South African Red Data Book – Terrestrial Mammals

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Cover sketch: Wild dogs, Lycaon pictus, an endangered species.
Drawing by Mrs Clare Abbott

TABLE OF CONTENTS

	Page
Abstract/Samevatting	(iv)
Preface	(v)
Acknowledgements	(vii)
Introduction	1
Terminology	6
The species and their categories	10
Investigations required	12
Systematic list of species and subspecies by category	27
Species included in the South African Red Data Books 1976/1977 now rejected	34
Tabular summary	37
Legislation in force 1985	46
Extinct species	49
Red data sheets: Endangered species	54
Vulnerable species	63
Rare species	101
Species now Out of Danger	162
Indeterminate species	169
Bibliography	192
Index of scientific names	206
Index of English names	209
Index of Afrikaans names	212
Recent titles in this series	215

ABSTRACT

Currently, 243 species of terrestrial wild mammals are known to occur in the Republic of South Africa. Using the well established IUCN definitions, 42 of these may be considered as exposed to some level of threat of extinction. Three species are listed as Endangered, 14 Vulnerable and 25 in the category Rare. In addition there are two species that have become Extinct and one that has become Extinct locally, although still occurring in countries to the north. A further two species are recorded in the category Out of Danger, having previously been listed in one of the three threatened categories. Information on these species is provided under a list 12 headings as a comprehensive summary of their conservation status. Information of a more limited nature is provided for a further 45 species which due to lack of data are listed as Indeterminate. Brief syntheses on various aspects of mammal conservation are provided together with a comprehensive bibliography.

SAMEVATTING

Daar is tans 243 wilde land-soogdierspesies bekend in die Republiek van Suid-Afrika. Volgens die gevestigde IUCN-definisies word 42 tot 'n meerdere of mindere mate bedreig deur uitsterwing. Hiervan word drie spesies as Bedreig aangegee, 14 as Kwesbaar en 25 as Seldsaam. Twee spesies het totaal uitgesterf en een het plaaslik uitgesterf, alhoewel laasgenoemde nog voorkom in lande ten noorde van Suid-Afrika. 'n Verdere twee spesies wat voorheen in een van die drie bedreigde kategorieë aangegee is, val nou in die kategorie Buite Gevaar. Inligting omtrent elk van hierdie 42 spesies word verskaf onder 12 opskrifte as 'n omvattende opsomming van hul bewaringstatus. Beperkte inligting word voorsien vir 'n verdere 45 spesies wat as gevolg van 'n gebrek aan data as Onbepaalbaar aangegee word. Kort sinteses van verskeie aspekte van soogdierbewaring word voorsien asook 'n omvattende bibliografie.

PREFACE

The publication of Red Data Books was the outcome of a decision by the International Union for the Conservation of Nature and Natural Resources made in the early 1960's. This decision was implemented by the publication of the first in the series: The Red Data Book: I Mammals, 1966 which covered the subject on a global basis. The aim of these publications was to present information on endangered, rare or threatened species in such a manner as to assist conservationists to assess their actions in respect of these species.

The concept was extended 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, Pretoria, in the publication of the South African Red Data Book: Small Mammals, Meester (1976) and a similar work on Large Mammals, Skinner, Fairall & Bothma (1977).

The purpose of the NPER is to obtain information on current and future environmental problems in order to conserve and manage ecosystems most effectively. The collation of information on endangered, rare and threatened species of mammals is an integral part of this effort.

To date the NPER has produced eight of these reports in the National Scientific Programmes Report series published by the CSIR: No 7 and 11 in 1976; 14 and 18 in 1977; 23 in 1978; 45 in 1980; 97 in 1984 and 117 in 1986. These cover birds, small mammals, fishes, large mammals, reptiles and amphibians and vascular plants. They must all be considered as provisional for research continues producing new knowledge on the ecology and status of species which often alters the category into which they have been placed. In the mammalian series there remains a long list of species, which, because so little is known about them, it is impossible at this juncture to place in any of the categories. It is hoped that, by drawing attention to this deficiency, attention will be specifically directed to remedying this state of affairs.

The Republic of South Africa can be justly proud of the efforts of its conservation authorities and private citizens to undo the devastating results of mismanagement of its wildlife resources in earlier times. Regrettably these efforts came too late to save the two species which became extinct within historical times: the quagga, Equus quagga, and the blue antelope, Hippotragus leucophaeus, but were timely in saving, among others, the two species of rhinoceros the square-lipped (white), Ceratotherium simum, and the hook-lipped (black), Diceros bicornis, the bontebok, Damaliscus dorcas dorcas, and the Cape mountain zebra, Equus zebra zebra.

It is also heartening to note that, since the publication of the South African Red Data Books in 1976/7, it is possible in this revision to remove from the Endangered category species such as the Cape mountain zebra, Equus zebra zebra, to the lower category of Vulnerable and to be able with some degree of confidence to note that, if present trends continue, it may be possible one day to remove them from the list altogether as has been possible in the case of the cheetah, Acinonyx jubatus.

The credit for these sort of recoveries goes to the conservation authorities in South Africa for applying sound management practices based on research and for establishing nuclei, especially of threatened species, on their holding grounds and when populations had reached satisfactory levels making surplus stock available for translocation to other suitable areas. South African zoos have and are taking an active part in the conservation effort more especially in the direction of captive breeding of threatened species. Spectacular results have been obtained from these programmes as, for example, in the case of the breeding of cheetah, Acinonyx jubatus, but in addition the holding of species in captivity provides the opportunity for research on many other aspects of a species, especially physiology and behaviour.

The individual landowner as well has played an important role in this conservation effort. Whether for purely aesthetic or economic reasons there arose a desire to stock their properties with species of wildlife which had long disappeared from them. This has restored to great areas of their former range species such as the black wildebeest, Connochaetes gnou, and the springbok, Antidorcas marsupialis.

There is, however, no room for complacency for these most laudable efforts are under pressure from a human population explosion and the consequent demand for land to house and feed these growing populations. Against these pressures aesthetic considerations alone are insufficient to ensure the conservation of our wildlife heritage. The most careful balance will have to be maintained between what is hoped may be voluntary control of increasing human populations and the responsibility on the present generation of South Africans to see that a full spectrum of the wildlife of southern Africa remains for future generations to enjoy.

This volume is the first revision of two earlier South African Red Data Books which dealt with Small Mammals, (Meester, 1976) and Larger Mammals (Skinner, Fairall & Bothma, 1977), and now consolidates the two into a single publication. By providing more comprehensive data, gleaned from publications which have appeared since 1976, and experience gained in efforts to conserve species, some of which came near to extinction, it aims to highlight what has been achieved through these efforts and at the same time indicates fields where there remain weaknesses.

The text and references were completed by December 1985 and therefore exclude information which became available after this date.

ACKNOWLEDGEMENTS

Although this book has a single author many people were involved in its preparation. In order to arrive at a consensus of opinion on the categorization of the species for example, a wide range of individuals involved in the wildlife field were consulted, either by circular or verbally. In addition a workshop was held to give some of these individuals the opportunity of meeting round the table and discussing the controversial issues arising from the circulars. I would like to express my keen appreciation for the ready response of these individuals, whose names are mentioned below, to my many enquiries. The information and opinions which they provided were of the greatest assistance to me in the preparation of the final document.

In addition to these names it would be invidious not to pay tribute to the contribution to the knowledge of the species involved by South African and overseas biologists whose names appear in the Bibliography and are so often mentioned in the text.

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I have to thank Miss Ingrid Vis for the typing of the original draft texts, several editions of which had to be prepared for circulation, Mrs Margaret Orton of the CSIR for the final text and Mrs Clare Abbott for the donation of the drawing of the wilddogs reproduced on the cover.

INTRODUCTION

The area covered by this publication is the Republic of South Africa and the Independent States within its borders. Although the Prince Edward Islands, which lie to the south-east of the continent in the Sub-Antarctic are part of the Republic they are irrelevant for purposes of this book as only two introduced, terrestrial mammals occur on them, the house cat, Felis catus, and the house mouse, Mus musculus.

The aim of this publication is to bring up to date and to consolidate in one volume the two former South African Red Data Books: Mammals (Meester 1976) and Skinner, Fairall & Bothma (1977). This revised edition deals only with terrestrial mammals for it is proposed to do a separate book on the marine species.

For this revision it was necessary to review the status of the species included in the former publications as some, through careful conservation and management over the intervening 10 years, have improved in their conservation status to the extent that they can now be moved from the Endangered to the Out of Danger category (cheetah) or at least downgraded (Cape mountain zebra), while other species required a change of category (riverine rabbit) or to be newly recognized as worthy of inclusion. Contact was established with a number of individuals associated with conservation or other types of organizations interested in mammals in each of the four provinces of the Republic and in Bophuthatswana in order to obtain first-hand information on the status and ecology of species in their particular areas.

This information, used in conjunction with that published in the former Red Data Books or gleaned from literature, allowed the preparation of a list placing the species, which it was felt worthy of inclusion, in the various categories of Endangered, Vulnerable, Rare etc as defined in the chapter on TERMINOLOGY.

Several editions of this list were circulated from time to time as new information altered the status of species.

At first these lists were considered on the basis of the species but later issues took cognisance of the subspecies that occur in the Republic. This may seem premature, as the validity of some of these remain in doubt and with others we lack a proper knowledge of their distributional ranges or the areas of intergradation between them. In spite of these weaknesses there are examples, such as the four-toed elephant-shrew, where two subspecies occur in widely separated areas, one in the north-eastern Transvaal, the other in northern KwaZulu. In the former, as they occur in the Kruger National Park, their habitat is well protected whereas in the latter and indeed throughout a wide sector in this part of the Republic their forest habitat is being widely degraded. Meester (1976) noted that in time it would be necessary to consider the relative survival rates of the different subspecies and this sort of example, of which there are others in this work, highlights the necessity of giving attention to the status of subspecies in the future. By listing them now we will at least be recognizing their possible importance and it may also draw attention to cases where a re-evaluation of some of them is overdue.

As far as the former distribution of species is concerned such information as is available to us is found in the writings of pioneers, hunters and settlers from the time of the first European settlement of the Cape in 1652. In the main they recorded only the larger and more spectacular species and, in so far as the small species are concerned, we have no written records to go by. These small species are however, less affected by overexploitation, development and other factors which have led to the larger species disappearing from parts of their former range.

In so far as the larger species are concerned the decline in their distributional range is well established. The historical record is full of records of species such as the square-lipped (white) rhinoceros, showing their wide distribution in the Republic in historical times but they came close to joining the quagga and blue antelope as an extinct species. Vaughan-Kirby, the first game conservator in Zululand, reported that, in 1922, there were only 20 individuals surviving in reserves in Zululand. This may have been an underestimate but the fact remains that numbers had reached a dangerously low level. It is greatly to the credit of Natal Parks Board and a number of persons dedicated to the survival of this species that from the nucleus remaining, through sound conservation and management, numbers increased to the stage when Natal Parks have been able to make stock available to wildlife parks and zoos in southern Africa and overseas. Through these efforts the species is considered to be not only no longer endangered but is not included in any category in the present list.

Except in a very few species such as elephant and some of the larger bovids and equids we are not in a position to discuss numbers. In some species, especially those that are recovering after reaching dangerously low levels such as the Cape mountain zebra, numbers are very important as a measure of the success of conservation efforts and numbers are available.

So far as the protection afforded to species by legislation is concerned all four provinces and Bophuthatswana have ordinances which are from time to time amended to meet new circumstances.

Comment is called for under the heading Protective measures proposed. Meester (1976) felt that this was more properly a function of the National Committee for Environmental Science who should judge on the evidence which he published in the South African Red Data Book: Small Mammals. In only one species, the tree dassie, out of the 49 he dealt with did he make a recommendation under this heading, quoting another author for his suggestion. In this work suggestions are made on ways and means of extending the efforts presently being made by conservation agencies in this direction. These agencies throughout the Republic, armed with a much better knowledge than they had 10 years ago of the ecology of the species concerned and ways of managing them through continuing research programmes, have done and are doing a great service and it is difficult to think of yet other ways in which their efforts might be improved. In many cases stocks are being conserved and surpluses are being made widely available for translocation to suitable safe areas. In some cases such as the tree dassie it is obviously necessary to set aside areas for them. This could perhaps be best achieved by combining this need with the need for more sample areas of the types of forest in which they live or, having set aside these sample

areas, to translocate tree dassies to them, thus serving two conservation needs in one operation. This principle has applications to other species as well.

The African elephant does not properly fit into any of the categories available to us. Skinner, Fairall & Bothma (1977) also found this and indeed placed it in a Special Category. Internationally the species is considered as Endangered and the most gloomy prognostications have been made as to their long-term chances of survival. In the Republic the species in historical times, occurred if not on the Cape Peninsula certainly as an occasional visitor to the Cape Flats and from there widely throughout. Today naturally occurring populations exist only in the Kruger National Park in the Transvaal, the Addo Elephant Park in the Cape Province with a relict population of three in the Knysna Forest. On the other hand the elephant is a resilient species, and given protection, populations soon inrease in numbers and outgrow the carrying capacity of the areas set aside for them. In the Kruger National Park, as indeed in other National Parks and reserves in neighbouring countries in southern Africa, it has become necessary by means of culling to hold populations within these carrying capacities and annually no less than about 1 000 are culled in the Kruger National Park alone. Elephants are only suitable for translocation to the largest reserves and the number of these with suitable habitat is restricted. Already the Pilanesberg Game Reserve in Bophuthatswana and the Hluhluwe Corridor Umfolozi Game Reserve Complex in Natal have had translocated stock introduced. Not being subject to predation to any measurable extent and in an area where they are protected and managed the only factor that could alter the present state of affairs in the Kruger National Park is a major alteration to its status.

As far as the 45 species listed as Indeterminate are concerned all of them are small species for which we have insufficient information to place them in any of the other categories. Their status may well vary from being Rare to Endangered or they may be commoner and more widespread than is presently thought, which only further field studies will show.

Twenty-seven of these are bats which, as an Order, comprise, in numbers of species, no less than about 25% of the terrestrial mammalian fauna of the southern part of Africa. It is only within recent years that this Order has attracted the attention that it certainly deserves and we may expect that in time we will be able to categorize at least some of the species more satisfactorily than at present.

One chapter of this publication highlights certain aspects of the ecology of the species listed which require special attention as our knowledge of them is woefully inadequate. These must not be interpreted as being the only ones worthy of attention for we still have a great deal to learn about most of the mammalian species that occur in the Republic. There are extensive tracts of the country that require basic surveys and we are still uncertain of the taxonomic status of some of the smaller species in particular.

Although we now realize that the riverine rabbit is one of our most endangered species its ecology is unknown and studies are only now being initiated to provide the basic information which is so necessary for its proper conservation and management. Particularly in the case of these

smaller species it is necessary to obtain specimens for study and it is hoped that authorities entrusted with the issuing of permits for the collection of specimens will appreciate that even with species presently listed in the higher categories it is necessary to have this material. The most serious consideration therefore, should be given to requests from recognized scientific bodies for these permits, for without the knowledge that accrues from their studies conservation agencies cannot advise on the conservation and management of species whose future has been entrusted to them. As a corollary no permit for any species, especially of the smaller mammals, should be issued unless the organization involved undertakes that where specimens have to be collected, they are properly processed and full data recorded and that they are deposited in a recognized State or Provincial collection where they will be available for future reference.

THE USE OF RED DATA BOOKS

Although references to Red Data Books do not always appear in published works it was obvious from discussion at the Workshop held in November 1985, at which there were representatives from National Parks, museums and conservation agencies in the four provinces in the Republic, that they were widely used. They were in fact of primary importance in the preparation and revision of ordinances governing the protection and utilization of wildlife in which references to them are inappropriate. In addition they are used in other ways by provincial conservation agencies, by Government Departments involved with agriculture or with water affairs and by their environmental consultants in drawing up recommendations in respect of developments that have major effects on the environment. They are useful in fund raising for research projects, as a guideline for post graduate students in projects for higher degrees and as a pointer to the need for further taxonomic and ecological research for professional officers in museums and other organizations. They are a useful measure of the success of conservation efforts directed at species whose numbers may have reached a low ebb in providing dated information against which to judge the rehabilitation of these species.

As a development of the information contained in Red Data Books there is a need for public education which can probably best be met by the publication of semipopular booklets dealing with the species which are listed in these books, well illustrated and written in simple language. The success attending these sort of semipopular publications made available by organizations such as National Parks is a measure of their popularity and value.

An important factor that has been made wide use of in the Republic in rehabilitating species is their translocation to suitable areas within their former range where they no longer occur. Where surplus stocks have been made available, the private landowner has played an important part in this process. Papers have been published on the introduction or reintroduction of some species but there is a need for the whole spectrum of translocation in the Republic to be reviewed and published. This would be a most interesting document and would do much to enhance South Africa's image internationally as a leading country in the field of conservation.

In the process of translocation, the greatest care must be taken by organizations and individuals involved to avoid the unfortunate situation seen

today where bontebok and blesbok have been permitted to hybridize by the translocation of the former species out of its known former range into that of the latter.

In this publication attention has been directed to the necessity of investigating certain aspects of the ecology of the species listed. It is important that this should not be interpreted as all that has to be learnt about our mammals for indeed there is not one species among the 243 terrestrial mammals that occur in the Republic where a diligent worker or a keen observer could not add to our existing knowledge.

In making reference to species listed in this work it is meaningless to state that they appear on the "South African red data list" or are "a red data species" if the category in which they are listed is not quoted. In this respect only those species included in the category Extinct, Endangered, Vulnerable or Rare should be referred to as red data species where a collective description is necessary.

TERMINOLOGY

The order in which the data sheets are presented in the text follows that used by Swanepoel, Smithers & Rautenbach (1980) in so far as the Orders and Families are concerned.

As a heading to each data sheet the English colloquial name is used, followed by its conservation status at the date of this publication as defined by the International Union for the Conservation of Nature and Natural Resources (IUCN, 1978) under the categories of Extinct, Endangered, Vulnerable, Rare, Out of Danger or Indeterminate, with such modifications of definition as are appropriate to the consideration of a limited area as opposed to the whole world. For clarification these definitions are as follows:

EXTINCT: Taxa which are known to have become extinct since the arrival of the first settlers to the Cape in 1652 and for which, therefore, there is an historical record.

ENDANGERED: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose habitat has been so drastically diminished in size and/or degraded that they are deemed to be in danger of extinction.

VULNERABLE: Taxa which it is believed are likely to move into the endangered category if the causal factors continue operating. Included are taxa of which all or most populations are decreasing because of overexploitation; extensive destruction or degradation of their habitat or other environmental disturbances; taxa with populations which have been seriously depleted and whose ultimate security is not yet assured and taxa with populations which are still sizeable but which are under threat from serious adverse factors throughout their range.

RARE: Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a somewhat more extensive range.

OUT OF DANGER: Taxa formerly included in one of the above categories in the South African Red Data Books: Mammals and which are now considered to be relatively secure because effective conservation measures have been taken; the previous threat to their survival has been removed or which for other reasons it is inappropriate to retain their names in any category in this revision.

INDETERMINATE: Taxa which might be worthy of inclusion in any of the above categories but for which insufficient information is currently available on which to judge their status.

Note: In practice Endangered and Vulnerable categories may include, temporarily, taxa whose populations are beginning to recover as a result of conservation measures but not yet to the extent that would justify their transfer to another category.

Following a note of the category into which it is proposed to place the taxa, the Afrikaans colloquial name is given followed by the scientific name with the name of the author and the date of the original description; the full reference to this description; the locality from which the original specimen was taken and the Order and Family to which the species belongs.

As colloquial names may vary regionally the name chosen is the one felt to be most appropriate and generally acceptable and is the one used in Smithers (1983) where reasons are given for its choice. In some cases, where alternative names are well entrenched, they are mentioned.

Other information on the species is organized under a set of twelve recurrent headings as follows:

Present distribution

This is the distribution of naturally occurring populations of the species concerned and takes no cognisance of introductions or reintroductions, a process which has been proceeding at an accelerating rate over many years and has been such an important factor in ensuring the continuing existence of many species. A short dissertation in the text is accompanied by a map drawn up on the basis of material records in the case of the smaller species or well authenticated visual records in the case of the larger and more easily identifiable species. These maps show the areas within the Republic of South Africa where the species may be expected to be found where suitable habitat is available within the demarcated area.

Former distribution

Only the larger and more conspicuous species are mentioned in the historical record and even among these it is sometimes difficult or impossible to decide on the species concerned. Sufficient information is available, nevertheless, to highlight the appalling reduction in range suffered by some species through factors such as overexploitation, habitat destruction or degradation brought about by man. A good illustration of this is the hook-lipped or black rhinoceros which at one time had a wide distribution throughout the Republic but which was only just saved from extinction by the proclamation of the Hluhluwe and Umfolozi Game Reserves in Natal at the end of the 19th century. Numbers of the square-lipped or white rhinoceros in the early 1920's had reached a dangerously low level and again were only saved by the efforts of dedicated conservationists and conservation authorities. It is to the credit of these authorities that today the future of species such as the square-lipped rhinoceros and the bontebok are assured and through careful management it seems likely that others such as the Cape mountain zebra are reaching the stage when they can be downgraded in their conservation status or perhaps eventually relegated to the Out of Danger category. See du Plessis (1969) and Skead (1980) for historical references.

Habitat

A brief description is given of the type of habitat in which the species occurs and any special requirements that they may have in so far as this aspect of their ecology is concerned.

Habits

Of necessity the information provided under this heading is only an outline of what is known. Special attention is directed to the times of activity of the species, whether noctural or diurnal, their social organization and feeding habits.

Breeding in the wild

This section provides information on the reproductive potential of the species in its natural habitat with notes on the gestation period, number of young at a birth, the time of the year at which the young are born and where the females have their young.

Breeding potential in captivity

Captivity in this context refers to the containment of the species in zoological gardens and not in game parks and reserves where such information as is available is reported under "Remarks". The statement on their breeding potential under these circumstances is a consensus of opinion drawn up by the author after discussion with the directors and other staff members of zoological gardens in the Republic and information published in the International Zoo Year Book (1982-84).

Reasons for decline

This section deals briefly with the factors known or suspected to be involved in the decrease whether in numbers or in the distributional range of the species. Especially in so far as the smaller species are concerned very little direct evidence is available and the assessment is made on the basis of their known vulnerability to predation, the fact that they are made use of as food by indigenous peoples or that their habitat is known or suspected to be being degraded or destroyed by various causes.

Numbers in captivity

Most of the information provided as far as the medium sized to large species are concerned is taken from zoological garden stock sheets or from discussions with directors or staff members of these organizations in the Republic. On an international basis these are in some cases augmented by a statement drawn up on information published in the International Zoo Year Book (1982-84).

Few of the smaller species are kept in captivity except by the South African Institute for Medical Research or by universities and allied organizations who may retain specimens in captivity during the course of special investigations.

Protective measures in operation

This section gives the legal status of the species concerned as reflected in ordinances in operation in the various provinces of the Republic of South Africa. The occurrence of a species in a reserve or National Park is mentioned as an important factor in their conservation.

Protective measures proposed

This covers suggestions for the strengthening of measures presently in operation or the encouragement of those presently being followed and which are proving beneficial to the conservation of the species concerned.

Current research

This lists investigations in train on the species mentioned with the name of the researcher and the organization under which the work is being undertaken. Apart from the references listed in the text attention is drawn to papers already published which deal specifically with the species under which the entry is made.

Remarks

This section provides for the inclusion of any matter of general interest including notes on the distribution of the species outside the borders of the Republic, the numbers of a species presently held in reserves and National Parks in the Republic and observations that might have a bearing on the conservation of the species concerned.

References

Throughout the text reference is made to works of particular interest, in so far as the species being dealt with is concerned, by the name of the author and date of publication. Full reference to these will be found in the Bibliography. The original reference to the description of the species and subspecies is provided, together with a note of the type locality. Other purely taxonomic references are not included in the BIBLIOGRAPHY.

THE SPECIES AND THEIR CATEGORIES

Of the 92 species included in this Red Data Book the breakdown between the various categories, as they are defined in the section TERMINOLOGY, is given in the following list.

The category into which the various species were placed in the former Red Data Books, Meester (1976) and Skinner, Fairall & Bothma (1977) is indicated by the placing of the capital letters before the colloquial name: E Endangered; V Vulnerable; R Rare; O Out of Danger; I Indeterminate; SC Special Case; ND Not Designated; and - Not Included.

Two species have become EXTINCT within historical times:

Quagga

Blue antelope

One species is EXTINCT IN SOUTH AFRICA although it still occurs extra-limitally:

Lichtenstein's hartebeest

Three species are considered to be ENDANGERED:

R Riverine rabbit
E Wild dog
E Roan antelope

Fourteen species are considered to be VULNERABLE:

R Giant golden mole
\- Rough-haired golden mole
R Tonga red squirrel
R Ngoye red squirrel
\- White-tailed mouse
R Honey badger
\- African wild cat
R Pangolin
ND Antbear
E Cape mountain zebra
E Hook-lipped rhinoceros
V Oribi
R Sable antelope
E Suni

Twenty-five species are considered as RARE:

R South African hedgehog
R Yellow golden mole
R Grant's golden mole
ND Four-toed elephant-shrew
R Samango monkey
R Namaqua dune molerat
R Woosnam's desert rat
R Giant rat
R Spectacled dormouse
R African striped weasel
R African civet
R Meller's mongoose
\- Selous' mongoose
R Aardwolf
R Brown hyaena
R Serval
\- Small spotted cat
R Leopard
R Tree dassie
SC Hippopotamus
R Bontebok
R Tsessebe
R Blue duiker
R Red duiker
R Sharpe's grysbok

Two species are now considered to be OUT OF DANGER:

E Cheetah

SC African elephant

Forty-five species, are so inadequately known that they must be relegated to the INDETERMINATE category:

- Long-tailed forest shrew
R Maquassie musk shrew
- Greater dwarf shrew
- Least dwarf shrew
R Van Zyl's golden mole
R De Winton's golden mole
R Visagie's golden mole
- Duthie's golden mole
- Sclater's golden mole
- Gunning's golden mole
- Zulu golden mole
R Juliana's golden mole
R Egyptian tomb bat
R Large-eared free-tailed bat
- Natal free-tailed bat
- Madagascar free-tailed bat
R Transvaal free-tailed bat
- Ansorge's free-tailed bat
R Midas free-tailed bat
R Welwitsch's hairy bat
R Angola hairy bat
R Lesueur's hairy bat
- Rufous hairy bat
- Rüppell's bat
- Kuhl's bat
- Rusty bat
R Butterfly bat
- De Winton's long-eared bat
- Botswana long-eared bat
R Aloe serotine bat
R Damara woolly bat
R Lesser woolly bat
- Wood's slit-faced bat
- Lander's horseshoe bat
- Peak-saddle horseshoe bat
- Dent's horseshoe bat
- Swinny's horseshoe bat
- Short-eared trident bat
- Commerson's leaf-nosed bat
- Tiny fat mouse
- Nyika climbing mouse
- Pygmy rock mouse
R Water rat
R Mozambique woodland mouse
- Grant's rock mouse

INVESTIGATIONS REQUIRED

This chapter is designed to focus attention on aspects of the species listed as Endangered, Vulnerable and Rare that warrant investigation. To this end the taxonomic status and five facets of the ecology of each species is set out in tabular form following the name and categorization of the species. Where information on any of these is meagre or, as it is in some cases, nonexistent and where special efforts should be made to remedy this a cross + is placed in the box below the heading.

In the case of the riverine rabbit, for example, while its taxonomic status has been investigated in detail (Robinson, 1980, 1981a,c; Robinson & Skinner, 1983) nothing is known about the five facets of its ecology listed and therefore a + appears below each of the headings. In some cases our knowledge of the species is so fragmentary that a complete survey of all the aspects tabulated is required. In others we have some knowledge of some of these aspects but a lack in the case of others which warrant special attention.

By dealing with this list of species individually the opportunity is afforded of drawing attention to particular issues of importance in the conservation of some species.

In some cases research projects are already in train and reference to these projects will be found under Current Research on the Red Data Sheets.

As far as the species listed as Indeterminate are concerned the very fact that they are so included shows that their ecology is to all intents and purposes unknown and furthermore in some cases their taxonomic status is uncertain. In many cases they are very uncommonly encountered and are so poorly represented in collections that taxonomic studies using morphometrics are presently impossible and ecological studies in the field made very difficult.

RIVERINE RABBIT **ENDANGERED**
Bunolagus monticularis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

The taxonomic status of the three genera of Lagomorpha which occur in the Republic, Lepus; Pronolagus and Bunolagus was investigated by Robinson (1981a) using univariate and multivariate analysis, morphometric analysis, karyology, sperm morphology and electrophoretic analysis of serum proteins and red blood cell enzymes, which did much to clarify the relationships of the species of these genera. It established Bunolagus monticularis, the riverine rabbit, as clearly being a rabbit as opposed to a species of the genus Lepus, the hares.

The species appears to occur in two discrete areas in the Karoo but this might be an artefact of its being overlooked by collectors in the intermediate zone or that it has become extinct in this sector.

Except for the fact that they occur in the scrub vegetation fringing dry watercourses, are nocturnal and generally solitary, nothing is known of their ecology. Locals suggest that the species has its young in holes and that they are altricial at birth, the young being born blind and naked, both features of rabbits.

WILD DOG **ENDANGERED**
Lycaon pictus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
					+

Attempts have been made on a continental basis to relate colour pattern to geographical areas and to create subspecies to accommodate these (Matschie, 1915). Neither Honaki, Kinman & Koeppl (1982) nor Meester (in prep.), however, recognize subspecies. In the Republic there is a tendency for the Kruger National Park populations to have more white on their bodies than those seen in central Mozambique, western Zimbabwe or Botswana.

Their distribution in the Republic is today so restricted that further investigation except for reporting the occurrence of vagrants seems fruitless.

While there is only meagre evidence of the times of the birth of young in the Republic the species has been intensively studied in East Africa and a great deal is known about its ecology (Kruuk 1972; Schaller 1972). Both of these publications have extensive bibliographies, including reference to this species. Pienaar (1969) showed that impala, Aepyceros melampus, were the most common prey species in the Kruger National Park; Smithers (1983) showed springbok, Antidorcas marsupialis, were most common in Botswana.

ROAN ANTELOPE **ENDANGERED**
Hippotragus equinus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+		+	

Originally described from Litakun (Kuruman) Cape Province the species is now extinct in this area and no topotypical material exists in the Republic which could be used in a reassessment of the subspecies. The subspecies Hippotragus equinus cottoni is recorded as occurring in the extreme north-eastern parts of Namibia and four others are listed from Sub-Saharan Africa.

The distribution of the species is today too restricted in the Republic to make it worthy of further investigation. Joubert (1970, 1973, 1976a,b) studied the species in the Kruger National Park and we have, therefore, a good knowledge of their ecology. As they are especially sensitive to habitat change, a further knowledge of their requirements would be useful.

GIANT GOLDEN MOLE **VULNERABLE**
Chrysospalax trevelyani

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

The restricted distribution of the species suggests that within such a relatively small area it is unlikely that subspecies would be found. There is a suggestion that they no longer occur in the eastern parts of their former range but this and the possibility of their occurrence in other adjacent areas seems worthy of investigation and there are the other facets of their life history about which we have little information.

ROUGH-HAIRED GOLDEN MOLE **VULNERABLE**
Chrysospalax villosus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+	+	+	+	+	+

Considering the somewhat limited distribution of this species it seems that too many (six) subspecies have been described and their validity should be checked. There is the difficulty as stated by G. Hickman (in litt.) that although he and his colleague (A.C. Duckworth) of the University of Natal, Pietermaritzburg, are engaged in work on golden moles in general they have only seen one specimen of this species in 10 years. Whether this is an artefact of the difficulty of collecting specimens of these subterranean

mammals is not known but certainly with other species this is the case. Practically nothing is known about the ecology of this species except odd notes by Roberts (1951).

TONGA RED SQUIRREL, Paraxerus palliatus tongensis **VULNERABLE**
NGOYE RED SQUIRREL, P. p. ornatus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+	+				

These two subspecies of the red squirrel, Paraxerus palliatus are considered together. Apart from the extralimital nominate form from Mossimboa, coastal Mozambique at 11°S, four other subspecies have been described from south-eastern Africa and authors are not unanimous on the validity of some and the relationships of others and the subspecies require revision. This should more clearly reveal the distribution of the various subspecies which are eventually recognized.

WHITE-TAILED MOUSE **VULNERABLE**
Mystromys albicaudatus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

While the taxonomic status of this species has not been questioned it has a wide range and appears at the moment to occur in two discrete areas which suggests that there is the possibility of more than just the nominate subspecies being present. This break in distribution should be investigated and further information obtained as to its status in the fynbos area where the renosterbos and heath associations have been degraded by agriculture. Does it survive in agricultural lands under these conditions? The same question might be directed to its grassland habitat in the east which is also subject to degradation by agricultural practices and to encroachment by the karoo associations (Acocks, 1975). These are pertinent in the light of Dean's (1978) remarks that in the eastern parts of its range the species is in need of conservation. We have very little information on breeding in the wild and further information on habits and food would be useful.

HONEY BADGER **VULNERABLE**
Mellivora capensis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Smithers (1983) reviewed the information available on the ecology of this

species and while a fair amount is known about most of the aspects of its life history there is a paucity of information on reproduction. They are widely blamed for their depredations on small domestic stock and for the damage they do in apiaries.

AFRICAN WILD CAT **VULNERABLE**
Felis lybica

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+					+

While we have a fair amount of information on the ecology of this species it is included for the somewhat unusual reason that it is subject to hybridization with domestic cats and pure strain Felis lybica is not today found around settlements where there are domestic cats. It seems inevitable that this process, albeit slow, will continue to the eventual elimination of F. lybica in southern Africa.

The characters that mark F. lybica and the domestic strains are fairly obvious and a watch should be maintained for hybridization and efforts made in some of the larger conservation areas to prevent this taking place. In Natal the staff members of parks and reserves may keep cats only if they have been rendered sterile.

PANGOLIN **VULNERABLE**
Manis temminckii

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Except in the northern and north-western Transvaal, from whence there are numerous records, records of the species in the Republic are few and far between and therefore sightings of the species, which is unmistakable among African mammals, should be brought to the notice of conservation authorities. Information is needed on the other facets of its life history as noted in the table. There is a need to know their susceptibility to certain organic insecticides.

ANTBEAR **VULNERABLE**
Orycteropus afer

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+		+		+

Our knowledge of the time of year in which the young are born and

circumstances attending births is based on very slender evidence and there is a need to add to this. Other aspects of the ecology of the species are reasonably well known but could be expanded, home range, for example is poorly known.

CAPE MOUNTAIN ZEBRA **VULNERABLE**
Equus zebra zebra

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+			

Through the work of Penzhorn (1975, 1979, 1984, 1985) and Grobler (1983) a great deal is known about the ecology of this species and following the early census of Millar (1970) numbers have been estimated from time to time in various areas. With the translocations in train to the Karoo National Park, Beaufort West and private properties the monitoring of these populations will be important as with continuing rise in overall numbers the species can in time qualify for the Out of Danger category. Their habitat requirements following translocations, especially to areas outside their former range, would be worth investigation.

HOOK-LIPPED RHINOCEROS **VULNERABLE**
Diceros bicornis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+		+			

The nominate form, Diceros bicornis bicornis, was described from a specimen from the "Cape of Good Hope" where it is now extinct, D. b. minor having its type locality fixed by Zukowsky as "Zululand". Five other subspecies have been described from Sub-Saharan Africa. The validity of the subspecies will now be impossible to check owing to the lack of material, as only D. b. minor now occurs in numbers and seems the only one likely to survive in the future. Their habitat requirements following translocations might be profitable to monitor.

Information is available on the ecology of the species in Zululand (Hitchins, 1967, 1968b, 1969, 1970, 1972, 1975).

ORIBI **VULNERABLE**
Ourebia ourebi

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+	+	+	+

The distribution of oribi in the Republic, as it is further north in Africa, is discontinuous and, outside the eastern Cape Province, where a survey has been carried out (Bezuidenhout & Long, 1985), a watch should be kept on these islands of occurrence as the species is sensitive to habitat change.

In the Transvaal, P.C. Viljoen (1975, 1977, 1982) studied their ecology. In Natal, Oliver, Short & Hanks (1978) covered aspects of their population ecology, Rowe-Rowe (1983) their ecology in the Giants Castle Game reserve and habitat preferences and coexistence with other antelope species (Rowe-Rowe, 1983) and Howard & Marchant (1984) their status and distribution on private land and population trends over the last 10 years.

SABLE ANTELOPE **VULNERABLE**
Hippotragus niger

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+			

Sable have attracted the attention of workers and there is a considerable volume of information available on their ecology. As sable are restricted in distribution in the Republic much of this work has been done in adjacent countries (Botswana: Child, 1968; Zimbabwe: Child & Wilson 1964a; Grobler, 1974, 1979, 1980a,b, 1981a,b). In the Republic they have been the subject of study by Joubert (1974); Wilson, Bartsch, Bigalke & Thomas (1974); D.E. Wilson, (1975); and Wilson & Hirst (1977).

Where they have been translocated to areas outside their former range their habitat preferences should be monitored.

Their social organization was studied in East Africa by Estes & Estes (1970).

SUNI **VULNERABLE**
Neotragus moschatus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+		+	+	+	+

The taxonomic status of the populations in the northern parts of the Kruger National Park warrant evaluation as they may represent a southern extension of Neotragus moschatus livingstonianus rather than the N. m. zuluensis of north-eastern Natal. Heinichen (1972) provided information on some aspects of the ecology of this species and Howard & Marchant (1984) on their status and distribution. A detailed study has just been completed (November 1984) by D. Lawson of the University of Natal, Pietermaritzburg.

SOUTH AFRICAN HEDGEHOG **RARE**
Atelerix frontalis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

No single study directed solely at the ecology of this species has so far been undertaken although one has recently been launched on the physiology of the species by Miss W. van der Colf of the Mammal Research Institute, University of Pretoria.

The species occurs in two discrete areas, one in the Republic and the other in Namibia and Angola but whether this is an artefact of the species being overlooked by collectors or is indeed real, remains to be confirmed. Such information as is presently available is in the form of scattered observations and there is a need for a detailed field study of the species. See Rowe-Rowe (1974) and Smithers (1983).

YELLOW GOLDEN MOLE **RARE**
Calcochloris obtusirostris

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

This species has a marginal distribution in South Africa in the south-eastern lowveld of the Transvaal and northern KwaZulu where it occurs in sandy alluvium and in dry sandy riverbeds. Little is known about its ecology and there is no information on its reproduction.

GRANT'S GOLDEN MOLE **RARE**
Eremitalpa granti

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

This species occurs in a narrow coastal belt in the south-western Cape Province from St Helena Bay north to the Orange River, in sand dunes. Holm (1969) showed that they were strictly nocturnal and foraged up to distances of 5 800 m. Their food consists of beetle larvae, crickets, termites, moths, spiders and the web-footed gecko, Palmatogecko rangei.

FOUR-TOED ELEPHANT-SHREW **RARE**
Petrodromus tetradactylus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Most of the information available on this species is drawn from observations made in other parts of Africa (Ansell & Ansell, 1969, Zambia) and the ecology of the species warrants study in the two areas of the Republic in which it occurs. The only published information on reproduction originated from work in Zambia, Ansell and Ansell (1969).

SAMANGO MONKEY **RARE**
Cercopithecus mitis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+	+	+	+	+	+

Scorer (1980) studied the feeding ecology and socio-biology of the species in the Republic, and in Zululand, Van der Zee & Skinner (1977) the feeding behaviour. At the western extreme of their distributional range in the Cape Province there appears to have been a shrinkage in their occurrence which warrants investigation of their present occurrence in this sector. Further information is required on all aspects of their ecology and a project is now in train by M. Laws at the University of Natal, Pietermaritzburg.

NAMAQUA DUNE MOLERAT **RARE**
Bathyergus janetta

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

While the taxonomic status of this species is well established and no subspecies recognized (Meester, in prep.), very little is known about any aspect of its ecology which warrants investigation.

WOOSNAM'S DESERT RAT **RARE**
Zelotomys woosnami

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

While Smithers (1971) and Birkenstock & Nel (1977) contributed to the knowledge of the ecology of this species much remains to be learned and the species is worthy of a full-scale investigation. There are suggestions that they are to some extent carnivorous and that they use the burrows of other gerbils, which require confirmation. While their reproduction in captivity has been studied (Birkenstock & Nel, 1977) little is known about their reproduction in the field.

GIANT RAT **RARE**
Cricetomys gambianus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
					+

Knight (1984) investigated the burrow system, food and foraging distances, home range, growth, digestion and thermoregulation in individuals taken in the northern Transvaal. There remains a paucity of information on the times of breeding in the wild.

SPECTACLED DORMOUSE **RARE**
Graphiurus ocularis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Channing (1984) studied the ecology of the species in the Cedarberg Wilderness area, Cape Province, and provided information on its habitat requirements, habits, food and reproduction. He noted the desirability of repeating this type of work in other parts of the species' range. J. Breytenbach (in litt.) is studying this species among others in relation to a fire regime in the Swartberg near George, Cape Province.

AFRICAN STRIPED WEASEL **RARE**
Poecilogale albinucha

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
+	+	+		+	

Four subspecies are listed from the Republic. Predominently based on variation in the black and white colour pattern on the body, their validity requires reassessment. Rowe-Rowe (1975, 1978a,b,c) studied the species in Natal but apart from this work there is a paucity of records of the species outside Natal and a need for more information on their ecology.

D.T. Rowe-Rowe (in litt.) suggests that an investigation of their habitat requirements in relation to the changes taking place in the grasslands in southern Africa would be interesting.

AFRICAN CIVET **RARE**
Civettictis civetta

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+		+	+	+

Randall (1977) studied the ecology of the species and he and Smithers & Wilson (1979) dealt with food and feeding habits. There still remains opportunities for the study of their habitat requirements, food and feeding habits in areas not already covered and in reproduction where the records of the time of birth of the young in the field are sparse.

MELLER'S MONGOOSE **RARE**
Rhynchogale melleri

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Throughout its range in the eastern parts of the continent from the Transvaal to Tanzania the distribution of the species is discontinuous, and everywhere it is considered as uncommon. Very little is on record concerning the ecology of this species which feeds predominantly on termites.

SELOUS' MONGOOSE **RARE**
Paracynictis selousi

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Most of the information regarding this species comes from observations in the extralimital parts of its range in Zimbabwe and Botswana and it is worthy of investigation within its limited range in the Republic.

AARDWOLF **RARE**
Proteles cristatus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+				

Numbers appear to be on the increase in the south-western Cape Province the reasons for which are not understood and could profitably be investigated. The effect of termite control, by various means, especially those involving pesticides, on the aardwolf should be investigated.

A number of aspects of the ecology of this species have recently been investigated. This has greatly increased our knowledge of this species and its life history (see Richardson, 1985).

BROWN HYAENA **RARE**
Hyaena brunnea

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+			+	

The ecology of this species is fairly well known as it has been intensively studied by the workers listed under Current Research on the Red Data sheet. Confirmation of their status in the extreme north-western parts of the Cape Province is required, where they have been reported from the Richtersveld.

Further information is required on their relationship to domestic stock especially in the northern Cape Province where they are widely blamed for stock raiding.

SERVAL **RARE**
Felis serval

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Much of the information relating to the ecology of this species originates from work in Zimbabwe and it would be worthwile extending this to within the borders of the Republic. Attention should be directed to their food preferences as they are still accused of killing antelope and small stock which is not found to be the case further north. Information on reproduction is required from this part of their range as well. An investigation is required into their distribution in the southern part of the Cape Province, and their sensitivity to changes in their habitat.

SMALL SPOTTED CAT **RARE**
Felis nigripes

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

Very little is known about the ecology of this species and an intensive study is overdue.

LEOPARD **RARE**
Panthera pardus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+		+	

There is a need for further information on population densities and home ranges in various parts of their distributional range and their relationship to domestic stock under different environmental conditions. Further information on how they manage to survive in intensively farmed areas would be useful.

TREE DASSIE **RARE**
Dendrohyrax arboreus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

So little has been published on the ecology of this species that an investigation of all aspects is required. Being noctural they will not be so easy to study as the other dassies. Their reported occurrence in the eastern Transvaal and on the Limpopo River in the north-east should be investigated.

HIPPOPOTAMUS **RARE**
Hippopotamus amphibius

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+				

At one time widely distributed throughout the Republic where there was suitable aquatic habitat. Their occurrence is today marginal in the north-east and eastern parts of the country. In parts the numbers

occurring are known but some of the information is out of date and it would be interesting to know the numbers present and their location outside National Parks and reserves, particularly in the Transvaal.

BONTEBOK **RARE**
Damaliscus dorcas

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+				

The ecology of this species is reasonably well known through the work of David (1970, 1973) and aspects of their reproduction have been studied by Skinner, Dott, de Vos & Millar (1980). One of the most urgent problems for the conservation authorities is to stop the bontebok/blesbok contact that is leading to hybridization of these two subspecies on a growing scale. An investigation of their habitat, habits and food in areas to which they have been translocated, which lie outside of their former range, might be interesting.

TSESSEBE **RARE**
Damaliscus lunatus

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+	+	+	

Considerable success has attended the efforts to conserve tsessebe in the Transvaal with the result that increasing numbers will become available for translocation in the future. We need as full a knowledge as possible of their food, reproduction and habitat requirements under conditions ruling in the Transvaal so that translocations can be carried out with success.

Joubert (1972, 1974) provided useful information on various aspects of their ecology in the Kruger National Park where the status of the populations are monitored from time to time.

BLUE DUIKER **RARE**
Philantomba monticola

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+		+	+	+

The habitat of this species is being or has been fragmented and it would be interesting to have a fuller knowledge of their present distribution which probably should appear as being discontinuous and not continuous as shown.

The nature of the habitat renders observation of the species difficult and there is a need for fuller information on this aspect of their ecology as well as on reproduction.

In Natal Howard & Marchant (1984) provide information on their distribution, status and populations on privately owned land.

RED DUIKER **RARE**
Cephalophus natalensis

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
	+	+	+	+	+

While Heinichen (1972) published information particularly on the habits and food of this species a comprehensive investigation of its ecology is overdue and is being undertaken by A. Bowland of the University of Natal, Pietermaritzburg, in 1985. Howard & Marchant (1984) provide information on their status and distribution on privately owned land.

The species is not common anywhere in its range in southern Africa and the nominate form, Cephalophus natalensis natalensis, originally described from Durban, Natal apparently no longer occurs near the type locality and may be extinct.

SHARPE'S GRYSBOK **RARE**
Raphicerus sharpei

Taxonomy	Distribution	Habitat	Habits	Food	Reproduction
		+	+	+	+

Wilson (1975) provided information on habitat, and Smithers & Wilson (1979) on reproduction but these papers dealt with the species in Zimbabwe. An investigation of the ecology of this species in its limited range in the Republic is needed.

SYSTEMATIC LIST OF SPECIES AND SUBSPECIES BY CATEGORY

Category in 1976/7 Red Data Books: Abbreviations. E. Endangered, V. Vulnerable, R. Rare, O. Out of Danger, I. Indeterminate, ND. Not Designated, SC. Special Case, - Not Included.

ENDANGERED (E)

Category 1976/7

Order Lagomorpha

Family Leporidae

R Riverine rabbit, Bunolagus monticularis

Order Carnivora

Family Canidae

E Wild dog, Lycaon pictus

Order Artiodactyla

Family Bovidae

E Roan antelope, Hippotragus equinus equinus

VULNERABLE (V)

Order Insectivora

Family Chrysochloridae

R Giant golden mole, Chrysospalax trevelyani
\- Rough-haired golden mole, Chrysospalax villosus villosus
Chrysospalax villosus transvaalensis
Chrysospalax villosus leschae
Chrysospalax villosus dobsoni
Chrysospalax villosus rufopallidus
Chrysospalax villosus rufus

Order Rodentia

Family Sciuridae

R Tonga red squirrel, Paraxerus palliatus tongensis
R Ngoye red squirrel, Paraxerus palliatus ornatus

Family Cricetidae

\- White-tailed mouse, Mystromys albicaudatus

Order Carnivora

Family Mustelidae

R Honey badger, Mellivora capensis capensis

Family Felidae

\- African wild cat, Felis lybica cafra
Felis lybica griselda

Order Pholidota

Family Manidae

R Pangolin, Manis temminckii

Order Tubulidentata

Family Orycteropodidae

ND Antbear, Orycteropus afer afer

Order Perissodactyla

Family Equidae

E Cape mountain zebra, Equus zebra zebra

Family Rhinocerotidae

E Hook-lipped rhinoceros, Diceros bicornis minor

Order Artiodactyla

Family Bovidae

V Oribi, Ourebia ourebi ourebi

R Sable antelope, Hippotragus niger niger

E Suni, Neotragus moschatus zuluensis

RARE (R)

Order Insectivora

Family Erinaceidae

R South African hedgehog, Atelerix frontalis frontalis

Family Chrysochloridae

R Yellow golden mole, Calcochloris obtusirostris chrysillus
Calcochloris obtusirostris limpopoensis

R Grants golden mole, Eremitalpa granti granti

Order Macroscelidea

Family Macroscelididae

ND Four-toed elephant-shrew, Petrodromus tetradactylus beirae
Petrodromus tetradactylus warreni

Order Primates

Family Cercopithecidae

R Samango monkey, Cercopithecus mitis labiatus
Cercopithecus mitis erythrarchus

Order Rodentia

Family Bathyergidae

R Namaqua dune molerat, Bathyergus janetta

Family Muridae

R Woosnam's desert rat, Zelotomys woosnami

Family Cricetidae

R Giant rat, Cricetomys gambianus ansorgei

Family Gliridae

R Spectacled dormouse, Graphiurus ocularis

Order Carnivora

Family Mustelidae

- African striped weasel, Poecilogale albinucha albinucha
Poecilogale albinucha transvaalensis
Poecilogale albinucha bechuanae
Poecilogale albinucha lebombo

Family Viverridae

R African civet, Civettictis civetta australis

R Meller's mongoose, Rhynchogale melleri langi

\- Selous' mongoose, Paracynictis selousi selousi
Paracynictis selousi sengaani

Family Protelidae

R Aardwolf, Proteles cristatus cristatus

Family Hyaenidae

R Brown hyaena, Hyaena brunnea

Family Felidae

R Serval, Felis serval serval

\- Small spotted cat, Felis nigripes nigripes
Felis nigripes thomasi

R Leopard, Panthera pardus melanotica

Order Hyracoidea

Family Procaviidae

R Tree dassie, Dendrohyrax arboreus arboreus

Order Artiodactyla

Family Hippopotamidae

SC Hippopotamus, Hippopotamus amphibius capensis

Family Bovidae

R Bontebok, Damaliscus dorcas dorcas

E Tsessebe, Damaliscus lunatus lunatus

R Blue duiker, Philantomba monticola monticola
Philantomba monticola bicolor

R Red duiker, Cephalophus natalensis natalensis

R Sharpe's grysbok, Raphicerus sharpei colonicus

OUT OF DANGER (O)

Order Carnivora

Family Felidae

E Cheetah, Acinonyx jubatus jubatus

Order Proboscidea

Family Elephantidae

SC African elephant, Loxodonta africana africana

INDETERMINATE (I)

Order Insectivora

Family Soricidae

\- Long-tailed forest shrew, Myosorex longicaudatus

R Maquassie musk shrew, Crocidura maquassiensis

\- Greater dwarf shrew, Suncus lixus gratulus

\- Least dwarf shrew, Suncus infinitesimus chriseos

Family Chrysochloridae

R Van Zyl's golden mole, Cryptochloris zyli

R De Winton's golden mole, Cryptochloris wintoni

R Visagie's golden mole, Chrysochloris visagiei

\- Duthie's golden mole, Chlorotalpa duthieae

\- Sclater's golden mole, Chlorotalpa sclateri sclateri
Chlorotalpa sclateri montana
Chlorotalpa sclateri guillarmodi
Chlorotalpa sclateri shortridgei

\- Gunning's golden mole, Amblysomus gunningi

\- Zulu golden mole, Amblysomus iris iris
Amblysomus iris corriae
Amblysomus iris septentrionalis

R Juliana's golden mole, Amblysomus julianae

Order Chiroptera

Family Emballonuridae

R Egyptian tomb bat, Taphozous perforatus sudani

Family Molossidae

R Large-eared free-tailed bat, Otomops martiensseni icarus

R Natal free-tailed bat, Tadarida acetabulosus natalensis

\- Madagascar free-tailed bat, Tadarida fulminans

\- Transvaal free-tailed bat, Tadarida ventralis

\- Ansorge's free-tailed bat, Tadarida ansorgei

R Midas free-tailed bat, Tadarida midas midas

Family Vespertilionidae

R Welwitsch's hairy bat, Myotis welwitschii

R Angola hairy bat, Myotis seabrai

R Lesueur's hairy bat, Myotis lesueuri

\- Rufous hairy bat, Myotis bocagei

\- Rüppell's bat, Pipistrellus rueppellii vernayi

\- Khul's bat, Pipistrellus kuhlii subtilis
Pipistrellus kuhlii broomi

\- Rusty bat, Pipistrellus rusticus

R Butterfly bat, Chalinolobus variegatus variegatus

\- De Winton's long-eared bat, Laephotis wintoni

\- Botswana long-eared bat, Laephotis botswanae

R Aloe serotine bat, Eptesicus somalicus zuluensis

R Damara woolly bat, Kerivoula argentata zuluensis

R Lesser woolly bat, Kerivoula lanosa lanosa
Kerivoula lanosa lucia

Family Nycteridae

- Wood's slit-faced bat, Nycteris woodi sabiensis

Family Rhinolophidae

- Lander's horseshoe bat, Rhinolophus landeri lobatus
- Peak-saddle horseshoe bat, Rhinolophus blasii empusa
- Dent's horseshoe bat, Rhinolophus denti
- Swinny's horseshoe bat, Rhinolophus swinnyi

Family Hipposideridae

- Short-eared trident bat, Cloeotis percivali australis
- Commerson's leaf-nosed bat, Hipposideros commersoni marungensis

Order Rodentia

Family Cricetidae

- Tiny fat mouse, Steatomys parvus tongensis
- Nyika climbing mouse, Dendromus nyikae longicaudatus
- Pygmy rock mouse, Petromyscus collinus barbouri

Family Muridae

R Water rat, Dasymys incomtus incomtus
Dasymys incomtus capensis

R Mozambique woodland mouse, Grammomys cometes cometes

- Grant's rock mouse, Aethomys granti

SPECIES INCLUDED IN THE SOUTH AFRICAN RED DATA BOOKS 1976/1977 NOW REJECTED

R Straw-coloured fruit bat, Eidolon helvum

Although there are a few widely scattered records from the Republic it appears that this fast flying, widely ranging bat is visiting as a migrant or vagrant. Within its wide breeding range in West and East Africa many roosting colonies of 50 000 to 100 000 are on record and in the centre of Kampala, Uganda a colony of up to 200 000 is known, which has occupied the same clump of trees for many years.

R Hairy slit-faced bat, Nycteris hispida

Does not occur in the Republic.

R Horny-skin bat, Eptesicus notius

Koopman (1975) regards this species as a synonym of E. capensis, a widely ranging and common species in the Republic.

R or E Lesser bushbaby, Galago moholi (Senegal galago, Galago senegalensis)

Meester (1976) acknowledged its extensive occurrence in suitable woodland savanna habitat, particularly in the Transvaal where it is afforded Schedule 1 protection. He included it on account of its popularity as a pet but present legislation appears to have checked this usage and appears adequate to protect it. In view of the fact that in the northeastern sector of the Republic it is common and widespread there seems no good reason to retain it on the present list.

R Thick-tailed bushbaby, Otolemur crassicaudatus (Large grey galago, Galago crassicaudatus)

Meester (1976) acknowledged that this species probably was in no danger. Although of marginal distribution in the north-eastern parts of the Republic populations appear to be secure and there seems no valid reason for retaining it on any of the categories.

R Dassie rat, Petromus typicus

Although of limited distribution in the north-western parts of the Cape Province their distribution extends through the eastern parts of Namibia into south-western Angola. They are closely confined to rocky outcrops and hillsides, a type of habitat that is unlikely to be degraded. Common in parts there seems no good reason to retain them on the list.

R Verreaux's mouse, Myomyscus verreauxii (Verreaux's rat, Praomys verreauxii)

Although of limited distribution in the south-western Cape Province from about Clanwilliam to Knysna they are quite common where they occur and their habitat on grassy hillsides, the margins of forest and in riverine forest seems reasonably secure.

R Cape gerbil, Tatera afra (Cape greater gerbil, Tatera afra)

Originally included by Meester (1976) as it had a limited distribution in the south-western Cape Province. It was noted however, that it was not uncommon and no decline was noted in numbers or range. A prolific breeder, females producing up to seven litters in a season each numbering two to six. They occur in sandy soils in the fynbos zone and although this association is heavily degraded through agricultural activities, the Cape gerbil adapts well to this type of habitat in which it is quite common. There seems that no useful purpose is served by keeping it on the list.

R Brush-tailed hairy-footed gerbil, Gerbillurus vallinus, (Brushtailed gerbil, Gerbillurus vallinus)

Previously thought to have a very restricted distribution in the north-western Cape Province, B.H. Erasmus (in litt.) records that not only are they very common in parts of their range but their distribution extends south of the Orange River to Brandvlei in the west and Prieska to the east in parts occurring commonly. There seems no valid reason to retain the species therefore on the Rare category where they were placed by Meester (1976). B.H. Erasmus (in litt.) states that their preferred habitat is gravel or shale plains in the Brandvlei sector or calcrete drainage lines in the Prieska sector. The vegetation in their habitat in both areas consists predominently of Rhigozum trichotommum, Lycium spp and Phaeoptilum spinosum.

R Kreb's fat mouse, Steatomys krebsii (Cape fat mouse, Steatomys pentonyx)

Meester (1976), while not considering this species as being endangered and not declining in numbers or range, included it on what was then thought to be a restricted distribution in the south-western Cape Province. It has subsequently been shown to have a much wider albeit fragmented distributional range from the Cape to north-western Botswana and, extralimitally in the Southern African Subregion, northwards to Angola, Zambia and south-eastern Zaire. S. k. pentonyx is restricted in occurrence to the south-western Cape Province where it is not in any way endangered.

R Cape spiny mouse, Acomys subspinosus (Spiny mouse, Acomys subspinosus)

Meester (1976) noted the limited distribution of this species to the south-western Cape Province from about the Clanwilliam district to Knysna but could not point to any decline in numbers or range. The habitat of the species, which is predominantly restricted to rocky mountainous terrain, is of such a nature as to be unlikely to be degraded and there seems no useful purpose in retaining the species on the present list.

E Dugong, Dugong dugon

A marine species which presumably will be considered for inclusion in the South African Red Data Book: Marine mammals.

TABULAR SUMMARY

KEY TO THE TABLE

Column 1.	The present conservation status of the taxon: E = Endangered; V = Vulnerable; R = Rare; O = Out of Danger; I = Indeterminate: as defined in the section on TERMINOLOGY.
Column 2.	The conservation status of the taxon as it appeared in the earlier Red Data Books (Meester, 1976 and Skinner, Fairall & Bothma, 1977). Notation as above, plus: SC = Special case; - = not included.
Column 3.	Endemic = The species (SP) or the subspecies (SSP) occurs only within the borders of the Republic.
Columns 4,5,6.	The distribution of the species or subspecies in the Republic: 4. Wide = occurs widely throughout in suitable habitat. 5. Marginal = occurs marginally within South Africa but widely in areas beyond the Republic's borders. 6. Limited = occurs only in a restricted area in the Republic or, records both from within and without the borders of the Republic are insufficient to show that the species is occurring at the periphery of an extensive distributional range.
Column 7.	The current population trend U = up; S = stable; D = down; O = not known.
Column 8.	The distribution pattern of the species extralimitally in Africa: W Widely distributed L Limited distribution (Sub-Saharan) M Marginally distributed (also occurs in Namibia, Botswana, Zimbabwe, southern Angola or southern Mozambique).
Column 9.	The data sheet page of the taxon.

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No.
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Family Soricidae Long-tailed forest shrew *Myosorex longicaudatus*	I	-	SP			X	S		169
Maquassie musk shrew *Crocidura maquassiensis*	I	R				X	S	M	170
Greater dwarf shrew *Suncus lixus gratulus*	I	-				X	S	M	170
Least dwarf shrew *Suncus infinitesimus chriseos*	I	-	SSP			X	S		171
Family Erinaceidae South African hedgehog *Atelerix frontalis*	R	R		X			S	M	101
Family Chrysochloridae Giant golden mole *Chrysospalax trevelyani*	V	R	SP			X	D		63
Rough-haired golden mole *Chrysospalax villosus villosus*	V	-	SSP			X	D		65
C. v. transvaalensis	V	-	SSP			X	S		
C. v. leschae	V	-	SSP			X	D		
C. v. dobsoni	V	-	SSP			X	D		
C. v. rufopallidus	V	-	SSP			X	D		
C. v. rufus	V	-	SSP			X	S		
Yellow golden mole *Calcochloris obtusirostris chrysillus*	R	R				X	S	M	103
C. o. limpopoensis	R	R				X	S	M	
Grant's golden mole *Eremitalpa granti granti*	R	R	SSP			X	S	M	105
Van Zyl's golden mole *Cryptochloris zyli*	I	R	SP			X	S		171
De Winton's golden mole *Cryptochloris wintoni*	I	R	SP			X	S		172

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Visagie's golden mole Chrysochloris visagiei	I	R	SP			X	S		172
Duthie's golden mole Chlorotalpa duthieae	I	-	SP			X	S		172
Sclater's golden mole Chlorotalpa sclateri sclateri	I	-	SSP			X	S		173
C. s. montana	I	-	SSP			X	S		
C. s. guillarmodi	I	-	SSP			X	S		
C. s. shortridgei	I	-	SSP			X	S		
Gunning's golden mole Amblysomus gunningi	I	-	SP			X	S		174
Zulu golden mole Amblysomus iris iris	I	-	SSP			X	S		174
A. i. corriae	I	-	SSP			X	S		
A. i. septentrionalis	I	-	SSP			X	S		
Juliana's golden mole Amblysomus julianae	I	R	SP			X	S		175
Family Macroscelididae Four-toed elephant-shrew Petrodromus tetradactylus beirae	R	-				X	S	M	107
P. t. warreni	R	-				X	D	M	
Family Emballonuridae Egyptian tomb bat Taphozous perforatus sudani	I	R			X		S	W	175
Family Molossidae Large-eared free-tailed bat Otomops martiensseni icarus	I	R	SSP		X		S	L	175
Natal free-tailed bat Tadarida acetabulosus natalenses	I	-	SSP			X	O	?	176
Madagascar free-tailed bat Tadarida fulminans	I	-			X		O	L	176

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No.
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Transvaal free-tailed bat Tadarida ventralis	I	-			X		0	L	177
Ansorge's free-tailed bat Tadarida ansorgei	I	-			X		0	W	177
Midas free-tailed bat Tadarida midas midas	I	R			X		S	W	178
Family Vespertilionidae Welwitsch's hairy bat Myotis welwitschii	I	R			X		S	L	178
Angola hairy bat Myotis seabrai	I	R			X		S	M	179
Lesueur's hairy bat Myotis lesueuri	I	R	SP		X		0		179
Rufous hairy bat Myotis bocagei bocagei	I	-			X		S	W	180
Rüppell's bat Pipistrellus rueppellii vernayi	I	-	SSP		X		S	W	180
Kuhl's bat Pipistrellus kuhlii subtilis P. k. broomi	I I	- -	SSP SSP			X X	S S	W	181
Rusty bat Pipistrellus rusticus	I	-			X		S	W	181
Butterfly bat Chalinolobus variegatus variegatus	I	R			X		S	W	182
De Wintons long-eared bat Laephotis wintoni	I	-			X		0	L	182
Botswana long-eared bat Laephotis botswanae	I	-			X		0	L	183

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No.
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Aloe serotine bat Eptesicus somalicus zuluensis	I	R			X		S	L	183
Damara woolly bat Kerivoula argentata zuluensis	I	R				X	S	L	184
Lesser woolly bat Kerivoula lanosa lanosa K. l. lucia	I I	R R	SSP		 X	X	S S	L	184
Family Nycteridae Wood's slit-faced bat Nycteris woodi sabiensis	I	-				X	O	M	185
Family Rhinolophidae Lander's horseshoe bat Rhinolophus landeri lobatus	I	-			X		O	L	185
Peak-saddle horseshoe bat Rhinolophus blasii empusa	I	-			X		S	W	186
Dent's horseshoe bat Rhinolophus denti	I	-				X	S	L	186
Swinny's horseshoe bat Rhinolophus swinnyi	I	-			X		S	L	187
Family Hipposideridae Short-eared trident bat Cloeotis percivali australis	I	-			X		S	L	187
Commerson's leaf-nosed bat Hipposideros commersoni marungenis	I	-			X		S	W	188
Family Cercopithecidae Samango monkey Cercopithecus mitis labiatus C. m. erythrarchus	R R	R R	SSP			X X	D D	W	109
Family Manidae Pangolin Manis temminckii	V	R				X	D	W	79

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No.
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Family Leporidae Riverine rabbit Bunolagus monticularis	E	R	SP			X	D		54
Family Sciuridae Tonga red squirrel Paraxerus palliatus tongensis	V	R				X	D	L	68
Ngoye red squirrel Paraxerus palliatus ornatus	V	R	SSP			X	D	L	70
Family Bathyergidae Namaqua dune molerat Bathyergus janetta	R	R	-			X	S	M	112
Family Cricetidae White-tailed mouse Mystromys albicaudatus	V	-	SP			X	D		72
Giant rat Cricetomys gambianus ansorgei	R	R	SSP			X	S	W	116
Tiny fat mouse Steatomys parvus tongensis	I	-				X	S	W	188
Nyika climbing mouse Dendromus nyikae longicaudatus	I	-	SSP			X	S	L	189
Pygmy rock mouse Petromyscus collinus barbouri	I	-				X	S	M	189
Family Muridae Woosnam's desert rat Zelotomys woosnami	R	R			X		S	M	114
Water rat Dasymys incomtus incomtus D. incomtus capensis	I I	- -	SSP			X X	D D	M	190
Mozambique woodland mouse Grammomys cometes cometes	I	-			X		S	L	190

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Grant's rock mouse Aethomys granti	I	-	SP			X	0		191
Family Gliridae Spectacled dormouse Graphiurus ocularis	R	R	SP	X			S		118
Family Canidae Wild dog Lycaon pictus	E	E			X		S	L	57
Family Mustelidae Honey badger Mellivora capensis capensis	V	R		X			S	W	75
African striped weasel Poecilogale albinucha albinucha	R	-			X		0	W	
P. a. transvaalensis	R	-	SSP			X	0		120
P. a. bechuanae	R	-				X	0		
P. a. lebombo	R	-				X	0		
Family Viverridae African civet Civettictis civetta australis	R	R				X	S	W	123
Meller's mongoose Rhynchogale melleri langi	R	R				X	S	M	125
Selous' mongoose Paracynictis selousi selousi	R	-			X				127
P. s. sengaani	R	-				X	S	L	
Family Protelidae Aardwolf Proteles cristatus cristatus	R	-		X			S	W	129
Family Hyaenidae Brown hyaena Hyaena brunnea	R	R				X	S	M	132

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No.
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Family Felidae Cheetah *Acinonyx jubatus jubatus*	O	E				X	S	W	162
Leopard *Panthera pardus melanotica*	R	R				X	S	W	140
Serval *Felis serval serval*	R	R				X	D	W	135
Small spotted cat *Felis nigripes nigripes* *F. n. thomasi*	R R	- -	 SSP			X X	S S	M	138
African wild cat *Felis lybica cafra* *F. l. griselda*	V V	- -		X X			D D	W	77
Family Elephantidae African elephant *Loxodonta africana africana*	O	SC				X	U	L	165
Family Procaviidae Tree dassie *Dendrohyrax arboreus arboreus*	R	R				X	S	L	143
Family Orycteropodidae Antbear *Orycteropus afer afer*	V	-		X			S	W	82
Family Rhinocerotidae Hook-lipped rhinoceros *Diceros bicornis minor*	V	E				X	U	M	88
Family Equidae Cape mountain zebra *Equus zebra zebra*	V	E	SSP			X	U	M	84
Family Hippopotamidae Hippopotamus *Hippopotamus amphibius capensis*	R	SC				X	S	W	145

	CONSERVATION STATUS		POPULATION DISTRIBUTION				CURRENT POPULATION TREND	AFRICAN DISTRIBUTION	DATA SHEET PAGE No
	1985	1976/7	Endemic	Wide	Marginal	Limited			
Family Bovidae Bontebok Damaliscus dorcas dorcas	R	R	SSP			X	U		148
Tsessebe Damaliscus lunatus lunatus	R	E				X	U	L	151
Blue duiker Philantomba monticola monticola P. m. bicolor	R R	R R	SSP			X X	S D	W M	154
Red duiker Cephalophus natalensis natalensis	R	R	SSP			X	S	L	157
Roan antelope Hippotragus equinus equinus	E	E			X		U	L	60
Sable antelope Hippotragus niger niger	V	R			X		S	L	95
Oribi Ourebia ourebi ourebi	V	V				X	D	W	92
Sharpe's grysbok Raphicerus sharpei colonicus	R	R				X	S	L	159
Suni Neotragus moschatus zuluensis	V	E				X	S	L	98

LEGISLATION IN FORCE 1985

The provinces of the Republic differ in their legislation in so far as the species protected and the nature of the protection are concerned. This legislation is presently being reviewed but the measures in force as of 1985 are as follows:

TRANSVAAL (Information from Mr W. K. Kettlitz)

Ordinance 12 of 1983

Schedule 2 (Protected Game)

Animals on this Schedule may not be hunted, kept in captivity, captured, poisoned, sold, bought, imported or exported without a permit from the Administrator.

Schedule 3 (Ordinary Game)

The Administrator may declare an "open season" for these species when owners of land may hunt them. Non-owners may also hunt them if they have the necessary licence to do so and also the prior written permission of the owner of the land. When no "open season" is declared all persons must have permits to hunt them.

Ordinary game may not be captured or kept in captivity and live specimens may not be imported, exported, sold or bought without a permit.

Schedule 4 (Protected Wild Animals)

These may not be hunted without a permit provided that the owner of land may hunt them if they are causing damage to livestock. They may not be captured or kept in captivity and live specimens may not be imported, exported, sold or bought without a permit.

Schedule 5

Animals listed under this schedule may be hunted but may not be kept in captivity, they include only a few bird species and snakes and leguans (no mammals).

All the other animals not listed in the above-mentioned schedules and also exotic animals may be hunted but not without the prior written consent of the owner of the land.

Provision is made to control all imports and exports of fauna and flora listed in the two appendices of the "Convention on the International Trade in Endangered Wild Species of Fauna and Flora".

NATAL (Information from Dr D. T. Rowe-Rowe)

Open game
May be hunted throughout the year. (Springbok and blesbok)

Ordinary game
May be hunted during the shooting season by the owner of the property or by persons in possession of a hunting licence. (Bushbuck, grey duiker, impala).

Protected

Permits are required for hunting, capture and keeping in captivity, as well as sale, purchase and export.

Specially protected

Hunting, capture, keeping in captivity, sale, purchase and export again require a permit, which is issued only for very good reasons such as control of damage, scientific research, etc. Higher penalties are imposed than in the case of protected animals.

Note. Under the "Mammals" chapter of the Ordinance (15/1974), all wild mammals other than those scheduled as game are protected as follows:

1. Any wild mammal indigenous to South Africa or South West Africa on the IUCN Red Data List is classed as an endangered mammal, and no-one, other than the Natal Parks Board, may purchase, acquire by any means, possess or keep in captivity any endangered mammal.
2. In the case of all other wild mammals the keeping in captivity, sale, purchase or exchange requires a permit from the Board.

ORANGE FREE STATE (Information from Dr C. D. Lynch)

Schedule 1 (Protected game)

1. No hunting season.
2. May only hunt protected game if issued with a permit.

Schedule 2 (Ordinary game)

1. Hunting season - which by proclamation declares which of the species listed, the number, in which areas and during which periods of the year and by whom they may be hunted. Grey rhebuck, grey duiker, oribi and klipspringer are classified as ordinary game but the proclamation for 1985 reads that nobody (including the landowner) may hunt these species during the period 1 January 1985 to 31 December 1985 inclusive.

2. Schedule 2 game may only be hunted by a person issued with a licence.

Note: The Administrator may, by notice, delete from or add to Schedule 1 or 2 the name of any species of wild animal.

CAPE PROVINCE (Information from Mr P. H. Lloyd)

Schedule 1 (endangered wild animals)

May not be hunted, killed, captured or kept in captivity without a permit which is only rarely granted. No one may be in possession of any carcass or part of a carcass of an endangered wild animal without a permit.

Schedule 2 (protected wild animals)

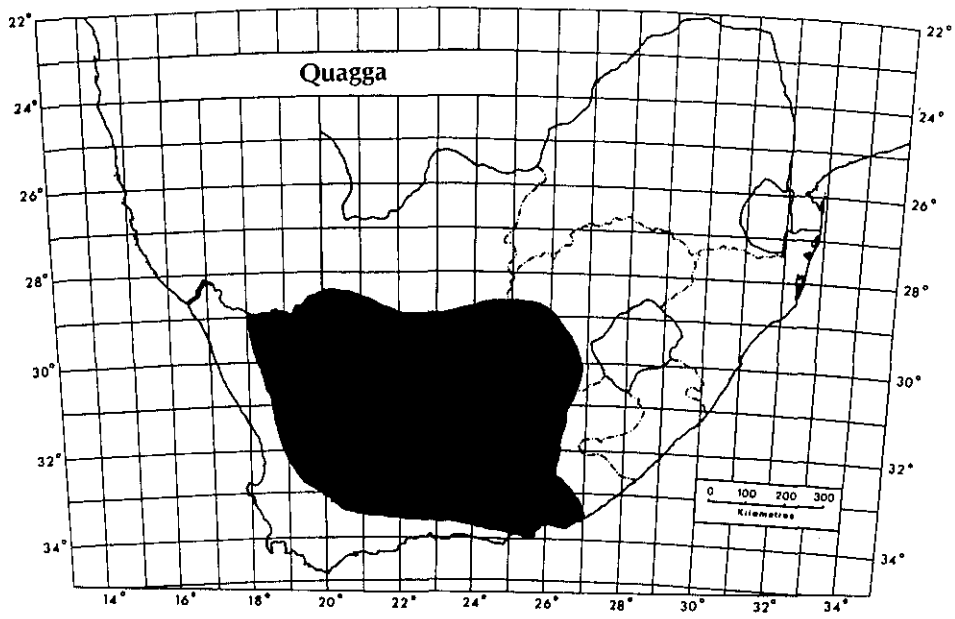
May not be hunted, killed, captured or kept in captivity without a permit from the Department of Nature and Environmental Conservation or under licence during the prescribed hunting season which is proclaimed annually for each animal in each divisional council area.

The Administrator may confiscate any endangered wild animal and pay compensation or protect such wild animal on land not belonging to the Administration if such action is deemed necessary.

Any animal can be added to or deleted from the schedules of endangered or protected animals by proclamation of the Administrator.

EXTINCT SPECIES

Species which have become extinct within historical times



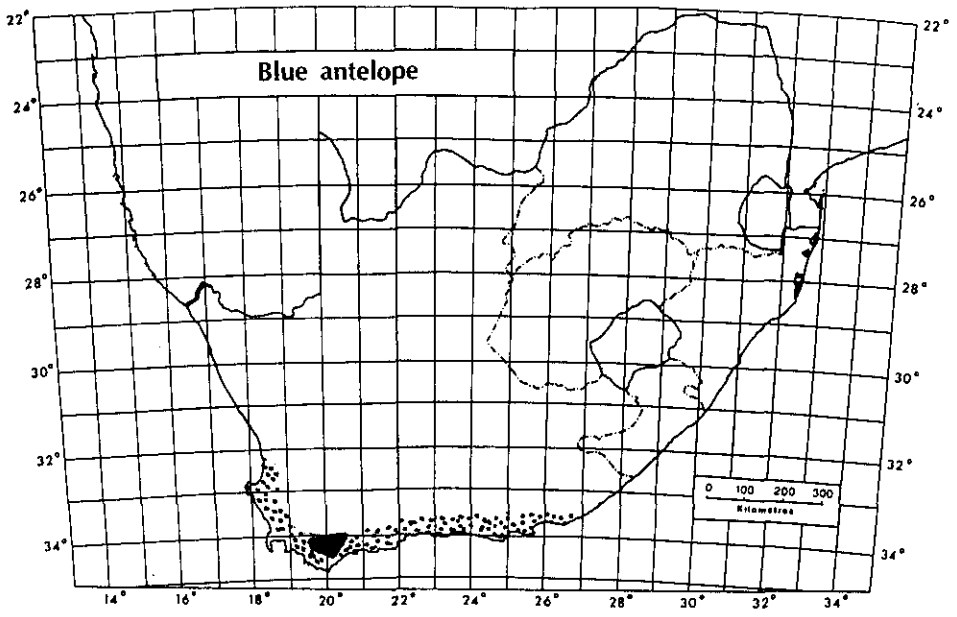
QUAGGA **EXTINCT**
Kwagga

Equus quagga Gmelin, 1788

1788 Equus quagga Gmelin, Linnaeus' Systema Naturae 13 ed. 1 (1): 213. South Africa.

Unfortunately the historical record is filled with inconsistencies as far as equids are concerned, these being often referred to simply as "horses", "mules" or "asses". Where striping of the body is mentioned there is no clear recognition of the differences between mountain zebra, Burchell's zebra and the quagga. The early history of the species is therefore obscure and it is not until the latter part of the 18th century that we can be certain that the observations recorded were of E. quagga (Skead, 1980). By 1850 Bryden (1889) reported that they were practically extinct south of the Orange River and Flower & Lyddekker (1891) believed that they survived in the Orange Free State up to about 1878. The last individual to be held in captivity died in 1883 and was mounted and is in the collection of the Amsterdam Museum, Holland.

The species previously occurred in most parts of the Cape Province, except possibly the coastal plains from Port Elizabeth to the Orange River and in the north-eastern parts of the province, and in the southern parts of the Orange Free State (Greig, 1983). There is a growing body of opinion that prefers to consider this species as the southernmost subspecies of Burchell's zebra, Equus burchelli.

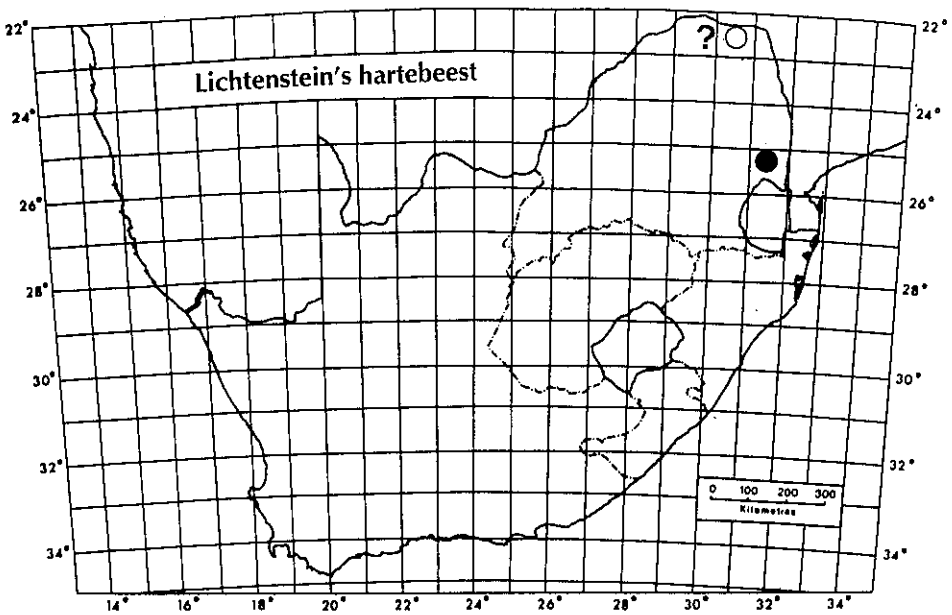


BLUE ANTELOPE **EXTINCT**
Bloubok

Hippotragus leucophaeus (Pallas, 1766)
1766. Antilope leucophaea Pallas Miscellanea Zoologica: 4; 1767, Spicilegia Zoologica 1: 6; 1777, Spicilegia Zoologica 12:12. Swellendam district, Cape Province.

Early travellers and settlers including Thunberg (1793 or 1795), first met with this species just east of the Hottentot Hollands Mountains in 1774. Even then they were accounted as rare and were found only in a triangle of country between Caledon, Swellendam and Bredasdorp, in the south-western Cape Province. Archaeological and palaeontological evidence show that they were, in still earlier times, more widespread occurring on the coastal side of the mountain chain from Elands Bay in the north-west to near Uniondale in the east (Klein, 1974).

It seems that the processes that eventually led to the extinction of the species were in operation before the arrival of the first settlers in the Cape. Klein (1974) suggested that it was due to habitat change brought about by the introduction of sheep in 400 AD, coupled in the latter stages by the advent of Europeans with firearms.



LICHTENSTEIN'S HARTEBEEST **EXTINCT IN SOUTH AFRICA**
Lichtenstein se hartbees

Sigmoceros lichtensteinii (Peters, 1849)

1849. Antilope lichtensteinii Peters, Sitzungs Berichte der Gesellschaft Naturforschender Freunde zu Berlin, in Spenersche Zeitung for 23 December 1849; 1852 Reise nach Mossambique Säugetheire: 190, pl. 43,44. Tete Zambezi River, Mozambique.

Order Artiodactyla **Family Bovidae**

Other colloquial names

Mofhartbees

Present distribution

The species became extinct in the Republic of South Africa about the end of the 19th century, the last material record being a specimen collected by P. Krantz in the Lydenburg district, eastern Transvaal, the skull of which is in the collection of the Transvaal Museum, Pretoria (Roberts, 1914).

Former distribution

The Lydenburg district specimen marked what was apparently their most southerly limits in the Republic. There is a letter in the archives of the Transvaal Museum from Dr H. G. Breijer, Director of the Museum, to the Administer of the Transvaal stating that, on an expedition to the northern Transvaal in 1916, he was informed that Lichtenstein's hartebeest still occurred in the vicinity of the Njelelle and Nuanetse Rivers and asked that they be afforded protection as Royal Game. This points to the possible occurrence of the species in this part of the Transvaal as well.

Habitat

A savanna species particularly associated with the ecotone of open woodland and vleis or floodplain grassland.

Habits

Gregarious, occurring in small herds of up to about 10 individuals which seasonally aggregate into large herds. The males are territorial, establishing territories which in Zambia were just over 2,5 km^2 into which they herd up to about nine females with their calves. These territories are maintained on a year-round basis and remain occupied by a territorial bull until such time as he is displaced by another adult bull. Fighting is common during the rut as adult bulls attempt to displace territorial bulls. Bachelor herds consist of young bulls and bulls displaced from territories and are unstable units as bulls attaining maturity leave to attempt to establish their own territories. The bachelor herds move their home ranges from time to time and are usually found in the least favourable part of the habitat. Predominantly grazers they have been recorded as browsing. They are partial to burnt areas feeding on the newly sprouting grasses.

Breeding in the wild

Seasonal breeders in Zimbabwe and Mozambique, a single calf is born early in the rainy season, about September/October. Females have their first calf at the age of about two years.

Breeding potential in captivity

Not known.

Reasons for decline

Habitat change brought about by agricultural developments, the introduction of cattle and hunting pressures.

Numbers in captivity

None in the Republic.

Protective measures in operation

Not mentioned in the legislation of any of the provinces in South Africa.

Protective measures proposed

None.

Current research

None, but the National Parks Board will be monitoring the reaction to those recently introduced to the Kruger National Park. See also Dowsett (1966); Wilson (1966); Tinley (1977) and Booth (1980).

Remarks

Sydney (1965) records that they occur in Mozambique north of latitude 24°S but by 1976 Smithers & Tello (1976) stated that they no longer occurred south of 21° 30'S in the vicinity of the Save River in the Inhambane district. There is a relict population in south-eastern Zimbabwe and they occur in Zambia, eastern Zaire, north-eastern Angola, Malawi and Tanzania.

In 1985 the National Parks Board translocated the species from Malawi to the Kruger National Park where, in November of that year, there were two males and four females one of which had a calf (A. Hall-Martin, in litt.).

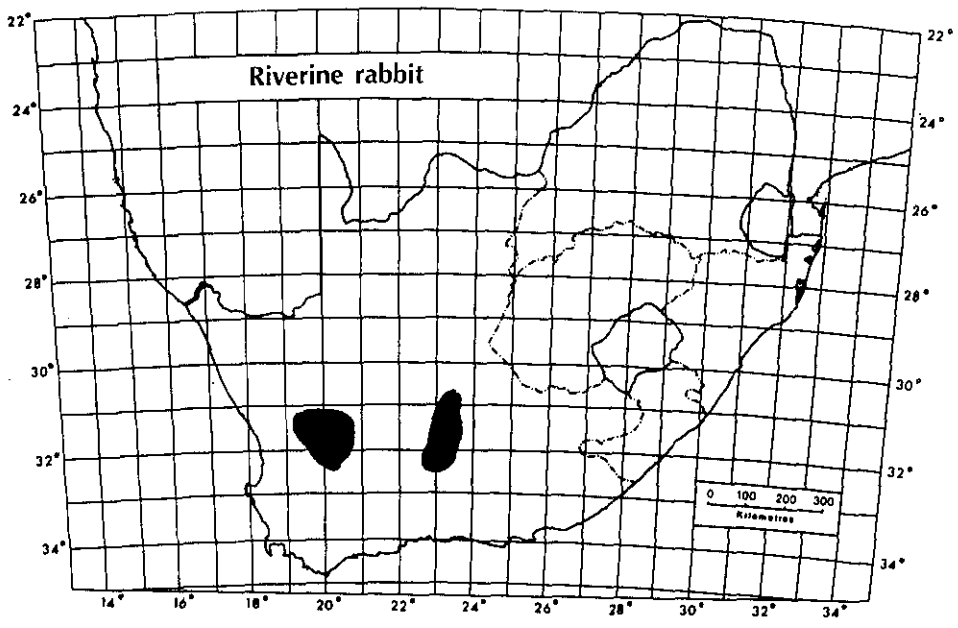
Distribution maps: symbols

◗ Where areas of occurrence on the maps are very small their location is indicated by this symbol.

→ Where species are not resident but move into the Republic temporarily, the directions of these movements are indicated by this symbol.

RED DATA SHEETS

THE ENDANGERED SPECIES



RIVERINE RABBIT **ENDANGERED**
Rivierkonyn

Bunolagus monticularis (Thomas, 1903)

1903. Lepus monticularis Thomas, Annals and Magazine of Natural History (7) 11:78. Deelfontein (30°59'S, 23°48'E), north of Richmond, Cape Province.

Order Lagomorpha **Family Leporidae**

Other colloquial names

Deelfontein hare, bushman hare, river hare, vleihaas, doekvoetjie, pondhaas.

Historical note

First discovered near Deelfontein, Cape Province by Trooper (later Capt.) C. H. B. Grant in 1902. Twenty-seven years were to elapse before it was rediscovered in 1929. Capt G. C. Shortridge, Curator of the Kaffrarian Museum, King Williams Town, spent many years subsequently in his search for the species being misled by the name L. monticularis and the note in Thomas (1903) in the original description associating the species with mountainous terrain, but was not rewarded in his efforts until 1947.

From 1947 no further information came to light until, during the course of a research project initiated by the Mammal Research Institute of the University of Pretoria in 1979, a specimen was caught near Victoria West and another individual seen. In 1985 a further three were seen in this area (T.J. Robinson 1981a,b,c, and pers. comm.).

Present distribution

The only localities for which specimens have been taken are in the Cape Province as follows: East of Calvinia (31°32'S, 20°32'E) and (31°27'S, 19°50'E); Deelfontein (30°59'S, 23°48'E); Middelpos (31°95'S, 20°13'E); Nelspruit (32°07'S, 23°00'E); north of Sutherland (32°12'S, 20°42'E) and Victoria West (32°26'S, 23°07'E) (Robinson, 1981a). These records indicate a very restricted distribution in the south central Karoo of the Cape Province.

Former distribution

Unknown, but probably more widespread in suitable habitat.

Habitat

Closely confined to riverine scrub fringing seasonally dry river courses in the Karoo in the Cape Province.

Habits

Little is known about the habits of this species. Shortridge recorded in his field notebook that "they run with a slow clumsy action, their tails hanging between their legs and are so slow footed that any dog can catch them". Subsequent observations show that this is by no means the case and in fact they are extremely fleet of foot and agile in running through thick riverine cover (T.J. Robinson pers. comm.).

Breeding in the wild

Unknown.

Reasons for decline

While there are no criteria against which to judge whether they have declined in number or range, agricultural development of the riverine fringes has degraded or at least fragmented their habitat to the extent that they may well have become locally extinct. Farm labourers catch them with the aid of dogs and by other means and make use of them as food which could be a factor in their decline in numbers locally.

Numbers in captivity

None.

Protective measures in operation

Not protected by legislation in the Cape Province and not occurring in any reserve area.

Protective measures proposed

The species is worthy of protection under Schedule 1: endangered wild animals in the Nature Conservation Ordinance in the Cape Province. Unfortunately there is no suitable habitat in the Karoo National Park for the species and no reserved area within the known range of the species into which they could be introduced or in which they occur and could be conserved (T.J. Robinson pers. comm.). Robinson also reports that a landowner in the Victoria West area, on whose property they occur, has offered to set aside a section for their conservation, an offer which is being followed up. These types of agreement however, are never entirely satisfactory as they are not necessarily permanent. The ideal solution is the purchase of land under the Cape Provincial Department of Nature and Environmental Conservation as a reserve for the species, an action which in view of the status of the species is warranted.

Current research

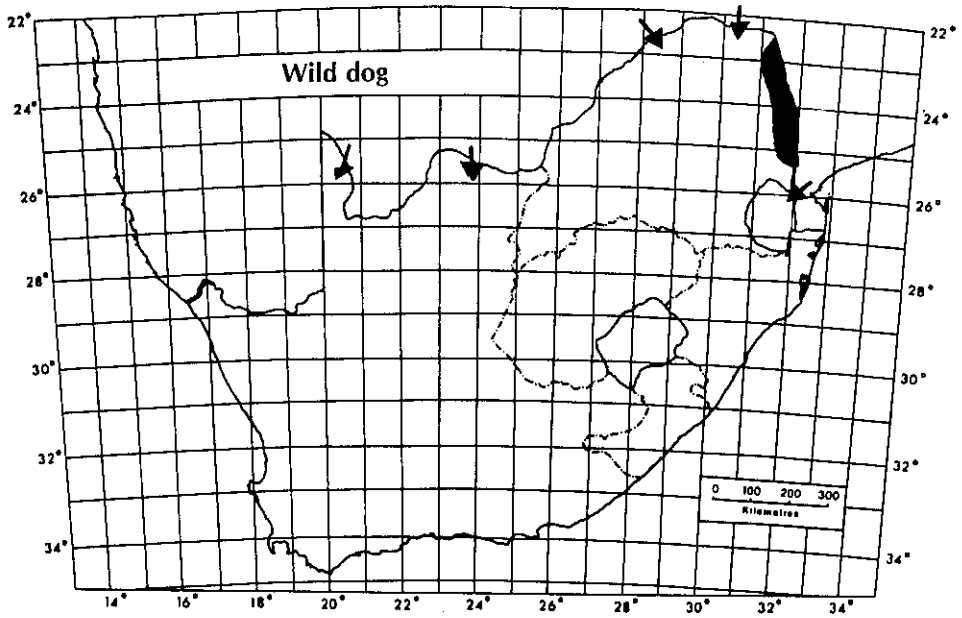
Dr T. J. Robinson and A. G. Duthie of the Mammal Research Institute of the University of Pretoria, are engaged in research on and are following up issues appertaining to its future conservation.

Robinson (1981b) has already brought the matter to international attention leading to the inclusion of the species as endangered in the IUCN Red Data Book: Mammals. This has led to the IUCN pressing for an overall survey of the status of this species. Robinson reported on progress at the meeting of the SSC Lagomorph Specialist Group of the IUCN at the International Conference held in Edmonton, Canada in August 1985. See Robinson (1981a,b,c).

Remarks

Nothing is known about the ecology of this species and, as it appears to be one of South Africa's most endangered species, the first step must be to remedy this deficiency. Without this knowledge questions as to how best to conserve the species cannot be properly answered.

Arrangements are already in train for the initiation of a cooperative project between the Mammal Research Institute and the National Zoological Gardens involving the provision of facilities to keep individuals in captivity for physiological and life history studies.



WILD DOG **ENDANGERED**
Wildehond

Lycaon pictus (Temminck, 1820)

1820. Hyaena picta Temminck, Annales generales des sciences physiques, Bruxelles 3: 54. Coast of Mozambique.

Order Carnivora **Family Canidae**

Other colloquial names

Hunting dog

Present distribution

Stable populations occur only in the Kruger National Park, eastern Transvaal, and in adjacent private game reserves on its western boundary, where they fluctuate in numbers caused principally by sporadic outbreaks of rickettsial epizootics (Pienaar, 1963). They are recorded from Swaziland but whether they are resident or occurring as vagrants is not recorded. Individuals or small packs sporadically cross into the farming areas in the northern Transvaal from Zimbabwe and into the northern Cape Province from Botswana, but these are soon exterminated (Stuart, 1981), and packs have been recorded in the Kalahari Gemsbok National Park, Cape Province (Von Richter, 1972) but apparently are not resident.

Former distribution

There has been a spectacular reduction in the distribution of the species since the days of the early settlement of the Cape (Skead, 1980). While

some of the earlier records may be based on misidentification that of de Grevensbroek in 1684 of packs of 10 to 20 disembowelling sheep and calves near the Cape is probably authentic (Shapera & Farrington, 1933). They were seen near Saldanha Bay, Cape Province in 1773 (Masson, 1776); in Namaqualand (Thompson, 1827); in the northern (Burchell, 1822) and north-eastern Cape Province (Harris, 1838) and near Mossel Bay (La Trobe, 1818). Hewitt (1931) recorded them from Addo in the eastern Cape Province as late as 1906 and in the Albany and Bedford districts up to 1925. They are today extinct in all these areas.

Habitat

Open plains or open savanna woodland, avoiding forest or woodland with thick underbush or grassland with a tall grass cover.

Habits

Gregarious, they live in packs numbering 10 to 15 individuals, although much larger packs of up to 50 have been recorded (Kruger National Park, Pienaar, 1969). Diurnal, hunting by sight the pack relentlessly pursuing the prey which, if large, is attacked in flight, eventually to fall exhausted and be torn to pieces.

Breeding in the wild

Litters of seven to 10, are born in holes in the ground during the winter months of about March to July, after a gestation period of 69 to 73 days (Schaller, 1972). Pup mortality is high caused by gastro-intestinal distemper or rickettsial diseases. Pups start weaning at about 14 days after birth, food being regurgitated for them by any members of the pack, who will also feed the mother or other members left at the breeding den while the pack forages. When old enough to join the pack in hunting, juveniles enjoy first priority at kills.

Breeding potential in captivity

Good from compatible pairs. At De Wildt it was found that litters were more successfully reared if the pairs were segregated owing to the tendency of the young to be killed when large numbers were left together (A. van Dyk, pers. comm.). The National Zoological Gardens, Pretoria have bred from a pair under zoo conditions (M. J. Penrich, pers. comm.) and the Hartebeestpoort Snake and Animal Park in 1985 had a litter of six. The International Zoo Yearbook (1984) reports that they have been bred in zoos throughout the world although not always successfully reared.

Reasons for decline

Eradication of their naturally occurring prey which consists principally of medium sized antelopes. In the absence of these their depradations on domestic stock has lead to intensive control to the level of extermination.

Number in captivity

As at November, 1985 the National Zoological Gardens, Pretoria have a pair as well as 21 at De Wildt; the Johannesburg Zoo has five males and six females; the Hartebeestpoort Snake and Animal Park has one male and two females and Bloemfontein Zoo a pair.

Protective measures

No protective measures are in operation except where they occur in National Parks such as Kruger and the Kalahari Gemsbok National Parks.

Protective measures proposed

In view of their imcompatibility with animal husbandry protective legislation outside reserves would not be acceptable or effective. As they wander over great distances reintroduction to any but the larger reserves with adequate wildlife populations would not be successful as their wanderings outside would lead to their destruction. In Natal protective measures are proposed for individuals outside reserves (D.T. Rowe-Rowe, in litt.).

Current research

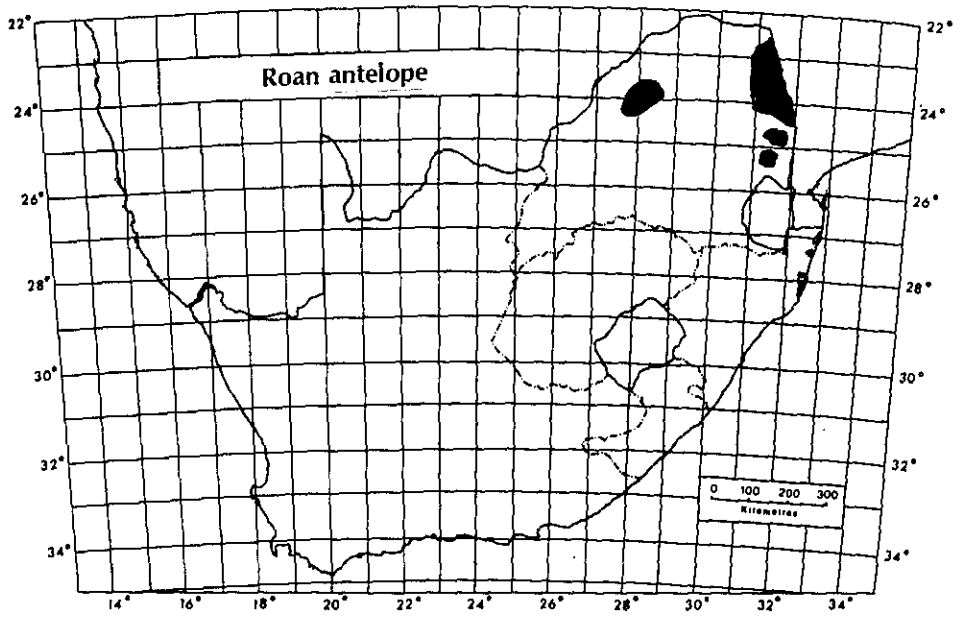
None, but see Kühme (1965), Estes & Goddard (1967), Schaller & Lowther, (1969), Van Lawick Goodall & Van Lawick (1970), Smithers (1971), Kruuk (1972), Schaller (1972), Reich (1977).

Remarks

From a conservation point of view the difficulty with this species is the large size of their home range which, in the Kruger National Park covered up to 450 km^2 (Reich, 1981) and can be very much larger in other areas. Schaller & Lowther (1969) recorded successive sightings of a pack in East Africa which moved 72 km and Reich (1977) recorded the home ranges of packs up to 4 000 km^2.

Wild dogs still have a wide distribution in Sub-Saharan Africa but have been largely exterminated wherever cattle ranching is the principal land use. Within the limits of their distribution therefore, their occurrence is patchy and discontinuous and it seems likely that, in time, they will survive only in remote wilderness areas and in National Parks and the larger wildlife reserves, where there is a food supply sufficient to sustain them.

Twenty-two were reintroduced to the Hluhluwe Game Reserve in Natal in 1980/81 and there are now three packs in the Hluhluwe Corridor Umfolozi Game Reserve Complex and many pups have been observed (D.T. Rowe-Rowe, in litt.).



ROAN ANTELOPE **ENDANGERED**

Bastergemsbok

Hippotragus equinus equinus (Desmarest, 1804)

1804. Antilope equina Desmarest, Nouveau Dictionnaire d'Histoire naturelle 1 ed. 24: 4. Locality unknown; Vicinity of Litakun (=Kuruman, Cape Province) Harper, Journal of Mammalogy 21: 330, 1940).

Order Artiodactyla **Family Bovidae**

Present distribution

In the Transvaal free ranging herds are found today only in the Kruger National Park and in the Waterberg district where there are isolated herds.

Former distribution

They formerly occurred widely in the Transvaal except in the southern central sector, extending in the south-east into Swaziland and south-westwards into the north-eastern Cape Province possibly as far south as the Orange and Vaal Rivers (du Plessis, 1969).

Habitat

Open savanna woodland with extensive open areas of grassland with medium to tall grasses, where water is available. Joubert (1976a) noted that they avoid woodland where the trees form a closed canopy or where the underbush, from the level of 1,5 to 4,0 m forms thick closed stands. They are tolerant of low bush growth up to 1,5 m in the grassland provided this

forms an open scattered association and remains so and they avoid areas of short grass, the open stands of medium to tall grasses being an essential habitat requirement. As a result of these habitat requirements the distribution of roan antelope is patchy and discontinuous. Their occurrence can within a short space of time be inhibited through factors such as bush encroachment or the overutilization of the grass or its trampling down by other species which render the habitat less suitable for them.

Habits

Diurnal and gregarious, living in small herds of five to 12 individuals, these herds forming temporary aggregations of up to 80. The social organization consists of solitary bulls, nursery herds and bachelor herds. The nursery herds are comprised of a dominant bull, females and juveniles of both sexes and occupy large and exclusive home ranges over periods of many years. The dominant bull will defend the females in his herd and an area estimated to be 300 to 500 m around them from the attention of strange bulls (Joubert, 1970). Young bulls, at the age of about two years, are evicted from the nursery herd by the dominant bull, and group together in batchelor herds. Occasionally these young bulls will compete with a dominant bull for the nursery herd. Once evicted, the dominant bull usually becomes solitary. The dominant cow in the nursery herd acts as a sentinel, characteristically being found on the periphery of the nursery herd when it is grazing or resting and takes the initiative in herd movements (Joubert 1970).

Breeding in the wild

A single calf is born at any time during the year, the females having their first calf at 32 to 34 months of age, the mean calving interval being 317 days (Joubert, 1976a). Courtship and mating follows a pattern. The dominant bull approaches a female with his head held high, nose directed forward and if she shows signs of submission, by lowering her head, he will nuzzle her vulva, causing her to urinate, insert his nose in the stream and exhibit flehmen to judge if she is in oestrus. If so he will tap the female between the hind legs with his foreleg and if she is receptive, copulation follows. The gestation period is 276 to 287 days; the female leaving the herd to give birth to her calf in cover, where she hides it while foraging. At birth the calves are a light to rich rufous colour, the adult facial markings showing indistinctly. The mother-heifer calf bond persists for long periods but the bond with a bull calf is broken when, at about two years of age, he is evicted from the nursery herd by the dominant bull.

Breeding potential in captivity

The International Zoo Yearbook (1984) records the successful breeding of the species in zoos throughout the world. In the Republic, although they have not been bred under zoo conditions, they have been shown to be good breeders when reintroduced to reserves within their former range in the Transvaal.

Reasons for decline

Habitat destruction brought about by agricultural development, changes in the habitat caused by bush encroachment and overutilization of the grassland by domestic and other grazing species, appear to have been the main causes of their decline in range and numbers. They appear to be sensitive to the alteration of their habitat by the increase of woody vegetation or loss of the medium and tall grasses. They also appear to be susceptible to diseases, particularly anthrax.

Numbers in captivity

The National Zoological Gardens, Pretoria has one adult female (1985).

Protective measures in operation

In the Transvaal protected by legislation as a Schedule 1 protected game species. A programme of immunization against anthrax is in train. Consideration is being given to affording the species protection under the proposed new legislation in the Cape Province. Immunization against anthrax is being carried out in the Kruger National Park.

Protective measures proposed

Management of the habitat in which they presently occur should be designed to avoid the loss of medium and tall grasses and to minimize bush encroachment of grassland. The present policy of reintroduction to approved reserves with suitable habitat should be continued, as surplus stock becomes available.

Current research

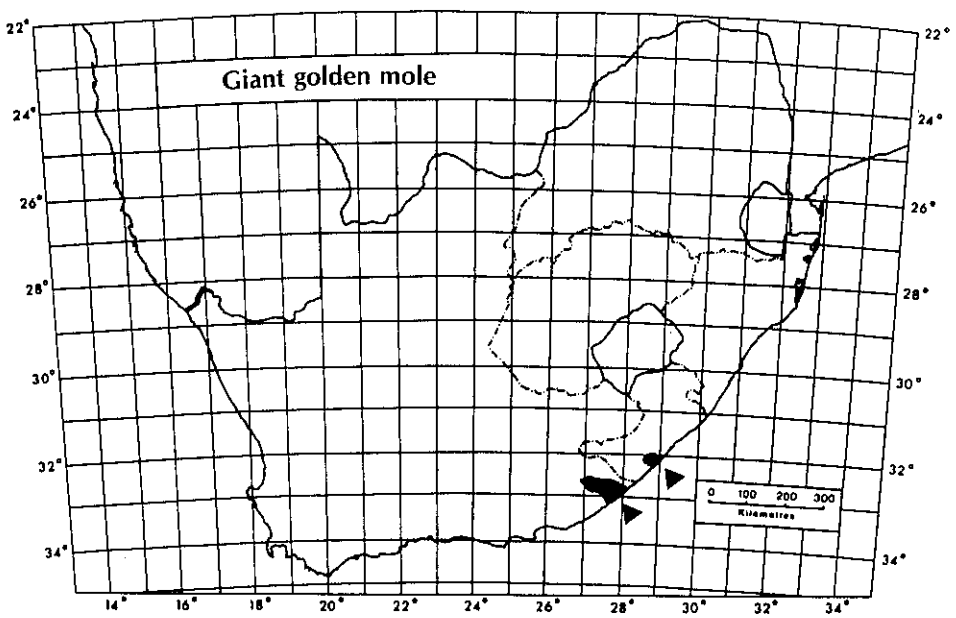
R. Ben-Shahar of the Mammal Research Institute, University of Pretoria is studying their ecology in the Waterberg district of the Transvaal. (See also Joubert, 1970, 1973, 1974, 1976 a&b).

Remarks

A species that is particularly sensitive to changes in its habitat but when introduced to suitable areas flourishes and breeds well. Where they occur careful monitoring of the habitat is necessary to watch for signs of bush encroachment and overutilizing of the grassland by other species.

A survey undertaken by the Transvaal Division of Nature Conservation shows that at November 1985 the number present in provincial nature reserves was as follows: Nylsvley 35, Percy Fyfe 55, Doorndraai Dam 35 and Hans Strydom Dam 10: on private properties in the Waterberg 150 and on the Atherstone Private Game Reserve about 10. They have been reintroduced to a number of private game reserves in the northern Cape Province.

THE VULNERABLE SPECIES



GIANT GOLDEN MOLE **VULNERABLE**
Reuse kruipmol

Chrysospalax trevelyani (Gunther, 1875)

1875. Proceedings of the Zoological Society, London: 311. Pirie Forest, near King William's Town, Cape Province.

Order Insectivora **Family Chrysochloridae**

Present distribution

Known only from a series of restricted areas in the Cape Province from the King William's Town and East London districts eastwards to Port St Johns in the Transkei and marginally westwards into the Ciskei.

Former distribution

While there is no evidence to suggest that they occurred more extensively than at present, degradation of their forest habitat has taken place both on the perimeter of their present range and within it. A.C. Duckworth & G. Hickman (in litt.) believe, for example, that they no longer occur in the eastern parts of their former range in the Manubi and Port St Johns area of the Transkei and within it extensive degradation of their habitat has taken place through human agencies to the extent that they now occur only in scattered islands where the habitat remains relatively undisturbed.

Habitat

Forest and valley forest where the soil is deep, the shrub density is high and a deep litter layer is present (A.C. Duckworth & G. Hickman, in litt.).

Habits

Nocturnal, they live in burrows, which have a diameter of nine to 11 cm, among the roots of trees in the forest, some burrows extending outwards from it into more open ground. Slow-moving they forage in the surface litter and hibernate during the cold weather.

Breeding in the wild

Unknown.

Breeding potential in captivity

Unknown, but the subject of an investigation by the University of Natal, Pietermaritzburg which is now underway (A.C. Duckworth & G. Hickman, in litt.).

Reasons for decline

Habitat degradation, especially where close to settlement, through firewood gathering, barkstripping, cutting of saplings for hut building and through the driving of stock into the forests to feed seem to be the main reasons. Invertebrates important in the diet of the golden mole are primarily affected by these disturbances. They are vulnerable to predation by dogs, common throughout their range. Only the Dwesa Forest, Transkei, is fenced and is therefore protected from the ingress of dogs (A.C. Duckworth & G. Hickman, in litt.). The increase in human populations has lead to an increase in the numbers of uncontrolled dogs which is an additional threat to the survivial of this species.

Number in captivity

Three at the University of Natal, Pietermaritzburg.

Protective measures in operation

None. Feral dogs are subject to control throughout the areas in which the golden mole occurs (A.C. Duckworth & G. Hickman, in litt.).

Protective measures proposed

Rigid control of the remaining habitat by Transkeian, Ciskeian and South African officials has been suggested (A.C. Duckworth & G. Hickman, in litt.). Some portion of their habitat should be set aside as a reserve for the golden mole which would at the same time ensure that a sample of the

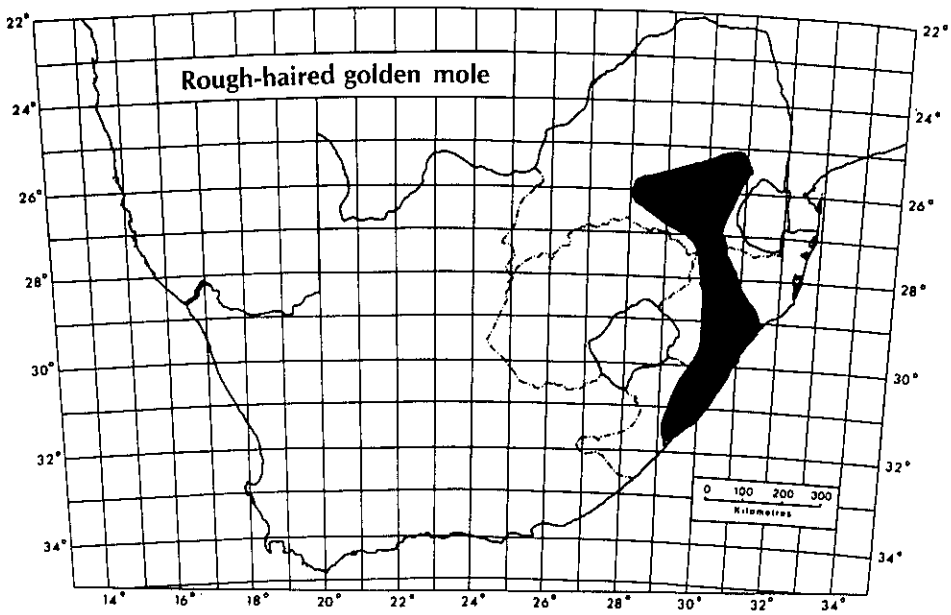
forest association, which is rapidly being degraded, would be preserved for the future. Worthy of protection in the Cape Province legislation.

Current research

An investigation of the ecology of the species is being undertaken by A. C. Duckworth of the University of Natal, Pietermaritzburg, and three papers with A. Maddock and Dr G. C. Hickman are in the course of preparation.

Remarks

The areas of habitat suitable for the golden mole are discontinuous and the populations are therefore isolated. While the forest habitat has not been diminished significantly in size over the past 50 years it has been degraded by the factors mentioned above. The valley forest on the other hand has been seriously overexploited in some areas, eg below Iselini, where only individual trees remain. This species which is endemic to the Republic of South Africa has habits that are unique among the Chrysochloridae but at the moment we know very little about it. Dr W. Poduschka, who is Chairman of the SSC, Insectivore Group of the IUCN had very little time to conduct his investigation (Poduschka, 1980) and it hardly provides a basis for serious consideration of the status of the species. A.C. Duckworth & G. Hickman (in litt.) put in a strong plea for the species to be considered as Endangered which may well be its correct rating once Duckworth's results are published.



ROUGH-HAIRED GOLDEN MOLE **VULNERABLE**
Grasveldkruipmol

Chrysospalax villosus villosus (A. Smith, 1833)
1833. Chrysochloris villosus A. Smith, South African Quarterly Journal 2: 81. "Towards Natal" (near Durban, fide Roberts, The Mammals of South Africa 1951: 121.

Chrysospalax villosus transvaalensis (Broom, 1913)
1913. Bematiscus transvaalensis Broom, Abstracts, Proceedings of the Zoological Society, London: 546 (Sept 1913). Endicott, Springs, Transvaal.

Chrysospalax villosus leschae (Broom, 1918)
1918. Bernatiseus leschae Broom, Proceedings of the Zoological Society, London: 189. St Cuthberts, Isolo (=Tsolo: Roberts, 1951: Ellerman et al, 1953), Griqualand East, Natal.

Chrysospalax villosus dobsoni (Broom, 1981)
1918 Bematiscus dobsoni Broom, Proceedings of the Zoological Society, London: 190. Pietermaritzburg, Natal Midlands.

Chrysospalax villosus rufopallidus (Roberts, 1924)
1924. Bematiscus rufopallidus Roberts, Annals of the Transvaal Museum 10: 65. Wakkerstroom, southeastern Transvaal.

Chrysospalax villosus rufus (Meester, 1953)
1953. Bematiscus rufus Meester, South African Journal of Science 49: 207. Spitzkop, Sabie, eastern Transvaal.

The status of the subspecies is uncertain and warrants investigation.

Order Insectivora **Family Chrysochloridae**

Present distribution

Occur from the extreme eastern parts of the Cape Province through southern and central Natal to the south-eastern and south central parts of the Transvaal.

Former distribution

Unknown, probably very similar to the present.

Habitat

Grassland with a preference for the use of dry substrate on the fringes of marshes or wet vleis.

Habits

Unlike many other golden moles they do not make subsurface runs but excavate burrows, the entrances to which are left open and which are characterized by piles of loose soil thrown up at the sides and back. Roberts (1951) believed that they live in chambers in the burrow systems and were more inclined to emerge and forage on the ground surface after rain. In foraging, tracks are formed to preferred feeding sites which are marked by disturbance of the soil caused by rooting with the horny nose pad.

Breeding in the wild

Roberts (1951) records a female with two foetuses but does not give a date.

Breeding potential in captivity

Unknown.

Reasons for decline

There is no evidence that the species has declined in range or numbers, but in Natal they are apparently uncommon as G. Hickman and A.C. Duckworth (in litt.) report that they have only trapped one specimen over a period of ten years.

Numbers in captivity

None.

Protective measures proposed

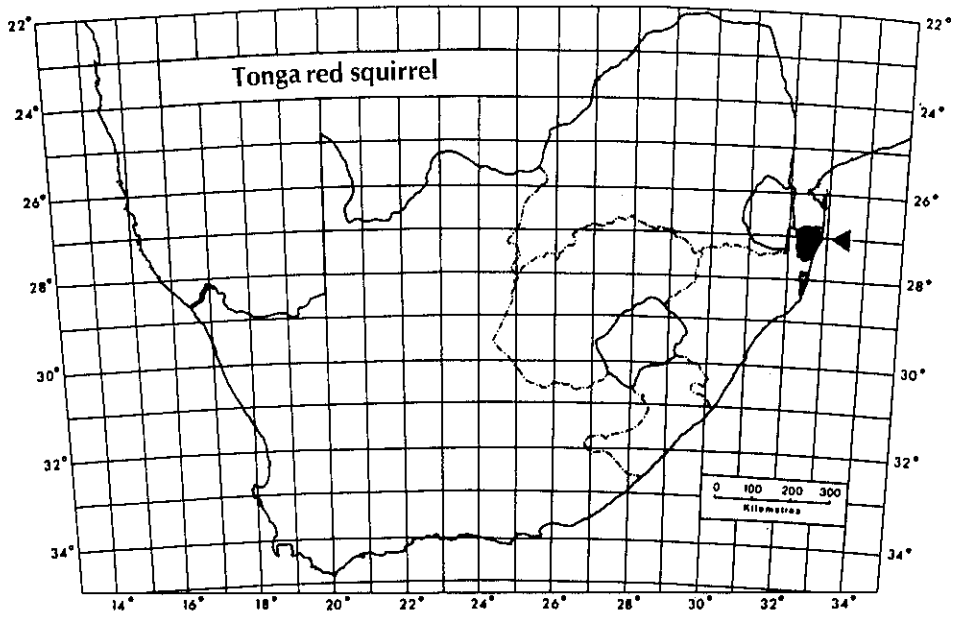
The lack of information on this species precludes any recommendations.

Current research

Dr G. Hickman and A.C. Duckworth of the University of Natal, Pietermaritzburg are engaged in research on golden moles, including this species.

Remarks

The distribution of the species suggests that in time it may be shown to occur in reserved areas within its range but otherwise there seems little that can be done to ensure the future of golden moles on account of their mode of life. G. Hickman (in litt.) remarks that he knows of no area within their known range where they can be trapped with certainty.



TONGA RED SQUIRREL **VULNERABLE**
Tonga rooi eekhoring

Paraxerus palliatus tongensis Roberts, 1931

1931. Paraxerus sponsus tongensis Roberts, Annals of the Transvaal Museum 14: 229. Mangusi Forest, northeastern KwaZulu.

Order Rodentia **Family Sciuridae**

Present distribution

Occur in the Manguzi forest and associated forests in north-eastern KwaZulu and Natal.

Former distribution

Their forest habitat was at one time much more extensive than at present and probably formed a continuum over a very large area which would include the Ngoye forest (Acocks, 1975) southwards and extend northwards into Mozambique to join up with the habitat of P. p. sponsus.

Habitat

Dry or moist evergreen forest and dune forest.

Habits

Diurnal, arboreal and solitary or a female accompanied by her young, with

temporary associations of a pair while the female is in oestrus. The social organization is based on a group consisting of a male, a female and, at least during the early part of their lives, her young which are driven out when subadult by their parents. The female is the nucleus of the group, the males changing from time to time. She will vigorously defend an area in the vicinity of the nest while she has young offspring, the females of this subspecies being much more aggressive in this respect than others. The home ranges of the females overlap at good food sources. They advertise their presence by tail fluffing and flicking and stamping their feet and mark by urine dribbling and anal dragging.

Breeding in the wild

Litters of up to two young are born during the summer months of August to March after a gestation period of 60 to 65 days. While the females produce up to two litters during the season in captivity, so far as is known they have only a single litter during the year in the wild. The young leave the nest at about 18 days old, at first remaining in its immediate vicinity and gradually, under the guidance of the female, increasing this distance. They are weaned by about 40 days old (S. Viljoen, 1980).

Breeding potential in captivity

Good, under these circumstances females can have up to two litters in a season (S. Viljoen, 1980).

Reasons for decline

There is no evidence to indicate that they have declined in numbers. The Manguzi forest is a proclaimed forest reserve but in the past has been greatly reduced through lack of management. It has however, recently passed to the management of the KwaZulu Bureau of Natural Resources who have erected a fence round the remaining forest patches and provided a permanent staff presence to prevent further destruction of the forest (M.C. Ward, in litt.).

Numbers in captivity

Unknown.

Protective measures in operation

Parts of their habitat in north-eastern Natal lie within the boundaries of reserves under the jurisdiction of Natal Parks Board. No special protection is specifically afforded to the species.

Protective measures proposed

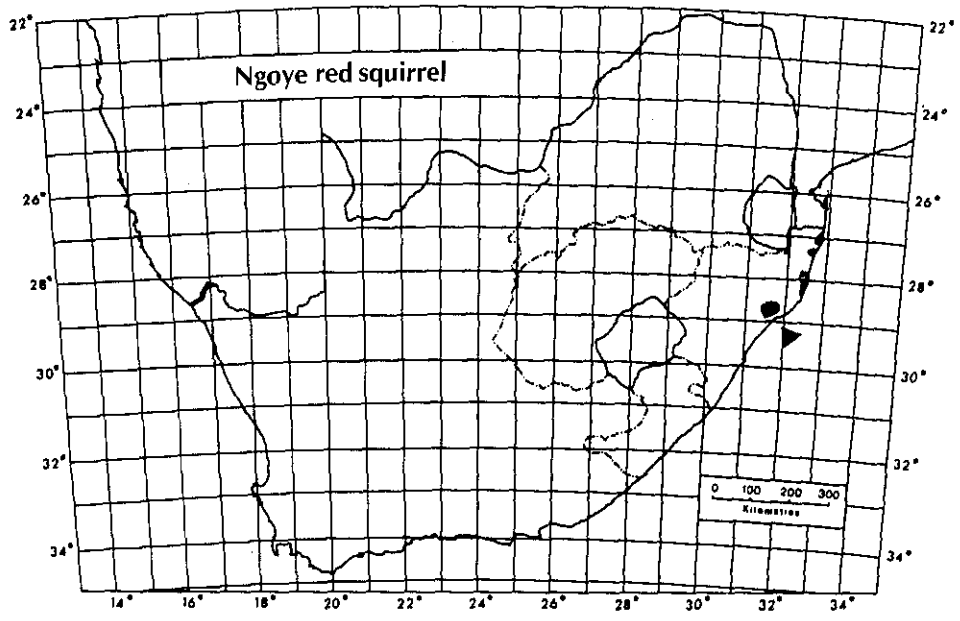
Add the species to the list of protected species in Natal to cover the two subspecies P. p. tongensis and P. p. ornatus.

Current research

See Viljoen (1980, 1982, 1983a,b).

Remarks

Because of the occurrence of this subspecies in reserves in part of their range and because their habitat is more extensive than that of their close relative, the Ngoye red squirrel, the Tonga red squirrel is less vulnerable. It nevertheless has a restricted distributional range and is worthy of inclusion.



NGOYE RED SQUIRREL **VULNERABLE**
Ngoye rooi eekhoring

Paraxerus palliatus ornatus (Gray, 1864).

1864. Sciurus ornatus Gray, Proceedings of the Zoological Society, London: 13. Ngoye Forest, Eshowe district, KwaZulu.

Order Rodentia **Family Sciuridae**

Present distribution

Confined to the 2 900 ha of the Ngoye forest, northern KwaZulu.

Former distribution

The Ngoye forest is a southern relict of a much more extensive forest

(Acocks, 1975) which formed a continuum over a much larger area and joined up with the forest habitat of the Tonga red squirrel. The isolation of the Ngoye forest has led to subspeciation.

Habitat

Evergreen forest.

Habits

Diurnal and arboreal, living in family groups of a male, female and, for a temporary period, her offspring. They tend to forage solitarily; the male closely associating with the female only when she is in oestrus. The female is the nucleus of the group whose males may change from time to time. For a time after the young are born the female drives the male away from the vicinity of the nest and the young are driven off by their parents on becoming subadult. The males have larger home ranges than the females and move up to about 1 000 m, the females never over about 700 m from the nest. Tail fluffing and flicking is more prevalent in dense than in more open habitat. Vocalization takes the form of clicking which rises to a trilling or warbling with the degree of alertness. Under stress they give a deep bark. Olfactory signalling takes the form of urine dribbling and anal dragging. When disturbed they make for the nearest thick cover of vegetation or hollow trees tending to move towards the forest floor rather than upwards (S. Viljoen, 1980).

Breeding in the wild

Litters of up to two are born during the summer months of August to March, in holes in trees lined with leaves. In captivity they may produce two litters in a season but so far as is known only one in the wild (S. Viljoen, 1980). The young first leave the nest at about 18 days old, remaining at first in its vicinity and gradually extending their excursions from it in company with the female. They are fully weaned by about 40 days old (S. Viljoen, 1980).

Breeding potential in captivity

Good, producing up to two litters in a season after a gestation period of 60 to 65 days (S. Viljoen, pers. comm.).

Reasons for decline

There is no evidence to suggest that they have declined in numbers or range.

Numbers in captivity

None.

Protective measures in operation

While the squirrel is not protected by legislation, the forest, which is under the jurisdiction of the KwaZulu Bureau of Natural Resources, is protected. Entrance is by permit and the area is fenced and field staff employed to curb poaching and stop logging (M.C. Ward, in litt.).

Protective measures proposed

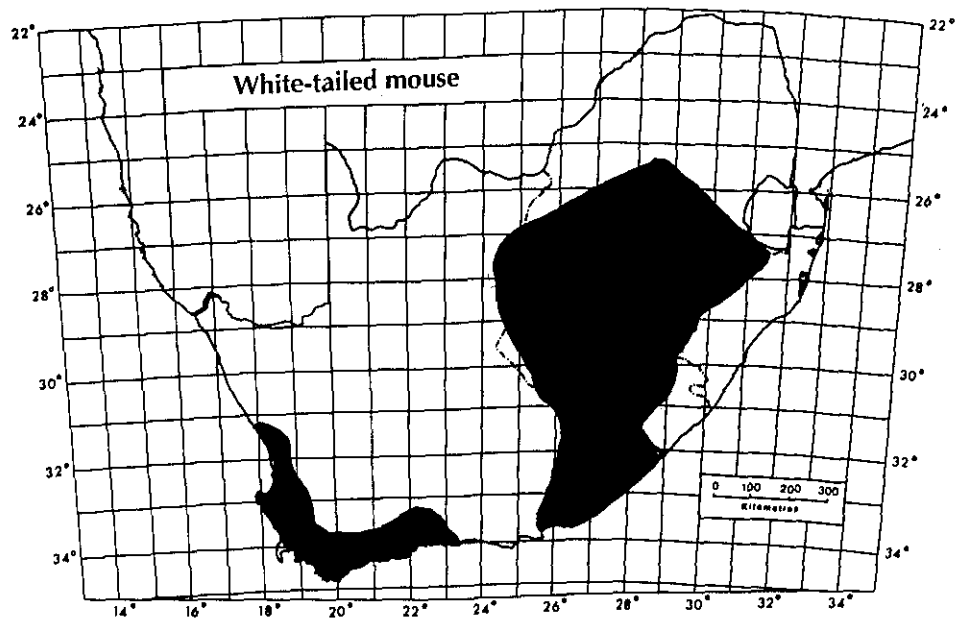
Add the species to the list of protected species in Natal so as to cover the subspecies P. p. ornatus and P. p. tongensis.

Current research

Recently completed, see S. Viljoen (1980).

Remarks

While at the moment neither the squirrel nor its forest habitat appear to be in any way endangered, there remains the danger with species closely associated with forest that this will be degraded.



WHITE-TAILED MOUSE **VULNERABLE**
Witstertmuis

Mystromys albicaudatus (A. Smith, 1834)

1834. Otomys albicaudatus A. Smith, South African Quarterly Journal Series 2, 2: 148; 184, Illustrations of the Zoology of South Africa, Mammalia: pl 33 and text. Albany district, eastern Cape Province.

Order Rodentia **Family Cricetidae**

Present distribution

Occur widely but sparsely in the southern savanna grasslands from southern Transvaal, eastern Swaziland, Orange Free State and Natal to the eastern parts of the Cape Province, with a relict population in the fynbos of the south-western Cape Province.

Former distribution

Probably occurred throughout the southern savanna grasslands and the heathland and renosterveld of the south-western Cape Province.

Habitat

Grassland and fynbos.

Habits

Nocturnal and terrestrial they live in holes and cracks in the ground (De Graaff, 1981) and have been observed to use the burrows of the suricate, Suricata suricatta, in which they construct cup-shaped nests of vegetable debris.

Breeding in the wild

Roberts (1951) states that they breed throughout the year but in captivity Meester & Hallett (1970) recorded that no litters were born during the colder months of mid April to mid June. There is a lack of breeding records from wild populations except that two specimens in the Transvaal Museum collection were taken with clinging young in January and early March, Rautenbach (1982) records a female with three foetuses in July in Transvaal and Lynch (1983) a gravid female with two foetuses in June and another with four foetuses in December in the Orange Free State.

Breeding potential in captivity

Good. Meester & Hallett (1970) reported on 51 litters born in captivity which showed that they were slow breeders although nipple-clinging by the young allowed for a high survival rate, estimated by Davis (1963) at 80%. Under these conditions no litters were born during the colder months of the year from mid April to mid June. The mean number of young per litter being 2,9; the minimum age of the females at their first litter 146 days and the minimum interval between litters 36 days. See also Hallett & Meester (1971).

Reasons for decline

In the south-western Cape Province the species occurs in the renosterveld and heathlands sectors of the fynbos which are the two sectors grossly

degraded by agricultural development (Moll, Jarman & Bossi, 1984). The southern savanna grasslands are similarly threatened for the same reason and in addition by the extensive encroachment of the Karoo which Acocks, (1975) estimates has extended its range eastwards into the grasslands for distances, in parts, of up to 250 km. Dean (1978) recorded that this species might be in need of conservation, noting that fewer specimens had been received within recent years by the State Medical Ecology Laboratory, Johannesburg. Cricetine rodents of the genus Mystromys predominate in microfaunas of the cave brecchias in the Sterkfontein, Transvaal cave areas from early Pleistocene times, an area where they are today difficult to obtain (Davis, 1959, 1962).

Numbers in captivity

Breeding colonies of this species have been maintained by the South African Institute for Medical Research, Johannesburg since 1941 where they have been used in research on poliomyelitis, benign histoplasmosis and periodontal diseases. The numbers in captivity vary with breeding success, availability and use.

Protective measures in operation

The species occurs on a number of reserves in the Transvaal and other provinces, excepting the Cape Province and in National Parks in the Orange Free State and Lesotho (Dean, 1978).

Protective measures proposed

None, as any proposed are unlikely to be practical.

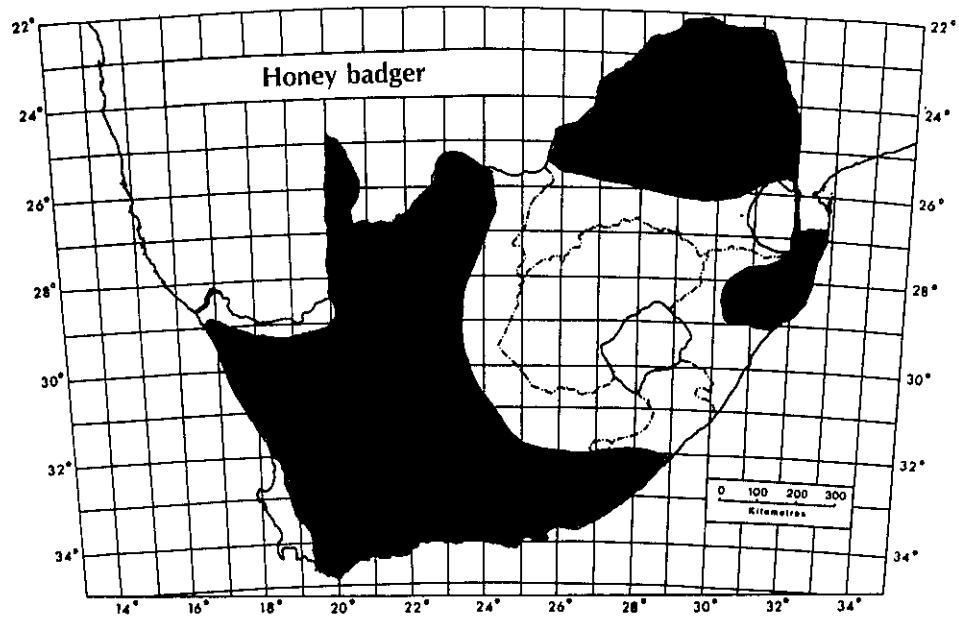
Current research

None, but see Dean (1978).

Remarks

An endemic South African species. Occurs in the following reserves in the various provinces in the Republic and in Lesotho:

Transvaal	Van Riebeeck Nature Reserve, Barberspan Nature Reserve, Suikerbosrand Nature Reserve, Vaal Dam Nature Reserve, S A Lombard Nature Reserve.
Orange Free State	Willem Pretorius Game Reserve, Golden Gate Highlands National Park.
Natal	Giants Castle Game Reserve, Cathedral Peak Mountain Catchment Area.
Lesotho	Sehlabathe National Park.



HONEY BADGER **VULNERABLE**
Ratel

Mellivora capensis capensis Schreber, 1776

1776. Viverra capensis Schreber, Säugtheire: pl 125; and 1777, 3: 450, 588. Cape of Good Hope.

Order Carnivora **Family Mustelidae**

Present distribution

They occur widely in the Transvaal, except in the southern parts of the province; in north-eastern Natal and KwaZulu and in the central and western parts of the Cape Province. While not recorded from Swaziland their occurrence in adjacent areas suggests that they may well occur there at least in the east.

Former distribution

Unknown but probably occurred more widely than at present.

Habitat

Catholic in their habitat requirements being absent only from desert.

Habits

Predominantly nocturnal but, in undisturbed areas, have some diurnal activity. Terrestrial, they occur solitarily or in pairs. Walk with a slow rolling gait, sniffing here and there for prey which consists of

insects, scorpions, large ground tunnelling spiders, which they dig up with their powerful knife-like claws. They also eat mice, reptiles, occasionally birds, honey and bee larvae and carrion.

Breeding in the wild

Information is scanty and although the indications are that the young are born during the summer, Fairall (1968) believed that in the eastern Transvaal, they breed throughout the year.

Breeding potential in captivity

Apparently poor. Crandall (1964) reports that in overseas zoos breeding has not taken place.

Reasons for decline

There is no evidence to show that they have declined in numbers but, as they will raid poultry runs and particularly apiaries and thus become subject to control, this factor and the alteration of parts of their habitat by human development has led to their extermination locally. They are relentlessly destroyed in the northern Cape Province by the use of gin traps, hunting by various means and the laying of poisonous baits which are the most comon factors responsible for their decline.

Numbers in captivity

The National Zoological Gardens, Pretoria, and Johannesburg and Bloemfontein Zoos each have a pair. Crandall (1964) reported that in zoos overseas they were found to be hardy and vigorous and had lived for up to 24 years.

Protective measures in operation

Protected in the Cape Province as a Schedule 2 protected wild animal.

Protective measures proposed

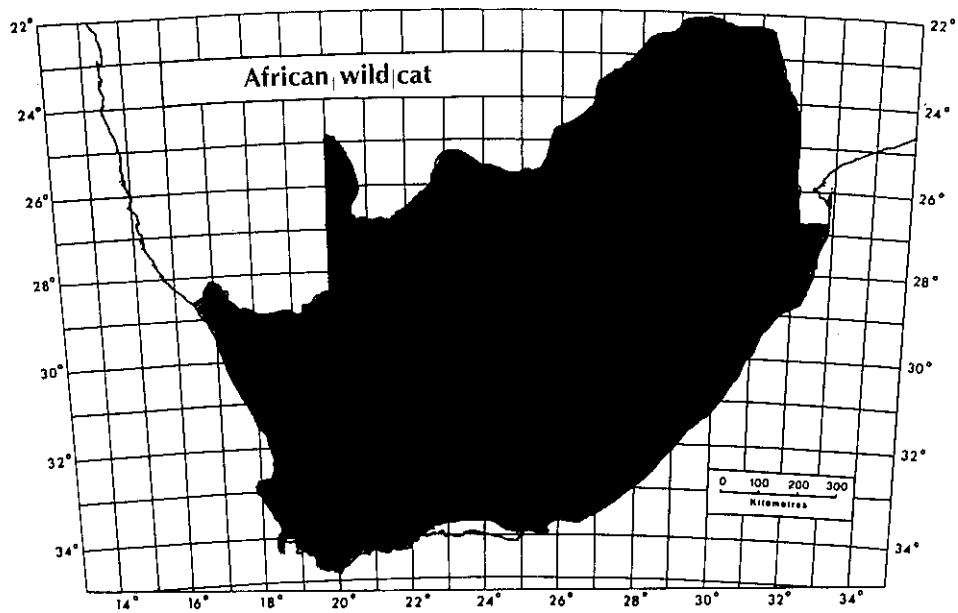
None.

Current research

None.

Remarks

This species is uncommon anywhere throughout its wide distributional range, which covers most of Sub-Saharan Africa.



AFRICAN WILD CAT **VULNERABLE**
Vaalboskat

Felis lybica cafra Desmarest, 1822
1822. Felis cafra Desmarest, Encyclopédie Méthodique, Mammalogie: 540. Kaffraria. The southern and eastern parts of the species range.

Felis lybica griselda Thomas, Annals and Magazine of Natural History (9) 17: 180. 80 km south of Dombe Grande, Benguella, southwestern Angola. The northern and western parts of the species range.

Order Carnivora **Family Felidae**

Present distribution

Widely distributed throughout southern Africa, except in desert.

Former distribution

The historical record is vague and the term generally used, "wild cat", might well be applied to other species (Skead, 1980). There seems little doubt however, that their distributional range in historical times would be similar to the present.

Habitat

They have a wide habitat tolerance as is shown by their occurrence in most associations on the continent except desert and the forested areas of the Congo Basin and West Africa. Their requirements include the presence of

cover in the form of rocky areas, underbush, stands of tall grass, reedbeds or holes in the ground in which to rest during the day. They are independent of water but will drink when it is available.

Habits

Nocturnal, they forage singly, males associating with a female when in oestrus, when fighting is a common occurrence. They are territorial, both sexes marking and defending the territory.

Breeding in the wild

Litters of up to five young, usually three, are born in cover, after a gestation period of 63 days, during the summer months. There is no evidence to show that in the wild a female will have more than one litter in the year.

Breeding potential in captivity

Good. Females in captivity can have more than one litter in a year. Breeding success is greater if two or more males are introduced to females in oestrus.

Reasons for decline

There is no evidence to show that they have declined in numbers or range. The reason for the inclusion in this category is that they freely hybridize with domestic cats and already it is impossible to find pure Felis lybica anywhere in the vicinity of settlements where there are domestic cats. Hybridization of F. lybica with domestic cats in captivity has shown that the characters which mark F. lybica as a species, among others its long legs and ears that are clearly reddish on the back, are lost in the hybrids. This is today found even in remote areas where there has been even temporary settlement such as in parts of Botswana (Smithers, 1971) where individuals were taken with, in addition, white legs and white patches on their bodies. It seems inevitable that eventually this process will lead to virtual extinction of F. lybica as we know it at present.

Numbers in captivity

The National Zoological Gardens, Pretoria has in the past had a number in captivity but at the moment have none.

Protective measures in operation

None. Although they occur in National Parks and reserves they are nowhere, except in remote areas away from settlement and therefore free of the threat of hybridization.

Protective measures proposed

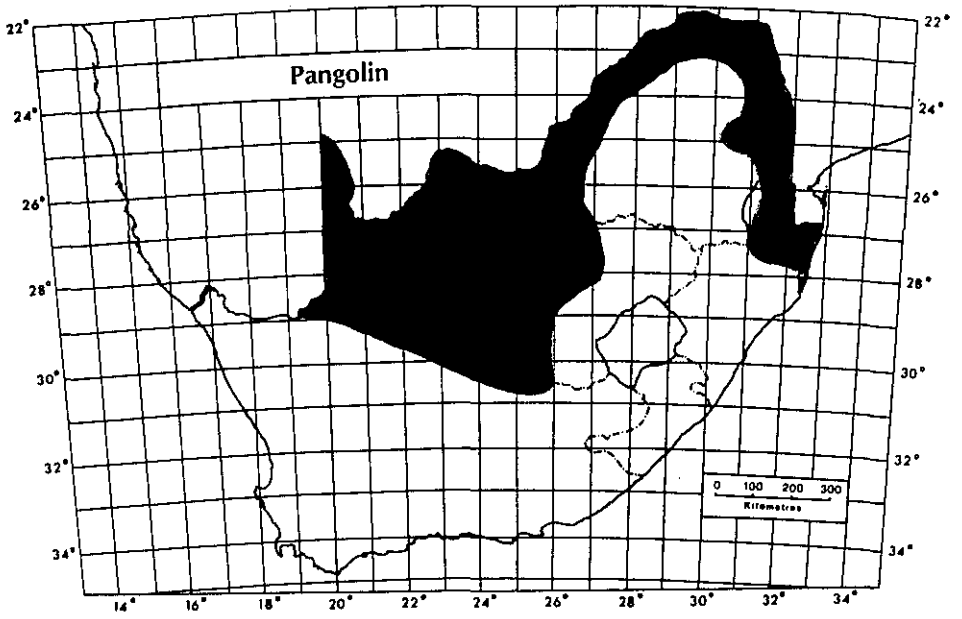
There seems no practical solution to this problem except the breeding of pure strains in captivity. In Natal staff members living in parks and reserves may only keep domestic cats if they have been rendered sterile and the same ruling applies to staff members of the National Parks.

Current research

None.

Remarks

Although the spread of hybridization is a relatively slow process it might be useful for the future to have pure strain F. lybica in captivity.



PANGOLIN **VULNERABLE**
Ietermagô
Manis temminckii Smuts, 1832

1832. Manis temminckii Smuts, Dissertatio Zoologica, enumerationem Mammalium Capensium continens: 54, pl 3, Fig 1-2. Beyond Lataku (=Litakun), near Kuruman, northern Cape Province.

Order Pholidota **Family Manidae**

Present distribution

They occur in the north and north-eastern Cape Province; in the north-

western parts of the Orange Free State; in the northern parts of Natal and in the western, northern and eastern Transvaal.

Former distribution

Skead (1980) lists a number of historical records of the species going back to the time of Lichtenstein in 1815 but all these fall within the limits of its present distribution. Shortridge (1934) noted that there was a record from Colesberg, Cape Province, which was the only record he was aware of from south of the Orange River. This extends its present distribution slightly further south in the Cape Province than it has been recorded in later times. The unique features of the species are such that it appears likely that early travellers would have recorded them from other localities if they had occurred and one is led to the conclusion that they never occurred outside the limits of their present known range.

Habitat

Most of the records indicate an association of this species with savanna woodland but it has also been taken on floodplain and other open grassland areas. They appear to be catholic in their habitat requirements, their occurrence governed more by the availability of the various species of ants and termites that constitute their principal food.

Habits

Predominantly nocturnal, in cool weather they will move during the day. They are slow movers and can be followed at a walk. Under stress they either "freeze", standing motionless, when their brown colour blends well with the background, leading to their being overlooked, or will roll into a tight ball, their head and soft underbelly enclosed in the protection of the hard scales on the upper surface of the body and tail. They walk on their back feet, the front feet and tail held off the ground, their spoor only occasionally showing the marks of the long curved claws on the front feet and the scrape of the tail. During the day they rest in piles of debris or more commonly in disused antbear burrows or under the exposed roots of trees.

Breeding in the wild

Very little information is available but the indications are that a single young is born during the winter months, there being two records for July.

Breeding potential in captivity

Crandall (1964) reported on the difficulty of keeping pangolins in captivity; most introductions living for very limited periods. Van Ee (1978) kept two pairs at the Bloemfontein Zoo and noted mating in one pair which produced a single young after a gestation period of 139 days. A second pair lived for 14 months and also gave birth to a single young.

Both pairs died from poisoning by benzenehexachloride, in one case after being treated with a solution to kill a mite infestation, the second when their enclosure was sprayed with BHC and they were introduced a month later.

Reasons for decline

Easily captured the scales are in demand by herbalists and witchdoctors and command high prices. Human and agricultural developments leading to habitat degradation and their apparent high susceptibility to insecticides (Van Ee, 1978) renders them vulnerable.

Numbers in captivity

None.

Protective measures in operation

Protected by legislation in all four provinces, they occur in the Kruger National Park and in reserves in the Transvaal and Natal.

Protective measures proposed

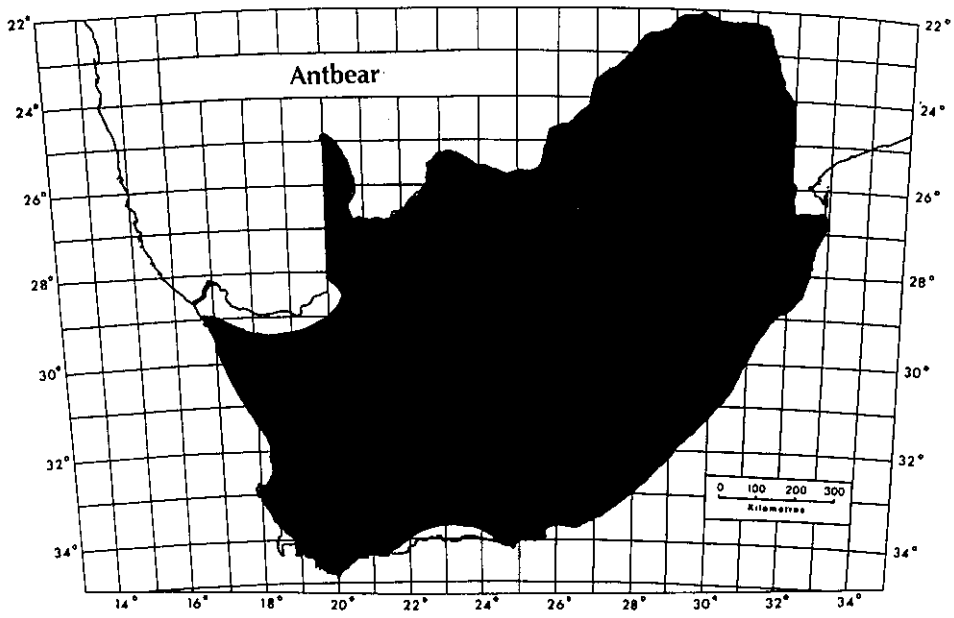
Translocate captures to National Parks and reserves within their known range.

Current research

None, but see Stuart (1980).

Remarks

If they are as susceptible to BHC poisoning as shown by Van Ee's (1978) experience then they are gravely at risk. It seems that further investigation of this should be carried out. Stuart (1980) reports that in the Cape Province, Orange Free State and Natal they are extremely rare and they might be approaching extinction in the Orange Free State.



ANTBEAR **VULNERABLE**
Erdvark

Orycteropus afer afer (Pallas, 1766)

1766. Myrmecophaga afra Pallas, Miscellanea Zoologica: 64. Cape of Good Hope.

Order Tubulidentata **Family Orycteropodidae**

Present distribution

Sparsely but widely distributed throughout the Republic, except in desert or forest.

Former distribution

Similar to the present. The historical record, while making no mention of the Cape Peninsula, notes the danger to life and limb, through riders being unhorsed, when their mounts encountered half hidden burrows, and to the breaking of wagon wheels (Skead, 1980).

Most historical references are to their burrows rather than to the animal itself but that it was known is confirmed by the accurate description provided by De Grevenbroek (Shapera & Farrington, 1933) for about the year 1684. The presence of their characteristic burrows is today widely used as an indication of their presence for they are seldom encountered, being nowhere common and being shy and retiring. From the south-western Cape Province and throughout southern Africa, these records show that they occurred widely in the Republic as they do today.

Habitat

They are catholic in their habitat requirements, occurring in all associations except desert and forest.

Habits

Nocturnal and solitary, they are avid burrowers. Their exploratory scatchings, shallow burrows used for daylight resting over short periods and their extensive, deep burrows used over long periods and in which to breed are clear evidence of their powerful digging abilities. Bryden (1900) records how he and his assistants endeavoured to dig one out, their excavations extending over 32 m without success, as the aardvark will dig ahead of such disturbances at a prodigious rate. They bury their faeces in shallow scrapings, sometimes returning to defaecate in the same place (Melton, 1976). Their diet consists of formicid ants and termites, the former during the dry season, the latter during the wetter summer months.

Breeding in the wild

A single young, rarely twins (Melton, 1976) is born in the burrow in the late dry or early wet season from about July to November after a gestation period given by Sampsell (1969) as seven months. Verheyen (1951) records that the young forage with the mother at about two weeks old and dig for themselves at the age of six months.

Breeding potential in captivity

While on one occasion (Frankfurt Zoo; Crandall, 1964) the species has been bred in captivity, there is too little evidence to judge their potentialities in this direction.

Reasons for decline

While they do not appear to have declined in numbers or range, in the northern Cape Province they are hunted for their meat which is considered a delicacy and in some sheep farming areas labourers are encouraged to eradicate them because they dig under jackal-proof fences. In this sector their burrows are treated with poisonous gas or closed up (B.H. Erasmus, in litt.). D. Melton (in litt.) suggests that due to hunting pressures in KwaZulu they may well be extinct. In other areas the snout and claws are in high demand as witchdoctors "medicine" and the flesh is palatable which no doubt locally has an effect on the numbers of a species which occurs everywhere at low densities.

Number in captivity

Not in captivity in South Africa but have been kept for periods of up to 12 years by zoos overseas (Chicago; Crandall, 1964).

Protective measures in operation

Protected in the Transvaal under Schedule 2 protected game animal; in Natal specially protected; in the Orange Free State and Bophuthatswana under Schedule 1 protected game and in the Cape Province under Schedule 2 protected wild animals. They occur in National Parks and game reserves in all four provinces and in Bophuthatswana.

Protective measures proposed

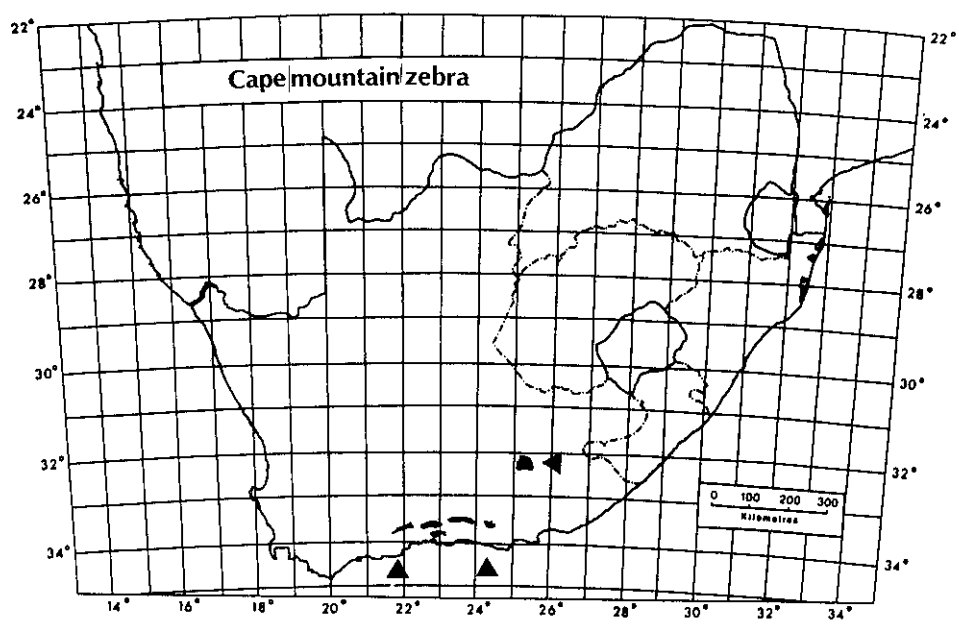
None.

Current research

None, but see Melton (1976).

Remarks

The species has a wide distribution in Africa from the Republic northwards to East Africa, Ethiopia and the Sudan and westwards to Senegal, excluding the forests of the Congo basin and West Africa and is nowhere common throughout this range.



CAPE MOUNTAIN ZEBRA **VULNERABLE**
Kaapse bergsebra

Equus zebra zebra Linnaeus, 1758

1758. Equus zebra Linnaeus, Systema Naturae 10 ed 1: 74. "India, Africa"; fixed by Roberts (1951: 244) as Paardeberg, near Malmesbury, south-western Cape Province, where now extinct.

Order Perissodactyla **Family Equidae**

Other colloquial names

Kaapse bergkwagga

Present distribution

Occur in the south-western and southern parts of the Cape Province in the Mountain Zebra National Park, Cradock and in the Gamka, Kamanassie and until recently the Kouga and Baviaanskloof mountains.

Former distribution

There is great confusion in the historical record in so far as the south-western Cape Province is concerned between the now extinct quagga, Equus quagga and this species through the use of loose colloquial terms such as "horses", "asses", "donkeys", "pied horses", "mules" etc. In 1685 a written report by Tachard (Raven-Hart, 1971) describes a journey to the mountains seven kilometres north-west of Stellenbosch where he describes horses striped "all over the whole head and body" and "with long ears" which may well have been mountain zebra. Du Plessis (1969) in reviewing the past distribution of the species stated that they occurred widely in the mountainous areas of the Cape Province from the Suurberg range in the east to the mountains in the south-west of the province and northwards in the west in similar terrain to the Orange River. It seems reasonable to suppose in view of their close relationship that there would be a continuum in distribution into Namibia with Hartmann's mountain zebra and that within the northern part of the range of the Cape mountain zebra there would be a broad band of transition between the two subspecies. The Kamiesberg Gap may, however, have been the dividing line between the two subspecies (P.H. Lloyd, pers. comm.).

Habitat

Closely confined to mountainous areas that offer the required types of grazing and a plentiful water supply as well as the shelter of kloofs and rocky ridges.

Habits

Gregarious and diurnal, occurring in small herds consisting of a stallion, mares and foals, which remain stable over many years (Penzhorn, 1975). Herd stallions may have to fight to retain their status against adult males attempting to take over their females but have been known to retain this status up to periods of 15 years (Penzhorn, 1979). They are not territorial, the home ranges of the herds overlapping.

Young males, at the age of two or three years old, leave the breeding herds and join up to form bachelor herds in which they remain until they are physiologically and psychologically mature enough to attempt to become herd stallions at the age of five or six years old. The herds rest in the open

but are sensitive to adverse weather conditions when they tend to take shelter in kloofs and other sheltered areas. During the cold winter months the herds often move to lower altitudes than those occupied during the summer.

Breeding in the wild

Breeding takes place throughout the year with a peak during the summer months, a single foal being born after a gestation period of approximately one year (Penzhorn, 1985). The foal remains for the first few weeks of its life in close association with its mother. Mares have their first foal at four or five years of age, the mean period between the birth of foals being 24 months (Penzhorn, 1985).

Breeding potential in captivity

Not known.

Reasons for decline

Not now declining, but came near to extinction in the 1930's in which year the State purchased Babylons Toren farm in the Cradock district which is now part of the Mountain Zebra National Park. By 1945 only two stallions and a mare remained but the situation was saved by the addition of five stallions and six mares from an adjoining farm.

Numbers in captivity

Bloemfontein Zoo has three.

Protective measures in operation

Protected by legislation in the Cape Province under Schedule 2 as protected wild animals, the main bulk of present numbers are in National Parks, Provincial Nature Reserves or in areas under the jurisdiction of the Forestry Branch of the Department of Environment Affairs.

Protective measures proposed

Continuation of the present policy of translocation of surplus stock to reserves in areas of suitable habitat within their former range.

Current research

The Department of Nature and Environmental Conservation in the Cape Province monitor the status of populations on a regular basis. See Millar (1970); Penzhorn (1975, 1979, 1984, 1985); Grobler (1983).

Remarks

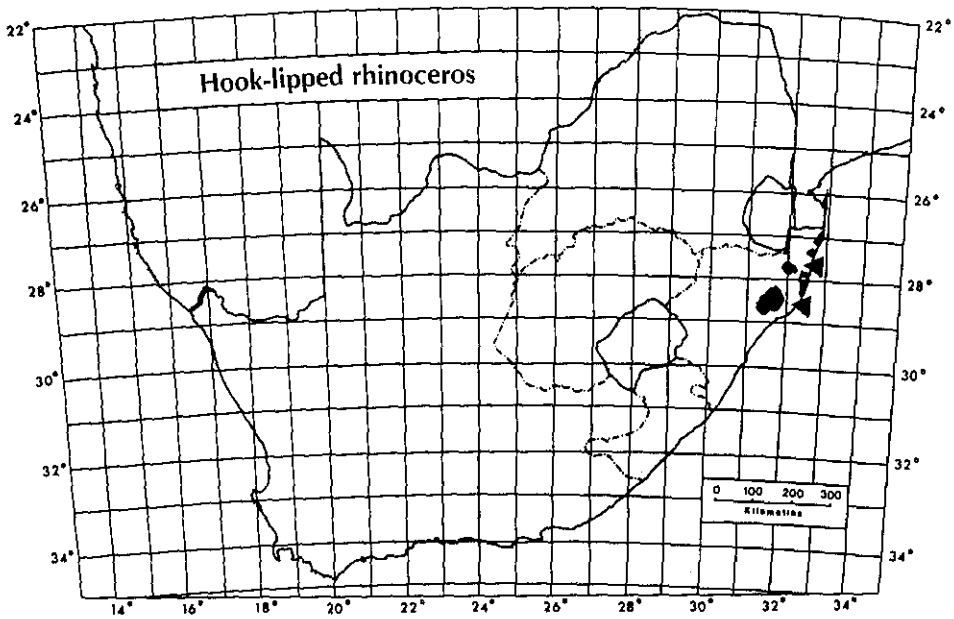
Originally listed as an endangered species, great success has attended the effort to rehabilitate this subspecies but numbers have not yet risen to such a level as to warrant their move to the Out of Danger category.

The Inter-organization meeting reported that at the 29 August 1985 numbers were as follows:

	Number	Origin
National Parks Board		
Mountain Zebra National Park (MZNP)	228	
Karoo National Park	80	ex MZNP
	308	
Cape Provincial Administration		
Gamka Mountain Nature Reserve	19	naturally occurring
De Hoop Nature Reserve	26	mixed, mainly ex MZNP
Commando Drift Nature Reserve	7	ex MZNP
Karoo Nature Reserve	33	ex MZNP
	85	
Department of Environment Affairs		
Kamanassie mountains	12	naturally occurring
Ciskei		
Tsolwana	33	ex MZNP
OFS Department Nature Conservation		
Verwoerd Dam Nature Reserve	4	ex MZNP
Bloemfontein Zoo	3	ex MZNP
Private Landowers		
Mr M. Cawood	7)	
Mr E. Moorcroft	7)	
Mr R. Halse	9)	ex MZNP
Mr C. Scott	4)	
Mr W. Murray	2)	
	29	
GRAND TOTAL ...	474	

A stud book is maintained as a cooperative project by the National Parks Board and the Cape Department of Nature and Environmental Conservation.

There is an unconfirmed report that three Hartmann's mountain zebras, Equus zebra hartmannae, have crossed the Orange River from southern Namibia. Should this be confirmed this subspecies will have to be incorporated in the list, probably in the category Rare.



HOOK-LIPPED RHINOCEROS **VULNERABLE**
Swartrenoster

Diceros bicornis minor (Drummond, 1876)

1876. Rhinoceros bicornis minor Drummond, Proceedings of the Zoological Society, London: 109. All country southeast of the Zambezi. Zululand selected by Zukowsky (1876).

Order Perissodactyla **Family Rhinocerotidae**

Other colloquial names

Black rhinoceros.

Present distribution

Naturally occurring populations are found only in the Hluhluwe Corridor Umfolozi Game Reserve Complex and Mkuze Game Reserve in Natal, with some spill over into adjacent areas.

Former distribution

The diary of Van Riebeeck for 1652 records the presence of rhinoceros, undoubtedly this species, in the vicinity of the fort at Cape Town and on the slopes of Table Mountain (Thom, 1958). Hunters and pioneers recorded their presence in Namaqualand and in the northern Cape Province (Mossop, 1935), the southern coastal areas of the Cape Province (Thunberg, 1795; Paterson, 1790), in the eastern Cape Province (Pringle, 1835), Natal (Baldwin, 1894), and the Transvaal (Gyldenstolpe, 1934). These and many

other records mentioned by Skead (1980) confirm that the species had a wide distribution in South Africa except that no historical record appears to exist of their presence in the Orange Free State. The proclamation of the Hluhluwe and Umfolozi Game Reserves in 1897 in Natal came just in time to save them from extinction.

Habitat

Savanna woodland and scrub. Being browsers they require that the habitat provides an adequate supply of food in the form of shrubs and young trees up to four metres in height, pushing over higher growth to reach the edible parts that grow out of reach. Habitat requirements include well developed woodland or thickets in which to shelter and a supply of water, seldom being found more than 15 km from it. Bush encroachment improves the habitat for this species.

Habits

They tend to be solitary, the only stable bond being between the female and her calf which persists until the birth of the females next calf. All other associations are transitory. The males are not territorial but may fight over a female in oestrus but not over a piece of territory. Their home ranges, which vary in size according to their sex, age and the type of habitat in which they occur, being smaller where there are dense stands of shrubs or thickets and larger in more open country. The bulls tend to be aggressive in encounters with other bulls but usually deliberately avoid contact. They deposit their dung in latrines, which are used by a number of individuals, vigorously scraping the heap with the back feet which, by being scented in this manner, mark their presence in their tracks. They may also defaecate fortuitously anywhere in the home range. The bulls urinate in a backward directed spray in short bursts on to bushes or other objects, the females in squirts as they move. Urination advertises their presence in an area to other conspecifics. Where hunted or disturbed they have a reputation of being irascible and bad tempered which is not in evidence where they are left undisturbed. They are assiduous wallowers in mud or dust, which no doubt has a function in thermoregulation and in controlling ectoparasites.

Breeding in the wild

Precopulatory behaviour involves complex encounters between the bull and cow, the latter squirting urine onto the ground which the bull sniffs and performs flehmen to test if she is in oestrus. Courtship is largely governed by the cow, the pair sparring with their horns or nudging each other with their heads, the bull prodding the cow with his horn between the hind legs. The gestation period is about 15 months, a single calf being born at any time during the year. The interval between calves is about three years. The calf walks by the side of its mother and starts to wean at about a few weeks of age, suckling continuing until it is about a year old. Females with a calf are extremely intolerant of disturbance and the female will vigorously defend the calf against predators such as lions and spotted hyaenas. The females reject their calves at two to four years of age either during the next pregnancy or at the birth of the next calf.

Breeding potential in captivity

Have been bred freely in zoos in South Africa and overseas in the past but there are indictions today that breeding under these conditions has declined within recent years. Breeding under zoo conditions, on account of their size, could never be a factor in their conservation.

Reasons for decline

Hunting pressure and poaching encouraged by the high price obtained for the horns appear to have been the main factors leading to the reduction in their distributional range and numbers in the past both in South Africa and in Africa as a whole. These factors do not apply in South Africa at the moment.

Numbers in captivity

The National Zoological Gardens, Pretoria and the Johannesburg Zoo each have a single male (1985) and the International Zoo Yearbook (1984) reports that they are widely held by zoos overseas.

Protective measures in operation

Listed as a Specially Protected species in Natal with viable populations in the Hluhluwe Corridor Umfolozi Game Reserve Complex from which surplus stock has been made available for translocation to approved reserved areas both inside and outside the province as well as to zoos in South Africa and overseas.

Protective measures proposed

A continuation of the present practice of reintroduction to approved areas from surplus stocks in Natal. Suitable habitat remains available for translocated stock and the Department of Nature and Environmental Conservation in the Cape are considering their reintroduction to the De Hoop Nature Reserve and the Andries Vosloo Provincial Nature Reserve. The South African Nature Foundation has joined forces with the Natal Parks Board in initiating a project aimed at improving breeding success and assisting in the translocation of stock to safe areas.

Current research

A detailed study of the population in the Hluhluwe Corridor Umfolozi Game Reserve Complex was undertaken by Hitchins (1967, 1968b, 1969, 1970, 1972, 1975) and the population is currently (1985) being surveyed by P.M. Hitchins with the financial assistance of the Natal Parks Board and the Endangered Wildlife Trust. P.J. Viljoen of the Eugene Marais Chair of Wildlife Management, University of Pretoria includes data on this species in his study of elephants in Kaokoland and Damaraland, Namibia. See also: Guggisberg (1966); Goddard (1967, 1968); Hitchins (1968b); Schenkel & Schenkel-Hullinger (1969); Hitchins (1969); E. Joubert (1969); Goddard (1970a,b,c); Moss (1976) and Smithers (1983).

Remarks

Formerly widely distributed in Sub-Saharan Africa the hook-lipped rhinoceros today survives only in a series of small islands of distribution scattered throughout its former range. In the main this has been brought about by the unprecendented level of poaching, encouraged by the high value of the horn which finds a ready market in the Yemen and the Far East. In the northern parts of their range the level of poaching is such that it is difficult to keep pace with the changing situation as they quickly disappear locally. Believing that conservation measures are in themselves insufficient to ensure the future existence of the species in the northern parts of its range, the Rhino Group of the International Union for the Conservation of Nature is endeavouring to control or if possible stop the trade in rhinoceros horn.

Dr. E.B. Martin (Our living world, June 1985) stated that Africa's hook-lipped rhinoceros populations had fallen from 65 000 in 1970 to 7 500 in 1985 representing the slaughter of 90% of the population in 15 years. In June 1986 the latest estimates give a figure of 6 000 of which some 650 are found in South Africa.

Poaching has not reached these high levels in the southern parts of their range until recently when the population in the Zambesi Valley in Zimbabwe became subject to poaching from across the river from Zambia. Specially trained anti-poaching units have had to be organised to combat this encroachment which has reached serious proportions.

In the Republic of South Africa, owing to high level supervision by conservation agencies and the strict control of the export of horn, poaching is not at the moment a major factor in their conservation but there is no room for complacency for the future.

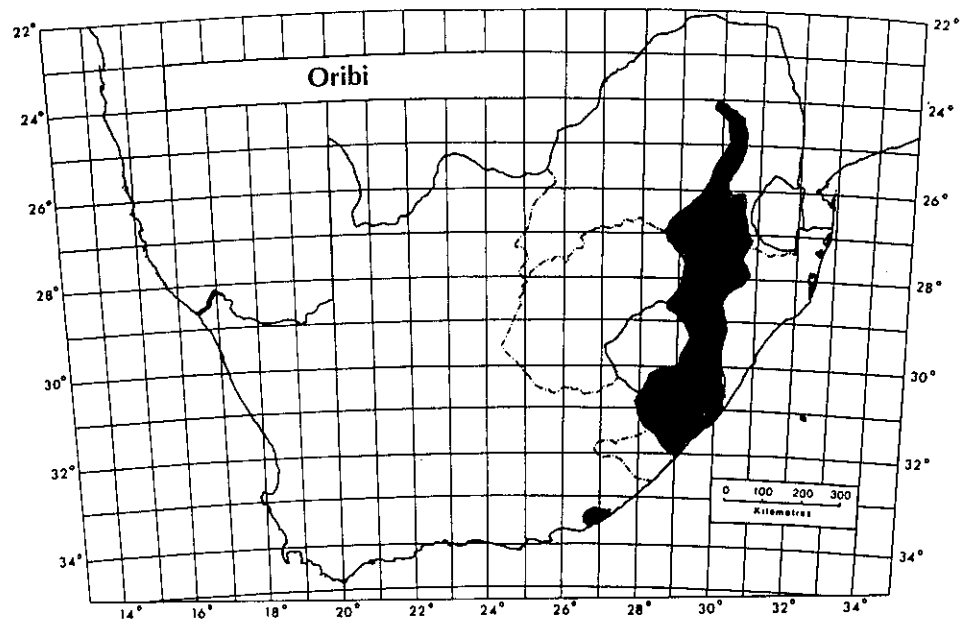
D.T. Rowe-Rowe (in litt.) reports that in Natal in 1985 there were an estimated 300 in the Hluhluwe Corridor Umfolozi Game Reserve Complex, 70 in Mkuzi Game Reserve, 30 in Ndumu Game Reserve, 40 in the Itala Game Reserve, four in the Weenen Nature Reserve and 10 in the East Shores Nature Reserve, St. Lucia. Hitchins (1984) reviewed the translocation of 138 from the Corridor linking Hluhluwe and Umfolozi Game Reserves to reserves in Natal, the Transvaal and Bophuthatswana. The stock presently held in the Addo National Park Cape Province arose from an importation from East Africa of the subspecies D. b. michaeli.

The early history of the species in this part of Africa is one of over-exploitation to the verge of extinction. Only the proclamation of reserves in Natal in 1897 came just in time to allow for their rehabilitation. Through careful conservation the Natal Parks Board has within recent years been able to make available surplus stock from their reserves for translocation to other safe areas with the result that today there is a healthy and growing population in South Africa and it has been deemed possible to remove the species from the Endangered category to that of Vulnerable. Providing the present processes continue it may in time be possible to downgrade them still further and perhaps even to remove them from the list altogether.

It is fortunate that there remain many safe areas within their former range into which they can be reintroduced but they are unfortunately not suitable for introduction to the smaller reserves to which the public has access on

foot, owing to their unpredictable nature.

The nominate form, D. b. bicornis, described from a specimen from the "Cape of Good Hope" is now extinct.



ORIBI **VULNERABLE**
Oorbietjie

Ourebia ourebi ourebi (Zimmermann, 1783)

1783. Antilope ourebi Zimmermann, Geographische Geschichte 3: 268. Cape of Good Hope. Uitenhage district according to Roberts (1951: 337).

Order Artiodactyla **Family Bovidae**

Present distribution

They occur in the south-eastern Transvaal; the extreme north-eastern parts of the Orange Free State; in the north-western, and the central western and southern parts of Natal; in the northern parts of the Transkei and in the Bathurst District of the eastern Cape Province. Throughout their whole range their distribution is today patchy and discontinuous.

Former distribution

Their distribution was probably less fragmented and may even have been continuous from the south-eastern Transvaal southwards and certainly extended west from the Bathhurst area to at least the Uitenhage district and probably to the Langkloof (Thunberg, 1795).

Habitat

They occur on open grassland on flat to gently undulating terrain (D.T. Rowe-Rowe, in litt.) with a short grass cover or with scattered cover in the form of stands of tall grass or scattered scrub.

Habits

They occur in pairs or a family party of a male with up to two females and their offspring. Family parties may join up temporarily to form small loose groups of up to a dozen (Ansell, 1960). Diurnal they lie up during the heat of the day in stands of tall grass. In Natal, Oliver, Short & Hanks (1978) found that the males had a home range of about 49 ha; in the Transvaal, P.C. Viljoen (1982) gives a figure of 34 ha and Bezuidenhout & Long (1983) 26,4 ha in the eastern Cape Province. Assiduous markers, oribi nip off the ends of tall grass stems and insert the standing tips into the preorbital glands which leaves a black secretion on them. Inquisitive, on being disturbed, they will run off a short distance, stand and gaze back at the source of the disturbance or even walk back towards it.

Breeding in the wild

Seasonal breeders, the main lambing season falls during the summer months with occasional records at other times of the year. A single lamb is born after a gestation period of about 210 days (Kenneth & Ritchie, 1953; P.C. Viljoen, 1982). The female hides her lamb in tall grass when she moves off to forage. The lying-up period lasts for about four weeks. See also Rowe-Rowe (1983).

Breeding potential in captivity

There is little information available to judge their potentialities. The Johannesburg Zoo has bred the species but unfortunately lost the progeny.

Reasons for decline

Degradation of their habitat by agricultural and other types of development, bush encroachment, overexploitation, hunting with dogs and poaching appear to be the main reasons.

Numbers in captivity

The Johannesburg Zoo has two males and four females (1985).

Protective measures in operation

The oribi is protected by legislation in all four provinces of the Republic. In the Transvaal it occurs in the following four nature reserves: Sterkspruit, Jericho Dam, Rustenburg and Steenkampsberg (R.D. Carr, pers. comm.) and has been reintroduced to the Kruger National Park. In the Orange Free State they occur in the Golden Gate Highlands

National Park. The whole of the population, amounting to 240 individuals, still remaining in the eastern Cape Province, is scattered over a series of privately owned properties (Bezuidenhout & Long, 1985).

Protective measures proposed

Recommendations have already been put forward by Bezuidenhout & Long (1985) to the Divisional Council of Dias for the establishment of a reserve in the eastern Cape Province for oribi. The situation of the populations, especially those in reserved areas in the other provinces, should be periodically monitored as the species appears particularly sensitive to changes in their habitat.

Current research

B. K. Reilly of the Eugène Marais Chair of Wildlife Management, University of Pretoria has recently completed an MSc study on the habitat utilization by this species in the Golden Gate Highlands National Park, Orange Free State.

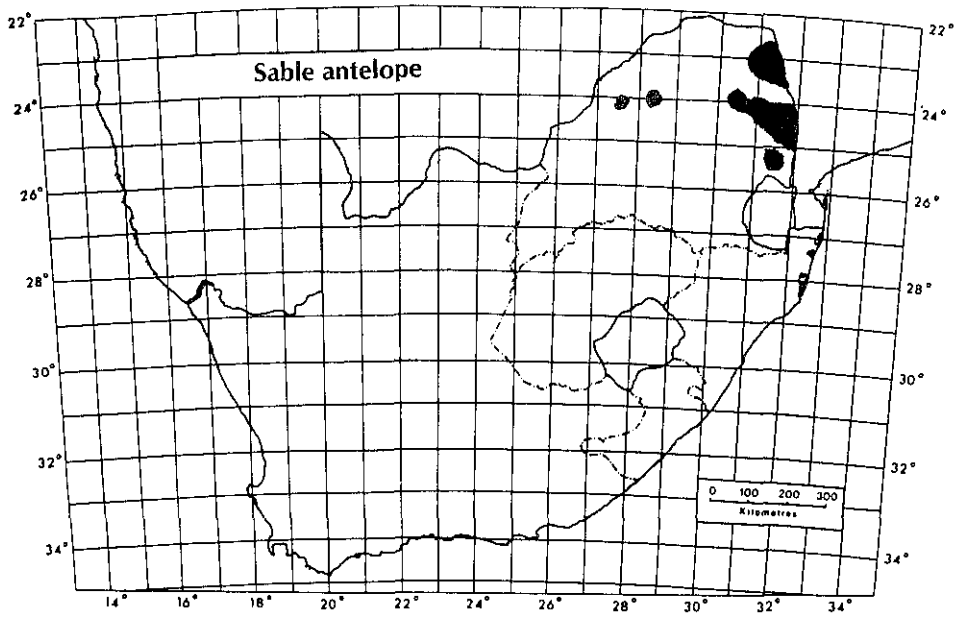
The Natal populations are monitored both on nature reserves and on private land by the Natal Parks Board. Rowe-Rowe and Scotcher (in press) discuss population limitation in the Drakensberg. See also Mentis (1978); Rowe-Rowe (1982a).

Remarks

The habitat requirements of this species appear to be highly specialized. On cattle ranches they live in harmony with cattle providing the area is not overgrazed. On the other hand if the cattle are removed and the grassland allowed to thicken up this can have an adverse effect on the species. In extreme cases, where bush encroachment follows, oribi have been known to disappear (parts of Mashonaland, Zimbabwe). Agricultural development destroys the habitat for oribi.

In Natal Howard & Marchant (1984) dealt with the status and distribution of the species on private land and gave details of population trends during the past 10 years. Oliver, Short & Hanks (1978) examined population ecology and Rowe-Rowe (1983) discussed habitat preferences and coexistence with other antelope and various aspects of oribi ecology and population dynamics are included in Rowe-Rowe (1982a; 1983).

In Natal oribi occur on 11 game and nature reserves and Howard & Marchant (1984) give details of oribi distribution on private lands. The nature of their habitat is such as to be prone to agricultural development and consequently is being lost to cultivation. Heavy grazing of grassland by livestock is altering its composition and leading to reduction in cover (D.T. Rowe-Rowe, in litt.). Howard & Marchant (1984) record that oribi have disappeared from 25% of their former range in Natal and that on 28% of private lands landowners report declining numbers.



SABLE ANTELOPE **VULNERABLE**
Swartwitpens

Hippotragus niger niger (Harris, 1838)

1838. Aigocerus niger Harris, Proceedings of the Zoological Society, London: 2. Cashan Mountains, near Pretoria (=Magaliesberg, fide Shortridge, 1934, 2: 577) where now extinct.

Order Artiodactyla **Family Bovidae**

Present distribution

Occur in parts of the Letaba, Pilgrims Rest and Waterberg districts, Transvaal and in the Kruger National Park. Even in the Kruger National Park their distribution is discontinuous. The bulk of the population occurs north of the Letaba River separated from a smaller population which occupies an area just north of the Sabie River southwards.

Former distribution

While the limits within which they formerly occurred are very similar to those at present, within these it would have been less patchy and discontinuous and numbers would probably be greater than they are today.

Habitat

Savanna woodland with adjacent vleis and grassland where there is water. They avoid woodland where the tree density is high and areas where the grassland is overutilized or the grass short.

Habits

They are diurnal and gregarious, occurring in herds of 20 to 30, which aggregate to form much larger but temporary herds of up to 200. The bulls are seasonally territorial, defending their territories by displays which may develop into fighting with roaring, horn clashing and sparring. Serious fighting may lead to the death of contestants. The nursery herds consist of females with their young of both sexes and while the young females may remain with the herd for life, the young males are evicted by the territorial bull at the age of about three years when they then join the bachelor herds. The nursery herds move over the territories of the males which, during the rut, endeavour to retain them by herding. Within the nursery herds one or more females establish dominance and take the lead in their movements, watching for danger and directing flight from it, the remainder of the herd sorting themselves into a hierarchy (Wilson, 1975). The nursery herds have, in the Kruger National Park, home ranges of 200 to 400 ha (Joubert, 1974) the territorial bulls home ranges of 25 to 40 ha (Wilson, 1975).

The herds rest up in the heat of the day in the shade of the woodland. Predominantly grazers, they also browse especially towards the end of the dry season when the nutritional value of the grass is low. Selective feeders they have a preference for the fresh growth of grasses of medium height.

Breeding in the wild

Seasonal breeders, in the Transvaal single calves are dropped in late summer from January to March. The females leave the herds to give birth, the young hiding themselves in cover while the female forages. When the calf is able to move with its mother they rejoin the herd. The calves are reddish-brown in colour, the facial markings indistinct.

Breeding potential in captivity

Breeds well in captivity when the herd size is kept to about a dozen. When allowed to exceed this number the dominant male is inclined to kill females (National Zoological Gardens, Pretoria). The International Zoo Yearbook (1984) reports that the species has been bred successfully in zoos throughout the world.

Reasons for decline

Degradation of habitat by domestic stock, habitat destruction by agriculture and other human developments, and in the past overexploitation by hunting.

Numbers in captivity

National Zoological Gardens, Pretoria has two males and 13 females (1985) and the International Zoo Yearbook (1984) shows that they are widely held by overseas zoos.

Protective measures proposed

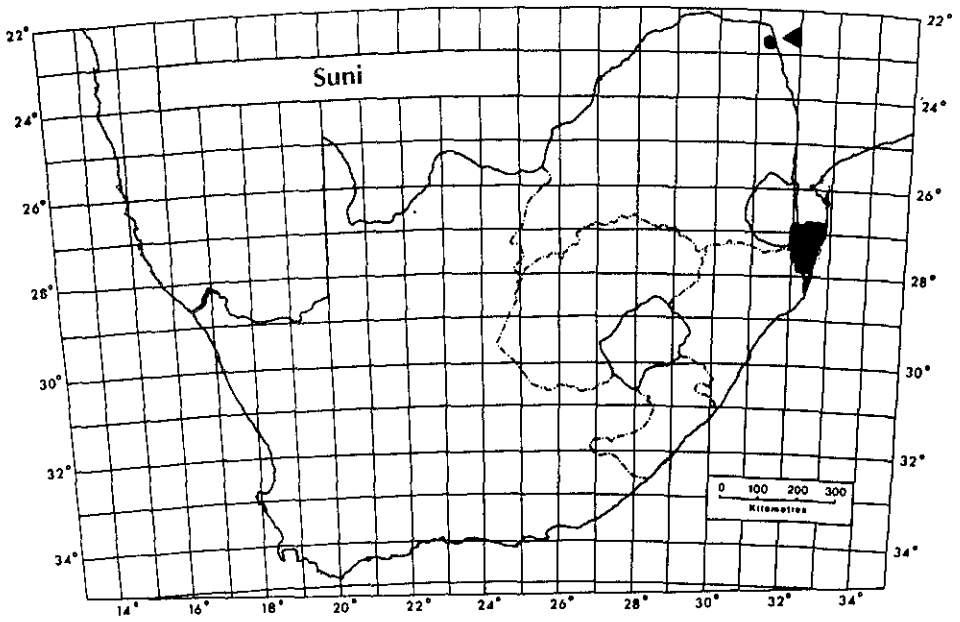
Establishment of viable populations in suitable areas by translocation.

Current research

None, but see: Child (1968); Child and Wilson (1964); Grobler (1974); Joubert (1972, 1974), Wilson (1969); O. E. Wilson (1975); Wilson, Bartsch, Bigalke & Thomas (1974).

Remarks

Recently introduced to the Magudu area in Natal (Howard & Marchant, 1984) and to game farms in the northern and eastern Cape Province. In the Transvaal it was estimated that there were, at January 1985, 1 413 on private land and 2 056 in the Kruger National Park, giving a total for the province of about 3 500.



SUNI **VULNERABLE**
Soenie

Neotragus moschatus zuluensis Thomas, 1898

1898. Neotragus livingstonianus zuluensis Thomas, Annals and Magazine of Natural History (7) 2: 317. Umkuja (=Umjuzi) Valley, KwaZulu.

Order Artiodactyla **Family Bovidae**

Present distribution

In the Transvaal confined to a restricted area in the extreme northern parts of the Kruger National Park and to the north-eastern coastal parts of KwaZulu in the area known as Maputaland.

Former distribution

Unknown, but probably in any suitable habitat on the coastal lowland of Maputaland.

Habitat

Suni are limited by habitat structure and will inhabit a wide range of vegetation communities provided there is a high woody stem density and sparse ground cover. In Natal they are found in their highest densities in sandveld thicket and forest.

Habits

In disturbed areas they are crepuscular or nocturnal. In other areas they are active in daylight. Activity bouts alternate with bouts of rest or rumination when they will lie up in dense cover. Occur singly, in pairs or in family parties of a pair and their offspring. The nature of the habitat makes observation difficult and they are extremely wary so that only a fleeting glimpse is usual. When disturbed they dart away with a jinking run often vocalizing with a high-pitched 'sneeze-snort'. They have small territories and sometimes use communal latrines. They are predominantly foragers, feeding mainly on fallen leaves on the forest floor.

Breeding in the wild

A single young is born at any time of the year. Some records indicate a birth peak between August and February.

Breeding potential in captivity

Very good. Under the correct conditions they are easy to keep, adopting a diet of fresh lucerne and commercial antelope cubes. They breed readily with no conflict as long as adult males are separated.

Reasons for decline

Great reductions have occurred. Land clearance for agriculture has affected the southern parts of their range around Hluhluwe and Mkuze. Within conservation areas overpopulations of browsers (particularly nyala) has led to overutilization of habitat which opens up the understorey and reduces cover for suni. In other areas local extinctions have occurred in areas unprotected by conservation patrols, by excessive hunting using dogs and snares.

Numbers in captivity

A small breeding colony (10+) is held at De Wildt by the National Zoological Gardens. There are a number in zoos in the USA. Dallas Zoo has a good breeding record.

Protective measures in operation

Protected by legislation in the Transvaal under Section 2 protected game and in Natal as a protected species. In both provinces they occur in National Parks or reserves.

Protective measures proposed

None.

Current research

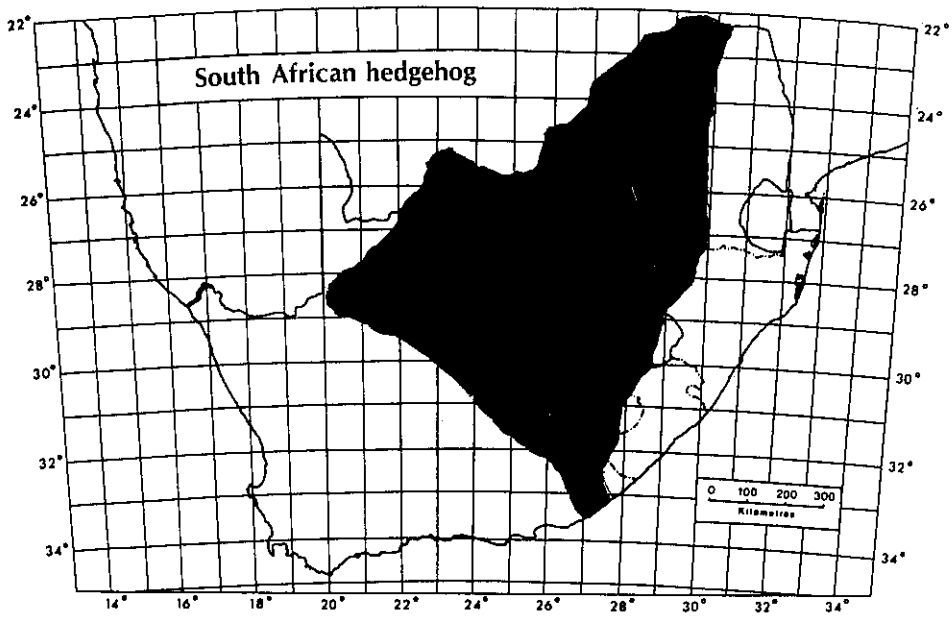
A study of the ecology of the suni in Natal, which has been in progress for five years, is nearing completion. The work was done by D. Lawson, University of Natal/Natal Parks Board Research Fund. Howard & Marchant (1984) discussed status, distribution and population trend. Distribution on private land is monitored by Natal Parks Board.

Remarks

Outside the Kruger National Park only one viable population remains in the Tembe Elephant Reserve in KwaZulu. However, there is suitable habitat outside conservation areas and if these areas can be protected this species shows high potential for reintroduction.

Extralimitally they have a wide distribution in the eastern parts of Africa as far north as Kenya. Their occurrence in the Republic is marginal at the extreme southernmost parts of their range. Declining in Malawi in areas that once held high densities (A. Hall-Martin, pers. comm.). No information concerning their status in Mozambique is available but Tello & Van Gelder, (1975) suggest that they are on the decline in the face of increasing nyala populations.

THE RARE SPECIES



SOUTH AFRICAN HEDGEHOG **RARE**
Suid-Afrikaanse krimpvarkie

Atelerix frontalis (A. Smith, 1831)

1831. Erinaceus frontalis. A. Smith, South African Quarterly Journal 1 (5): 10. Restricted to the northern parts of the Graaf Reinet district, Cape Province, by Ellerman. Morrison-Scott & Hayman, Southern African Mammals 1758 to 1951: a reclassification: 18, 1953.

Order Insectivora **Family Erinaceidae**

Present distribution

In the Transvaal they occur widely west of about 31°E; throughout the Orange Free State and western Lesotho and in the northern and eastern parts of the Cape Province south to the Grahamstown district. Not recorded from Natal, Sclater's (1901) record from this province is believed to be an error.

Former distribution

Not known.

Habitat

Grassland, open thornveld and karroid associations. They have adapted themselves to living in urban and peri-urban gardens where there is a plentiful supply of insects, earthworms and other food.

Habits

Noctural and generally solitary, they are little in evidence during the winter months which they spend in a state of torpidity, only becoming active and feeding during spells of warm weather. Particularly active during the summer months with the onset of the rains during which time they build up fat reserves against the colder period. They rest curled up under matted grass or in piles of vegetable debris or in holes in the ground. Slow moving, when disturbed they show a surprising turn of speed which they accomplish by rising on their long legs and running or will curl up in a ball, which encloses the head and soft underbelly.

Breeding in the wild

The young are born during the summer months after a gestation period believed to be about 35 days but requiring confirmation. The average number in a litter is four, one to nine being recorded. At birth the young are flattish and elongate oval in shape, the tips of the spines just showing in the skin. They are born blind and naked in sheltered, debris-lined nests in dry places or in holes similarly lined. The young accompany their mothers in foraging from the age of about 14 days old.

Breeding potential in captivity

Poor. Given large enclosures and good cover litters of up to four young have been successfully reared but in captivity females are inclined to prey on the young in their early stages of life.

Reasons for decline

No factual evidence is available to confirm that they have declined in range or in numbers. They are palatable to indigenous people and many are killed annually for food and on roads by vehicles which might constitute a threat. Frequently kept as pets, although legislation forbids this except under permit, statements have been made that they were more freely available in former times for this purpose. Agricultural development degrades and diminishes the habitat available to this species while on a lesser scale garden development in urban and peri-urban areas may even improve it. Vulnerable to predation by man and his dogs. Frequently sold in "muti" shops.

Numbers in captivity

The Mammal Research Institute, University of Pretoria is presently collecting live specimens for their project mentioned under Current Research. The Bloemfontein Zoo has two males and five females.

Protective measures in operation

Protected under Schedule 2 in the Cape Province and Transvaal Ordinances and Schedule 1 in the Orange Free State. In the Transvaal, occur in private and other types of nature reserves.

Protective measures proposed

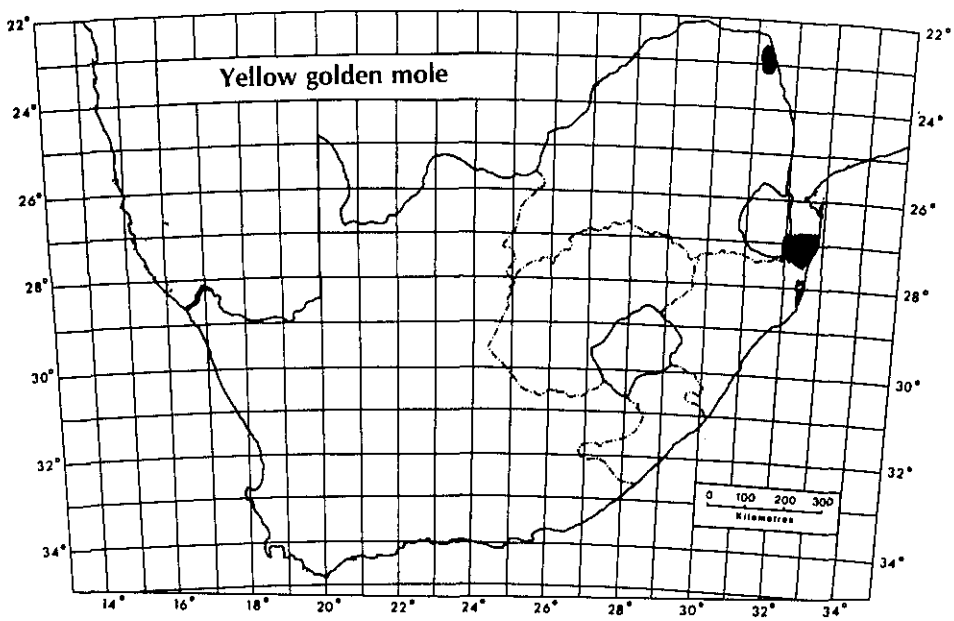
Strict enforcement of current legislation is necessary.

Current research

Miss W. van der Colff of the Mammal Research Institute, University of Pretoria is engaged in an investigation of certain aspects of the life history of the species.

Remarks

They probably occur in reserved areas in the Orange Free State and the Cape Province.



YELLOW GOLDEN MOLE **RARE**
Geel kruipmol

Calcochloris obtusirostris limpopoensis (Roberts, 1964)

1946. Chrysotricha obtusirostris Roberts, Annals of the Transvaal Museum 20: 311. Masiene, north of the mouth of the Limpopo River, Mozambique. The Transvaal range of the species.

Calcochloris obtusirostris chrysillus (Thomas & Schwann, 1905).

1905. Amblysomus chrysillus Thomas & Schwann, Proceedings of the Zoological Society, London 1: 261. Delagoa Bay (=Maputo) coastal Mozambique. The northern KwaZulu range of the species.

Order Insectivora **Family Chrysochloridae**

Present distribution

Confined to the extreme north-eastern parts of the Transvaal in the Pafuri area of the Kruger National Park and from northern KwaZulu.

Former distribution

Unknown but unlikely to be different from the present.

Habitat

Occur in light sandy soils, sandy alluvium and coastal sand dunes apparently being unable to burrow in more compacted substrate.

Habits

Live in subsurface burrows like other golden moles; the burrows may reach to a depth of about 20 cm and have chambers in which they rest. They are particularly active after rain.

Breeding in the wild

No data available.

Breeding potential in captivity

Unknown.

Reasons for decline

A lack of data precludes a knowledge as to whether they have declined in numbers or distributional range.

Numbers in captivity

None.

Protective measures in operation

None.

Protective measures proposed

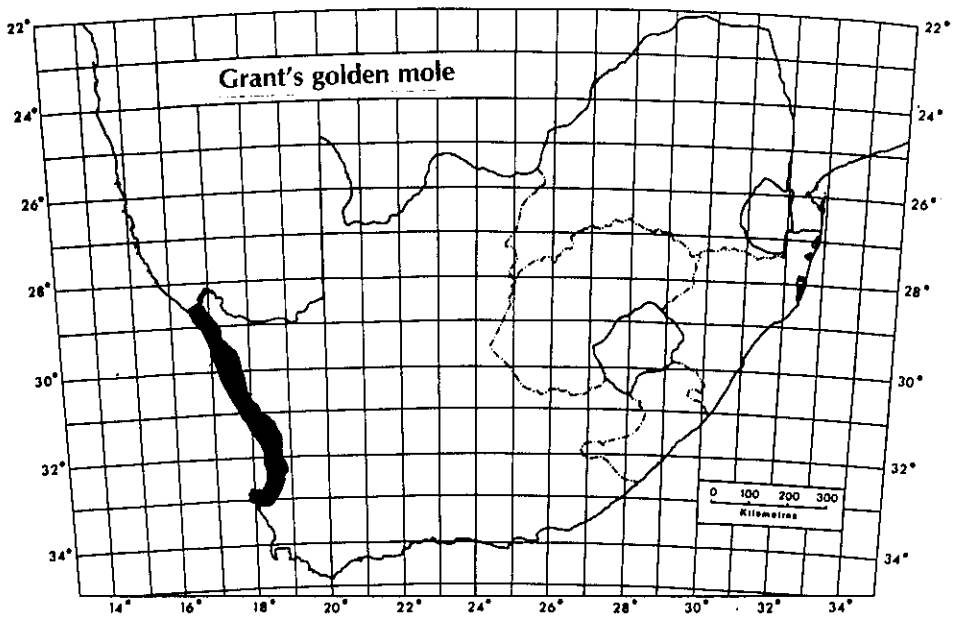
None.

Current research

None.

Remarks

Although restricted in distribution in the Republic this species occurs in south-eastern Zimbabwe and widely in the southern parts of Mozambique. It is endemic to the Southern African Subregion. It is included as it has a marginal distribution in the Republic.



GRANT'S GOLDEN MOLE **RARE**
Grant se kruipmol

Eremitalpa granti granti (Broom, 1907)

1907 Chrysochloris granti Broom, Annals and Magazine of Natural History (7) 19: 265. Garies, Little Namaqualand, northwestern Cape Province.

Order Insectivora **Family Chrysochloridae**

Present distribution

Occur narrowly along the west coast of the Cape Province from St Helena Bay northwards to the Orange River.

Former distribution

Unknown but probably similar to its present distribution.

Habitat

Confined to sand dunes with a preference for those with scattered clumps of dune grass, Aristida sabulicola, (Coetzee, 1969).

Habits

Nocturnal, they "swim" through the loose sand leaving only faint traces of the subsurface runs and burrow to depths of over 50 cm. Holm (1969) followed the subsurface runs for distances of 5 800 m, noting that, where food was more freely available in sandy riverbeds, foraging distance was reduced to about 300 m.

Breeding in the wild

Holm (1969) recorded two females each with a single foetus in October but apart from this no further information is available.

Breeding potential in captivity

Unknown.

Reasons for decline

No information is available suggesting that they have declined in numbers or distributional range but in parts of their range diamond mining activities, which necessitate the removal of dunes, must have fragmented their habitat.

Numbers in captivity

None.

Protective measures in operation

None.

Protective measures proposed

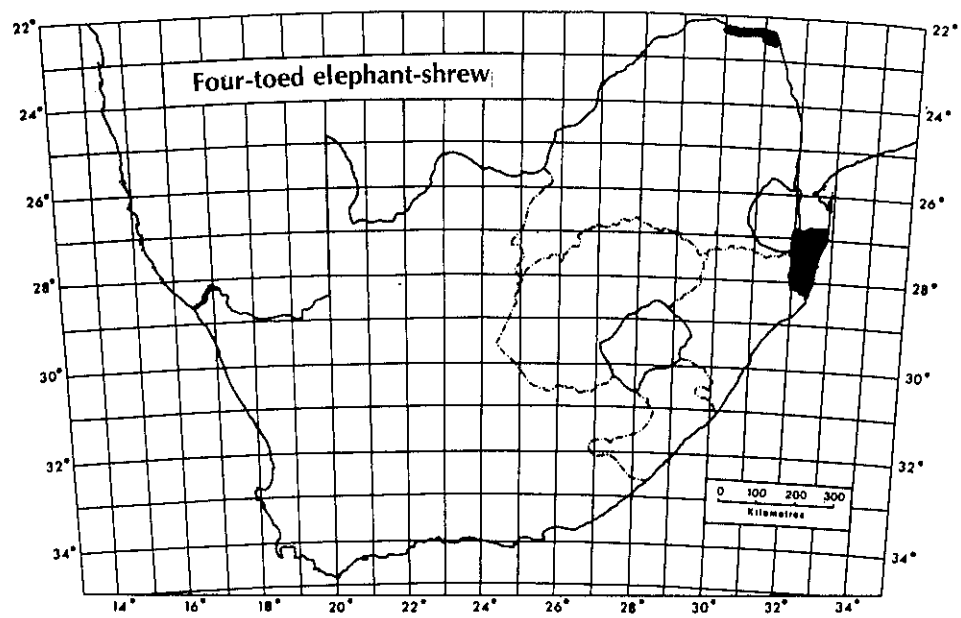
The proposed establishment of the Groen River National Park would ensure that a part at least of their habitat was secured for the future.

Current research

L. Fielden of the University of Natal, Pietermaritzburg, is engaged on a project on this species.

Remarks

While not protected in any way and not occurring in reserves in the Republic the nature of their habitat is such that at least sections will remain undisturbed. Their distribution extends northwards into the Namib Desert Park in Namibia, where they occur in similar habitat.



FOUR-TOED ELEPHANT-SHREW **RARE**
Bosklaasneus

Petrodromus tetradactylus beirae Roberts, 1913

1913. Petrodromus beirae Roberts Annals of the Transvaal Museum 4: 69. Zimbiti, Beira, Mozambique. The Transvaal range of the species.

Petrodromus tetradactylus warreni Thomas, Annals and Magazine of Natural History (9) 1: 364. Manguzi, northern KwaZulu. The northern Natal and KwaZulu range of the species.

Order Macroscelidea **Family Macroscelididae**

Present distribution

This species has a very restricted distribution in two areas: one the north-eastern Transvaal, in the riparian forests of the Limpopo and Pafuri Rivers and in adjacent areas of thicket; the other in the extreme north-eastern parts of Natal and KwaZulu in similar habitat.

Former distribution

Unknown but probably not very different from the present.

Habitat

Well developed riverine coastal and evergreen forest and thickets in rainfall areas in excess of 700 mm per year.

Habits

Diurnal and terrestrial they occur singly or in pairs resting in holes under tree roots, in termite mounds, under fallen logs or in dense underbush. They form runs from these shelters to feeding areas which are marked by bare patches in the ground litter about 70 cm between their centres, caused by their proceeding in jumps. When alarmed they stamp their hind feet and may utter a loud shrill squeak. Under stress they make a soft purring noise caused by vibration of the hind feet on the substrate.

Breeding in the wild

Litters of up to two young are born during the early part of the summer from about August to October.

Breeding potential in captivity

Unknown.

Protective measures in operation

The major part of the range of this species in the north-eastern Transvaal lies within the border of the Kruger National Park and is unlikely to be disturbed. Similarly in Natal and KwaZulu part at least of the habitat lies in reserves. No protective measures in either province are directed to the species itself.

Protective measures proposed

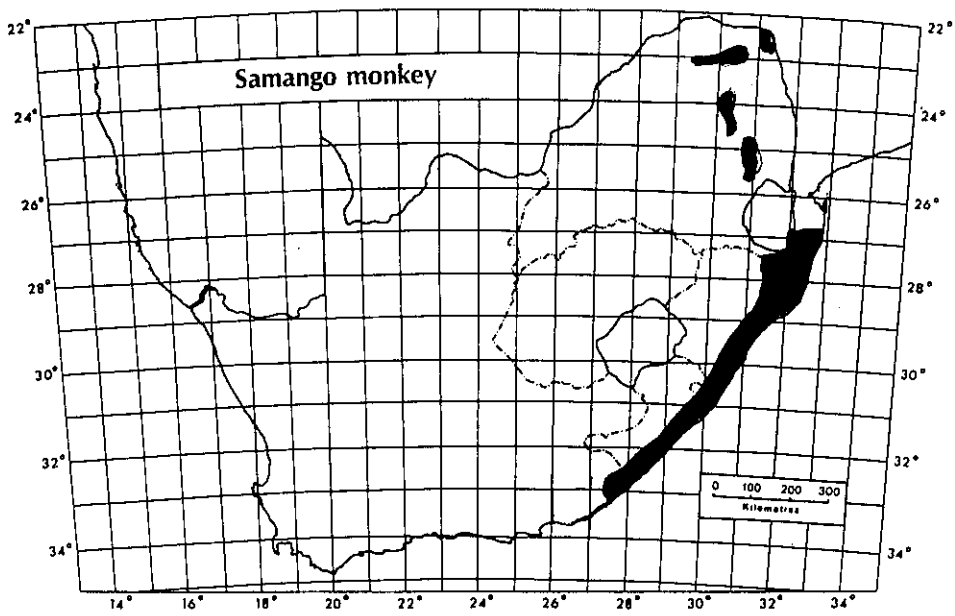
None.

Current research

The Family is presently under investigation by Dr P. Woodall of the Mammal Research Institute, University of Pretoria, who in due course intends to include this species in his investigations.

Remarks

Although restricted in distribution in the Republic this species occurs widely in the eastern and northern parts of Mozambique and in countries northwards including Zambia, Malawi, Tanzania and parts of Zaire. Although the species has a marginal distribution in the Republic it is in parts of its range quite common where there is suitable habitat.



SAMANGO MONKEY **RARE**
Samango-aap

Cercopithecus mitis labiatus I. Geoffroy, 1843

1843. Cercopithecus labiatus I. Geoffroy, Archives du Museum national d'Histoire Naturelle, Paris (1) 2: 555. (South) Africa. Ranges from the eastern Cape Province to KwaZulu and the northeastern Transvaal.

Cercopithecus mitis erythrarchus Peters 1852

1852. Cercopithecus erythrarchus Peters, Reise nach Mossambique, Säugethiere : 1. Quelimane, Inhambane, coastal southern Mozambique. The northestern coastal parts of Natal and KwaZulu.

Order Primates **Family Cercopithecidae**

Present distribution

Occurs in the north-eastern Transvaal in the Soutpansberg and in isolated forest patches in the Woodbush-Ohrigstad sector, with a single record of a troop which took up residence temporarily in dense riverine forest in the Pafuri area of the Kruger National Park. Recorded from the eastern parts of Swaziland, Natal, KwaZulu and coastally in the eastern Cape Province as far west as the Hogsback in the King Williams Town area.

Former distribution

Unknown. The historical record is vague so far as monkeys are concerned. Thunberg (1793 or 1795, 2: 40) records seeing a pet monkey in the possession of a farmer in the Montagu-Swellendam district, purported to come from the "Houtniquas wood" (the George or Outeniqua forest) in which the "legs were all black" which suggests that it was a samango, yet there are no historical records of their occurrence in the Tsitsikama forest east of this (Skead, 1980).

Habitat

Forest.

Habits

Diurnal and gregarious, living in troops of up to about 30 individuals, the numbers remaining relatively constant over long periods. In the small troops there is one adult male, in the larger up to three or more. They rest at night in trees hiding themselves among the foliage. The adult males act as sentinels for the troops and direct their movements. Aggression among members of the troops is rare, threats, in which the head is projected forwards with raised eyebrows, usually being sufficient to cause the submissive individual to move off. Adult males, however, will fight over females, grappling and biting each other.

Breeding in the wild

Seasonal breeders; a single young, rarely twins, is born during the summer months of September to April. The young becomes independent of its mother at about two months old.

Breeding potential in captivity

Will breed in captivity but there is no evidence to indicate whether they are easy to breed or otherwise.

Reasons for decline

Destruction of their forest habitat on which they are dependent and in parts competition with increasing numbers of vervet monkeys.

Numbers in captivity

The National Zoological Gardens, Pretoria has two males and a female (1985), the Tygerberg Zoo two males and three females, the Hartebeestpoort Snake and Animal Park a young pair, and the East London Zoo two males.

Protective measures in operation

Protected by legislation in the Transvaal under Schedule 1; in the Cape Province under Schedule 2 and listed as protected in Natal.

Protective measures proposed

None.

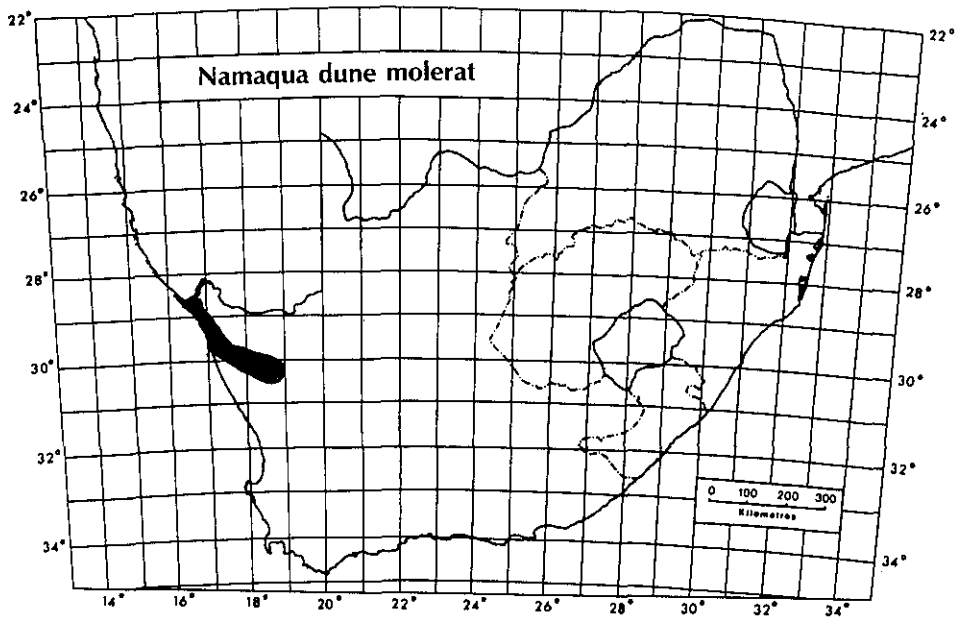
Current research

An investigation of their ecology is in train at the University of Natal, Pietermaritzburg, by M. Laws.

Remarks

The forest habitat of this species has been massively fragmented and in parts totally destroyed by development throughout its range in the Republic. In Natal Mathias & Bourquin (1984) report that 71% of the Natal coastal forests south of the Tugela River have been destroyed and in the midlands record that the Karkloof forests have been reduced from 32 400 ha in 1880 to 4 500 ha today.

An investigation is in progress on the extent of damage caused by this species on pine forests, particularly in the Entabeni and Soutpansberg districts in the Transvaal. This is being conducted by the Forestry Division of the Department of Environment Affairs.



NAMAQUA DUNE MOLERAT **RARE**
Namakwa-duinmol

Bathyergus janetta Thomas & Schwann, 1904

1904. Bathyergus janetta Thomas & Schwann, Abstracts, Proceedings of the Zoological Society, London 2: 6; Proceeding of the Zoological Society, London 1: 180. Port Nolloth, coastal northwestern Cape Province.

Order Rodentia **Family Bathyergidae**

Present distribution

Confined to a narrow sector of the north-western Cape Province.

Former distribution

Unknown, probably similar to its present distribution.

Habitat

Coastal sand dunes and inland in areas of driven sand and sandy alluvium.

Habits

Live in subterranean burrow systems, throwing up mounds at intervals along the main burrow line.

Breeding in the wild

Unknown.

Breeding potential in captivity

Unknown.

Reasons for decline

At least in the extreme northern coastal parts of their range, in the vicinity of Orangemund, the removal of the sand dunes in diamond mining operations will have destroyed part of their habitat.

Protective measures in operation

None.

Protective measures proposed

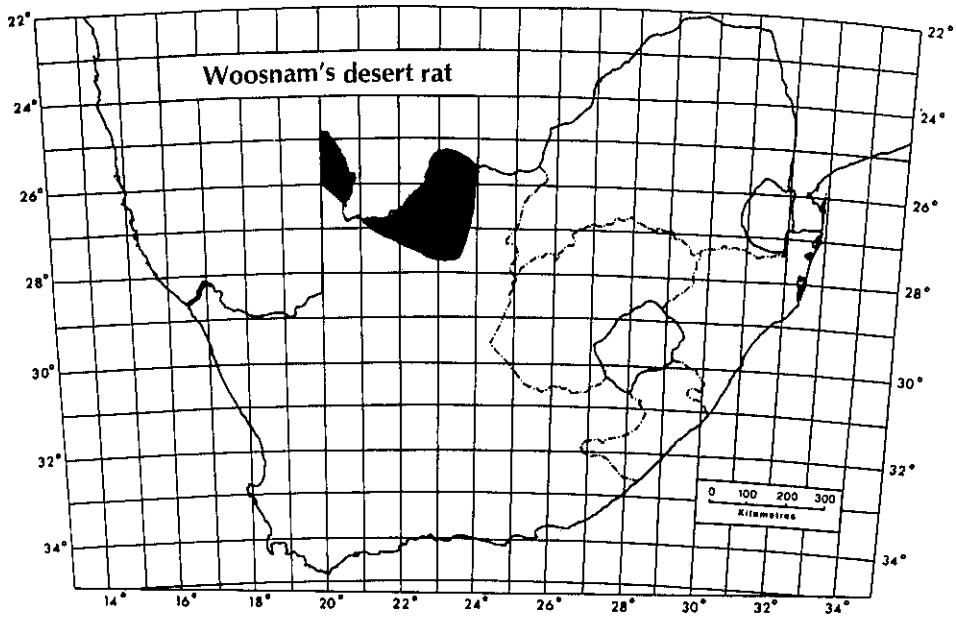
The proposed establishment of the Groen River Naional Park would ensure that part of their habitat was secure for the future.

Current research

None.

Remarks

At least in part of their range, particularly that inland from the coast, the very nature of the habitat and the area in which they occur are unlikely to be seriously disturbed. The species is included on account of its restricted distribution.



WOOSNAM'S DESERT RAT **RARE**
Woosnam se woestynrot

Zelotomys woosnami (Schwann 1906)

1906. Mus woosnami Schwann, Proceedings of the Zoological Society, London: 108. Molopo River, border of northern Cape Province and southern Botswana.

Order Rodentia **Family Muridae**

Present distribution

Restricted to parts of the northern Cape Province from the Kalahari Gemsbok National Park eastwards, in the Molopo River valley, to Maralaleng and south to about Upington and Kuruman.

Former distribution

Unknown.

Habitat

Sandy soils with a sparse cover of scrub.

Habits

Nocturnal, terrestrial and solitary. Burrow to about 55 cm below ground level, the burrows with one or more chambers lined with shredded grass (Birkenstock & Nel, 1977). Appear to use the burrows of other rodents, particularly gerbils, Tatera spp and recorded as using holes among the roots of thorn trees (Roberts, 1951). Wherever they have been taken gerbils, Tatera spp were particularly common. Gerbil hair has been recorded in their stomach contents which suggests that to some extent they may be carnivorous. Adept climbers, they can jump from branch to branch over distances of up to 20 cm (Birkenstock & Nel, 1977).

Breeding in the wild

They apparently have a high breeding potential, as females with up to 11 foetuses are on record. While information is scanty, the young appear to be born during the summer months.

Breeding potential in captivity

Wild caught individuals placed in pairs in cages are mutually intolerant and one is usually killed and then partially consumed. It appears that females allow the males to approach and cohabit with them only when in oestrus. However, if allowed to become familiar with one another through a barrier they will settle and breed successfully (Birkenstock & Nel, 1977).

Reasons for decline

A lack of data precludes a comment on whether they have declined in numbers or in range.

Numbers in captivity

None.

Protective measures in operation

None applied to the species, but they occur in the Kalahari Gemsbok National Park.

Protective measures proposed

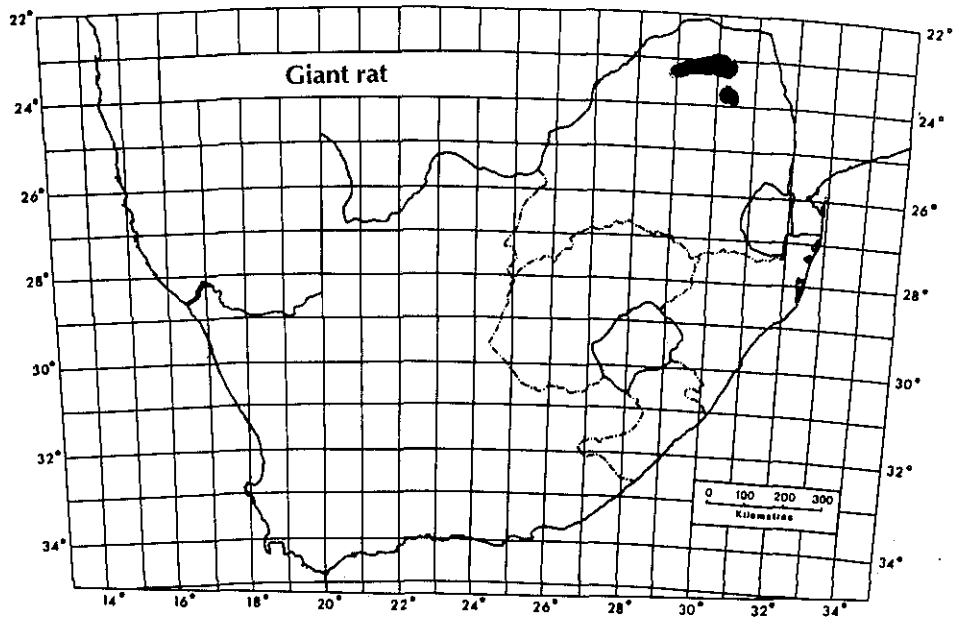
A lack of data precludes a recommendation.

Current research

None.

Remarks

This species is endemic in the Southern African Subregion and occurs in northern and eastern Namibia and widely in Botswana. It is however, rarely trapped and appears to be uncommon throughout its range.



GIANT RAT
Reuserot

RARE

Cricetomys gambianus ansorgei Thomas, 1904

1904. Cricetomys ansorgei Thomas, Annals and Magazine of Natural History (7) 13: 412. Pungo Andongo, northern Angola.

Order Rodentia

Family Cricetidae

Present distribution

Occur in the Soutpansberg in the northern Transvaal and in northern KwaZulu.

Former distribution

Unknown, but the forest and scrub forests of the Soutpansberg were at one time more extensive than at present (Acocks, 1975) and the species might therefore have been correspondingly more widely distributed in this sector.

Habitat

Forest or woodland with dense underbush.

Habits

Crepuscular and terrestrial, resting in relatively short burrows under rocks or other substantial surface cover in burrows leading to a cup-shaped nest lined with vegetable debris and the unpalatable remains of food, stones, bones and other debris. Will also use holes in termitaria, the entrance down the vertical ventilation shaft. Once in the burrow they usually block the entrance with debris. They climb for wild fruits and are avid diggers for bulbs and tubers. Omnivorous but predominantly vegetarian they carry back food to the burrows either in their cheek pouches or if it is large, in their mouths.

Breeding in the wild

Litters of two to four young are born early in the summer months from August to October after a gestation period of 42 days (Morris, 1963).

Breeding potential in captivity

Good, the young are easy to rear.

Reasons for decline

There is no evidence which suggests that they have declined in numbers. The growing of orchard crops such as mangoes, macadamia nuts and avocado pears adjacent to their forest habitat may even have led to an increase in their numbers. In the peri-urban areas of cities such as Harare, Zimbabwe, they flourish on the development of gardens, especially vegetable gardens and find suitable cover in hedges and garden shrubberies.

Numbers in captivity

Not known.

Protective measures in operation

None.

Protective measures proposed

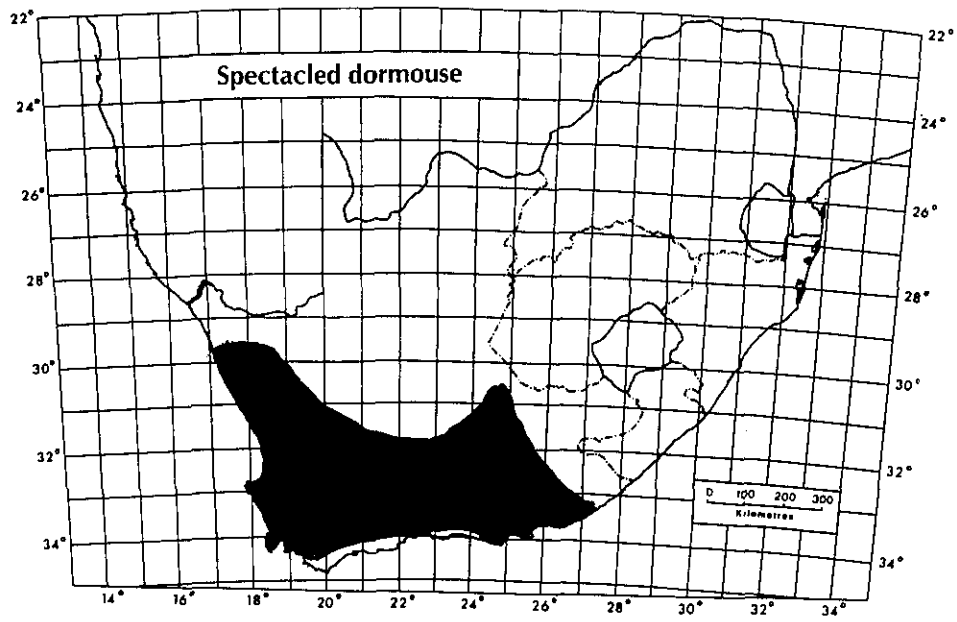
A lack of data precludes a recommendation.

Current research

None, but see Knight (1984).

Remarks

Included on account of their limited distribution in the Republic.



SPECTACLED DORMOUSE
Gemsbokmuis

RARE

Graphiurus ocularis (A. Smith, 1829)

1829. Sciurus ocularis A. Smith, Zoological Journal 4: 439. Near Plettenberg Bay, east of Knysna, southern Cape Province.

Order Rodentia

Family Gliridae

Present distribution

Widely but discontinuously distributed in the Cape Province, except in the north and north-west and in the coastal areas in the south-west with a single record in literature from the south-western Transvaal from Linokana, near Zeerust, the whereabouts of the specimen being unknown. (Roberts, 1951).

Former distribution

Unknown.

Habitat

Associated with krantzes and rocky areas, have also been taken in trees and buildings.

Habits

Poorly known except that they are nocturnal and predominantly terrestrial and to some extent arboreal.

Breeding in the wild

Unknown. Captured in the wild a female produced six young in captivity. (J. Jarvis in Meester, 1976).

Breeding in captivity

Unknown.

Reasons for decline

There is no evidence to show they have declined either in number or range.

Number in captivity

None.

Protective measures in operation

None directed at the species but they occur in the Karoo National Park and widely in Forestry areas in the western and southern Cape Province.

Protective measures proposed

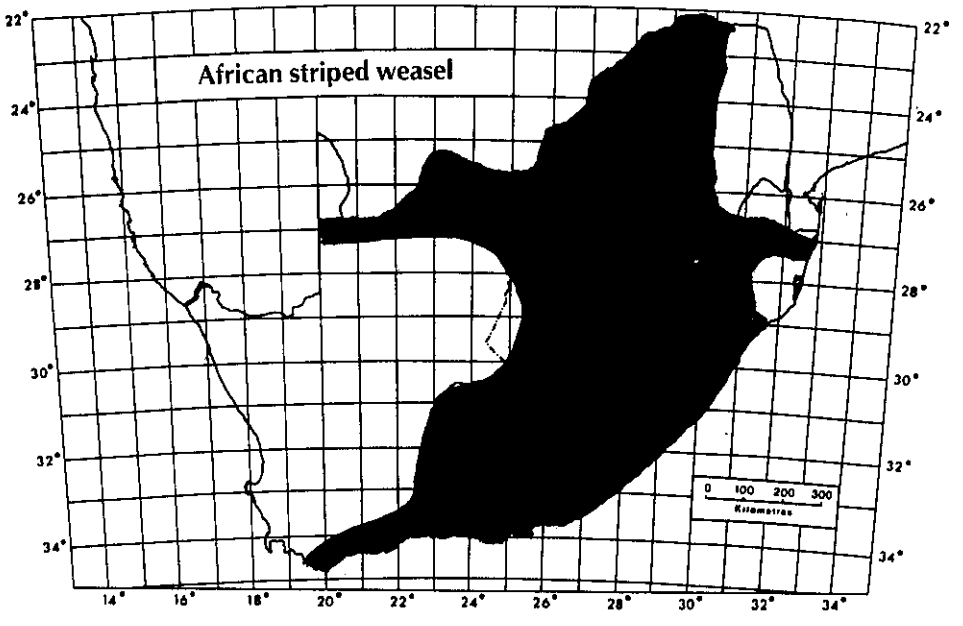
None.

Current research

J. Breytenbach, Saasveld Forestry Research Station, George is obtaining information on the species relative to veld burning and density of populations in this area. See also Channing (1984).

Remarks

Doubt has been expressed by Meester (in prep.) as to the relationship of this species with the Senegal species, Myoxus cattoirii, J. B. Fischer 1829 which Ellerman (1940) and Genest-Villard (1978) include as a synonym, as there is a lack of records from the intervening area. This species is poorly represented in collections and the nature of its habitat is such as to render its distribution patchy and discontinuous and to protect it from interference.



AFRICAN STRIPED WEASEL **RARE**
Slangmuishond

Poecilogale albinucha albinucha (Gray, 1864)

1864. Zorilla albinucha Gray, Proceedings of the Zoological Society, London: 69. Locality unknown; eastern Cape Province fide Roberts, Annals of the Transvaal Museum 14: 226, 1931. The species range in the southern and eastern Cape Province.

Poecilogale albinucha transvaalensis Roberts, 1926.

1926. Poecilogale albinucha transvaalensis Roberts, Annals of the Transvaal Museum 11: 247. Tzaneen, northeastern Transvaal. The species range in the central and northeastern Transvaal.

Poecilogale albinucha bechuanae (Roberts, 1931)

1931. Poecilogale albinucha lebombo Roberts, Annals of the Transvaal Museum 14: 226. Ubombo, northern Zululand, Natal. The species range in Natal.

Not all these subspecies may be valid.

Order Carnivora **Family Mustelidae**

Present distribution

Occur in the northern, north-eastern, eastern and southern Cape Province, the Transvaal, Orange Free State, Ciskei, Transkei and Natal. Except in Natal, records of this species are few and scattered and they appear to be less common in the western and northern parts of their range.

Former distribution

Unknown, but probably very similar to their present distribution.

Habitat

Open savanna woodland and grasslands.

Habits

Nocturnal with some diurnal activity, terrestrial and generally solitary. Owing to their small size, short legs and low slung body, observations of the species in the wild are meagre. Avid diggers, they excavate shallow burrows about five centimetres in diameter which end in chambers 10 to 15 cm in diameter (Rowe-Rowe, 1975).

Breeding in the wild

In Natal litters of one to three young are born in spring or summer after a gestation period of 32 days. A single litter is produced in a season but if the young die at an early stage, the female may have a second litter (Rowe-Rowe, 1978a). During the early stages of their life the young may be carried by the mother by grasping them in her mouth across the shoulders or middle of the body or later by the scruff of the neck. The young are weaned by the time they are 11 weeks old, small mice being killed at the age of about 13 weeks (Rowe-Rowe, 1978b).

Reasons for decline

There is no evidence that they have declined either in range or numbers. D.T. Rowe-Rowe (in litt.) noting that the species lives almost entirely on rodents and insectivores suggests that it is subjected to pressures caused

by the reduction in numbers of the prey species in areas subjected to intensive agriculture and grazing. Increasing numbers of dogs in rural areas compete with the weasel for food and often kill them (D.T. Rowe-Rowe, in litt.).

Numbers in captivity

Unknown.

Protective measures in operation

Listed in the Ordinance in the Cape Province under Schedule 2 as protected wild animals.

Protective measures proposed

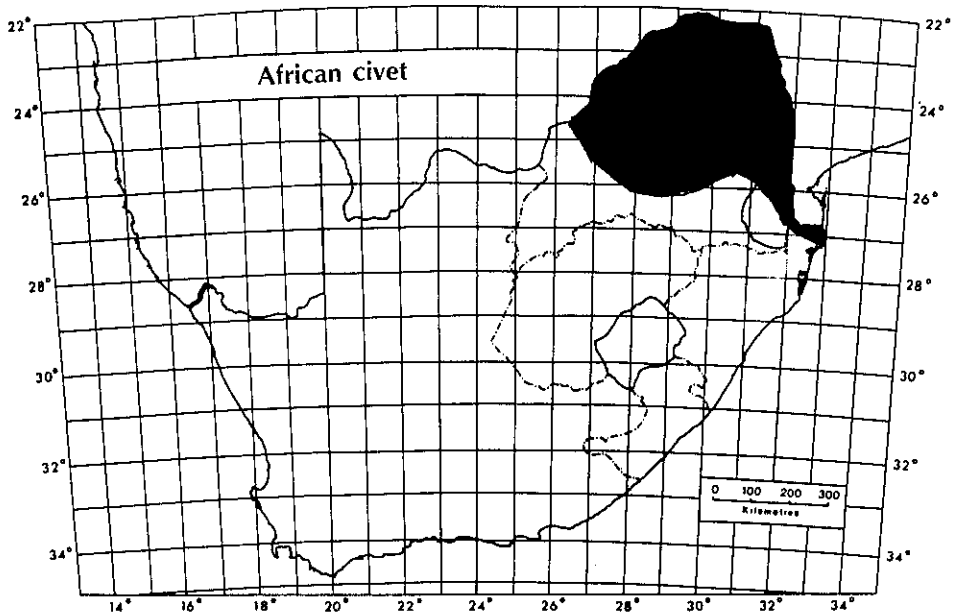
None. In the Transvaal and Natal they are recorded from a number of game reserves.

Remarks

The status and ecology of the species are best known in Natal simply because it was the subject of a special investigation by a professional officer (Rowe-Rowe 1975). In other provinces they are still considered as an uncommon species but if similar investigations were carried out they might well be found to be more common than previously thought.

The validity of the subspecies remains in doubt but they are retained pending further investigation, which may prove difficult on account of the uncommon nature of the species in most of its range in the Republic and the consequent scarcity of material.

Scattered records are availbale from most countries northwards to Uganda and the Congo Republic mainly from the southern savanna woodland and only a few from the drier western parts of the continent.



AFRICAN CIVET **RARE**
Afrikaanse siwet

Civettictis civetta australis (Lundholm, 1955)

1955. Viverra civetta australis Lundholm, Annals of the Transvaal Museum 22: 290. Klaserie, Olifants River, northeastern Transvaal.

Order Carnivora **Family Viverridae**

Present distribution

Occur throughout the central northern and eastern parts of the Transvaal, Swaziland and the northern parts of KwaZulu.

Former distribution

Unknown, but doubtless more widespread than at present especially in areas such as the central Transvaal where there has probably been a decline in numbers and where, through development, they have disappeared locally.

Habitat

Savanna woodland and forest, throughout their range being associated with the availability of water, although not dependent on it. Have a preference for areas where there is good cover in the form of riverine underbush, thickets, stands of tall grass or reed beds and where the trees and shrubs provide wild fruits.

Habits

Nocturnal and usually solitary and nowhere common throughout this range. When disturbed they may freeze motionless then slink off quietly or allow close approach and then explode out of hiding and bound away. Cough and growl under stress and erect the hair as a defence mechanism. Deposit their faeces in communal latrines (civetries), which, through prolonged use, become very large. Assiduous markers, they apply a sweet smelling secretion to stems of grass, twigs or other objects from perineal glands.

Breeding in the wild

Litters of two to four young are born in holes, often using abandoned antbear burrows, during the summer months.

Breeding potential in captivity

Unknown.

Reasons for decline

While there is no evidence that they have declined in numbers or range this is likely in areas which have been intensively developed. They are particularly prone to being killed by "coyote getters" set for black-backed jackals, in the northern Transvaal six are killed for every one jackal (R.D. Carr, pers. comm.). In this sector in particular numbers are poisoned annually by strychnine baits laid for black-backed jackals.

Numbers in captivity

The National Zoological Gardens, Pretoria has two males, the Johannesburg Zoo one male and one female and the Hartebeestpoort Snake and Animal Park two pairs.

Protective measures in operation

None. In the Transvaal viable populations occur in the Kruger National Park and they are found in reserves in other parts of the province.

Protective measures proposed

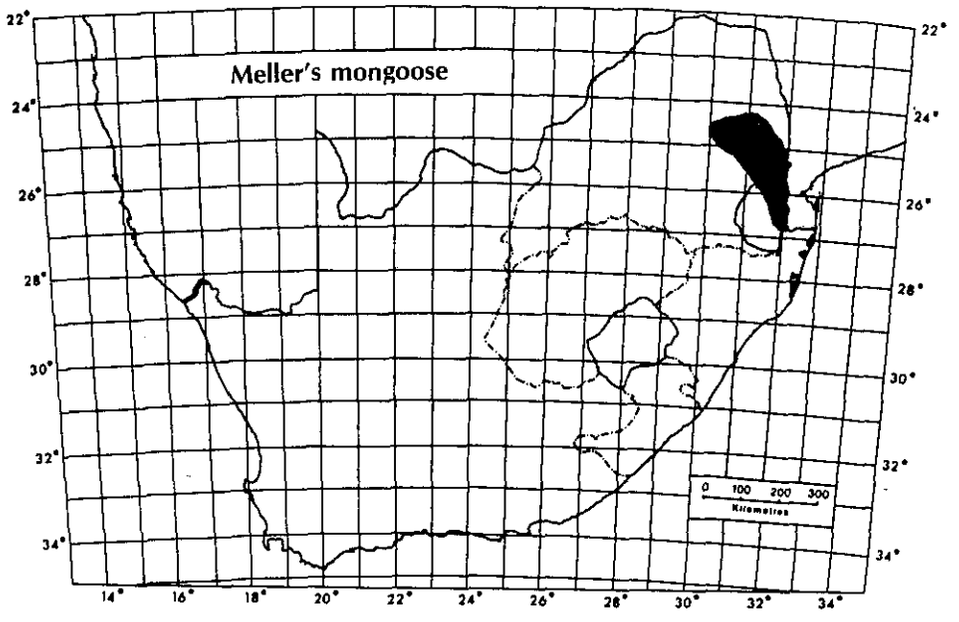
None, but they are worthy of protection.

Current research

None, but see Randall (1977).

Remarks

The occurrence of this species in the Republic is at the tip of a very wide distribution which covers most countries south of the Sahara. They are included because of their restricted distribution in the Republic and because they are believed to be declining in numbers and have already become extinct locally.



MELLER'S MONGOOSE **RARE**
Meller se muishond

Rhynchogale melleri langi Roberts, 1938

1938. Rhynchogale melleri Roberts, Annals of the Transvaal Museum 19: 243. Ranches Ltd, Swaziland.

Order Carnivora **Family Viverridae**

Present distribution

Occur in a restricted area in the eastern Transvaal lowveld from Phalaborwa and the confluence of the Klaserie and Olifants Rivers in the north to the southern parts of the Kruger National Park and in Swaziland.

Former distribution

Unknown.

Habitat

A savanna species particularly associated with open woodland or grassland with termitaria.

Habits

Nocturnal, terrestrial and solitary. Little is known about their behaviour. They live predominantly on termites with insects, reptiles and amphibia forming a small proportion of their diet.

Breeding in the wild

Information is sparse but indications from gravid females and young, suggest that the young are born during the early summer months.

Breeding potential in captivity

Unknown.

Reasons for decline

There is no evidence to show that they have declined in distributional range or numbers.

Numbers in captivity

None.

Protective measures in operation

None, but considering their diet, are worthy of protection.

Protective measures proposed

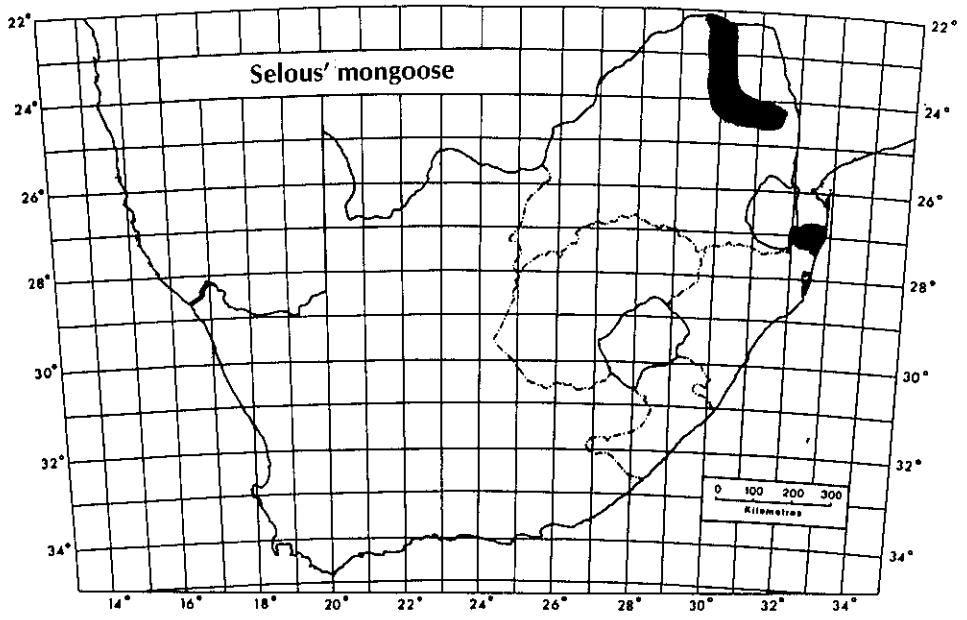
None.

Current research

None.

Remarks

Included because of their marginal range in the Republic and the fact that within this they are rarely encountered and are certainly uncommon. Throughout their known range in Africa, from northern Tanzania to the extreme southern parts of Mozambique, their distribution is broken and discontinuous.



SELOUS' MONGOOSE **RARE**
Klein Witstertmuishond

Paracynictis selousi selousi (De Winton, 1896)

1896. Cynictis selousi De Winton, Annals and Magazine of Natural History (6) 18: 469. Essexvale, near Bulawayo, Matabeleland, Zimbabwe. The Transvaal range of the species.

Paracynictis selousi sengaani Roberts, 1931.

1931. Paracynictis sengaani Roberts, Annals of the Transvaal Museum 14: 227. Maputa, northeastern KwaZulu. The range of the species in northern KwaZulu.

Order Carnivora **Family Viverridae**

Present distribution

Occur in the northern and north-eastern parts of the Transvaal and in north-eastern KwaZulu.

Former distribution

Probably similar to the present.

Habitat

Predominantly associated with open country with a sandy substrate.

Habits

Nocturnal and terrestrial, they occur singly or in pairs. Lie up during the day in burrows which they excavate themselves, which may have several entrances and two or more underground chambers. Under stress will take to any convenient hole. Avid diggers they will dig or scratch in debris in search of food or dig at the base of grass tufts in search of beetle larvae. Their principal food is insects, sun spiders and scorpions but they will take mice and reptiles and occasionally birds.

Breeding in the wild

Litters of up to four young are born in chambers in the burrows during the summer months.

Breeding potential in captivity

Unknown.

Reason for decline

There is no evidence to suggest that they have declined in numbers or range.

Numbers in captivity

The Hartebeestpoort Snake and Animal Park has one male.

Protective measures proposed

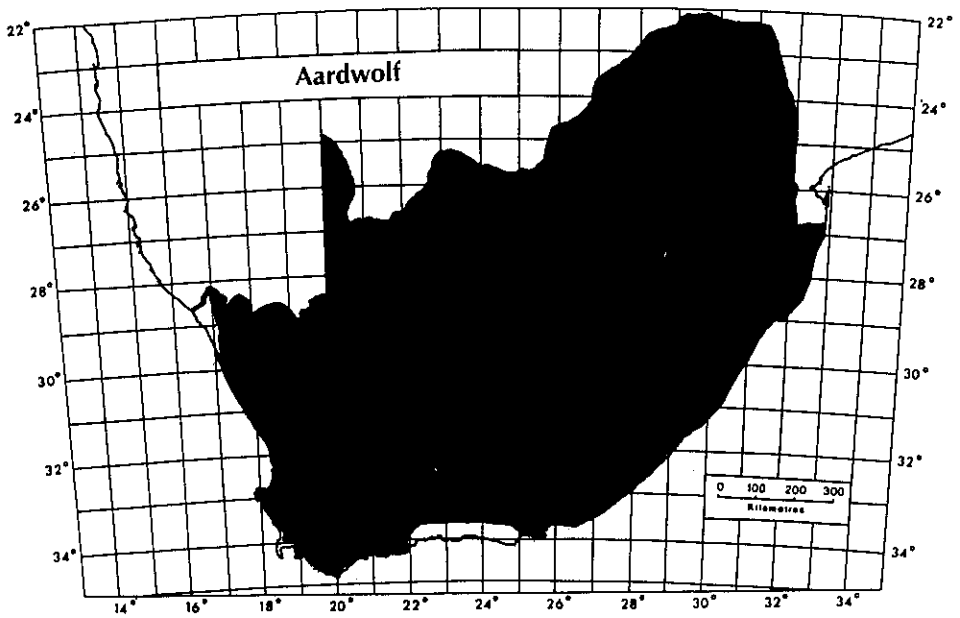
None.

Current research

None.

Remarks

They may eventually be shown to occur in the western Transvaal as there are records from adjacent parts of Botswana (Smithers, 1971). They have been recorded from Angola, Zambia, Botswana, Zimbabwe, south-eastern and southern Mozambique and north-eastern Namibia. In parts of this range (Zimbabwe, Botswana) they are not uncommon.



AARDWOLF **RARE**
Aardwolf

Proteles cristatus cristatus (Sparrman, 1783)

1783. Viverra cristata Sparrman, Resa Goda Hopps-Uden 1: 581. Near Little Fish River, Somerset East, eastern Cape Province.

Order Carnivora **Family Protelidae**

Present distribution

Widely but sparsely distributed throughout the Republic except in forested areas and desert.

Former distribution

Similar to the present distribution.

Habitat

Catholic in their habitat requirements they occur in the savanna woodland and grassland zones as well as in the south-west arid zone. They are commoner in the drier areas with a mean annual rainfall of 100 to 600 mm. Their occurrence throughout is dependent on the availability of the various species of termites which constitute their principal food, in particular Trinervitermes rhodesiensis, Macrotermes falciger and Hodotermes mossambicus (Smithers, 1983).

Habits

Predominantly nocturnal, terrestrial, they occur singly or in a family party of a pair with their young. During the day rest in holes in the ground, using disused antbear burrows or the burrows of springhares which they enlarge to their requirements or will excavate their own. Assiduous markers, Nel & Bothma (1983) record two types, the first applied to grass stems on twigs in the foraging area which leave blobs of secretion three to six millimetres long, the second, quick wipes which leave a minute deposit and appear to serve as an indication that the area has been visited. Defaecate in middens which tend to be grouped within the foraging area. A specialist feeder living mainly on harvester termites, Trinervitermes spp. On the Namaqualand coast their diet consists mainly of beetles (J. du P Bothma, pers. comm.).

Breeding in the wild

Litters of one to four young are born during the summer months of October to February, with occasional births outside this period. The young are born in the resting burrows, the males taking no part in the rearing of the young but rejoining the family party when the young are ready to leave the den.

Breeding potential in captivity

The Hartebeestpoort Snake and Animal Park have had considerable success over a number of years in breeding (J. Seal, pers. comm.) and the Johannesburg Zoo had one birth in 1984. The East London Zoo has one of a pair that lived for many years in captivity.

Reasons for decline

While there is no evidence to show they have declined in range or numbers many are killed annually in the mistaken idea that they kill small domestic stock and on main roads at night by vehicles as they tend to stand disorientated in the beam of headlights. Poisoning for termite control reduces the food available and may have an effect on the aardwolves themselves.

Numbers in captivity

The National Zoological Gardens, Pretoria has a male and female and six at De Wildt but so far no breeding has taken place. Johannesburg Zoo has six, the Hartebeestpoort Snake and Animal Park three pairs, Bloemfontein Zoo three, the East London Zoo one and the International Zoo Yearbook (1983) reports that the San Antonio Zoo, USA has three. Crandall (1964) comments on the difficulty in their maintenance in captivity overseas, but at the same time records some successes such as that of Regents Park, London, which had a male for close on 13 years.

Protective measures in operation

Protected in the Transvaal and Cape Province under Schedule 2 as protected wild animals and in the Orange Free State under Schedule 1 as well as internationally in Africa.

Protective measures proposed

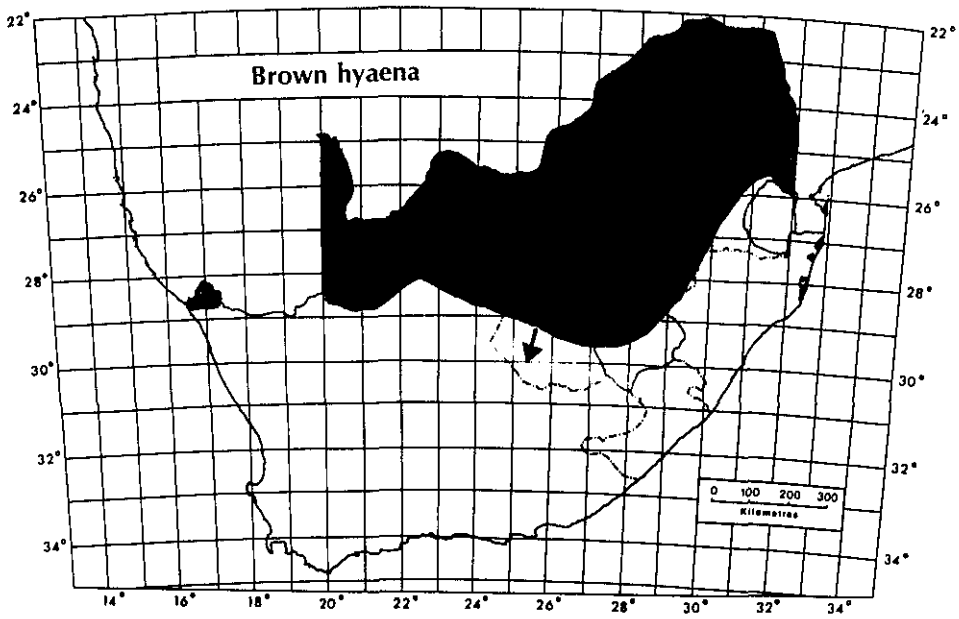
Continued propaganda among the farming community to educate them to the fact that they do not kill domestic stock and are indeed incapable of dealing with anything except an insect diet.

Current research

The following projects are in train at the Mammal Research Institute, University of Pretoria:
P. Richardson: Sociobiology in the north-western Cape Province (since published Richardson, 1985).
J. D. Skinner and R. J. van Aarde: Home range and utilization of space in the Transvaal.
J. D. Skinner and I. Wilkenson: Ecophysiology of captive individuals, and under the Eugène Marais Chair of Wildlife Management, University of Pretoria:
J. du P Bothma and J. A. J. Nel: Behaviour in the central Namib Desert.

Remarks

They occur widely but sparsely in the Southern African Subregion extending into southern Angola and southern Zambia with a break in their distribution northeastwards recurring in Tanzania and northwards to the coast of the Red Sea in south-eastern Egypt.



BROWN HYAENA **RARE**
Strandjut

Hyaena brunnea Thunberg, 1820

1820. Hyaena brunnea Thunberg, Kongliga Svenska Vetenskapsakademiens Handlingar, Stockholm: 59. Cape of Good Hope.

Order Carnivora **Family Hyaenidae**

Other colloquial names

Strandwolf, bruin hiëna, blouwolf, swartwolf, tierwolf.

Present distribution

In the Cape Province there are unconfirmed reports of their occurrence in the Richtersveld in the north-west and they occur in the Kalahari Gemsbok National Park, where Mills (in Stuart, 1981) reports a population of about 200; along the northern border with Botswana and in the north-east on the Transvaal and east on the Orange Free State border. There are a number of unconfirmed records from Beaufort West in the Karoo and in the south-eastern parts of the Province of what are thought to be transitory individuals (Stuart, 1981) but no material records during the last 15 years. They occur sparsely throughout the Orange Free State; in western Lesotho; in the Transvaal, except in the grassveld of the southern parts of the province and in parts of Swaziland. They occur as vagrants in the north-western parts of Natal.

Former distribution

There is a paucity of authentic reports of this species in the early historical record. Shortridge (1934) lists Sparrman's 1785 record from the Cape Peninsula and judging from later writings they had a wide distribution in this province (Skead 1980) and in the remainder of the Republic except in Natal from which province no early records are available.

Habitat

Both in their past and present distributional ranges they are associated with the south-west arid zone and the drier parts of the southern savannas where they occur in a range of associations from desert to open woodland. Some type of cover in which to rest during the day is an essential requirement but the availability of water is not, although they will drink when it is available.

Habits

Nocturnal, they live in groups but forage solitarily, the groups occupying fixed territories. The size of the group varies throughout the year through the birth of cubs and the emigration of subadults. Nomadic males are a feature of their social organization (Mills, 1981). They lie up during the heat of the day in holes in the ground or under bushes. Predominently scavengers they have been recorded from the centre of cities (Johannesburg) and urban areas (Pretoria) surviving by raiding dustbins.

Breeding in the wild

Litters of one or two young are born in holes in the ground during the early summer months of August to November. Females with three foetuses have been recorded. Skinner (1976) illustrated a maternity den in the Transvaal which had three entrances and two underground chambers. In the early stages of their lives the female may carry the young to a new den perhaps as a result of the build-up of ectoparasites and by six months of age the young may initiate such a move by themselves. Two females may have their litters in the same den. By the time they are 10 to 15 months old the young spend time away from the den during the day being fully weaned by 15 months old. The female and subadult members of the group carry back food for the young, often from long distances (Mills, 1981).

Breeding potential in captivity

South African zoos have had considerable success in captive breeding (National Zoological Gardens, (De Wildt), Natal Zoological Gardens and Hartebeestpoort Zoo) but outside South Africa results have been disappointing. The success at De Wildt may have been due to the regular visits of wild individuals to the outside of the enclosures acting as a stimulus (M.J. Penrith, pers. comm.).

Reasons for decline

There is no evidence to show they are declining but they are regarded, mistakenly, as problem animals and are shot or fall victim to poison baits which are often specifically laid to kill spotted hyaenas.

Numbers in captivity

National Zoological Gardens, Pretoria has 10 (eight at De Wildt); Natal Zoological Gardens five and Bloemfontein Zoo has a pair.

Protective measures in operation

Protected in the Cape Province and Transvaal under Schedule 2 as protected wild animals and occur in National Parks and reserves in the Transvaal, Orange Free State and Cape Province.

Protective measures proposed

Total protection.

Current research

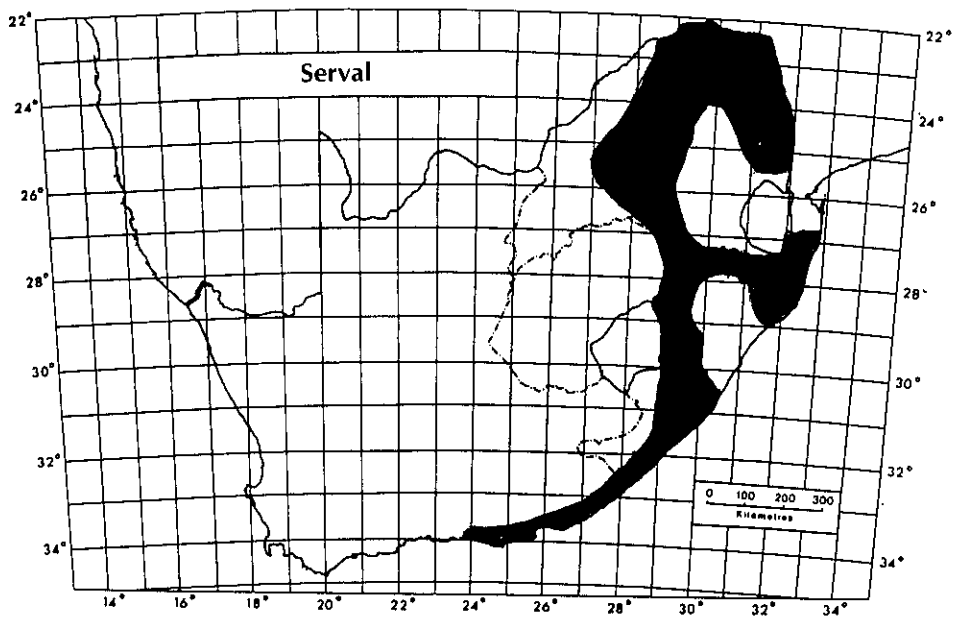
Dr J.D. Skinner and Dr R. van Aarde, Mammal Research Institute, University of Pretoria are investigating their ecology in the Namib Desert, Namibia. See also Skinner (1976), Mills (1977, 1981), Skinner & Van Aarde (1981).

Remarks

Secretive, they may be more abundant than commonly supposed. They are great wanderers, a female with a radio collar released in the western Transvaal was shot, some five months later in the Orange Free State having covered a distance of some 800 km. (R.J. Van Aarde, pers. comm.). Commonly but usually wrongly blamed for predation on domestic stock. (Skinner, 1976).

Occurs widely in the Southern African Subregion with a marginal extension into south-western Angola.

In the Cape Province they have been introduced successfully to the Rolfontein and Andries Vosloo Nature Reserves (B.H. Erasmus, pers. comm.) and in Natal to the Itala Game Reserve (D.T. Rowe-Rowe, pers. comm.).



SERVAL **RARE**
Tierboskat

Felis serval serval Schreber, 1776

1776. Felis serval Schreber, Säugthiere : pl 108; and text 3: 407, 587, 1777. Cape of Good Hope; probably eastern Cape Province (Lundholm, 1955).

Order Carnivora **Family Felidae**

Present distribution

Occur in the central, northern and eastern parts of the Transvaal, excluding the highveld grasslands; in parts of Natal, the Transkei and the foothills of the Drakensberg in the Orange Free State and the coastal areas of the eastern Cape Province as far west as about Mossel Bay. Stuart (1985) considers, however, that they are extinct as a viable species in the Cape Province.

Former distribution

Extended further west coastally in the southern Cape Province at least to the Somerset West district if not to the Cape Peninsula itself (Smithers, 1978). Shortridge (1934) records a serval skin in the collection of the South African Museum from Somerset West taken as late as 1898.

Habitat

Confined to areas where there is permanent water with reed beds; areas of swamp or wet vleis especially along rivers where there is adjacent cover of underbush or stands of tall grass in which they lie up during daylight hours.

Habits

Nocturnal and terrestrial, occur solitarily or in pairs or a female with her offspring which remain with her until about half-grown. Under stress will climb trees but more usually take to the cover of reed beds, undergrowth or stands of tall grass.

Breeding in the wild

Litters of up to three young are born in the cover of tall grass or underbush in dry areas, after a gestation period of 68 to 72 days (Jones, 1952) during the summer months from about September to April. Rarely litters are recorded as late as July. If disturbed females may move the litters to new cover, carrying the young if still small, in their mouths.

Breeding potential in captivity

The National Zoological Gardens, Pretoria have a pair which have bred twice within the year (M. J. Penrith, pers. comm.); De Wildt has five where breeding is stated to be good (A. van Dyk, pers. comm.); and the Hartebeestpoort Snake and Animal Park reports successful breeding (J. Seal, pers. comm.). The International Zoo Yearbook reports that they have been successfully bred in zoos overseas.

Reasons for decline

Wrongly considered problem animals, their disappearance from the coastal parts of the south-western Cape Province is to some extent due to this factor as well as to disturbance of their habitat brought about by agriculture and other development.

Numbers in captivity

The National Zoological Gardens, Pretoria have a pair and five at De Wildt; the Hartebeestpoort Snake and Animal Park five and the International Zoo Yearbook (1984) reports that they are widely held in zoos overseas.

Protective measures in operation

Protected in the Cape Province under Schedule 2 as protected wild animals.

Protective measures proposed

The species is worthy of protection in the other three provinces. Easily caught and handled they could be reintroduced to reserves within their former range.

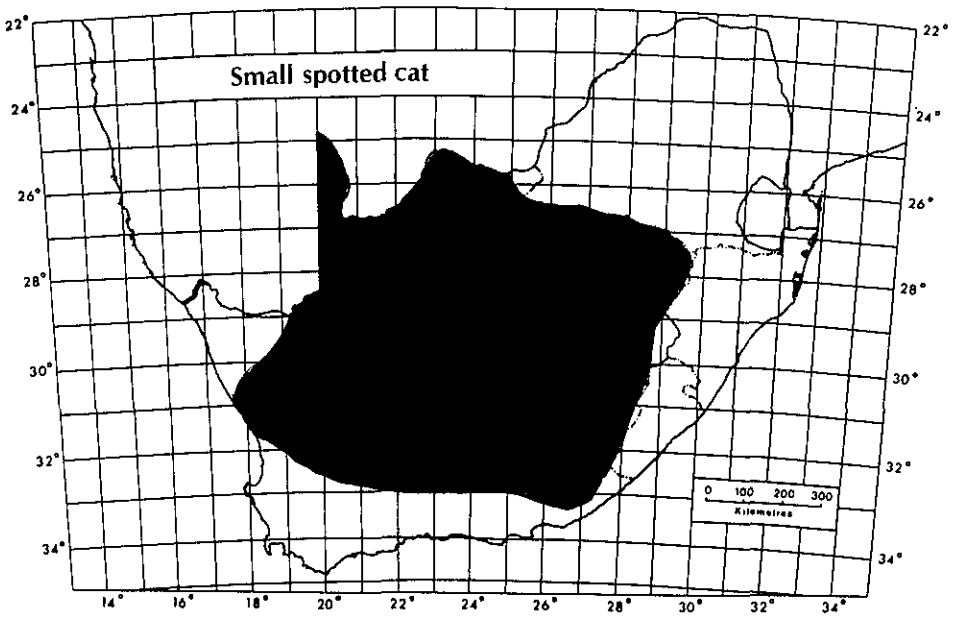
Current research

None, but see Smithers (1978), Smithers (1983).

Remarks

Like other predators servals will raid free ranging poultry and ornamental and other types of birds. Under these circumstances the removal of the culprit is sufficient to stop the predation and the population of servals as a whole should not be indiscriminately blamed and consequently subjected to control. Examination of a large sample (65) of serval stomachs in a farming area showed that their diet consisted predominantly of rodents, principally vlei rats, Otomys spp, and multimammate mice, Praomys natalensis, with small percentages of small birds, reptiles and insects, the largest mammals recorded being a young cane rat and a scrub hare (Smithers, 1978). In spite of statements that have appeared in literature young cane rats and hares are about the largest prey they can tackle and they could safely be reintroduced to reserves where there are populations of small antelope.

The species has a wide distribution extralimitally from parts of north-western Africa, West and East Africa and in all countries southwards to the border of the Republic, in savanna where water is available.



SMALL SPOTTED CAT **RARE**
Klein gekolde kat

Felis nigripes nigripes Burchell, 1823

1823. Felis nigripes Burchell, Travels in the interior of southern Africa 2: 592, footnote. Batlahapin Reserve, near Kuruman, nothern Cape Province. The northern parts of the species range.

Felis nigripes thomasi Shortridge, 1931

1931. Felis (Microfelis) nigripes thomasi Shortridge, Records of the Albany Museum 4: 119. Thornkloof (Carlisle Bridge) near Grahamstown, eastern Cape Province. The southern part of the species range.

Order Carnivora **Family Felidae**

Other colloquial names

Black footed cat, miershooptier.

Present distribution

In the Transvaal confined to the southern and south-western parts of the province and occur widely in the Cape Province and in the Orange Free State.

Former distribution

Unknown, but probably not very different from their present distribution.

Habitat

Particularly associated with open terrain with some cover in the form of stands of tall grass or scrub within the south-west arid zone.

Habits

Nocturnal and solitary, they rest during the day in disused antbear or springhare holes or holes in termitaria. Secretive and shy, if disturbed, they take cover and are difficult to observe as they remain crouching low and well hidden. Sensitive to dazzling lights they slink off only glancing back momentarily as they seek cover.

Breeding in the wild

Litters of one to three young are born in holes in the ground during the early summer months of November/December after a gestation period of 67 to 68 days (Visser, 1977).

Breeding potential in captivity

Unknown.

Reasons for decline

There is no evidence to show that they have declined either in range or numbers.

Numbers in captivity

One in the Bloemfontein Zoo.

Protective measures in operation

In the Cape Province listed under Schedule 2 as protected wild animals. In the Transvaal occur in the Barberspan Provincial Game Reserve, in Game Reserves in the Orange Free State and in the Cape Province in the Kalahari Gemsbok National Park, the Karoo National Park and the Addo National Park as well as in a number of reserves.

Protective measures proposed

Warrants listing in the Orange Free State Ordinance but otherwise their occurrence in National Parks and reserves should be sufficient to ensure their survival.

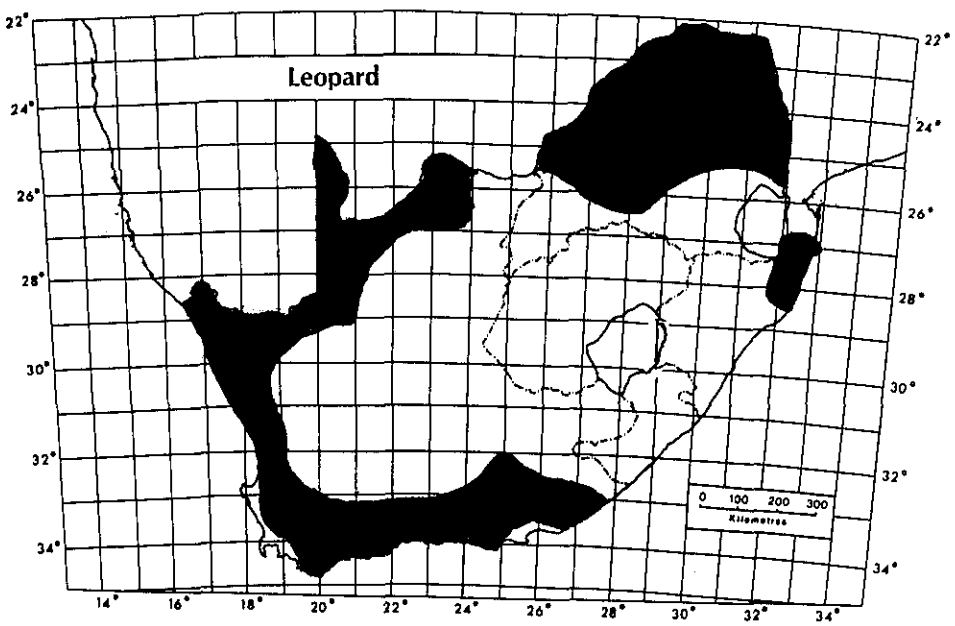
Current Research

None, but the study of the ecology of this species, which is the smallest of the known felids, is warranted.

Remarks

The small size, secretive nature and nocturnal habits of this species may be obscuring its status and it may be commoner than generally supposed.

Very few specimens are held in collections but at least in parts of its range in the Cape Province Visser (1977) believes that they are quite common. In spite of 500 to 600 hours of observation at night with dazzling lights within the range of the species in Botswana only a few and in every case solitary individuals were contacted (Smithers, 1971).



LEOPARD
Luiperd

RARE

Panthera pardus melanotica (Günther, 1885)

1885. Felis leopardus var melanotica. Günther, Proceedings of the Zoological Society, London: 243. 64 km from Grahamstown, eastern Cape Province.

Order Carnivora

Family Felidae

Present distribution

They occur throughout the mountainous parts of the western, south-western, southern and eastern Cape Province; along the Orange River from the Richtersveld eastwards to about 20° E and marginally in the north along the Botswana border, including the Kalahari Gemsbok National Park. Widely but sparsely distributed in the Transvaal excluding the grassland areas, the highest populations being in the Kruger National Park and on private game reserves on its western boundary. Absent in central Natal and in the Drakensberg along the Lesotho boundary. Not recorded within recent times in the Orange Free State (Smithers, 1983).

Former distribution

Occurred widely throughout the Republic.

Habitat

Leopards have a wide habitat tolerance and while they are generally associated with areas of rocky hills, mountain ranges, riverine or kloof forests, which provide them with shelter they also occur in semi-desert areas where there is cover in the form of stands of tall grass or underbush. The inaccessability of mountainous habitat has assisted in their persistence in the areas where this is available.

Habits

Predominantly nocturnal, their cunning and secretive habits together with the nature of the habitat in which they live allows them to survive even in close proximity to human developments. Generally solitary, pairs associate during the mating period and young may accompany their mothers until they are about two years of age.

Breeding in the wild

They become sexually mature from about two-and-a-half to four years of age. Normally litters of two to three cubs, although up to six are on record, are born at any time throughout the year after a gestation period of about 100 days. The female carries food back to the young which are born in sheltered places among rocks, in hollow trees or holes in the ground. They are born blind, the eyes opening on the sixth to tenth day after birth. They are weaned by the age of three months and accompany their mother from about four months of age while she hunts.

Breeding potential in captivity

Good. Properly adjusted and well matched pairs breed freely in captivity. The International Zoo Yearbook (1984) records the births of 130 cubs in 50 zoos throughout the world and in former years up to 280 (1978) have been recorded.

Status

Rare. While at this juncture the leopard cannot be considered as warranting inclusion on the endangered or vulnerable species lists, increased control and hunting pressures could reduce populations to the level where they were no longer viable, their survival then depending on containment only in National Parks and reserves.

Reasons for decline

Predation on domestic stock and the high commercial value of their skins has encouraged overexploitation to the extent that they have become extinct in areas where they formerly occurred.

Numbers in captivity

The Bloemfontein Zoo has three and the East London Zoo two males and one female. The National Zoological Gardens, Pretoria has two males and one female melanistic individual and one male and three females normally marked; Johannesburg Zoo one male and one female melanistic and one male and one female normal. Tygerberg Zoo has one male melanistic and one aberrantly marked female and one male and two female Cape leopards, and the Hartebeestpoort Snake and Animal Park two males and three females. The International Zoo Yearbook (1984) records that 55 individuals were in the possession of zoos throughout the world.

Protective measures in operation

In the Transvaal listed under Schedule 4 as a protected wild animal, in Natal specially protected, in Bophuthatswana protected under Schedule 3 wild animals, and in the Cape Province under Schedule 2 protected wild animals.

Three of the larger National Parks and Game Reserves, Kruger, the Kalahari Gemsbok National Parks and the Hluhluwe Corridor Umfolozi Game Reserve Complex have viable populations and they occur widely in areas under the jurisdiction of the Forestry Department in the Cape Province. In Bophuthatswana, while not listed, viable populations are found throughout where there is suitable habitat. In the northern and eastern Transvaal protected by their occurrence in State forests.

Protective measures proposed

P.M. Norton (in litt.) reports that the Cape Department of Nature and Environmental Conservation, in collaboration with the Wildlife Society, are planning to establish sanctuary areas where leopards may be afforded maximum protection.

Current research

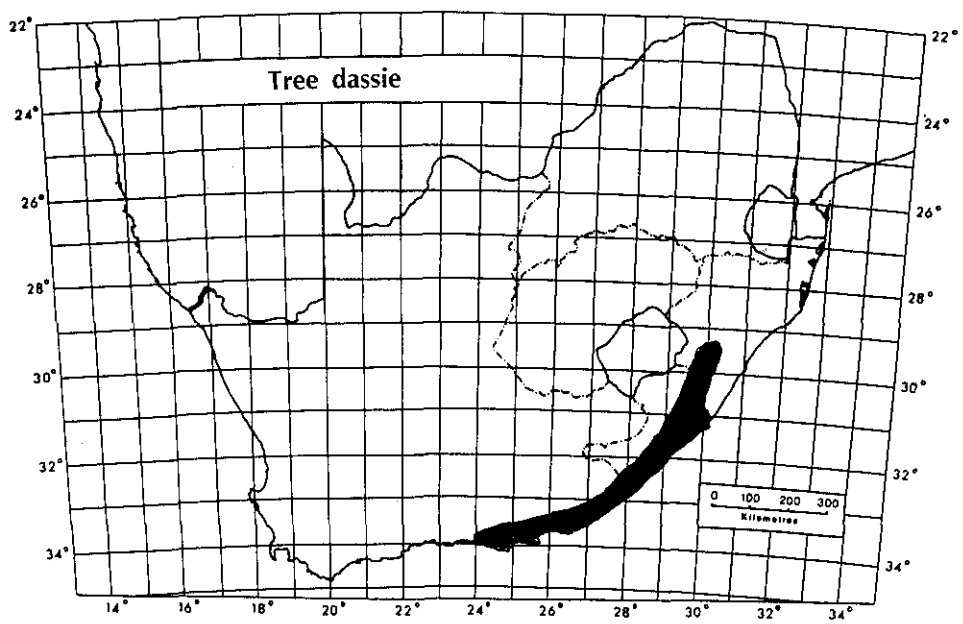
J. E. Kruger of the Eugène Marais Chair of Wildlife Management has recently (1985) completed an MSc study on carnivore relationships in the Klaserie Private Game Reserve directed principally at this species and J. du P. Bothma and E. A. N. le Riche of the same organization have, since 1976, been studying the ecology and behaviour of the species in the Kalahari. A. Grimbeek of the Mammal Research Institute, University of Pretoria is scheduled to undertake a study on the ecology of the species starting in 1985.

See also Norton & Lawson (1985) and Bothma & le Riche (1984).

Remarks

Leopards have a wide distribution in Sub-Saharan Africa and are recorded from Morocco. Their distribution extends into the Middle East, parts of Europe, India and Asia, many subspecies having been described some of which eg P. p. orientalis of Siberia and P. p. tulliana of Asia Minor are listed by IUCN as endangered. Adjacent countries (Botswana, Zimbabwe) judge that populations are healthy to the extent that quotas are given to safari hunting companies.

In the south-western Cape Province they have very large home ranges and their density is very low (Norton & Lawson, 1985).



TREE DASSIE **RARE**
Boomdas

Dendrohyrax arboreus arboreus (A. Smith, 1827)

1827. Hyrax arboreus A. Smith. Transactions of the Linnean Society of London 15: 468. Forests of the eastern Cape Province.

Order Hyracoidea **Family Procaviidae**

Present distribution

Occur in the eastern parts of the Cape Province coastally from 25° E eastwards to the Ciskei and Transkei and the south-western parts of Natal.

Former distribution

Their forest habitat was more extensive and less fragmented than it is today (Acocks, 1975) and correspondingly the distribution of the species followed this pattern. The present fragmentary pattern of their distribution from Malawi southwards suggests that they may in times past have had a continuous range from this area southwards at least as far as their present limits in the Cape Province.

Habitat

Forest.

Habits

Predominantly nocturnal, arboreal and solitary they rest during the day in hollow trees or among thick foliage and create latrines which are situated in the low fork of a tree or on the ground beside the trunk.

Breeding in the wild

Apart from Shortridge's (1934) statement that they breed throughout the year and have a litter size of one to three, no information is available.

Breeding potential in captivity

Unknown.

Reasons for decline

Fragmentation and destruction of their forest habitat.

Numbers in captivity

None.

Protective measures in operation

Protected by legislation in the Cape Province as a Schedule 2 protected species.

Protective measures proposed

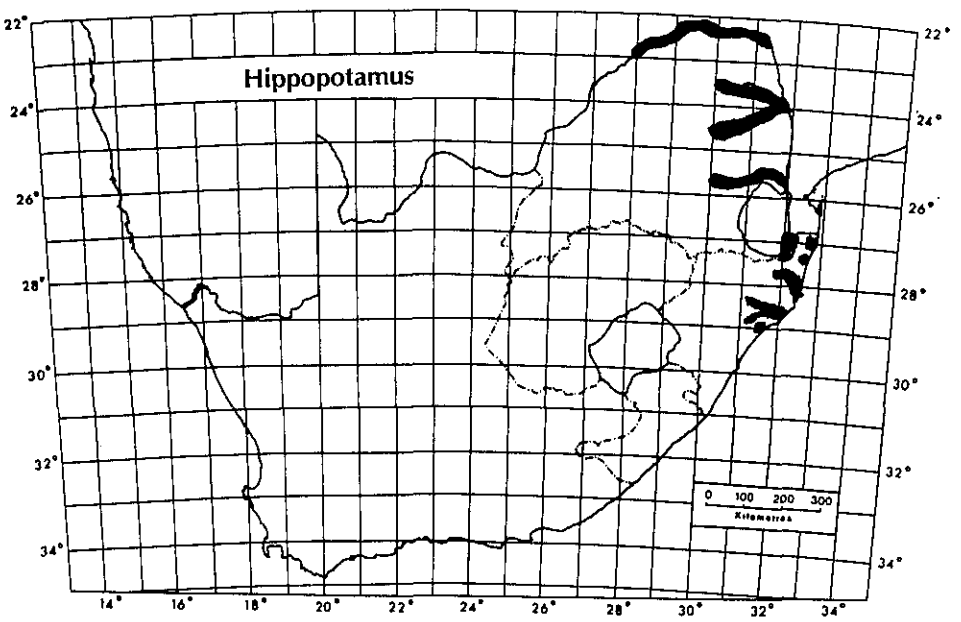
Introduction to areas of suitable habitat otherwise reserved.

Current research

None.

Remarks

Although primarily dependent on a forest habitat, in parts of the Cape Province, they have adapted to living in gardens and the roofs of houses of coastal resorts and villages (C.T. Stuart in litt.). There are unconfirmed reports of their occurrence in parts of the eastern Transvaal.



HIPPOPOTAMUS **RARE**
Seekoei

Hippopotamus amphibius capensis Desmoulins, 1825

1825. Hippopotamus capensis Desmoulins, Dictionnaire classique d'Histoire naturelle 8: 220. Lower Berg River, north of Cape Town, western Cape Province (where now extinct).

Order Artiodactyla **Family Hippopotamidae**

Present distribution

Occur in major rivers systems, where there is sufficient permanent water to hold them, in the eastern Transvaal; in north-eastern Natal and KwaZulu, southwards in the coastal parts of Natal to about 29°S which marks their most southerly occurrence in the Republic.

Former distribution

Occurred widely in suitable habitat throughout the Republic. Theal (1.1888) recorded that, in 1652, hippopotamus were killed in the swamp that is now Church Square, Cape Town and Skead (1980) lists many historical records to show that they were widespread in the Cape Province.

Habitat

An essential habitat requirement is permanent water deep enough to allow them to submerge, with a preference for open stretches of water with submerged sandbanks or gently sloping shady banks which allow them to rest during the day with their heads just out of the water. Seasonal flooding causes them to move but they return to suitable pools as the floods subside.

Habits

Nocturnal and semi-aquatic, they leave the pools, in which they rest during the day, at sundown to graze. Where food is plentiful in the vicinity they remain near the resting pools but are recorded as moving up to 30 km overnight to feeding grounds (Fuente, 1970). Individuals of both sexes are prone to vagrant movements and may turn up in farm dams and other water impoundments far from their usual haunts. They are gregarious, living in schools of 10 to 15 but often congregating in larger numbers. The males are territorial and establish territories on dry ground which they will actively defend against trespassers, marking these territories with piles of faeces which they scatter over bushes with a sideways flicking of the short, flattened tail.

Breeding in the wild

Mating takes place in the water, a single calf being born at any time throughout the year after a gestation period of 225 to 257 days (Asdell, 1964). Females have their first calf at about four years of age and leave the school to give birth in seclusion in the shelter of reed beds, the calf being capable of swimming from birth. The female and her young remain segregated from the school for some months before rejoining it when other females in the school will look after the calf while the mother forages.

Breeding potential in captivity

While they breed in captivity (Brand, 1963) this can never be a factor in their conservation as for economic and other reasons only very small numbers can be kept.

Reasons for decline

From the time of the early settlement of the Cape in 1652 it was soon found that the flesh was palatable, the fat useful for cooking and the hide for making sjamboks. Leibbrandt (1900) records that hippopotamus meat was, in 1665, readily available on the Cape Town market. Overutilization in this manner continued as the hunters, pioneers and settlers penetrated the country. Their propensity to raid crops made them imcompatible with agricultural and other human developments and led to unremitting control, to the extent of their disappearance from the greater part of their range. Where conserved, numbers increase to the extent that culling becomes necessary.

Numbers in captivity

The National Zoological Gardens, Pretoria has one male, two females and one juvenile (1985), Bloemfontein Zoo has one male and two females and the International Zoo Yearbook shows that they are widely held by overseas zoos.

Protective measures in operation

Protected by legislation in the Transvaal and the Cape Province under Schedule 2 as protected wild animals and in Natal. They occur in the Kruger National Park, Transvaal and in reserves in Natal. In these reserved areas, their breeding potential being good, their numbers have to be kept within the carrying capacity of their habitat and excess numbers have to be culled.

Protective measures proposed

None. Unsuitable for translocation to any but the larger reserves where the water is not used for recreational purposes, as they are inclined to be dangerous.

Current research

None.

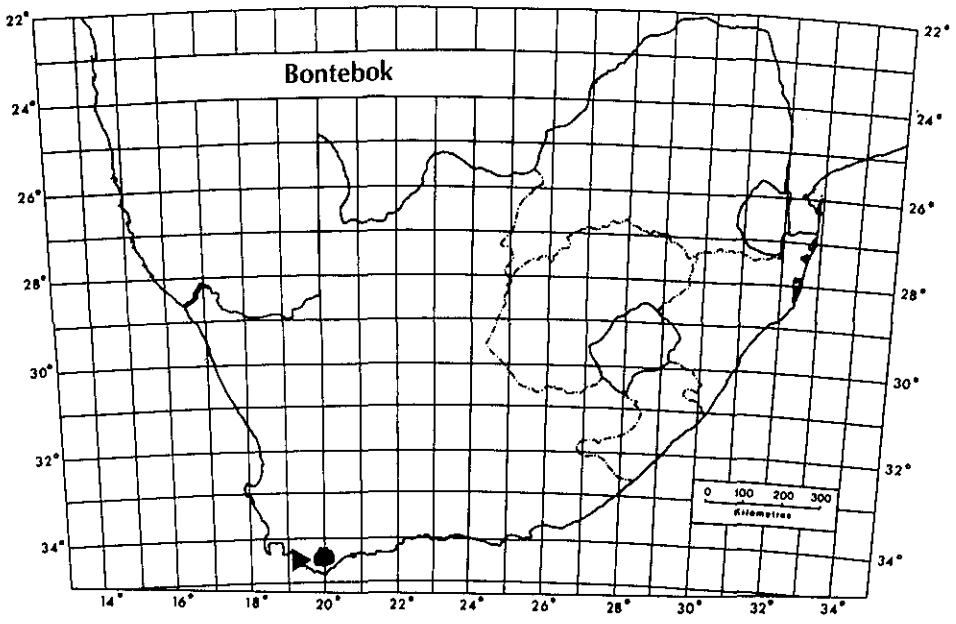
Remarks

As in the Republic, their distribution in Sub-Saharan Africa is fragmented and in many parts they are now locally extinct. They still occur however, in West and East Africa and southwards in all countries to the borders of the Republic.

In the Transvaal there are resident populations in the Kruger National Park where there is sufficient permanent water in the Limpopo, Levuvhu, Letaba, Olifants, Sabie and Crocodile Rivers, their distribution extending marginally westwards in these rivers into private game reserves. They also occur in similar conditions in the Limpopo River in the north and north-west.

In Natal resident populations are found at Kosi Bay and in the Ndumu, Mkuze, Lake St Lucia, Sibaya, Umfolozi and Hluhluwe Reserves and in pans inland from Richards Bay. In the Orange Free State two were introduced to a game farm in the Ficksburg district, in Bophuthatswana eight to the Pilanesberg Game Reserve and in the Cape Province four to the Rondevlei Bird Sanctuary, near Cape Town.

In parts of their range they are considered to be out of danger but their river habitat remains vulnerable to change.



BONTEBOK **RARE**
Bontebok

Damaliscus dorcas dorcas (Pallas, 1766)

1766. Antilope dorcas dorcas Pallas, Miscellanea Zoologica: 6. No locality, but Caffer Kuyls (=Kaferkuils) River, between Mossel Bay and Swellendam, southwestern Cape Province, nominated by Harper (Journal of Mammalogy 21: 329, 1940).

Order Artiodactyla **Family Bovidae**

Present distribution

Confined to a restricted area in the south-western Cape Province lying between Bredasdorp and Cape Agulhas.

Former distribution

Historically this subspecies occurred from Bot River to Mossel Bay and inland to the Sondereind and Langeberg mountains (Bigalke, 1955). At the time of the early settlement of the Cape in 1652 there was a distance of some 320 km between the limits in which this subspecies occurred and the occurrence of the blesbok, D. d. phillipsi which were never encountered west of Colesberg and did not occur in the Great Karoo. The species D. dorcas must at some earlier time have had a distribution extending widely from the Cape to the Transvaal, the two populations being at some stage separated by climatic or habitat changes.

Habitat

They occur in a narrow sector of coastal plains at an altitude of 60 to 200 m above sea level in the fynbos association of the Cape Province. They are dependent on drinking water and the shelter of trees and bushes which are found along the banks of the small streams in the area. This plain provides the grassland association essential to this grazing species.

Habits

Diurnal and gregarious, occurring in small herds. The males are territorial each establishing and defending a territory varying in size from four to 28 ha on a year round basis which they may maintain for the duration of their adult lives. Defence of these territories from trespassers takes the form of ritual displays, rarely fighting. The female herds consist of small numbers of adult females and their young, which wander over the territories of a number of males. During the rut the males herd females and court them by displays, endeavouring to hold them within the territory. Bachelor herds consisting of old decrepit males and young males, which have joined from the female herds, may include also a small number of females. Young males usually leave the female herds at about 12 months of age, at the time when the female has her next lamb (David, 1970). The territorial males create latrines within their territory, a centrally placed latrine often being used to lie up on during the day.

During heavy rain they seek the shelter of bushes and trees and stand facing away from its direction with their heads held low.

Breeding in the wild

Seasonal breeders, the rut takes place between January and mid March, a single young being born after a gestation period of 238 to 254 days. The main lamb crop is born between September and November with late arrivals up to February.

The females become sexually mature at just over two years of age having their first lamb at about three years old (David, 1975).

Breeding potential in captivity

Unknown.

Reasons for decline

The heathlands of the south-western Cape Province, which is the natural habitat of the species, have largely been developed for agricultural purposes leaving only a relatively small proportion undisturbed. As early as 1837 the precarious situation of this species was recognized and the timely action of Messrs P. V. and A. van der Byl who set aside a portion of their farm "Nacht Wacht" as a reserve for 27 individuals is deserving of recognition. This example was followed by other farmers in the area (Bigalke, 1955). The Bontebok National Park was proclaimed in 1931 and then had a population of 22 individuals. By 1969 it was estimated that numbers had reached the carrying capacity of the Park and the National Parks Board of Trustees has made the surplus stock available to farmers and Reserves in the south-western Cape Province.

Although the position today is a healthy one, the bontebok remains one of the least common antelope in southern Africa.

Numbers in captivity

None.

Protective measures in operation

Protected by legislation in the Cape Province as a Schedule 2 protected wild animal. Viable populations are present in the Bontebok National Park the Cape Point Nature Reserve and De Hoop Provincial Nature Reserve and they have been distributed to reserves and to farmers in the south-western Cape Province.

Protective measures proposed

Continuation of the present policy of making surplus stock available to farmers, reserves etc in the south-western Cape Province where there is suitable habitat. Translocation to areas outside their natural range should be forbidden.

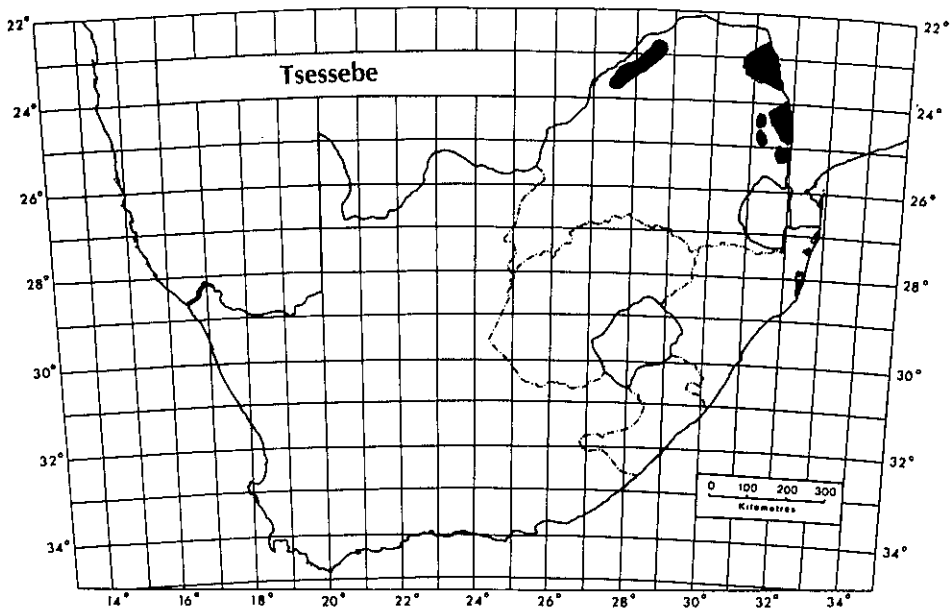
Current research

None, but see David (1970, 1973, 1975).

Remarks

In 1942 five were moved to Thornkloof farm, Grahamstown, where they flourished, at one time on this farm alone the population being estimated as numbering over 200. From this nucleus, stock was moved to farms in the neighbourhood where today there are viable populations of pure strain animals.

Unfortunately from some farm in this area a number were disposed of to a farm in the Harrismith district, Orange Free State, where they hybridized with blesbok. Hybrids from this area have been widely dispersed to game farms in the northern Cape Province and Natal, the situation having been reached when it seems doubtful if any action would be warranted to stop this unfortunate practice. The Transvaal Department of Nature Conservation is most anxious to prevent this happening in this province (P.F.S. Mulder, pers. comm.). As at this date the De Hoop Provincial Nature Reserve has the largest population estimated at about 400.



TSESSEBE **RARE**
Tsessebe

Damaliscus lunatus lunatus (Burchell, 1823)

1823. Antilope lunata Burchell, Travels in the interior of southern Africa 2: 334. Makkwarin River 27° 20'S, 24°30'E on Burchell's map (Ellerman et al 1953: 201) = Matlhawareng River, 27°06'S, 23°04E, at junction with the Kuruman River (Skead 1973: 140), near Kuruman, northern Cape Province.

Order Artiodactyla **Family Bovidae**

Present distribution

In the Transvaal they occur in the Kruger National Park, on privately owned reserves and farms on its western boundary and in scatterd localities in the western Waterberg and Potgietersrus districts. Extralimitally their distribution today is patchy and discontinous.

Former distribution

Du Plessis (1969) showed that their distribution in former times was much more extensive in the northern half of the Transvaal and extended south-eastwards into Swaziland, the extreme northern parts of Natal, as well as south-westwards to the north-eastern Cape Province as far south as the Orange and Vaal Rivers.

Habitat

The habitat requirements of the species include the availability of palatable grasses, water and shade. They favour the ecotone of grasslands with woodland where there is surface water, which is an essential habitat requirement.

Habits

Diurnal and gregarious, they occur in small herds which may temporarily form larger aggregations. The males are territorial establishing and maintaining permanent regularly patrolled territories of, in the Kruger National Park, two to four square kilometres (Joubert, 1972). Both sexes mark grass stems with a sticky secretion of the preorbital glands, the territorial males being assiduous in doing so. The territorial males defend their territories by advertising their presence by standing on raised ground and displaying themselves to trespassers and by head bobbing or dropping to their knees and horn clashing with them; serious fighting being rare. While territorial males will herd females into their territories the harem herds tend to remain permanently with their territorial male. Young males are evicted from the harem herds by the territorial males as the rut approaches and they join up to form bachelor herds which take up areas on the periphery of the male territories. Reputed to be the fastest of the antelopes over short distances, they can sustain a lumbering gallop over long distances. Inquisitive and curious to the verge of stupidity they will stand in the open even after members of the herd have been shot, a factor which has no doubt led to their disappearance from parts of their range.

Breeding in the wild

Seasonal breeders, the rut commences in January and the bulk of the calf crop is born in October with odd births up to the end of December. The females make no attempt to hide their young and while the females forage,

the young join up to form nursery herds. Females have their first calf at about 36 months old, the males becoming sexually mature at 40 to 42 months old. A single calf is produced at birth.

Breeding potential in captivity

The Johannesburg Zoo had two births in 1984.

Reasons for decline

Pienaar (1963) reported that the replacement of palatable by unpalatable grasses such as Bothriochloa insculpta led to a decline in the species in the Kruger National Park. Bush encroachment, agricultural and other human developments with alteration of the habitat, overexploitation and disease have all played a part in their local disappearance. In the past hunting pressures led to a decline in numbers.

Numbers in captivity

The Johannesburg Zoo has three males and three females.

Protective measures in operation

Protected by legislation in the Transvaal under Schedule 2 Protected Game, they occur in the Kruger National Park and reserves on its western boundary and in other reserves in the province and have been reintroduced to reserves in northern Natal.

Protective measures proposed

A continuation of the present policy of reintroduction to suitable reserved areas.

Current research

None, but see Child, Robbel & Hepburn (1972), Joubert (1972, 1974).

Remarks

S.C.J. Joubert (in litt.) records that the 1984 survey showed that there was a population of some 930 in the Kruger National Park; the subpopulation on the eastern plains north of the Shingwedzi River having declined in numbers from a peak in 1984 to 390 to 278 in 1985 as a result of three consecutive years of drought experienced in this area. It is hoped that now that the drought has broken the population will pick up in numbers in the future. The main subpopulation south of the Shingwedzi River have shown an increase in numbers over the years 1977 to 1984. Both these subpopulations are accounted as being in a healthy condition. Translocation to other parts of the Park is in train, an initial translocation of nine to the Pretorius Kop area having successfully adapted to this environment.

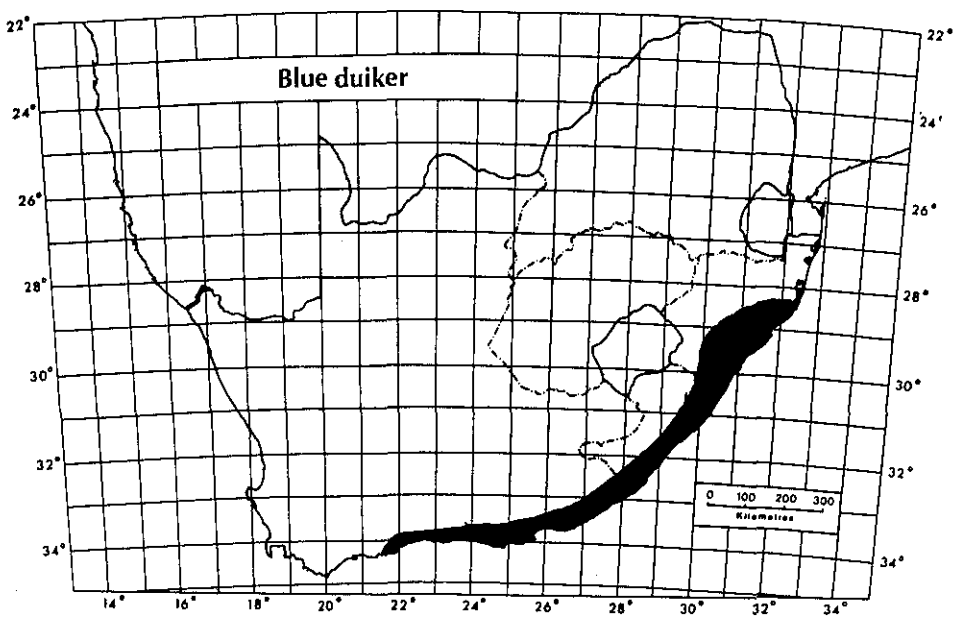
The National Zoological Gardens have been highly successful in breeding the species on their farm at Potgietersrus now having a population of about 40. From this nucleus, stock will be translocated in the near future to their other farm at Lichtenburg (L.J. Smith, pers. comm.). The Transvaal Division of Nature Conservation have also established viable populations on their reserves in the province.

In spite of their marginal distribution in the Republic and the sensitivity of the species to alteration of their habitat, the healthy state of the Kruger National Park populations and the success attending the efforts of the Transvaal Division of Nature Conservation and National Zoological Gardens to establish viable populations on their reserves allow the removal of the species from the endangered category to the status of Rare.

At November 1985 R.D. Carr (pers. comm.) reports that numbers in reserves and private lands in the Transvaal were as follows:

Doorndraai Dam Nature Reserve 180; Nylsvley Nature Reserve 50; Percy Fyfe Nature Reserve 70 and on private lands about 250. Stock is available for translocation in the Transvaal and is being taken up on a broad basis.

They have been reintroduced to a number of farms in the northern Cape Province.



BLUE DUIKER **RARE**
Blouduiker

Philantomba monticola monticola (Thunberg, 1789)

1789. Capra monticola Thunberg, Resa uti Europa, Africa, Asia ....2: 66. Langkloof, about 33°40'S, 23° 40'E, Knysna district, Cape Province. The sector of their range in the Cape Province.

Philantomba monticola bicolor (Gray, 1863)

1863. Cephalophus bicolor Gray, Proceedings of the Zoological Society, London, 1862: 263. Umgozy (Ngoye) Forest, Ntunsini district, KwaZulu. The range of the species in Natal and KwaZulu.

Order Artiodactyla **Family Bovidae**

Present distribution

Occur in Natal and KwaZulu and narrowly along the south coast through the Transkei and Ciskei to the Knysna district.

Former distribution

There is some evidence that their distribution extended further west to Grootvadersbosch in the Swellendam district (Skead, 1980).

Habitat

Forest, thickets and dense coastal bush.

Habits

Crepuscular and usually solitary, pairs associate temporarily.

Breeding in the wild

From the little information that is available they appear to breed throughout the year producing a single lamb at a birth.

Breeding potential in captivity

Very good, Von Ketelhodt (1973) records births at the Queens Park Zoo, East London over an 11 year period which confirms that they breed throughout the year with a peak of births early in the summer months.

The National Zoological Gardens, Pretoria had two births in 1984, the East London Zoo a single birth in 1983 and the Hartebeestpoort Snake and Animal Park find that they are easily bred in captivity (J. Seal, pers. comm.). The International Zoo Yearbook (1982-1984) record births in zoos overseas.

Reasons for decline

No evidence is available to show that they have declined except possibly marginally in the extreme west of their range. Dependent on forest, thickets and coastal bush all these associations have been, at least in parts, destroyed or fragmented leading to the local disappearance of the

species. Hunting, snaring and poaching has also taken toll of numbers and uncontrolled dogs are increasing in numbers and kill large numbers annually.

Numbers in captivity

The National Zoological Gardens, Pretoria have a male and three females; the Johnnesburg Zoo three males and two females; the East London Zoo two males and six females and the Hartebeestpoort Snake and Animal Park seven males and seven females. Where coastal forests were being cleared for development 59 were reported as being successfully captured and held pending shipment overseas from the Durban district (Mathias & Bourquin, 1984).

Protective measures in operation

Protected by legislation in Natal and in the Cape Province under Schedule 2 as protected wild animals. They occur in protected areas in Natal.

Protective measures proposed

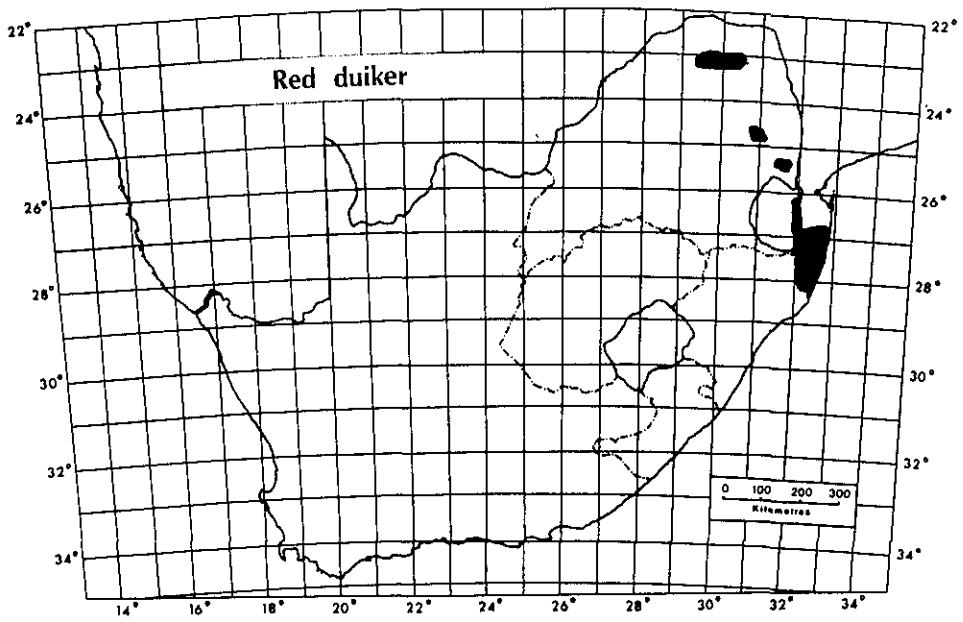
There is a need to control more strictly their forest habitat and the numbers of uncontrolled dogs.

Current research

An investigation of the ecology of this species will this year (1985) be undertaken by the University of Natal, Pietermaritzburg by A. Bowland. Numbers are monitored in some of the nature reserves in Natal and data on status and distribution on private land are being collected. See Howard & Marchant (1984).

Remarks

Successful methods of capture and translocation are given by Mathias & Bourquin (1984).



RED DUIKER **RARE**
Rooiduiker

Cephalophus natalensis natalensis A. Smith, 1834

1834. Cephalophus natalensis A. Smith, South African Quarterly Journal Ser. 2, 2: 217. Port Natal (=Durban) Natal. Meester (in prep.) considers C. n. amoenus Wroughton, 1911 and C. n. lebombo Roberts 1936, to be synonyms of C. n. natalensis.

Order Artiodactyla **Family Bovidae**

Present distribution

In the Transvaal there are isolated populations on the southern slopes of the Soutpansberg from the vicinity of Louis Trichardt to about 45 km east of this and in the vicinity of Ohrigstad and Nelspruit in the eastern parts of the province. In Natal they occur in the north-east including parts of KwaZulu but only as far south as 28° 45'S. They may well occur in parts of eastern Swaziland but there are no records to confirm this. Throughout this range their occurrence is discontinuous.

Former distribution

Although with no material records to support his assertion, Sclater (1900) stated that they occurred in Tembuland and Pondoland, which are now parts of the Transkei. They occurred coastally in Natal at least as far south as Durban and north to the Mozambique border and in eastern Swaziland, Du Plessis (1969).

Habitat

They occur in forests or dense thickets where water is available, there being records from riverine forest, thickly wooded ravines and dense coastal bush.

Habits

Usually found solitary or a female with her offspring or a loose association of pairs during the mating season. Shy and secretive they are difficult to observe. It is not known if they are territorial. Browsers, they use communal latrines.

Breeding in the wild

A single young is born during the summer months.

Breeding potential in captivity

Unknown.

Reasons for decline

Agricultural and urban development has taken a heavy toll of the coastal forests in Natal. It is estimated that 71% of this association, south of the Tugela River has been destroyed and midland forests have also suffered, the Karkloof for example being reduced in size from its 1880 level of 32 400 ha to 4 500 ha in 1984 (Matthias & Bourquin, 1984). The red duiker does not now occur south of 28°45'S in Natal and if Sclater (1900) is correct when he stated that they were found in what is now the Transkei, then they have suffered a marked shrinkage in their distribution in the southern parts of their range. Illegal hunting has probably also played a part in this reduction in range.

Numbers in captivity

The Johannesburg Zoo has one male and two females.

Protective measures in operation

Protected under Schedule 2 protected game in the Transvaal and protected in Natal. Occur in the Kruger National Park and in the following Provincial Nature Reserves in the Transvaal: Happy Rest, Blyderivierpoort; Swadini and Pongola.

Protective measures proposed

Reintroduction into areas of suitable habitat within the former range of the species. Strict control of their forest habitat and of uncontrolled dogs.

Numbers in captivity

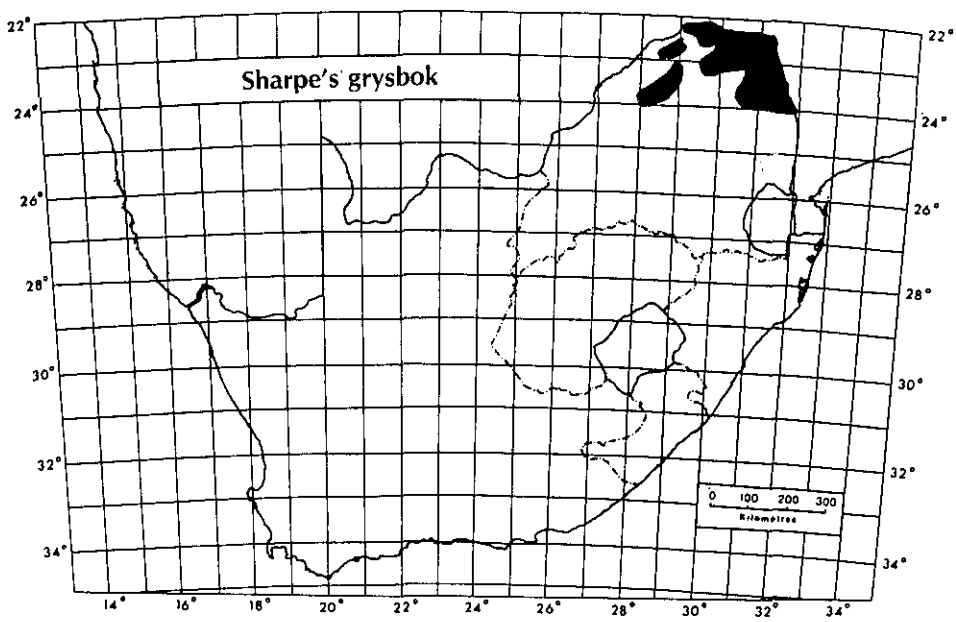
None.

Current research

An investigation of the ecology of the species is being undertaken by A. Bowland of the University of Natal, Pietermaritzburg this year (1985). Numbers are monitored in some nature reserves in Natal and data on status and distribution on private land are being collected. See Howard & Marchant (1984) for Natal and Conservation Plan, 1984, Nature Conservation Division, Transvaal (Visagie, 1984).

Remarks

Throughout their distributional range in eastern Sub-Saharan Africa their occurrence is patchy and discontinuous.



SHARPE'S GRYSBOK **RARE**
Sharpe se grysbok

Raphicerus sharpei colonicus Thomas & Schwann, 1906

1906. Raphicerus sharpei colonicus Thomas & Schwann, Proceedings of the Zoological Society, London: 583. Klein Letaba, 305 m (1 000 ft) west of Kruger National Park, eastern Transvaal.

Order Artiodactyla **Family Bovidae**

Present distribution

Restricted to the northern sector of the Transvaal and to the low lying eastern parts of Swaziland.

Former distribution

Unknown.

Habitat

Occur in areas of low scrub in savanna woodland, often in areas where the trees have been removed and there is a low secondary growth of bushes and regenerating trees with a grass cover or around the bases of rocky areas and stony ridges with scrubby vegetation.

Habits

Very little is known about the ecology of this species. Predominently nocturnal, they live in a concealing habitat in which they lie up tightly unless disturbed by close approach when they run off, crouching low to the ground, giving the observer a glimpse only of their reddish backs. They occur singly or a female with her young and are shy and secretive. They both browse and graze, the relative proportions in stomach contents being 70% and 30% in a sample of 91 from Zimbabwe.

Breeding in the wild

Such data as is available suggests that they breed throughout the year (Kerr & Wilson, 1967) producing a single young at a birth after a gestation period of seven months (Strijbis, 1977).

Breeding potential in captivity

Unknown.

Reasons for decline

There is no evidence to suggest that they have declined in numbers or range.

Numbers in captivity

None.

Protective measures in operation

Protected by legislation in the Transvaal under Schedule 2 protected game, and is Specially Protected in Natal. They occur in the Kruger National Park and in the following Provincial Nature Reserves in the Transvaal: Hans Merensky, Strydom Dam, and Messina (R.D. Carr, pers. comm.).

Protective measures proposed

None.

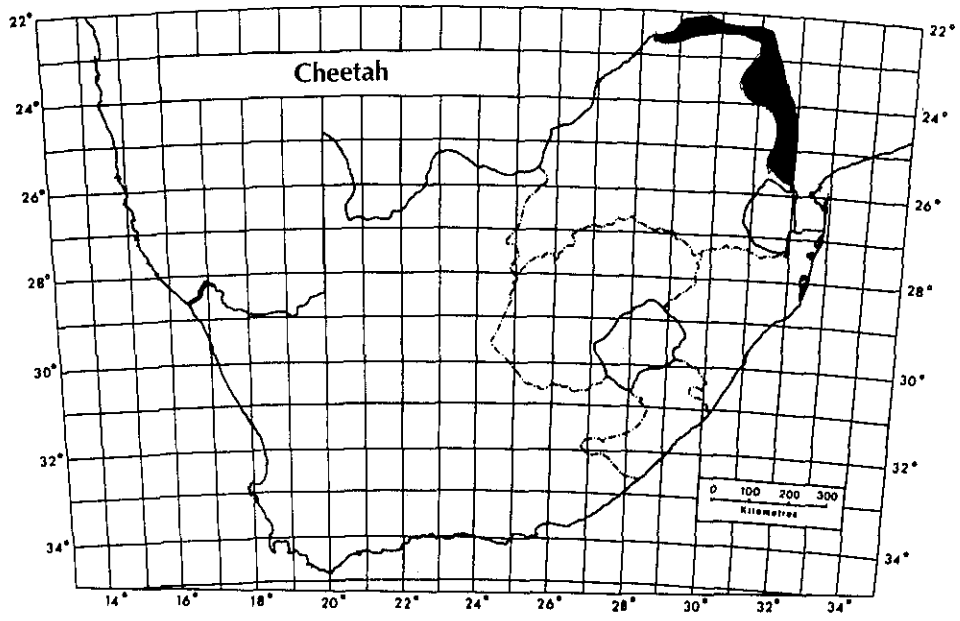
Current research

None.

Remarks

The species has a wide distribution in Mozambique and Zimbabwe, its distribution extending northwards to central Tanzania.

SPECIES NOW OUT OF DANGER



CHEETAH **OUT OF DANGER**
Jagluiperd

Acinonyx jubatus jubatus (Schreber, 1775)

1775. Felis jubata Schreber, Säugthiere 3: pl 105; text: 393 (1777). Cape of Good Hope.

Order Carnivora **Family Felidae**

Present distribution

In the Cape Province there is a small resident population in the Kalahari Gemsbok National Park and they occur from time to time as vagrants on farms in the northern parts of the province along the Botswana border. Extinct in the Orange Free State and Natal. In the Transvaal there is a resident population in the Kruger National Park and individuals cross onto farms in the north from Zimbabwe and Botswana (Rautenbach, 1982).

Former distribution

Poorly recorded in the historical record. Backhouse (in Skead, 1980) recorded the species from the Orange River at Goodhouse, Cape Province. The "woolly cheetah", an aberrant form in which the characteristic tear marks of the normal cheetah were absent and which was brown spotted, was shipped alive to the Zoological Gardens, London about 1877. It was caught

near Beaufort West in the Karoo (Sclater, 1877). Lichtenstein (2, 1815: 394) recorded cheetah from the north-eastern parts of the province but there are no records from the south or south-west (Skead, 1980).

Exterminated in Natal by about 1930, they were widespread in the Transvaal in former times.

Habitat

Open plains and open savanna woodland, avoiding forest and woodland with dense underbush. While they will drink when water is available they are not dependent on this relying on their prey for their moisture requirements.

Habits

Diurnal, occurring solitarily, in pairs or family parties of up to four, the males sometimes forming bachelor groups of three or four. The family parties have large home ranges estimated at up to 80 km^2 (Pettifer, 1981), their home ranges overlapping with those of other groups. Opinions differ as to whether they are territorial or not. The males assiduously mark with urine and faeces and the females aggressively defend their cubs but in general there is little agnostic behaviour between groups, which tend to avoid each other.

Breeding in the wild

The question as to whether cheetah are seasonal breeders or not remains unresolved and the time of the year of births of litters seems to vary according to the locality. In the Kruger National Park, Stevenson-Hamilton (1912, 1947) stated that litters were born between June and December, in Namibia, Shortridge (1934) gave the time as December or January. Females have the potential of producing litters at any time during the year. Litters usually number three, but up to five have been recorded and are born after a gestation period of 90 to 95 days, in the shelter of tall grass or underbush and are hidden very cunningly. The young start to wean at five to six weeks old and are fully reared by the age of three months but continue to suckle up to the age of six months. They will hunt on their own by the age of eight to 12 months. The young females become sexually mature from the age of 21 to 24 months.

Breeding potential in captivity

Until the pioneering work of Miss A. van Dyk and Dr D. Meltzer carried out on De Wildt Estates, a breeding station of the National Zoological Gardens, near Pretoria, cheetah had proved to be difficult to breed in captivity. The problems were largely resolved by these investigations at De Wildt and providing certain conditions are met they have been shown to be excellent breeders in captivity. Successfully bred at the Hartebeestpoort Snake and Animal Park (J. Seal, pers. comm.).

Reasons for decline

The development of their habitat, their incompatibility with domestic stock and the high value of their skins appear to be the main factors in their decline.

Numbers in captivity

The National Zoological Gardens, Pretoria has four and 60 at De Wildt; the Johannesburg Zoo eight; the Hartebeestpoort Snake and Animal Park five males and five females and the East London Zoo two males and a female. Small numbers are held at the Loskop Dam Provincial Nature Reserve, Transvaal, by the Oudtshoorn Zoo, Cape Province, and by Mr N. Hewitt in Natal. The Bloemfontein Zoo has three males and one female.

Protective measures in operation

In the Transvaal listed under Schedule 4 as a protected wild animal; in Natal specially protected and in the Cape Province protected under Schedule 1 as an endangered wild animal.

Protective measures proposed

Total protection, capture of problem individuals and translocation to game reserves, as is at present in operation in the Transvaal, should continue.

Current research

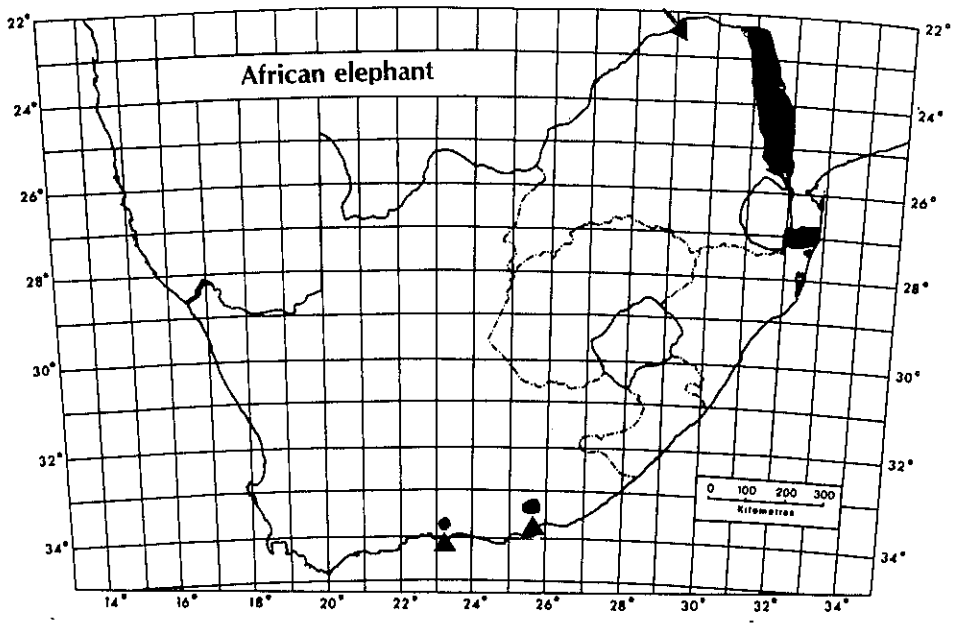
Dr D. Meltzer working with the National Zoological Gardens and the Mammal Research Institute, University of Pretoria is engaged on investigations into male fertility, the oestrus cycle of females, food conversion and intake, infectious diseases and red cell metabolism of the species.

Remarks

With the success of captive breeding at De Wildt there seems the necessity of investigating whether it is possible to introduce young stock to reserves. There are problems in this connection as most suitable areas already have cheetah; they are incompatible with domestic stock and where reserves have wildlife populations, their predation on these is a factor to be contended with. In spite of this it would be interesting to know if captive born young can be returned to the wild although one experiment in this direction failed. In the Transvaal numbers of individuals are trapped annually as problem animals on farming areas in the north and it is becoming increasingly difficult to find suitable areas for the release of these which mitigates against the use of young stock from De Wildt.

They have been reintroduced with success to reserves in the Cape Province and Transvaal and viable populations exist from reintroduction to the Hluhluwe Corridor Umfolozi Game Reserve Complex, Mkuze and Itala reserves in Natal (D.T. Rowe-Rowe, pers. comm.).

D. Meltzer (pers. comm.) suggests that the export of wild caught individuals should be prohibited, this trade confined to individuals reared in captivity.



AFRICAN ELEPHANT **OUT OF DANGER**
Afrikaanse olifant

Loxodonta africana africana (Blumenbach, 1797)

1797. Elephas africanus Blumenbach, Handbuch der Naturgeschichte 5 ed: 125, Atlas, pl 19, fig C. Central and Southern Africa; Orange River, South Africa, nominated by Pohle, Zeitschrift für Säugetierkunde 1: 63, 1926. See Allen (1939: 453) for comment on the type locality.

Order Proboscidea **Family Elephantidae**

Present distribution

Barely surviving in the Knysna Forest, southern Cape Province and likely to become extinct there before long. Elephants still occur in the Addo Elephant National Park, south-eastern Cape Province; in Tongaland, northern KwaZulu and in the Transvaal in the Kruger National Park and on private game reserves on its western boundary.

Former distribution

Occurred widely throughout the Republic. The first historical record of their presence in southern Africa was made by Vasco da Gama in December 1497 at Mossel Bay (Colvin 1912: 24). Van Riebeeck's diary makes no mention of their presence on the Cape Peninsula but the entry for March 1702 records that a herd seeking water "as the valleys were drying up" visited Tiger Valley (Tiervlei) on the Cape Flats. As groups of pioneers started to explore the hinterland, reports of elephants showed that they occurred as far to the north-west as the Orange River (Paterson, 1790: 62 and 64) and the northern Cape Province (Burchell, 2, 1824: 466), all along the southern coastal parts of the province and in parts of the Little and Great Karoo (Skead, 1980). In the early part of the nineteenth century they occurred in Natal from the Mozambique border south to Durban becoming extinct about 1860. They were widely hunted in the Transvaal in later years to extermination except in what is today the Kruger National Park and in its vicinity.

Habitat

They have a wide habitat tolerance and will use virtually all types of habitat from semi-desert to forest providing water and food are available but have a preference for wooded areas as opposed to areas of more open terrain.

Habits

Both nocturnal, diurnal and gregarious, they live in family groups of an adult female and her offspring or a number of closely related females with their offspring. These family groups, usually numbering up to about 10 individuals, join up to form herds. The bulls join the family groups when the females are in oestrus but leave after mating to remain solitary or to join with other bulls in temporary associations. Elephant society is matriarchal, based on the lead female in the family group or a number of lead females in the herds. On becoming sexually mature at about 10 years of age the young bulls leave the family groups.

Breeding in the wild

A single calf, rarely twins, is born at any time during the year with indications that in some parts of their range there is a peak in calving during the early summer months. The gestation period is 22 months, the females seeking a secluded, shady retreat to give birth, often accompanied by other females who stand guard. The females give birth standing up; the calf, in dropping free, ruptures the umbilical cord. Maternal care of the calf is intense for the first two years of its life, female calves reaching puberty at about 11 years old, males at about 10 years but they do not compete for females until they are about 20 years of age. The females may remain sexually mature up to the age of about 60 years.

Breeding potential in captivity

Could never be a factor as for economic reasons large numbers cannot be held in captivity.

Reasons for decline

Their incompatibility with any type of human development and in earlier times their exploitation for their ivory.

Numbers in captivity

The Johannesburg Zoo has two males and two females (1985).

Protective measures in operation

Protected in national parks, reserves and forestry areas the species is protected under Schedule 2 of the Nature Conservation Ordinance in the Cape Province, Schedule 2 in the Transvaal, and as a protected species in Natal.

Protective measures proposed

None, other than the protection they receive in the areas where they presently occur.

Current research

P. J. Viljoen of the Eugène Marais Chair of Wildlife Management, University of Pretoria will shortly complete a DSc study on the ecology and behaviour of the desert-dwelling elephants of Kaokoland and Damaraland, Namibia and E. W. Klingelhoeffer of the same institute is presently (1985) writing up his MSc study on the ecology and management of the Tongaland elephants. B. Page of the University of Natal, Durban recently (1985) completed a study on movements of translocated elephants in the Hluhluwe Game Reserve, Natal.

Remarks

Wherever elephant have been afforded adequate protection their numbers have increased beyond the carrying capacity of the areas set aside for them. The Kruger National Park is a good example of this where culling at the rate of about 1 000 per year is in practice to hold numbers within this carrying capacity.

The area within the Addo Elephant National Park available to the resident population, estimated to be about 130, has recently been increased to give them access to about 8 000 ha of the total area of 8 500 ha. This is a viable population which no doubt will continue to increase to the stage when culling will become necessary. The three that are reported to be left in the Knysna Forest are certainly doomed to extinction within the next few years.

Translocation of up to about 20 individuals is presently in train into the Hluhluwe Game Reserve, Natal and a small number have been introduced to the Tembe Reserve in KwaZulu and twenty-six were introduced to the Pilanesberg Game Reserve in Bophuthatswana.

The nature of elephants is such that the only hope for their survival lies in their containment within the larger National Parks. In the long term it is difficult to estimate how long these Parks can be retained intact against the mounting pressures of rapidly increasing human populations and the consequent land hunger. On this basis while present conservation measures are as adequate as can be given the long-term future for the species is uncertain although at the moment, except in the Knysna Forest, populations are viable and numbers on the increase.

G. De Graaff (in litt. Feb 1985) and D.T. Rowe-Rowe (in litt. Nov 1985) provide the following numbers of elephants in the Republic of South Africa:

Tongaland	100
Knysna Forest	3
Addo Elephant National Park	130
Kruger National Park	8 051 (at 1983)
Klaserie Game Reserve	65
Timbavati Game Reserve	18+
Sabi Sand Game Reserve	10+
Pilanesberg (Bophuthatswana)	40
Hluhluwe Corridor Umfolozi Game Reserve Complex	45
	8 462+

THE INDETERMINATE SPECIES

The criterion for species relegated to this category is that we have insufficient information to currently judge their status.

Several considerations have led species to being included: six are included because they are known to occur in the Republic of South Africa from only a single specimen. These are: Cryptochloris zyli, Van Zyl's golden mole; Chrysochloris visagiei, Visagie's golden mole; Tadarida acetabulosus, Natal free-tailed bat; Tadarida ventralis, Transvaal free-tailed bat; Laephotis wintoni, De Winton's long-eared bat; Hipposideros commersoni, Commerson's leaf-nosed bat. Cryptochloris zyli, Van Zyl's golden mole is an endemic species and doubt remains as to its relationship with Chrysochloris asiatica, the Cape golden mole. Myotis welwitschii, Welwitsch's hairy bat, Tadarida ansorgei, Ansorge's free-tailed bat, are known from one or two records yet are widely distributed and common extralimitally, their occurrence in South Africa being marginal. The Chiroptera as an Order have been neglected in the past in spite of the fact that they constitute in number of species about 25% of the mammalian fauna of South Africa. Within recent years however, interest in the Order has revived and they are receiving attention by biologists. This should eventually allow some of the species at least, to be asigned to specific conservation categories with more confidence.

Among the rodents, we know little about the ecology of species such as Grant's rock mouse, Aethomys granti, and the tiny fat mouse, Steatomys parvus. Although the former is the subject of investigation at the moment, their categorization must await fuller information.

All species in this category are included in the hope that it will stimulate scientific interest and investigation which will lead to a fuller knowledge of their distribution, biology and conservation status. It is probable that some of them are actually quite common, while others may well deserve the highest protection status. Several of the more doubtful species require proper taxonomic assessment before energy is expended in trying to determine their conservation status. To this end, the priority for future work is to improve the field collections. It may then be necessary to apply some of the more sophisticated aids to taxonomy, such as electrophoretic techniques, karyology, sperm morphology and special analytical processes in order to clarify these poorly understood relationships.

LONG-TAILED FOREST SHREW **INDETERMINATE**
Langstertbosskeerbek

Myosorex longicaudatus Meester & Dippenaar, 1978

1978. Myosorex longicaudatus Meester & Dippenaar, Annals of the Transvaal Museum 31: 30. Diepwalle Forest Station, 14 km NNE Knysna, southern Cape Province, 33°57'S, 23°10'E.

Order Insectivora **Family Soricidae**

So far known only from forested areas in the southern parts of the Cape Province from the Langeberg Mountains, near Heidelberg, eastwards to the Diepwalle Forest Reserve in the Outeniqua Mountains near Knysna. Very little is known about the ecology of this species except that it appears to prefer living in dense fern clumps on the ecotone of forest and fynbos. It is the latest new species of mammal to be described from southern Africa.

MAQUASSI MUSK SHREW **INDETERMINATE**
Maquassi skeerbek

Crocidura maquassiensis Roberts, 1946

1946. Crocidura maquassiensis Roberts, Annals of the Transvaal Museum 20: 312. Klipkuil, Maquassi, Wolmaransstad district, western Transvaal.

Order Insectivora **Family Soricidae**

Only six specimens of this tiny shrew are known, two each from the Transvaal, Swaziland and Zimbabwe. While difficulties attend the collection of tiny shrews, as assiduous collecting has been undertaken in some of the localities from which specimens are available and as no further material has turned up, it appears to be an uncommon species. Nothing is presently known about its ecology and its taxonomic status remains in doubt. Meester (in prep.) suggests that it may be a southern African form of the Asian C. sauveolens (Pallas, 1811) and to be closely allied to C. pitmani Barclay, 1932 of Zambia. Included in Meester (1976) as "very rare", not sufficient is known about it to place it satisfactorily.

GREATER DWARF SHREW **INDETERMINATE**
Groter dwergskeerbek

Suncus lixus gratulus (Thomas & Schwann, 1907)

1907. Pachyura gratula Thomas & Schwann, Proceedings of the Zoological Society, London 1906: 781. Legogot near White River, eastern Transvaal.

Order Insectivora **Family Soricidae**

Known only from the central, north-eastern and eastern parts of the Transvaal in savanna woodland. Very few specimens of this tiny shrew have been collected and we know very little about its ecology. The only other records are two from Zimbabwe and a single record from Botswana.

Extralimitally the species is known to occur as far north as Tanzania, but correspondingly, in this range, records are few and scattered and nowhere is it common. To some extent this may be due to the difficulty of collecting tiny shrews of this type.

LEAST DWARF SHREW **INDETERMINATE**
Kleinste dwergskeerbek

Suncus infinitesimus chriseos (Kershaw, 1921)

1921. Pachyura chriseos Kershaw, Annals of the Durban Museum 3: 31. Durban, Natal.

Order Insectivora **Family Soricidae**

Recorded from the Transvaal; the north-eastern and south-eastern parts of the Orange Free State; southern Natal and in the coastal parts of the eastern Cape Province. Although it appears to have a fairly wide distribution in the Republic, few specimens are available and apart from casual observations on its ecology, little is known about this species.

Extralimitally there are no records between the Transvaal and East Africa where the nominate form occurs in Kenya and the Central African Republic.

VAN ZYL'S GOLDEN MOLE **INDETERMINATE**
Van Zyl se kruipmol

Cryptochloris zyli Shortridge & Carter, 1938

1938. Cryptochloris zyli Shortridge & Carter, Annals of the South African Museum 32: 284. Compagnies Drift, 10 miles inland from Lamberts Bay, northwestern Cape Province.

Order Insectivora **Family Chrysochloridae**

Known only from a single specimen from Lamberts Bay, Cape Province, nothing is known about the ecology of this species. Included in the former Red Data Book as Rare, it is retained on the list pending further material for study becoming available.

DE WINTON'S GOLDEN MOLE **INDETERMINATE**
De Winton se kruipmol

Cryptochloris wintoni Broom, 1907

1907. Cryptochloris wintoni Broom, Annals and Magazine of Natural History (7) 19: 264. Port Nolloth, Coastal Little Namaqualand, Cape Province.

Order Insectivora **Family Chrysochloridae**

So far known only from two specimens from sand dunes at Port Nolloth, Cape Province. Until further material becomes available the relationship of this species ramains problematical. It occurs in the same habitat as Grant's golden mole, Eremitalpa granti, which has a wide distribution narrowly along the coast, but differs in having expanded temporal bullae. Included in the former Red Data Book as Rare, the species is retained pending the availability of further material.

VISAGIE'S GOLDEN MOLE **INDETERMINATE**
Visagie se kruipmol

Chrysochloris visagiei Broom, 1950

1950. Chrysochloris visagiei Broom, Annals of the Transvaal Museum 21: 238. Gouna, 54 miles E of Calvinia, western Cape Province.

Order Insectivora **Family Chrysochloridae**

Known only from a single specimen, its relationship to the more widespread Cape golden mole, Chrysochloris asiatica remains in doubt. Meester (1974) suggests that it is simply an aberrant form of this species. Included in the former Red Data Book as Rare, too little is known about this species to place it with certainty.

DUTHIE'S GOLDEN MOLE **INDETERMINATE**
Duthie se kruipmol

Chlorotaepa duthieae (Broom, 1907)

1907. Cryptochloris duthiae Broom, Transactions of the South African Philosophical Society 18: 292. Knysna, southern Cape Province.

Order Insectivora **Family Chrysochloridae**

Restricted in its distribution to a narrow belt of coastal alluvial sand and sandy loam from about Knysna to Port Elizabeth in the southern Cape Province. Although apparently not uncommon in this area, nothing is known of its ecology and few specimens are available in collections.

SCLATER'S GOLDEN MOLE **INDETERMINATE**
Sclater se kruipmol

Chlorotalpa sclateri sclateri (Broom, 1907)

1907. Chrysochloris sclateri Broom, Annals and Magazine of Natural History (7) 19: 263. Beaufort West, western central Cape Province.

Chlorotalpa sclateri montana Roberts, 1924.

1924. Chlorotalpa montana Roberts, Annals of the Transvaal Museum 10: 64. Kastrol Nek, 6 500 ft, east of Wakkerstroom southeastern Transvaal.

Chlorotalpa sclateri guillarmodi Roberts, 1936.

1936. Chlorotalpa guillarmodi Roberts, Annals of the Transvaal Museum 18: 253. Mamathes, northwestern Lesotho.

Chlorotalpa sclateri shortridgei Broom, 1950.

1950. Chlorotalpa shortridgei Broom, Annals of the Transvaal Museum 21: 238. Sutherland, roughly 100 miles west of Beaufort West, west central Cape Province.

Order Insectivora **Family Chrysochloridae**

This species is represented by a series of scattered records covering an area of the central Karoo of the Cape Province and extending north-eastwards to the south-eastern Transvaal, with records from the eastern Orange Free State and Lesotho. Meester (in prep.) notes that the validity of the subspecies is by no means beyond doubt and should be reviewed. The species occurs at high altitudes in the Drakensberg and in the north-eastern Transvaal and on the escarpment at Beaufort West but apart from these observations nothing is known of its ecology and too little information is available on which to judge its status.

GUNNING'S GOLDEN MOLE **INDETERMINATE**
Gunning se kruipmol

Amblysomus gunningi (Broom, 1908)

1908. Chrysochloris gunningi Broom. Annals of the Transvaal Museum 1: 14. Woodbush, Transvaal.

Order Insectivora **Family Chrysochloridae**

Known only from the Woodbush Forest, north-eastern Transvaal, and the Agatha Forest Reserve some 20 km south of this (Rautenbach, 1978). Appears on our present knowledge to have a very restricted distribution and only seven specimens are known. It appears to be associated with montane forest although it has also been taken in ploughed lands and in open montane grassland (Rautenbach, 1978). This is the sum total of our knowledge of the ecology of this species.

ZULU GOLDEN MOLE **INDETERMINATE**
Zoeloelandse kruipmol

Amblysomus iris iris Thomas & Schwann, 1905

1905. Amblysomus iris Thomas & Schwann, Abstracts, Proceedings of the Zoological Society, London No 18: 23; Proceedings of the Zoological Society, London 1: 259. Umfolozi Station, Zululand, Natal.

Amblysomus iris corriae Thomas & Schwann, 1905.

1905. Amblysomus corriae Thomas & Schwann, Abstracts of the Zoological Society, London No 20: 5; Proceedings of the Zoological Society, London 2: 57. Knysna, southern Cape Province.

Amblysomus iris septentrionalis Roberts, 1913.

1913. Amblysomus corriae septentrionalis Roberts, Annals of the Transvaal Museum 4: 73, Wakkerstroom, southeastern Transvaal.

Order Insectivora **Family Chrysochloridae**

Although this species has a relatively wide distribution from Knysna, Cape Province to the Transvaal, it occurs only in a narrow coastal strip from Knysna to northern KwaZulu, with a single record from Wakkerstroom, Transvaal. Little is known about its ecology and its status is uncertain. It appears to be associated with light sandy soils throughout its range.

JULIANA'S GOLDEN MOLE **INDETERMINATE**
Juliana se kruipmol

Amblysomus julianae Meester, 1972

1972. Amblysomus julianae Meester, Annals of the Transvaal Museum 28: 35. The Willows, Pretoria, Transvaal.

Order Insectivora **Family Chrysochloridae**

Known only from three localities near Pretoria and two in the Kruger National Park, a total of five specimens only have so far been collected. Too little information is available on which to judge its status and its ecology warrants study.

EGYPTIAN TOMB BAT **INDETERMINATE**
Egiptiese witlyfvlermuis

Taphozous perforatus sudani Thomas, 1915

1915. Taphozous sudani Thomas, Annals and Magazine of Natural History (8) 15: 561. Mongalla, north of Lado, Upper Nile, Sudan.

Order Chiroptera **Family Emballonuridae**

Occurs widely in the southern parts of Zimbabwe and although not so far recorded from the Republic, has been taken on the northern bank of the Limpopo River at the junction of this river and the Shashi River on the boundary of the Transvaal and Zimbabwe. A savanna woodland species that rests in rock crevices during the day, in small colonies numbering up to about a dozen, the individuals bunched tightly together deep in the crevices. Included in the former Red Data Book as Rare, too little is known about the species under southern African conditions at the moment to assess its status. The species has a wide distribution from Egypt southwards; throughout East and West Africa southwards to the extreme northern parts of Zambia, then with a break in distribution, recurring in northern Botswana and southern Zimbabwe.

LARGE-EARED FREE-TAILED BAT **INDETERMINATE**
Bakoor-losstertvlermuis

Otomops martiensseni icarus Chubb, 1917

1917. Otomops icarus Chubb, Annals of the Durban Museum 1: 433. Durban, Natal.

Order Chiroptera **Family Molossidae**

In the Republic known only from the vicinity of Durban, Natal. Extralimitally it is known from Lake Kariba, Zimbabwe; Angola; north-eastern Zaire; Kenya; north-eastern Tanzania; south-western Uganda; and Madagascar.

In East Africa they are recorded as being gregarious; colonies numbering hundreds, have been recorded from lava tunnels on Mount Suswa, Kenya, where they roost packed closely together (Kingdon, 1974). They are fast fliers with a direct straight flight. In Durban they have been taken from lofts of dwelling houses, but apart from this observation nothing is on record concerning their ecology or status in the Republic where they appear to be highly localized.

NATAL FREE-TAILED BAT **INDETERMINATE**
Natalse losstertvlermuis

Tadarida acetabulosus natalensis (A. Smith, 1847)

1847. Bysopes natalensis A. Smith, Illustrations of the Zoology of South Africa, Mammals: pl 49 and text. Near Port Natal = Durban, Natal.

Order Chiroptera **Family Molossidae**

This species which occurs on the Indian Ocean islands of Madagascar, Mauritius and Reunion is known on the African mainland from two specimens: the type taken near Durban and the second from near Lake Rudolph in south-eastern Ethiopia. Nothing is known about this species under South African conditions and it has not been recorded since the original specimen was taken.

MADAGASCAR FREE-TAILED BAT **INDETERMINATE**
Madagascarse losstertvlermuis

Tadarida fulminans (Thomas, 1903)

1903. Nyctinemus fulminans Thomas, Annals and Magazine of Natural History (7) 12: 501. Fianarantsoa, eastern Betsileo, Madagascar.

Order Chiroptera **Family Molossidae**

So far recorded only from the Pafuri area of the Kruger National Park, eastern Transvaal (I.L. Rautenbach, pers. comm.). Few and scattered records of this species are available from countries northwards as far as north-eastern Zaire and Kenya and it appears to be an uncommon species.

They roost in rock crevices during the day in colonies of up to about a dozen individuals together. In Zimbabwe a single young is born early in the summer months.

TRANSVAAL FREE-TAILED BAT **INDETERMINATE**
Transvaalse losstertvlermuis

Tadarida ventralis (Heughlin, 1861)

1861. Nyctonemus (Bysopes) ventralis Heughlin, Nova Acta Academiae Caesareae Leopoldino-Carolinae germanicae naturae curiosorum, Halle 29 (8): 4, 11. Keren, Eritrea (now Ethiopia).

Order Chiroptera **Family Molossidae**

Tadarida africanus (Dobson 1876) was described from an unknown locality in the Transvaal and was subsequently shown by Kock (1975) to be a synonym of the older named T. ventralis. Rare in collections the species has been recorded from Malawi, from two localities in Mozambique (Smithers & Tello, 1976) and from north-eastern Zaire, Kenya and Ethiopia (Hill & Morris, 1971) and the Sudan (Koopman, 1975) but has not subsequent to Dobson's (1876) specimen been taken in the Republic. Free-tailed bats are high flying species and difficult to collect and nothing is known about their ecology in the southern part of their range.

ANSORGE'S FREE-TAILED BAT **INDETERMINATE**
Ansorge se losstertvlermuis

Tadarida ansorgei (Thomas, 1913)

1913. Nyctinemus ansorgei Thomas, Annals and Magazine of Natural History (8) 11: 318. Malango (=Malanji), Angola.

Order Chiroptera **Family Molossidae**

Recorded from the Mkuze Game Reserve, Natal and the Kruger National Park these are the only localities to date in the Republic where it has been taken.

Extralimitally they occur widely, there being scattered records northwards to Ethiopia and westwards to Angola and Cameroun where in parts it is a common species. In north-eastern Zaire, Lang & Chapin (1917) state that they occur in hundreds in clefts in rocks in total darkness, from where they are smoked out and collected in baskets for food by the local inhabitants.

Nothing is known about their ecology or status in the Republic.

MIDAS FREE-TAILED BAT **INDETERMINATE**
Midas se losstertvlermuis

Tadarida midas midas (Sundevall, 1843)

1843. Dysopes midas Sundevall, Kongliga Svenska Vetenskapsakademien Handlingar, Stockholm 1842: 207, pl 2, fig 7. Bahr-el-Abaid (=White Nile), Sudan. Kock (1969) suggests that the type locality is at Jebel el Funj, between the White and Blue Nile, and Koopman (1975) restricts it to the west bank of the White Nile at about 11°45'N, 33°30'E, Blue Nile Province, Sudan.

Order Chiroptera **Family Molossidae**

Occurs in the north-eastern Transvaal on the Limpopo and Levubu Rivers and in the eastern parts of the province on the Sabie River at Skukuza in the Kruger National Park, which marks its most southerly limits of occurrence in Africa. In Botswana they were found to rest during the day in colonies numbering hundreds, in total darkness under the roofs of houses, and in southern Zimbabwe in dozens tightly packed together in the joints of a concrete bridge. In Botswana the colony at Maun has occupied the same resting place in a roof for over 10 years. A high, fast-flying species; the young are born during the summer months of February to April, one young at a birth.

Extralimitally the species has a patchy and discontinuous distribution south of East Africa. It occurs westwards to Senegal and northwards to the northern parts of Ethiopia and into Arabia. It occurs widely on Madagascar.

The distribution of the species is marginal in the Republic and they are accounted as uncommon at this extremity of their southerly range.

WELWITSCH'S HAIRY BAT **INDETERMINATE**
Welwitsch se langhaarvlermuis

Myotis welwitschii (Gray, 1866)

1866. Scotophilus welwitschii Gray, Proceedings of the Zoological Society, London: 211. Angola.

Order Chiroptera **Family Vespertilionidae**

Recorded from the central and eastern parts of the Transvaal from single specimens from six localities and from a single specimen from Bloemfontein, Orange Free State; it is apparently a rare species in the Republic about which little is known.

Extralimitally it occurs north to Kenya and westwards to central Angola and within this range as well its distribution appears to be patchy and discontinuous and relatively few specimens have been collected. Too little information is available on its ecology and nothing is known of its status in the Republic.

ANGOLA HAIRY BAT **INDETERMINATE**
Angola-langhaarvlermuis

Myotis seabrai (Thomas, 1912)

1912. Cistugo seabrai Thomas, Annals and Magazine of Natural History (8) 19: 205. Mossamedes, southwestern Angola.

Order Chiroptera **Family Vespertilionidae**

Confined to the extreme north-western parts of the Cape Province. Some doubt exists as to the relationship of this species and Lesueur's hairy bat, Myotis lesueuri, which is slightly larger.

The distribution of this species extends northward in a narrow strip through the western parts of Namibia to Mossamedes in south-western Angola and in parts of Namibia (Luderitz district) it is plentiful (I.L. Rautenbach, pers. comm.). Herselman & Norton (1985) stated that it was common at Steyerskraal, 100 km east of Goodhouse, and Shortridge (1942) found it to be plentiful at Goodhouse on the Orange River, Cape Province.

Herselman & Norton (1985) concluded that they were fairly common but within a very restricted range in the Cape Province.

LESUEUR'S HAIRY BAT **INDETERMINATE**
Lesueur se langhaarvlermuis

Myotis lesueuri (Roberts, 1919)

1919. Cistugo lesueuri Roberts, Annals of the Transvaal Museum 6: 112. Lormarins, Franschoek valley, near Paarl, south-western Cape Province.

Order Chiroptera **Family Vespertilionidae**

Confined to a limited area in the south-western Cape Province from Paarl north to Citrusdal and north-east to Mazelsfontein in the Karoo, and east to the George district. Some doubt exists as to the relationship of this species and the Angola hairy bat, Myotis seabrai, which is slightly smaller.

Only about a dozen specimens of this bat have so far been collected in the Cape Province, but Herselman & Norton (1985) suggest that it may be more widely distributed in this Province than present records indicate. Nothing is known about its ecology or status.

RUFOUS HAIRY BAT **INDETERMINATE**
Rooi langhaarvlermuis

Myotis bocagei (Peters, 1870)

1870. Vespertilio bocagei Peters, Journal de Sciencias Mathematicas, Physicas e Naturaes, Lisboa (1) 3: 125. Duque de Braganca, northern Angola.

Order Chiroptera **Family Vespertilionidae**

So far recorded in the Republic only from Skukuza and the Pafuri sector of the Kruger National Park, eastern Transvaal. All the specimens so far taken were netted in savanna woodland and there are no records therefore of their roosting places. Extralimitally they occur in small numbers, roosting in hollow trees, in palm leaves, in bunches of bananas and in the sheaths of arum lilies (Rosevear, 1965).

They have a wide distribution in West Africa and occur in Gabon, Zaire, northern Angola, with scattered records eastwards in Tanzania, Kenya, Malawi, eastern Zimbabwe and in south-western Arabia. In West Africa they are particularly associated with the High Forest Zone.

RÜPPELL'S BAT **INDETERMINATE**
Rüppell se vlermuis

Pipistrellus rueppellii vernayi Roberts, 1932

1932. Pipistrellus vernayi Roberts, Annals of the Transvaal Museum 15: 16. Maun, Ngamiland, Botswana.

Order Chiroptera **Family Vespertilionidae**

So far known in the Republic only from the north-eastern Transvaal in the Pafuri area of the Kruger National Park. Apart from their association in other parts of their range with riverine conditions, nothing is known about the ecology of this species.

The species has a wide distribution extralimitally from East and West Africa where it occurs from Ethiopia to Senegal; westwards to Angola and the Congo Republic and northwards to Egypt; with records from Algeria and the Middle East.

KUHL'S BAT **INDETERMINATE**
Kuhl se vlermuis

Pipistrellus kuhlii subtilis (Sundevall, 1846)

1846. Vesperugo subtilis Sundervall, Öfversight of Kongliga Svenska Vetenskapsakademien Förhandlingar, Stockholm 3(4): 119. Interior o: Caffraria.

Pipistrellus kuhlii broomi Roberts, 1948.

1948. Pipistrellus (Romicia) kuhlii broomi Roberts, Transactions of the Royal Society of South Africa, Broom Commemorative volume: 9. Malvern, Durban, Natal.

Order Chiroptera **Family Vespertilionidae**

They occur in the central parts of the Transvaal from near the Botswana border to the Kruger National Park and south-eastwards to Natal and the extreme eastern parts of the Cape Province. Herselman & Norton (1985) state that the species is marginal in the Cape Province, where they account it as very rare. They occur in small roosting colonies of up to about 12, in rock crevices and under the bark of dead trees and are slow, acrobatic fliers, foraging about eight metres above the ground. A single young is born during the summer months.

This species has a wide distribution extralimitally in East and North Africa extending into Europe and eastwards to India.

RUSTY BAT **INDETERMINATE**
Roeskleurvlermuis

Pipistrellus rusticus (Tomes, 1861)

1861. Scotophilus rusticus Tomes, Proceedings of the Zoological Society, London: 31, 35. Damaraland. Allen (1939) records a lectotype from Olifantsvlei.

Order Chiroptera **Family Vespertilionidae**

Occurs in the north-eastern parts of the Transvaal including the Pafuri area of the Kruger National Park, with a single record from Pretoria. Taken in savanna woodland in association with riverine conditions. Little is known about the ecology of this species and its status is uncertain.

The species occurs in two discrete populations, the southern in northern Namibia and Botswana, in parts of Zimbabwe, the Transvaal and western Zambia and the northern in a broad belt from Senegal eastwards to the southern Sudan and central and southern Ethiopia. Not well represented in collections; too little is known about its ecology and status to place it in any but this category.

BUTTERFLY BAT **INDETERMINATE**
Vlindervlermuis

Chalinolobus variegatus variegatus (Tomes, 1861)

1861. Scotophilus variegatus Tomes, Proceedings of the Zoological Society, London: 36. Otjoro, Namibia (fide Shortridge, 1934 = Otjihoro), about 32 km west of Ondongwa, Ovamboland.

Order Chiroptera **Family Vespertilionidae**

In the Transvaal this species has been taken in the Pafuri area of the Kruger National Park and in the Soutpansberg and, as it occurs in the Limpopo valley on the northern bank of the river in Zimbabwe, will probably in time be shown to occur in other parts of the valley in the Transvaal. They have also been taken in north-eastern KwaZulu. Apart from being a high flying species with a characteristic fluttering flight, nothing is known about its ecology or status in the Republic.

The species has a wide distribution in Sub-Saharan Africa, being absent only from forest and desert; its distribution is marginal in the north of Namibia and Botswana; the records from north-eastern KwaZulu mark their most southerly limit on the continent.

DE WINTON'S LONG-EARED BAT **INDETERMINATE**
De Winton se langoorvlermuis

Laephotis wintoni Thomas, 1901

1901. Laephotis wintoni Thomas, Annals and Magazine of Natural History (7) 7: 460. Kitui (1 067 m), Kenya.

Order Chiroptera **Family Vespertilionidae**

Known only from a single specimen taken from the Algeria Forest Station, Cedarberg Wilderness area, south-western Cape Province (Rautenbach & Nel, 1978). The occurrence of this species, previously known only from Kenya, in the south-western part of the continent is surprising and suggests that when further material of this and the other three species of Laephotis

which occur is obtained, further taxonomic investigation would be profitable.

No information is available on their ecology or status in this part of Africa and only about 20 specimens are known from Kenya where it is considered to be a rare species.

BOTSWANA LONG-EARED BAT **INDETERMINATE**
Botswana-langoorvlermuis

Laephotis botswanae Setzer, 1971

1971. Laephotis botswanae Setzer, Proceedings of the Biological Society of Washington 84: 260. 80 km west and 19 km south of Shakawe, Botswana.

Order Chiroptera **Family Vespertilionidae**

Known only in the Republic from a single specimen from the Pafuri area of the Kruger National Park, eastern Transvaal. Extralimitally very few specimens of this species are known from localities in north-western Zimbabwe, Botswana and Zambia, and south-eastern Zaire where they occur in savanna woodland. Otherwise nothing is known about their ecology and their relationship to the other three known species L. wintoni, L. angolensis and L. namibensis warrants study when more adequate material becomes available.

ALOE SEROTINE BAT **INDETERMINATE**
Aalwyndakvlermuis

Eptesicus somalicus zuluensis Roberts, 1924

1924. Eptesicus zuluensis Roberts, Annals of the Transvaal Museum 10: 60, text fig 1. White Umfolosi Game Reserve, Zululand, Natal.

Order Chiroptera **Family Vespertilionidae**

Recorded from a number of scattered localities in the northern and eastern parts of the Transvaal, from most of which only single specimens have been taken, and from the vicinity of the White Umfolozi River, Natal. Externally very similar to the common and widespread Cape serotine bat, E. capensis, but it differs in the morphology of the skull and has wing membranes edged with white. Very little is known about their ecology and their status cannot be judged on the information that is presently available.

Extralimitally they have been recorded from northern Namibia, Botswana, Zimbabwe and Zambia and from localities in East Africa and the Sudan.

DAMARA WOOLLY BAT **INDETERMINATE**
Damara-wolhaarvlermuis

Kerivoula argentata zuluensis Roberts, 1924

1924. Kerivoula nidicola zuluensis Roberts, Annals of the Transvaal Museum 10: 61. White Umfolosi River, Zululand, Natal.

Order Chiroptera **Family Vespertilionidae**

So far a single specimen of this subspecies has been taken in the Pafuri sector of the Kruger National Park in the north-eastern Transvaal and it occurs in northern Natal and northern KwaZulu, in this sector southwards to the White Umfolozi River. The subspecies has not been studied in detail and only casual observations are available on its ecology. It has been taken roosting during the day in the nests of spectacled weavers, Ploceus ocularis, and masked weavers, P. velatus, up to three to a nest, and roosting in a tight clump of five together, hanging on the wall of a rondavel, sheltered by the overhanging eaves. They have a slow fluttering flight, foraging within two or three metres of the ground. They appear to be uncommon in the Republic.

Extralimitally the species occurs north to East Africa and west to Angola, with records from Zaire and northern Namibia.

LESSER WOOLLY BAT **INDETERMINATE**
Klein-wolhaarvlermuis

Kerivoula lanosa lanosa (A. Smith, 1847)

1847. Vespertilio lanosus A. Smith, Illustrations of the Zoology of South Africa, Mammals: 50 and text. Cape coast, 320 km east of Cape Town.

Kerivoula lanosa lucia Hinton, 1920.

1920. Kerivoula lucia Hinton, Annals and Magazine of Natural History (9) 6: 240. Ndola, Zambia.

Order Chiroptera **Family Vespertilionidae**

The nominate form occurs coastally in the southern Cape Province from Knysna eastwards to the Ciskei, intergrading with K. l. lucia between this and the north-eastern parts of KwaZulu, where they are recorded from Ingwavuma. In the Transvaal K. l. lucia is recorded from Pafuri in the Kruger National Park and the Soutpansberg. Herselman and Norton (1985) note that they are restricted to forested regions in the Cape Province.

They have been taken roosting in the nests of masked weavers, Ploceus velatus, spectacled weavers, P. ocularis, and scarlet-chested sunbirds, Nectarinia senegalensis. Too few records are available from the Republic to allow for a proper assessment of their status, but in the Cape Province Herselman & Norton (1985) account them as very rare.

Extralimitally the distribution of the species is patchy and discontinuous, but it has a wide distribution in Sub-Saharan Africa, with records from Liberia eastwards to Ethiopia and south to the Republic.

WOOD'S SLIT-FACED BAT **INDETERMINATE**
Wood se spleetneusvlermuis

Nycteris woodi sabiensis Roberts, 1946

1946. Nycteris woodi sabiensis Roberts, Annals of the Transvaal Museum 20: 304. Birchenough Bridge, Sabi River, Melsetter district, southeastern Zimbabwe.

Order Chiroptera **Family Nycteridae**

Recorded from the northern Transvaal from localities on the Limpopo River and from the Pafuri area in the northern parts of the Kruger National Park, eastern Transvaal. Accounted as one of the rarest species of the genus in other parts of Africa, with a few scattered records from Cameroun, Ethiopia, Tanzania, Zambia, Malawi and Zimbabwe. Insufficient material and information is available to assess its status, but it appears in the Republic to be as uncommon as it is elsewhere.

LANDER'S HORSESHOE BAT **INDETERMINATE**
Lander se saalneusvlermuis

Rhinolophus landeri lobatus Peters, 1852

1852. Rhinolophus lobatus Peters, Reise nach Mossambique, Säugetiere: 41. Sena, Tete district, south bank of the Zambezi River, Mozambique (restricted by Moreau, Hopkins and Hayman, 1946).

Order Chiroptera **Family Rhinolophidae**

Occur only in the north-eastern parts of the Transvaal in the Kruger National Park and on Letaba Ranch on its western boundary (Rautenbach, 1982). In other parts of its range, which includes most of Sub-Saharan Africa, it rests in small colonies of up to about a dozen in mine adits, caves and hollow trees, hanging from the roofs in clusters, the individuals well separated from one another. Fenton (1975) showed that 92% of the food

consisted of Lepidoptera, the remainder of Orthoptera. In Zimbabwe a gravid female with a single foetus was taken in October. Nowhere common, the species has not been studied in depth in the Republic.

PEAK-SADDLE HORSESHOE BAT **INDETERMINATE**
Spitssaalneusvlermuis

Rhinolophus blasii empusa K. Andersen, 1904

1904. Rhinolophus empusa K. Andersen, Annals and Magazine of Natural History (7) 14: 378. Zomba, southern Malawi.

Order Chiroptera **Family Rhinolophidae**

Occur in the central, southern and north-eastern parts of the Transvaal and the north-eastern parts of Natal and KwaZulu. The species has a very wide distribution in Europe, south-western Asia and the Middle East. In the Middle East and throughout their range in Africa their distribution appears to be patchy and discontinuous. In Africa they occur in Morocco, with scattered records from Ethiopia to north-eastern Natal and KwaZulu. The scattered nature of their occurrence may in some measure be due to the availability of daylight resting places in the form of caves or mine adits, where they hang from the roofs in small clusters. They are not always present in these caves and appear to be subject to local movements. No information is available on their reproduction in the Republic and their status cannot be judged on the information presently available.

DENT'S HORSESHOE BAT **INDETERMINATE**
Dent se saalneusvlermuis

Rhinolophus denti Thomas, 1904

1904. Rhinolophus denti Thomas, Annals and Magazine of Natural History (7) 13: 386. Kuruman, northern Cape Province.

Order Chiroptera **Family Rhinolophidae**

Herselman & Norton (1985) state that this species is extremely rare, if not extinct in the Cape Province but B.H. Erasmus (in litt.) reports that it occurs widely in the eastern half of the northern Cape Province and as far south as Carnavon. In Koegelbeen Cave, near Griekwastad, I.L. Rautenbach (pers. comm.) states that the colony numbered thousands and in caves at Warrenton and Postmasburg they occurred in very large numbers.

SWINNY'S HORSESHOE BAT **INDETERMINATE**
Swinny se saalneusvlermuis

Rhinolophus swinnyi Gough, 1908

1908. Rhinolophus swinnyi Gough, Annals of the Transvaal Museum 1: 71. Ngqueleni district, west of Port St Johns, Transkei.

Order Chiroptera **Family Rhinolophidae**

Recorded from the type locality in the Transkei and the King William's Town district of the Cape Province. They roost in caves in small numbers, rarely more than about five in a colony, in total darkness, scattered over the ceiling singly or two together. Extralimitally there are scattered records from Zimbabwe and Zambia and they are recorded from Zanzibar Island and the western coastal area of Zaire. Little information is available on their ecology; their status connot be judged on present information.

Koopman (1966) suggests that this species may be conspecific with R. denti and until this is clarified and their ecology better known they must remain as Indeterminate.

SHORT-EARED TRIDENT BAT **INDETERMINATE**
Drietand-bladneusvlermuis

Cloeotis percivali australis Roberts, 1917

1917. Cloeotis percivali australis Roberts, Annals of the Transvaal Museum 5: 264. Mooimeisiesfontein, Rustenburg district, western Transvaal.

Order Chiroptera **Family Hipposideridae**

Known from three localities in the Pretoria and Rustenburg districts, from Komatipoort in the Transvaal and from Swaziland. Extralimitally they are recorded from a few scattered localities as far north as coastal Kenya. In the southern part of their range they roost in caves and tunnels in small numbers, rarely over about 10 in a colony, in total darkness. In Zimbabwe the young are born during the summer months of October to December. Nothing is known about their ecology in the Republic and their status cannot be judged on the information presently available.

COMMERSON'S LEAF-NOSED BAT **INDETERMINATE**
Commerson se bladneusvlermuis

Hipposideros commersoni marungensis (Noack, 1887)

1887. Phyllorhina commersoni var marungensis Noack, Zoologische Jahrbücher, Systematik 2: 272. Qua Mpala, Marungu, west shore of Lake Tanganyika, southern Zaire.

Order Chiroptera **Family Hipposideridae**

Represented in the Republic by a single specimen taken in the northern part of the Kruger National Park near Pafuri.

Extralimitally the species has a wide distribution in Sub-Saharan Africa, occurring as far south as northern Namibia, northern Botswana, eastern Zimbabwe and central Mozambique. They also occur widely on Madagascar. They roost in caves in numbers estimated in hundreds, hanging from the ceiling in total darkness, each individual separated from its neighbour. They exhibit local movements, but use the same cave for very long periods judging from the deep accumulation of skeletal material on the floor.

Their status in the Republic cannot be judged on the information presently available.

TINY FAT MOUSE **INDETERMINATE**
Dwergvetmuis

Steatomys parvus tongensis Roberts, 1931

1931. Steatomys chiversi tongensis Roberts, Annals of the Transvaal Museum 14: 233. Manaba, northern Zululand, Natal.

Order Rodentia **Family Cricetidae**

Recorded from northern Natal and KwaZulu. Apart from being nocturnal and terrestrial, nothing is known about the status or ecology of this subspecies in the Republic. Extralimitally S. p. minutus occurs in Namibia, southern Angola and Zambia and marginally in north-western Zimbabwe and the nominate form S. p. parvus in East Africa.

NYIKA CLIMBING MOUSE **INDETERMINATE**
Nyika-klimmuis

Dendromus nyikae longicaudatus Roberts, 1913

1913. Dendromus longicaudatus Roberts, Annals of the Transvaal Museum 4: 83. Tzaneen Estates, eastern Transvaal.

Order Rodentia **Family Cricetidae**

Recorded from two localities in the Transvaal, the type locality and the Hans Merensky Provincial Nature Reserve.

Extralimitally the species occurs in Zimbabwe, Malawi, Zambia and Angola.

Apart from the fact that one of the Transvaal specimens was taken in dense grass in mopane woodland (Rautenbach, 1982), nothing is known about the ecology and too little to assess its status in the Republic.

PYGMY ROCK MOUSE **INDETERMINATE**
Dwergklipmuis

Petromyscus collinus barbouri Shortridge & Carter, 1938

1938. Petromyscus barbouri Shortridge & Carter, Annals of the South African Museum 32: 288. Witwater, Kamiesberg, 1 067-1 158 m, Little Namaqualand, northwestern Cape Province.

Order Rodentia **Family Cricetidae**

Restricted in their distribution to the north-western parts of the Cape Province southwards to about the Orange River, J. Meester (in prep.) notes that P. c. barbouri may be worthy of full specific status. The validity and relationships of the many subspecies that have been described remain to be reviewed which, has been difficult owing to their not being well represented in collections, but this should be possible in the near future as B.H. Erasmus (pers. comm.) has built up a useful series from the northern Cape Province.

They occur in arid areas where they are associated with rocky terrain but otherwise little is known about their ecology.

WATER RAT **INDETERMINATE**
Waterrot

Dasymys incomtus incomtus (Sundevall, 1847)

1847. Mus incomtus Sundevall, Ofversicht af Kongliga Svenska Vetenskaps-Akademiens Forhandlangar, Stockholm, 1846, 3 (4): 120. "E. Caffraria prope Port Natal" (Durban, Natal). The species range in the Transkei, Natal, KwaZulu and Transvaal.

Dasymys incomtus capensis Roberts, 1936

1936. Dasymys incomtus capensis Roberts, Annals of the Transvaal Museum 18: 254. La Plisante, Wolseley, southwestern Cape Province. The species range in the southwestern Cape Province.

Order Rodentia **Family Muridae**

Although fairly widespread in distribution in the south-west and north-eastern parts of the Republic there are relatively few specimens in collections and it appears that it occurs in small numbers. Davis (1962) suggested that they appeared to be losing their hold in southern Africa and it may be that desiccation and the draining of wet-lands may to some extent account for this. Listed as Rare in the former Red Data Book, little is known about the ecology of the species and until we have further information it is included as Indeterminate.

MOZAMBIQUE WOODLAND MOUSE **INDETERMINATE**
Mosambiek-woudmuis

Grammomys cometes cometes (Thomas & Wroughton, 1908)

1908. Thamnomys cometes Thomas & Wroughton. Proceedings of the Zoological Society, London: 549. Coguno Inhambane district, coastal southern Mozambique.

Order Rodentia **Family Muridae**

Occur in the south-eastern Transvaal and in north-eastern KwaZulu as far south as the Ngoye Forest.

In parts of its range this species is sympatric with the woodland mouse, G. dolichurus, which is everywhere more abundant and has a greater distributional range. The relationship of the two species remains uncertain and relatively few specimens are presently available. It was included in the former Red Data Book as Rare and is included as Indeterminate until further information becomes available.

GRANT'S ROCK MOUSE **INDETERMINATE**
Grant se klipmuis

Aethomys granti (Wroughton, 1908)

1908. Mus granti Wroughton. Annals and Magazine of Natural History (8) 1: 257. Deelfontein, north of Richmond, Cape Province.

Order Rodentia **Family Muridae**

The taxonomic status and distribution of this species which is not well represented in collections remains in doubt. These and other aspects of its ecology are presently being investigated by D. Visser of the Mammal Research Institute, Pretoria and until these findings are published the species is included as Indeterminate.

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INDEX OF SCIENTIFIC NAMES

Red Data Sheet numbers in bold.

A

acetabulosus, Tadarida 32,39, **176**
Acinonyx jubatus 31,44, **162**
Acomys subspinosus 36
Aethomys granti 33,43, **191**
afer, Orycteropus 16,28,44, **82**
afra, Tatera 35
africana, Loxodonta 31,44, **165**
albicaudatus, Mystromys 15,27,42, **72**
albinucha, Poecilogale 21,29,43, **120**
Amblysomus gunningi 31,39, **174**
Amblysomus iris 31,39, **174**
Amblysomus julianae 31,39, **175**
amphibius, Hippopotamus 24,30,44, **145**
ansorgei, Tadarida 32,40, **177**
arboreus, Dendrohyrax 24,30,44, **143**
argentata, Kerivoula 32,41, **184**
Atelerix frontalis 19,28,38, **101**

B

Bathyergus janetta 20,29,42, **112**
bicornis, Diceros 17,28,44, **88**
blasii, Rhinolophus 33,41, **186**
bocagei, Myotis 32,40, **180**
botswanae, Laephotis 32,40, **183**
brunnea, Hyaena 23,30,43, **132**
Bunolagus monticularis 13,27,42, **54**

C

Calcochloris obtusirostris 19,29,38, **103**
capensis, Mellivora 15,28,43, **75**
Cephalophus natalensis 26,30,45, **157**
Cercopithecus mitis 20,29,41, **109**
Chalinolobus variegatus 32,40, **182**
Chlorotalpa duthieae 31,39, **172**
Chlorotalpa sclateri 31,39, **173**
Chrysochloris visagiei 31,39, **172**
Chrysospalax trevelyani 14,27,38, **63**
Chrsyospalax villosus 14,27,38, **65**
civetta, Civettictis 22,30,43, **123**
Civettictis civetta 22,30,43, **123**
Cloeotis percivali 33,41, **187**
collinus, Petromyscus 33,42, **189**
cometes, Grammomys 33,42, **190**
commersoni, Hipposideros 33,41, **188**
crassicaudatus, Otolemur 34
Cricetomys gambianus 21,29,42, **116**
cristatus, Proteles 23,30,43, **129**
Crocidura maquassiensis 31,38, **170**
Cryptochloris wintoni 31,38, **172**
Cryptochloris zyli 31,38, **171**

D

Damaliscus dorcas 25,30,45, **148**
Damaliscus lunatus 25,30,45, **151**
Dasymys incomtus 33,42, **190**
Dendrohyrax arboreus 24,30,44, **143**
Dendromus nyikae 33,42, **189**
denti, Rhinolophus 33,41, **186**
Diceros bicornis 17,28,44, **88**
dorcas, Damaliscus 25,30,45, **148**
Dugong dugon 36
dugon, Dugong 36
duthieae, Chlorotalpa 31,39, **172**

E

Eidolon helvum 34
Eptesicus notius 34
Eptesicus somalicus 32,41, **183**
equinus, Hippotragus 14,27,45, **60**
Equus quagga **49**
Equus zebra 17,28,44, **84**
Eremitalpa granti 19,29,38, **105**

F

Felis lybica 16,28,44, **77**
Felis nigripes 24,30,44, **138**
Felis serval 23,30,44, **135**
frontalis, Atelerix 19,28,38, **101**
fulminans, Tadarida 32,39, **176**

G

Galago crassicaudatus 34
Galago moholi 34
gambianus, Cricetomys 21,29,42 **116**
Gerbillurus vallinus 35
Grammomys cometes 33,42, **190**
granti, Eremitalpa 19,29,38, **105**

Graphiurus ocularis 21,29,43, 118
gunningi, Amblysomus 31,39, 174

H

helvum, Eidolon 34
Hippopotamus amphibius 24,30,44, 145
Hipposideros commersoni 33,41, 188
Hippotragus equinus 14,27,45, 60
Hippotragus leucophaeus 50
Hippotragus niger 18,28,45, 95
hispida, Nyeteris 34
Hyaena brunnea 23,30,43, 132

I

incomtus, Dasymys 33,42, 190
infinitesimus, Suncus 31,38, 171
iris, Amblysomus 31,39, 174

J

janetta, Bathyergus 20,29,42, 112
jubatus, Acinonyx 31,44, 162
julianae, Amblysomus 31,39, 175

K

Kerivoula argentata 32,41, 184
Kerivoula lanosa 32,41, 184
krebsii, Steatomys 35
kuhlii, Pipistrellus 32,40, 181

L

Laephotis botswanae 32,40, 183
Laephotis wintoni 32,40, 182
landeri, Rhinolophus 33,41, 185
lanosa, Kerivoula 32,41, 184
lesueuri, Myotis 32,40, 179
leucophaeus, Hippotragus 50
lichtensteinii, Sigmoceros 51
lixus, Suncus 31,38, 170
longicaudatus, Myosorex 31,38, 169
Loxodonta africana 31,44, 165
lunatus, Damaliscus 25,30,45, 151
lybica, Felis 16,28,44, 77
Lycaon pictus 13,27,43, 57

M

Manis temminckii 16,28,41, 79
maquassiensis, Crocidura 31,38, 170
martienseni, Otomops 32,39, 175
melleri, Rhynchogale 22,30,43, 125
Mellivora capensis 15,28,43, 75
midas, Tadarida 32,40, 178
mitis, Cercopithecus 20,29,41, 109
moholi, Galago 34
monticola, Philantomba 25,30,45, 154
monticularis, Bunolagus 13,27,42, 54
moschatus, Neotragus 18,28,45, 98
Myomyscus verreauxii 35
Myosorex longicaudatus 31,38, 169
Myotis bocagei 32,40, 180
Myotis lesueuri 32,40, 179
Myotis seabrai 32,40, 179
Myotis welwitschii 32,40, 178
Mystromys albicaudatus 15,27,42, 72

N

natalensis, Cephalophus 26,30,45, 157
Neotragus moschatus 18,28,45, 98
niger, Hippotragus 18,28,45, 95
nigripes, Felis 24,30,44, 138
notius, Eptesicus 34
Nycteris hispida 34
Nycteris woodi 33,41, 185
nyikae, Dendromus 33,42, 189

O

obtusirostris, Calcochloris 19,29,38, 103
ocularis, Graphiurus 21,29,43, 118
Orycteropus afer 16,28,44, 82
Otolemur crassicaudatus 34
Otomops martiensseni 32,39, 175
ourebi, Ourebia 17,28,45, 92
Ourebia ourebi 17,28,45, 92

P

palliatus, Paraxerus 15,27,42, 68, 70
Panthera pardus 24,30,44, 140
Paracynictis selousi 22,30,43, 127
Paraxerus palliatus 15,27,42, 68, 70
pardus, Panthera 24,30,44, 140
parvus, Steatomys 33,42, 188
pentonyx, Steatomys 35

percivali, Cloeotis 33,41, **187**
perforatus, Taphozous 32,39, **175**
Petrodromus tetradactylus 20,29,39, **107**
Petromys typicus 34
Petromyscus collinus 33,42, **189**
Philantomba monticola 25,30,45, **154**
pictus, Lycaon 13,27,43, **57**
Pipistrellus kuhlii 32,40, **181**
Pipistrellus rueppellii 32,40, **180**
Pipistrellus rusticus 32,40, **181**
Poecilogale albinucha 21,29,43, **120**
Praomys verreauxi 35
Proteles cristatus 23,30,43, **129**

Q

quagga, Equus **49**

R

Raphicerus sharpei 26,30,45, **159**
Rhinolophus blasii 33,41, **186**
Rhinolophus denti 33,41, **186**
Rhinolophus landeri 33,41, **185**
Rhinolophus swinnyi 33,41, **187**
Rhynchogale melleri 22,30,43, **125**
rueppellii, Pipistrellus 32,40, **180**
rusticus, Pipistrellus 32,40, **181**

S

sclateri, Chlorotalpa 31,39, **173**
seabrai, Myotis 32,40, **179**
selousi, Paracynictis 22,30,43, **127**
serval, Felis 23,30,44, **135**
senegalensis, Galago 34
sharpei, Raphicerus 26,30,45, **159**
Sigmoceros lichtensteinii **51**
somalicus, Eptesicus 32,41, **183**
Steatomys krebsii 35
Steatomys parvus 33,42, **188**
subspinosus, Acomys 36
Suncus infinitesimus 31,38, **171**
Suncus lixus 31,38, **170**
swinnyi, Rhinolophus 33,41, **187**

T

Tadarida acetabulosus 32,39, **176**
Tadarida ansorgei 32,40, **177**
Tadarida fulminans 32,39, **176**
Tadarida midas 32,40, **178**
Tadarida ventralis 32,40, **177**
Taphozous perforatus 32,39, **175**
Tatera afra 35
temminckii, Manis 16,28,41, **79**
tetradactylus, Petrodromus 20,29,39, **107**
trevelyani, Chrysospalax 14,27,38, **63**
typicus, Petromys 34

V

vallinus, Gerbillurus 35
variegatus, Chalinolobus 32,40, **182**
ventralis, Tadarida 32,40, **177**
verreauxii, Myomyscus 35
verreauxii, Praomys 35
villosus, Chrysospalax 14,27,38, **65**
visagiei, Chrysochloris 31,39, **172**

W

welwitschii, Myotis 32,40, **178**
wintoni, Cryptochloris 31,38, **172**
wintoni, Laephotis 32,40, **182**
woodi, Nycteris 33,41, **185**
woosnami, Zelotomys 20,29,42, **114**

Z

zebra, Equus 17,28,44, **84**
Zelotomys woosnami 20,29,42, **114**
zyli, Cryptochloris 31,38, **171**

INDEX OF ENGLISH NAMES

Red Data Sheet numbers in bold

A

Aardwolf 10,23,30,43, **129**
African civet 10,22,30,43, **123**
African elephant 11,31,44, **165**
African striped weasel 10,21,29,43, **120**
African wild cat 10,16,28,44, **77**
Aloe serotine bat 11,32,41, **183**
Antbear 10,16,28,44, **82**
antelope, Blue 10, **50**
antelope, Roan 10,14,27,45, **60**
antelope, Sable 10,18,28,45, **95**

B

badger, Honey 10,15,28,43, **75**
bat, Aloe serotine 11,32,41, **183**
bat, Angola hairy 11,32,40, **179**
bat, Ansorge's free-tailed 11,32,40, **177**
bat, Botswana long-eared 11,32,40, **183**
bat, Butterfly 11,32,40, **182**
bat, Commerson's leaf-nosed 11,33,41, **188**
bat, Damara woolly 11,32,41, **184**
bat, Dent's horseshoe 11,33,41, **186**
bat, Egyptian tomb 11,32,39, **175**
bat, Hairy slit-faced 34
bat, Horny-skin 34
bat, Kuhl's 11,32,40, **181**
bat, Lander's horseshoe 11,33,41, **185**
bat, Large-eared free-tailed 11,32,39, **175**
bat, Lesser woolly 11,32,41, **184**
bat, Lesueur's hairy 11,32,40, **179**
bat, Madagascar free-tailed 11,32,39, **176**
bat, Midas free-tailed 11,32,40, **178**
bat, Natal free-tailed 11,32,39, **176**
bat, Peak-saddle horseshoe 11,33,41, **186**
bat, Rüppell's 11,32,40, **180**
bat, Rufous hairy 11,32,40, **180**
bat, Rusty 11,32,40, **181**
bat, Short-eared trident 11,33,41, **187**
bat, Straw coloured fruit 34
bat, Swinny's horseshoe 11,33,41, **187**
bat, Transvaal free-tailed 11,32,40, **177**
bat, Welwitsch's hairy 11,32,40, **178**
bat, De Winton's long-eared 11,32,40, **182**
bat, Wood's slit-faced 11,33,41, **185**
Blue antelope 10, **50**
Blue duiker 10,25,30,45, **154**
Bontebok 10,25,30,45, **148**
Brown hyaena 10,23,30,43, **132**
Brush-tailed hairy-footed gerbil 35
bushbaby, Lesser 34
bushbaby, Thick-tailed 34
Butterfly bat 11,32,40, **182**

C

Cape gerbil 35
Cape mountain zebra 10,17,28,44, **84**
Cape spiny mouse 36
cat, African wild 10,16,28,44, **77**
cat, Small spotted 10,24,30,44, **138**
Cheetah 11,31,44, **162**
civet, African 10,22,30,43, **123**
climbing mouse, Nyika 11,33,42, **189**

D

Dassierat 34
dassie, Tree 10,24,30,44, **143**
desert rat, Woosnam's 10,20,29,42, **114**
De Winton's golden mole 11,31,38, **172**
De Winton's long-eared bat 11,32,40, **182**
dormouse, Spectacled 10,21,29,43, **118**
Dugong 36
duiker, Blue 10,25,30,45, **154**
duiker, Red 10,26,30,45, **157**
Duthie's golden mole 11,31,39, **172**

E

Egyptian tomb bat 11,32,39, **175**
elephant, African 11,31,44, **165**
elephant-shrew, Four-toed 10,20,29,39, **107**

F

fat mouse, Kreb's 35
fat mouse, Tiny 11,33,42, **188**
Four-toed elephant-shrew 10,20,29,39, **107**
free-tailed bat, Ansorge's 11,32,40, **177**
free-tailed bat, Large eared 11,32,39, **175**
free-tailed bat, Madagascar 11,32,39, **176**
free-tailed bat, Midas 11,32,40, **178**
free-tailed bat, Natal 11,32,39, **176**
free-tailed bat, Transvaal 11,32,40, **177**

G

gerbil, Brush-tailed hairy-footed 35
gerbil, Cape 35
Giant golden mole 10,14,27,38, **63**
Giant rat 10,21,29,42, **116**
golden mole, De Winton's 11,31,38, **172**
golden mole, Duthie's 11,31,39, **172**
golden mole, Giant 10,14,27,38, **63**
golden mole, Grant's 10,19,29,38, **105**
golden mole, Gunning's 11,31,39, **174**
golden mole, Juliana's 11,31,39, **175**
golden mole, Rough-haired 10,14,27,38, **65**
golden mole, Sclater's 11,31,39, **173**
golden mole, van Zyl's 11,31,38, **171**
golden mole, Visagie's 11,31,39, **172**
golden mole, Yellow 10,19,29,38, **103**
golden mole, Zulu 11,31,39, **174**
Grant's golden mole 10,19,29,38, **105**
Greater dwarf shrew 11,31,38, **170**
grysbok, Sharpe's 10,26,30,45, **159**
Gunning's golden mole 11,31,39, **174**

H

hairy bat, Angola 11,32,40, **179**
hairy bat, Lesueur's 11,32,40, **179**
hairy bat, Rufous 11,32,40, **180**
hairy bat, Welwitsch's 11,32,40, **178**
hairy-footed gerbil, Brush-tailed 35
hartebeest, Lichtenstein's 10, **51**
hedgehog, South African 10,19,28,38, **101**
Hippopotamus 10,24,30,44, **145**
Honey badger 10,15,28,43, **75**
Hook-lipped rhinoceros 10,17,28,44, **88**
Horny-skin bat 34
horseshoe bat, Dent's 11,33,41, **186**
horseshoe bat, Lander's 11,33,41, **185**
horseshoe bat, Peak-saddle 11,33,41, **186**
horseshoe bat, Swinny's 11,33,41, **187**
hyaena, Brown 10,23,30,43, **132**

J

Juliana's golden mole 11,31,39, **175**

K

Kreb's fat mouse 35
Kuhl's bat 11,32,40, **181**

L

Large-eared free-tailed bat 11,32,39, **175**
leaf-nosed bat, Comerson's 11,33,41, **188**
Least dwarf shrew 11,31,38, **171**
Leopard 10,24,30,44, **140**
Lesser bushbaby 34
Lichtenstein's hartebeest 10, **51**
long-eared bat, Botswana 11,32,40, **183**
long-eared bat, De Winton's 11,32,40, **182**
Long-tailed forest shrew 11,31,38, **169**

M

Madagascar free-tailed bat 11,32,39, **176**
Maquassie musk shrew 11,31,38, **170**
Meller's mongoose 10,22,30,43, **125**
molerat, Namaqua dune 10,20,29,42, **112**
mongoose, Meller's 10,22,30,43, **125**
mongoose, Selous' 10,22,30,43, **127**
monkey, Samango 10,20,29,41, **109**
mouse, Cape spiny 36
mouse, Grant's rock 11,33,43, **191**
mouse, Kreb's fat 35
mouse, Mozambique woodland 11,33,42, **190**
mouse, Nyika climbing 11,33,42, **189**
mouse, Pygmy rock 11,33,42, **189**
mouse, Tiny fat 11,33,42, **188**
mouse, Verreaux's 35
mouse, White-tailed 10,15,27,42, **72**

N

Namaqua dune molerat 10,20,29,42, **112**
Natal free-tailed bat 11,32,39, **176**
Ngoye red squirrel 10,15,27, **70**

O

Oribi 10,17,28,45, **92**

P

Pangolin 10,16,28,41, **79**

Q

Quagga 10, **49**

R

rabbit, Riverine 10,13,27,42, **54**
rat, Giant 10,21,29,42, **116**
rat, Water 11,33,42, **190**
rat, Woosnam's desert 10,20,29,42, **114**
Red duiker 10,26,30,45, **157**
rhinoceros, Hook-lipped 10,17,28,44, **88**
Riverine rabbit 10,13,27,42, **54**
Roan antelope 10,14,27,45, **60**
rock mouse, Grant's 11,33,43, **191**
rock mouse, Pygmy 11,33,42, **189**
Rough-haired golden mole 10,14,27,38, **65**
Rüppell's bat 11,32,40, **180**
Rufous hairy bat 11,32,40, **180**
Rusty bat 11,32,40, **181**

S

Sable antelope 10,18,28,45, **95**
Samango monkey 10,20,29,41, **109**
Sclaters golden mole 11,31,39, **173**
Selous' mongoose 10,22,30,43, **127**
Serval 10,23,30,44, **135**
Sharpe's grysbok 10,26,30,45, **159**
shrew, Greater dwarf 11,31,38, **170**
shrew, Least dwarf 11,31,38, **171**
shrew, Long-tailed forest 11,31,38, **169**
shrew, Maquassie musk 11,31,38, **170**
slit-faced bat, Hairy 34
slit-faced bat, Wood's 11,33,41, **185**
Small spotted cat 10,24,30,44, **138**
South African hedgehog 10,19,28,38, **101**
Spectacled dormouse 10,21,29,43, **118**
squirrel, Ngoye red 10,15,27,42, **70**
squirrel, Tonga red 10,15,27,42, **68**
Straw coloured fruit bat 34
Suni 10,18,28,45, **98**

T

Thick-tailed bushbaby 34
Tonga red squirrel 10,15,27,42, **68**
Tree dassie 10,24,30,44, **143**
trident bat, Short-eared 11,33,41, **187**
Tsessebe 10,25,30,45, **151**

V

Van Zyl's golden mole 11,31,38, **171**
Verreaux's mouse 35
Visagie's golden mole 11,31,39, **172**

W

Water rat 11,33,42, **190**
weasel, African striped 10,21,29,43, **120**
White-tailed mouse 10,15,27,42, **72**
Wild dog 10,13,27,43, **57**
woodland mouse, Mozambique 11,33,42, **190**
woolly bat, Damara 11,32,41, **184**
woolly bat, Lesser 11,32,41, **184**
Woosnam's desert rat 10,20,29,42, **114**

Y

Yellow golden mole 10,19,29,38, **103**

Z

zebra, Cape mountain 10,17,28,44, **84**
Zulu golden mole 11,31,39, **174**

INDEKS VAN AFRIKAANSE NAME

A

Aalwyndakvlermuis **183**
aap, Samango- **109**
Aardwolf **129**
Afrikaanse olifant **165**
Afrikaanse siwet **123**
Angola-langhaarvlermuis **179**
Ansorge se losstertvlermuis **177**

B

Bakoor-losstertvlermuis **175**
Bastergemsbok **60**
bergsebra, Kaapse **85**
Bloubok **50**
Blouduiker **154**
Bontebok **148**
Boomdas **143**
Bosklaasneus **107**
Botswana-langoorvlermuis **183**

C

Commerson se bladneusvlermuis **188**

D

Damara wolhaarvlermuis **184**
das, Boom- **143**
Dent se saalneusvlermuis **186**
De Winton se kruipmol **172**
De Winton se langoorvlermuis **182**
Doekvoetjie **54**
Drietand-bladneusvlermuis **187**
duiker, Blou= **154**
duiker, Rooi= **157**
duinmol, Namakwa **112**
Duthie se kruipmol **172**
Dwergklipmuis **189**
Dwergvetmuis **188**

E

eekhoring, Ngoye rooi **70**
eekhoring, Tonga rooi **68**
Egiptiese witlyfvlermuis **175**
Erdvark **82**

G

Geel kruipmol **103**
Gemsbokmuis **118**
Grant se klipmuis **191**
Grant se kruipmol **105**
Grasveldkruipmol **65**
Groter dwergskeerbek **170**
grysbok, Sharpe se **159**
Gunning se kruipmol **174**

H

hartebees, Lichtenstein se **51**

I

Ietermagô **79**

J

Jagluiperd **162**
Juliana se kruipmol **175**

K

Kaapse bergsebra **84**
kat, Klein gekolde **138**
kat, Tierbos= **135**
Klein gekolde kat **138**
Klein witstertmuishond **127**
Klein wolhaarvlermuis **184**
Kleinste dwergskeerbek **171**
klimmuis, Nyika- **189**
klipmuis, Dwerg- **189**
klipmuis, Grant se **191**
krimpvarkie, Suid-Afrikaanse **101**
kruipmol, De Winton se **172**
kruipmol, Duthie se **172**
kruipmol, Geel **103**
kruipmol, Grant se **105**
kruipmol, Grasveld **65**
kruipmol, Gunning se **174**
kruipmol, Juliana se **175**
kruipmol, Reuse **63**
kruipmol, Sclater se **173**
kruipmol, Van Zyl se **171**
kruipmol, Visagie se **172**

kruipmol, Zoeloelandse 174
Kuhl se vlermuis 181
Kwagga 49

L

Lander se saalneusvlermuis 185
Langstertbosskeerbek 169
Lesueur se langhaarvlermuis 179
Lichtenstein se hartbees 51
losstertvlermuis, Transvaalse 177
losstertvlermuis, Ansorge se 177
losstertvlermuis, Midas se 178
Luiperd 140

M

Madagascarse losstertvlermuis 176
Maquassi skeerbek 170
Meller se muishond 125
Midas se losstertvlermuis 178
Mosambiek-woudmuis 190
muis, Dwergklip= 189
muis, Dwergvet= 188
muis, Grant se klip= 191
muis, Mosambiek woud= 190
muis, Nyika-klim= 189
muis, Witstert= 72
muishond, Klein witstert= 127
muishond, Meller se 125
muishond, Slang= 120

N

Namakwa-duinmol 112
Natalse losstertvlermuis 176
Ngoye rooi eekhoring 70
Nyika-klimmuis 189

O

olifant, Afrikaanse 165
Oorbietjie 92

P

Pondhaas 54

R

Ratel 75
renoster, Swart= 88
Reuse kruipmol 63
Reuserot 116
Rivierkonyn 54
Roeskleurvlermuis 181
Rooiduiker 157
rooi eekhoring, Ngoye 70
rooi eekhoring, Tonga 68
Rooi langhaarvlermuis 180
rot, Water= 190
Rüppell se vlermuis 180

S

Samango-aap 109
Sclater se kruipmol 173
Seekoei 145
Sharpe se grysbok 159
siwet, Afrikaanse 123
skeerbek, Groter dwerg= 170
skeerbek, Kleinste dwerg= 171
skeerbek, Langstertbos= 169
skeerbek, Maquassi 170
Slangmuishond 120
Soenie 98
Spitssaalneusvlermuis 186
Strandjut 132
Strandwolf 132
Suid Afrikaanse krimpvarkie 101
Swartrenoster 88
Swartwitpens 95
Swinny se saalneusvlermuis 187

T

Tierboskat 135
Tierwolf 132
Tonga rooi eekhoring 68
Tsessebe 151

V

Vaalboskat 77
Van Zyl se kruipmol 171
vetmuis, Dwerg= 188
Visagie se kruipmol 172
vleihaas 54

vlermuis, Aalwyndak= 183
vlermuis, Angola-langhaar= 179
vlermuis, Ansorge se losstert= 177
vlermuis, Bakoor losstert= 175
vlermuis, Botswana langoor= 183
vlermuis, Commerson se bladneus= 188
vlermuis, Damara wolhaar= 184
vlermuis, Dent se saalneus= 186
vlermuis, De Winton se langoor= 182
vlermuis, Drietand bladneus= 187
vlermuis, Egiptiese witlyf= 175
vlermuis, Klein wolhaar= 184
vlermuis, Roeskleur= 181
vlermuis, Kuhl se 181
vlermuis, Lander se saalneus= 185
vlermuis, Lesueur se langhaar= 179
vlermuis, Madagascarase losstert= 176
vlermuis, Midas se losstert= 178
vlermuis, Natalse losstert= 176
vlermuis, Rooi langhaar= 180
vlermuis, Rüppell se 180
vlermuis, Spitssaalneus= 186
vlermuis, Swinny se saalneus= 187
vlermuis, Transvaalse losstert= 177
vlermuis, Vlinder= 182
vlermuis, Welwitsch se langhaar= 178
vlermuis, Wood se spleetneus= 185
Vlindervlermuis 182

W

Waterrot 190
Welwitsch se langhaarvlermuis 178
Wildehond 57
Witstertmuis 72
Woestynrot, Woosnam se 114
Wood se spleetneusvlermuis 185
Woosnam se woestynrot 114
woudmuis, Mosambiek- 190

Z

Zoeloelandse kruipmol 174

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