



South African Red Data Book - Large Mammals

JD Skinner, N Fairall and Jdu P Bothma

A report of the Committee for Terrestrial Biology
National Programme for Environmental Sciences

SOUTH AFRICAN NATIONAL SCIENTIFIC PROGRAMMES REPORT NO

18

NOVEMBER 1977

(ii)

Issued by the
Cooperative Scientific Programmes
Council for Scientific and Industrial Research
P O Box 395
PRETORIA 0001
from whom copies of reports in this series are available on request.

*Printed 1977 in the Republic of South Africa
by the Graphic Arts Division of the CSIR*

ISBN 0 7988 1216 8

Authors' addresses -

Professor J D Skinner and Dr N Fairall, Mammal Research Institute,
University of Pretoria, Hillcrest, Pretoria 0181

Professor J du P Bothma, Eugène Marais Chair of Wildlife Management,
University of Pretoria, Hillcrest, Pretoria 0181

PREFACE

The National Programme for Environmental Sciences is one of several national scientific programmes administered by the CSIR. It is a cooperative undertaking of scientists and scientific institutions in South Africa concerned with research related to environmental problems. It includes research designed to meet purely local needs as well as projects being undertaken in South Africa as contributions to international scientific activities.

The increasing threat to indigenous animal and plant species in South Africa posed by development pressure, by changing vegetation patterns, by habitat destruction, by the invasion of alien species and by commercial exploitation is an environmental problem of enormous magnitude. Steps are therefore being taken within the national programme to collect information relating to threatened species, to promote research into their biology and to assist in finding means for their conservation. The South African Red Data Book series is an attempt to collate available information on threatened species and is a part of this programme.

Three Red Data Books, on birds, small mammals and fishes, have been published in this series. A subsequent volume will deal with reptiles and amphibians.

ACKNOWLEDGEMENTS

We would like to thank Mr R S Crass (Natal Parks, Game and Fish Preservation Board), Mr R Dieckmann (University of Pretoria), Dr G de Graaff (National Parks Board), Professor F C Eloff (University of Pretoria), Mr R Garstang (Division of Nature Conservation, Transvaal Provincial Administration), Mr J C Greig (Department of Nature and Environmental Conservation, Cape Provincial Administration), Dr A J Hall-Martin (National Parks Board), Dr M J F Jarvis (formerly Department of Nature and Environmental Conservation, Cape Provincial Administration), Mr N H G Jacobsen (Division of Nature Conservation, Transvaal Provincial Administration), Dr S C J Joubert (National Parks Board), Mr M T Mentis (Natal Parks, Game and Fish Preservation Board), Mr M G L Mills (National Parks Board), Dr G A Robinson (National Parks Board), Mr K L Tinley (University of Pretoria), Dr D Wilson (Division of Nature Conservation, Transvaal Provincial Administration) and Mr D van Wyk (Goraas, Carnarvon, Cape Province) for information included in this report.

We would also like to thank Professor J A J Meester (University of Natal, Pietermaritzburg) for his assistance and interest in the project.

TITLES IN THIS SERIES

1. A description of the Savanna Ecosystem Project, Nylsvley, South Africa. December 1975. 24 pp.
2. Sensitivity analysis of a simple linear model of a savanna ecosystem at Nylsvley. W M Getz and A M Starfield. December 1975. 18 pp.
3. Savanna Ecosystem Project - Progress report 1974/1975. S M Hirst. December 1975. 27 pp.
4. Solid wastes research in South Africa. R G Noble. June 1976. 13 pp.
5. Bibliography on marine pollution in South Africa. D A Darracott and C E Cloete. June 1976. 131 pp.
6. Recycling and disposal of plastics waste in South Africa. R H Nurse, N C Symington, G R de V Brooks and L J Heyl. June 1976. 35 pp.
7. South African Red Data Book - Aves. W R Siegfried, P G H Frost, J Cooper and A C Kemp. June 1976. 108 pp.
8. South African marine pollution survey report 1974-1975. C E Cloete and W D Oliff (editors). September 1976. 60 pp.
9. Modelling of the flow of stable air over a complex region. M T Scholtz and C J Brouckaert. September 1976. 42 pp.
10. Methods and machinery for pulverising solid wastes. M J Simpkins. October 1976. 29 pp.
11. South African Red Data Book - Small mammals. J A J Meester. November 1976. 59 pp.
12. Savanna Ecosystem Project - Progress report 1975/1976. B J Huntley. March 1977. 41 pp.
13. Disposal and recovery of waste paper in South Africa. G R de V Brooks. April 1977. 35 pp.
14. South African Red Data Book - Fishes. P H Skelton. July 1977. 39 pp.
15. A checklist of the birds of the Nylsvley Nature Reserve. W R Tarboton. September 1977. 14 pp.
16. Grondsoorte van die Nylsvley-natuureservaat. H J von M Harmse. September 1977. 64 pp.
17. Description and manual for the use of DRIVER - an interactive modelling aid. P R Furniss. September 1977. 23 pp.
18. South African Red Data Book - Large mammals. J D Skinner, N Fairall and J du P Bothma. November 1977. 29 pp.

ABSTRACT

Data sheets are provided for 22 threatened South African large mammals, one exterminated (Lichtenstein's hartebeest), eight endangered (cheetah, hunting dog, dugong, Cape mountain zebra, black rhinoceros, tsessebe, roan antelope, suni), one vulnerable (oribi), nine rare (leopard, serval, brown hyaena, aardwolf, bontebok, sable antelope, blue duiker, red duiker, Sharpe's grysbok) and three special cases (elephant, Hartmann's mountain zebra, hippopotamus).

UITTREKSEL

Datavelle word voorsien vir 22 bedreigde Suid-Afrikaanse groot soogdier-soorte, een uitgewis (mofhartbees), agt in gevaar (jagluiperd, wildehond, dugong, Kaapse bergsebra, swart renoster, basterhartbees, bastergemsbok, suni), een kwesbaar (oorbietjie), nege seldsaam (luiperd, tierboskat, strandwolf, aardwolf, bontebok, swartwitpens, blou duiker, rooi duiker, Sharpe se grysbok) en drie spesiale gevalle (olifant, Hartmann se bergsebra, seekoei).

TABLE OF CONTENTS	Page
Preface	(iii)
Titles in this series	(iv)
Abstract	(v)
Uittreksel	(v)
Introduction	1
Protective legislation	2
Definition of categories	4
List of threatened taxa	5
Red Data sheets	6
References	28

INTRODUCTION

Threats to the survival of larger mammals in Africa have long attracted a great deal of attention, too often for reasons of sentiment rather than science. As the larger mammal populations of most African states become progressively more confined in their distribution to the limits of conservation areas, accurate information on the status of individual taxa both within and outside national parks and reserves has become essential to their conservation.

The mammals included in this survey have been selected firstly on an arbitrary basis of size (the status of small mammals being reviewed by Meester 1976) and their known past or present occurrence as breeding populations within the geographic limits of the Republic of South Africa.

The inclusion of dugong, Hartmann's mountain zebra and Lichtenstein's hartebeest, taxa for which accurate documentary evidence of their occurrence as breeding populations in the Republic is not available, is here supported by the contention that their former ranges probably extended to within the borders of this country.

Elephant and hippopotamus are included despite their relative abundance within certain conservation areas due to the restricted area of these parks and reserves and their consequent sensitivity to changes both man-made or natural.

The use of the terms "threatened", "endangered", "vulnerable" and "rare" follow IUCN definitions (see below) and relate to a taxon's status in the Republic and do not reflect the situation on an international scale.

PROTECTIVE LEGISLATION

The four provinces of the Republic differ in their conservation legislation in terms of both species protected and the nature of protection afforded. All listed species are offered either total protection or protection subject to management constraints within the country's official conservation areas. Outside of such areas protection is afforded in terms of the various nature conservation ordinances, to which frequent reference will be made in this review. Legislation measures currently in force include -

TRANSVAAL

Schedule 1 (protected game)

Animals on this schedule may not be hunted, poisoned, bought, sold, held in captivity or controlled without a permit from the Administrator. This is seldom given. In addition, section 6 of the Ordinance makes provision for the capture and payment of compensation by the Administration in cases where it is necessary for the survival of any species, which is then placed on a nature reserve belonging to the Administration.

Schedule 5 (problem animals)

Species which may be freely hunted by approved control clubs, and receive no protection in terms of other sections of the Ordinance.

NATAL

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 "Zoos control" chapter of the Ordinance (15/1974), all wild mammals other than those scheduled as game are protected as follows -

- 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.
- In the case of all other wild mammals the keeping in captivity, sale, purchase or exchange requires a permit from the Board.

CAPE PROVINCE

Schedule 1 (endangered wild animals)

May not be hunted, killed, captured or kept in captivity without a permit which is however, 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 ground 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.

ORANGE FREE STATE

Schedule 1 (protected animals)

No person shall hunt in any manner whatsoever to kill or capture or attempt to kill or capture; to shoot at, search for, follow or lie in wait with intent to kill, shoot or capture or wilfully disturb, or keep in captivity any animal listed on this schedule except under authority of permit.

Schedule 2 (ordinary game)

A hunting season is determined and proclaimed on an annual basis.

Schedule 3 (wild animals)

May be hunted (as defined in schedule 1) throughout the year, but may not be captured and kept in captivity without a permit.

Note. No one may export or import, or keep in captivity, or transport any live indigenous wild animal or game animal without a permit from the Administration.

DEFINITIONS OF CATEGORIES

Threatened

Taxa included in the categories endangered, vulnerable and rare as defined below.

Endangered

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

Vulnerable

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

Rare

Taxa with small populations that are not at present endangered or vulnerable, but are at risk. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range. They may be reproductively isolated, or they may be relict forms with wide distribution. They may also be forms seldom recorded but which may be commoner than supposed although there is reasonably good evidence that their numbers are low.

Special cases

Taxa not threatened in Africa as a whole but included in this book either because their commercial exploitation gives cause for concern or because their distributions are very localised.

LIST OF THREATENED TAXA		Page
Leopard	<i>Panthera pardus</i>	6
Cheetah	<i>Acinonyx jubatus</i>	7
Serval	<i>Felis serval</i>	8
Brown hyaena	<i>Hyaena brunnea</i>	9
Aardwolf	<i>Proteles cristatus</i>	10
Hunting dog	<i>Lycaon pictus</i>	11
Elephant	<i>Loxodonta africana</i>	12
Dugong	<i>Dugong dugon</i>	13
Cape mountain zebra	* <i>Equus zebra zebra</i>	14
Hartmann's mountain zebra	<i>Equus zebra hartmannae</i>	15
Black rhinoceros	<i>Diceros bicornis</i>	16
Hippopotamus	<i>Hippopotamus amphibius</i>	17
Bontebok	* <i>Damaliscus dorcas dorcas</i>	18
Tsessebe	<i>Damaliscus lunatus lunatus</i>	19
Lichtenstein's hartebeest	** <i>Alcelaphus lichtensteini</i>	20
Roan antelope	<i>Hippotragus equinus</i>	21
Sable antelope	<i>Hippotragus niger niger</i>	22
Oribi	<i>Ourebia ourebi</i>	23
Blue duiker	<i>Cephalophus monticola</i>	24
Red duiker	<i>Cephalophus natalensis</i>	25
Suni	<i>Neotragus moschatus</i>	26
Sharpe's grysbok	<i>Raphicerus sharpei</i>	27

* Taxa endemic to South Africa.

** Taxa no longer found in South Africa.

LEOPARD

Panthera pardus (Günther, 1885)

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: Body spotted in adult, no tail tuft, no mane in male (Meester *et al* 1964).

Present distribution: Country-wide; outside sanctuaries found mainly in mountainous regions.

Former distribution: As above.

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Gestation period three months, litter numbers two to three.

Reasons for decline: Skin trade; destruction following predation on domestic livestock; incompatible with animal husbandry.

Protective measures already taken: Protected in Natal and Cape Province.

Measures proposed: Total protection; extermination only by special permit following extensive investigation by qualified authority. Total protection in mountain catchment areas.

Number in captivity: Not more than 30.

Breeding potential in captivity: Good.

Remarks: None.

CHEETAH

Acinonyx jubatus (Schreber, 1776)

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: Claws when retracted not covered by sheaths; body with single spots, long-legged; short face with dark stripe down each side of nose; profile of skull short and high (Meester *et al* 1964).

Present distribution: Northern and eastern Transvaal, Zululand game reserves, Kalahari, isolated animals in northern Cape (Wrogemann 1975).

Former distribution: Same as above but including plains habitat of Cape Province, Orange Free State and Natal.

Status: Endangered.
Increasing in numbers in northern Transvaal.

Estimated numbers: 150 plus in Kalahari, 250 in Kruger National Park, 110 in Zululand, 40 in northern Transvaal, 50 in Timbavati/Klaserie/Sapie Sand. Estimated number in South Africa ~ 700 (Myers 1975).

Breeding rate in wild: Gestation 90-95 days; litter one to eight; breeds throughout the year (polyoestrus), peak November, good reproductive turnover (Wrogemann 1975).

Reasons for decline: Skin trade; destruction as result of predation on domestic stock; cultivation of prime habitat.

Protective measures already taken: None except in game reserves. Protected in Natal. Endangered wild animal in Cape Province.

Measures proposed: Total protection; conservation education of land-owners and reintroduction into suitable game reserves.

Number in captivity: Approximately 80.

Breeding potential in captivity: Variable, good at Whipsnade (United Kingdom) and recently also in South Africa at the National Zoological Gardens.

Remarks: Increasing in farming areas of northern Transvaal possibly due to lack of competition from other large predators. Recent legislation prohibiting export of skins will enhance protective measures.

SERVAL

Felis serval Schreber, 1776

Order CARNIVORA

Family FELIDAE

Distinguishing characteristics: Height of shoulders 350 mm, length 1100 mm, mass 10 kg; large, slender cat with proportionately long legs, large head and short tail ringed with black; base colour is yellowish buff heavily marked with black spots, bands and stripes, the underparts are lighter (Dorst and Dandelot 1970).

Present distribution: Subtropical bushveld of northern and eastern Transvaal extending south in a narrow coastal strip to the eastern Cape Province; also occurring in the northern Cape in the Vryburg and Mafeking areas.

Former distribution: Probably much as at present but not as sparsely distributed. Occurred in the south-western Cape where they are now extinct.

Status: Rare.

Still reasonably widespread but sparsely distributed.

Estimated numbers: Not known.

Breeding rate in wild: Litter size two or three born during the summer but with a wide spread from July to March (Smithers *in litt*).

Reasons for decline: Probably never very plentiful and hunted mercilessly in farming areas. Habitat change and agricultural development are additional factors.

Protective measures already taken: Protected in Cape Province.

Measures proposed: Education of the general public.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: Needs detailed study.

BROWN HYAENA

Hyaena brunnea Thunberg, 1820

Order CARNIVORA

Family HYAENIDAE

Distinguishing characteristics: Ears pointed, back sloping and heavily maned, hair long and shaggy, body unicolour, upper molar less reduced than in *Crocuta*; smaller than *Crocuta* (Skinner 1976).

Present distribution: Transvaal, Orange Free State, east and northern Cape Province, Kalahari Gemsbok National Park (Skinner 1976), diamond areas of north-western Cape coast.

Former distribution: Not known but undoubtedly wider; plentiful in Zululand game reserves (Roberts 1951) and north-western Cape Province (Van Wyk pers comm).

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Litter one to five, possibly biennially, mainly whelp from August to November in Transvaal (Skinner 1976).

Reasons for decline: Not certain if numbers are declining but often mistakenly regarded as problem animals and shot on sight.

Protective measures already taken: None outside game reserves. Protected in Cape Province.

Measures proposed: Total protection.

Number in captivity: Not more than 15.

Breeding potential in captivity: Good provided neonates are removed and hand-reared (Schulz 1966).

Remarks: Perhaps more abundant than commonly believed; distribution certainly widespread but sparse in the Transvaal (Skinner 1976).

AARDWOLF

Proteles cristatus (Sparman, 1783)

Order CARNIVORA

Family PROTELIDAE

Distinguishing characteristics: Height at shoulder about 460-500 mm, mass about 10-15 kg; superficially a diminutive striped hyaena, not bigger than a jackal, with slender legs, narrow, long and pointed ears; well-developed mane from neck to tail; coat buffy yellow to reddish brown, with conspicuous vertical dark brown stripes on shoulders, flanks and thighs; legs with irregular black stripes; tail fairly long and bushy, with black tip (Roberts 1951); jaws weak, cheek teeth vestigial and widely spaced, but canines well developed (Coetzee 1971).

Present distribution: From eastern Cape to Little Namaqualand in the Cape, Orange Free State, central and north-western Natal, Zululand and Transvaal (Coetzee 1971).

Former distribution: Probably as at present, but not as sparsely distributed.

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Litter size two to four, usually three (Roberts 1951). In the southern part of their range usually give birth in November and December (Walker 1968). Indications are that in Botswana young are dropped over a wide season (Smithers 1971).

Reasons for decline: A timid species, threatened by human activity and habitat destruction by farming. Favoured as a delicacy by some people in the north-western Cape Province particularly in May when it is said to be at its fattest (Dieckmann pers comm).

Protective measures already taken: Transvaal - schedule 1; Cape Province - protected; Orange Free State - schedule 1.

Measures proposed: Set up reserves in areas of suitable habitat.

Number in captivity: Two in East London Zoological Gardens; otherwise very few probably due to dietary requirements.

Breeding potential in captivity: Not known.

Remarks: Studies on captive animals required.

HUNTING DOG

Lycan pictus (Temminck, 1820)

Order CARNIVORA

Family CANIDAE

Distinguishing characteristics: Dog-like appearance, legs long and slender, tail with white brush; colour mottled black, yellow and white; ears long and rounded, covered with short hair; first toe of forefoot (pollex) missing; skull short with broad muzzle, massive jaws and teeth; two upper, three lower molars (Roberts 1951).

Present distribution: Kruger National Park and adjoining private game reserves, sometimes straying into northern and eastern Transvaal (Roberts 1951). Also occurs sporadically in the Kalahari Gemsbok National Park (Mills pers comm).

Former distribution: Until recently occurred in Zululand reserves (Coetzee 1971) and doubtlessly more widely in Zululand and northern Transvaal, as well as the Addo area, eastern Cape (Roberts 1951). In earlier times widespread over the Republic.

Status: Endangered.

Surviving only in Kruger National Park, adjoining private game reserves and one pack in the Kalahari Gemsbok National Park.

Estimated numbers: Not known.

Breeding rate in wild: No regular breeding season, but in temperate climates breed mainly in spring and autumn; gestation period reported as 63 and 80 days; usually six to eight young (Walker 1968). Whelping season May to July; two to eight cubs per litter (Ansell 1960). Gestation period about two months; up to twelve young per litter (Dorst and Dandelot 1970).

Reasons for decline: Disappearance of prey; still considered vermin and are shot on sight even on nature reserves (Jacobsen pers comm). A certain minimum number per pack is essential for effective hunting. Incompatible with animal husbandry.

Protective measures already taken: Protected in national parks.

Measures proposed: Reintroduction into certain game reserves.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: Likely to get little sympathy from farmers as it also takes domestic stock. A most difficult animal to protect except in large reserves.

ELEPHANT

Loxodonta africana (Blumenbach, 1797)

Order PROBOSCIDEA

Family ELEPHANTIDAE

Distinguishing characteristics: Unmistakable, the largest mammal in South Africa.

Present distribution: Kruger National Park and adjoining private game reserves, Addo Elephant National Park and Knysna forests in the southern Cape. A few bulls occur in Tongaland.

Former distribution: Widespread throughout the savanna areas; probably not occurring in the arid and treeless areas but known to have occurred in the south-western Cape fynbos.

Status: Special case.

Confined to only three localities where one population (Knysna) consisting of about 12 animals has a doubtful future even with maximum protection. Addo population vulnerable to epidemic disease or catastrophic climatic conditions. Kruger National Park population is confined to an area that is small relative to the needs of the species.

Estimated numbers: 7 400 in Kruger National Park, ~ 250 in adjoining private game reserves, 90 in Addo Elephant National Park, ~ 12 in Knysna forest, not more than 30 in Tongaland where no confirmed sightings of breeding herds since 1946 (Hall-Martin pers comm).

Breeding rate in wild: Cows breed from age of 10-12 years and continue to ~ 60 years at intervals of four years. Gestation 22 months with lactation anoestrus. Calving takes place throughout the year although seasonal peaks have been reported.

Reasons for decline: Incompatible with human development and agriculture.

Protected measures already taken: Protected in national parks and forestry areas.

Measures proposed: None.

Number in captivity: Very few and for economic reasons this cannot be increased.

Breeding potential in captivity: Not relevant.

Remarks: None.

DUGONG

Dugong dugon (Müller, 1776)

Order SIRENIA

Family DUGONGIDAE

Distinguishing characteristics: Forelimbs developed as flippers, no rudimentary nails; tail broadly notched into pair of flukes; male short enlarged tusks; skin almost naked, grey-brown above, underparts whitish grey (Dorst and Dandelot 1970).

Present distribution: Sea; off coast of northern Zululand (Dorst and Dandelot 1970).

Former distribution: Same as above.

Status: Endangered.

Estimated numbers: Not known.

Breeding rate in wild: Not known.

Reasons for decline: Hunting, regarded as delicacy by fishermen.

Protected measures already taken: Protected in Natal.

Measures proposed: Protection along the coast of northern Zululand.

Number in captivity: None.

Breeding potential in captivity: Not known.

Remarks: None.

CAPE MOUNTAIN ZEBRA

Equus zebra zebra Linnaeus, 1758

Order PERISSODACTYLA

Family EQUIDAE

Distinguishing characteristics: Stripes on croup form a grid-iron pattern, dewlap present, ears large (Penzhorn 1975).

Present distribution: Bredasdorp; eastern Cape mountain ranges - Cradock and Oudtshoorn districts (Penzhorn 1975).

Former distribution: Same but probably more extensive. Mountain ranges south of Olifants River in the Cape.

Status: Endangered.

Estimated numbers: 165 in Mountain Zebra National Park, about 20 elsewhere in the Cape Province (Hall-Martin pers comm).

Breeding rate in wild: Gestation one year; foaling season usually September to April, foaling interval 16-30 months (Penzhorn 1975).

Reasons for decline: Skin trade; extermination following settlement; incompatible with agriculture.

Protected measures already taken: Totally protected. Endangered wild animal in Cape Province.

Measures proposed: Establishing more protected habitats and stocking these.

Number in captivity: None.

Breeding potential in captivity: Unknown, probably good.

Remarks: None.

HARTMANN'S MOUNTAIN ZEBRA

Equus zebra hartmannae (Matschie, 1898)

Order PERISSODACTYLA Family EQUIDAE

Distinguishing characteristics: Stripes on croup form a grid-iron pattern, dewlap present and large ears; legs transversely striped to the hooves; consistently larger than *E zebra zebra*.

Present distribution: Wild populations no longer occur in the Republic. Reintroduced to Hester Malan Nature Reserve, Springbok and Cape of Good Hope Nature Reserves (extralimitally), also extralimitally on private farms in Fort Beaufort, Piquetberg, Tulbagh and Worcester divisions in the Cape Province.

Former distribution: Namaqualand division of the Cape Province (Sidney 1965).

Status: Special case.

There is some doubt as to whether or not this subspecies occurred in the Cape. The northern subspecies was more closely in contact with the now exterminated mountain zebra populations in the Kammiesberg and Richtersveld and it is likely that these were actually Hartmann's zebra. All the animals presently occurring have been introduced from South West Africa and there is no viable population in South Africa at present.

Estimated numbers: 8 in Hester Malan Nature Reserve, 6 in Cape of Good Hope Nature Reserve. Total for the Cape possibly less than 30.

Breeding rate in wild: Breeding in the reserve populations has been unsatisfactory but there are indications that this is improving.

Reasons for decline: Hunting and habitat deterioration.

Protected measures already taken: Protected in Cape Province.

Measures proposed: Reintroduction into its original distribution area (on farms).

Number in captivity: Not known.

Breeding potential in captivity: Good.

Remarks: None.

BLACK RHINOCEROS

Diceros bicornis (Linnaeus, 1758)

Order PERISSODACTYLA

Family RHINOCEROTIDAE

Distinguishing characteristics: Proportionately short head and narrow muzzle; upper lip narrow, tip prehensile; mass 1 000 to 1 500 kg (Meester *et al* 1964).

Present distribution: Game reserves of Zululand, Kruger National Park and Addo Elephant National Park.

Former distribution: Whole of southern Africa except Orange Free State and southern Transvaal (Bothma 1975).

Status: Endangered.

Estimated numbers: 328 in Hluhluwe/Umfolozi Game Reserves, 51 in Mkuzi Game Reserve, 28 in Ndumu Game Reserve, 2 in Itala Game Reserve, 6 in Makatini Flats, total for Zululand 415 (Crass pers comm); 24 in Kruger National Park; ~ 10 in Addo (De Graaff pers comm, Hall-Martin pers comm).

Breeding rate in wild: Single calf, gestation 15-16 months, breeds every three years, calves throughout the year (Dorst and Dandelot 1970, Hall-Martin pers comm).

Reasons for decline: Hunted for various reasons; incompatible with transformation of habitat especially following development.

Protected measures already taken: Protected in game reserves. Specially protected game in Natal.

Measures proposed: Reintroduction into other suitable game reserves.

Number in captivity: Not more than six.

Breeding potential in captivity: Variable.

Remarks: None.

HIPPOPOTAMUS

Hippopotamus amphibius Linnaeus, 1758

Order ARTIODACTYLA Family HIPPOPOTAMIDAE

Distinguishing characteristics: Unmistakable; a short-legged large animal with a proportionately large head, broad muzzle and prominent eyes placed high in the head.

Present distribution: Kruger National Park and adjacent private game reserves, northern Natal and KwaZulu. A few individuals occur in the Limpopo River border with Botswana and in Lake Sibaya, KwaZulu.

Former distribution: Widespread in all areas with large permanent rivers and other permanent water-bodies.

Status: Special case.

Although numbers are at present sufficient and breeding potential is good the animals are largely confined to two areas which are small relative to the requirement of the animal. Because of their dependence on water and the increasing use of this commodity by man, they are vulnerable. Due to their restriction to water and effect on the environment, their numbers have to be controlled even in areas where they are protected.

Estimated numbers: 2 200 in Kruger National Park, 600 plus in northern Natal and Zululand, ~ 20 along the Limpopo River.

Breeding rate in wild: Cows breed from age of three years and at intervals of three years. Longevity is given as 40 years but this is probably not attained in the wild. Gestation is eight months and there is a long period of lactation (Pienaar *et al* 1966).

Reasons for decline: Incompatible with human development and agriculture.

Protected measures already taken: Protected in Kruger National Park and Natal reserves.

Measures proposed: None.

Number in captivity: Very few and for economic reasons this is unlikely to increase significantly.

Breeding potential in captivity: The animals breed in captivity (Brand 1963).

Remarks: None.

BONTEBOK

Damaliscus dorcas dorcas (Pallas, 1766)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Larger, darker and more richly coloured than blesbok, white facial band usually continuous from base of horns to the nose and narrower between the eyes; large pure white patch on rump, lower part of legs white (Ansell 1971).

Present distribution: South-western Cape; introduced into eastern Cape - Grahamstown, Bedford (David 1973), also introduced in Orange Free State - Harrismith, where probably mixed with blesbok.

Former distribution: Same, but more extensive (Du Plessis 1969).

Status: Rare.

Estimated numbers: 260 in Bontebok National Park, about 800 elsewhere in the southern Cape Province, of these a small population of approximately 250 on private property in eastern Cape (Mentis pers comm).

Breeding rate in wild: Good apart from Bontebok National Park. Gestation eight months, one lamb born annually, peak months September/October (David 1973).

Reasons for decline: Limited habitat, previous habitat practically all under the plough.

Protected measures already taken: Protected. Widely distributed in nature reserves and private property.

Measures proposed: Establish new populations and acquisition of suitable habitat.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: None.

TSESSEBE

Damaliscus lunatus lunatus (Burchell, 1828)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Face not white, front black, limbs dark with a purplish gloss; horns ringed except at tip and crescent-shaped when viewed from front (Ansell 1971).

Present distribution: Eastern Transvaal near Klaserie and in Kruger National Park, Percy Fyfe Nature Reserve and Ellisras district, north-western Transvaal (Garstang pers comm, Joubert pers comm).

Former distribution: Throughout the Transvaal except south-central and south-western areas and in north-eastern Cape Province (Du Plessis 1969).

Status: Endangered.

Estimated numbers: 250 in Klaserie areas, 550 in Kruger National Park, few near Ellisras and in Hans Merensky Nature Reserve, 120 in Percy Fyfe Nature Reserve.

Breeding rate in wild: Excellent in Kruger National Park, poor at Klaserie where survival rate of calves is also poor, good elsewhere (Garstang pers comm, Joubert pers comm, Wilson pers comm).

Reasons for decline: Habitat change; poaching; disease especially cytoxoonosis (Garstang pers comm, Wilson pers comm).

Protected measures already taken: Protected in game reserves.

Measures proposed: Total protection until viable populations have been built up.

Number in captivity: Not known.

Breeding potential in captivity: Two births in Pretoria Zoo (Brand 1963); probably good.

Remarks: None.

LICHTEINSTEIN'S HARTEBEEST

Alcelaphus lichtensteini (Peters, 1852)

Order ARTIODACTYLA Family BOVIDAE

Distinguishing characteristics: Large (130-160 kg) with hartebeest features but frontal region very wide not forming pedicle; back bright rufous contrasting with pale fawn flanks and whitish hindquarters; dark blaze in middle of face, dark stripe down front of legs; both sexes horned (Dorst and Dandelot 1970).

Present distribution: Exterminated in South Africa.

Former distribution: Thought to have occurred in the bushveld areas of north-eastern Zululand, north-eastern Transvaal from Pafuri to escarpment and perhaps as far as Messina (Tinley pers comm). Shortridge (1934) mentions its distribution occurring as far south as Swaziland and that the extinct Zululand hartebeest was possibly Lichtenstein's hartebeest. It may well have occurred in the Pongolo Game Reserve (Bigalke 1966).

Status: Exterminated in South Africa.

Estimated numbers: Nil.

Breeding rate in wild: In Rhodesia numbers are declining due to low breeding rate. In Mozambique very good, mostly born in September (Tinley pers comm).

Reasons for decline: Shot out.

Protected measures already taken: Not applicable.

Measures proposed: Research to establish previous distribution; importations from neighbouring countries to re-establish a breeding nucleus in suitable habitat.

Number in captivity: None.

Breeding potential in captivity: Not known.

Remarks: None.

ROAN ANTELOPE

Hippotragus equinus (Desmarest, 1804)

Order ARTIODACTYLA Family BOVIDAE

Distinguishing characteristics: Colour pale brown, white underparts less well-defined, horns short (Ansell 1971).

Present distribution: Transvaal, except southern and south-western areas.

Former distribution: As above and north-western Cape Province - Kuruman/Vryburg area (Du Plessis 1969, Ansell 1971).

Status: Endangered.

Estimated numbers: 280 in Kruger National Park, 50 in Percy Fyfe Nature Reserve, few in Waterberg (Joubert pers comm, Wilson pers comm).

Breeding rate in wild: Single calf born annually, no annual cycle. Reproductive rate excellent, calf survival rate poor outside Kruger National Park (Joubert 1970).

Reasons for decline: Susceptibility to disease especially anthrax; destruction of habitat through agriculture (Joubert 1970).

Protected measures already taken: Protected where it occurs.

Measures proposed: Habitat management to establish suitable areas for reintroduction. Acquisition of suitable habitat in northern Cape Province.

Number in captivity: Not known.

Breeding potential in captivity: Excellent.

Remarks: None.

SABLE ANTELOPE

Hippotragus niger niger (Harris, 1838)

Order ARTIODACTYLA Family BOVIDAE

Distinguishing characteristics: Colour black or chestnut, white underparts well-defined, long recurved horns, well-developed mane (Ansell 1971).

Present distribution: Transvaal except southern and south-western areas (Wilson 1975).

Former distribution: Same as above.

Status: Rare.

Estimated numbers: 800 in Transvaal excluding Kruger National Park, 1200 in Kruger National Park (Joubert pers comm, Wilson 1975).

Breeding rate in wild: Excellent, one calf per year, seasonal breeding, survival rate of calves very low (Wilson 1975).

Reasons for decline: Hunting and habitat change.

Protected measures already taken: Protected.

Measures proposed: Establishment of new populations in suitable habitats.

Number in captivity: Not known.

Breeding potential in captivity: Not known, probably good. 18 births in Pretoria Zoo (Brand 1963).

Remarks: None.

ORIBI

Ourebia ourebi (Zimmerman, 1783)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Small (10-20 kg), silky coat, general colour bright sandy rufous to brownish fawn in sharp contrast to pure white belly; forehead and crown rich rufous to dark brown; bare patch below ear appears as black spot; tail short rufous-brown with black tip or black; males horned (Dorst and Dandelot 1970).

Present distribution: Open grassland areas in eastern Cape Province, Natal, Transvaal and eastern Orange Free State.

Former distribution: Similar but much wider (Roberts 1951).

Status: Vulnerable.

Estimated numbers: Not known.

Breeding rate in wild: Usually one lamb per annum, peak in summer.

Reasons for decline: Habitat change; poaching, particularly hunting with dogs.

Protected measures already taken: Protected in all areas.

Measures proposed: Reintroduction into suitable habitat.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: Local population in eastern Cape less than 50 individuals; possibly faces extinction.

BLUE DUIKER

Cephalophus monticola (Thunberg, 1789)

Order ARTIODACTYLA Family BOVIDAE

Distinguishing characteristics: Smallest of all duikers (mass 5-10 kg), slate-grey to dark brown; a lighter streak on forehead extending to base of horns; opening of facial glands curved, not straight as in other duikers, tail rather long, bushy, black bordered with white; horns very small usually present in both sexes but may be absent in females (Dorst and Dandelot 1970).

Present distribution: Coastal forest areas of eastern Cape Province and Natal (Dorst and Dandelot 1970).

Former distribution: From Outeniqua forests eastwards to eastern Cape Province and Natal upland forests (Roberts 1951).

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Lambs born throughout the year with a peak from September to December (Mentis 1972, Von Ketelhodt 1977).

Reasons for decline: Habitat change, hunting and poaching.

Protected measures already taken: Protected in Natal and Cape, reintroduced to A Vosloo Kudu Reserve, Grahamstown.

Measures proposed: Reintroduction to suitable areas.

Number in captivity: Excellent lambing throughout the year with peak from October to December (Von Ketelhodt 1977).

Breeding potential in captivity: Not known.

Remarks: Numbers in wild underestimated in eastern and south-eastern Cape (Greig and Jarvis pers comm). Increase in Tsitsikama Coastal National Park (Robinson pers comm).

RED DUIKER

Cephalophus natalensis (A Smith, 1834)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Small (15 kg), colour almost uniform bright rufous-chestnut, somewhat paler on underparts; tail short with well developed tuft of mixed black and white hairs; horns present in both sexes (Dorst and Dandelot 1970).

Present distribution: From the Natal coastal bush to forests in the Transvaal including the Soutpansberg.

Former distribution: Natal coastal bush, foothills of the escarpment in the Barberton district (Roberts 1951).

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Not known, probably seasonal, single lambs.

Reasons for decline: Habitat change, hunting and poaching.

Protected measures already taken: Protected in the Transvaal and Natal.

Measures proposed: Reintroduction into suitable habitat. Acquisition of suitable habitat.

Number in captivity: Not known.

Breeding potential in captivity: Not known, probably good. Seven births in Pretoria Zoo (Brand 1963).

Remarks: None.

SUNI

Neotragus moschatus (Von Deuben, 1846)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Small (9 kg), dull fawn-grey to rich chestnut on back with slightly speckled appearance, throat white and underparts whitish; tail rather long, dark brown with white tip; horns only in male and comparatively long (5-10 cm) in relation to body size (Dorst and Dandelot 1970).

Present distribution: Coastal area of Natal from St Lucia Bay northwards and in the north-eastern corner of Transvaal (Heinichen 1972).

Former distribution: From Lake St Lucia area northwards on the east of the Lebombo mountains (Roberts 1951).

Status: Endangered.

Estimated numbers: Not known.

Breeding rate in wild: Not known.

Reasons for decline: Hunting.

Protected measures already taken: Protected in Natal.

Measures proposed: Proclamation of specific areas as game reserves to ensure survival.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: None.

SHARPE'S GRYSBOK

Raphicerus sharpei (Thomas, 1897)

Order ARTIODACTYLA

Family BOVIDAE

Distinguishing characteristics: Small (8-12 kg), wiry coat, colour rich rufous-brown speckled with white, muzzle brown with narrow white superciliary stripe, underparts white; ears smaller than Cape grysbok; horns only in male, very short (3-4 cm) (Dorst and Dandelot 1970).

Present distribution: Western parts of the Soutpansberg (Eloff pers comm) and north-eastern Transvaal.

Former distribution: North-eastern and north-western Transvaal and eastern Ngamiland (Roberts 1951).

Status: Rare.

Estimated numbers: Not known.

Breeding rate in wild: Not known.

Reasons for decline: Status not certain.

Protected measures already taken: Protected in Kruger National Park.

Measures proposed: Establishment of nature reserves in suitable habitat to ensure survival.

Number in captivity: Not known.

Breeding potential in captivity: Not known.

Remarks: None.

REFERENCES

- Ansell W F H 1960. *Mammals of northern Rhodesia*. Government Printer, Lusaka. 155 pp.
- Ansell W F H 1971. Order Artiodactyla. In : *The mammals of Africa : an identification manual*. J A J Meester and H W Setzer (eds). Smithsonian Institution Press, Washington. Part 15, 1-84.
- Bigalke R 1966. South Africa's first game reserve. *Fauna & Flora* 17, 13-18.
- Bothma J du P 1975. Conservation status of the larger mammals of southern Africa. *Biol Conserv* 7, 87-95.
- Brand D J 1963. Records of mammals bred in the National Zoological Gardens of South Africa during the period 1908-1960. *Proc Zool Soc Lond* 140, 617-659.
- Coetzee C G 1971. Order Carnivora. In : *The mammals of Africa : an identification manual*. J A J Meester and H W Setzer (eds). Smithsonian Institution Press, Washington. Part 8, 1-69.
- David J H M 1973. The behaviour of the bontebok, *Damaliscus dorcas dorcas* (Pallas 1766), with special reference to territorial behaviour. *Z Tierpsychol* 33, 38-107.
- Dorst J and P Dandelot 1970. *A field guide to the larger mammals of Africa*. Collins, London. 287 pp.
- Du Plessis S F 1969. The past and present geographical distribution of the Perissodactyla and Artiodactyla in southern Africa. MSc thesis, University of Pretoria. 333 pp.
- Heinichen J G 1972. Preliminary notes on the suni *Nesotragus moschatus* and red duiker *Cephalophus natalensis*. *Zool Afr* 7, 157-166.
- Joubert S C J 1970. A study of the social behaviour of the roan antelope *Hippotragus equinus equinus* (Desmarest 1804) in the Kruger National Park. MSc thesis, University of Pretoria. 205 pp.
- Meester J A J 1976. South African Red Data Book - small mammals. *South African National Scientific Programmes Report* 11, 1-59.
- Meester J A J, D H S Davis and C G Coetzee 1964. An interim classification of southern African mammals. CSIR, Pretoria. Unpublished mimeograph. 76 pp.
- Mentis M T 1972. A review of some life history features of the large herbivores of Africa. *Lammergeyer* 16, 1-89.
- Myers N 1975. *The cheetah Acinonyx jubatus in Africa*. Monograph 4. IUCN, Morges. 90 pp.

- Penzhorn B L 1975. Behaviour and population ecology of the Cape mountain zebra *Equus zebra zebra* Linn 1758 in the Mountain Zebra National Park. DSc thesis, University of Pretoria. 292 pp.
- Pienaar U de V, P van Wyk and N Fairall 1966. An experimental cropping scheme of the hippopotamus in the Letaba River of the Kruger National Park. *Koedoe* 9, 1-33.
- Roberts A 1951. *The mammals of South Africa*. Trustees "The mammals of South Africa" book fund, Johannesburg. 700 pp.
- Schulz W C 1966. Breeding and hand rearing brown hyaena. *Int Zoo Yb* 6, 173-176.
- Shortridge G C 1934. *The mammals of South West Africa*. Vol 2. Heinemann, London. 779 pp.
- Sidney J 1965. The past and present distribution of some African ungulates. *Trans Zool Soc Lond* 30, 1-396.
- Skinner J D 1976. Ecology of the brown hyaena *Hyaena brunnea* in the Transvaal with a distribution map for southern Africa. *S Afr J Sci* 72, 262-269.
- Smithers R H N 1971. *The mammals of Botswana*. National Museum of Rhodesia, Salisbury. 340 pp.
- Von Ketelhodt H F 1973. Breeding notes on blue duiker. *Zool Afr* 8, 138.
- Von Ketelhodt H F 1977. A lambing interval of the blue duiker *Cephalophus monticola* Gray in captivity with observations on its breeding and care. *S Afr J Wildl Res* 7, 41-43.
- Walker E P 1968. *Mammals of the world*. 2nd edition. John Hopkins, Baltimore. 1500 pp.
- Wilson D E 1975. Factors affecting roan and sable antelope populations on nature reserves in the Transvaal with particular reference to ecophysiological aspects. DSc thesis, University of Pretoria. 295 pp.
- Wrogemann N 1975. *Cheetah under the sun*. McGraw-Hill, Johannesburg. 159 pp.