribution of Leonhard's spadesnouted wormlizard *(Monopeltis leonhardi).*



Map 93. Distribution of the blunttailed wormlizard *(Dalophia pistillum).*

BLUNTTAILED WORM-LIZARD
Stompstert-wurmakkedis

International status: NOT LISTED
South African status: PERIPHERAL

Dalophia pistillum (Boettger 1895) **Class:** Reptilia, **Suborder:** Amphisbaenia, **Family:** Amphisbaenidae

Monopeltis pistillum Boettger, 1895. Zwei neue Reptilien vom Zambesi. *Zool. Anz.* 18: 62. Type locality: Zambesi, East Africa (Boroma, 20km upstream from Tete, Mozambique).

SUMMARY

Status: Peripheral. Only two records of this species in South Africa, from the Waterberg, Transvaal and near Vryburg in the northern Cape. Likely to be more common with more detailed surveys of suitable habitat.

Research: Poor. More extensive surveys needed.

SPECIES DATA

Identification: A medium to large (maximum size 630 mm) species. Nasal shields separated by rostral segment, no precloacal pores. Azygous head shields fused, no constricted autotomy annulus and caudal annuli 19-33.

Colour: Flesh-coloured anteriorly but becoming speckled with grey posteriorly, particularly on the tail.

Distribution: Only known from two localities in South Africa, near Vryburg in the northern Cape and between Nylstroom and Vaalwater in the Waterberg, Transvaal. Elsewhere it is widely distributed in Botswana, Zimbabwe, Zambia and Mozambique.

Breeding: Oviparous, four eggs appearing to be the norm. These are laid during September in Mozambique (Broadley et al., 1976).

Remarks: It is likely that the species is more widely distributed in South Africa.

CONSERVATION

Status: Although only recorded to date from two localities in South Africa it is likely that the species is more widely distributed. It is a fossorial reptile and therefore only found during large scale earth moving operations, such as road construction. As its habitats are in sandy soil in regions used mainly for ranching purposes, it is likely to be in a secure position.

Threats: None known. Destruction of habitat for farming is the only likely threat.

Existing Conservation Measures: Partial protection is given under the Transvaal and Cape Provincial Ordinances.

Breeding Potential in Captivity: Not known, probably poor.

Recommended Conservation Measures: More detailed surveys of the areas from which it is known are needed: Also surveys to determine its existance elsewhere. A priority species.

Remarks: As for the above before additional conservation measures can be considered. Not listed in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: Boettger, 1895; Broadley, Gans and Visser, 1976; ; FitzSimons, 1943.

Conservation: Jacobsen, Newbery and Petersen, 1986.

Account prepared by: N.H.G. Jacobsen, Transvaal Nature Conservation Division.

POYNTON'S CACO
Poynton se caco

International status: NOT LISTED
South African status: INDETERMINATE

Cacosternum poyntoni Lambiris 1988. **Class:** Amphibia, **Order:** Anura, **Family:** Ranidae.

Cacosternum poyntoni Lambiris, 1988. A new species of *Cacosternum* (Amphibia: Anura; Ranidae) from Natal. *S. Afr. J. Zool.* 23(1): 63-66. **Type locality:** Carter's Nursery, Town Bush Valley, Pietermaritzburg, Natal.

SUMMARY

Status: Indeterminate. Know only from a single specimen collected in 1954 from an area now disturbed by urban development and bush encroachment.

Research: Only recently described; the ecology and habitat preferences of this species are completely unknown.

SPECIES DATA

Identification: A small (15 mm snout-vent length), slender, smooth-skinned frog that is distinguisable from other members of the genus by its bold reticulated pattern of dark brown blotches on a yellow background, both dorsally and ventrally.

Distribution: Known only from the type locality in the suburbs of Pietermaritzburg, Natal.

Habitat and Ecology: Unknown.

Breeding: Probably similar to other members of the genus, laying relatively small numbers of eggs in the flood margins of vleis.

CONSERVATION

Status: Unknown. It is possible that the original population has become extirpated due to habitat destruction. Lambiris (1988) reports that careful searching at and around the type locality, and elsewhere in the Pietermaritzburg region, has failed to produce further specimens. The circulation of 200 pamphlets illustrating the species and its probable habitat, to the residents of Town Bush Valley, also failed to uncover additional specimens.

Threats: The species was collected near a small water reservoir in "natural woodland with short grass". The area is now thickly overgrown with closed woodland and tall, dense grass.

Existing Conservation Measures: Protected by Natal Ordinance. Not recorded from any protected area.

Breeding potential in captivity: Probably poor due to its small size and specialised feeding requirements.

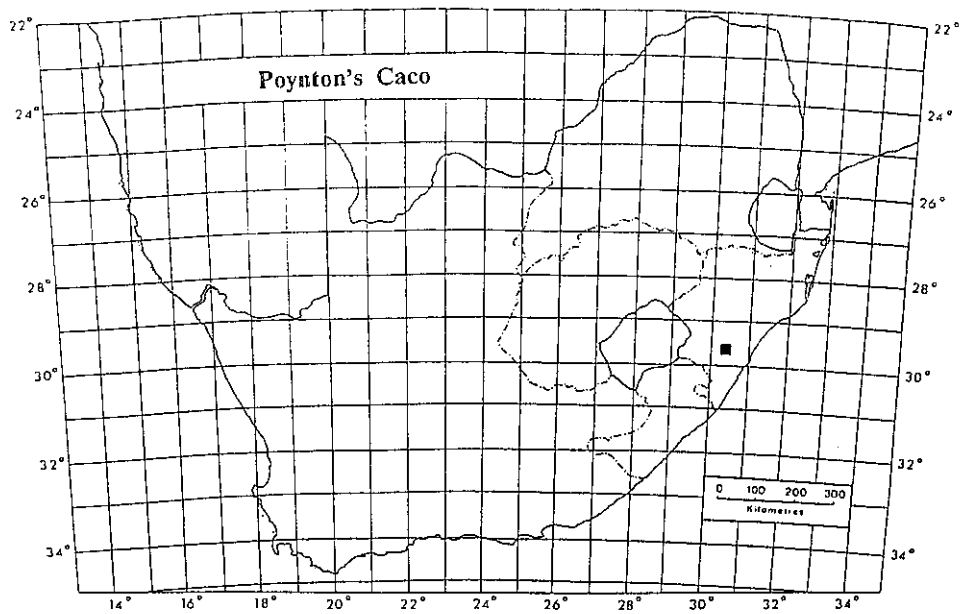
Recommended Conservation Measures: Further surveys of the area and adjacent Natal midlands should be instigated to determine the full distribution and status of the species.

Remarks: Only recently described and therefore not listed in previous Red Data Book (McLachlan, 1978).

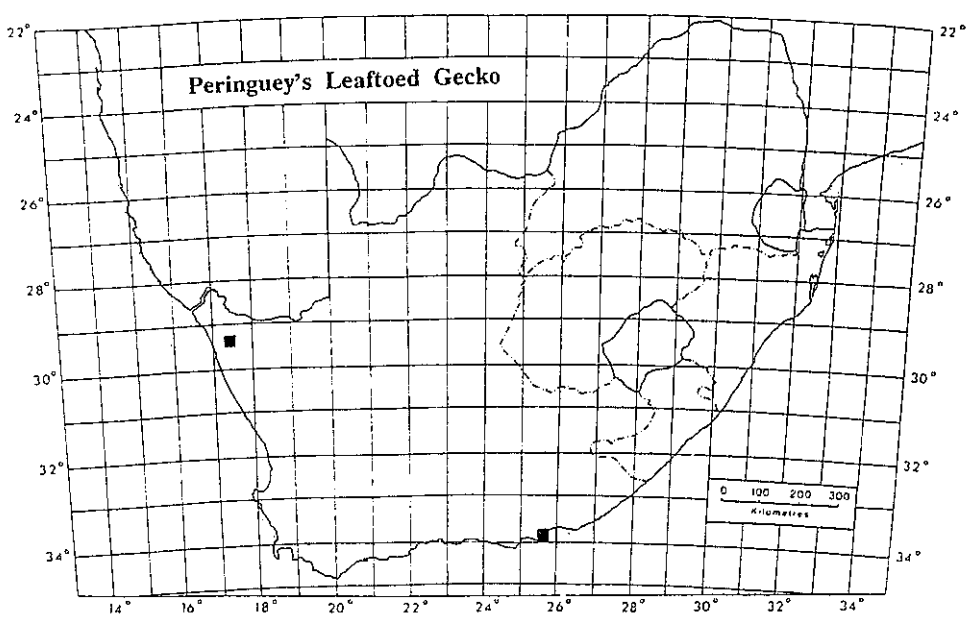
BIBLIOGRAPHY

Taxonomy: Lambiris, 1988.

Account prepared by: W. R. Branch, Port Elizabeth Museum, P.O. Box 13147, Humewood 6013.



Map 94. Distribution of Poynton's caco *(Cacosternum poyntoni).*



Map 95. Distribution of Peringuey's leaftoed gecko *(Phyllodactylus peringueyi).*

PERINGUEY'S LEAFTOED GECKO
Peringuey se blaartoongeitjie

International status: NOT LISTED
South African status: INDETERMINATE

Phyllodactylus peringueyi Boulenger 1910. **Class:** Reptilia, **Suborder:** Sauria, **Family:** Gekkonidae.

Phyllodactylus peringueyi Boulenger, 1910. A revised list of the South African Reptiles and Batrachians with synoptic tables, special reference to the specimens in the South African Museum and descriptions of new species. *Ann. S. Afr. Mus.* **5:** 455-538. **Type locality:** Little Namaqualand (see remarks).

SUMMARY
Status: Indeterminate. Described on the basis of two specimens, reported to come from Little Namaqualand and Port Elizabeth. Not rediscovered despite numerous searches.

Research: The two specimens have been extensively examined by local and overseas researchers. Dr. J. Dixon of Texas University maintains that they are neither American or Madagascan.

SPECIES DATA
Identification: Small geckos. not exceeding 28 mm for head and body. Tubercles are present dorsally as elongated ovals, strongly keeled and numerous.

Habitat and Ecology: Nothing is known about this species, except that SAM 8628 was reportedly "found on the beach".

Breeding: Nothing known.

Remarks: This species was established on the basis of two specimens in the South African Museum: SAM 777 allegedly from Namaqualand District and SAM 8628 from Chelsea Point near Port Elizabeth. SAM 777 was recorded in the Annual Report of the museum as follows:

> *Phyllodactylus ? sp. nov.*, Namaqualand District, Peringuey L.

SAM 8628 was recorded in the Annual Report of 1904 as follows:

> Under thanks: Mr. A. Moorhouse, for a new lizard of the family Gekkonidae, and the genus *Diplodactylus*, found by him near Port Elizabeth.

In the Appendices to the report appears:

> A. Moorhouse 1 Reptile - *Diplodactylus sp. nov.*

The presentation of SAM 8628 was accompanied by a letter in which the exact locality was given as Chelsea Point. Unfortunately the letter is no longer available.

Specimen SAM 777 was catalogued in a long list of other species such as *Crotaphopeltis hotamboeia* and *Pseudocordylus microlepidotus* which are not known from Namaqualand proper. However, the Annual Report states that Peringuey visited Little Namaqualand during 1885 and the insect collection shows that he visited Port Nolloth, Steinkopf, Springbok and Garies.

CONSERVATION
Status: Unknown.

Threats: Unknown.

Existing Conservation Measures: Protected by Cape Provincial Ordinance.

Breeding Potential in Captivity: Probably good.

Recommended Conservation Measures: None can be proposed until the gecko is located in the wild, and its status as a South Africa gecko confirmed.

Remarks: The remark that SAM 8628 was found "on the beach" implies that the specimen may have arrived by rafting, and therefore may not be endemic to South Africa. Listed as indeterminate in previous Red Data Book (McLachlan, 1978).

BIBLIOGRAPHY

Taxonomy: FitzSimons, 1943.

Conservation: McLachlan, 1978.

Account prepared by: G.R. McLachlan, South African Museum. Cape Town.

APPENDIX 1. CHECKLIST OF THE ENDEMIC HERPETOFAUNA OF SOUTH AFRICA

Bill Branch, Port Elizabeth Musuem

The following checklists of the endemic herpetofauna of South Africa (including Lesotho, Swaziland and the Independent States) are based on published records (eg. Branch, 1981; De Waal, 1978, 1980a, 1980b, etc) and unpublished observations (E. Baard and A. de Villiers, Cape Province; N. Jacobsen, Transvaal; O. Bourquin and A. Lambiris, Natal; and W. D. Haacke, Lesotho and Swaziland). Endemic species are here defined as those having more than 90% of their range in the region.

TABLE 1. **Checklist of the endemic amphibians of South Africa**

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
CLASS: AMPHIBIA						
ORDER: ANURA						
FAMILY: ARTHROLEPTIDAE						
SUBFAMILY: ARTHROLEPTINAE						
Arthroleptis wahlbergi			*			
FAMILY: BUFONIDAE						
Bufo amatolica				*		
B. angusticeps				*		
B. gariepensis gariepensis	*	*		*		*
B. gariepensis nubicolus			*			*
B. pardalis			*	*		
B. rangeri	*	*	*	*		
B. vertebralis	*	*		*		
Capensibufo rosei				*		
C. tradouwi				*		
FAMILY: HELEOPHRYNIDAE						
Heleophryne hewitti				*		
H. natalensis	*		*		*	
H. purcelli purcelli				*		
H. purcelli depressa				*		
H. purcelli orientalis				*		
H. regis				*		
H. rosei				*		
FAMILY: HEMISOTIDAE						
Hemisus guttatus	*		*			
FAMILY: HYPEROLIIDAE						
SUBFAMILY: HYPEROLIINAE						
Afrixalus knysnae				*		

TABLE 1. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Hyperolius horstokii				*		
H. marmoratus marmoratus			*			
H. marmoratus verrucosus			*	*		
H. pickersgilli			*			
H. semidiscus +	*		*	*	?	
SUBFAMILY: KASSININAE						
Semnodactylus wealii	*	*	*	*		
SUBFAMILY: LEPTOPELINAE						
Leptopelis natalensis			*			
L. xenodactylus			*			?
FAMILY: MICROHYLIDAE SUBFAMILY: BREVICIPITINAE						
Breviceps acutirostris				*		
B. adspersus pentheri	*	*	*	*		
B. gibbosus				*		
B. macrops +				*		
B. montanus				*		
B. namaquensis				*		
B. rosei				*		
B. sylvestris sylvestris	*					
B. sylvestris taeniatus	*					
B. verrucosus verrucosus	*		*	*		
B. verrucosus maculatus			*			
B. verrucosus tympanifer						
FAMILY: PIPIDAE SUBFAMILY: XENOPODINAE						
Xenopus gilli				*		
FAMILY: RANIDAE SUBFAMILY: PETROPEDETINAE						
Anhydrophryne rattrayi				*		
Arthroleptella hewitti		*	*			?
A. lightfooti				*		
Cacosternum capense				*		
C. namaquense +				*		
C. nanum nanum	*		*	*		
C. nanum parvum	*	*	*	?		

+ Occurs extralimitally

TABLE 1. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Cacosternum poyntoni			*			
Microbatrachella capensis				*		
Natalobatrachus bonebergi			*			
SUBFAMILY: RANINAE						
Rana dracomontana			*			*
R. fuscigula +	*	*	*	*		
R. vertebralis			*	*		*
Strongylopus bonaespei				*		
S. fasciata fasciata	*	*		*		
S. grayii grayii +	*	*	*	*	?	*
S. hymenopus		*	*	?		?
S. springbokensis				*		
S. wageri			*			
Tomopterna delalandii				*		
T. natalensis	*		*			

TABLE 2. **Checklist of the endemic reptiles of South Africa**

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
CLASS: REPTILIA						
ORDER: CHELONII						
SUBORDER: CRYPTODIRA						
FAMILY: TESTUDINIDAE						
SUBFAMILY: TESTUDININAE						
Homopus femoralis	*	*		*		
H. areolatus				*		
H. boulengeri				*		
H. signatus signatus				*		
H. signatus cafer				*		
Chersina angulata +				*		
Psammobates geometricus				*		
P. tentorius tentorius				*		
Kinixys natalensis +	*		*		*	

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
SUBORDER: SERPENTES						
INFRAORDER: SCOLECOPHIDIA						
FAMILY: TYPHLOPIDAE						
SUBFAMILY: TYPHLOPINAE						
Typhlops bibronii +	*	*	*	*	*	*
FAMILY: LEPTOTYPHLOPIDAE						
Leptotyphlops gracilior +				*		
L. conjunctus conjunctus +	*		*	*	*	*
L. distanti	*		*		?	
INFRAORDER: CAENOPHIDIA						
FAMILY: COLUBRIDAE						
SUBFAMILY: BOAEDONTINAE						
Lycodonomorphus laevissimus laevissimus			*	*		
L. laevissimus fitzsimonsi	*		*			
L. laevissimus natalensis			*			
Lamprophis inornatus	*	*	*	*		*
L. guttatus	*	*	*	*	?	*
L. aurora	*	*	*	*	?	*
L. fiskii				*		
L. fuscus	*	*	*	*		?
L. swazicus	*				*	
Duberria lutrix lutrix	*	*	*	*	*	*
SUBFAMILY: 'INCERTA CEDES'						
Amplorhinus multimaculatus +	*		*	*		*
Prosymna sundevallii sundevallii *	*	*		*		*
SUBFAMILY: PSAMMOPHIINAE						
Psammophylax r. rhombeatus +	*	*	*	*	*	*
Psammophis leightoni leightoni				*		
P. crucifer +	*	*	*	*	*	*
SUBFAMILY: ATRACTASPIDINAE						
Macrelaps microlepidotus			*	*		
Amblyodipsas concolor	*		*		*	
A. microphthalma nigra	*					

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Homoroselaps lacteus	*	*	*	*		*
H. dorsalis	*	*	*		*	*
Xenocalamus transvaalensis +	*		*			
X. bicolor australis	*					
SUBFAMILY: COLUBRINAE						
Philothamnus natalensis occidentalis	*	*	*	*	*	
Dasypeltis inornata	*		*	*	*	
FAMILY: ELAPIDAE						
SUBFAMILY: ELAPINAE						
Aspidelaps lubricus lubricus +		*		*		
A. scutatus intermedius	*					
Elapsoidea sundevallii sundevallii	*		*		*	
E. sundevallii media	*	*				
Hemachatus haemachatus +	*	*	*	*	*	*
FAMILY: VIPERIDAE						
SUBFAMILY: VIPERINAE						
Bitis atropos +	*	*	*	*	*	*
B. cornuta albanica				*		
B. inornata				*		
SUBORDER: AMPHISBAENIA						
FAMILY: AMPHISBAENIDAE						
Chirindia langi langi	*					
C. langi occidentalis	*					
SUBORDER: SAURIA						
INFRAORDER: SCINCOMORPHA						
FAMILY: SCINCIDAE						
SUBFAMILY: ACONTIINAE						
Acontias breviceps	*			*		
A. gracilicauda gracilicauda	*	*	*	*		
A. gracilicauda namaquensis				*		
A. lineatus tristis				*		
A. lineatus grayi				*		
A. litoralis				*		
A. meleagris meleagris				*		
A. meleagris orientalis				*		
A. percivali tasmani				*		

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Acontophiops lineatus	*					
Typhlosaurus aurantiacus fitzsimonsi *	*					
T. caecus				*		
T. cregoi cregoi	*					
T. gariepensis +				*		
T. lineatus subtaeniatus	*					
T. lineatus richardi	*					
T. lomii				*		
T. vermis				*		
SUBFAMILY: SCINCINAE						
Scelotes anguina				*		
S. arenicola			*			
S. bidigittatus	*		*			
S. bipes				*		
S. sexlineatus				*		
S. brevipes	*		*		*	
S. caffer				*		
S. gronovii				*		
S. guentheri			*			
S. inornatus inornatus			*			
S. kasneri				*		
S. limpopoensis limpopoensis +	*					
S. limpopoensis albiventris	*					
S. mira	*		*		*	
SUBFAMILY: LYGOSOMATIINAE						
Mabuya homalocephala homalocephala				*		
Mabuya homalocephala peringueyi				*		
M. homalocephala smithii	*	*	*	*		
FAMILY: LACERTIDAE						
Lacerta australis				*		
L. rupicola	*					
Nucras lalandii	*	*	*	*	?	
N. taeniolata taeniolata				*		
N. tessellata livida				*		
Pedioplanis burchelli	*	*	*	*		*
P. laticeps				*		
P. lineoocellata pulchella	*			*		
Tropidosaura cottrelli			*	*		*
T. essexi			*			*
T. gularis				*		

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Tropidosaura montana montana				*	?	
T. montana natalensis			*			
T. montana rangeri			*	*		
FAMILY: CORDYLIDAE						
SUBFAMILY: GERRHOSAURINAE						
Gerrhosaurus typicus				*		
Tetradactylus africanus africanus			*	*	*	
T. africanus fitzsimonsi				*		
T. breyeri	*	*	*			
T. eastwoodae	*					
T. seps seps			*	*		
T. seps laevicauda			*	*	?	
T. tetradactylus tetradactylus		*		*		
T. tetradactylus bilineatus				*		
SUBFAMILY: CORDYLINAE						
Chamaesaura aenea aenea	*	*	*			
C. anguina anguina	*		*	*	*	
C. macrolepis +	*		*		*	
Cordylus cataphractus				*		
C. coeruleopunctatus				*		
C. cordylus		*		*		
C. giganteus	*	*	*			
C. lawrencei				*		
C. macropholis				*		
C. mclachlani				*		
C. minor				*		
C. peersi				*		
C. tasmani				*		
C. vittifer vittifer +	*	*	*		*	
C. warreni warreni	*		*		*	
C. warreni barbertonensis	*		*		*	
C. warreni breyeri	*					
C. warreni depressus	*					
C. warreni laevigatus	*					
C. warreni perkoensis	*					
C. warreni vandami	*					
Platysaurus fitzsimonsi	*					
P. guttatus guttatus +	*					
P. guttatus minor	*					
P. intermedius intermedius	*					
P. intermedius natalensis	*		*		*	
Platysaurus intermedius parvus	*					

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
P. intermedius wilhelmi	*		*		*	
P. relictus	*					
Pseudocordylus capensis capensis				*		
P. capensis robertsi				*		
P. langi			*			?
P. melanotus melanotus	*	*		*		*
P. melanotus subviridis	*	*	*		*	*
P. melanotus transvaalensis	*					
P. microlepidotus microlepidotus				*		
P. microlepidotus fasciatus				*		
P. microlepidotus namaquensis				*		
P. spinosus		*	*			?
INFRAORDER: IGUANIA						
FAMILY: AGAMIDAE						
Agama aculeata distanti	*					?
A. atra atra +	*	*	*	*		*
A. hispida hispida +		*		*		
FAMILY: CHAMAELEONIDAE						
Bradypodion caffrum						
B. damaranum				*		
B. dracomontanum			*			?
B. gutturale				*		
B. karroicum				*		
B. melanocephalum			*			
B. nemorale			*			
B. pumilum				*		
B. setaroi			*			
B. taeniabronchum				*		
B. thamnobates			*			
B. transvaalense	*				?	
B. ventrale ventrale		*		*		
B. ventrale occidentale +				*		
INFRAORDER: GEKKOTA						
FAMILY: GEKKONIDAE						
SUBFAMILY: GEKKONINAE						
Afroedura africana namaquensis				*		
A. amatolica				*		
A. hawequensis				*		
A. karroica karroica				*		
A. karroica halli		*		*		
A. nivaria		*	*			?
A. pondolia pondolia			*			

TABLE 2. (cont)

TAXA	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
Afroedura pondolia haackei	*					
A. pondolia langi	*					
A. pondolia major					*	
A. pondolia marleyi	*		*		* ?	
A. pondolia multiporis	*					
A. tembulica				*		
Homopholis mulleri	*					
Lygodactylus methueni	*					
L. ocellatus	*				*	
Pachydactylus austeni				*		
P. capensis vansoni			*		?	
P. capensis affinis	*				*	
P. labialis				*		
P. geitje				*		
P. maculatus +	*		*	*	* ?	
P. oculatus		*		*		
P. mariquensis mariquensis		*		*		
P. rugosus barnardi				*		
P. rugosus formosus				*		
P. serval purcelli				*		
Phelsuma ocellata +				*		
Phyllodactylus lineatus lineatus +				*		
P. lineatus essexi				*		
P. lineatus rupicolus +				*		
P. microlepidotus				*		
P. peringueyi				*		
P. porphyreus				*		

TABLE 3. **Regional distribution of the endemic herpetofauna in South Africa**

TAXA	TOTAL	TVL	OFS	NATAL	CAPE	SWAZI	LESOTHO
CLASS: REPTILIA							
ORDER: CHELONII	9	2	1	1	8	2	0
ORDER: SQUAMATA							
Suborder: Serpentes	36	27	16	24	24	13	14
Suborder: Amphisbaenia	2	2	0	0	0	0	0
Suborder: Sauria	148	56	20	41	87	16	6
CLASS: AMPHIBIA	61	17	11	28	41	1	5
TOTAL	**256**	**100**	**48**	**94**	**160**	**32**	**25**

APPENDIX 2 SYNOPSIS OF THE TOTAL AND ENDEMIC HERPETOFAUNA OF SOUTH AFRICA

Bill Branch, Port Elizabeth Museum.

TABLE 1: **Synopsis of the total and endemic herpetofauna of South Africa** *

FAMILY	GENERA	SPECIES	TAXA**
CLASS: AMPHIBIA			
ORDER: ANURA			
Arthroleptidae	1 (0)	1 (1)	1 (1)
Bufonidae	3 (1)	12 (7)	13 (9)
Heleophrynidae	1 (1)	5 (5)	7 (7)
Hemisotidae	1 (0)	3 (1)	3 (1)
Hyperoliidae	5 (1)	21 (7)	23 (9)
Microhylidae	3 (0)	13 (9)	16 (12)
Pipidae	1 (0)	3 (1)	4 (1)
Ranidae	12 (3)	36 (18)	38 (21)
Rhacophoridae	1 (0)	1 (0)	1 (0)
Total amphibians	**17 (6)**	**95 (49)**	**106 (61)**
CLASS: REPTILIA			
ORDER: CHELONII			
SUBORDER: CRYPTODIRA			
Testudinidae	5 (1)	11 (7)	15 (9)
Cheloniidae	4 (0)	4 (0)	4 (0)
Dermochelyidae	1 (0)	1 (0)	1 (0)
Emydidae (Introduced)	1 (0)	1 (0)	1 (0)
SUBORDER: PLEURODIRA			
Pelomedusidae	2 (0)	5 (0)	5 (0)
Total chelonians	**13 (1)**	**22 (7)**	**26 (9)**
ORDER: SQUAMATA			
SUBORDER: SERPENTES			
INFRAORDER: SCOLECOPHIDIA			
Typhlopidae	2 (0)	5 (1)	5 (1)
Leptotyphlopidae	1 (0)	8 (2)	9 (3)
INFRAORDER: HENOPHIDIA			
Boidae	1 (0)	1 (0)	1 (0)
INFRAORDER: CAENOPHIDIA			
Colubridae			
Boaedontinae	6 (0)	18 (7)	20 (10)
Psammophiinae	5 (0)	14 (1)	16 (3)
Atractaspidinae	6 (1)	13 (5)	16 (7)
Colubrinae	8 (0)	14 (1)	16 (2)
'Incerta cedes'	3 (1)	7 (1)	8 (2)
Elapidae	6 (1)	13 (1)	17 (5)
Viperidae	2 (0)	10 (2)	11 (3)
Total snakes	**40 (3)**	**103 (21)**	**119 (36)**

* Endemicity includes any species having more than 90% of its range in southern Africa

** Total in South Africa (Number endemic to South Africa); from Branch *et al.*, 1988.

TABLE 1. (cont.)

FAMILY	GENERA	SPECIES	TAXA**
CLASS: REPTILIA (cont)			
SUBORDER: AMPHISBAENIA			
Amphisbaenidae	4 (0)	7 (1)	9 (2)
Total worm lizards	**4 (0)**	**7 (1)**	**9 (2)**
SUBORDER: SAURIA			
INFRAORDER: SCINCOMORPHA			
Scincidae			
Acontiinae	3 (1)	16 (9)	24 (18)
Scincinae	1 (0)	13 (12)	16 (14)
Lygosomatiinae	4 (0)	13 (0)	19 (3)
Lacertidae	7 (1)	23 (9)	28 (14)
Cordylidae			
Gerrhosaurinae	3 (0)	11 (6)	14 (9)
Cordylinae	4 (1)	27 (19)	43 (39)
INFRAORDER: ANGUIOMORPHA			
Varanidae	1 (0)	2 (0)	2 (0)
INFRAORDER: IGUANIA			
Agamidae	1 (0)	5 (0)	7 (3)
Chamaeleonidae	2 (0)	15 (13)	16 (14)
INFRAORDER: GEKKOTA			
Gekkonidae	11 (0)	40 (18)	54 (34)
Total lizards	**37 (3)**	**165 (86)**	**223 (148)**
ORDER: CROCODYLIA			
Crocodylidae	1 (0)	1 (0)	1 (0)
Total crocodiles	**1 (0)**	**1 (0)**	**1 (0)**
Total amphibians	**17 (6)**	**95 (49)**	**106 (61)**
Total reptiles	**98 (7)**	**301 (115)**	**382 (195)**
Total herpetofauna	**115 (13)**	**396 (164)**	**488 (256)**
Endemicity amphibians	**35.29%**	**51.58%**	**57.55%**
Endemicity reptiles	**7.14%**	**38.21%**	**50.79%**
Endemicity herpetofauna	**11.30%**	**41.41%**	**52.46%**

APPENDIX 3. LEGISLATIVE CONTROLS ON REPTILES AND AMPHIBIANS IN SOUTH AFRICA

O. Bourquin, Natal Parks Board.

The control over the utilization of, or actions concerning, herpetofauna in the Republic of South Africa is embodied in an international agreement, Acts of Parliament and Provincial Ordinances. These are summarised below.

CITES

The Republic of South Africa, Lesotho and Swaziland are co-signatories to the Convention of International Trade in Endangered Species (CITES) of wild fauna and flora, signed on 3 March 1973. The import and export of certain species (see Table 1.) requires the authority of exporting and importing countries, and the giving of such authority in South Africa is vested in the Provincial Conservation Departments. The Independent States are not signatories of CITES but the import/export of CITES-listed species between these States and the RSA and other signatory countries must be accompanied by official documents.

PARLIAMENTARY ACTS

The Acts which control some activities concerning herpetofauna are:

The Animal Diseases Act (No. 35 of 1984);
The Sea Fisheries Act (No. 58 of 1973);
The Animal Protection Act (No. 71 of 1962);
The Performing Animals Protection Act (No. 24 of 1935).

Table 2. summarises the actions controlled to one or another degree by these Acts.

PROVINCIAL ORDINANCES

The Provincial Nature Conservation Ordinances all differ in terms of the restrictions, definitions, the permits, licences or other forms of permission required, and of the species involved. To avoid the lengthy detail which would result if all of these differences were detailed, the actions requiring any form of special action/ permission/ authority are simply listed here against the animals involved for each province (Tables 3 and 4). Fuller details must be sought from the relevant ordinances.

In addition, no animals may be released into, removed from, or hunted in a proclaimed game or nature reserve in any province without a permit, and similar restrictions apply to any area controlled by the Department of Environment Affairs or the Government of Kwazulu.

TABLE 1. **South African herpetofauna included in CITES**

GROUP	APPENDIX 1	APPENDIX 2
Land tortoises		
Testudinidae	*Psammobates geometricus*	All other species.
Sea turtles		
Cheloniidae	All species.	
Dermochelyidae	*Dermochelys coriacea*	
Crocodiles		
Crocodylidae	*Crocodylus niloticus*	
Lizards		
Gekkonidae		*Phelsuma ocellata*
Chamaeleonidae		All *Chamaeleo* spp.
		All *Bradypodion* spp.
Cordylidae		All *Cordylus* spp.
		All *Pseudocordylus* spp.
Varanidae		All *Varanus* spp.
Snakes		
Boidae		*Python sebae natalensis*

TABLE 2. Controls over herpetofauna by Parliamentary Acts.

ACT	ACTION				
	HUNT, KILL OR CAPTURE	POSSESS KEEP	CONVEY OR TRANSPORT	IMPORT	EXPORT
Animal Diseases			AH	IH and AH	
Sea Fisheries	IMH	IMH		IMH	IMH
Animal Protection	IH	IH	IH		
Performing Animals		AH, IH, IMH			

AH = Alien herpetofauna IH = Indigenous herpetofauna IMH = Indigenous marine herpetofauna

TABLE 3. Special categories of Herpetofauna in Provincial Ordinances

Protected Indigenous Reptiles (Natal)

All indigenous tortoises	Testudinidae
African rock python	*Python sebae natalensis*
Gaboon adder	*Bitis gabonica gabonica*
Nile crocodile	*Crocodylus niloticus*
Water monitor	*Varanus niloticus*
Rock monitor	*Varanus exanthematicus*

Endangered Wild Animals (Schedule 1, Cape)

Cape platanna	*Xenopus gilli*
Micro frog	*Microbatrachella capensis*
Cape caco	*Cacosternum capense*
Geometric tortoise	*Psammobates geometricus*
Nile crocodile	*Crocodylus niloticus*

Protected Wild Animals (Schedule 2, Cape)

All frogs and toads (Anura), lizards, and chelonians (except those endangered) and all snakes of the genera *Lycodonomorphus, Lamprophis, Lycophidion, Mehelya, Duberria, Dasypeltis, Pseudaspis, Philothamnus, Prosymna* and *Python.*

Table 4. Controls over herpetofauna in Provincial Ordinances.

ACTIONS	ORDINANCES AND ACTS				
	TRANSVAAL Ord. 12 of 1983	NATAL Ord. 15 of 1974	KWAZULU Act 8 of 1975	ORANGE FREE STATE Ord. 8 of 1969	CAPE Ord. 19 of 1974
Hunt, kill, capture	IH and AH	PIR	IH and AH	IH and AH	IH and AH
Possess, keep	IR, AC and Pyxicephalus dspersus	PIR	IH AH (live only)	IH and AC	IH and AH EWA (dead)
Receive	IR, AC and Varanus spp and all snakes (live)	-	IH (dead)	AC	EWA PWA (live)
Purchase	AC and Pyxicephalus adspersus plus all species of reptiles	-	IH AH (live)	IH and AC	EWA PWA (live)
Donate	IR , AC and Pyxicephalus adspersus	-	IR (dead)	IH and AC	EWA and PWA(live)
Sell	IH and AH	-	IH and AH	IH and AC	PWA and EWA (live)
Set Free	AH	-	-	AH	AH
Convey or Transport	IR, AC and Pyxicephalus adspersus	-	IR (dead)	IH and AC	IH and AH
Import	IH and AH	IH and AH	IR (dead)	IH and AH	IH and AH
Export	IH	IH	IR (dead)	IH	IH and AH

AC = Alien chelonians, AH = Alien herpetofauna, EWA = Endangered wild animals, IA = Indigenous amphibians,
IH = Indigenous herpetofauna, IR = Indigenous reptiles, PWA = Protected wild animals, PIR = Protected indigenous reptiles.

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