

optimal habitat for the species, as marginal habitat, even with the best of intentions, will prove to be of no value for the survival of the species.

Status: Endangered in South Africa.

Cape grysbok (*Raphicerus melanotis*)

Endemic to the southwestern Cape zone and east along the coast to about 28°E (Bigalke *et al.* 1962). Abundance and survival is very difficult to assess, as our knowledge of the habitat requirements is rather scanty. Bigalke *et al.* (1962) describe the habitat as scrubby mixed grassveld and mixed grassveld in areas with high mountains and sheltered valleys, since all records come from such areas.

Bigalke (*in litt.*) maintains that the species might still occur in some Drakensberg valleys, but that this represents the very edge of its natural range where it has always been rare. It was quite common in Giant's Castle Game Reserve until the mid-thirties, but has since declined and has not been recorded in 10 years (Barnes *pers. comm.*). Bigalke *et al.* (1962) report particularly low numbers in the eastern parts of the species' range. Some of the people interviewed maintained that the species has always been rare, while others have indicated a reduction in numbers and that in several reserves the species has declined during the last decade. It is quite possible that both opinions are correct for different areas. The species would probably do well in areas where the vegetation was in a state of transition, for instance from grassland to scrubby mixed grassveld. The where woody vegetation is allowed to spread in the absence of fire and grazing pressure by domestic stock, would adversely affect the species.

The species is found in all reserves throughout its range in varying numbers. It is apparent that more knowledge is essential to be able to manage the conservation areas for the benefit of the species.

Status: Rare (endemic).

Sharpe's grysbok (*Raphicerus sharpei*)

The species is endemic to the southern savanna and of restricted distribution within that zone (Ansell 1968). Pienaar (1963) reports Sharpe's grysbok from the Kruger National Park where the centre of its distribution is north of the Letaba River. No definite records could be obtained from any of the provincial or large private reserves in the northern and eastern Transvaal, though most of them fall within the range of the species (Ansell 1968). However, the species has been reported from farms in the Lydenburg, Letaba, Pietersburg, Soutpansberg and Sibasa districts in this area. It is also known from the Waterberg and Thabazimbi districts in the western Transvaal and one specimen is recorded from the Rustenburg district. It has been reported that the species has disappeared from a number of areas in the Transvaal in the recent past.

The main cause for the alleged decline of the species is probably

habitat alteration brought about as a result of human activities. It is therefore advisable to consider the inclusion of suitable habitat in proposed new conservation areas within the species range.

Status: Rare.

Suni/Livingstone's antelope (*Neotragus moschatus*)

An inhabitant of the tropical littoral, the species extends its range in South Africa only into Zululand and the extreme northeastern corner of the Transvaal. The only known range in the northeastern Transvaal falls within the Kruger National Park (Pienaar 1963).

In the Zululand reserves the best protected habitat is to be found in the Ndumu Game Reserve, where the species is reported to be common. In the Mkuzi Game Reserve the species is barely holding its own as suitable habitat is very limited and has been reduced in the last decade. The species has been seen here only rarely during the past five or six years (*Mentis in litt.*). In False Bay Nature Reserve and St Lucia Game Reserve the species is still quite common, but only on the eastern shore of the lake in the latter reserve. There are indications that browsing species (nyala) have an adverse influence on the vegetation and so cause a decrease in suni habitat. This is a matter to be viewed with some concern. Kosi Bay Nature Reserve and Sordwana Bay National Park are too small to hold any significant populations.

The occurrence outside conservation areas in Zululand is not well known. However, due to increasing population pressure and accompanying heavy habitat destruction, especially in Tongaland, the survival prospects of suni seem to be poor. The only area where suitable habitat is still found in almost virgin conditions is the dry forest complex halfway between Ndumu Game Reserve and the Mosi Swamps. Unfortunately, this is not a conservation area and it could be destroyed in the near future.

Status: Endangered in South Africa.

Aardvark (*Orycteropus afer*)

It is a common species in the Kruger National Park and widespread where there is an abundance of anthills, particularly in sandveld (Pienaar 1964). It has been reported throughout the Transvaal on provincial and private reserves where suitable habitat occurs.

It is widespread and, in some areas, common in the Cape Province (Bigalke *et al.* 1962) and has been reported in the Kalahari Gemsbok National Park.

It has been reported in most game reserves in Zululand in fair numbers. It is absent from all the reserves in the Drakensberg range, due to lack of proper habitat.

In the Orange Free State the species occurs in the Willem Pretorius Game Reserve and the Tussen-die-Riviere Game Farm in the south. It has been recorded from farmlands throughout the province, though in low numbers.

In South West Africa it is widespread and has a refuge in the Etosha Pan National Park.

The greatest danger to the survival of the species might lie in its alleged "medicine" value accorded to it by the African population, as well as in changes in the vegetation.

Status: Not common, but secure.

Pangolin (*Manis temminckii*)

An abundance of termitaria is the major habitat requirement of the species. The rather shy and mainly nocturnal habits of the species make it difficult to assess its abundance and survival status. It has probably always been rare but widespread.

It is distributed throughout the Kruger National Park wherever suitable habitat occurs (Pienaar 1964). It has been reported in the Hans Merensky Game Reserve, the Sabi Sand Private Nature Reserve and the Timbavati Private Nature Reserve. It presumably still occurs on farmland in this area as well. In the north of the province it has been reported in the Langjan Nature Reserve, and in the central part of the Loskop Dam Nature Reserve.

In the Cape Province it is confined to the north according to Meester (1969) and is reported from the Kalahari Gemsbok National Park.

In Natal it is confined to the northern parts and was recently found in the False Bay Park Nature Reserve. In Ndumu and Mkuzi Game Reserves it has not been recorded for the last 10 years, although it did occur there, according to local residents.

In the Orange Free State its presence is recorded predominantly in the western parts (Von Richter *et al.* 1972).

It occurs throughout South West Africa and has been recorded in the Etosha Pan National Park.

Present knowledge of the biology and ecology of the species is very limited. The very small number of records from non-conserved areas could possibly indicate that its survival is precarious. It is much sought after by various African tribes for its alleged medicinal value.

Status: Rare – endangered in South Africa.

3.1 Rare and endangered terrestrial Carnivora

Large feline predators are confined in South Africa mostly to game reserves of sufficient size. Outside conservation areas all species are relentlessly persecuted for actual or alleged livestock killings. In the face of this the survival of leopard in inaccessible shelters, even in areas of dense human population, is remarkable. Leopards are not uncommon in the hilly and mountainous country around Pretoria and Cape Town. Lion seem to be less able to survive outside conservation areas and cheetah even less so, because of their very specific habitat requirements.

The smaller feline species, like lynx, serval, wild cat and black-footed cat, still survive in some areas in appreciable numbers where suitable habitat is found. The lynx, which now appears in the list of vermin species, is alleged to kill sheep and is hunted vigorously in sheep farming areas, but seems to maintain its status more or less. The serval, its distribution being restricted to areas of higher rainfall, has fared less well. Its numbers have decreased substantially, partly due to extensive trapping, but probably also in part as a result of changes in the habitat. African wild cat and black-footed cat seem to hold their own. The latter has probably always been rare, and it is almost impossible to estimate their abundance or survival.

Spotted and brown hyena are largely confined to conservation areas and are persecuted if they stray outside. The brown hyena seems to be the more abundant species outside game reserves, as indicated by the number of animals shot over the last decade in almost every part of the Republic and seems to be able to survive in more remote areas.

The aardwolf is still common in suitable habitat inside and outside conservation areas. Motor traffic, however, takes an increasing toll on the road at night. The species still suffers from persecution by the farming community for alleged lamb killing habits.

All of the species mentioned are much maligned as killers of livestock and are actively persecuted. The scanty information available on the food habits of the smaller carnivora, however, does not support the general notion that their main diet consists of domestic stock (Bothma 1965, 1966a, 1966b, 1971; Grafton 1965). Moreover, both authors deplore the indiscriminate hunting of these species and stress that only known marauders should be hunted.

Stock killing by predators is of course in part at least a consequence of the fact that farming areas are denuded of their wild game populations. This forces the larger predators to take to stock killing and thereby to invite their own death. Wilson (1969) reports that the leopard might be an exception to this rule. He has found free roaming leopards to prey almost exclusively on rockhares and dassies. It is equally known that baboons contribute to the diet of leopards. However, dassie and baboon are viewed as pests in many parts of South Africa and as such measures have been instituted to control them. Leopard, dassie and baboon share very similar habitat and, if protected, the leopards will keep the others from getting out of hand.

Unless the policy of indiscriminate hunting is discontinued, the larger predators will become confined to conservation areas, and the smaller predators will be severely reduced in numbers and range. The ecological side effects of this cannot be predicted at this stage. For a more detailed discussion of the present status and distribution see Von Richter (1972).

Lion (*Panthera leo*)

Large populations are today confined to the Kalahari Gemsbok National Park, the Kruger National Park and the Etosha Pan National

Park. There is also a small population in the Umfolozi Game Reserve in Zululand. Also, the large Timbavati and Sabi Sand Private Nature Reserves in the eastern Transvaal Lowveld still harbour a fair number. Individual animals are encountered throughout the Lowveld and the northern Cape and are probably stragglers either from the large sanctuaries or from Botswana.

Status: Rare.

Leopard (*Panthera pardus*)

The largest numbers are to be found in the Kruger National Park, the Kalahari Gemsbok National Park, Etosha Pan National Park, and the Umfolozi, Hluhluwe, Mkuzi, Ndumu and St Lucia Game Reserves in Zululand. In the Transvaal, resident populations have been reported in the provincial Loskop Dam, Blyde River and Rustenburg Nature Reserves.

In the eastern Transvaal Lowveld the species is regularly met with on the large Timbavati and Sabi Sand Private Nature Reserves, as well as on the smaller provincial and private reserves. A private nature reserve just outside Pretoria in the Magaliesberg reports resident leopards and in the western Transvaal the Thabazimbi Private Nature Reserve has a resident population.

The holdings of the Department of Forestry in the Drakensberg and all along the mountain ranges in the Cape, harbour smaller or larger numbers of leopards.

Outside conservation areas the species is frequently encountered in more remote and undeveloped areas of the country and in inaccessible mountain ranges. Its secretive and cunning habits have enabled it to survive even in the face of ruthless persecution. In the Cape Province, excluding the northern Cape and most of the Karoo, nearly 100 animals were destroyed during the five year period 1965–1969 by professional vermin destruction clubs. The total number killed was probably much higher as leopards are killed by landowners as well.

With increasing human population and the pressure now being directed on remote and undeveloped areas, the species is most certainly endangered. The only possible way of forestalling its complete eradication would be to stop the all-out "war" on the species and to destroy only known stock killers. Moreover, the creation of a substantially sized conservation area in the western Cape would benefit not only leopard but other species as well.

Status: Endangered in South Africa.

Cheetah (*Acinonyx jubatus*)

The survival prospects of the species in South Africa are a matter of grave concern. The Kruger National Park and the Kalahari Gemsbok National Park are the only sanctuaries where cheetah can be encountered

in reasonable numbers. Even in the Etosha Pan National Park the species is rare.

Cheetah have been re-introduced into the Umfolozi, Hluhluwe and Mkuzi Game Reserves in Zululand where they have acclimatized well.

Small numbers are reported from the large private game reserves in the Transvaal Lowveld and very occasional animals have been seen on farmlands in the Letaba and Pilgrims Rest districts.

Cheetah have been reported from the western and eastern Caprivi (Tinley *pers. comm.*; Rautenbach *pers. comm.*). Reports from South West Africa are somewhat confusing, as some informants claim that the status has not changed much, while others maintain that the species is definitely on the decline. The overall picture appears to be that the species is becoming rare.

The main cause for the decline of the species is to be found in the habitat changes which have taken place during the last century. Past land use practices have rendered large parts of the former range unsuitable through bush encroachment (Pienaar 1969). The exceedingly low numbers in the Kruger National Park (250 in 1970, Labuschagne *pers. comm.*) reflect the very limited habitat available in the Park. With the absence of any serious veld management outside the Park in the Lowveld, it seems only a matter of time before the last cheetah will have disappeared from there, too. The Zululand reserves also face the increasing problem of bush encroachment and the established cheetah populations will soon reach the limits of available habitat.

To prevent the extinction of the species in South Africa, the only reasonable solution is to concentrate on veld management policies, thereby re-claiming suitable habitat and preventing further deterioration of open savanna grassland vegetation types in the existing conservation areas. Re-introduction should be attempted only in existing or newly created conservation areas where sufficient suitable habitat is available.

Status: Endangered.

Brown hyaena (*Hyaena brunnea*)

Next to the cheetah, the brown hyaena is probably the rarest carnivore species in South Africa. It is endemic to the southern savanna and the centre of its distribution is in the arid south west. A very small population has found refuge in the Etosha Pan National Park and the species also occurs in the Kalahari Gemsbok National Park and the Kruger National Park, where about 150 individuals have been estimated to be present (Pienaar 1969). In the Transvaal Lowveld a few individuals have been reported from the provincial Hans Merensky Game Reserve and some private reserves. The Loskop Dam Nature Reserve and the Blyde River Nature Reserve in the eastern and central Transvaal harbour small resident populations and, in the western Transvaal, the species has been reported from the Thabazimbi Private Nature Reserve. A small private reserve outside Pretoria in the Magaliesberg protects a small number of brown hyaena. With the exception of the Kalahari Gemsbok National Park, the

species has virtually disappeared from the Cape Province, the Orange Free State and Natal, where it apparently always was rare.

Indications of a surprisingly wide distribution of brown hyaena in South Africa come from animals being reported occasionally from farmlands in the northern and southeastern Cape, from most of the undeveloped parts of the Transvaal, especially southwestern and western parts, and from some areas in the Orange Free State, northern Natal and the Drakensberg range. In South West Africa the species is occasionally reported from the more remote regions in the north, but is considered to be facing extinction.

As an alleged threat to domestic stock the species is mercilessly destroyed whenever encountered outside conservation areas, and the survival of the species is only safeguarded in the existing sanctuaries. A more sophisticated and discriminating approach to the hunting of the species would certainly benefit its survival. Additional conservation areas in the northern Cape would be of tremendous value in conserving the brown hyaena.

Status: Endangered.

Spotted Hyaena (*Crocuta crocuta*)

The species is largely confined to the Etosha Pan National Park, the Kalahari Gemsbok National Park, the Kruger National Park and the Hluhluwe, Umfolozi, Mkuzi Game Reserves in Zululand. In the eastern Transvaal Lowveld the species is regularly encountered on the larger private game reserves and the Hans Merensky Game Reserve. The Loskop Dam Nature Reserve also has a resident population.

Occasional reports indicate the presence of the species in the northern and eastern Cape, the eastern and northeastern Transvaal, the Natal Drakensberg (*Mentis in litt.*) and in northeastern Zululand on undeveloped farmlands or Bantu areas. Probably all of these individuals are stragglers from the conservation areas. In South West Africa the species has been reported from remote areas in the northeastern parts of the territory. Apart from the Etosha Pan, however, no sanctuary is provided for the species.

In the near future the species will probably be entirely confined to conservation areas.

Status: Rare.

Hunting dog (*Lycaon pictus*)

This gregarious predator is almost exclusively confined to the large conservation areas, the Etosha Pan National Park, the Kalahari Gemsbok National Park and the Kruger National Park. The species has been reported on some of the large private game reserves in the Transvaal Lowveld and occasional stragglers are destroyed throughout the Lowveld on big cattle ranches.

Hunting dogs may still be encountered in the remote areas in the northeast of South West Africa, but in due course will also be exterminated.

Status: Rare.

3.2 *Rare and endangered marine mammal species*

The only marine mammal species occurring permanently along the coast or on islands within South African territorial waters is the Cape fur seal (*Arctocephalus pusillus*). Seal herds are distributed from Angola along the west coast to Cape Point, then east to Algoa Bay (Nel 1968). Rand (1959) lists 17 main rookeries of which 15 are on islands and the remainder are on the mainland in South and South West Africa.

Rookeries on the islands fall under the control of the Superintendent of the Guano Islands, while the mainland populations are to be found in prohibited areas in terms of diamond regulations. The total population is estimated at 500 000 in 1968 (Rand *in litt.*). The rookeries themselves are protected and sealing is carried out during limited periods only, but all rookeries are hunted. No island or rookery on the mainland give full protection on a year-round basis. The protection of the species is based solely on their economical value and thereby to the demand on the world market. If this demand drops, deliberate culling would be instituted to protect the interest of commercial fishing. Fur seals are commercially exploited for fur, leather, meat or bone meal and oil. A quota system which is associated with export market requirements is applied to each sealing area.

The situation gives no immediate concern for the survival of the species and century-long exploitation apparently has had only a limited influence on the range and probably numbers of the species. The controlled exploitation at the present level poses no danger to the species.

Nevertheless, it is considered of great importance that some rookeries are proclaimed full conservation areas where no culling should be carried out. The creation of island sanctuaries are especially important in view of some bird species as well, as will be shown in detail later.

Status: Rare, endemic to South Africa.

4.0 *Rare and endangered bird species*

In co-operation with the Percy Fitzpatrick Institute of African Ornithology a list of bird species has been drawn up for rare or endangered birds which are in need of better or additional protection. Some of the species are rare by the nature of their habitat requirements or have their main distribution outside South Africa. Only those species which require immediate additional protection will be discussed here.

Jackass penguin (Spheniscus demersus)

An endemic species of the South African Coast from the Cunene River

mouth in the west to Lourenco Marques in the east, but found only irregularly from the Transkei northwards (Roberts 1957), and mostly found on the islands. Of an estimated total of 190 000 birds, a small remnant of the numbers of 30 years ago, a very large percentage is found on Dassen Island off the west coast and on Dyers Island off the south coast (Elliott 1970). The increasing danger of oil pollution since the closure of the Suez Canal, egg-collection for overseas gourmets and a reduced food supply because of excessive fishing operations have put the species in a precarious situation. The main danger, however, comes from the continuing collection of guano on the islands off the west coast. The islands are being paved and the burrows where the jackass penguin breeds destroyed to facilitate the removal of guano. To avoid wave action carrying away the guano, the islands have been walled, a major obstacle for the birds who cannot fly to reach their breeding places (Elliot 1970). Should a major oil spill occur, the survival of the species is put into great jeopardy, not counting the constant harassment by guano and egg collectors and the destruction of their habitat.

The establishing of a conservation area for the jackass penguin is strongly recommended and would also benefit the bank cormorant, *Phalacrocorax neglectus*. This species is confined to the islands off the west coast and is also in need of more and better protection. The suggested conservation area could then also include fur seal rookeries.

Status: Endangered (endemic).

Pink-backed pelican (*Pelecanus rufescens*)

The only known breeding colony in South Africa is found in the northern part of Lake St Lucia. The devastating increase in the salinity during the last five years in the St Lucia system has placed this colony in great jeopardy. The adult birds do not fish on the lake themselves but take their fledglings onto it to feed. The drastic change in the whole ecosystem has resulted in the virtual absence of any fodder fish in the vicinity of the colony.

Any lasting moves to save the colony can only be coupled with a general and all-embracing effort to stop and revert the trend of the St Lucia system of turning into a salt lake.

Status: endangered in South Africa.

White pelican (*Pelecanus onocrotalus*)

Colonial breeders which breed in South Africa only on islands off the south west Cape and on Lake St Lucia. The population in St Lucia is endangered for the same reason as the pink-backed pelican, as outlined above. The populations on the islands are probably not endangered at the moment.

Status: Endangered in South Africa.

Bald ibis (*Geronticus calvus*)

A species endemic to South Africa and Lesotho. Its very specific habitat requirements make its distribution rather localised and patchy. Siegfried (1971) has estimated the total breeding population at 2 000 birds, with the centre of the distribution in the Orange Free State. The number of breeding colonies and birds has substantially decreased and the species has disappeared entirely from the Cape Province. The main cause for the decline is apparently the destruction of suitable habitat.

The species is covered by all the Nature Conservation Acts giving it full protection, but unfortunately only two breeding colonies are situated on state-controlled land where any meaningful protection can be carried out. It is considered to be of the greatest importance that some of the large breeding colonies should be incorporated into new conservation areas.
Status: Endangered.

Lammergeyer (*Gypaetus barbatus*)

As all raptorial birds, the species has suffered mostly through the persecution by man and has been greatly reduced. It is now mainly confined to the Drakensberg range in Lesotho and Natal. Approximately 40 breeding pairs are thought still to survive (Barnes *pers. comm.*). Giant's Castle Game Reserve probably harbours the largest proportion of the South African population and the species breeds there. In the Golden Gate Highlands National Park one or two pairs also breed regularly.

The best protection to the species is probably offered by the inaccessible nesting sites, while the main danger is to be seen in human persecution due to alleged livestock killing.

Status: Endangered.

Other bird species

The Egyptian vulture (*Neophron percnopterus*) and the wattled crane (*Buggeranus carunculatus*) are also in need of additional conservation. Both species are covered by various conservation ordinances. Unfortunately only few existing conservation areas provide adequate habitat. Habitat destruction, especially in the case of the wattled crane, edges of swamps and adjoining grassy vleis, is the main factor reducing the numbers and range of the species.

5.0 Rare and endangered reptile species

Three large reptile species are considered to be endangered in South Africa.

Nile crocodile (*Crocodylus niloticus*)

The species has suffered a drastic decline throughout the African

continent, notably through hunting for skins, habitat destruction and persecution as a potent competitor for man's activities.

In South Africa the species has found refuge in the Kruger National Park as well as in some of the larger private game reserves in the eastern Transvaal where perennial river courses still exist.

In Zululand, the Ndumu, Hluhluwe and St Lucia Game Reserves are the only refuges for the species. The St Lucia Game Reserve used to have the largest breeding population in Zululand, but this has suffered severely during the last few years by the salination of the system and by increasing human disturbance. The population has abandoned most of its age-old breeding grounds. The Ndumu population is at present the only large population within a conservation area (Pooley 1969).

As the breeding grounds and the areas where most crocodiles are encountered are not necessarily identical, the danger for survival lies outside the conservation areas. Breeding specimens are the largest ones and are much sought after by crocodile hunters.

A provincial ordinance was recently promulgated in Natal by which the species is given full protection throughout the province. The Natal Parks Board is rearing crocodiles in captivity for redistribution in those areas where they have been destroyed. A number of important breeding grounds in northern Zululand lie outside the existing conservation areas and attempts should be made to safeguard these from destruction.

Legal protection for the species in the Transvaal would be of great importance. The export of crocodile skins should be banned for a period to allow populations to recover. Crocodile farming as a means of commercial utilization should be given serious consideration.

Status: Endangered.

Turtle species

Two marine turtle species, the loggerhead turtle (*Caretta caretta*) and the leatherback turtle (*Dermochelys coriacea*) use the beaches of northern Tongaland as breeding grounds. Hughes (1970) gives a detailed literature review of the breeding of these species. The leatherback turtle is considered to be very rare and the Tongaland beach, stretching from the Mocambique border about 50 km southward, is one of the only nine known breeding grounds in the world.

Formal protection is awarded to the species at present, but this is considered inadequate largely because of the practical difficulties of enforcement. The creation of a marine turtle sanctuary on the beaches of Tongaland is strongly recommended. It would not only provide refuge for the turtles, but would help to protect vegetation unique to South Africa.

Status: Endangered.

6.0 Rare and endangered amphibian species

All available information seems to indicate that no species is in need of urgent or more special protection than that already offered in the existing conservation areas.

7.0 *Rare and endangered fish species*

A list of rare and endangered fish and proposals for possible refuges for the species have been drawn up for Project Aqua. All of the fish listed are endemic either to South Africa or even to specific water systems. The danger to their survival originates in the introduction of exotic species like trout or in the destruction of habitat due to building of dams, channelling of rivers, and so forth.

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