The IUCN Species Survival Commission

# African Antelope Database 1998

**Compiled by Rod East and the IUCN/SSC Antelope Specialist Group**

Occasional Paper of the IUCN Species Survival Commission No.21

IUCN
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IUCN
The World Conservation Union

Species Survival Commission

Chicago Zoological Society

WWF

DETR
Environment
Transport
Regions

*Giant eland, Central Africa*

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Cover photo: Upper: (left to right): waterbuck, giant eland male, giant eland female, sable. Lower (left to right): roan, gemsbok, scimitar-horned oryx. Although shown as "mounted heads", these are all photographs of living animals taken in the wild in Central Africa (waterbuck, giant eland male, roan) and Southern Africa (sable, gemsbok) and in captivity in North America (giant eland female, scimitar-horned oryx). Heads are shown on approximately the same scale.*(photos: Rod East)*

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# Contents

# Foreword

This work is the culmination of more than 15 years of painstaking efforts by Rod East. Soon after becoming a member of the Antelope Specialist Group in 1982, he volunteered to take responsibility for the global survey of antelopes, which had been designated as the ASG's primary mission. "Specifically," he wrote *(in lit.,* 20 May 83), "I would be very happy to collate, analyse and edit antelope survey material, to write to particular individuals within the ASG and help to track down others who can provide useful information to the antelope survey."

He did all of that and more. He also drafted the country accounts, but assigned authorship or co-authorship to those who had provided most of the information, in return for assuming responsibility for the chapter's accuracy. Between 1988 and 1990, East completed the country-by-country survey of sub-Saharan Africa which IUCN published as Parts 1, 2, and 3 of *Antelopes: Global Survey and Regional Action Plans.*

Five years later Rod began producing a series of *Antelope Survey Updates.* Seven were published by IUCN between August 1995 and January, 1998. Taking a taxonomic leap, he even found the time to turn out an extra report in 1997 on the "Current Status of Burchell's Zebra" for the Equid Specialist Group.

This whole series of reports was capped by production of the *African Antelope Database 1998,* 434 pages long, bound copies of which were circulated early in 1999 before IUCN undertook to publish it. Responding to praise from Simon Stuart and Mariano Dixon at SSC HQ, Rod wrote *(in lit.,* 2 Mar 99):

"I have been stitching it together in my limited spare time over the last 12-18 months in response to many requests for species-wide information, as opposed to the country reports in the Antelope Survey Updates… My prime motivation in preparing the Antelope Updates and now the Database has been to get the information out to those interested (this type of information is obviously useless unless people have access to it) and to try and raise the profile of antelope conservation a little."

In response to my comments about the amount of work involved, Rod said it was just a matter of extracting the information he had collected and stored in his computer files. Now there's a "masterpiece of British [commonwealth] understatement!" I realized, as soon as I started reading this tome. The effort that had gone into "stitching it together" was quite astonishing. Simon Stuart got it right when he wrote (email of 1 Mar 99): "I've had a great weekend! Great, because I had the joy of thumbing through your monumental *African Antelope Database 1998.* Congratulations to you and all of the ASG! This is one of the best outputs I have ever seen from the SSC."

What makes it so great?

a) Simply putting all the latest information about sub-Saharan antelopes together in one volume is a noteworthy accomplishment. The account of each species not only includes a table giving "Estimated populations/relative abundance and population trends," but also presents an overview of its conservation status in each country where it occurs and considers its longterm survival prospects. This last prompted Simon Stuart (op. cit.) to comment, ". . .this is the first time I have seen someone do anticipated Red List categories for 2025!" In addition, a 34-page table (Appendix 4) encapsulates the available data on antelope (plus buffalo, giraffe, okapi, and chevrotain) species distribution, abundance and population trends for each range state in which the species occurs.

b) Chapter 2, "Conservation of Antelopes" considers the requirements of antelope conservation, the various factors affecting antelope populations, action plans for conservation of antelope communities, conservation of threatened antelopes, and a summary of ASG projects. Most important is the map (Fig. 2.1) showing and listing 86 "key locations for the conservation of antelope communities," and the accompanying table (2.3), which rates the current level of protection and management, the overall status of wildlife, the trends of antelope populations, and sources of external support for each location.

c) East goes on (in Appendix 1) to compare key conservation areas for antelope communities with those for other large mammals, leading to the conclusion that "the key areas for the conservation of antelope communities include a high proportion of those for other taxa of large mammals and hence a high proportion of Africa's key wildlife areas."

d) Chapter 3, "Conservation status of wildlife in sub-Saharan Africa," summarizes the present state and future prospects of wildlife conservation in each country, taking into account human population density and growth rate, the percentage of land dedicated to conservation and the degree of protection afforded.

Chapters 2 and 3 would be a valuable contribution to African wildlife conservation all by themselves. The designation of key locations for conservation of antelope communities (Fig. 2.1 and Table 2.3) is of crucial importance for two reasons:

1. Most of these locations are equally important for the conservation of other large mammals and what remains of their ecosystems.
2. They include most of the continent's gazetted protected areas, and there is little likelihood of more being created. As East points out in the Executive Summary: "Hence Africa's key wildlife areas are now generally well defined and there is little point in further debating the adequacy for larger mammals of the existing protected-area network. The key challenge facing antelope conservation in Africa is improvement of the conservation status of identified key areas and populations."

*The African Antelope Database 1998* could be used as a blueprint for African wildlife conservation in the 21st century. Assuming that human populations continue to increase, about the best that can be hoped is to slow the rate of attrition. Although most antelope species still exist in large numbers, up to three-quarters of the ±76 species are presently in decline. In East's words, "Most antelopes are subjected to increasing rates of fragmentation of their distributions and reduction or extermination of local populations. If current trends continue, Africa will lose a substantial proportion of its remaining antelope populations during the 21st century. The proportion of antelope species in sub-Saharan Africa which is threatened (or extinct) is projected to double from its present level of about one-quarter to about half by 2025."

In thinking over Rod East's contributions to the ASG, SSC, and African wildlife conservation, two thoughts keep recurring:

1. To produce all these publications in his spare time, while holding down a demanding job as Operations Manager of the New Zealand National Institute of Water and Atmospheric Research, demonstrates the truism that you go to the busiest people when you want to get a job done;
2. Rod East is a shining example of volunteerism, an inspiration to anyone who wants to serve the cause of wildlife conservation as an avocation.

*R. D. Estes, ASG Co-chair*

# Executive Summary

The purpose of this report is to provide those interested in antelope conservation with the information currently held by the IUCN/SSC Antelope Specialist Group on the conservation status of each antelope species (and selected subspecies) in sub-Saharan Africa. This species-wide view complements the country-based reports in other recent Antelope Specialist Group publications.

Threats to the survival of antelopes arise fundamentally from the rapid growth of human and livestock populations, and consequent degradation and destruction of natural habitats and excessive offtake by meat hunters. In addition, some parts of Africa are now almost completely devoid of large wild animals because of uncontrolled slaughter during recent civil wars. The wildlife of substantial areas of the sahelo-Saharan zone has been senselessly annihilated by motorised hunting parties.

Key areas have been identified for the conservation of representative antelope communities. These show a high degree of overlap with the conservation requirements of other groups of larger mammals. Most of these areas have been included by African governments in their gazetted protected-area systems, and opportunities for the establishment of major new protected areas are very limited or non-existent in many countries. Hence Africa's key wildlife areas are now generally well defined and there is little point in further debating the adequacy for larger mammals of the existing protected-area network. The key challenge facing antelope conservation in Africa is improvement of the conservation status of identified key areas and populations. At present, levels of protection and management of many of these areas are low or non-existent and their wildlife populations are depleted, in some cases severely. This reflects factors such as lack of political commitment to conservation and declining budgets of government wildlife agencies.

By far the greatest international contribution to the conservation of antelopes and other African wildlife is through external donor support to major wildlife areas, including development of the capacity of the wildlife agencies responsible for these areas and community-based conservation projects. This support is at an historically high level, but the long-term success of wildlife conservation will also depend on greater political commitment to conservation at the national and local level in many African countries. Greater recognition of wildlife conservation in national and regional development plans is often a critically important requirement.

Most antelope species still exist in large numbers in sub-Saharan Africa. Half of the species considered in this report are estimated to number at least in the hundreds of thousands and 85% in the tens of thousands or more. Despite this superficially favourable situation, up to three-quarters of the species are in decline. Most antelopes are subjected to increasing rates of fragmentation of their distributions and reduction or extermination of local populations. If current trends continue, Africa will lose a substantial proportion of its remaining antelope populations during the 21st century. The proportion of antelope species in sub-Saharan Africa which is threatened (or extinct) is projected to double from its present level of about one-quarter to about half by 2025. Reversal of this trend will depend on greater realisation of the economic potential of wildlife, e.g., through game-viewing tourism and international trophy hunting. The private sector may play an increasingly important role in the successful conservation of many antelope species, as in Southern Africa at present.

## Notes added in proof:

Bangassou Forest/Chinko River Basin. Central African Republic (see p. 38): In 1999, the Canadian non-governmental organisation CECI commenced plans to implement a GEF-funded project on the sustainable utilisation of biodiversity in the Bangassou Forest. This project has been designed with a community-based approach to conservation. "The main objective is to establish a natural resources management plan in order to set up a sustainable NR use area with particular concerns for endangered species and habitats. The project will not set up direct anti-poaching activities but those concerns will necessarily be taken into account" (Louis Fournier, *in lit.,* April 1999). The project area does not include the Chinko Basin but is restricted to Bangassou Forest.

Sitatunga/Ghana (see p. 124): The continued presence of the sitatunga in the Avu Lagoon of southern Volta region in southeastern Ghana was confirmed by field observations in August 1998 (J. J. Mason, *in lit.,* March 1999). A report to the ASG by Patrick Adjewodah and Godwin Yerenkyi of the Nature Conservation Research Centre in Accra in April 1999 indicates that the sitatunga still occurs in reasonable numbers in this area.

Giant Eland/Chad (see p. 145): Recent observations from Chad indicate that, in addition to increasing incursions of this species in Bahr Aouk region near the CAR border, it also occurs in unknown but small numbers in the Beinamar region near the Cameroon border (population shared with the Bouba Ndjida National Park area of Cameroon) and in Goundi region to the west of Manda National Park, near the town of Sahr, where a large herd of perhaps 50 individuals was observed during the 1998/99 dry season (P. Chardonnet, *in lit.,* March 1999). The Goundi population, which is resident within Chad, is apparently isolated from other giant eland populations and is a remnant of the herds for which Manda National Park was originally established.

Korriqum/Ghana (see p. 201): In February 1999, a surviving population of the korrigum was reported by local hunters in the Gambaga Escarpment area of northeastern Ghana near the confluence of the Red and White Volta Rivers (J. J. Mason, *in lit.,* March 1999). A field assistant of the Accra-based National Conservation Research Centre subsequently photographed a live specimen which had been caught in a snare, and horn, skin and skull samples were observed and photographed in hunters' shrines in this area (report to ASG by Patrick Adjewodah and Godwin Yerenkyi, April 1999).

# 1. Introduction

Africa's tropical savannas support the world's most spectacular mammalian fauna. The magnificent spectacles provided by large herds of antelopes and other game with their attendant predators form a vital part of the continent's unique wildlife. Africa's forest ecosystems also support diverse antelope communities. In total, sub-Saharan Africa supports more than 70 antelope species (the precise number depending on taxonomic treatment), which is a much greater diversity than achieved by any other group of medium to large-sized mammals. As well as comprising a major component of the continent's biodiversity, Africa's antelopes and other wildlife are a priceless global heritage which is deeply instilled in human culture. This reflects the pivotal role of the African plains as a cradle of human evolution.

Many antelope species have high aesthetic appeal. Most people who have spent time in Africa's remaining wilderness areas have special memories of wildlife. As well as species such as elephant, rhinos and large carnivores, these memories often include antelopes, as illustrated by the following description of the giant or Lord Derby's eland (*Tragelaphus derbianus*)*:*

> 'The noted naturalist and author, Leslie Brown, had summed it up very nicely when he wrote, "It is generally agreed that the most impressive of all antelopes is either the greater kudu or the sable. Only these two ideally combine stature and beauty. The Derby eland might be a contender, but the roan, large and handsome enough, is coarse and colourless beside the sable. And the beautiful lesser kudu, or the bigger gazelles, lack the greater kudu's magnificent sweep of spiral horns. To me, each has at some special moment seemed to be the most glorious beast that ever stepped. But on the whole I choose the sable, less retiring, easier to see, and more erect of bearing than the slender kudu. The utter blackness of a sable bull, the splendid curve of his horns, and the sharp white marking on face and belly set him apart." (Brown 1965).
>
> Having seen the giant eland in its natural habitat, I can go further than Brown's suggestion that it might be a contender. It is definitely a contender and is arguably even more impressive than the sable or greater kudu. I cannot better the description by Colonel T.R.H. Owen, who spent 27 years in the southern Sudan as a District Commissioner and Provincial Governor with the British Colonial Service during the 1930s, 40s and 50s. Owen was a keen naturalist and sportsman and took the first known photo of the giant eland in the wild. He had no doubt that it is the finest species among all the antelope, and made the following comparison with the common eland: "Whether the giant eland is really appreciably bigger than the ordinary eland I am not sure. A full-grown bull can certainly stand nearly if not

> quite six feet at the withers and is an enormous animal, and the cow only a trifle lighter and smaller. Yet it is as different a beast from the common eland as can well be imagined ... the real physical differences in appearance lie in the head and in the carriage. A head of the common eland is seldom impressive, and the horns do not often branch widely and seem rather insignificant for so bulky a creature. The horns of *derbianus* are magnificent. An average bull will have horns of 38 to 39 inches; heads of over 40 inches are not rare, and the record is over 44 inches. They have a wide spread and noble symmetry. Those of the cow are also fine, being thinner but often just as long and symmetrical. Equally marked is the difference in carriage. The common eland, though impressive by its very size, is rather a bovine creature, giving a heavy and plebeian impression. *Derbianus* carries himself like a king. The head is held higher, the movements are more alert and the whole impression regal and delighting to the eye." (Owen 1960).
>
> It is the huge size, regal bearing and magnificent horns which remain as permanent memories of my first sighting of giant eland: two enormous bulls striding through the woodlands of Cameroon's Bouba Ndjida National Park. Subsequent sightings confirmed my view that the giant eland is just as impressive as the many superb sable and greater kudu I have seen elsewhere in Africa.' (East 1996a).

While many people who visit the continent are very enthusiastic about and committed to the conservation of African wildlife, the future of antelopes and other large mammals will be decided by Africa's permanent residents. Antelopes are a valuable natural resource. They provide an important source of protein for human consumption and other valuable products such as skins and trophies in many African countries. The diversity of antelopes may include species with major potential as domesticated livestock. Antelopes are also a significant component of the fauna which attracts game-viewing tourists to Africa's better-known national parks and reserves. Some antelopes, e.g., giant eland, giant sable, gemsbok, scimitar-horned oryx and addax are flagship species for the conservation of important wildlife areas in Africa, a role which is assumed more generally by highly charismatic species such as the elephant and lion.

Despite their economic value, most antelope species are declining in distribution and numbers as human populations continue their rapid growth and expansion. This decline is caused by destruction of natural habitats, competition with livestock and excessive offtake by meat hunters, in many cases through the actions of poor rural communities who lack alternative development options. Africa's antelopes and other wildlife will not survive in the long term unless adequate areas of natural habitat are protected; forms of land use are developed and implemented which enable wildlife and people to co-exist to the highest degree possible outside protected areas; there is greater public awareness of the value of wildlife conservation, including establishment at the local level of wildlife utilisation schemes which allow rural populations to benefit materially from the presence of wildlife on their land; and illegal offtake is restricted to levels which do not threaten the viability of wildlife populations.

## INFORMATION ON ANTELOPE POPULATIONS AND CONSERVATION STATUS

One of the key objectives of the IUCN/SSC Antelope Specialist Group (ASG) is to monitor the conservation status of antelope species and the success of attempts to conserve and sustainably utilise antelopes. The group conducted an extensive survey of the distribution, abundance and conservation status of antelopes in all countries of sub-Saharan Africa during the mid to late 1980s. The results were published in three parts (East 1988, 1989, 1990), according to the regions shown in Fig. 1-1. These publications provided a baseline for future comparisons, and identified priorities for international conservation action in the Regional Action Plans for antelope conservation. More recent information regularly becomes available through the network of ASG members and contacts and is published in the group's *Gnusletter* and the *Antelope Survey Update* series (see p. 400). Antelope status is usually considered on a country by country basis in these

publications, since countries are the political units through which conservation actions are taken. In addition to antelopes, the ASG has responsibility within IUCN/SSC for giraffe, okapi, water chevrotain and African buffalo.

This report has been produced in response to numerous requests for species-wide information on the status of antelopes, i.e., information on the overall status of each antelope species rather than for individual countries. It essentially provides a "snapshot" of the information currently held by the ASG on the status of each species within all of its range states in sub-Saharan Africa. This includes countries which have recently been reviewed in the *Antelope Survey Update* series and those which have not. For a few countries, little or no new information is available to the ASG since the publication of the Antelope Survey and Regional Action Plans for sub-Saharan Africa (East 1988, 1989, 1990), viz., Burundi, Gambia, Guinea, Lesotho and Sierra Leone. The ASG relies entirely on the voluntary inputs of its Co-Chair, members and contacts in gathering and producing this information. While the accuracy of all data included is carefully checked, there are many parts of Africa for which recent information on the status of antelopes is difficult to obtain. This database therefore has many gaps and we lack adequate data for substantial parts of the distributions of some species.

Since information is only useful if it is made widely available, the purpose of this report is to provide the available information to those interested in antelope conservation. It has been produced in hard copy rather than electronic format, since many of the recipients of this report in Africa do not yet have reliable access to the internet and world-wide web. The report is not written as a stand-alone document and should be read in conjunction with the original Antelope Survey publications (East 1988, 1989, 1990) and the *Antelope Survey Updates.* For recent, broader accounts of antelopes and their conservation see Estes (1991), P. Chardonnet (1995) and Kingdon (1997).

As background to the species accounts in section 4, the conservation of antelope communities and threatened species and subspecies is reviewed briefly in section 2 and the status of wildlife conservation in each country of sub-Saharan Africa in section 3. The findings are summarised in section 5. The appendices include a comparison of the conservation requirements of antelope communities with those for other large mammals (Appendix 1), the data on antelope species (Appendix 4) and the sources of this information (Appendix 3). Detailed locality maps are not included in this report (see, for example, East 1988, 1989, 1990; the *Antelope Survey Updates* and IUCN 1998).

## TAXONOMIC TREATMENT

Taxonomic treatment follows that used in East (1988, 1989, 1990), with two exceptions. The beisa/fringe-eared oryx (*Oryx beisa*) is treated as a separate species rather than a subspecies of the gemsbok (*O. gazella),* and Weyns' duiker is treated as a subspecies of Peters' duiker (*Cephalophus callipygus weynsi*) rather than as a separate species. These changes are arbitrary but reflect current practice (e.g., Kingdon 1997).

## ACKNOWLEDGEMENTS

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## REQUEST FOR FURTHER INFORMATION

If anyone reading this report has significant new information on any of the antelope species of sub-Saharan Africa, please send it to Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

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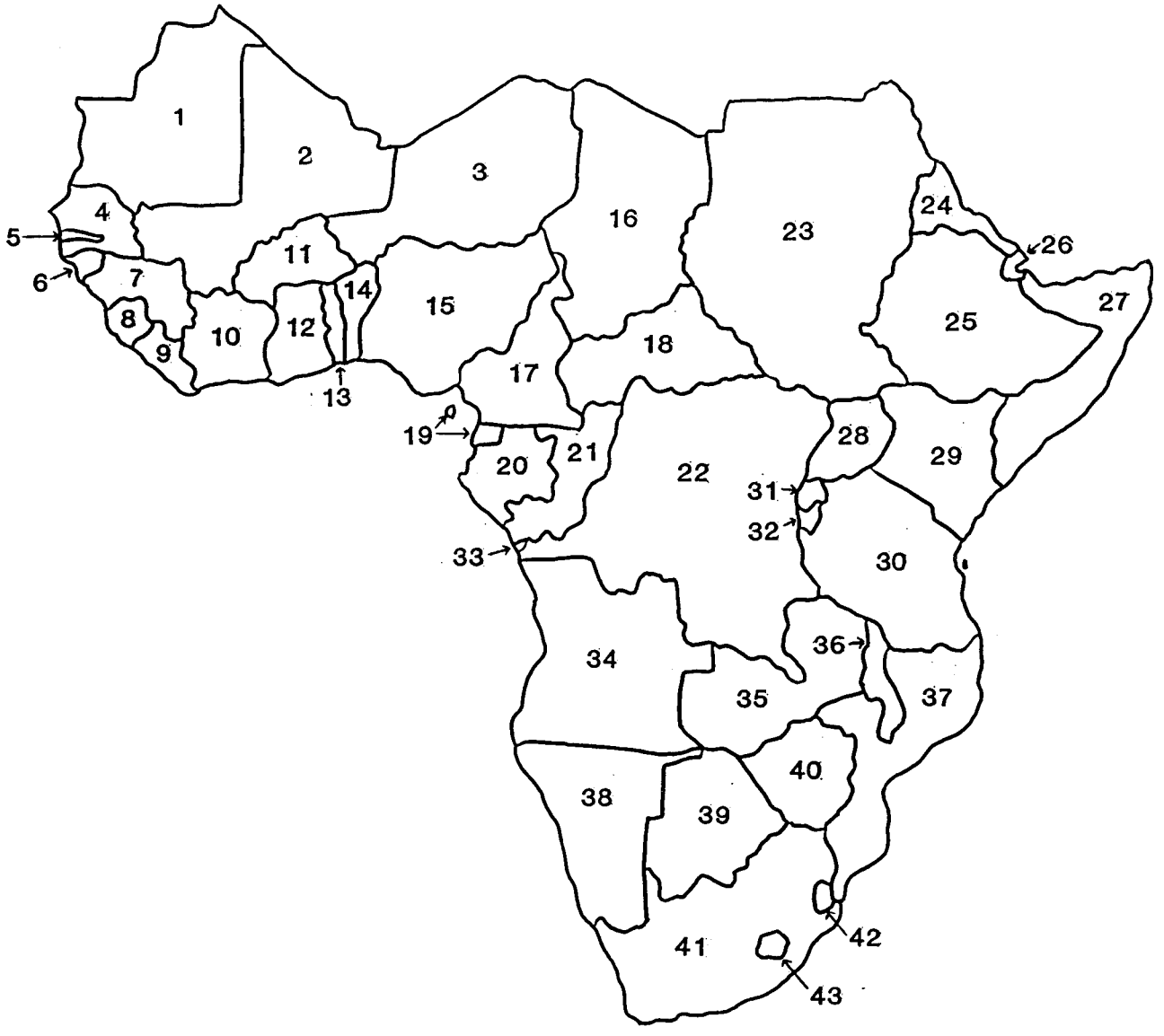
Fig. 1-1 (opposite). Countries of sub-Saharan Africa.

West Africa
1: Mauritania. 2: Mali. 3: Niger. 4: Senegal. 5: Gambia. 6: Guinea-Bissau. 7: Guinea. 8: Sierra Leone. 9: Liberia. 10: Ivory Coast. 11: Burkina Faso. 12: Ghana. 13: Togo. 14: Benin. 15: Nigeria.

Central Africa
16: Chad. 17: Cameroon. 18: Central African Republic. 19: Equatorial Guinea. 20: Gabon. 21: Congo-Brazzaville. 22: Congo-Kinshasa.

East & Northeast Africa
23: Sudan. 24: Eritrea. 25: Ethiopia. 26: Djibouti. 27: Somalia. 28: Uganda. 29: Kenya. 30: Tanzania. 31: Rwanda. 32: Burundi.

Southern & South-central Africa
33: Cabinda (Angola). 34: Angola. 35: Zambia. 36: Malawi. 37: Mozambique. 38: Namibia. 39: Botswana. 40: Zimbabwe. 41: South Africa. 42: Swaziland. 43: Lesotho.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# 2. Conservation of Antelopes

## REQUIREMENTS OF ANTELOPE CONSERVATION

Africa's wildlife faces an uncertain future. Rapid growth of human populations and expansion of human activities is accelerating the destruction of wildlife populations and their habitats. In this situation, the goal for international antelope conservation policy is to ensure the long-term survival of all antelope species by maintaining as many viable populations as possible of each species in as wide a range of its habitats as are practical. Key words in this goal are "possible" and "practical". To succeed, antelope conservation must not be an end in itself, but part of an overall environmental and biodiversity conservation strategy which takes full account of, and is integrated with, human development needs (East 1988, 1989, 1990).

Conservation of antelopes therefore requires preservation of as many areas as possible of suitable habitat sufficiently large to support healthy populations, and restriction of offtake levels as necessary within these areas to enable viable populations to persist. This can include a range of land-use options, from strictly protected national parks and reserves where consumptive use of wildlife is not permitted, to areas of natural habitat which are managed for sustainable utilisation, e.g., through trophy and/or meat hunting, as part of multiple resource use systems.

## FACTORS AFFECTING ANTELOPE POPULATIONS

Some of the major factors which currently affect antelope populations positively and/or negatively include:

*Human Population Growth*

Human population growth is the fundamental cause of the current and potential loss of most of the earth's biodiversity. Current growth rates of human populations in most countries in sub-Saharan Africa are between 2.5% and 3.5% per annum (population doubling times of 20-40 years) and are projected to remain at high levels in future (Stuart et al. 1990; World Resources Institute 1994). As a result, Africa will change dramatically in the next 100 years with major, negative consequences for most antelope species (East 1995a). These consequences will arise mainly through degradation and destruction of natural habitats and excessive offtake by meat hunters. Livestock diseases introduced and spread by human agencies also affect antelope populations.

Habitat Degradation and Destruction: The expansion of agricultural settlement, timber extraction

and livestock populations over large regions of Africa is resulting in increased degradation and destruction of natural habitats and increased competition with wildlife for water, grazing and other natural resources. Natural habitats are relatively intact in regions where settlement is sparse, e.g., extensive areas of the equatorial forests of Central Africa, but this will change during the next 20-50 years. The Central African forests, for example, are now a settlement frontier, despite a limited capacity to support human population growth (Barnes & Lahm 1997). Forest destruction is likely to increase markedly during the next few decades. The populations of forest-dependent wildlife species which are currently widespread in Central Africa may crash until they occur only in those fragments of forest which survive as protected areas within a human-dominated landscape (Barnes 1990; Oates 1996a; Fay 1998).

Meat Hunting: Antelopes are a major component of bushmeat and hence a major source of protein for human populations in many parts of Africa. Some antelope species, such as duikers, show considerable resilience to hunting pressure (e.g., Anstey 1991a, 1991b). Subsistence hunting in areas with very low human densities generally has little or no impact on antelope populations, but this can change rapidly as human populations increase (e.g., Wilkie et al. 1998). Commercial hunting to provide meat to urban centres can rapidly deplete wildlife populations even in areas where settlement is sparse. As human populations grow, hunting for bushmeat is escalating out of control over large regions of Africa. New logging roads in Central Africa, for example, are opening up thousands of square kilometres of previously inaccessible forest to hunters (e.g., Juste et al. 1995; Rose 1996; Usongo & Curran 1996). Antelopes in many protected areas are being affected adversely by illegal hunting for meat, including such world-famous parks as Serengeti (Sinclair & Arcese 1995), but most bushmeat hunting occurs in areas outside parks and reserves where wildlife is unprotected. Hence most of the meat hunting which is currently conducted by rural people throughout Africa is essentially uncontrolled. Attempts to regulate meat hunting, e.g., in buffer zones around national parks, are unlikely to succeed in the long term, since the demands of increasing human populations for meat will eventually outstrip the capacity of the wildlife resource to provide it on a sustainable basis. Development programmes which reduce the demand for bushmeat by providing alternative sources of protein for rural populations may therefore be vital for successful long-term conservation, e.g., in areas such as the Ituri Forest (Wilkie et al. 1998) and the Serengeti/Mara (Sinclair & Arcese 1995; Campbell & Borner 1995; Norton-Griffiths 1995).

Diseases: Until 100-150 years ago, the large herbivore biomass of Africa's savannas was dominated by antelopes and other wildlife species (especially elephant) and domestic livestock formed only a relatively small component. This situation has now been reversed. Most remaining concentrations of savanna wildlife are surrounded by or share their ranges with large populations of livestock. The expansion of human and livestock populations has been accompanied by the spread of livestock diseases, many of which affect wild herbivores. One of the most significant examples is rinderpest. The rinderpest virus was introduced into sub-Saharan Africa in the late 19th century, probably through infected cattle brought into Ethiopia. It swept rapidly through the continent and caused catastrophic mortality of cattle and the most susceptible wildlife species, e.g., buffalo. Outbreaks have occurred sporadically in various parts of Africa since the 1890s, e.g., in Central Africa during the early to mid-1980s and in eastern Kenya in the mid-1990s. The rinderpest virus is now endemic in cattle in some regions of Africa, e.g., eastern Kenya/Somalia (Kock 1997). Vaccination of cattle can successfully eradicate the disease, e.g., eradication of rinderpest from cattle populations around Serengeti National Park in Tanzania was one of the factors responsible for the five-fold increase in this area's wildebeest population between 1961 and 1977 (see Rodgers & Swai 1988), but regular vaccination of cattle herds is necessary to prevent the recurrence of the disease. This is often not possible where extensive illegal movements of cattle occur or in areas affected by civil war and insecurity, e.g., the virus is currently active in Sudan (Kock 1997). Various other diseases have become important factors in wildlife management in Africa. Buffalo in South Africa's Kruger National Park, for example, have been affected recently by an outbreak of bovine tuberculosis. This has spread into other species, including greater kudu and the park's lion population, which has decreased by up to 75% in the

southern part of the park (J.L Anderson, in litt. September 1998). It is possible that tuberculosis has been present at low levels in Kruger's buffalo since the 1960s, when there was an outbreak in cattle on a farm at the park's southern boundary.

*Political Support for Conservation at the National and Local Level*

While the conservation of Africa's spectacular large mammal fauna is of great global importance to conservationists, the specific actions required to minimise or negate the impacts of human population growth on wildlife are taken at the national or local level, not at the international level. Countries and their administrative subdivisions (provinces, districts etc.) are the political units through which conservation actions are implemented. Saving Africa's (or the world's) wildlife does not require a global solution or international legislation (a notable exception is control of international trade in threatened wildlife; this is not a significant issue for African antelopes, unlike the Tibetan antelope and saiga; Mallon & Kingswood, in preparation).

Africans will decide the future of their wildlife. The decision on whether or not to destroy a forest and its wildlife, for example, and whether or not to enforce that decision will be taken locally or nationally. If a country does not wish to safeguard its wildlife heritage, international conventions are unlikely to change its mind. Hence political commitment to conservation at the national and local level will be a vital factor in the future of Africa's wildlife. At present, this commitment varies widely between countries. Strengthening political and popular support for wildlife conservation at the national and local level is therefore one of the highest priorities for securing the future of Africa's flora and fauna, and one in which international organisations have a valid role to play. Christoffersen (1995) pointed out that, despite budget crises, structural adjustments and declining export incomes in many African countries, there is ample room for government core funding of biodiversity protection programmes in all countries, e.g., by re-allocation of relatively small amounts of funding from military expenditure.

*Protected Areas*

Establishment of national parks, game reserves and other protected areas of natural habitat has been a major component of wildlife conservation in both colonial and post-independence Africa. A network of protected areas now extends across the continent (IUCN 1998). While opportunities for further, major expansion of this network are now very limited in most regions because of the growth of human populations, new protected areas are still being gazetted each year somewhere in Africa. However, it is of major concern that in many countries the level of protection and management of legally gazetted protected areas is minimal or non-existent. In reality, only a small proportion of these areas is effectively protected, although some others retain largely unexploited plant and animal populations because they are situated in very remote regions with few inhabitants.

Throughout most of Africa, government wildlife agencies' operating budgets for law enforcement have decreased in real terms (inflation-adjusted) to levels well below those required to guarantee the integrity of protected areas (e.g., Dublin et al. 1994). This reflects factors such as lack of political commitment to conservation and the impact of economic restructuring programmes on protected area staffing levels and operating budgets. As a result, wildlife populations in these areas are often in long-term decline because of poaching and the encroachment of settlement and livestock. Graham et al. (1997) could have been describing the situation in protected areas in any one of a large number of African countries when they wrote:

> "The remarkable thing is that most large animals have not declined beyond the point of recovery....This is in no way attributable to good management....Any concept of regular, comprehensive surveillance had already been abandoned by the early-1970s. The resources allocated by the management authority to the wardens are the bare minimum required for the mere survival of the staff in their headquarters....There is therefore no management of the parks - simply a tenuous presence. The reasons why substantial populations of large animals persist...are the well-known, universal ecological factors of low rainfall, tsetse fly and a preoccupation among the people with keeping their traditional enemies at bay. This

> seems to have created a spurious perception on the part of the management authority that all is well. But in the end sheer numbers of people overwhelm such barriers and are set to do so...in the next few decades. The management authority is simply staging a cut-price wildlife show whose principal actors are about to take their final curtain calls before the theatre itself is closed down for lack of interest."

Key steps which need to be taken urgently by African countries and the international conservation community to address this situation include integration of protected areas with multi-sectoral planning, strengthening political and popular support for protected areas, reinforcing the human and financial capacity for protected area management, and expansion of international support for African protected areas (WCPA 1994). There is also a need to assist governments to reduce corruption in wildlife departments in some countries (Cumming et al. 1990), although corruption also extends to much higher levels of government in some cases.

These problems are not confined to protected areas in Africa. The IUCN Programme on Protected Areas reported in 1998 on progress in implementing the Action Plan developed at the IV World Parks Congress held in 1992 at Caracas, Venezuela (Anon. 1998a). This report noted several achievements, including increased recognition for protected areas in national strategies for biodiversity, better involvement of local people in the establishment and management of protected areas and increased funding for protected areas. The report also issued a "health warning", noting that in many protected areas in developing countries environmental conditions continue to deteriorate, biodiversity is in retreat, local communities feel alienated from protected area objectives and managers are poorly resourced.

In several African countries, former government wildlife agencies have been given parastatal status to provide them with more autonomy and the ability to generate and retain revenue from wildlife on conservation land, in order to improve the resources available for protected area management. Generation of revenue from wildlife will play a key role in the success of these parastatals in achieving their conservation objectives. While most national parks in Africa have in theory been established to preserve the country's natural heritage, in practice the better protected parks are usually those which generate significant revenue from tourism. Wildlife-viewing tourism is a major earner of foreign exchange for some countries in eastern and southern Africa, but it is unlikely to be economically viable in more than a small fraction of Africa's remaining wildlife areas because of factors such as lack of infrastructure for tourism, unfavourable climate, low wildlife densities and lack of spectacular scenery.

*Conservation with the Participation of Local People*

Effective control of poaching and prevention of encroachment by settlement and livestock is a universal feature of successful protected areas in Africa, as typified by parks and reserves such as North and South Luangwa National Parks (Zambia) (Jeffery et al. 1996; Jachman & Billiouw 1997), Selous Game Reserve (Tanzania) (TWCM et al. 1997), and Hluhluwe-Umfolozi Park and Kruger National Park (South Africa) (Anderson et al. 1996). Ideally, there should be a minimum set of properly managed and strictly protected national parks of international significance in sub-Saharan Africa, which would provide the foundation for a network of diverse types of protected areas at the national level to further the maintenance of life support systems and sustainable development (Cumming 1984). In practice, the traditional approach of strict protection of national parks and equivalent reserves has failed in many parts of Africa, because of factors such as lack of political commitment to conservation, limited potential for tourism and conflict with local rural people. While it is important to appreciate that wildlife cannot be conserved without some people being denied access to this resource (just as land is alienated for mines, dams, airports etc.), in many parts of Africa it is not politically or logistically feasible at present to establish and maintain large, strictly protected parks and reserves. In these circumstances, there is now widespread interest among aid agencies and African governments in the development of integrated conservation and development (ICDP) and community-based conservation projects. These community-based approaches include management of protected areas with the cooperation and support of local people,

and usually include social and economic development projects to provide alternatives to the exploitation of natural resources.

These approaches are based on the premise that nature conservation will fail without the support and active participation of local rural people, but to date it has proved difficult to make conservation compatible with development. ICDPs and similar approaches are most likely to succeed where local circumstances are favourable, e.g., the local community is small and stable and has land and resource tenure and there is effective control of immigration by people attracted by the development components of the project, in order to prevent increased pressure on natural resources (see reviews by Kiss 1990, Wells et al. 1992 and Noss 1997). Without genuine community involvement and leadership in managing the resource, community-based approaches may have little impact on illegal hunting by local people (e.g., Lewis & Phiri 1998). Despite these difficulties, protected area and natural resource management with the participation and support of local communities may be the only viable long-term option under today's conditions in many parts of Africa (McNeely 1995). Determining the most practical approaches to providing tangible benefits from wildlife to local people will therefore be crucial to the future of parks and wildlife in Africa (Christoffersen 1995). Wildlife conservation is unlikely to succeed on more than a very limited scale unless the economic value of biodiversity is recognised, the value of wildlife utilisation exceeds that of alternative land-use options, and conservation contributes directly to sustainable economic development (McNeely 1993; Lane et al. 1994; Adams & Thomas 1996).

*Trophy Hunting*

Over large regions of Africa where it is neither feasible nor appropriate to establish strictly protected national parks and equivalent reserves, sport hunting for trophies is often the only option for realising the potentially high economic value of wildlife. As well as being one of the most profitable ways of utilising antelopes and other wildlife, trophy hunting probably has the least environmental impact. Trophy hunters prefer a truly natural landscape, generally require less infrastructure and cause less habitat modification than non-hunting tourists, are content with much lower wildlife population densities and kill only a very small proportion of wildlife populations (Kiss 1990). Hence trophy hunting can operate successfully in many parts of Africa where mass tourism based on game-viewing is not feasible. There is a large and growing market of international sport hunters, particularly in North America and Europe, and trophy hunting generates substantial revenue and benefits for rural communities (Jackson 1996) in many African countries.

By providing strong economic reasons for the conservation of wildlife species and natural habitats, trophy hunting is the primary justification for setting aside over half of the land which is currently used for wildlife conservation and utilisation in Africa, e.g., in countries such as Zimbabwe. Trophy hunting is by far the most important source of revenue in community-based conservation programmes such as CAMPFIRE (Anderson & Wilson 1998). It will continue to provide the major economic value of wildlife over large regions of Africa. Hence agitation against sustainable trophy hunting by animal rights groups in western countries is potentially a major threat to the future of Africa's wildlife. If rich and well-fed westerners destroy the value of wildlife for poor rural people in Africa, it would not only be a new form of neo-colonialism, but would also result in the rapid destruction of much of Africa's remaining wildlife resources by removing the economic justification for their conservation. As Georgiadis & Heath (1998) pointed out, it is irresponsible to oppose hunting without suggesting alternative mechanisms that are at least as effective in increasing the economic value of wildlife.

[Author's Note: Like many other people who take a pragmatic approach to wildlife conservation, I occasionally receive "hate mail" from avid animal rights activists for daring to mention trophy hunting as a valid and important conservation option in my writings on antelopes. As I point out to these people, they should visit a bushmeat market in any African city for a few hours to see how out of touch their views are with the reality of Africa. Personally, I don't hunt. I prefer photography (the front cover of this report shows some of my modest "trophy room"), but many of my friends and colleagues are hunters. I have the highest admiration for trophy hunters and

professional hunting guides who follow legal and ethical hunting practices. Trophy hunting operators and safari hunting organisations collectively make an enormous contribution to wildlife conservation in many parts of Africa, e.g., they are in the front line of the war against poachers throughout much of Central Africa. Without the efforts of these people and organisations, wildlife populations would be in a much worse state than they are. There is no doubt in my mind that sustainable trophy hunting, monitored and controlled by well thought-out, comprehensive and effectively implemented regulations, will be a prime justification of and vital element in successful long-term conservation of antelope populations in Africa.]

*External Donor Support*

Assistance from external donors has a major role to play in the development of wildlife protection capacity in Africa, especially in those countries with strong political support for conservation. External donor support to protected area and biodiversity conservation is now extensive, particularly through bilateral development assistance from individual western countries and the European Union and through the Global Environment Facility (GEF). The magnitude of this support and its steady increase during the 1990s is indicated in the report by Lapuyade (1996) (Table 2-1). In addition, high levels of support have been provided to wildlife projects in some countries not included in Lapuyade's study. The second phase of the EU-funded "Programme de Developpement de la Region Nord" in the northern protected areas of the Central African Republic, for example, involved support of US$18 million over the period 1994-98, to give but one example. Many of the projects funded by external donors include assisting development of the capacity to protect and manage wildlife resources. In many countries of sub-Saharan Africa, protected areas with moderate to high levels of protection and management are now usually reliant on support from external donors. This reliance may persist for the foreseeable future in many African countries (Edroma 1994).

The support to protected areas in Africa provided by the international donor community includes support for most of the priorities identified in the Regional Action Plans for Antelope Conservation (East 1988, 1989, 1990). These priority areas for antelope conservation include many of the key wildlife areas in sub-Saharan Africa, which are also high priorities for the conservation of elephants, rhinos, carnivores and other large mammals (see Fig. 2-1, Table 2-3 and Appendix 1). While external donor support for these areas has not usually been directed specifically at antelopes, it is by far the major international contribution to improving the protection and management of antelope communities and addresses many of the key priorities in antelope conservation.

TABLE 2-1. Annual Allocations of External Donor Funding to Wildlife and Protected Area Conservation Projects in 14 African Countries (US$) (Source: Lapuyade 1996).

| Region | 1992 | 1993 | 1994 | 1995 | 1996 |
|---|---|---|---|---|---|
| West Africa (Ivory Coast, Burkina Faso, Ghana) | 3,733,820 | 3,464,050 | 5,501,687 | 5,811,905 | 8,175,192 |
| Central Africa (Cameroon, Gabon, Congo-Brazzaville) | 7,054,278 | 10,175,556 | 14,635,347 | 17,146,413 | 21,376,259 |
| East Africa (Ethiopia, Uganda, Kenya, Tanzania) | 12,276,457 | 37,171,225 | 33,452,495 | 36,453,543 | 49,698,909 |
| Southern Africa (Zambia, Namibia, Botswana, Zimbabwe) | 12,993,176 | 15,967,419 | 16,888,236 | 18,056,827 | 19,606,841 |
| Total | 36,057,731 | 66,778,250 | 70,477,765 | 77,468,688 | 98,857,201 |

*Private Sector*

The private sector now plays a major role in the protection and management of antelopes in some African countries, most notably Namibia, Zimbabwe and South Africa. In these three countries, many antelope species are now more numerous on private farms than on state conservation land. Commercially successful private-sector wildlife industries have been established on the basis of wildlife being treated legally as the property of landowners. The economic returns achieved from various combinations of trophy hunting, photographic tourism, meat production and live capture of game for sale have made investment in wildlife very worthwhile. As a result game farming has expanded rapidly. In some cases, amalgamation of former cattle ranches has created privately owned conservancies of up to several thousand square kilometres which now rival some of these countries' most famous national parks as tourist destinations. The private wildlife sector is also developing in several other African countries, such as Botswana, Zambia and Kenya.

In view of the problems faced by many government wildlife departments in Africa, such as inadequate funding, staff and resources to protect and manage the parks and reserves for which they are responsible, the private sector is likely to play an increasingly important role in wildlife conservation. This will be constrained in some countries, however, by the very limited amount of land which is under freehold title and by legal constraints on the use of wildlife by private individuals and local communities.

As well as bringing overall benefits to antelope conservation, the increasing involvement of the private sector will create problems. Examples include the introduction of species and subspecies to areas well outside their historical ranges, with attendant veterinary problems and interbreeding of taxa which would not be possible in nature. Some antelopes have already been introduced widely outside their natural ranges in southern Africa, and the introduction of roan antelope from Benin to private farms in South Africa in 1995 was probably the precursor of many such wide-scale translocations in future. Management of generally small populations of wild ungulate species in private farms and reserves may also result in reduced genetic diversity due to restricted numbers of founders and consequent inbreeding. Unnatural age and sex structures of populations may have unknown consequences for population viability and productivity (Hack et al. 1998).

*Political and Civil Instability*

Political instability, civil disturbance, armed insurrection and civil war are growing impediments to conservation action in many parts of Africa. Within the four regions of Africa (see Fig. 1-1), significant armed conflicts and associated political upheavals have occurred during the 1990s in seven (47%) of the 15 countries in West Africa, four (57%) of the seven countries in Central Africa, seven (70%) of the ten countries in East and Northeast Africa, two (20%) of the ten countries in Southern and South-central Africa, and 20 (48%) of the total of 42 countries in sub-Saharan Africa. The effects of civil war on wildlife are not always detrimental, e.g., in remote areas with very low densities of people wildlife may survive wars in large numbers, as occurred in southern Sudan during the 1957-72 civil war (Winter 1997a). This can arise from factors such as rural depopulation through emigration and removal of arms from civilians. More typically, civil wars result in marked destruction of wildlife, particularly when they are fought with modern weapons by armies who live off the land, as in southern Sudan at present (Winter 1997a). There are extensive areas of Africa which are now almost completely devoid of large wild animals because of uncontrolled slaughter during civil wars and their aftermath, e.g., the Karamoja area in Uganda and much of Angola and Mozambique. As Oates (1996a) pointed out, the prospects of long-term success for many conservation projects in Africa are poor unless better government and stronger indigenous institutions take hold in more countries, civil wars subside, and economic circumstances and educational opportunities improve.

Pessimistic views about the future of Africa are widespread. Schwartz & Leyden (1997), for example, projected the next 25 years as a period of unprecedented economic growth and prosperity for most of the world (including Southern Africa), fuelled by fundamental technological change and the globalisation of national economies, but predicted that Central Africa will descend into "a swirl

of brutal ethnic conflict, desperate poverty, widespread famine and disease". Such views could prove to be unduly negative, but conservation projects in Africa must clearly take into account political and economic conditions. It should also be noted that the remarkable resilience of African wildlife often enables it to survive tribulations such as armed occupation of protected areas by warring factions. The wildlife of Uganda's Queen Elizabeth and Murchison Falls National Parks, for example, suffered severely during the civil strife and breakdown in law and order which occurred during the 1970s and early 1980s, but these parks are now substantially rehabilitated with no loss of antelope species (von Richter et al. 1997). As recent experiences in countries such as Congo-Kinshasa have demonstrated, the best preparation for conservation in the face of political instability is the professional development of national staff, strong site-based conservation programmes and the support of local communities for protected areas (Hart & Hart 1997).

## CONSERVATION OF ANTELOPE COMMUNITIES

The Regional Action Plans for Antelope Conservation adopted a systematic approach to the conservation of antelope biodiversity by using a quantitative method to identify key areas for the conservation of antelope communities in the major biogeographic divisions of sub-Saharan Africa (East 1988, 1989, 1990). This systematic approach is essential to ensure representation of the antelope communities characteristic of different biomes. A simplistic "hot spot" approach to identifying the areas of greatest species diversity would fail to achieve this, e.g., in effect only two of the 15 biomes (phytochoria) recognised by White (1983) in sub-Saharan Africa are represented among the 14 protected areas with the largest numbers of antelope species (Table 2-2) (Kidepo Game Reserve is included in the Sudanian Regional Centre of Endemism, but is in the transition zone with the Somalia-Masai Regional Centre of Endemism and its antelope fauna has a strong Somalia-Masai component).

Fig. 2-1 shows the areas which are the highest international priorities for the conservation of antelope communities as identified in the Regional Action Plans (East 1988, 1989, 1990), with a few subsequent additions based on new information (e.g., see the *Antelope Survey Update* series) and through the inclusion of giraffe, okapi, water chevrotain and buffalo. Table 2-3 summarises the current levels of protection and management and the current status of antelopes in these areas, together with information on external donor involvement during the period 1992-98 where this is known to the ASG. It is stressed that while the areas shown in Fig. 2-1 and listed in Table 2-3 are identified as having such exceptional importance that their conservation assumes very high international priority, it must not be inferred that other areas are unimportant. Many other areas of Africa are also vitally important for antelope conservation, e.g., at the national level. In particular, many areas not shown in Fig. 2-1 are important for the conservation of threatened antelopes (see Fig. 2-2 and Table 2-6).

Comparison with information for other groups of larger mammals (Appendix 1) indicates that the areas shown in Fig. 2-1 include a high proportion of the key areas for the conservation of these other taxa. Hence most of the areas in Fig. 2-1 are of outstandingly high importance for the conservation of representative examples of Africa's unique and spectacular diversity of large mammals, not just antelopes. These areas are probably also important for many other groups of fauna and flora and for representative natural ecosystems, although in some cases the information is not yet available for these comparisons to be made. In the case of plants, for example, information on conservation priorities is selective rather than providing a complete coverage (Davis et al. 1994).

The list of key areas (Table 2-3) is not fixed. This list can be expected to change as the wildlife populations of some neglected areas become so severely depleted that they lose their conservation values, and/or other areas of high conservation value are identified or rehabilitated. Addition of new areas will probably be minimal, however. The key areas for the conservation of antelope and large mammal biodiversity at the community and ecosystem level are now generally well defined

TABLE 2-2. African Conservation Areas with the Largest Numbers of Antelope Species (source: East 1988, 1989, 1990).

| Country | Area | Bioaeoqraphic Division | No. Species |
|---|---|---|---|
| Tanzania | Serengeti NP-Maswa GR-Ngorongoro CA | Somalia-Masai Regional Centre of Endemism | 21 |
| Zambia | Kafue NP | Zambezian Regional Centre of Endemism | 20 |
| South Africa | Kruger NP | Zambezian Regional Centre of Endemism | 19 |
| Tanzania | Selous GR | Zambezian Regional Centre of Endemism | 18 |
| Botswana | Chobe NP | Zambezian Regional Centre of Endemism | 18 |
| Kenya | Masai Mara NR | Somalia-Masai Regional Centre of Endemism | 17 |
| Mozambique | Gorongosa NP-Zambezi Valley WU | Zambezian Regional Centre of Endemism | 17 |
| Zimbabwe | Hwange-Matetsi-Zambezi protected area complex | Zambezian Regional Centre of Endemism | 17 |
| Ethiopia | Omo NP-Tama WR-Mago NP | Somalia-Masai Regional Centre of Endemism | 16 |
| Kenya | Tsavo NP | Somalia-Masai Regional Centre of Endemism | 16 |
| Kenya | Amboseli NP | Somalia-Masai Regional Centre of Endemism | 16 |
| Tanzania | Ruaha NP-Rungwa-Kisigo GRs | Somalia-Masai Regional Centre of Endemism | 16 |
| Tanzania | Ugalla GR | Somalia-Masai Regional Centre of Endemism | 16 |
| Sudan | Kidepo GR | Sudanian Regional Centre of Endemism | 16 |

(Fig. 2-1; see also Fig. 2-2). The vast majority of the areas shown in Fig. 2-1 have been given some protected area status (Table 2-3), i.e., they have been chosen by African governments as representative areas for the conservation of important elements of their countries' biodiversity. In many countries, rapidly increasing rural populations have expanded recently to occupy most other regions, including the land adjoining these protected areas (e.g., Steenkamp & Hughes 1997). In these cases, there is little or no prospect of the creation of additional protected areas, particularly

very large parks and reserves which may be especially important for the long-term conservation of larger mammals (East 1981a, 1981b, 1983).

Valuable new approaches to the analysis of species distributions, patterns of richness and endemism, "hot spots" of species diversity, "greedy area minimum sets" etc. have been made possible by modern techniques of numerical analysis and information management (e.g., Boitani et al. 1998; Burgess et al. 1998), but the use of these approaches to evaluate the adequacy of the existing protected area networks is unlikely to have much practical impact on large mammal conservation in Africa. For better or worse, most African countries have already decided the locations of their major protected areas. Consequently, the key areas where Africa's large mammal communities will stand or fall are already well defined (e.g., Fig. 2-1). The major challenge facing antelope conservation in particular and wildlife conservation in general is to ensure the future of as many of Africa's existing protected areas as possible, by gaining support for their conservation from African governments, local communities and international donors. Activities such as the neverending refinement of knowledge of species' distribution patterns and Red List status (to which this report is a contribution) are of relatively minor significance, but can contribute useful information to the guidance of international conservation efforts.

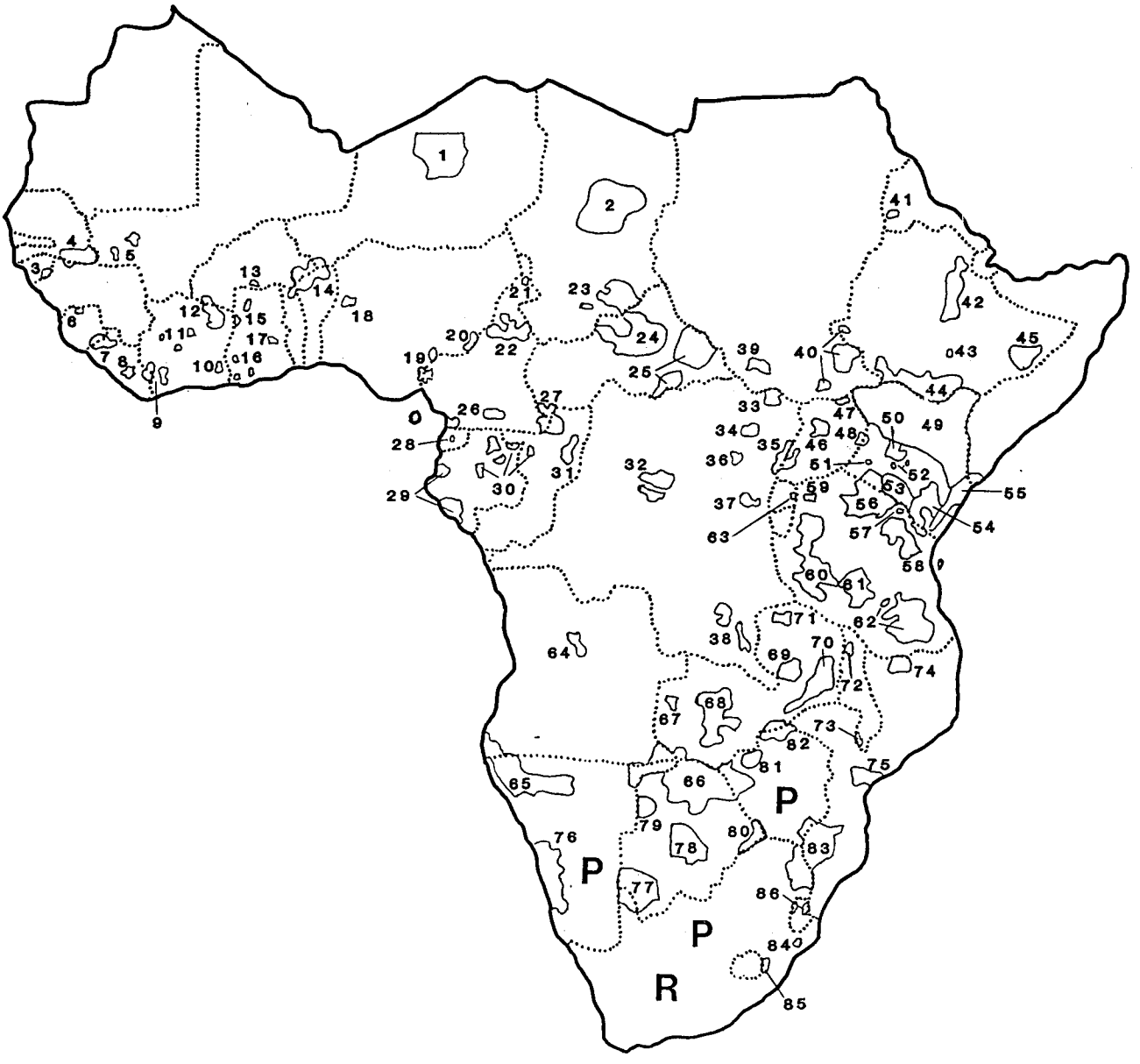
Some areas have received high levels of protection and management entirely from a country's internal resources, most notably the national parks and provincial reserves of South Africa. External assistance has been instrumental in the successful protection and/or rehabilitation of a number of other important wildlife areas, e.g., Nazinga (Burkina Faso), Pendjari (Benin), Zakouma (Chad), Dzanga-Sangha - Dzanga-Ndoki and Sangba (Central African Republic), Nouabale-Ndoki and Odzala (Congo-Brazzaville), Monte Alen (Equatorial Guinea), Lope (Gabon), Queen Elizabeth-Kibale and Murchison Falls (Uganda), Masai Mara (Kenya), Selous and Mkomazi (Tanzania) and North and South Luangwa (Zambia), and parts of other areas such as Tai (Ivory Coast), Manovo-Gounda-St. Floris (Central African Republic), Garamba (Congo-Kinshasa) and Serengeti (Tanzania). In other cases, external support has commenced very recently and has not yet had a major impact on conservation status or antelope population levels, e.g., Diefoula-Logoniegue and Arly-Singou (Burkina Faso), Siniaka Minia and Manda (Chad), Benoue, Bouba Ndjida and Faro (Cameroon), Omo-Mago (Ethiopia), Udzungwa (Tanzania), Kafue (Zambia), Central Kgalagadi Game Reserve and Gemsbok National Park (Botswana) and the wildlife areas of Mozambique.

In some cases there have been major delays in implementing projects funded by external donors because of administrative problems in the recipient countries. Civil war and insecurity have caused the suspension of external support in other cases, e.g., in countries such as Sierra Leone, Liberia, Togo, Sudan and Angola. Despite low levels of protection and little or no external support, some key areas have retained healthy wildlife populations because of their remoteness from human population centres, e.g, Sapo (Liberia), Lobeke-Mongokele (Cameroon), Minkebe-Mingouli-Djoua (Gabon), Maiko and the lowland section of Kahuzi-Biega (Congo-Kinshasa) and parts of the northern rangelands of Kenya.

The information in Table 2-3 indicates that the overall status of wildlife is depleted or severely depleted in 80% of the areas listed for West Africa, 49% for Central Africa, 51% for East and Northeast Africa and 33% for Southern and South-central Africa (regions as in Fig. 1-1). Similarly, current levels of protection and management are low-moderate or worse in 69% of the areas listed for West Africa, 61% for Central Africa, 55% for East and Northeast Africa and 41% for Southern and South-central Africa. These figures illustrate the major challenges facing wildlife conservation in Africa, particularly in West, Central, East and Northeast Africa. The increasing levels of external support which are now being given (Table 2-1) may need to continue for the foreseeable future if these challenges are to be successfully overcome.

Fig. 2-1 (opposite). Key locations for the conservation of antelope communities (see Table 2-3).

(NP = National Park). 1: Air & Tenere National Nature Reserve (Niger). 2: Ouadi Rime-Ouadi Achim Faunal Reserve & adjoining areas of Ennedi, Kanem & Batha (Chad). 3: Corubal River (Dulombi) area (Guinea-Bissau). 4: Niokolo-Koba NP-Faleme Hunting Zone (Senegal)-Badiar NP (Guinea). 5: Boucle du Baoule protected area complex, Bafing Faunal Reserve & surrounds (Mali). 6: Outamba-Kilimi NP (Sierra Leone). 7: Gola Forest Reserves (Sierra Leone)-Gola-Kpelle-Lorma National Forests (Liberia). 8: Sapo NP-Krahn-Bassa National Forest (Liberia). 9: Tai NP-Haut Dodo-Rapide Grah-Hana Forest Reserves (Ivory Coast), Cavally-Gouin Forest Reserve (Ivory Coast)-Grebo National Forest (Liberia). 10: Songan-Tamin-Mabi-Yaya Forest Reserves (Ivory Coast). 11: Marahoue & Mont Sangbe NPs, Haut Bandama Game Reserve (Ivory Coast). 12: Comoe NP-Ouarigue-Monts Tingui Forest Reserves (Ivory Coast)-Diefoula-Logoniegue Classified Forests (Burkina Faso). 13: Nazinga Game Ranch (Burkina Faso). 14: Arly-Singou protected area complex-W NP-Kourtiago Faunal Reserve (Burkina Faso)-W NP-Tamou Faunal Reserve (Niger)-Pendjari NP-Atakora-Pendjari Hunting Zones-W NP-Djona Hunting Zone (Benin)-Keran NP-Oti Valley Faunal Reserve (Togo). 15: Mole & Bui NPs (Ghana). 16: Bia NP & Game Production Reserve, Nini-Suhien NP-Ankasa Game Production Reserve, Kakum NP-Assin Attandanso Game Production Reserve (Ghana). 17: Digya NP (Ghana). 18: Kainji Lake NP (Nigeria). 19: Cross River NP (Boshi-Okwangwo & Oban divisions) (Nigeria)-Korup NP (Cameroon). 20: Gashaka-Gumpti NP (Nigeria). 21: Waza NP (Cameroon). 22: Benoue, Bouba Ndjida & Faro NPs & adjoining hunting zones of North Province (Cameroon). 23: Zakouma NP-Bahr Salamat Faunal Reserve-Siniaka Minia Faunal Reserve-Auok Hunting Zone & adjoining areas of Salamat, & Manda NP (Chad). 24: Manovo-Gounda-St. Floris NP-Bamingui-Bangoran NP-Sangba Pilot Zone-northern region hunting zones (Central African Republic). 25: Chinko Basin (including Zemongo Faunal Reserve), Bangassou Forest (Central African Republic). 26: Campo & Dja Reserves (Cameroon). 27: Dzanga-Sangha Dense Forest Reserve-Dzanga-Ndoki NP (Central African Republic)-proposed Lobeke-Mongokele Reserve (Cameroon)-Nouabale-Ndoki NP-Kabo Forest (Congo-Brazzaville). 28: Monte Alen NP (Equatorial Guinea). 29: Wonga-Wongue Reserve, Gamba protected area complex (Gabon). 30: Lope Reserve, Minkebe-Mingouli-Djoua Forests (Gabon), Odzala NP-Lekoli-Pandaka Faunal Reserve-M'Boko Hunting Reserve (Congo-Brazzaville). 31: Lake Tele-Likouala-aux-Herbes protected area (Congo-Brazzaville). 32: Salonga NP (Congo-Kinshasa). 33: Garamba NP-Azande-Gangala na Bodio-Mondo-Missa Hunting Zones (Congo-Kinshasa). 34: Okapi Faunal Reserve (Congo-Kinshasa). 35: Virunga NP (Congo-Kinshasa)-Queen Elizabeth NP-Kyambura Game Reserve-Kigezi Game Reserve-Kibale Forest NP (Uganda). 36: Maiko NP (Congo-Kinshasa). 37: Kahuzi-Biega NP-Babira-Bakwame Forest (Congo-Kinshasa). 38: Upemba & Kundelungu NPs (Congo-Kinshasa). 39: Southern NP (Sudan). 40: Boma & Badingilo NPs (Sudan), Gambella NP (Ethiopia). 41: Gash-Setit Wildlife Reserve & surrounds (Eritrea). 42: Awash NP-Alledeghi Wildlife Reserve-Afdem-Gewane Controlled Hunting Area-Awash West Controlled Hunting Area-Gewane Wildlife Reserve-Yangudi Rassa NP-Mille-Sardo Wildlife Reserve (Ethiopia). 43: Bale Mountains NP (Ethiopia). 44: Omo NP-Tama Wildlife Reserve-Mago NP-Murule Controlled Hunting Area-Chew Bahir Wildlife Reserve-Borana Controlled Hunting Area-Yabelo Wildlife Sanctuary (Ethiopia). 45: Southern Ogaden (Ethiopia). 46: Murchison Falls NP-Bugungu Game Reserve-Karuma Game Reserve (Uganda). 47: Kidepo Valley NP (Uganda). 48: Mount Elgon NP (Uganda)-Mount Elgon NP & Forest Reserve (Kenya). 49: Sibiloi NP, Marsabit NP & National Reserve, Samburu-Buffalo Springs-Shaba National Reserves, Meru NP-Rahole-Kora-Bisanadi-North Kitui National Reserves, Losai National Reserve & surrounding rangelands of Turkana, Marsabit, Wajir, Mandera, Samburu, Isiolo and Garissa (northern Kenya). 50: Private & group ranchlands of Laikipia (Kenya). 51: Southwest Mau Nature Reserve (Kenya). 52: Aberdare NP & Forest Reserve, Mount Kenya NP & Forest Reserve (Kenya). 53: Amboseli & Nairobi NPs & adjoining rangelands of Kajiado & eastern Narok (Kenya). 54: Tsavo NP-Ngai Ndethia-South Kitui National Reserves & surrounds (Kenya)-Mkomazi Game Reserve (Tanzania). 55: Boni-Dodori National Reserves & rangelands of Lamu, Tana River, Kalifi & Kwale (Kenya)-Bush Bush (Lack Badana) NP (Somalia). 56: Serengeti NP-Ngorongoro Conservation Area-Maswa-Grumeti-Ikorongo Game Reserves-Loliondo Game Controlled Area & adjoining game controlled areas (Tanzania)-Masai Mara National Reserve-Mara group ranches (Kenya). 57: Kilimanjaro NP & Forest Reserve (Tanzania). 58: Tarangire NP & adjoining game controlled areas (Tanzania). 59: Biharamulo-Burigi Game Reserves (Tanzania). 60: Moyowosi-Kigosi Game Reserves, Ugalla River Game Reserve & adjoining game controlled areas-Katavi NP-Lake Rukwa region (Tanzania). 61: Ruaha NP-Muhesi-Kisigo-Rungwa Game Reserves & surrounds (Tanzania). 62: Selous Game Reserve-Mikumi NP-Kilombero Game Reserve & surrounds, Udzungwa Mountains NP & adjoining forest reserves (Tanzania). 63: Akagera NP (Rwanda). 64: Luando Natural Integral Reserve-Kangandala NP (Angola). 65: Etosha NP-Kaokoland (Namibia)-Iona




NP (Angola). 66: Okavango Delta-Moremi Game Reserve-Chobe NP-Linyanti swamps-Makgadikgadi-Nxai Pan NP & surrounds (Botswana)-Hwange & Zambezi NPs-Matetsi & adjoining areas of northwestern Matabeleland (Zimbabwe)-Kaudom & Mahango Game Parks-West Caprivi Game Reserve-Mamili & Mudumu NPs & surrounds (Namibia)-Luiana Partial Reserve (Angola)-Sioma Ngwezi NP (Zambia). 67: Liuwa Plain NP (Zambia). 68: Kafue NP & adjoining game management areas-Lochinvar & Blue Lagoon NPs-Kafue Flats Game Management Area (Zambia). 69: Bangweulu-Kafinda Game Management Areas (Zambia). 70: North & South Luangwa, Luambe & Lukusuzi NPs & adjoining game management areas (Zambia). 71: Mweru Wantipa & Nsumbu NPs-Tondwa Game Management Area (Zambia). 72: Nyika NP (Malawi). 73: Lengwe NP (Malawi). 74: Niassa Game Reserve (Mozambique). 75: Gorongosa NP-Zambezi Valley Wildlife Utilisation Unit-Marromeu Game Reserve (Mozambique). 76: Namib-Naukluft Park (Namibia). 77: Gemsbok NP & surrounds (Botswana)-Kalahari Gemsbok NP (South Africa). 78: Central Kgalagadi-Khutse Game Reserves (Botswana). 79: Southwestern Ngamiland (Botswana). 80: Tuli block farms & surrounds (Botswana). 81: Chizarira & Matusadona NPs & adjoining areas of Sebungwe (Zimbabwe). 82: Mana Pools NP & adjoining safari areas of Middle Zambezi Valley (Zimbabwe)-Lower Zambezi NP (Zambia). 83: Kruger NP & adjoining private reserves (South Africa)-Gaza Province-Zinave & Banhine NPs (Mozambique)-Gonarezhou NP-Malipati Safari Area (Zimbabwe). 84: Hluhluwe-Umfolozi Park (South Africa). 85: Natal Drakensberg Park (South Africa). 86: Hlane Game Reserve & Malolotja Nature Reserve (Swaziland). P: Private farmland & conservancies (not shown on map) (Namibia, Zimbabwe & South Africa). R: Other protected areas (not shown on map) (National Parks Board of South Africa, KwaZulu-Natal Conservation Services, Gauteng, Northern Cape, Eastern Cape & Western Cape provincial reserves) (South Africa).

TABLE 2-3. Key Locations for the Conservation of Antelope Communities (including giraffe, okapi, water chevrotain and buffalo). Areas are numbered as in Fig. 2-1. Agencies/countries known to have provided external support during the period 1992-98 are listed for each area (see Appendix 2 for definition of acronyms).

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 1 | Niger | Air & Tenere National NR | 77,360 | low-mod | severely depleted | D | WWF, IUCN |
| 2 | Chad | Ouadi Rime - Ouadi Achim FR | 80,000 | nil | severely depleted | D | - |
| | Chad | adjoining areas of Ennedi, Kanerr & Batha | 50,000 | nil | severely depleted | D | - |
| 3 | Guinea-Bissau | Corubal River (Dulombi) area | 1,500 | low | depleted | S/D | CECI, IUCN |
| 4 | Senegal | Niokolo-Koba NP | 9,130 | mod | depleted to good | S/D | FAC, EU, USFWS |
| | Senegal | Faleme HZ | 10,000 | low | depleted | ? | - |
| | Guinea | Badiar NP | 380 | mod | severely depleted | S/I | EU |
| 5 | Mali | Boucle du Baoule prot. areas | 7,710 | low | severely depleted | D | Nether-lands |
| | Mali | Bafing FR & surrounds | 5,000 | nil-low | severely depleted | D | USPC, GTZ, IUCN |
| 6 | Sierra Leone | Outamba-Kilimi NP | 980 | nil | severely depleted | D | - |
| 7 | Sierra Leone | Gola FRs | 738 | nil | depleted | D | - |
| | Liberia | Gola-Kpelle-Lorma NFs | 4,253 | nil | ? | ? | - |
| 8 | Liberia | Sapo NP | 1,308 | nil | good | ? | FFI, EU |
| | Liberia | Krahn-Bassa NF | 5,140 | nil | ? | ? | - |
| 9 | Ivory Coast | Tai NP | 4,540 | mod-high (west) low-mod (east) | good (west) depleted (east) | 1 (west) D (east) | Germany, WWF, EU |
| | Ivory Coast | Haut Dodo-Rapide Grah-Hana FRs | 4,762 | nil-low | depleted | D | - |
| | Ivory Coast | Cavally-Gouin FR | 1,890 | nil-low | depleted | D | - |

TABLE 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 9 | Liberia | Grebo NF | 2,673 | nil | ? | ? | - |
| 10 | Ivory Coast | Songan-Tamin-Mabi-Yaya FRs | 2,307 | low-mod | depleted | D | GTZ |
| 11 | Ivory Coast | Marahoue NP | 1,010 | mod | depleted | S/D | EU |
| | Ivory Coast | Mont Sangbe NP | 950 | low-mod | depleted | S/D | EU |
| | Ivory Coast | Haut Bandama GR | 1,230 | low | depleted | D | - |
| 12 | Ivory Coast | Comoe NP | 11,500 | low | depleted | D | World Bank, EU, GEF |
| | Ivory Coast | Ouarigue-Monts Tingui CFs | 1,760 | low | severely depleted | D | GEF, IUCN, Belgium |
| | Burkina Faso | Diefoula-Logoniegue CFs | 1,140 | low-mod | depleted | I | GEF, IUCN, Belgium |
| 13 | Burkina Faso | Nazinga GR | 940 | mod-high | good | S/I | GEF, CIDA |
| 14 | Burkina Faso | Arly-Singou prot. areas | 6,388 | low-mod | depleted | S/D | FAC/FFEM, DDA |
| | Burkina Faso | W NP-Kourtiago FR | 2,860 | low | severely depleted | D | EU |
| | Niger | W NP-Tamou FR | 2,977 | low | severely depleted | D | EU |
| | Benin | Pendjari NP-Atakora & Pendjari HZs | 6,505 | mod | good | S | EU, GTZ, World Bank |
| | Benin | W NP-Djona HZ | 7,930 | low | severely depleted | D | - |
| | Togo | Keran NP-Oti Valley FR | >2,000 | nil-low | severely depleted | D | - |
| 15 | Ghana | Mole NP | 4,921 | mod-high | good | S | World Bank, IUCN, JICA, USFWS |
| | Ghana | Bui NP | 3,074 | mod | depleted | S | JICA |
| 16 | Ghana | Bia NP & GPR | 306 | mod | depleted | S/D | JICA |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 16 | Ghana | Nini-Suhien NP-Ankasa GPR | 311 | mod | depleted | S | EU, JICA |
| | Ghana | Kakum NP-Assin Attandanso GPR | 347 | mod | depleted | S/I | USAID, CI, JICA, IUCN |
| 17 | Ghana | Digya NP | 3,126 | low | severely depleted | D | World Bank, IUCN |
| 18 | Nigeria | Kainji Lake NP | 5,340 | low | severely depleted | D | |
| 19 | Nigeria | Cross River NP | 3,750 | low-mod | severely depleted | S/D | EU, ODA, WWF |
| | Cameroon | Korup NP | 1,260 | mod | depleted | S/D | USAID, EU, GTZ/KfW, ODA, WCS, WWF |
| 20 | Nigeria | Gashaka-Gumpti NP | 5,950 | low-mod | severely depleted | S/D | ODA, WWF |
| 21 | Cameroon | Waza NP | 1,700 | mod | good | S | USFWS, IUCN, WWF, Netherlands |
| 22 | Cameroon | Benoue, Bouba Ndjida & Faro NPs | 7,500 | low-mod | depleted | D | FAC, GEF, WWF |
| | Cameroon | adjoining HZs in North Province | 22,200 | nil-high in individ. zones | good to severely depleted in individ. zones | D | - |
| 23 | Chad | Zakouma NP | 3,000 | mod-high | good | S/I | EU |
| | Chad | Bahr Salamat FR | 20,600 | nil-low | severely depleted | D | - |
| | Chad | Siniaka Minia FR | 4,260 | mod | severely depleted | S/I | EU |
| | Chad | Aouk HZ & adjoining areas of Salamat | 40,000 | low | severely depleted | D | - |
| | Chad | Manda NP | 1,140 | low-mod | severely depleted | S/I | FAC |
| 24 | CAR | Manovo-Gounda-St Floris NP | 17,400 | mod-high (30% of park) | good | S | EU |
| | | | | nil-low (70% of park) | severely depleted | D | EU |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 24 | CAR | Bamingui-Bangoran NP | 11,560 | nil-low | severely depleted | D | EU |
| | CAR | Sangba Pilot Zone | 11,000 | mod-high | good | S/I | EU |
| | CAR | Northern Region HZs | 60,000 | low-mod | depleted | S/D | EU |
| 25 | CAR | Chinko Basin-Zemongo FR | 95,000 | nil | severely depleted | D | - |
| | CAR | Bangassou Forest | 16,600 | nil-low | depleted | S/D | WWF, USFWS |
| 26 | Cameroon | Campo R | 3,000 | low | depleted | D | GEF, Netherlands |
| | Cameroon | Dja R | 6,194 | mod | good | S | EU, Netherlands |
| 27 | CAR | Dzanga-Sangha R-Dzanga-Ndoki NP | 4,579 | mod-high | good | S | WWF, GTZ, USAID, WCS |
| | Cameroon | Lobeke-Mongokele R | 2,500 | low | good | S | GEF, WCS, USAID, FAC, GTZ |
| | Congo-Braz. | Nouabale-Ndoki NP-Kabo Forest | 6,266 | mod-high | good | S | GEF, WCS, USAID, GTZ, WWF |
| 28 | Equ. Guinea | Monte Alen NP | 1,500 | mod-high | good | S/I | EU |
| 29 | Gabon | Wonga-Wongue R | 4,800 | mod | good | ? | - |
| | Gabon | Gamba prot. area complex | 11,000 | low | good | S | World Bank, WWF, GTZ, USFWS, Netherlands |
| 30 | Congo-Braz. | Odzala NP-Lekoli-Pandaka FR-M'Boko HR | 2,848 | mod-high | good | S | EU |
| | Gabon | Minkebe-Mingouli-Djoua Forests | >25,000 | nil | good | S | - |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 30 | Gabon | Lope R | 5,000 | mod-high | good | S | EU, WCS, WWF |
| 31 | Congo-Braz. | Lake Tele-Likouala area | 10,500 | low-mod | good | S | GEF |
| 32 | Congo-Kinshasa | Salonga NP | 36,560 | nil-low | depleted | S | - |
| 33 | Congo-Kinshasa | Garamba NP & adjoining HZs | 12,447 | mod-high in south of NP, low elsewhere | good in south, depleted in north | S | WWF, FZS, UNESCO, IUCN, USFWS |
| 34 | Congo-Kinshasa | Okapi FR | 13,726 | low-mod | good | S | Gilman Fn, WCS, WWF |
| 35 | Congo-Kinshasa | Virunga NP | 7,800 | low-mod | depleted | D | FFI, AWF, WWF, GEF, UNESCO, UNDP, EU |
| | Uganda | Queen Elizabeth NP & adjoining GRs-Kibale Forest NP | 3,233 | high | good | S/I | EU, UNDP, DSCF, Neth-erlands, USAID |
| 36 | Congo-Kinshasa | Maiko NP | 10,800 | nil-low | good | S | WCS |
| 37 | Congo-Kinshasa | Kahuzi-Biega NP-Babira-Bakwame For. | 1 1,000 | low-mod | good | S | GTZ, WCS |
| 38 | Congo-Kinshasa | Upemba NP | 11,730 | nil-low | severely depleted | D | - |
| | Congo-Kinshasa | Kundelungu NP | 7,600 | nil-low | severely depleted | D | - |
| 39 | Sudan | Southern NP | 23,000 | nil | ? | D | - |
| 40 | Sudan | Boma NP | 22,800 | nil | ? | D | - |
| | Sudan | Badingilo NP | 8,400 | nil | ? | D | - |
| | Ethiopia | Gambella NP | 5,061 | nil-low | severely depleted | D | EU |
| 41 | Eritrea | Gash-Setit WR & surrounds | >2,000 | nil | severely depleted | D | USFWS |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 42 | Ethiopia | Awash Valley from Awash NP to Mille-Sardo | 26,000 | nil-low | depleted | D | NORAD, WCS, UNDP |
| 43 | Ethiopia | Bale Mts NP | 2,471 | low-mod | depleted | S/I | WWF |
| 44 | Ethiopia | Omo NP-Tama WR-Mago NP-Murule CHA-Chew Bahir WR -Borana CHA-Yabelo WS | 54,000 | nil-low | depleted | D | EU, WCS, UNDP |
| 45 | Ethiopia | Southern Ogaden | 15,000 | nil | depleted | D | - |
| 46 | Uganda | Murchison Falls NP & adjoining GRs | 5,198 | mod-high | depleted | S/I | KfW/GTZ |
| 47 | Uganda | Kidepo Valley NP | 1,340 | mod | severely depleted | S/I | IFAW |
| 48 | Uganda | Mt Elgon NP | 1,145 | mod | depleted | ? | NORAD, IUCN, Neth -erlands |
| | Kenya | Mt Elgon NP & FR | 469 | mod | depleted | S | WWF, IUCN, World Bank |
| 49 | Kenya | Sibiloi NP | 1,571 | low-mod | good | S | World Bank |
| | Kenya | Marsabit NP & NR | 2,090 | mod | depleted | S/D | World Bank |
| | Kenya | Samburu-Shaba -Buffalo Springs NRs | 743 | mod-high | good | S/D | World Bank |
| | Kenya | Meru NP & adjoining NRs | 5,273 | low | severely depleted | D | WWF |
| | Kenya | Losai NR | 1,806 | mod | depleted | S/D | World Bank |
| | Kenya | other areas of northern rangelands | 230,000 | nil-low | varies locally from good to severely depleted | S/D | - |
| 50 | Kenya | Laikipia ranchlands | 10,000 | mod-high | good | S | - |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 51 | Kenya | Southwest Mau NR | 430 | low | depleted | D | |
| 52 | Kenya | Aberdare NP & FR | 1,966 | mod-high | good | S/D | ODA, World Bank |
| | Kenya | Mt Kenya NP & FR | 1,367 | mod-high | depleted | S/D | EU, IUCN, World Bank |
| 53 | Kenya | Amboseli NP | 392 | mod | depleted | S/D | WCS.AWF, World Bank |
| | Kenya | Nairobi NP | 117 | mod-high | good | S | WCS, ODA, World Bank |
| | Kenya | rangelands of Kajiado & eastern Narok | 28,000 | low | varies locally from good to depleted | S/D | - |
| 54 | Kenya | Tsavo NP-Ngai Ndethia & S. Kitui NRs & surrounds | 40,000 | mod | depleted | D | ODA, AWF, EU, WWF, USAID, JICA, World Bank |
| | Tanzania | Mkomazi GR | 3,100 | mod-high | good | S/D | FoC, FZS, USAID, Belgium |
| 55 | Kenya | Boni-Dodori NRs | 2,117 | low | good | ? | WWF |
| | Kenya | coastal range -lands | 15,000 | low | depleted | S/D | - |
| | Somalia | Bush Bush NP | 4,267 | low-mod | depleted | ? | Eco Terra |
| 56 | Tanzania | Serengeti NP-Ngorongoro CA & adjoining GRs & GCAs | 40,000 | mod-high in parts of NP & CA, low-mod elsewhere | good | S/D | FZS, EU, NORAD, FoC, WCS, IUCN.BMZ, SIDA, USFWS, Netherlands |
| | Kenya | Masai Mara NR | 1,670 | mod-high | good | S | EU, JICA, WWF, FoC, ODA, KfW, World Bank |
| | Kenya | Mara group ranches | 3,890 | low-mod | good | D | ODA, EU, FoC |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 57 | Tanzania | Kilimanjaro NP & FR | 1,835 | mod | depleted | S/D | IUCN, SIDA |
| 58 | Tanzania | Tarangire NP & adjoining GCAs | 20,000 | mod in NP, low-mod in GCAs | good | S/D | EU, AWF, IUCN, FZS, WCS.SIDA, NORAD, Engelhard Foundation |
| 59 | Tanzania | Biharamulo-Burigi GRs | 2,850 | low-mod | good (Burigi), depleted (Biharamulo) | S (Burigi), D (Biharamulo) | USFWS, USAID, FZS |
| 60 | Tanzania | Moyowosi-Kigosi GRs & adjoining GCAs | 23,000 | low | good | S | USFWS, USAID, FZS |
| | Tanzania | Ugalla River GR & adjoining GCAs | 7,000 | low | good | S | USFWS, USAID, FZS |
| | Tanzania | Katavi NP-Lake Rukwa region | 15,000 | low-mod | good | S | BMZ, FZS, SIDA |
| 61 | Tanzania | Ruaha NP-Muhesi-Kisigo-Rungwa GRs & surrounds | 42,000 | mod-high in NP, low-mod elsewhere | good | S | ODA, FZS, Ruaha Trust, Cote d'Or Foundation, USAID, WWF |
| 62 | Tanzania | Selous GR-Mikumi NP-Kilombero GCA & surrounds | 92,000 | high in GR, nil-low elsewhere | good | S | KfW/GTZ, FZS, WWF, AWF, ODA, Belgium |
| | Tanzania | Udzungwa Mts NP & adjoining FRs | 3,000 | nil-low | depleted | D | WWF, FINNIDA |
| 63 | Rwanda | Akagera NP | 1,500 | nil-low | severely depleted | D | GTZ, WWF |
| 64 | Angola | Luando R-Kangandala NP | 8,910 | nil | depleted | ? | - |
| 65 | Namibia | Etosha NP | 22,270 | high | good | S | USAID, EU, USFWS, ODA |
| | Angola | Iona NP | 15,150 | nil | severely depleted | D | - |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 65 | Namibia | Kaokoland | 70,000 | mod-high | good | S | WWF,0DA, USFWS, USAID, NORAD |
| 66 | Botswana | Okavango-Moremi-Chobe NP-Linyanti-Makgadikgadi-Nxai Pan NP & surrounds | 80,000 | mod-high in Moremi & Chobe, low-mod elsewhere | good | S | USAID, CI, EU, ODA |
| | Zimbabwe | Hwange NP-Matetsi-Zambezi NP & surrounds | 25,000 | low-mod | good | S | WWF.ODA, NORAD |
| | Namibia | Kaudom-Mahango GPs - W. Caprivi GR-Mamili & Mudumu NPs & surrounds | 20,000 | mod | good | S/I | EU, KfW, USAID, USFWS, Nether-lands |
| | Angola | Luiana PR | 8,400 | nil | severely depleted | D | - |
| | Zambia | Sioma Ngwezi NP | 5,240 | low | severely depleted | D | DSCF |
| 67 | Zambia | Liuwa Plain NP | 3,660 | low | good | D | JICA |
| 68 | Zambia | Kafue NP & adjoining GMAs | 65,000 | low-mod | depleted in NP, severely depleted in some GMAs | S/D | JICA, DSCF, USFWS |
| | Zambia | Lochinvar & Blue Lagoon NPs-Kafue Flats GMA | 6,000 | mod-high | depleted | S/D | WWF,0DA, DANIDA, EU |
| 69 | Zambia | Bangweulu-Kafinda GMAs | 7,500 | low-mod | good | S | WWF,0DA, DANIDA, EU |
| 70 | Zambia | N. & S. Luan-gwa NPs-Luku-suzi & Luambe NPs & adjoining GMAs | 43,720 | high in N. Luangwa, mod-high in S. Luan-gwa, low elsewhere | good in N. & S. Luangwa, depleted elsewhere | S/D | NORAD, FZS, WWF, Owens Foundatn, USFWS, USAID, ODA, Netherlands |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 71 | Zambia | Mweru Want-ipa NP | 3,134 | low | severely depleted | D | JICA |
| | Zambia | Nsumbu NP-Tondwa GMA | 2,560 | low-mod | depleted | S/D | USAID, JICA |
| 72 | Malawi | Nyika NP | 3,134 | mod-high | good | S | WWF, FZS |
| 73 | Malawi | Lengwe NP | 887 | mod | depleted | S/D | WWF, FZS |
| 74 | Mozam-bique | Niassa GR & surrounds | 15,000 | mod | depleted | ? | Madal |
| 75 | Mozam-bique | Gorongosa NP -Zambezi Valley -Marromeu GR | 19,970 | mod | severely depleted | S/I | EU, IUCN, African Dev. Bank |
| 76 | Namibia | Namib-Naukluft P | 49,768 | mod-high | good | S | ODA |
| 77 | Botswana | Gemsbok NP & surrounds | 50,000 | low-mod | migratory species severely depleted, other species good | S/I | EU, ODA |
| | South Africa | Kalahari Gemsbok NP | 9,591 | high | good | S | - |
| 78 | Botswana | Central Kgala-gadi-Khutse GRs | 55,300 | low-mod | migratory species severely depleted, other species good | S/I | EU, ODA |
| 79 | Botswana | southwestern Ngamiland | 10,000 | nil-low | good | S/D | EU |
| 80 | Botswana | Tuli block farms & surrounds | 15,000 | high on pvt. land, nil-low elsewhere | good | S | - |
| 81 | Zimbabwe | Chizarira NP-Matusadona NP & adjoining areas of Sebungwe | 16,000 | low-mod | good | S | WWF.ODA, USAID, EU, NORAD |
| 82 | Zimbabwe | Mana Pools NP & adjoining Middle Zambezi Valley | 14,000 | low-mod | good | S | WWF,ODA, USFWS, USAID, NORAD |
| | Zambia | Lower Zambezi NP | 4,092 | low-mod | depleted | S/D | JICA |

Table 2-3 (continued)

| No. | Country | Location | Area (sq km) | Current Level of Protn & Mgmt | Overall Status of Wildlife | Overall Trend of Ant. Popns | External Support |
|---|---|---|---|---|---|---|---|
| 83 | South Africa | Kruger NP & adjoining Rs | 23,700 | high | good | S | IFAW |
| | Mozam-bique | Gaza Province -Zinave & Banhine NPs | 70,000 | mod | severely depleted | ? | GEF |
| | Zimbabwe | Gonarezhou NP-Malipati SA | 5,200 | low-mod | depleted | S | GEF, BMZ |
| 84 | South Africa | Hluhluwe-Umfolozi P | 965 | high | good | S | - |
| 85 | South Africa | Natal Drakens-berg P | 2,428 | high | good | S | - |
| 86 | Swazi-land | Hlane GR | 163 | mod-high | good | S | USAID, USPC |
| | Swazi-land | Malolotja NR | 180 | mod-high | good | S | USAID, USPC |
| P | Namibia, South Africa & Zimbabwe | Private farmland | > 100,000 | high | good | S/I | - |
| R | South Africa | Other prot. areas | 27,000 | high | good | S | IFAW |

CONSERVATION OF THREATENED ANTELOPES

Threatened species (Table 2-4) comprise a much smaller proportion of the antelope fauna of sub-Saharan Africa than in North Africa, the Middle East and Asia (Table 2-5). This reflects the severe effects of uncontrolled hunting and degradation of arid and semi-arid rangelands through overgrazing by livestock in much of North Africa and the Middle East (the status and conservation requirements of antelopes in these regions are reviewed in detail in Mallon & Kingswood, in preparation; see also East 1992a, 1992b, 1993). It should be noted, however, that projections based on the continuation of current trends suggest that a higher proportion of the antelope species of sub-Saharan Africa will be threatened or extinct within the next 20-30 years (see section 5). While most savanna antelope species are currently categorised as Lower Risk (conservation dependent), most forest antelope species are categorised as Lower Risk (near threatened) because of the threats posed by the rapid opening up of Africa's remaining equatorial forests to logging,

TABLE 2-4. Threatened and Extinct Antelopes of Sub-Saharan Africa.

| Red List Category | Species | Subspecies |
|---|---|---|
| Extinct | bluebuck | NL* |
| Extinct in the Wild | scimitar-horned oryx | NL |
| Critically Endangered | hirola | giant sable |
| | addax | |
| Endangered | mountain nyala | western giant eland |
| | slender-horned gazelle | mountain (eastern) bongo |
| | dama gazelle | western mountain reedbuck |
| | Aders' duiker | Swayne's hartebeest |
| | | tora hartebeest |
| | | western klipspringer |
| | | Rwenzori black-fronted duiker |
| Vulnerable | dorcas gazelle | Kafue lechwe |
| | red-fronted gazelle | black lechwe |
| | Speke's gazelle | bontebok |
| | Soemmerring's gazelle | korrigum |
| | dibatag | black-faced impaia |
| | silver dikdik | Heuglin's gazelle |
| | beira | Haggard's oribi |
| | zebra duiker | Brooke's duiker |
| | Abbott's duiker | |
| | Jentink's duiker | |

*NL = not listed; a considerable number of described subspecies of African antelopes may now be extinct, but the validity of many of these forms is uncertain.

Source of information: East et al. (1996) and Baillie & Groombridge (1996), with modifications to the status of a few species (see species accounts in section 4).

mining, road construction, meat hunting and the expansion of settlement (East 1995a, 1995b).

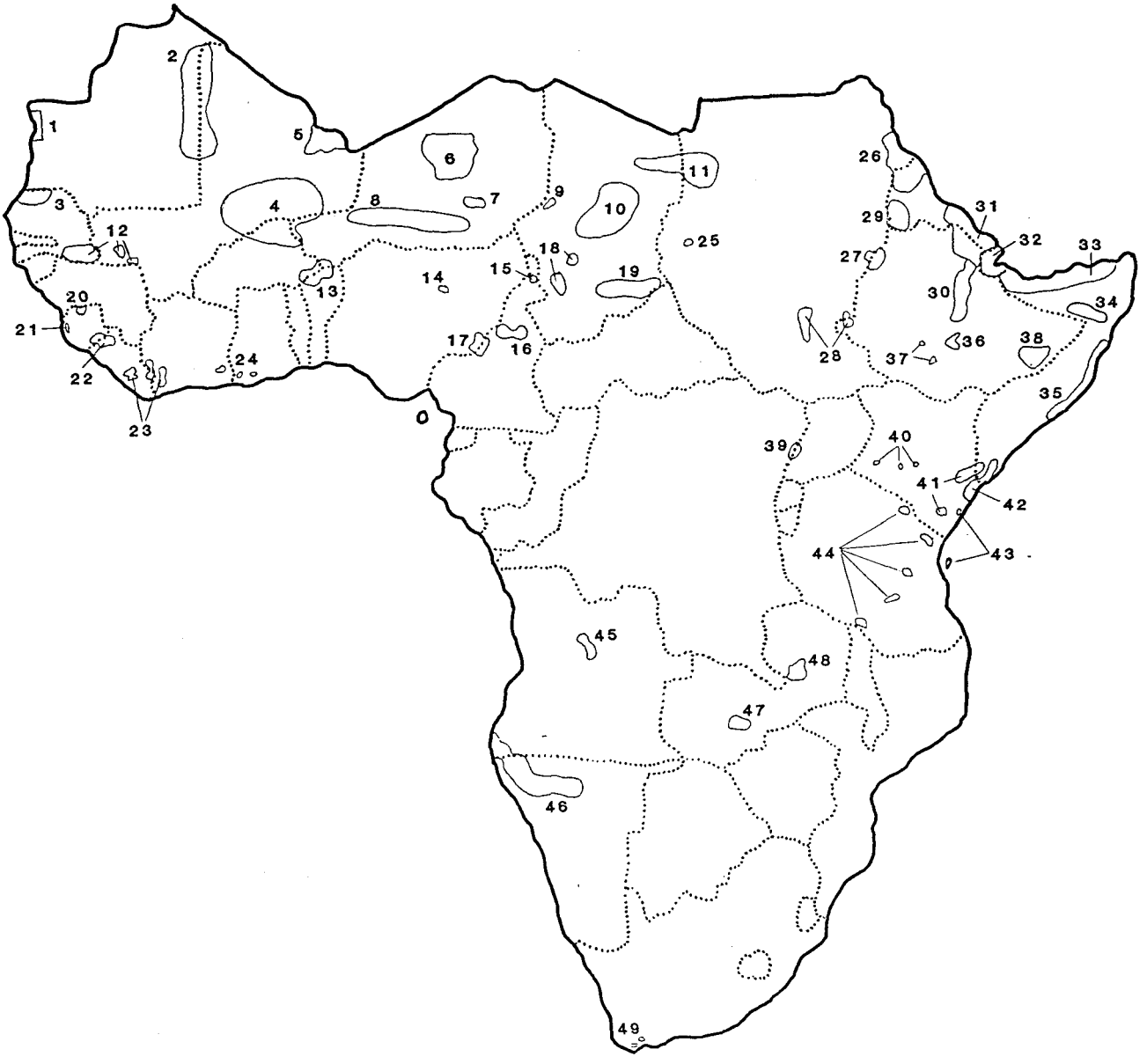
Key locations for the survival of threatened species and subspecies are shown in Fig. 2-2 and listed in Table 2-6. These areas tend to be concentrated in the arid and semi-arid zones of the Sahara, sahel and northeastern Africa, reflecting the general lack of effective conservation and marked decline of wildlife in these regions, as in North Africa and the Middle East. Some threatened species and subspecies occur in areas identified as having key importance for the conservation of antelope communities (Fig. 2-1). There is an approximately 50% overlap between the areas shown in Figs. 2-1 and 2-2.

TABLE 2-5. Summary of Red List Status of Antelope Species.

| | Sub-Saharan Africa | | N. Africa, Middle East & Asia | |
|---|---|---|---|---|
| Red List Category | No. Spp. | % of Total | No. Spp. | % of Total |
| *Extinct* | | | | |
| Extinct | 1 | | 3 | |
| Extinct in the Wild | 1 | | 1 | |
| subtotal | 2 | 2.5 | 4 | 19.0 |
| *Threatened* | | | | |
| Critically Endangered | 2 | | 2 | |
| Endangered | 4 | | 4 | |
| Vulnerable | 10 | | 5 | |
| subtotal | 16 | 20.5 | 11 | 52.4 |
| *Not Threatened* | | | | |
| Lower Risk (conservation dependent) | 37 | | 3 | |
| Lower Risk (near threatened) | 16 | | 3 | |
| Lower Risk (least concern) | 7 | | - | |
| subtotal | 60 | 77.0 | 6 | 28.6 |
| Total | 78 | | 21 | |

Source of information: East et al. (1996) & Baillie & Groombridge (1996), with modifications to the status of a few African species (see species accounts in section 4).

Fig. 2-2 (opposite). Key locations for threatened antelopes in sub-Saharan Africa (see Table 2-6). (NP = National Park). 1: Banc d'Arguin NP (Mauritania). 2: Majabat al Khoubra (Mauritania & Mali). 3: Northern Senegal. 4: Sahel zone (Mali & Burkina Faso). 5: Adrar des Iforhas & adjoining plains (Mali). 6: Air & Tenere National Nature Reserve (Niger). 7: Termit Massif & adjoining plains (Niger). 8: Sahel zone (Niger). 9: Bodele-Niger border area of northern Kanem (Chad). 10: Ouadi Rime-Ouadi Achim Faunal Reserve and adjoining areas of Kanem & Batha (Chad). 11: Mourdi Depression & surrounding areas (Chad & Sudan). 12: Niokolo-Koba NP-Faleme Hunting Zone (Senegal), Bafing Faunal Reserve & surrounds, Guinea border area south of Kita (Mali). 13: W, Arly & Pendjari NPs & adjoining reserves (Burkina Faso, Benin & Niger). 14: Lame-Burra Game Reserve & surrounds (Nigeria). 15: Waza NP (Cameroon). 16: Hunting zones & NPs of North Province (Cameroon). 17: Gashaka-Gumpti NP (Nigeria)-Adamaoua Mts (Cameroon). 18: Lake Fitri & Dourbali-Bousso (Chad). 19: Zakouma NP-Bahr Salamat & Siniaka Minia Faunal Reserves-northern Salamat-southern Ouaddai (Chad). 20: Outamba-Kilimi NP (Sierra Leone). 21: Western Area Forest Reserve (Sierra Leone). 22: Gola-Kpelle-Lorma Forests (Sierra Leone & Liberia). 23: Sapo NP-Krahn-Bassa National Forest, Grebo National Forest (Liberia), Tai NP-Haut Dodo-Rapide Grah-Hana Forest Reserves, Cavally Gouin Forest Reserve (Ivory Coast). 24: Nini-Suhien NP-Ankasa Game Production Reserve, Kakum NP-Assin Attandanso Game Production Reserve (Ghana), Songan-Tamin-Mabi-Yaya Forest Reserves (Ivory Coast). 25: Jebel Marra (Sudan). 26: Red Sea Hills & adjoining lowlands (Sudan & Eritrea). 27: Dinder River Valley (Ethiopia)-Dinder NP (Sudan). 28: Sudd swamps, Machar marshes (Sudan), Gambella NP (Ethiopia). 29: Gash-Setit Wildlife Reserve &




surrounding southwestern savannas (Eritrea). 30: Awash & Yangudi Rassa NPs-Alledeghi, Gewane & Mille-Sardo Wildlife Reserves-Afdem-Gewane & Awash West Controlled Hunting Areas (Ethiopia). 31: Northern Danakil Desert (Ethiopia)-southern coastal plain (Eritrea). 32: Djibouti. 33: Northern hills & coastal plain (Somalia). 34: Nugal Valley (Somalia). 35: Central coastal region (Somalia). 36: Bale Mts NP & other areas of Bale & Arsi Mts (Ethiopia). 37: Senkelle Wildlife Sanctuary, Nechisar NP (Ethiopia). 38: Southern Ogaden (Ethiopia). 39: Rwenzori Mts (Uganda & Congo-Kinshasa). 40: Aberdare & Mt Kenya NPs & Forest Reserves, Mau Escarpment Forests (Kenya). 41: Southern Garissa (Kenya) & adjoining parts of Somalia, southern Tsavo East NP (Kenya). 42: Boni-Dodori National Reserves, Bush Bush NP & adjoining areas (Kenya & Somalia). 43: Arabuko-Sokoke Forest (Kenya), Zanzibar Island (Tanzania). 44: from north to south, Kilimanjaro NP & Forest Reserve, Usambara Mts, Uluguru Mts, Udzungwa Mts, Mt Rungwe (Tanzania). 45: Luando Natural Integral Reserve-Kangandala NP (Angola). 46: Etosha NP-Kaokoland (Namibia)-Iona NP (Angola). 47: Lochinvar & Blue Lagoon NPs-Kafue Flats Game Management Area (Zambia). 48: Bangweulu-Kafinda Game Management Areas (Zambia). 49: Bontebok NP, De Hoop Nature Reserve & other areas (South Africa).

TABLE 2-6. Key Locations for Threatened Antelopes (numbered as in Fig. 2-2). (See species accounts in section 4).

| Location | Threatened Species & Subspecies |
|---|---|
| 1: Banc d'Arguin NP (Mauritania) | dorcas gazelle |
| 2: Majabat al Khoubra (Mauritania & Mali) | addax |
| 3: Northern Senegal | dorcas gazelle, red-fronted gazelle, dama gazelle (semi-captive) |
| 4: Sahel zone (Mali & Burkina Faso) | dorcas gazelle, red-fronted gazelle, dama gazelle |
| 5: Adrar des Iforhas & adjoining plains (Mali) | dorcas gazelle, slender-horned gazelle |
| 6: Air & Tenere National NR (Niger) | dorcas gazelle, slender-horned gazelle, dama gazelle, addax |
| 7: Termit Massif & adjoining plains (Niger) | dorcas gazelle, dama gazelle, addax |
| 8: Sahel zone (Niger) | dorcas gazelle, red-fronted gazelle |
| 9: Bodele-Niger border area of n. Kanem (Chad) | dorcas gazelle?, addax? |
| 10: Ouadi Rime-Ouadi Achim FR & adjoining areas of Kanem & Batha (Chad) | dorcas gazelle, red-fronted gazelle, dama gazelle, addax? |
| 11: Mourdi Depression & surrounding areas (Chad & Sudan) | dorcas gazelle, slender-horned gazelle, dama gazelle?, addax |
| 12: Niokolo-Koba NP-Faleme HZ (Senegal), Bafing FR & surrounds, Guinea border (Mali) | western giant eland |
| 13: W, Arly & Pendjari NPs & adjoining Rs (Burkina Faso, Benin & Niger) | korrigum, red-fronted gazelle |
| 14: Lame-Burra GR & surrounds (Nigeria) | western klipspringer |
| 15: Waza NP (Cameroon) | korrigum, red-fronted gazelle |
| 16: HZs & NPs of North Province (Cameroon) | western mountain reedbuck, korrigum, red-fronted gazelle |
| 17: Gashaka-Gumpti NP (Nigeria)-Adamaoua Mts (Cameroon) | western mountain reedbuck |
| 18: Lake Fitri & Dourbali-Bousso (Chad) | red-fronted gazelle |
| 19: Zakouma NP-Bahr Salamat & Siniaka Minia FRs-northern Salamat-southern Ouaddai (Chad) | red-fronted gazelle |
| 20: Outamba-Kilimi NP (Sierra Leone) | Brooke's duiker |
| 21: Western Area FR (Sierra Leone) | Jentink's duiker |

Table 2-6 (continued)

| Location | Threatened Species & Subspecies |
|---|---|
| 22: Gola-Kpelle-Lorma Forests (Sierra Leone & Liberia) | Brooke's duiker?, zebra duiker, Jentink's duiker |
| 23: Sapo NP-Krahn Bassa NF, Grebo NF (Liberia), Tai NP-Haut Dodo-Rapide Grah-Hana FRs, Cavally Gouin FR (Ivory Coast) | Brooke's duiker, zebra duiker, Jentink's duiker |
| 24: Nini-Suhien NP-Ankasa GPR, Kakum NP -Assin Attandanso GPR (Ghana), Songan-Tamin-Mabi-Yaya FRs (Ivory Coast) | Brooke's duiker? |
| 25: Jebel Marra (Sudan) | red-fronted gazelle |
| 26: Red Sea Hills & adjoining lowlands (Sudan & Eritrea) | dorcas gazelle, red-fronted gazelle, Soemmerring's gazelle |
| 27: Dinder River Valley (Ethiopia)-Dinder NP (Sudan) | tora hartebeest, red-fronted gazelle |
| 28: Sudd swamps, Machar marshes (Sudan), Gambella NP (Ethiopia) | Nile lechwe* |
| 29: Gash-Setit WR & surrounding south-western savannas (Eritrea) | tora hartebeest, red-fronted gazelle, Soemmerring's gazelle |
| 30: Awash Valley from Awash NP to Mille-Sardo WR (Ethiopia) | Soemmerring's gazelle |
| 31: Northern Danakil Desert (Ethiopia)-southern coastal plain (Eritrea) | dorcas gazelle, Soemmerring's gazelle |
| 32: Djibouti | dorcas gazelle, Soemmerring's gazelle, beira |
| 33: Northern hills & coastal plain (Somalia) | dorcas gazelle, beira |
| 34: Nugal Valley (Somalia) | Speke's gazelle, beira? |
| 35: Central coastal region (Somalia) | Speke's gazelle, Soemmerring's gazelle?, dibatag?, silver dikdik |
| 36: Bale Mts NP & other areas of Bale & Arsi Mts (Ethiopia) | mountain nyala |
| 37: Senkelle WS, Nechisar NP (Ethiopia) | Swayne's hartebeest |
| 38: Southern Ogaden (Ethiopia) | Soemmerring's gazelle, dibatag |
| 39: Rwenzori Mts (Uganda & Congo-Kinshasa) | Rwenzori black-fronted duiker |
| 40: Aberdare & Mt Kenya NPs & FRs, Mau Escarpment Forests (Kenya) | mountain bongo |

Table 2-6 (continued)

| Location | Threatened Species & Subspecies |
|---|---|
| 41: Southern Garissa (Kenya) & adjoining parts of Somalia, southern Tsavo E. NP (Kenya) | hirola |
| 42: Boni-Dodori NRs, Bush Bush NP & adjoining areas (Kenya & Somalia) | Haggard's oribi |
| 43: Arabuko-Sokoke Forest (Kenya), Zanzibar Island (Tanzania) | Aders' duiker |
| 44: Kilimanjaro NP & FR, Usambara Mts, Uluguru Mts, Udzungwa Mts, Mt Rungwe (Tanzania) | Abbott's duiker |
| 45: Luando R-Kangandala NP (Angola) | giant sable |
| 46: Etosha NP-Kaokoland (Namibia)-Iona NP (Angola) | black-faced impala |
| 47: Lochinvar & Blue Lagoon NPs-Kafue Flats GMA (Zambia) | Kafue lechwe |
| 48: Bangweulu-Kafinda GMAs (Zambia) | black lechwe |
| 49: Bontebok NP, De Hoop NR & other areas (South Africa) | bontebok |

*Although the Nile lechwe is currently given a Red List status of Lower Risk (near threatened), its status may be on the verge of threatened (see species account in section 4).

The precarious conservation status of the antelope species of the sahelo-Saharan zones of Africa, viz., dorcas, slender-horned and dama gazelles, scimitar-horned oryx and addax, plus Cuvier's gazelle of North Africa, was considered at a workshop held in Djerba, Tunisia in February 1998. This workshop was convened by the Secretariat of the Convention on the Conservation of Migratory Species (CMS) and the Institut Royal des Sciences Naturelles de Belgique. It was attended by representatives of range states, NGOs, ASG members and other experts. The workshop developed an Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes and adopted the Djerba Declaration. This includes a series of recommendations for improving the conservation status of these antelope species, and these proposals have reportedly received a significant pledge of support from the GEF (see *Gnusletter 17* (1): 2-3). If the parties involved act upon these recommendations, the CMS workshop and Action Plan will be a major watershed in reversing the fortunes of these threatened antelope species. Key requirements for their conservation and restoration include development and effective management of protected areas large enough to incorporate their seasonal migrations, systematic surveys of areas where remnant populations

may remain, reintroduction in protected areas of captive-born animals of all species apart from dorcas and Cuvier's gazelles, involvement of local communities in protected areas, and a substantial, long-term commitment of support from range states and international conservation and development agencies (Smith 1998).

## ANTELOPE SPECIALIST GROUP PROJECTS

The ASG is essentially a scientific advisory group. Since it was created in 1978, it has been concerned mainly with monitoring antelope populations and conservation status, identifying conservation priorities and publicising issues related to antelope conservation and research, e.g., through the Antelope Survey and Regional Action Plans (East 1988, 1989, 1990; Mallon & Kingswood, in preparation), and the *Gnusletter* and *Antelope Survey Updates* (see p. 400). Since 1995, the group has also become directly involved in fund-raising efforts for selected antelope conservation projects.

Most of the priorities identified in the Regional Action Plans for Antelope Conservation in sub-Saharan Africa (East 1988, 1989, 1990) involve improving the protection and management of existing protected areas (and some other areas) which support internationally significant antelope communities. Dixon & Stuart (1993) estimated that more than US$12 million had been raised to address priorities identified in these Antelope Action Plans subsequent to their publication. This figure is now undoubtedly much higher (see Tables 2-1 and 2-3).

There is now a substantial number of major conservation projects in Africa, each of the magnitude hundreds of thousands to millions of US dollars, funded through bilateral development assistance and agencies such as the GEF. These projects aim to support key protected areas, develop wildlife protection and management capacities and community-based conservation, and/or improve the conservation of key flagship species such as the African elephant (Lapuyade 1996). These major projects are the vehicles through which the great bulk of international support is channelled for improving biodiversity conservation in Africa, of which antelope conservation is a part. They are not usually aimed specifically at antelopes, but often recognise antelopes as a key component of biodiversity and are usually of general benefit to wildlife conservation (see Appendix 1).

In addition to these major biodiversity conservation projects, much smaller, antelope-specific projects (typically of the order thousands to tens of thousands of US dollars) can sometimes play a vital role in improving the conservation status of antelopes, e.g., by answering specific research questions of significance to antelope conservation, and by assisting the conservation of threatened taxa which are poorly represented in or absent from the existing network of protected areas in Africa. It is at this level of project that the ASG has focused its fund-raising efforts.

The group has no funded staff or facilities and relies entirely on the voluntary efforts of a small core of members. Most of these people are in full-time employment, in some cases in fields unrelated to antelope conservation. Hence our approach to fund-raising for projects regarded as high international priorities in antelope conservation has been selective and opportunistic, rather than based on a lengthy "wish-list" of potential antelope projects. In some cases the ASG is involved in a supportive role to projects of other organisations.

Projects which have been completed, are in progress or for which funding is sought are summarised below. The ASG is particularly grateful to those organisations and individuals who have provided financial support to antelope conservation projects. Anyone interested in supporting or learning more about any of the projects which are in progress or proposed should approach the ASG contacts listed for each project.

*Completed Projects*

1. Recovery Plan for the Hirola in Kenya

The bulk of a grant to the ASG from the IUCN Peter Scott Memorial Fund was used to support the preparation of this recovery plan by Chris Magin in 1995 (see *Gnusletter 15* (1): 2-9). Significant progress has subsequently been made in implementing this plan (see species account).

2. Recovery Plan for the Roan Antelope in Kenya

While supported by the Peter Scott Memorial Fund grant, Chris Magin also prepared a recovery plan for the roan antelope in collaboration with the Kenya Wildlife Service (see *Gnusletter 16* (2): 8-21).

3. Survey of Wildlife in Eritrea

Funding from the Peter Scott Memorial Fund was also utilised to assist ASG member Thomas A. Butynski to conduct preliminary ecological surveys in priority areas of Eritrea in 1995 (Butynski 1995).

4. Survey of Wildlife in the Ogaden Region of Ethiopia

A small grant from a private donor to the ASG was used to assist a reconnaissance survey of the Ogaden region by ASG member Friedrich Wilhelmi in 1997, which was conducted under the auspices of the Germany-based Zoological Society for the Conservation of Species and Populations. This survey, which was the first of this region's wildlife for 20 years, provided important information on the current status of endemic species such as the dibatag and identified potential areas for conservation action (Wilhelmi 1997; Schloeder et al. 1997).

5. Anti-poaching Feasibility Study in the Eastern Central African Republic

The eastern Central African Republic is one of the last great wildernesses in Africa, a vast area of dense, near pristine savanna woodlands and gallery forests with almost no resident people. Until recently, this region supported a great abundance of wildlife, but during the last 20 years this has been annihilated by uncontrolled poaching by armed gangs of meat hunters from Sudan (Blom et al. 1995; East & Chilvers 1995). In 1996, the Associated Hunting Professionals of Haut Chinko and the ASG (with support from a private donor) jointly funded an anti-poaching feasibility study by Joe Blatz in the 95,000 sq km Chinko River Basin. It was concluded that sufficient remnants of Chinko's wildlife survive to repopulate the region, that immediate action is essential if this region is to realise its potential as one of the world's greatest wildlife areas, and that a small, well-trained and equipped anti-poaching force could end the poaching by Sudanese hunters within 3 to 4 years (Blatz 1996). (See also project no. 9 below).

*Projects Currently in Progress*

6. Surveys of the Abundance of Gazelles and Other Threatened Species in Eastern Sudan

The arid and semi-arid savannas and scrublands of eastern Sudan may support important remnant populations of threatened antelopes. In 1996, ASG member Ibrahim M. Hashim commenced a 2-year field survey of the status of Soemmerring's and red-fronted (Heuglin's) gazelles, tora hartebeest and wild ass in this region, with the objectives of assessing the numbers and distributions of these species and developing management plans for their conservation. This project has been supported by the Zoological Society of San Diego, the Zoological Society of London and the Maree Noble and Elizabeth Stumpf Memorial Foundation.

Contacts: Ibrahim M. Hashim, Wildlife Research Centre, P.O. Box 30, Khartoum North, Sudan.

Steven C. Kingswood, C.R.E.S., Zoological Society of San Diego, P.O. Box 120551, San Diego, CA 92112-0551, USA.

7. Seasonal Movements of the Giant Eland in Northern Cameroon

The 30,000 sq km of savanna woodlands in Cameroon's North Province includes three national parks (Benoue, Bouba Ndjida and Faro) covering 7,500 sq km and 26 hunting zones covering 22,200

sq km. These woodlands support one of the most important savanna wildlife communities remaining in Africa (see Fig. 2-1 and Appendix 1). This includes one of the last two viable populations of the African wild dog known to survive in West and Central Africa (Woodroffe et al. 1997), the last few individuals of the western race of the black rhinoceros, a remnant population of cheetah, viable numbers of the Endangered western mountain reedbuck, and substantial populations of all of the other wildlife species characteristic of dry Central African savanna woodland including an important population of the giant eland.

Trophy hunting is of major economic value to the region's economy, and the areas where wildlife receives effective protection are mainly within hunting zones. In this context, the giant eland is an important flagship species for wildlife conservation in North Province. Cameroon is one of the few countries where safari hunters can obtain a giant eland trophy, and this species is the main attraction which brings international trophy hunters to North Province. A key issue facing wildlife authorities and professional hunters is management of the region's giant eland population to achieve an appropriate balance between protection and utilisation, e.g., through the setting of hunting quotas. Giant eland herds are believed to roam widely within these savanna woodlands, but very little is known about the ecology of this extremely shy and elusive species. ASG member Hubert Planton is conducting a field research project which aims to determine the seasonal movements of the giant eland in northern Cameroon using radio and satellite telemetry. This will assist the management of this species by answering key questions such as the extent of movement between national parks and adjoining hunting zones. The project is supported by the Howard Gilman Foundation and Los Angeles Zoo. A related project by ASG member Isabelle Michaux is conducting the first in-depth research on the feeding habits and parasitology of this little-known species with support through WWF-Cameroon.

Contacts: Hubert Planton, Cooperation Franco-Camerounaise, Projet Biodiversite Nord, P.O. Box 126, Garoua, Cameroon.

Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

8. Aerial Survey of the Western Giant Eland in Mali and Senegal

The Endangered western giant eland survives in a few small, isolated populations within fragmented areas of its former range in the savanna woodlands of West Africa. The main surviving population occurs in the eastern part of Niokolo-Koba National Park in southeastern Senegal. Little definite information has been available on whether it survives in viable numbers elsewhere. As a precursor to this project, ASG member Bertrand Chardonnet conducted a mission to Mali and Senegal on behalf of the ASG in December 1997, with his travel costs supported by a private donation. This mission confirmed the continued presence of the western giant eland in Faleme Hunting Zone in southeastern Senegal and several parts of southwestern Mali, such as the northern part of Bafing Faunal Reserve and the area to the northwest of this reserve (Chardonnet 1997b). Aerial surveys of these populations are planned to define their distribution and numbers more clearly, as an aid to the development of effective conservation measures within overall land-use plans for these regions of Mali and Senegal. The Mali component of this project is scheduled to be conducted in December 1998 with support from GTZ and in collaboration with the Malian Direction Nationale de l'Amenagement et de l'Equipement Rural and the West African Regional and Country Offices of IUCN.

Contacts: Bertrand Chardonnet, Conseiller Technique, Direction de la Faune et des Chasses, 01 BP 510 Ouagadougou, Burkina Faso (email: bchardonnet@cenatrin. bf).

Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

Steve Shurter, Conservation Coordinator, White Oak Conservation Center, 3823 Owens Road, Yulee, Florida 32097, USA (email: stevesh@wo.gilman.com).

*Projects for which Funding is Sought*

9. Conservation and Protection of Wildlife in the Chinko River Basin and Bangassou Forest, Central African Republic

The eastern Central African Republic, centred on the Chinko River Basin and Bangassou Forest, is one of the most remote, largest and most important wilderness areas remaining in Africa, but it has received virtually no protection from national or international sources. It includes a transition of habitats from blocks of dense forest and forest-savanna mosaic in the south to savanna woodland in the north. This region (see Fig. 2-1) offers an unusual opportunity for effective long-term conservation because of its combination of superb wildlife habitats and extremely low human population densities over a vast area. It is one of only two regions in sub-Saharan Africa, excluding the arid and semi-arid, where there is still less than one person per sq km over extensive areas of tens of thousands of sq km (the other is in the equatorial forests of the tri-national region of southeastern Cameroon, southwestern Central African Republic and northern Congo-Brazzaville, and some adjoining areas of northeastern Gabon). Pressures of increasing human populations, agricultural expansion and invasion by livestock are non-existent in the Chinko River Basin and Bangassou Forest. This is in marked contrast to many of Africa's better-known wildlife areas, where human demographics weigh much more heavily against the prospects for successful long-term conservation. The only current threat to the ecosystems of Chinko and Bangassou comes from large-scale poaching by Sudanese meat hunters. This has devastated most of Chinko's wildlife (including the Zemongo Faunal Reserve, which is completely unprotected) and is now causing a significant security threat in the region. In 1 997, this threat forced the suspension of operations in the Chinko River Basin safari hunting concession. Trophy hunting is the only viable economic option for the region besides traditional subsistence agriculture. Surveys conducted by WWF in 1995-96 with funding from US Fish & Wildlife Service (USFWS) indicated that Bangassou Forest still supports substantial populations of antelopes and other wildlife (Ottow et al. 1997).

A project proposal has been prepared by WWF-US with the support of the ASG, incorporating the recommendations of Blatz (1996) (see project no. 5 above), to survey the conservation potential of Bangassou Forest and Chinko River Basin and to create a highly trained and efficient anti-poaching unit within the Central African Republic's Department of Water and Forests for the protection of key areas identified in the surveys. This project has received the consent and support of the government of the Central African Republic and donor support is sought for its implementation (including that already earmarked by USFWS). Unlike the other projects listed in this section, this proposed project will require support on a relatively large scale,, i.e, at the level of the major projects discussed above (see p. 35).

Contacts: Brooke Chilvers Lubin, 27 Avenue des Bonshommes, 95290 L'lsle Adam, France.

Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

10. Bongo Antelope Telemetry, Northern Congo-Brazzaville

The bongo is the largest antelope species in the African equatorial forest. It faces an uncertain future because of increasing anthropogenic forces. Research being conducted by ASG member Paul Elkan in the Kabo Forest adjoining Nouabale-Ndoki National Park in northern Congo-Brazzaville is providing the first detailed knowledge of this species' demographics, social organisation and feeding ecology. Preliminary data on ranging suggest that bongo herds move seasonally over great distances within the equatorial forest. There are interesting similarities between the bongo and the giant eland (see project no. 7 above) despite their very different habitats. Both are large, spectacular antelopes which are flagship species for the conservation of their respective ecosystems, both have high economic value as trophy animals, both appear to range seasonally over large ranges, and in both cases more information is required urgently on their ranging behaviour and seasonal habitat use as an aid to conservation management planning.

Managers in the tri-national region of Cameroon, Congo-Brazzaville and Central African Republic are faced with the dilemma of increasing pressures to exploit the revenue potential of bongo safari

hunting while there is little known of the population status and ecology of the species. This project will utilise GPS/VHF technology to determine patterns in bongo home range and herd movements in time and space and describe bongo habitat utilisation with regard to distribution patterns. This information will be used to assist the design and implementation of a monitoring, conservation and management plan for the bongo on a tri-national level built upon sound understanding of the ecology of the species and sustainable exploitation principles.

Contacts: Paul Elkan, s/c Projet Nouabale-Ndoki, B.P.I4537, Brazzaville, Republic of Congo.

Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

11. Conservation of Swavne's Hartebeest and Other Endemic Antelopes in the Horn of Africa

The Endangered Swayne's hartebeest survives only in a few scattered, remnant populations in the southern Rift Valley region of Ethiopia. A mission to Ethiopia by ASG member Friedrich Wilhelmi in May 1998 on behalf of the Zoological Society for the Conservation of Species and Populations (ZSCSP) assessed the current status of this antelope and developed preliminary recommendations for improving its conservation (Wilhelmi 1998). These include assisting the Ethiopian Wildlife Conservation Organisation to improve the protection and management of the Senkelle Sanctuary, which supports about 80% of the surviving global population of Swayne's hartebeest, and developing support for the sanctuary from the local community. Other recommendations include investigating the possibilities of translocating small, isolated groups from other areas to a relatively secure locality such as the southern section of Awash National Park and establishing additional breeding groups on suitable ranchland. It was considered that if these actions are not taken, this antelope faces extinction in the near future. The ASG strongly supports this proposed project and other projects being developed by ZSCSP for the conservation of threatened endemic antelopes in this region of Africa. These include the dibatag in the southern Ogaden region of Ethiopia, and the beira and other threatened species in Djibouti in collaboration with Conservation des Especes et des Populations Animale (CEPA).

The group's involvement in these projects is coordinated by ASG member Jens-Ove Heckel, ZSCSP Project Coordinator for Northeastern and Eastern Africa and Arabia, who is the ASG's Representative for projects to develop conservation measures for Swayne's hartebeest and other threatened endemic antelopes of the Ethiopian region.

Contact: Jens-Ove Heckel, Sternbergstr. 8, D-34121 Kassel, Germany (email: J.-O.Heckel@t-online.de).

12. Conservation of Aders' Duiker on Zanzibar Island

The Endangered Aders' duiker is among the most threatened African antelope species. Its populations are continuing to decline because of habitat destruction and overhunting for meat. The ASG strongly supports current attempts to develop a long-term conservation project for this species in its main remaining stronghold in the Jozani Forest-Chwaka Bay area of Zanzibar Island, Tanzania. In addition to developing management capacity in the government agencies responsible for Jozani and conservation awareness in surrounding communities, it may be necessary to establish a captive population on Zanzibar to ensure this duiker's survival. As an emergency measure, attempts are being made by the privately owned Chumbe Island Coral Park protected area on Zanzibar to establish a breeding population by translocating up to 8 individuals from the main island to an area of 8 ha of undisturbed forest on Chumbe Island, which appears to provide excellent habitat for this species. The involvement of the ASG and the European and North American zoo communities in conservation efforts for Aders' duiker is being coordinated by ASG member Frank Rietkirk.

Contacts: Frank Rietkirk, Chair EEP Antelope TAG, National Foundation for Research in Zoological Gardens, Dutch Federation of Zoos, EAZA/EEP Executive Office, P.O. Box 20164, 1000 HD Amsterdam, The Netherlands (email: nvdzoos@nvdzoos.nl).

Rod East, c/o NIWA, P.O. Box 11-115, Hamilton, New Zealand (email: r.east@niwa.cri.nz).

13. Conservation of the Giant Sable in Angola

The giant sable is restricted to a relatively small area in central Angola, in and around the Luando reserve and Kangandala National Park. This region was repeatedly occupied by the country's rival armies during the prolonged civil war which lasted from the mid-1970s to the 1990s. Great fears were held for this antelope's survival, and the development of effective conservation measures for the giant sable has long been recognised as a very high international priority in antelope conservation. With the return of a fragile peace to Angola in recent years, new information has emerged that the giant sable survives in viable numbers. The ASG is currently developing a conservation project for this antelope. This may be based initially on the recommendations of Estes & Estes (1974) who carried out the only field research to have been conducted on the giant sable. Key aspects of their recommendations included safeguarding sable habitat within the designated protected areas and where possible outside them; developing alternatives to manioc cultivation (which tends to degrade the giant sable's preferred wet-season habitat) for the local Songo people; restricting translocations, if any are necessary, to other protected areas which are within the subspecies' natural range; and where appropriate utilising controlled trophy hunting and live-capture for sale to zoos as means of raising revenue for conservation and development activities involving the local community. These proposals will be modified as necessary in light of surveys to clarify the current status of the giant sable. The ASG is working with the Angolan Ministry for the Environment and the IUCN Regional Office in Southern Africa to develop this project. Initial funding support will be provided by Safari Club International. The giant sable's range was affected by a flare-up of fighting between government forces and UNITA in late 1998. Commencement of this project is on hold until security is re-established in this region.

Contacts: Richard D. Estes, 5 Granite Street, Peterborough, NH 03458, USA (email: estes@top.monad.net).

Jeremy L. Anderson, P.O. Box 594, White River, 1240, South Africa (email: conserva@global.co.za).

14. Re-introduction of the Mountain Bongo in Kenya

The distribution of the Endangered mountain or eastern bongo has been reduced to a few isolated areas of montane forest in Kenya. Its numbers have decreased to the point where it is no longer seen by tourists at the Aberdares and Mount Kenya lodges, where sightings of this species were once a regular feature. There is a healthy captive population of the subspecies in US zoos. A project proposal is under development by the ASG and the Rare Species Conservatory Foundation (the conservation wing of Palm Beach Zoo) to re-introduce captive-bred bongo from the USA to a suitable area of habitat within its historical range in Kenya where tourist viewing of bongo can occur under natural conditions. In collaboration with Kenya Wildlife Service, the IUCN/SSC Captive Breeding Specialist Group, AWF and the Eden Trust, potential re-introduction sites have been identified on the Aberdares and Mount Kenya. It is also planned to conduct surveys of the current numbers of bongo surviving in these areas.

Contacts: Richard D. Estes, 5 Granite Street, Peterborough, NH 03458, USA (email: estes@top.monad.net).

Steve Shurter, Conservation Coordinator, White Oak Conservation Center, 3823 Owens Road, Yulee, Florida 32097, USA (email: stevesh@wo.gilman.com).

In addition, potential projects on developing a translocation policy for antelopes in southern Africa that could be adopted by all SADC countries, coping with bovine TB, an aerial survey of Mozambique's Niassa Game Reserve, and determination of the geographical limits and conservation status of Roosevelt's sable were recommended for consideration at the ASG meeting held in Pretoria, South Africa in December 1997 (see *Gnusletter 16* (2): 2-6).

# 3. Conservation Status of Wildlife in sub-Saharan Africa

As background to the species accounts in section 4, this section presents a brief overview of the conservation status of wildlife in each country of sub-Saharan Africa. Countries are considered in the same order in which they are numbered in Fig. 1-1.

## WEST AFRICA

### *1. Mauritania*

By the 1980s, most of Mauritania's wildlife had been wiped out by uncontrolled hunting and habitat loss resulting from drought and desertification (Sournia & Verschuren 1990). Intensive slaughter by motorised hunting parties had catastrophically reduced the formerly substantial antelope populations of the desert zone, with the scimitar-horned oryx and dama gazelle reportedly extinct and other species such as addax and dorcas gazelle reduced to isolated remnant populations. The antelopes of the southern sahel zone had suffered severely from habitat destruction and overhunting.

Recent information indicates that a few remnants of Mauritania's antelope fauna have survived into the late 1990s, e.g., the dama gazelle apparently still exists and the addax may occur in slightly greater (but still very low) numbers than estimated in the late 1980s (B. Lamarche & 0. Hamerlynck, in litt. to Smith 1998). Some regions of the country are still of international significance for the survival of threatened sahelo-Saharan antelopes (Fig. 2-2). However, the few antelopes which survive are under constant, uncontrolled hunting pressure, and the country's politics, sociological characteristics, administration and legislation continue to be major constraints on conservation (Smith 1998).

Despite these constraints, there is some potential for conservation action to restore sahelo-Saharan antelopes, particularly as vast areas of the country have very few or no resident people. These include potential protected areas in regions such as the vicinity of Oualata and Tichitt in the southeast (Smith 1998), but the obstacles to conservation are enormous. The country is very poor and functions largely on foreign aid. Short-term, individual human well-being takes precedence over long-term conservation of wildlife resources. Indicative of this is the total failure of recent, reformed hunting and forestry codes, which were meant to give local communities greater control over management of natural resources. Antelope conservation and restoration projects are most likely to succeed in areas under the control of a single tribe whose religious and political leaders will support and actively participate in the project (B. Lamarche & 0. Hamerlynck, in litt. to Smith

1998).

*2. Mali*

Mali's wildlife has suffered severely from uncontrolled hunting, expansion of the livestock industry, agricultural development and desertification, which was aggravated by the very severe droughts of the 1970s and early 1980s. By the late 1980s, the survival of most antelope species within Mali was threatened (Heringa 1990).

Protective measures for wildlife have been concentrated mainly in the southwestern savanna woodlands, particularly in Boucle du Baoule National Park and the adjoining reserves. The integrity of these protected areas is seriously threatened by illegal hunting, invasion of livestock and encroachment of settlement. Wildlife populations have generally been reduced to low levels with some species now locally extinct (Duvall et al. 1997). The natural habitats of Boucle du Baoule are still in reasonably good shape and large-scale commercial poaching has been brought under control, but little has been done to prevent agricultural encroachment. Bafing Faunal Reserve, which was decreed in 1990, is situated in the sparsely populated middle Bafing River region. This has one of West Africa's last remaining substantial remnants of relatively intact Sudanian-Guinean savanna woodland and Mali's greatest surviving diversity of large mammals (Pavy 1993). Like Boucle du Baoule, the wildlife of the Bafing region has been affected severely by the activities of Mauritanian and Malian commercial meat hunters, as well as subsistence hunting by local people and recent incursions of large numbers of livestock forced southwards by degradation of the sahel rangelands. The Bafing reserve and its surrounds nevertheless retain an almost intact large mammal community which could recover its former abundance with adequate protection. This includes globally threatened taxa such as the western giant eland (Chardonnet 1997b; Mulley 1998). Current attempts to establish a multiple-use conservation unit in the Bafing region are at an early stage, but represent one of the last opportunities for Mali's savanna woodland wildlife to recover from the brink of extinction (Duvall et al. 1997).

Wildlife persists locally in other parts of the southwestern savanna woodlands and in the sahel zone and the northern deserts (Duvall et al. 1997). This includes important remnant populations of gazelles in the central and northeastern regions and addax in the northwest (Smith 1998). There are no existing conservation measures for sahelo-Saharan antelopes in Mali, but areas such as the Elephant and Ansongo-Menaka reserves in the sahel zone and the Adrar des Iforhas area in the northeastern desert are potentially important sites for biodiversity conservation (Duvall et al. 1997; Smith 1998).

If current trends continue, Mali is likely to lose most of its remaining antelope fauna during the next 15-30 years. At present, several areas of the country are still of major international significance to antelope conservation (Figs. 2-1 and 2-2). Enhanced protection and management of these areas could ensure the recovery of representative examples of Mali's wildlife resources.

*3. Niger*

During the 1970s and 1980s, the wildlife of Niger suffered a catastrophic reduction as a result of increasing competition with livestock for forage, habitat destruction through overgrazing by livestock and tree-felling by pastoralists and cultivators, severe droughts and extensive illegal hunting. By the mid-late 1980s, the surviving remnants of Niger's antelopes were concentrated mainly in a few isolated or mountainous and hilly tracts, notably in and around the Air and Termit Massifs (sahelo-Saharan species), and in W National Park-Tamou Faunal Reserve in the southwest (savanna species) (Grettenberger & Newby 1990). The Air and Tenere National Nature Reserve and W National Park are of international importance in the conservation of antelope communities (Fig. 2-1). Several regions of Niger are also of major significance for the conservation of threatened antelope species (Fig. 2-2).

Following 8 years of development work, the Air and Tenere reserve was established in 1988 with assistance from WWF, IUCN and international donors. The Nigerien Wildlife Service's management plan for the reserve aims to strike a balance between the requirements of conservation of the fauna and flora, rational exploitation of natural resources by local people and the development of tourism (Newby 1992). Between 1984 and 1990, there was a noticeable increase in the reserve's wildlife populations and a decrease in the flight distance of gazelles when approached by vehicles, indicating a significant decline in the motorised poaching that had previously annihilated the area's wildlife populations (Grettenberger 1991). The WWF/IUCN project that supported the reserve was suspended in March 1992, as a consequence of the armed Tuareg rebellion in northern Niger. The project's Nigerien director and assistant director were taken prisoner by Tuareg rebels and subsequently died in captivity. Despite the withdrawal of other expatriate and Nigerien project personnel to Niamey and the continuing rebellion, local communities formed a Provisional Committee to take responsibility for the reserve's infrastructure and equipment and to continue surveillance, pastoral regeneration, water management and other project activities (Hislaire 1994). This has allowed the reserve to remain at least marginally functional, despite continuing civil strife. Increased political stability in Niger in the late 1990s provides the opportunity to rehabilitate the Air and Tenere reserve and its development (Smith 1998).

For more than 25 years, W National Park and the contiguous Tamou Faunal Reserve have been under increasingly severe pressure from human encroachment, illegal grazing and hunting, uncontrolled bushfires and exploration for phosphate mining, with insufficient staff and resources to combat these threats. The park's wildlife populations had been depleted severely by the mid-1980s (Grettenberger & Newby 1990). The situation had deteriorated further by 1990 (Grettenberger 1991). Rehabilitation of this national park is vital for the survival of savanna antelopes in Niger, but this will not be possible without substantial, long-term external assistance.

*4. Senegal*

Senegal has been a leader in conservation achievements among West African countries. A well planned system of national parks and other protected areas covers more than 6% of the country, with Niokolo-Koba National Park in the southeast and Basse Casamance National Park in the southwest of greatest importance for antelope conservation (Sournia & Dupuy 1990). Overhunting and habitat modification arising from human activities have eliminated wildlife from extensive regions of the country outside protected areas, but significant antelope populations survive in Faleme Hunting Zone in the southeast, between Niokolo-Koba National Park and the Mali border (Chardonnet 1997a).

Niokolo-Koba National Park has long been recognised as one of the most important wildlife refuges in West Africa (Sournia & Dupuy 1990). It was accepted as a Biosphere Reserve and World Heritage Site by UNESCO in 1981. This national park continues to support a savanna antelope community of major international importance, including the Endangered western giant eland (Figs. 2-1 and 2-2). Niokolo-Koba contains an extensive area of savanna woodland, floodplain grasslands and well developed gallery forests on generally flat terrain drained by the Gambia River and its tributaries. This park was relatively well protected after its establishment in 1954, but commercial-scale hunting for meat by well-armed poaching gangs has been a serious problem since the early 1980s (Diop et al. 1996; Burnham 1998). The populations of several large wildlife species have decreased since the 1970s (Sillero-Zubiri et al. 1997). Population densities appear to have been reduced to low levels in localities of the park where poaching has been intense, although the central area of the park remains relatively well stocked with wildlife. Improved patrolling and greater investment in anti-poaching equipment and personnel are urgent requirements for this important park.

Senegal has negotiated a bilateral conservation agreement with Guinea, and Niokolo-Koba and Guinea's adjoining Badiar National Park are now managed as a single unit, the "Pare Transfrontaliere Niokolo Badiar". Whereas there are no settlements within the park, only camps for guards and tourists, the adjoining Faleme Hunting Zone has numerous villages with associated

cultivation and livestock, plus gold mining activity on the Faleme and Gambia Rivers. This hunting zone has the potential to support effective biodiversity conservation as part of a multiple purpose land-use system, with separate areas zoned for ecotourism, trophy hunting and village development (Chardonnet 1997a).

The forest-savanna mosaic of the Casamance region in southwestern Senegal formerly supported a diverse antelope community. Most of the larger species have disappeared from this region during the last 10-15 years because of uncontrolled meat hunting, and surviving populations are decreasing rapidly in the absence of even nominal protection of wildlife (Diop et al.1 996). This region has also been affected by armed insurrection since the late 1980s. The infrastructure of Basse Casamance National Park was attacked and destroyed by Diola rebels in 1993, with severe consequences for the park's wildlife (Burnham 1995). Fighting between rebels and government troops has increased in subsequent years (Burnham 1998).

Little wildlife survives in the semi-arid northern half of the country as a result of human activities, including extensive overgrazing by large numbers of livestock in the northern sahel zone. Small-scale reintroductions of gazelle species have been undertaken in some parts of the northwest, and there are potential opportunities for larger-scale reintroductions of sahelian antelope species (Sournia & Dupuy 1990; Diop et al. 1996; Smith 1998).

*5. Gambia*

Gambia is a small, densely populated riverine enclave at the western extremity of Africa. Much of the natural vegetation has been cleared for agriculture or greatly modified by livestock grazing. Loss of habitat and hunting for meat have greatly reduced or eliminated most antelope species (Camara 1990). Several nature reserves and national parks have been established to conserve the surviving remnants of the country's natural ecosystems.

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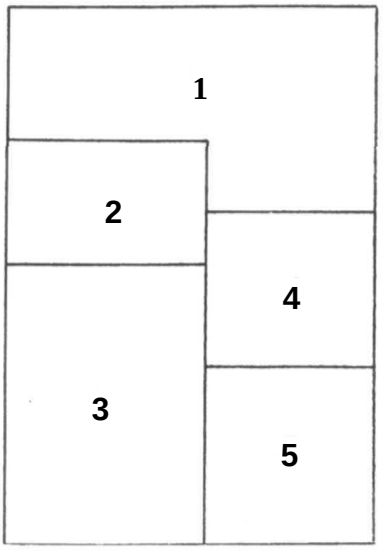
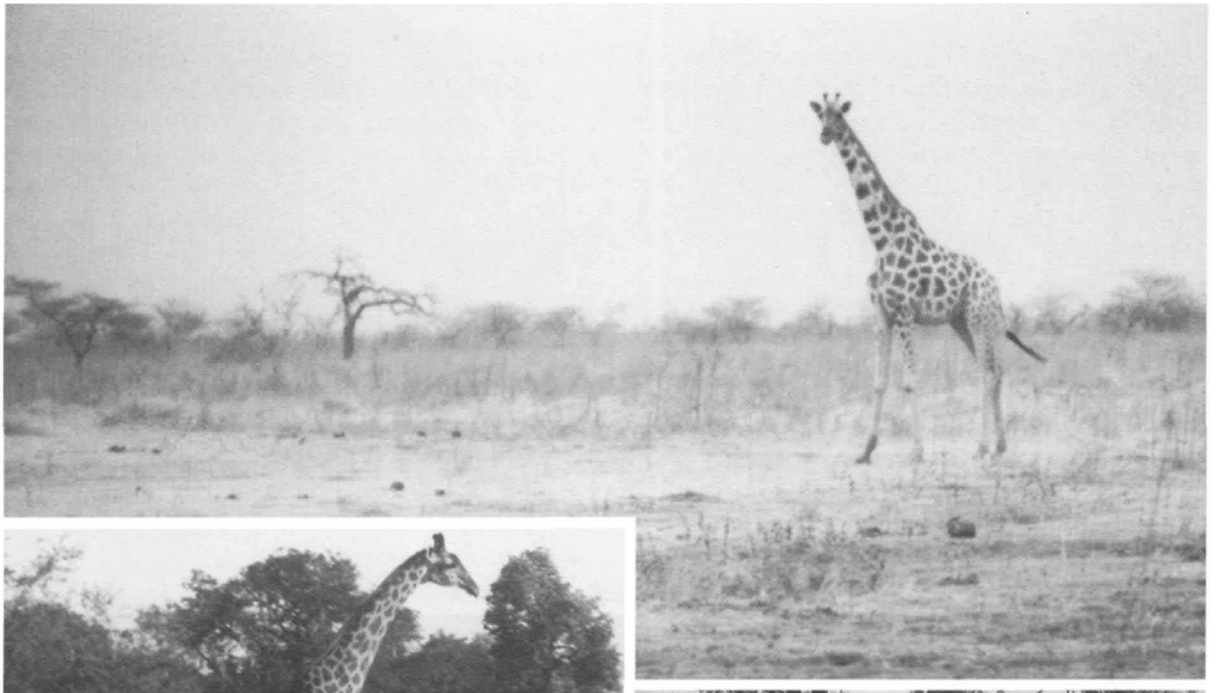


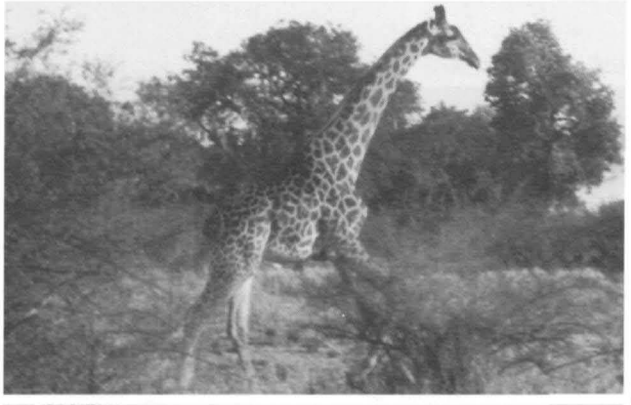

Opposite: Giraffes

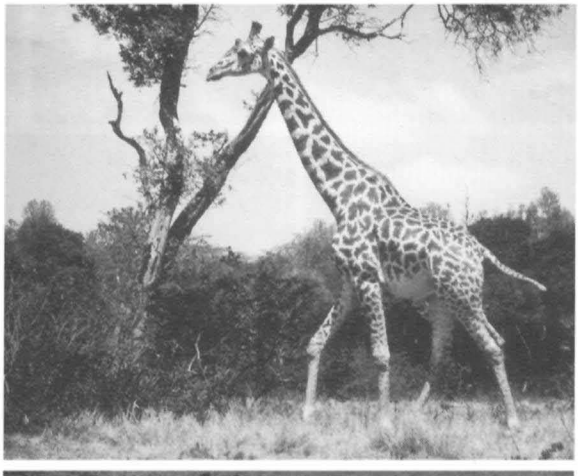
1: Sahel giraffe (*Giraffa camelopardalis peralta*), Waza National Park, Cameroon.
2: Thornicroft's giraffe (*G. c. thornicrofti*), South Luangwa National Park, Zambia.
3: Southern giraffe (G. *c. giraffa*), Kruger National Park, South Africa.
4: Masai giraffe (G. *c. tippelskirchi*), Nairobi National Park, Kenya.
5: Reticulated giraffe (G. *c. reticulata*), Samburu National Reserve, Kenya.

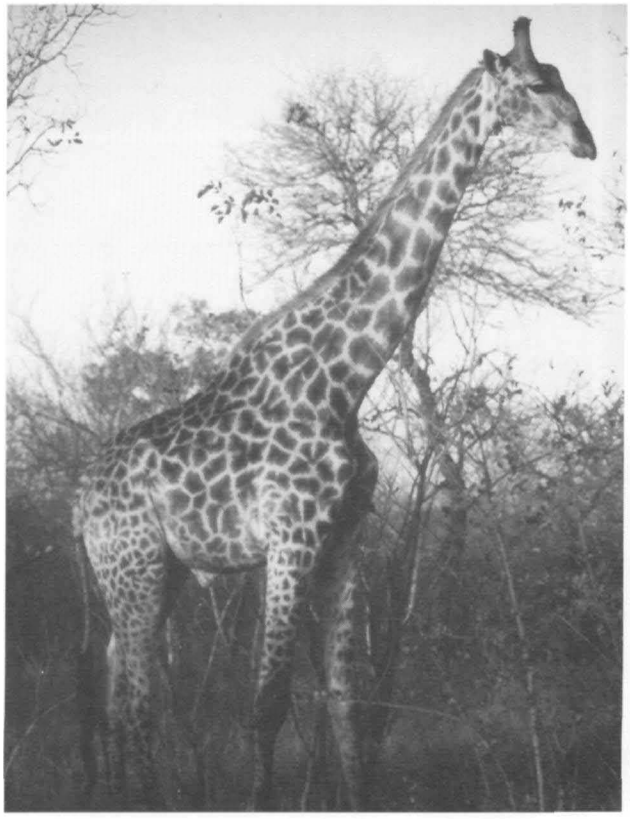
(photos: Rod East)

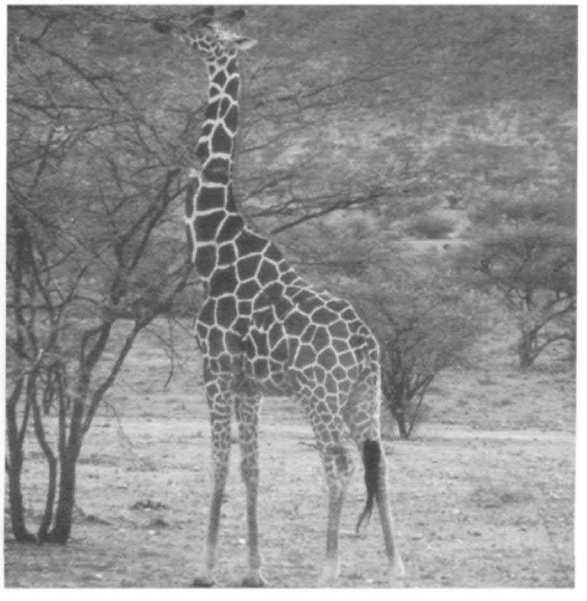
Plate 1





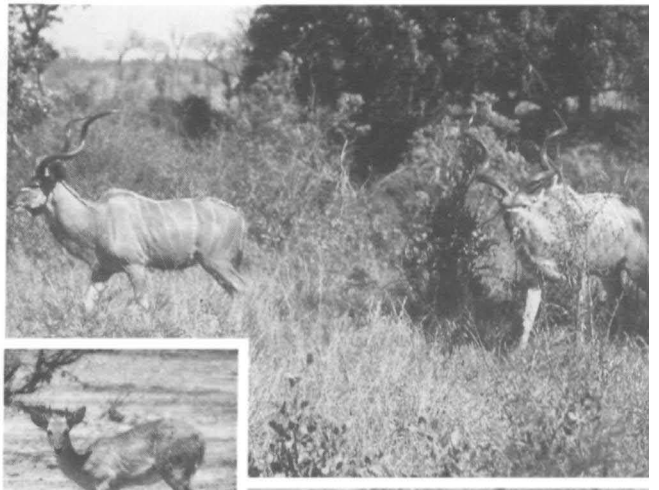


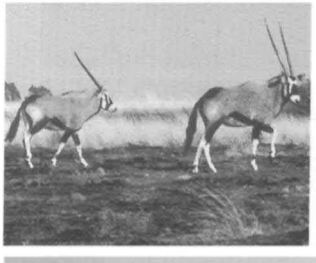


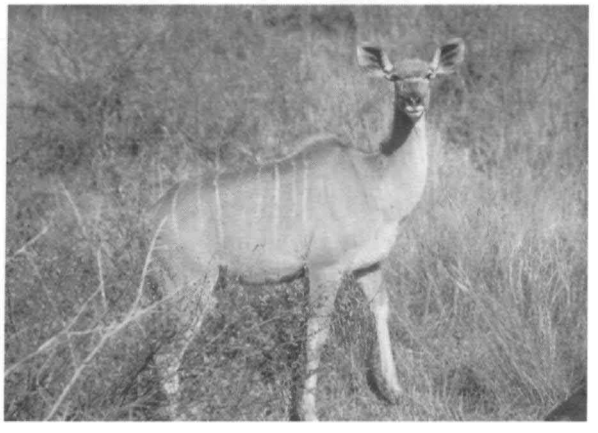


*Photos © Rod East*

Plate 2







*Photo© Richard D. Estes*

*Photos © Rod East*

*6. Guinea-Bissau*

Guinea-Bissau is one of the smallest and poorest countries in Africa. Forest-savanna mosaic formerly covered most of the mainland and parts of the islands of the Bijagos Archipelago, with extensive areas of mangrove in coastal regions. Much of the original vegetation has been cleared for agriculture, particularly in the relatively densely settled parts of the coastal plain, and secondary grasslands and savanna woodlands occur widely (Sayer et al. 1992). Guinea-Bissau has a subsistence economy and most of the population is rural. The country is not self-sufficient in food, and has to rely heavily on international aid. Bushmeat is an important source of protein for rural people and subsistence hunting pressures are high near settlements. There are nevertheless extensive areas with sparse settlement and significant wildlife populations (Chardonnet & Limoges 1990).

The fauna of Guinea-Bissau is relatively poorly known. Wildlife surveys conducted in 1 988-89 with technical assistance from Canadian cooperation (CECI) provided the first detailed information on the distribution of antelopes and other large mammals (Paris 1991). This included the first definite evidence of the occurrence of the bay duiker in Guinea-Bissau. The 1988-89 wildlife inventory revealed several regions with high biodiversity which were identified as potential protected areas (Chardonnet & Limoges 1990; Sayer et al. 1992). Those of significance to antelope conservation include the Corubal River-Dulombi area in the southeast, which supports populations of most of the country's antelope species, the Cantanhez Forest in the south, which contains some of the last remaining substantial patches of subhumid broadleaved forest, the Cufada lagoons and their adjoining dense forest mosaics in the central coastal region, the mangrove swamps and lowland forests of the Cacheu River on the northern coast which support rare species such as the sitatunga, and the Bijagos Archipelago which has been proposed as a biosphere reserve. The savanna woodlands and riverine forests of the Corubal River-Dulombi area, in particular, support an internationally significant antelope community (Fig. 2-1).

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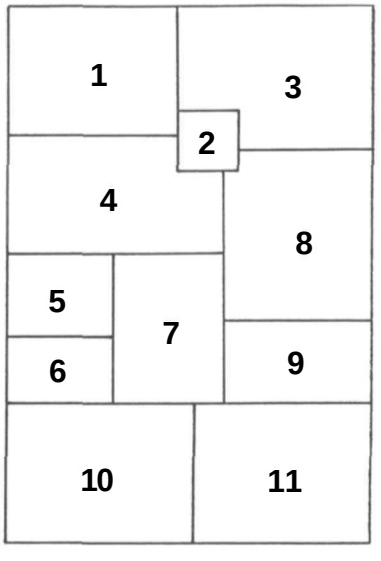


Opposite: Buffalo and tragelaphine, reduncine and hippotragine antelopes

1: Puku, Kafue National Park, Zambia.
2: Bohor reedbuck, Bouba Ndjida National Park, Cameroon.
3: Greater kudu, Kruger National Park, South Africa.
4: Savanna buffalo (*Syncerus caffer caffer*), Kruger National Park, South Africa.
5: Giant sable, Luando reserve, Angola.
6: Gemsbok, Lichtenburg Nature Reserve, South Africa.
7: Buffon's kob, Benoue National Park, Cameroon.
8: Common sable, Krugersdorp Game Reserve, South Africa.
9: Common sable, Chobe National Park, Botswana.
10: Common sable male and calves, Kafue National Park, Zambia.
11: Greater kudu, Kruger National Park, South Africa.

photos - giant sable: Richard D. Estes
all others: Rod East

Preliminary progress has been made during the 1990s towards the development of some of these proposed protected areas with external support from various sources, e.g., CECI, IUCN, UNDP, the Portugese parks service and SDC. However, areas such as the Cantanhez Forest remain unprotected and continue to suffer from agricultural encroachment and uncontrolled subsistence hunting (Gippoliti & Dell'Omo 1996). Implementation of effective conservation practices in the context of growing poverty and a national economy which is based on the exploitation of natural resources will require a sustained effort, involving participation of rural communities, consciousness-raising, capacity building and shared responsibility (Campredon 1993). Armed rebellion broke out in Guinea-Bissau in June 1998 when dissident forces led by a former army commander attempted to overthrow the government. This resulted in the suspension of aid programmes and the evacuation of most expatriates from the country.

*7.Guinea*

The mammalian fauna of Guinea and its past and present status are relatively poorly known. The wide range of natural habitats is reflected by the country's diversity of antelope species (Sournia et al. 1990; Grubb 1990; Barnett & Prangley 1997). The natural vegetation comprised a mosaic of moist lowland forest and savanna, with extensive areas of mangroves in the northern coastal zone, savanna woodland in the drier northeastern region towards the Mali border, closed-canopy rainforest in the southwest and southeast, and submontane vegetation on the higher parts of Fouta Djallon in west-central Guinea and Mount Nimba and the Ziama Massif in the southeast. Forests have been severely reduced in area and deforestation is continuing, primarily to make way for the expansion of agricultural settlement (Sayer et al. 1992). Population density is relatively high in the coastal zone, Fouta Djallon, the southeastern highlands and parts of the Niger River valley in the northeast. Large wild animals have been eliminated widely in the more densely settled regions, but pockets of wildlife persist within areas of lower human density, e.g., along parts of the Guinea-Bissau, Senegal and Mali borders in the north and locally in the east-central region (Sournia et al. 1990; Said et al. 1995; I. Hall, in litt. July 1998). The country's last extensive areas of primary closed-canopy forest are in the Ziama (1,123 sq km) and Diecke (556 sq km) Forest Reserves in the southeast. The survival of all forest-dependent species of fauna and flora is threatened by agricultural encroachment and hunting (Sayer et al. 1992). A system of forest reserves exists throughout the country, but these are orientated more towards the provision of timber and firewood than wildlife conservation (Barnett & Prangley 1997).

Nature conservation was given a very low priority between the 1960s and early 1980s under the Sekou Toure regime (MacKinnon & MacKinnon 1986). The economy also declined during this period. There has subsequently been increased government interest in the conservation of natural resources. National capacity to implement forestry and conservation programmes has begun to be developed with assistance from agencies such as the World Bank, UNDP and the German and French governments (Sayer et al. 1992; Barnett & Prangley 1997).

The country's sole national park, Badiar (380 sq km), was established on the northwestern border adjoining Senegal's Niokolo-Koba National Park in 1985. These two parks are now managed jointly by Senegal and Guinea as the "Parc Transfrontaliere Niokolo Badiar", which is one of the largest and most important protected areas in West Africa (Fig. 2-1). At present, most of the larger wildlife species of Niokolo-Koba are absent from Badiar National Park and the N'Dama Forest Reserve to the south of Badiar, probably because of previous hunting activities and incursions by cattle, but species such as the roan antelope are beginning to re-occupy Badiar and N'Dama (Bousquet 1992; Sillero-Zubiri et al. 1997).

The Mount Nimba Biosphere Reserve (140 sq km) in southeastern Guinea has been relatively well protected from hunting and agricultural encroachment (Sayer et al. 1992), although mining activities are a threat to this reserve's future. Other areas of the country also have potential conservation value, e.g., the 50 sq km Kounounkan Forest, which is situated 90 km southeast of the capital Conakry in southwestern Guinea. This area has one of the few surviving remnants of closed-

canopy forest remaining in the southwest. Recent surveys revealed that Kounounkan holds populations of a number of globally threatened primate and bird species, as well as large forest mammals such as bongo (Barnett et al. 1994). Hunting pressure is unusually low in this forest, possibly because it is difficult of access and part of the forest is considered sacred by local people. Consequently, its wildlife is relatively abundant and it offers significant long-term conservation opportunities (Barnett et al. 1994).

Information on the occurrence of two antelope species suspected but not confirmed to occur in the southeastern forests of Guinea (Sournia et al. 1990) was provided by Bourque & Wilson (1990), who gave a probable record for the zebra duiker and a possible record for Ogilby's duiker in their list of antelope species from Ziama and Diecke Forest Reserves.

*8. Sierra Leone*

Sierra Leone is one of the more densely populated countries in West Africa, especially the southern and western regions of the country. Most natural forest cover has been destroyed and replaced by agriculture, plantations and secondary vegetation such as farm bush, which establishes during the fallow stage of slash and burn agriculture. Wildlife has also been affected by extensive, commercial-scale hunting for bushmeat. By the late 1980s, there were very few intact wildlife habitats remaining, hunting pressures were often very high within these areas, and most antelopes and other large wildlife species were threatened with extinction in the short to medium term (Teleki et al. 1990). The best remaining wildlife areas were the proposed Outamba-Kilimi National Park in the forest-savanna mosaic of the northwest, and the Gola Forest Reserves in the southeast which contained the only substantial remnant of primary moist lowland forest. These areas are of international significance to the conservation of antelope communities (Fig. 2-1).

Most other forest reserves have been very heavily hunted and have suffered badly from agricultural encroachment and/or strip mining for diamonds. An exception is the Western Area Forest Reserve on the steep, forest-covered, sparsely populated interior of the Freetown Peninsula. This reserve has remained reasonably intact and is an important area for the conservation of the rare Jentink's duiker (Fig. 2-2).

Prospects for wildlife conservation appeared to be improving in the late 1980s. The country's first legally protected game sanctuary was established on Tiwai Island in the Moa River to the west of the Gola Forest Reserve complex, and development of the country's first proposed national park, Outamba-Kilimi, was initiated. Although this proposed park is in an area where human population density is relatively low and reliance on bushmeat is not high, it is threatened by illegal hunting and agricultural development. Actual protection of the proposed park's fauna was virtually nil (Teleki et al. 1990). The Gola Rain Forest Conservation Programme was launched in 1990 with the signing of an agreement between the government, the Conservation Society of Sierra Leone, the Royal Society for the Protection of Birds and the International Council for Bird Preservation. Initial activities of this programme included nature conservation education of local people, re-marking forest reserve boundaries and establishment of a research station in Gola Forest (Sayer et al. 1992).

In early 1991, fighting in the Liberian civil war spilled over into southeastern Sierra Leone. Armed rebellion spread rapidly throughout much of the eastern region of the country and expatriate conservation workers were evacuated from areas such as Tiwai Island and Gola Forest. In 1993, soldiers dissatisfied with the government's handling of the war staged a coup and ousted the government in Freetown. By mid-1995, the civil war had devastated Sierra Leone's mining-based economy and crippled most of the country's road network. Many civilians were forced to flee into the larger towns, where they faced famine. The military administration in Freetown agreed to elections which were held in mid-1996. These resulted in victory for the Sierra Leone People's Party whose leader, Tejan Kabbah, became the elected president. The rebel forces agreed to a ceasefire and began peace talks with the new government. Further political disruption occurred in

May 1997, when a military junta deposed the Kabbah government and formed an alliance with the country's former rebel forces. After 8 months of unsuccessful attempts by the 16-nation Economic Community of West African States to restore constitutional rule by negotiation, its military wing (Ecomog) stormed Freetown in February 1998 and evicted the ruling military junta. President Kabbah returned to Freetown in March 1998 from exile in Guinea. By June 1998, mopping up operations were continuing against junta remnants holding out in the east of the country. Even if peace is now restored in Sierra Leone, recovery from the damage of more than 7 years of political instability and civil war presents a massive challenge to national and international agencies. The effects of this devastation on the country's embryonic development of wildlife conservation are unknown but are probably catastrophic, at least in areas such as Tiwai Island which is in a region where fighting was intensive.

The review by Grubb et al. (1998) pointed out that there is no evidence for the occurrence within Sierra Leone of several antelope species which had been assumed to occur in the northern swamps and savannas (Teleki et al. 1990), viz., sitatunga, bohor reedbuck, common hartebeest and roan.

*9. Liberia*

Most of Liberia was formerly covered by closed-canopy moist lowland forest. More than two-thirds of the natural forest cover has been lost because of the expansion of agricultural settlement, logging and mining. Savannas and secondary bush resulting from expanding human activities now cover large parts of the country, especially in more densely settled areas such as the central region between the Saint Paul and Saint John Rivers. Bushmeat is a major source of protein for Liberia's rural and urban populations. The bushmeat trade has provided commercial hunters with a strong economic motive to hunt forest wildlife to the point of local extinction near the larger population centres. Hunting pressures are also high around rural villages and within 10 km of major highways. Despite these adverse trends, by the late 1980s the destruction of moist lowland forest and its wildlife had not proceeded as far as in some other West African countries and Liberia still possessed substantial wildlife populations, including antelopes (Peal & Kranz 1990). The most extensive remaining blocks of high forest, which are in the northwest (Gola-Kpelle-Lorma), the southeast (Sapo-Krahn Bassa) and on the Ivory Coast border (Grebo), are of major international importance to the conservation of forest antelope communities and threatened antelope species (Figs. 2-1 and 2-2).

Significant progress in wildlife conservation was made in Liberia in the late 1970s and early 1980s, following the establishment of the Division of Wildlife and National Parks within the Forestry Development Authority (FDA) in 1976. Sapo National Park, which was established in 1983, is one of the richest remaining unlogged areas for forest fauna and flora in West Africa. Considerable progress was made during the 1980s in developing and implementing protection and management plans for Sapo, including an agricultural and public awareness programme in surrounding areas, although the park faced strong pressures on all of its boundaries from forestry concessions, shifting agriculture and hunting for bushmeat. Progress was also made in demarcating parts of some national forests as potential protected areas (Peal & Kranz 1990; Sayer et al. 1992). The Large Mammal Survey of Liberia was initiated in 1989 by the Division of Wildlife and National Parks with technical and financial support from WWF, to provide the basis for future wildlife conservation and management measures.

Civil war erupted in Liberia during 1990, resulting in a complete breakdown of state structures and the deaths of at least 150,000 people. Much larger numbers of Liberians were displaced and many fled the country. Fighting in the multi-factional conflict continued intermittently until 1997. A peace agreement was eventually accepted by the warring factions, and an interim government was established prior to the presidential election which was held in July 1997. This resulted in the victory of former faction leader Charles Taylor. Prior to the election, a West African United Nations peace-keeping force had established security over much of the country. By early 1998, Liberia appeared to be entering a period of political stability. Rural people were gradually returning

to their abandoned homes and farms, and urban dwellers faced the task of completely rebuilding shattered towns and cities.

While the civil war was devastating to Liberia's people, wildlife probably benefitted to some extent from rural depopulation and curtailment of hunting, agriculture and wood-cutting. Sapo National Park, for example, was completely abandoned for 6 years during the war, but a mission to this park in 1997 led by the USA-based Society for the Renewal of Nature Conservation in Liberia (SRNCL) found that the park had been relatively unaffected, apart from the ransacking of its headquarters. Wildlife remains abundant in and around the park and may have increased during the conflict as a result of the dispersal of much of the human population (Dop 1997; Appleton & Morris 1997; A. Peal, in litt. October 1997). Efforts to assist the rebuilding of Liberia's conservation capacity are now underway by organisations such as SRNCL, WWF, FFI, IUCN and EU. These include activities such as park restoration and community projects in and around Sapo National Park.

The very high international importance of attempts to rebuild nature conservation in Liberia is highlighted by the results of the WWF/FDA Large Mammal Survey and related studies in 1989-90, before they were terminated prematurely by the civil war (Anstey 1991a, 1991b; Dunn 1991). These revealed that Liberia is one of the most important countries for forest wildlife in Africa. Most large mammals were found to be still widely distributed in the extensive mosaics of primary and secondary forest habitats in the southeast and northwest of the country. While hunting for bushmeat and, to a lesser extent, habitat destruction had affected wildlife populations adversely in these regions, even rare and globally threatened species such as Jentink's duiker and pigmy hippopotamus were still relatively widespread. Duiker species appeared to be particularly resilient to hunting pressure. This situation offers the opportunity for Liberia to develop extensive conservation approaches which attempt to achieve a balance between wildlife conservation, bushmeat production, logging and farming, rather than conservation actions being restricted to a few protected areas as in most other parts of West Africa (Anstey 1991a).

The sale value of bushmeat was estimated to be US$66 million per annum (Anstey 1991b). The most frequently harvested animals were antelopes, particularly duikers, which made up three-quarters of the volume and value of the bushmeat traded. Bushmeat harvesting emphasised species which occur commonly in farm bush and around human habitation, including crop pests. It was concluded that wildlife utilisation was potentially amenable to community-based sustainable management (Anstey 1991b). A major challenge facing the new government in Liberia is the development of land use and conservation practices that ensure that this important source of protein and income will be available to rural people on a sustainable basis.

*10. Ivory Coast*

The natural vegetation of Ivory Coast comprises Sudanian savanna woodland in the northern half of the country and Guinean rain forest in the southern half, separated by a band of forest-savanna mosaic. These vegetation zones formerly supported abundant and diverse wildlife communities, but most of the country's natural vegetation has been modified extensively by human activities. The savanna woodlands have been subjected to uncontrolled burning, livestock grazing and the spread of settlement. Large parts of the original closed-canopy forests in the south have been transformed by agricultural development into an open landscape, in which large plantations and small-scale agriculture intermingle with residual patches of primary and secondary forest and swamps. Relatively unmodified natural vegetation and most wildlife species are now generally confined to protected areas (national parks, faunal reserves and forest reserves). By the late 1980s, protection and management of these areas were generally inadequate to counter the massive increases in commercial and subsistence poaching which have accompanied the rapid growth of the country's human population (Roth & Hoppe-Dominik 1990).

The deterioration of Ivory Coast's economy during the last 10 years has further reduced capacity for enforcement of wildlife legislation and protection and management of national parks. Law

enforcement efforts are now insufficient to deter poachers in the national parks, except in a few parks where assistance from external donors has strengthened anti-poaching efforts (Dublin et al. 1994).

The country's two major protected areas, Comoe National Park and adjoining reserves in the northeastern savanna and Tai National Park and adjoining reserves in the southwestern forest (Fig. 2-1), are of outstandingly high international importance for the conservation of antelope communities (Fischer 1996; Hoppe-Dominik et al. 1998). Comoe National Park was relatively well protected in the 1970s and early 1980s, when it received external assistance from GTZ and other agencies. During the last 10 years the park's infrastructure has not been maintained, tourism has largely ceased and poachers are now able to hunt freely within the park. As a result, commercial-scale poaching for meat has greatly reduced the park's wildlife populations during the 1990s (Fischer 1996). Support is pending from the World Bank to provide Ivory Coast with the capacity to effectively manage Comoe National Park and other protected areas, and a 5-year community-based conservation project (GEPRENAF) funded by GEF and Belgium has commenced in the buffer zone of this park and an adjoining area of Burkina Faso. These developments have not yet had any impact on improving the protection of the park (F. Fischer, in litt. March 1998). The GEPRENAF project aims to provide the basis for profitable exploitation of wildlife by local communities through ecotourism and sustainable offtake by village hunters and expatriate trophy hunters. Trophy hunting was banned in Ivory Coast in 1974, but in 1994 the government decided to lift the ban once effective monitoring and control mechanisms are put in place.

Less than 10% of Ivory Coast's original forest cover remains. Tai National Park, which is the country's last major block of unmodified primary rain forest, is widely recognised as a critically important site for biodiversity conservation (Hoppe-Dominik et al. 1998). By the mid-1980s, this park was severely threatened by poaching and encroachment of settlement and cultivation. Rapid human population growth has continued on surrounding lands, with a massive influx of people into the area from other parts of Ivory Coast and from adjoining countries, including tens of thousands of refugees from Liberia. Much of the area around the park is now heavily settled. Following financial support to Tai National Park from WWF in 1988-93, an independent and autonomous project, "Projet Autonome pour la Conservation du Parc National de Tai" (PACPNT) commenced in 1994. With German financial and technical support and international cooperation with agencies such as WWF, this project's long-term objective is to ensure the lasting and sustainable protection of Tai National Park's fauna and flora. Considerable progress has been made in demarcating the park's boundaries and restricting encroachment of cultivation and illegal logging to insignificant levels, but poaching remains a major problem. Whereas densities of heavily hunted species such as duikers have recovered to high levels in primary forest in the west and southwest of the park, as a result of the permanent presence of researchers and park staff in this area, poaching pressures remain high in the east and in the park's peripheral zones (Hoppe-Dominik et al. 1998).

Several other protected areas are of international significance for antelope conservation (Figs. 2-1 and 2-2), but these areas generally receive low levels of protection and suffer from poaching and/or other disturbances. Attempts to strengthen the Songan-Mabi-Yaya Forest Reserves in the southeast, for example, lack the resources to combat rising levels of hunting for bushmeat (McGraw 1998). A partial exception is Marahoue National Park in the central forest-savanna mosaic. This park has benefitted from external support from EU, but most of its antelope populations show a tendency to decrease because of poaching (B. Hoppe-Dominik, in litt. March 1997).

*11. Burkina Faso*

The Sudanian and sahelian savannas of central and northern Burkina Faso have been modified extensively by settlement, agriculture and livestock grazing, but some regions in the south, e.g., the major river valleys and parts of the southwest and southeast, are relatively sparsely settled.

These less populated regions retain extensive areas of relatively unmodified savanna woodlands and floodplains with significant wildlife populations. Aerial surveys conducted in the early 1980s revealed that the largest populations of antelopes occurred in the Arly-Singou protected area complex and W National Park in the southeast, Nazinga Game Ranch and Kabore Tambi National Park near the Ghana border in the south, and Diefoula-Logoniegue Classified Forests in the southwest (Heringa et al. 1990). More recent information (Belemsobgo & Chardonnet 1996) indicates that most of these areas continue to support internationally important antelope communities (Fig. 2-1).

The successful protection and management of Nazinga Game Ranch since it was established in 1979 have demonstrated that habitat and wildlife population rehabilitation is technically feasible in areas of West African savanna woodland as small as 1,000 sq km. Harvesting of surplus animals for meat and trophy hunting commenced in 1989, and parts of the ranch have subsequently been developed for tourism. A 5-year GEF project commenced at Nazinga in 1995 to assist the further development of community-based wildlife management.

Arly National Park is the only other protected area which has received a reasonable level of infrastructure development for management and tourism, but the populations of most of this park's larger wildlife species have decreased substantially since the 1970s and tourism has declined 10-fold over the same period (Barry & Chardonnet 1998). The Arly-Singou protected area complex is the site of a new approach to wildlife management being developed by the government. This allows private operators to take charge of protected area management under a framework decided by the state, in order to overcome the shortage of internal and external funds for wildlife conservation (Lapuyade 1996). A major project funded by France commenced recently with the aim of developing and implementing this new approach in Arly-Singou and eight surrounding hunting areas, covering a total area of 6,200 sq km. This will involve tourism interests, trophy hunting operators, the Ministry of Water and Forests and local villages in the management of Arly-Singou (B. Chardonnet, in litt. June 1998). A key component of the project will be increased protection of Arly National Park to promote the recovery of wildlife populations (Barry & Chardonnet 1998). In contrast to Arly, W National Park has received no effective protection and its wildlife populations are now severely depleted, but EU assistance to this protected area is scheduled to commence in 1999. Arly-Singou, W and adjoining reserves and hunting areas are contiguous with protected areas in neighbouring Benin and Niger. Collectively, this tri-national complex of protected areas is one of the largest and most important savanna woodland wildlife areas remaining in West Africa (Fig. 2-1).

The Diefoula Classified Forest and adjoining sites in the Comoe region of Ivory Coast are the sites of the 5-year project "Gestion Participative des Ressources Naturelles et de la Faune" (GEPRENAF), which is funded jointly by GEF, Belgium and the governments of Burkina Faso and Ivory Coast. This region retains a biologically diverse natural savanna ecosystem. It is threatened by the rapid expansion of human activity, including organised commercial poaching for bushmeat, which has occurred following the elimination of onchocerciasis. The GEPRENAF project, which commenced in 1996, recognises that the protectionist approach to biodiversity conservation based on the establishment of national parks has largely failed in West Africa, because of lack of political commitment, inadequate financial resources, limited potential for tourism and conflict with local human populations. The project therefore aims to find a common solution to development and conservation concerns by involving local communities in the sustainable, profitable exploitation of natural resources and assisting them to manage their wild land areas for their own economic benefit and to maintain biodiversity (World Bank 1995). As in Arly-Singou, safari hunting is expected to play a major role in generating local revenue from wildlife, thereby providing an important incentive for conservation (Belemsobgo & Chardonnet 1996). International trophy hunting is already a well-established commercial activity in Burkina Faso. Recent surveys indicate that the antelope populations of Diefoula are now recovering from depleted levels (U. Belemsobgo, in litt. February 1998).

In addition to the importance of these areas for the conservation of antelope communities, some

regions of Burkina Faso are also of international significance for the conservation of threatened antelopes (Fig. 2-2). This includes the northern sahel zone, which is a potential site for the reintroduction of threatened sahelian antelopes (Smith 1998; B. Chardonnet, in litt. March 1998).

*12. Ghana*

Ghana is densely populated. Wildlife has been greatly reduced or eliminated by the expansion of settlement, agriculture and hunting for meat. In the savanna woodlands, larger wildlife species have generally been eliminated outside protected areas. In the moist lowland forest zone in the southwest, the growing need for agricultural land has led to extensive encroachment of natural habitats by settlement and the increasing demand for forest resources such as timber and bushmeat has resulted in heavy exploitation of the remaining forests. Some forest antelope species which adapt well to degraded habitats are still common locally despite heavy offtake for bushmeat, but species which are more dependent on unmodified forest are now rare or absent outside protected areas. As in many other African countries, the threats to wildlife are exacerbated by the lack of resources available to the wildlife authorities (Lapuyade 1996).

The country's system of protected areas includes representative examples of all of the major vegetation zones and antelope habitats (Ankudey & Ofori-Frimpong 1990). The level of protection and management of these areas was generally low to moderate in the mid-1980s (MacKinnon & MacKinnon 1986). This reflected factors such as pressures arising from the growing demand for natural resources by the country's increasing population, the economic decline during the post-independence period and the lack of infrastructure development in many protected areas (Manu 1987). A marked upturn in Ghana's economy has followed the economic recovery programme which was initiated in 1983, but poaching of wildlife, unresolved settlement issues and inadequate knowledge of ecological systems on which to base sound management decisions have hampered the development of some conservation areas (Sayer et al. 1992). Ghana's large rural population is traditionally dependent on the utilisation of natural resources for basic survival, and bushmeat continues to supply most of the protein intake of rural people. The use of wildlife resources will continue, and the challenge is to make this utilisation sustainable through appropriate institutional and economic arrangements involving wildlife and protected area management (Ghana Wildlife Department 1996).

Areas such as Mole and Bui National Parks in the northwestern savanna woodlands, Digya National Park in the eastern forest-savanna mosaic and Bia, Nini-Suhien and Kakum National Parks and adjoining reserves in the southwestern forest zone protect internationally important antelope communities (Fig. 2-1). A World Bank-funded project aimed at strengthening Ghana's institutions in forestry and wildlife management ran from 1989 to 1996, and other major externally funded conservation projects include assistance to Kakum National Park from USAID, ongoing assistance to Bia National Park and Game Production Reserve and Nini-Suhien National Park-Ankasa Game Production Reserve from EU, and a national natural resources conservation project funded by the World Bank for which JICA has funded a preparation phase (Lapuyade 1996). Levels of protection and management have improved substantially in some protected areas, e.g., Mole National Park, which supports important and generally stable or increasing antelope populations, but protection remains low in some other areas, e.g., Digya National Park, where most antelope species have been greatly reduced or even exterminated by uncontrolled poaching (Wilson 1994b; Ghana Wildlife Department 1996). Recent use of a purpose-built light aircraft for anti-poaching patrols in Mole National Park has reportedly reduced bushmeat poaching incidents by 80% (Anon. 1998). The three forest parks, Bia, Nini-Suhien and Kakum, have become increasingly isolated by the expansion of agriculture in surrounding areas. There was extensive commercial logging within these parks and the adjoining reserves until recently, and their wildlife populations have been reduced from historical levels by poaching.

*13. Togo*

Togo is a small, densely settled country. Most larger wildlife species have been eliminated outside protected areas. Prospects for wildlife conservation were nevertheless reasonably good in the mid to late 1980s. Effective control of illegal hunting had resulted in stable or increasing populations of savanna antelopes in protected areas in the north of the country, particularly Keran National Park (Chardonnet et al. 1990). This park and the adjoining Oti Valley Faunal Reserve are very close to the internationally important protected areas in neighbouring Benin and Burkina Faso (Fig. 2-1).

Since 1991, Togo has suffered major political upheavals and civil unrest. The effects on wildlife conservation have been disastrous. From November 1991 the people living in the north of the country, north of the Oti River, more or less threw off the control of the central government. The local interpretation of democracy was largely to do what you want, where you want. As a result, Keran and Fazao National Parks, Oti Valley Faunal Reserve and other protected areas have effectively ceased to exist. In the northern parks and reserves, 75-80% of the large animals were believed to have been killed by January 1992 (Walsh & Chardonnet 1995). By mid-1993, resettlement of Keran National Park was proceeding apace and villages were also being established within the Oti Valley reserve. In early 1995, a small part (25 sq km) of Keran National Park was under the control of the army and still supported a few buffalo and roan. By May 1995, the political situation in northern Togo was calm but the protected areas had been virtually destroyed.

The country's political situation resulted in the withdrawal of external support from 1991 to 1995. The Franz Weber Foundation signed an agreement with the Togolese government in 1 992 to manage Fazao National Park for 25 years, but this was not implemented. In late 1995, the situation seemed to be improving with the US and French governments announcing the resumption of their cooperation with Togo, but the 5-year reduction in conservation funding and activity may have had irreversible effects (Lapuyade 1996). The country appears likely to lose most of its remaining wild herbivores, apart from a few highly adaptable species such as the bushbuck and grey duiker (Walsh & Chardonnet 1995).

*14. Benin*

Settlement in the northern savanna zone of Benin has been precluded in the past by the endemic diseases onchocerciasis and trypanosomiasis. Consequently, the northern region of the country contains extensive areas of relatively unmodified savanna woodlands with few inhabitants. Significant wildlife populations survive in this region, mainly within Pendjari and W National Parks and the surrounding hunting zones (Green & Chardonnet 1990). These protected areas are contiguous with those of neighbouring Burkina Faso and Niger. This entire protected area complex covers >26,000 sq km, of which more than half lies within Benin, and it is of major international importance for the conservation of West African savanna wildlife and ecosystems (Fig. 2-1).

Parts of the protected areas of northern Benin received moderate levels of protection during the 1970s, but this declined to low levels in the early 1980s. The protection and infrastructure of Pendjari National Park was rehabilitated by an EU-funded project during the period 1985-92, which allowed this park's wildlife populations to increase substantially (Green & Chardonnet 1990; Chardonnet 1995). However, this project gave little attention to the concerns and interests of surrounding human populations or the financial resources likely to be available to maintain the project's achievements after external support had ceased (Tchabi 1994). Consequently, after the project had been completed the park's infrastructure and anti-poaching patrolling declined and illegal hunting increased. A World Bank-funded project has attempted to increase the awareness of local people of the importance of sustainable management of natural resources, and in 1995 external assistance to the infrastructure and protection of this important park resumed with finance from the World Bank and Germany.

Unlike Pendjari, W National Park has received no external assistance and has effectively been unprotected, with inadequate infrastructure and staffing. As a result, W National Park's wildlife

populations have been reduced to low levels by uncontrolled poaching, especially species which are easily hunted such as kob (Chardonnet 1995). The adjoining Djona Hunting Zone has received low to moderate protection, but access for poachers is facilitated by its location close to a major road. In addition to national parks and hunting zones, some of the larger classified forests in the north also contain significant wildlife populations. This is a result of very low human population densities in surrounding areas rather than active protection.

In contrast to the north, southern Benin is densely populated and the natural vegetation of forest-savanna mosaic has been severely degraded or replaced completely by the expansion of plantations and agriculture. Antelopes and other forest wildlife in the south are severely threatened by widespread destruction of natural habitats and heavy hunting pressures for bushmeat (Green & Chardonnet 1990). There are no large protected areas in southern Benin, and those which exist are poorly protected. The only relatively large area of natural forest that survives in the south is in the 163 sq km Lama Classified Forest, within which less than 20 sq km of natural forest remains (Oates 1996b). The remainder of this forest reserve is largely covered by teak plantations and agricultural crops, and hunting pressures are increasing. A GTZ project which is advising the Benin forestry authority on the management of Lama is urging the full protection of the remaining forest.

*15. Nigeria*

Nigeria is the largest country of tropical West Africa and is densely populated. By the early 1990s, Nigeria was already as densely populated as Western Europe with an average of 1 30 people per sq km, and the rapidly growing population was placing enormous pressures on the country's natural resource base (Sayer et al. 1992). Most of the formerly extensive natural forest and savanna habitats have been degraded or destroyed by the expansion of agriculture, excessive wood-cutting to supply timber and fuelwood, and overgrazing of grasslands by livestock. In addition to the very widespread degradation and destruction of natural habitats, wildlife has suffered severely from uncontrolled hunting for bushmeat.

Conservation of wildlife has never been given high priority. There is a long history of official apathy towards wildlife conservation, which is reflected by inadequate funding and administrative arrangements for protected areas and lack of enforcement of laws protecting wildlife. There has been little attempt to counter the excessive demands for land, bushmeat and fuelwood by the rapidly expanding human population or the general lack of concern for the welfare of wild animals (Anadu 1987; Osemeobo 1988). Some protected areas have been identified as having international significance in antelope conservation (Figs. 2-1 and 2-2), but by the late 1980s the country's protected areas had generally suffered badly from poor or non-existent protection and management, encroachment of agriculture and livestock, uncontrolled poaching and illegal wood-cutting and burning. The outlook for most antelope species was bleak (Anadu & Green 1990).

At both the state and federal level, Nigeria's wildlife legislation is generally inadequate and confusing. Most protected areas have continued to be poorly managed because of lack of staff training and dwindling resources. Virtually all state wildlife departments have a very low profile, are underfunded and lack essential staff and equipment (Dublin et al. 1994). In 1991, the federal government assumed control over several forest and game reserves which had become run down while they were the responsibility of state governments. These areas, viz., Chad Basin, Cross River, Gashaka-Gumpti, Kainji Lake and Old Oyo, were elevated to national park status (Anon. 1992). However, the status of many protected areas has remained uncertain. Chad Basin National Park in the northeast, for example, is a fragmented, multi-location park comprising the former Chingurmi-Duguma Game Reserve, Gorgoram and Zurgun Baderi Forest Reserves and Bulatura Oasis, but these areas have not been surveyed, their boundaries are not securely identified and they are occupied by large numbers of farmers, fishers and pastoralists (Adams & Thomas 1996). Chingurmi-Duguma and other gazetted game reserves and sanctuaries (Lake Chad, Sambisa) in the northeastern Bomo State have in practice been almost abandoned as conservation areas over the last 20 years, enabling local communities to claim the land for settlements and farms (Bita 1997).

Similarly, in the forest zone in the south of the country, logging, extensive commercial plantations and farming within forest reserves threaten the few remaining areas of natural forest (Oates 1995). Conservation prospects have not been improved by the country's economic decline which has followed the army's annulment of the 1993 presidential election, which was supposed to end a decade of military rule.

Despite the dramatic decline of its wildlife, to the point where most of Nigeria is now a faunal desert as far as large wild animals are concerned, there are a few areas where conservation may have reasonable long-term prospects. The least disturbed moist lowland forests are in Cross River National Park. This comprises two separate areas on the Cameroon border in the southeast, the 950 sq km northern (Boshi Okwangwo) and 2,800 sq km southern (Oban) divisions. The latter is contiguous with Cameroon's Korup National Park (Fig. 2-1). Gashaka-Gumpti National Park is in a mountainous region adjoining the Adamaoua Massif of Cameroon. This park contains a wide diversity of habitats including savanna woodland, gallery forest, and montane forest and grassland. Poaching had severely depleted the antelope populations of Cross River and Gashaka-Gumpti National Parks by the mid-late 1980s (Anadu & Green 1990), but their natural habitats generally remain intact. Rehabilitation of the protection and management of these two parks commenced in the early 1990s with external assistance from agencies such as WWF and ODA. Logging to supply a new paper mill was reported to be a major potential threat to Cross River National Park in 1996. The Niger Delta is also a priority area for conservation action and supports recently discovered populations of Ogilby's and black-fronted duikers (Powell 1997).

## CENTRAL AFRICA

### *16. Chad*

Chad's formerly abundant wildlife was badly affected by recurrent civil unrest, war, drought and uncontrolled meat hunting during the 1970s and 1980s. By the late 1980s most of the country's antelope populations had decreased dramatically, but substantial numbers survived in some sparsely populated regions such as Salamat and eastern Moyen Chari in the southeast (Thomassey & Newby 1990). Since the 20-year war with Libya ended with the expulsion of Libyan forces from northern Chad in 1987, the country's infrastructure has been substantially rebuilt with foreign assistance, particularly in the south. Despite occasional security problems in the north, the 1990s have been a period of political stability. The country's first multi-party presidential election was held in 1996.

The cessation of war and civil strife has made rehabilitation of protected areas feasible. Efforts to rehabilitate Zakouma National Park in the savanna woodlands and floodplains of the southeast have been assisted since 1989 by the EU-funded project "Conservation de l'Environnement dans le sud-est du Tchad". This has resulted in substantial recovery of Zakouma's wildlife populations, and the EU project is being extended to Siniaka Minia Faunal Reserve (Moksia & Reouyo 1996). The long-term success of attempts to conserve southeastern Chad's important reservoir of floral and faunal biodiversity will depend on major issues being addressed, viz., growing demographic pressure in the region, lack of awareness among local people of the need for conservation of natural resources and the country's precarious economic situation (Moksia 1994). The country's second national park, Manda, is situated on the Chari River to the southwest of Zakouma/Siniaka Minia in Moyen Chari region. Manda National Park has been regularly penetrated by pastoralists and their cattle. Its wildlife has been reduced to low levels by poaching, but its vegetation remains in very good condition (Scholte 1997; P. Chardonnet, in litt. December 1997). A project to rehabilitate Manda National Park with bilateral assistance from France commenced in 1995.

While the two national parks are the only protected areas with an effective conservation status at present, important antelope populations still occur in some other regions (Scholte 1997). In the southwest (Mayo Kebi), a natural resources project executed by GTZ included an aerial survey of the Binder Lere Faunal Reserve and surrounds in 1996. This revealed small but significant

populations of species such as giraffe, roan and red-fronted gazelle. Further to the north, parts of the Lake Fitri region and the area immediately east of the Chari River from Dourbali towards Bousso in Chari-Baguirmi region have been only marginally exploited by people and livestock and retain small, localised concentrations of species such as red-fronted gazelle and tiang. In central Chad, the vegetation and once-rich fauna of the sahelian and subdesert zones in the vast Ouadi Rime-Ouadi Achim Faunal Reserve and surrounding areas are still reasonably intact, apart from large antelopes (Scholte 1997). This reserve had been a major focus of international efforts to conserve sahelo-Saharan antelopes during the 1960s and 1970s, prior to the cessation of conservation efforts in 1978 by the civil war (Thomassey & Newby 1990; Smith 1998). Surveys conducted in the early-mid 1990s in central and northern regions (east Kanem, west Batha, Ouadi Achim, Ennedi) revealed significant populations of dorcas gazelle with red-fronted gazelle in the more southerly locations (Pfeffer 1995; Tubiana 1995, 1996; Scholte 1997). Evidence was also obtained for the survival of dama gazelle and addax, but not scimitar-horned oryx. Despite the improved security situation, many firearms remain in these regions and hunting continues to be a major threat to the surviving wildlife (Scholte 1997).

Many of Chad's remaining wildlife areas are of major international importance to antelope conservation (Figs. 2-1 and 2-2), but apart from the Zakouma, Siniaka Minia and Manda protected areas the country's wildlife is generally unprotected and in decline (Scholte 1997). Water point development poses the principal threat to the remaining areas of relatively undisturbed natural habitats, by opening up previously unexploited or marginally exploited areas to large numbers of livestock. The resulting degradation of rangelands results in the disappearance of wildlife. Under pressure from external donors such as the World Bank and French and Netherlands bilateral cooperation, many interventions in the field of livestock development have been accompanied by rangeland ecological assessment studies. Areas which are still "underexploited" by livestock have been identified and mapped, but these do not take into account the need to preserve wildlife (Scholte 1997). In addition, water point development has continued in areas already provided with sufficient water points to achieve optimal rangeland utilisation by livestock, indicating that other, less rational motivations continue to dominate land-use planning.

Recently efforts have been undertaken to open up the less intensively exploited rangelands to livestock, most notably in the Ouaddai and eastern Salamat regions but also in Chari-Baguirmi, putting further pressure on the remaining wildlife populations (Scholte 1997). The dramatic improvement in the security situation in most parts of the country since 1993 has stimulated interventions and assistance by international donors, but Chad will soon become another country which has lost its former wildlife riches unless the wildlife authorities become more involved in land-use planning. The remaining fauna is also threatened by parties of foreign Arab hunters who commenced hunting in Chad in the early-mid 1990s. These activities were recently terminated as a result of a public protest, but the threat of their resumption remains (Scholte 1997).

*17.Cameroon*

Cameroon is one of the most ecologically diverse countries in Africa, extending from dense equatorial forest in the south to dry savanna and sahel in the north. This is reflected in the country's exceptional biodiversity. Several areas have been identified as having outstanding international importance for the conservation of antelope communities, viz., Bouba Ndjida, Benoue and Faro National Parks and the adjoining hunting zones in the savanna woodlands of North Province, Waza National Park in the sahel savanna and floodplain of Far North Province, Korup National Park in the southwestern medium-altitude evergreen forest, Dja Reserve in the southern lowland evergreen forest, Campo Reserve in the southwestern coastal forest, and the proposed Lobeke-Mongokele reserve in the southeastern semi-deciduous forest (Fig. 2-1). The northern wildlife areas are also important for the conservation of the region's threatened antelopes (Fig. 2-2).

The national parks of northern Cameroon, particularly Waza, were formerly better protected than most other national parks in West and Central Africa. During the early 1980s, the environment was

given lower priority and the levels of protection and management of the northern parks declined. At the same time, human populations in areas such as North Province increased as people were resettled from the overpopulated extreme north of the country. The resulting increases in illegal hunting and expansion of cattle grazing and agriculture coincided with a severe rinderpest outbreak in northern Cameroon in 1982-83, which significantly reduced wildlife populations. Subsequently there has been some recovery of wildlife numbers, but the populations of most species in Bouba Ndjida, Benoue and Faro National Parks are now substantially lower than in the 1970s (Planton et al. 1995). These national parks are surrounded by the 26 hunting zones of North Province, of which nearly half are run as trophy hunting concessions under multi-year leases by professional hunters. More regular patrolling of some of these hunting zones over the past 10-15 years has resulted in higher wildlife densities than in the adjacent national parks, although some hunting zones which are not leased are now severely encroached by settlement and cultivation and suffer from uncontrolled poaching. Overall, the national parks and contiguous hunting zones of North Province form a 30,000 sq km mosaic of areas in which the status of natural habitats and wildlife populations varies from severely encroached and depleted to intact and well protected. Much of the natural habitat is still in good shape, and collectively North Province's national parks and hunting zones comprise one of the most important savanna wildlife areas remaining in Africa (Fig. 2-1 and Appendix 1).

Waza National Park in the northern sahel savanna continues to support internationally significant wildlife populations, despite problems of poaching, growth of the surrounding human population and the impacts of the Maga dam on the natural flooding regime of the Waza-Logone floodplain. Some of the southern forest areas are also of very high international significance in wildlife conservation, e.g., the Lobeke region in the southeast, but human populations are expanding in southern Cameroon, hunting of forest wildlife for bushmeat is uncontrolled, and the rapid expansion of logging into the country's last extensive, undisturbed forests in the southeast poses a major environmental threat (Planton et al. 1995; Usongo & Curran 1996).

Factors operating against attempts to improve the management of protected areas include decreased salaries and lack of recruitment of civil servants, reduced expenditure on resources for protected areas, and increased prices for imported equipment as a result of the country's economic difficulties and the 1994 devaluation of the CFA franc. By the early 1990s, there was little or no patrolling or anti-poaching activity in most of the country's protected areas (Dublin et al. 1994). The recently established Ministry of Environment and Forests (MINEF) has overall responsibility for wildlife, national parks and reserves.

Cameroon's rich biodiversity has attracted substantial support from international donors for the development and implementation of more effective conservation programmes (Planton et al. 1995; Lapuyade 1996; Usongo & Curran 1996). These include external assistance to all of the country's protected areas shown in Fig. 2-1 and to some additional areas. In some cases, progress on these projects has been delayed by factors such as institutional weakness in the capacity of MINEF, lack of a national biodiversity strategy to guide conservation planning at individual sites and weak financial management (Lapuyade 1996; GEF 1997). Effective, medium to long-term international assistance will nevertheless be essential for successful biodiversity conservation in Cameroon (Lapuyade 1996).

### *18. Central African Republic*

The Central African Republic (CAR) is one of the most important wildlife countries in Africa (Fay et al. 1990). Much of CAR is undeveloped and the relatively low-density human population lives mainly in the western and south-central regions. Natural habitats remain intact over very large areas, because of the low numbers of people and the absence of pressures from settlement and livestock. A vast region of about 300,000 sq km in the north and east, covering almost half the total area of the country, has extremely low human population densities and remarkably undisturbed natural vegetation, and is one of the last great wildernesses of Africa. This region extends from the dry savanna woodlands, floodplains and gallery forests of Manovo-Gounda-St. Floris and Bamingui-

Bangoran National Parks and adjoining hunting zones in the north through the denser, moister savanna woodlands and more extensive gallery forests of the Chinko River Basin and other areas in the east to Bangassou Forest in the southeast. Large parts of this vast region, e.g., the Chinko Basin, comprise well watered, uninhabited pristine wildlife habitat (Blom et al. 1995; East & Chilvers 1995; Blatz 1996). The 16,000 sq km Bangassou Forest is in fact a mosaic of dense forest patches, gallery forest, secondary forest and savanna. This region formerly supported a larger human population and has been affected by extensive shifting cultivation and forest clearance for coffee plantations. Since the collapse of the coffee industry, the forest has been recolonising many areas deforested in the past, and Bangassou currently supports significant populations of both forest and savanna wildlife species (Ottow et al. 1997). The dense forests of Dzanga-Sangha and Dzanga-Ndoki in the southwest contain extensive areas of undisturbed equatorial forest which supports high densities of wildlife (Fay et al. 1990; Blom et al. 1995). All of these areas are of outstandingly high international importance for the conservation of antelopes (Fig. 2-1) and other wildlife (e.g., Appendix 1).

Wildlife-based tourism is in its infancy in CAR, which lacks the economic resources to develop the infrastructure for large-scale tourism. In contrast, trophy hunting is well developed and most of the country's wildlife areas are zoned as hunting concessions which are operated by professional hunters. Licence fees from international trophy hunters provide a significant source of income for the government, and the long-term potential of safari hunting as a sustainable source of foreign exchange is high. The low numbers of people and absence of settlement pressures over vast regions will enable CAR to retain extensive wilderness areas for much longer than more densely populated countries, offering opportunities for biodiversity conservation that are now almost unique in Africa. Trophy hunting, managed with the participation of and benefits to local people where possible, provides the only realistic prospect for generating the revenue required to support successful long-term wildlife conservation in much of CAR.

This potential is being eroded by the steady loss of most of the country's spectacular wildlife resources because of uncontrolled poaching. For the last 20 years, gangs of meat hunters from neighbouring Sudan and Chad have invaded the country with little or no restriction, and additional poaching by local people occurs in some areas. Sudanese poachers have now wiped out most of the larger wildlife species over extensive areas in the east, from Birao in the north to Bakouma in the south (F. Duckworth, in litt. January 1998), and the uncontrolled spread of Sudanese poachers in the Chinko Basin (East & Chilvers 1995) forced the suspension of safari hunting in this area in 1997. Trophy hunting continues to operate successfully in regions such as the north (F. Duckworth, in litt. March 1998; R. & B. Lubin, pers. comm. October 1998) and the southwest. The potential for recovery of wildlife populations in depleted areas is immense, since resident humans and livestock are virtually absent from large areas and the natural vegetation is in near pristine condition. Wildlife populations could recover quite quickly if poaching was brought under control.

International support for wildlife protection and management has focused mainly on the wildlife areas in the north and southwest. The EU-funded "Programme de Developpement de la Region Nord" (PDRN) commenced in 1988 with the aim of improving the management of the two large northern national parks and integrating the sustainable utilisation of wildlife resources with this region's economic development. Over the last 10 years, the PDRN has been successful in protecting the wildlife populations of about 30% of the area of Manovo-Gounda-St. Floris National Park, where there have been frequent armed battles between game guards and poachers, but the wildlife populations of the remainder of Manovo-Gounda-St. Floris and almost all of Bamingui-Bangoran National Park have been reduced to low levels. These depleted areas are close to the Chad border, across which Chadian poachers have unrestricted access. In the southern part of the northern region, more distant from the Chad border, the PDRN has developed community-based wildlife conservation and utilisation in the Sangba Pilot Zone, which lies east-southeast of Bamingui-Bangoran National Park. Healthy populations of most wildlife species survive in this zone and in adjoining hunting concessions, as a result of the successful exclusion of both Sudanese and Chadian poachers by the PDRN (Blom et al. 1995; J. Lobao Tello, in litt. August 1995, October 1997; F.

Duckworth, in litt. March 1998; R. & B. Lubin, pers. comm., October 1998). However, the second phase of the PDRN is scheduled to conclude in December 1998, and the important gains made by this project over the last decade are fragile in view of the continuing threat posed by foreign poachers, the decline of CAR'S economy and the inability of the government to assume responsibility for continuing the actions initiated by the PDRN.

In the southwest, the ongoing WWF project and funding support from organisations such as GTZ, USAID and WCS have enabled good progress to be made in establishing protection of Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park, which were officially designated in 1990 (Blom et al. 1995; A. Blom, in litt. August 1997). These southwestern protected areas are sufficiently distant from the Sudan border to be generally out of the reach of Sudanese poachers. In addition, the N'gotto Forest at the northern edge of the southwestern forest zone is one of the sites of the EU-funded ECOFAC project.

The conservation projects in the north and southwest suffered various setbacks but continued to operate during the political instability and army mutinies which affected Bangui in 1996-97. There is also a need to develop wildlife conservation in Bangassou Forest and Chinko Basin (see p. 38). Wildlife is the only significant natural resource in many regions of CAR, and continued international support for conservation programmes will be essential if the country is to benefit in the long term from its rich wildlife resources. Effective application of anti-poaching and security measures are an essential pre-requisite for the successful implementation of community-based management of wildlife (Blom et al. 1995; Ottow et al. 1997).

*19. Equatorial Guinea*

Equatorial Guinea comprises a mainland enclave (Mbini, or Rio Muni) and a number of islands, of which only the largest (Bioko) supports antelopes. Extensive areas of Mbini and Bioko are covered with primary and secondary forest which supports internationally significant wildlife populations (Castroviejo et al. 1990; Fa 1992). The country faces severe financial difficulties and commercial logging is seen as the key to boosting the economy. Increased timber extraction rates are likely to result in more rapid degradation of the remaining blocks of forest, including increased encroachment by itinerant agriculture and greater hunting pressures on wildlife. Much of the animal protein consumed in urban centres in Mbini and Bioko is derived from hunting forest wildlife and the demand for bushmeat appears to exceed the supply (Juste et al. 1995). Extensive areas are sparsely populated. Faunal impoverishment in forested areas is unlikely to occur while hunting is for subsistence only, but this situation is changing rapidly as the urban population's demand for bushmeat increases. With the greater availability of shotguns, improved communications and transport, subsistence hunting is giving way to anarchic exploitation of wildlife for the commercial bushmeat trade.

Serious conservation efforts were not initiated in Equatorial Guinea until 1985, when a project on biological research and nature conservation commenced with funding from Cooperacion Espanola. This project and subsequent activities have been undertaken by scientists from Donana in Seville, Spain. The project recommended a network of protected areas, including five in Mbini and two on Bioko (Castroviejo et al. 1990). These protected areas were designated by the government in 1988, but to date only one of them, Monte Alen National Park, has received effective protection. Monte Alen is one of the sites of the EU-funded ECOFAC programme, which is operating in five Central African countries. This park is situated in the Niefang Mountains of west-central Mbini and is of major importance for large mammals (Castroviejo et al. 1990). Its fauna includes a high diversity of primates (Garcia & Mba 1997) and an internationally significant antelope community (Fig. 2-1). Conservation measures at Monte Alen commenced in 1992 at the start of the ECOFAC project, which is implemented by AGRECO-CIRAD Foret and the Asociacion Amigos del Coto de Donana. Development of the park's basic infrastructure, surveillance activities and control of access to shotguns have contributed to the mitigation of hunting pressures. Trapping of duikers and other wildlife still occurs, but the park's antelope populations are generally stable or increasing (L.

Arranz & N. Mangue, in litt. April 1 998).

The Pico Basile and Gran Caldera de Luba protected areas which cover almost half of Bioko Island contain substantial areas of undisturbed lowland and montane forest. Wildlife surveys conducted on Bioko in 1986-90 found a relatively intact fauna and flora. This had resulted from two decades of political, security and economic difficulties, a drop in the human population, removal of most firearms from civilians and abandonment of cocoa plantations, rather than from any active conservation measures (Butynski et al. 1995). Estimated annual hunting offtake of Bioko's two antelope species in 1990-91 were about 10,000 blue duikers and about 4,000 Ogilby's duikers. Offtake levels had appeared to be sustainable in the mid-1980s. In contrast, the considerable increase in hunting pressure which has occurred in the 1990s to supply the bushmeat markets of Bioko's urban centres appears to have increased the exploitation of Ogilby's duiker to unsustainable levels (Butynski et al. 1995).

Expansion of the conservation efforts at Monte Alen National Park to other designated protected areas on the mainland and to Pico Basile and Gran Caldera de Luba on Bioko Island, more training of national staff in forest protection and management, expansion of the legal framework for conservation, implementation of the sustainable use of wildlife, development of alternative sources of protein, conservation education programmes and the development of ecotourism must all be put into effect if Equatorial Guinea is to retain its important wildlife resources (Castroviejo et al. 1990; Fa 1992; Butynski et al. 1995; Garcia & Mba 1997).

*20.Gabon*

Gabon has one of the lowest human population densities in Africa and retains extensive areas of natural forests. Biologically it is one of the most important countries in Africa and an important reservoir of forest wildlife (McShane 1990; Said et al. 1995). Forest antelope populations are depleted in the immediate vicinity of settlements, but remain in near pristine condition over the extensive areas of the country where hunting pressures are low because of remoteness from roads and human habitation (Blom et al. 1990; Lahm et al. 1996). Areas such as the semi-evergreen moist lowland forest and forest-savanna mosaic of the Lope Reserve, the forests, swamps and coastal scrub and savanna of the Wonga-Wongue Reserve and the Gamba protected area complex, and the Minkebe, Mingouli and Djoua Forests in the northeast are of outstandingly high international importance for the long-term survival of equatorial forest antelope communities (Fig. 2-1).

Gabon's abundant wildlife resources are a product of low human population densities rather than active protection and management. The status of large areas of the country as an uninhabited wilderness is changing rapidly as economic development proceeds, and wildlife is highly vulnerable to the expansion of settlement into previously uninhabited forests. Forest exploitation, mainly by selective logging, has increased rapidly since the mid-1980s. Large areas of the formerly remote interior are now being opened up by logging, mining and oil exploration roads. This in turn opens up previously inaccessible regions to meat hunters and settlement. Regions such as Djoua and Minkebe still have large areas of uninhabited, unexploited forest, but they are now settlement frontiers with increasing economic activity based on exploitation of forest resources. Hunting and trapping for both subsistence and commercial purposes is creating intense pressure on wildlife populations within 2 to 5 km of villages and roads (Lahm 1993a, 1993b, 1995a).

The government's focus is on maximising the exploitation of natural resources to counter the country's high external debt, and conservation of wildlife and natural ecosystems is a low priority. None of Gabon's existing protected areas is legally protected from logging and most are critically understaffed and underfunded. There is little scope for the Ministry of Water and Forests, which includes the country's forestry and wildlife departments, to improve law enforcement and wildlife protection and management unless existing limitations in staff, resources and capacity are addressed comprehensively (Dublin et al. 1994). A notable exception to the general trend is the Lope Reserve, where good progress is being made in improving management, surveillance and

reserve development as a result of the EU-funded ECOFAC programme (Lahm et al. 1996). However, much of this reserve is either being or is scheduled to be logged selectively, and the number of staff is inadequate to effectively monitor the entire 5,000 sq km area.

Gabon's significance to biodiversity conservation is increasingly attracting other international support, e.g., from donors such as the World Bank, GEF and WWF. This includes support for attempts to develop protected areas and sustainable utilisation of wildlife. Attempts are also being made to improve the infrastructure, organisation and professional capacity of the Ministry of Water and Forests, as a step towards developing surveillance of logging and hunting to the level required to implement the country's legislation regulating the exploitation of natural resources. Most of these externally supported projects are either still at an early stage of implementation or have made only slow progress, but their success will be vital to Gabon's retention of its rich wildlife resources. As in other countries, the future of wildlife conservation in Gabon ultimately lies in the capacity of national agencies to fulfil their management role effectively and efficiently (Lapuyade 1996).

*21. Congo Republic (Congo-Brazzaville)*

The Congo Republic (Congo-Brazzaville), also known as the Republic of Congo, is the second most densely forested country in Africa, after the Democratic Republic of Congo (Congo-Kinshasa). In addition to extensive closed-canopy forests, there are large areas of apparently natural forest-savanna mosaic in the centre and south of the country. Hunting for bushmeat provides a lucrative source of income for hunters and is a major source of protein for a large section of the population, which lives mainly in the south, between Brazzaville and the coast. The relatively high densities of people in the south have resulted in greatly depleted wildlife populations, caused by intensive, widespread hunting plus extensive forest exploitation and agricultural expansion. Hunting pressures are high and increasing in unprotected areas of the southern forests and savannas and only two species of game, the blue duiker and brush-tailed porcupine, remain relatively common in areas such as the Mayombe Forest and the Point Noire region (Wilson & Wilson 1991). Populations of all other larger mammal species have declined to low levels or disappeared. Recent attempts to redress this situation have focused on the development of the Conkouati, Dimonika and Lefini protected areas, where levels of protection and management currently vary from nil to moderate (Stockenstroom et al. 1997).

In contrast to the south of the country, northern Congo-Brazzaville is among the most sparsely populated regions of Africa and retains extensive areas of closed-canopy forest. Habitat destruction is not yet an immediate threat to the wildlife of the northern forests, although exploitation by logging companies is increasing. Hunting pressures on antelope populations remain low in extensive areas of the north, but are increasing as logging activities expand and meat hunters penetrate deeper into previously undisturbed forests. The area of undisturbed forest is decreasing rapidly and hunting of wildlife to supply bushmeat to settlements and logging camps is becoming increasingly pervasive. Some areas in the north retain an exceptional abundance of wildlife and are the sites of current efforts to establish effective protected areas and sustainable wildlife utilisation in this region, notably Nouabale-Ndoki National Park and the adjoining Kabo and Pokola forestry concessions, Odzala National Park and adjoining reserves, and the Lake Tele-Likouala-aux-Herbes protected area (Stockenstroom et al. 1997). These areas are among the most important in Africa for the conservation of antelope communities (Fig. 2-1).

External support from agencies such as EU, GEF/World Bank, WCS, USAID and WWF-US has enabled the protection of Odzala and Nouabale-Ndoki to reach relatively high levels. Creation of benefits for local communities from the development of sustainable international trophy hunting and managed subsistence hunting in the forestry concessions adjoining these national parks are key components of the overall development of effective conservation and management of natural resources (Stockenstroom et al. 1997; Eves & Ruggiero, in preparation). In the Kabo forestry concession adjoining Nouabale-Ndoki National Park, heavy forest exploitation has occurred since this

concession was taken over by the large German logging company CIB in 1997, but general wildlife trends indicate that healthy wildlife populations are co-existing with intensive logging, controlled subsistence hunting and safari hunting (Congo Safaris 1997b). Whereas the Kabo and Pokola forestry concessions are being transformed by logging and hunting activities, the adjoining Nouabale-Ndoki National Park contains one of the last extensive areas of undisturbed pristine forest remaining in Africa.

Heavy fighting occurred between rival political factions in southern Congo-Brazzaville during the civil war which lasted from June to October 1997. This conflict destroyed most of the capital, Brazzaville, but had very little effect on the north of the country. Expatriate staff were temporarily withdrawn from the EU-funded ECOFAC Odzala project and the WCS/GEF Nouabale-Ndoki project, but the basic activities of these projects were not significantly disrupted. At Odzala, for example, surveillance of salines and river access and maintenance of infrastructures were continued from neighbouring Gabon throughout the civil war in Congo-Brazzaville (C. Aveling, in litt. February 1998). Safari hunting was successfully resumed in the Kabo and Pokola Forests in September 1997 (Congo Safaris 1997b), and expatriate technical assistants and researchers had returned to Odzala and Nouabale-Ndoki National Parks by January-February 1998.

Consolidation of the major progress made during the last 5 to 7 years in the development of effective protected areas and sustainable utilisation of wildlife in northern Congo-Brazzaville is a very high international conservation priority (Stockenstroom et al. 1997).

*22. Democratic Republic of Congo (Congo-Kinshasa)*

The Democratic Republic of Congo (Congo-Kinshasa, formerly Zaire) is one of the largest countries in Africa and contains over half of the continent's remaining tropical moist forests (Sayer et al. 1992). Wildlife has been greatly reduced or eliminated in the more densely populated regions of the country, e.g., the main agricultural areas in the southwest, the northwest and on the lower slopes of the eastern mountains, but relatively undisturbed natural vegetation persists over extensive areas. The commercial bushmeat trade is unregulated and hunting pressures on antelopes and other wildlife are increasing as human populations expand, but there are still large areas of forest with important wildlife populations. Examples include the Lomami Forests south of Opala, the Itombwe Forest in the east and most of the country's protected areas (von Richter et al. 1990; Wilson 1992; Hillman Smith et al. 1996).

After independence was gained in 1960, a series of internal conflicts and corruption up to the highest levels of government seriously weakened the country's infrastructure. Large regions became cut off from central government control. Throughout this period, the Institut Zairois pour la Conservation de la Nature (IZCN), now Institut Congolais pour la Conservation de la Nature (ICCN), which is responsible for managing national parks and hunting areas, maintained the integrity of most of the national parks and extended the protected area system. IZCN's operations became more difficult than usual during occasional periods of civil disturbance and frequently suffered from lack of resources, but support from external donors played a key role in assisting IZCN to continue to function.

The country's protected areas include some of Africa's largest and most spectacular national parks. Garamba in the northeastern savannas, Kahuzi-Biega in the eastern equatorial and montane forests, Salonga in the central lowland equatorial forest and Virunga in the Rift Valley region in the east are included in the UNESCO World Heritage List as being of outstanding natural value. These and other protected areas such as Maiko National Park and Okapi Faunal Reserve in the eastern equatorial forests and Upemba and Kundelungu National Parks in the southeastern savanna woodlands are of major international importance for the conservation of antelope communities (Fig. 2-1).

Hillman Smith et al. (1996) reviewed the status of the country's protected areas. In Garamba

National Park and the adjoining reserves, a conservation project which commenced in 1984 with funding by WWF, FZS, UNESCO and IUCN, in cooperation with IZCN, resulted in highly effective protection for the southern third of the park. Despite this progress, poaching by Sudanese meat hunters and the needs of 50,000 Sudanese refugees who have settled in the immediate vicinity since 1991 are creating major challenges for the future of this park. Virunga National Park benefited substantially from a major EU-funded programme which assisted IZCN to protect and develop the park from 1988 to 1991. EU activities in the country were then suspended because of political and civil disturbances in Kinshasa. The southern section of Virunga National Park was subsequently subjected to deforestation and meat hunting by hundreds of thousands of refugees who fled from neighbouring Rwanda in 1994. In response, external assistance to IZCN's efforts in Virunga from organisations such as EU, GEF, GTZ, UNESCO and UNDP recommenced in 1994-95, but poaching remained a major problem throughout much of the park. Okapi Faunal Reserve was established in 1992 in the central Ituri Forest. Considerable progress has been made in the Okapi reserve over the last 10-15 years with support from agencies such as WCS, the Howard Gilman Foundation and WWF. This area is also protected by its remoteness from major urban centres. About two-thirds of the Okapi reserve is subjected to some degree of subsistence hunting, but only a small part of the reserve is heavily hunted at present. The remaining one-third of the reserve receives almost no hunting pressure (J. Hart, in litt. December 1995). Subsistence-level exploitation of bushmeat may, however, not be sustainable in the long term if the region's human population continues to grow at its present rate (Wilkie et al. 1998).

Kahuzi-Biega National Park has received external support through collaborative projects between IZCN and GTZ (commencing in 1985) and WCS (commencing in 1 994). The 600 sq km montane forest sector in the east of this park has suffered from heavy poaching pressure, exacerbated by the influx of several hundred thousand Rwandan refugees into the region in 1994. Hunting pressures are much lower within the > 10,000 sq km of lowland forest in the west of Kahuzi-Biega National Park and the adjoining Babira-Bakwame Forest, except near roads, villages and mining camps. Maiko National Park has only marginal presence of IZCN personnel but this park has been protected effectively from poaching and habitat destruction by its isolation and very low density of humans (Hart & Sikubwabo 1994). The relative security and isolation of Maiko is likely to be breached by completion of a paved section of the trans-African highway linking Kisangani with Bukavu, which will pass within 5 km of the park's southern boundary. This will inevitably result in major increases in immigration, forest clearance and meat hunting. IZCN also has a marginal presence in the vast Salonga National Park in the central Congo Basin. This park has been largely under the control of heavily armed gangs of elephant and hippo poachers since the 1 980s, but there are very few resident people over most of the area. Salonga still comprises an intact and largely undisturbed lowland forest ecosystem and poaching has had only a very localised impact on antelope populations. This park was selected as one of the sites for the EU-funded ECOFAC programme which commenced in 1 992 in six Central African countries (including what was then Zaire). The Salonga component of ECOFAC did not eventuate because of the political situation in the country.

Unlike most of the country's other national parks, for which formal arrangements of ownership were signed when they were gazetted, Upemba and Kundelungu National Parks in the southeast were simply ceded for use as conservation areas and still belong to the local people. Apparently there has never been hard-line control of poaching in Upemba and Kundelungu, where IZCN could not shoot poachers following warnings as they were permitted to in other national parks. During political disturbances in Shaba/Katanga in the early 1990s, local politicians and regional authorities declared that people could move back into these two parks and hunt and cut firewood. IZCN staff had to more or less abandon the parks, and the wildlife populations of Upemba and Kundelungu have decreased dramatically (Hillman Smith et al. 1996).

Information on the status of wildlife outside protected areas is fragmentary, but that which has been obtained by the ASG over the last 10 years from sources such as IZCN, zoologists engaged in surveys of elephants and other wildlife, missionaries, aid workers and other travellers, indicates that some unprotected areas retain important wildlife resources. In the equatorial forest zone, for

example, which covers more than half of the country, intensive hunting for meat has greatly reduced or eliminated antelope populations within 5 to 15 km of settlements, roads and the larger navigable rivers, but extensive areas of sparsely inhabited lowland forest remain and most forest antelope species still occur widely. In contrast, extensive areas of the eastern highlands are now densely settled, with widespread destruction of natural habitats by the spread of settlement and intensive hunting of wildlife populations, e.g., in the highlands to the west of Lake Edward (Sarmiento & Butynski 1997b). There are also extensive areas of the forest-savanna mosaic zone, which covers vast areas to the north and south of the equatorial forest, which are now largely or completely devoid of the more easily hunted antelope species. The same applies to most of the southeastern savanna wodlands, because of widespread meat hunting to supply the region's mining towns (von Richter et al. 1990).

In 1996-97, forces led by Laurent Kabila routed Zairean government troops and the interahamwe Rwandan Hutu militia, which had maintained an iron grip on the vast refugee camps in the east of the country since they were established in 1994. This resulted in desertion of the refugee camps and the return of large numbers of Hutu refugees to Rwanda, reducing the pressures from these camps on protected areas such as Virunga and Kahuzi-Biega. Other groups of refugees moved westwards into Zaire and have spread as far west as northern Congo-Brazzaville and Gabon. The Kabila-led forces subsequently swept through the rest of Zaire, took over the government from the defeated forces of Mobutu and renamed the country the Democratic Republic of Congo. During and subsequent to this period of armed conflict, protected areas such as Garamba, Okapi, Kahuzi-Biega and Virunga have been affected by evacuation of expatriate staff, partial occupation by military forces and/or refugee populations, ongoing military operations against itinerant interahamwe militiamen, loss of protection, and/or destruction of protected area infrastructure and equipment during the widespread looting by retreating soldiers and mercenaries who were fighting for Mobutu (Hart & Hart 1997; Winter 1997b; S. Shurter, in litt. March 1998).

The major setback to wildlife conservation in the eastern protected areas caused by these events has been countered to some extent by the courage and initiative of local conservation staff, e.g., in continuing or resuming anti-poaching patrols in areas such as Virunga and Garamba National Parks (Hart & Hart 1997; Smith & Smith 1997; Winter 1997b). External support to local Congolese staff in areas such as Garamba and the Okapi reserve was maintained throughout the period of conflict.

The new government in Kinshasa must overcome major challenges if it is to rehabilitate the country. Conservation and sustainable utilisation of wildlife have the potential to contribute significantly to economic recovery, e.g., through rehabilitation of protected areas as a basis for tourism, and development of sustainable trophy and subsistence hunting, particularly as Congo-Kinshasa retains a major part of the African continent's remaining forests and forest wildlife. If political stability is re-established, it is likely that pressures on wildlife will increase. International logging companies, for example, have been reluctant to risk investment in the country because of political uncertainties, but the new government may encourage logging as a means to salvage the economy. By mid-1998, when this report was prepared, the Kabila government had not formally agreed to allow any conservation NGOs to resume work in the country, but negotiations were continuing to enable technical assistance to long-term conservation projects to resume in areas such as Garamba and Ituri.

In early August 1998, a new army rebellion was reported in the east of the country and there was civil unrest in the major cities of the western and central regions, Kinshasa and Kisangani. By mid-August, rebel forces were reported to be in control of one-third of the country, including the western seaboard. The Kabila government subsequently repelled the rebel advances in the west with assistance from the armies of countries such as Zimbabwe, Angola and Namibia, but fighting continued in the east.

*23. Sudan*

Sudan is the largest country in Africa. It covers 2.5 million sq km and extends from waterless deserts in the north to moist savannas, floodplains, swamps and forest in the south. The wildlife of northern and central Sudan has suffered severely from habitat destruction, desertification, expansion of human and livestock populations and overhunting (Hillman & Fryxell 1988; Ahmed et al. 1991; Hassaballa & Nimir 1991; UNDP 1994). Pressures of uncontrolled hunting have been extremely high in some localities, as a result of massive hunting expeditions by Saudi royalty (Cloudsley-Thompson 1992). The conservation status of protected areas is generally poor, with inadequate staffing and infrastructure, lack of control of poaching and encroachment by settlement, cultivation and livestock. Radom National Park in the west, for example, has been affected since the mid-1980s by displacement of people from the north by desertification, which has resulted in substantial migration to the Radom area. The park has been encroached by settlement and cattle grazing, and has suffered from intensive, commercial-scale poaching for meat (El Badawi & Hakim 1991; Hashim 1995). As a result, Radom's wildlife populations have generally been reduced to low levels. Buffalo and the larger antelope species have decreased to the point of local extinction or have already disappeared (Hashim 1996b). Dinder National Park in the east, which is one of the few areas in Blue Nile Province where wildlife survives (Hassaballa & Nimir 1991), has suffered severely from the effects of agricultural development of the surrounding areas, poaching, livestock encroachment and uncontrolled burning (El Badawi & Hakim 1991; Ernst & Elwasila 1991). Dinder's wildlife has declined dramatically since the early 1960s, although viable remnants of most species persist (Habibi 1994; Hashim 1996b). Despite the widespread destruction of wildlife in northern and central Sudan, parts of these regions are still of international significance for the conservation of threatened antelopes (Fig. 2-2).

In the 1980s, southern Sudan had a greater abundance of antelopes than almost any other part of Africa (Hillman & Fryxell 1988). This region was virtually isolated from the rest of the world during the protracted civil war that lasted from 1957 to 1972. Subsequently, the Addis Ababa Accord of 1972 brought 11 years of peace between the country's warring factions. Considerable progress was made in the south during this period in initiating wildlife conservation, including the first steps in establishing or rehabilitating protected areas such as Boma, Badingilo and Southern National Parks, which are of major international importance in antelope conservation (Fig. 2-1).

In 1983, the resumption of the civil war between the Khartoum government and southern rebel forces halted international assistance to southern Sudan's embryonic conservation programme. The war in the south of the country has continued throughout the intervening 15 years, with little or no prospect of its end in sight. The 1957-72 civil war was fought with spears and magazine rifles, rural populations took refuge in towns or outside the country, and wildlife was still plentiful when the war ended in 1972. In contrast, the current civil war which started in 1983 is being fought across the region's rural areas with automatic weapons and, increasingly, vehicles. As a result, wildlife is now in decline throughout southern Sudan, probably on a massive scale (Spinney 1996; Winter 1996, 1997a, 1997b). Incidental observations by aid workers and information from local rural people indicate that substantial remnants of the region's wildlife survive, particularly in the extensive areas where human population densities are extremely low. This highlights the urgency of conducting surveys of the region's key wildlife areas as the basis for devising conservation measures with local communities, in an attempt to ensure that the region's wildlife survives the war (Winter 1997a, 1997b).

*24. Eritrea*

Eritrea achieved independence in May 1993. This followed 30 years of warfare between the Eritrean People's Liberation Front and Ethiopian government forces, which ended in 1991. The long period of war took an unknown but probably high toll of the country's wildlife, especially larger mammals, but significant remnants persist (Hillman 1993; Butynski 1995; Hagos Yohannes, in litt.

January 1997; P. Moehlman, in litt. November 1997). The return of peace has provided Eritrea with the opportunity to rebuild its war-damaged infrastructure and economy, although fighting still flares occasionally in the region. In early 1996, for example, intermittent fighting intensified along the western border between Sudanese government forces and the Eritrean-based Democratic National Alliance which aims to overthrow the Khartoum government, and in mid-1998 a dispute with Ethiopia on Eritrea's southern border erupted briefly into military hostilities. Eritrea has already shown great resilience and initiative in tackling the major task of rebuilding and is placing great emphasis on self-reliance. This includes the National Environmental Management Plan, which aims to initiate the reduction of environmental degradation and promote environmental recovery.

During the Italian colonial period, the savanna bushland of the Gash-Setit area in the southwest harboured significant wildlife populations and contained two protected areas, Gash-Setit and Chire Wildlife Reserves. These reserves continued to exist, at least on paper, during the post-colonial period when Eritrea was part of Ethiopia (Hillman 1988). On the basis of historical data, the Gash-Setit area was identified as being of international significance for antelope conservation (Fig. 2-1). More recent observations indicate that much of the Gash-Setit area is heavily utilised by people and livestock, and large wild mammals are now very scarce (Butynski 1995; Litoroh 1997). Chire Wildlife Reserve, for example, has become severely degraded since many people moved into the area in the 1 980s, and it now has a high density of cattle and very little wildlife (Butynski 1995). However, the Gash-Setit area still contains significant remnant wildlife populations, including Eritrea's last few elephants (Litoroh 1997), and it has been proposed in the National Environmental Management Plan as the site of one of Eritrea's first two national parks. Detailed surveys are required to determine the status of natural habitats and wildlife populations in the more remote parts of the area which are 20 km or more distant from roads and villages (Butynski 1995).

Greater numbers of wildlife are known or suspected to survive in other regions of Eritrea. The Buri Peninsula area on the central coast, for example, which is proposed as the site of Eritrea's other initial national park, supports good and apparently stable numbers of Soemmerring's gazelle and reasonable numbers of dorcas gazelle (P. Moehlman, in litt. November 1997). The entire southern half of the coastal plain, from Massawa on the central coast to Assab near the Djibouti border, supports fairly good numbers of species such as Soemmerring's gazelle, dorcas gazelle and Salt's dikdik (Hillman 1993; P. Moehlman, cited by Butynski 1995; Hagos Yohannes, in litt. January 1997). This arid, 1,200 sq km region has few resident people because of its poor soils, high temperatures and lack of fresh water, and it probably holds some of Eritrea's best remaining wildlife populations (Butynski 1995).

Other important areas for wildlife include the Semanawi Bahri highlands to the north of Asmara, which contain Eritrea's last remnant (about 200 sq km) of mixed tropical evergreen forest and support a relatively diverse fauna and flora, and the vast, remote region of mostly rugged terrain which covers the northwestern third of the country. The latter region, which includes the Eritrean section of the Red Sea Hills and adjoining lowlands, has low human population density and probably retains some of the largest remaining wildlife populations in Eritrea (Butynski 1995). This region includes the former Nakfa and Yob Wildlife Reserves (Hillman 1988). Regions such as the northwest, the central and southern coastal plain and the southwestern savannas are of international importance for the conservation of threatened antelopes (Fig. 2-2).

Habitat degradation and drought have undoubtedly caused some loss of wildlife in Eritrea, but hunting to feed the combatants in the 30-year war probably had a greater effect (Butynski 1995). Large numbers of wild animals were taken as food by soldiers and others who were forced to live primarily off the land for the 30 years prior to 1991. Hence it is highly encouraging that the ban which has now been placed on hunting is being taken seriously by the public as well as by government officials. Butynski (1995) saw no evidence of hunting, either with guns or traps, during his field surveys. Other conservation measures already in place include restrictions of tree cutting, grazing and agriculture in areas such as Semanawi Bahri.

*25. Ethiopia*

Ethiopia's natural vegetation zones range from arid desert, open grassy plains and savanna woodlands to highland forest and Afroalpine moorlands. The wide range of climate, vegetation and terrain supports a spectacular diversity of antelope species, including unique forms endemic to the Horn of Africa. The remaining wildlife occurs mainly in the relatively thinly populated, arid to semi-arid lowlands which surround the country's two vast highland plateaux, and at the highest extremities of the mountains in Bale and Simien. Antelopes and other large mammals have suffered severely from the effects of overhunting by the heavily armed local populace, military operations (particularly in the east and north), habitat destruction caused by the activities of increasing populations of both nomadic pastoralists (throughout the northern, eastern and southern lowlands) and settled cultivators (Rift Valley and western lowlands) and severe droughts. Serious attempts at wildlife conservation were not initiated until the mid-1960s (Hillman 1988).

There are currently two gazetted national parks, seven proposed national parks (all of which have received some level of legal protection and development since the 1970s but have yet to be gazetted), 11 wildlife reserves and sanctuaries and 17 controlled hunting areas. These include areas of major international significance for the conservation of antelope communities, such as the Awash Valley in north-central Ethiopia, Omo and Mago National Parks in the southern lowlands, the southern Ogaden region in the southeast, Gambella National Park in the southwest and Bale Mountains National Park in the eastern mountains (Fig. 2-1). Many of the country's wildlife areas are also vitally important for the conservation of threatened species and subspecies, such as the endemic mountain nyala and Swayne's hartebeest (Fig. 2-2).

Active protection and management have occurred on only a limited number of protected areas, many of which have had major long-term problems of poaching and occupation by local people and their livestock. During the 1980s, the Ethiopian Wildlife Conservation Organisation (EWCO) made significant progress in some areas, e.g., Bale and Senkelle (Hillman 1988), but political disturbances kept protected areas in northern Ethiopia out of control of EWCO for much of the time. In 1991, there was a brief but widespread breakdown of law and order during the overthrow of the former government. During this period of lawlessness, EWCO suffered major losses in central and southern Ethiopia, e.g., looting and destruction of buildings and equipment in protected areas such as Bale Mountains National Park and the Senkelle Sanctuary. Wildlife was slaughtered indiscriminately, forests were destroyed, settlements were established in many protected areas and livestock grazing became commonplace within parks and sanctuaries (Shibru Tedla 1995). The new government has subsequently restored peace virtually throughout the country, which is steadily rebuilding its governmental and private sectors.

Many protected areas remain either largely or completely unstaffed, as a result of lack of trained manpower, funds and other resources. These problems are compounded by the complexity of land tenure and a general lack of public awareness of the value of the country's wildlife resources. By the mid-1990s, most of those protected areas which had an EWCO presence were afforded protection only within the immediate vicinity (e.g., 2 km radius) of park headquarters (Schloeder et al. 1997).

International trophy hunting was temporarily closed in 1993 but re-opened in 1996. In May 1996 the government transferred responsibility for management of most national parks from EWCO to regional government authorities. A government task force has identified the necessary actions to improve the management of protected areas and accommodate the needs of local communities who live in and around these areas, in order to arrest the massive destruction of wildlife habitats and drastic reduction in wildlife numbers which have been caused by decades of increasing human and livestock population pressure coupled with inappropriate land use (Shibru Tedla 1995). The extent to which these recommendations are put into effect will determine how much of the country's unique wildlife survives. Support from international donors for Ethiopia's wildlife conservation efforts increased substantially during the 1990s, e.g., Lapuyade (1996) identified 11 wildlife and protected area projects in Ethiopia which received a total of US$6.6 million in external support

during the period 1992-96. Despite this level of support, most projects have suffered setbacks of various kinds and, in general, only slow progress has been made in improving the protection and management of national parks and other wildlife areas (Schloeder et al. 1997). Wildlife conservation in Ethiopia still faces major challenges, but it is important to note that even threatened antelopes such as mountain nyala, dibatag and Swayne's hartebeest continue to exist in viable numbers. Their long-term future could still be assured by effective conservation measures.

*26. Djibouti*

The coastal enclave of Djibouti is covered mainly by semi-arid and arid grassland and scrubland, with relic patches of forest in highlands such as the Goda Massif. Natural habitats have been severely degraded through long-term overgrazing by livestock and excessive destruction of trees for firewood and charcoal, aggravated by severe droughts. Hunting also affected antelope populations prior to the early 1970s, when it was banned. By the mid-late 1980s, larger antelope species such as greater kudu and beisa oryx were on the verge of extinction but other species such as dorcas and Soemmerring's gazelles were showing signs of population recovery (East 1988; Laurent 1990). The hunting ban appeared to have reduced poaching to low levels, but the recovery of antelope populations was limited by competition with sheep and goats.

Widespread field expeditions in the southern 20% of Djibouti in 1991-96 indicated that the hunting ban is generally observed and that the country supports stable populations of several antelope species (Kunzel & Kunzel 1998; T. Kunzel, in litt. March 1998). Dorcas gazelle and Salt's dikdik are common, and Soemmerring's gazelle and gerenuk are uncommon. A major discovery of these expeditions was the first confirmation that the beira occurs in Djibouti (Kunzel & Kunzel 1998).

Apart from the ban on hunting, there have been no conservation measures for antelopes in Djibouti. Part of the Foret du Day on the Goda Massif was declared a national park but this has not been implemented because of lack of funds, and the area has suffered from forest destruction and overgrazing by livestock (East 1988; Kunzel & Kunzel 1998). A civil war-like situation between different political groups in Djibouti largely precluded access to the western and northern areas of the country between 1990 and 1996, but political security is returning following the ratification of a peace agreement between the government and the opposition (Kunzel & Kunzel 1998; T. Kunzel, in litt. March 1998). The hunting ban, the return of political stability and the presence of relatively good populations of several threatened, characteristic Somali-zone antelope species (Fig. 2-2) make Djibouti a potentially valuable regional centre for wildlife conservation. In 1997, IUCN's Eastern Africa Regional Office commenced the provision of technical assistance to the Djibouti government, to develop the GEF-funded National Biodiversity Strategy and Action Plan and to strengthen institutional capacity of government agencies for conservation and sustainable use of biodiversity.

*27. Somalia*

The Somali region has been an evolutionary centre of fauna and flora adapted to arid conditions. It contains many unique species, including antelopes such as beira, Speke's gazelle and dibatag. That part of the region which lies within the borders of Somalia formerly supported abundant wildlife populations but has suffered severely from long-term habitat degradation through human misuse. As a result of overgrazing, deforestation and uncontrolled slaughter of wild animals, Somalia's wildlife has declined greatly during the last 60 years. Despite these trends, significant remnants of the country's wildlife survived in the 1980s (Simonetta 1988).

Following wars with Ethiopia and then civil war, interclan strife has had a catastrophic effect on much of Somalia during the 1990s. Relatively little is known about the current status of wildlife. However, the available information indicates that some antelope species survive in reasonably good numbers. In the coastal plain, mountainous hinterland and Ogo Plateau of the Sanag region, which covers much of northern Somalia, surveys conducted in 1993-94 indicated that species such as

dikdiks and gazelles were still quite common, although others such as gerenuk and beira were uncommon or rare (Mohamud Ahmed Ayan 1994). This region's wildlife appeared to have been reduced drastically during the previous decade because of the increased availability of firearms, but there were signs in 1994 of some recovery of wildlife because of a reduction in the carrying of guns in response to reduced intertribal hostilities. Surveys conducted in April 1997 found that Speke's gazelle is locally common in the eastern and central Nugal Valley, and dikdiks occur in good numbers in the bushland of the Haud Plateau (P. Moehlman, in litt. November 1997). The central coastal plain and its hinterland supported significant antelope populations in the 1980s (Simonetta 1988; Thurow et al. 1995; Thurow 1996). This region includes the unique ecological zone of the Obbia coastal littoral thicket (Kingdon 1997). Some wildlife survives in this region, but it is increasingly under threat because of movement into parts of the coastal zone by people displaced by the civil war (Osman Gedow Amir, in litt. June 1996).

Good wildlife populations are reported to survive in Bush Bush National Park and adjoining areas of Badhadhe District in the Lower Juba region, in the extreme south of the country, including species such as buffalo, bushbuck, lesser kudu and hirola (Bashir Sheikh Mohammed, cited in Estes 1995a; J. Bauer, pers. comm. to T. Butynski, in litt. April 1997). This southernmost region of Somalia was heavily poached for elephants and other game animals until 1989, when interclan hostilities and the civil war prevented access by the Marehan clan, which was largely responsible for the poaching. Wildlife survives mainly in areas of dense bush which have been largely emptied of people by the fighting (Estes 1995a).

The regions of Somalia where wildlife is known to survive are of international significance in antelope conservation (Figs. 2-1 and 2-2). Despite the breakup of the country into areas controlled by rival clans, the lack of central government and ongoing security problems, some conservation action is possible. The Bush Bush National Park area of Badhadhe District, for example, has benefited from patrols by former game rangers, reconnaissance flights and an escort system which have operated since 1991 under a programme implemented by Eco Terra International (Said et al. 1995). The community development NGO, Community Services Somalia, is involved in the resettlement of Badhadhe District and is concerned for environmental protection and wildlife conservation (Estes 1995a). In 1997, IUCN's Eastern Africa Regional Office initiated a Somalia programme. The Somalia Ecological Society, which was active in the country's embryonic conservation efforts in the 1980s, has been re-established and has sent teams to both northern and southern Somalia to evaluate working conditions (J.-O. Heckel, in litt. June 1998).

*28. Uganda*

Human population densities are relatively high in Uganda. Examples of natural ecosystems are now largely restricted to protected areas, especially in the south. An effective system of conservation areas was established in the 1950s and 1960s and formed the basis of a substantial tourism industry. Tourism ceased with the civil strife and breakdown in law and order which occurred in the 1970s and early 1 980s. This also had severe consequences for the country's wildlife and protected areas. Political stability has returned to Uganda since the Museveni government came to power in 1986. While there is still some LRA rebel activity in the northern third of the country, peace has been restored in central and southern Uganda, good progress has been made towards rebuilding the country's infrastructure and economy, and wildlife conservation and the tourism industry have been revitalised. In 1996 the government established a new institution, the Uganda Wildlife Authority (UWA), which is responsible for the conservation and management of wildlife within and outside protected areas. UWA is formulating and implementing a wildlife conservation policy which stresses both the fundamental importance of preserving Uganda's rich biodiversity and the need for local communities to become involved in and benefit from wildlife conservation.

Relatively high levels of external support have been provided to Uganda's conservation efforts in recent years. The national parks are now more secure, and several important forest reserves have been upgraded to national park status with removal of illegal settlements and re-establishment of

protected area boundaries, viz., Bwindi-Impenetrable Forest, Mgahinga Gorilla, Rwenzori Mountains, Kibale Forest, Semliki Forest and Mount Elgon National Parks. Queen Elizabeth National Park has been substantially rehabilitated with support from EU and other donors, and the populations of some of this park's wildlife species, e.g., buffalo and kob, have recovered to or now exceed the levels of the early 1970s (von Richter et al. 1997). Murchison Falls National Park is the country's largest national park and, like Queen Elizabeth National Park, is of major international importance in antelope conservation (Fig. 2-1). The Murchison Falls park suffered more damage than any other national park during the political turmoil of the 1980s and its wildlife was poached intensively. Murchison Falls' wildlife populations are now well below the levels of 1970 and poaching pressures remain high around the park's boundaries, but wildlife numbers are gradually recovering as this park's rehabilitation progresses with bilateral assistance from Germany.

Wildlife populations in many other areas of Uganda have been reduced to very low levels during the last 1 5-20 years. The Karamoja region in northeastern Uganda, for example, was one of the country's finest wildlife areas until the 1970s, but aerial surveys conducted in 1995 revealed that most of this region is now devoid of large wildlife species as a result of 20 years of intensive poaching (Lamprey & Michelmore 1996). Former protected areas in Karamoja such as Bokora Corridor Game Reserve have also been encroached by settlement and large numbers of livestock. Most of the wildlife of Kidepo Valley National Park on the northern boundary of Karamoja has been destroyed by poaching to provide meat for military camps across the border in adjoining Sudan. As a result, the surviving populations of Kidepo's giraffe, buffalo and antelope species have been reduced by up to 98% since the 1970s, and some antelope species have been eliminated (von Richter et al. 1997). This park nevertheless remains one of Uganda's most important wildlife areas (Lamprey & Michelmore 1996). Human populations are relatively low around the park and there are no significant problems of agricultural encroachment or habitat degradation. With UWA's current rehabilitation efforts, Kidepo's future appears more promising than its recent past.

In general, while wildlife conservation in Uganda continues to face daunting challenges as a result of the disturbances of the 1970s and 1980s and the underlying problem of human population growth, recent progress and the ongoing level of external support for the country's conservation efforts offer the realistic prospect that many of these challenges will be met and overcome. Revenue from wildlife-based tourism is growing rapidly (Johnstone 1997) and major support to UWA from a World Bank-funded project "Protected Area Management and Sustainable Use" and an associated GEF-funded project "Biodiversity Conservation Outside Protected Areas" is scheduled to commence in the late 1990s (Lapuyade 1996).

*29. Kenya*

Kenya has one of the highest international profiles for wildlife preservation on the African continent, and wildlife-based tourism has been a major foreign exchange earner for more than 30 years. This reflects the country's internationally famous national parks and reserves and its exceptionally rich biodiversity, which includes more species of antelopes than any other country (Hillman et al. 1988). Large areas of Kenya are of major international significance for the conservation of antelope communities, e.g., Masai Mara National Reserve and the adjoining Mara group ranches in Narok district, Amboseli and Nairobi National Parks and the extensive adjoining rangelands of Kajiado district, Tsavo National Park and its surrounds, the coastal and northern rangelands, and forest areas such as Aberdare, Mount Kenya and Mount Elgon National Parks and Forest Reserves and the Mau Escarpment forests (Fig. 2-1). Some areas of Kenya are also vitally important for threatened antelopes such as hirola and mountain bongo (Fig. 2-2).

Protection and management of the country's parks and reserves declined during the 1970s and 1980s. By the late 1980s, the deterioration of Kenya's wildlife sector had reached crisis proportions, with widespread poaching and rampant corruption (Leakey 1988; Western 1991). This situation was swiftly reversed in the early 1990s, following the establishment of the Kenya Wildlife Service (KWS) in 1989 and the initiation of major external support to KWS through the

Protected Areas Wildlife Service project, which commenced in 1992 with funding by the World Bank and other donors. By 1994, generally effective control of poaching and improvement of security was in place within most of Kenya's major protected areas.

The wildlife management policies of KWS subsequently shifted away from strict protection of parks and reserves towards attempting to improve the co-existence of wildlife and rural communities (Western 1995; Pendry 1996; McRae 1998). Some wildlife species, e.g., giraffe, lesser kudu, Grant's gazelle and gerenuk, occur in greater numbers outside protected areas than within them (Grunblatt et al. 1996), and the revised KWS policy aimed to prevent wildlife from becoming increasingly restricted to the relatively small area of parks and reserves. This included de-emphasizing the boundaries between some protected areas and surrounding pastoral land, and greater tolerance of livestock within protected areas. As a result, there has been substantial encroachment of cattle into most of the country's parks and reserves. There is clearly a risk in attempting to achieve peaceful co-existence between wildlife and Kenya's burgeoning rural human population, e.g., opening up protected areas to incursions by livestock may increase pressures on dry-season resources of forage and water within parks and reserves, with displacement of wildlife and increased risk of disease transmission between cattle and wild ungulates (Anon. 1996a). There are also risks associated with the alternative approach of placing major emphasis on the protection of parks and reserves. This would increase the security of wildlife within protected areas, but may have the consequences of wildlife becoming increasingly confined to these areas, necessitating more intensive management of parks and reserves. There is also the possibility that some protected areas may be degazetted, as pressure for alternative forms of land use increases, especially if local communities do not benefit directly from the presence of wildlife.

In southern Kenya, pressures on wildlife from the expansion of agriculture and livestock grazing are increasing in and around some of the country's major wildlife areas, e.g., the Mara and Tsavo regions (Broten & Said 1995; Norton-Griffiths 1995; Butynski et al. 1997). Occasional severe droughts have also caused substantial declines in some wildlife populations. In addition, a major rinderpest outbreak caused heavy mortality of wildlife in the Tsavo area and other parts of eastern Kenya in 1994-95 and has subsequently spread westwards to Amboseli, Kajiado and Nairobi National Park. Regular, comprehensive, effective vaccination of all cattle populations in the region is essential to eradicate this disease from both livestock and wildlife (Kock 1997). Overall, Kenya's estimated populations of wild herbivores decreased by 40-60% between the 1970s and the 1990s (Grunblatt et al. 1996), reflecting the effects of factors such as poaching, drought, disease, and the expansion of human populations and consequent changes in land use. Populations of many species are continuing to decline in key regions such as Mara and Tsavo (Butynski et al. 1997). In early 1998, KWS was reported to be under severe financial constraints and the emphasis on community-based conservation at the expense of protection of the national parks had lost support from major donors such as the World Bank (McRae 1998). In September 1998, Dr. David Western resigned as Director of KWS and was replaced by Dr. Richard Leakey, who had been KWS's first Director from 1989-94.

Kenya's relatively small private game-ranching sector, which comprises about 25 ranches, is playing an increasingly important role in wildlife management. Wildlife now generally receives higher levels of protection and management on private game ranches and sanctuaries than in most of the national parks and reserves, and private wildlife concessions are expanding in some parts of Kenya (e.g., Turner 1998). Information on antelope populations on privately owned or managed land is not listed separately for Kenya in the species accounts in section 4 but is included in the data for Kenya's rangelands. However, separate data on antelope populations are available for the ranchlands of the Laikipia Plateau (see Appendix 4). The large-scale Laikipia cattle ranches, which vary in size from 10 to 450 sq km, have abundant permanent water, relatively little human disturbance and support some of Kenya's largest wildlife populations outside protected areas. Local landowners and residents recently formed the Laikipia Wildlife Forum (Cook 1996), a non-profit company which aims to promote sustainable management of the district's wildlife through game cropping, ecotourism and possibly sport hunting. Prior to the banning of sport hunting in 1977,

Kenya had the reputation of providing some of the finest trophy hunting in Africa. A KWS report in 1995 recommended that trophy hunting should be re-opened in Kenya, offering the prospect that well-managed international trophy hunting could contribute to the development of the country's wildlife utilisation industry (Georgiadis & Heath 1998).

Whereas pressures on wildlife from the expansion of agricultural settlement and livestock grazing are increasing in southern Kenya, pressures on natural habitats are much lower over large areas of the northern rangelands, which extend northwards from Isiolo and the Tana River. This vast area (Fig. 2-1) has very low human population densities and continues to support major wildlife populations. Most of northern Kenya's wildlife occurs outside the region's relatively small protected areas such as Sibiloi and Marsabit National Parks and Losai and Samburu-Buffalo Springs National Reserves. Kenya's northern districts are areas of major insecurity, banditry and uncontrolled flow of arms, and opportunistic poaching of wildlife occurs widely, but this region has good potential for the long-term survival of significant wildlife populations if security problems can be overcome (Butynski et al. 1997).

*30. Tanzania*

Tanzania has retained extraordinarily rich wildlife resources which are now without parallel in Africa. The government's commitment to wildlife conservation is demonstrated by the impressive system of conservation areas. National parks, game reserves, game controlled areas and other protected natural areas cover about 25% of the country. These include some of the continent's most important areas for antelope conservation, e.g., the Serengeti and Tarangire ecosystems in the north, Biharamulo-Burigi Game Reserves in the northwest, a continuous chain of wildlife areas in the west from Moyowosi-Kigosi Game Reserves to Katavi-Rukwa and the Ruaha ecosystem, the vast Selous Game Reserve in the southeast, and montane forests such as Kilimanjaro and Udzungwa (Fig. 2-1). The country's wildlife areas include critical habitats for the threatened Aders' and Abbott's duikers (Fig. 2-2).

Tanzania suffered severe economic difficulties during the late 1970s and early 1980s, and during this period there was a marked decline in infrastructure and staff morale within protected areas. Since the mid-1980s, there has been substantial economic recovery and a return to relative economic stability. Wildlife-based tourism has recovered to be an important and growing source of external revenue. Poaching of wildlife reached crisis proportions by the mid-late 1980s, when the government responded with a major anti-poaching effort, Operation Uhai. This ran from 1989-91 and involved a carefully planned nation-wide crackdown on poaching. More than 12,000 firearms were confiscated and several hundred hard-core poachers arrested. Similar but smaller-scale anti-poaching operations have been conducted subsequently, e.g., in 1997 an 8-month operation was carried out to curb poaching and illegal trade of wildlife products in southern and western wildlife areas.

While a significant component of the country's annual budget is expended on managing and maintaining wildlife areas, Tanzania has neither the financial resources nor sufficient skilled manpower to sustain a high level of protection and management of its extensive wildlife estate without substantial support from external donors. The international importance of Tanzania's wildlife and the government's demonstrated commitment to wildlife conservation have attracted significant external support for many of the country's protected areas, e.g., protection and management of the 43,000 sq km Selous Game Reserve have improved from low to relatively high levels since 1988 as a result of German development aid. Whereas game-viewing tourism has grown substantially over the last 10 years in the northern protected areas, the extensive tracts of wildlife habitat which remain in the west and south are often too remote and inaccessible to generate significant revenue from this source (e.g., Loefler 1995). A thriving international trophy hunting industry (Lamprey 1995; Overton 1998) is the main form of revenue generation from these western and southern areas, and from substantial parts of the northern wildlife areas.

Although Tanzania retains spectacular concentrations of wildlife, the expansion of human settlement, livestock grazing and agriculture are increasing the pressures on natural ecosystems. The world-famous Serengeti ecosystem, for example, which is widely recognised as one of the great natural wonders of the world, is now under severe threat from human encroachment and illegal hunting (Sinclair & Arcese 1995). Poachers have been estimated to remove 160,000-200,000 animals per annum, in order to satisfy the demand for wildlife meat by the large and rapidly increasing human population which has moved into the area immediately west of Serengeti National Park during the last 30 years (Campbell & Hofer 1995). The future of this region's wildlife is dependent on the success of current attempts to improve the protection and management of the national park and adjoining protected areas. Resumption of effective vaccination of cattle against rinderpest is also of major importance to the region's wildlife (Kock 1997).

Conflicts between wildlife conservation and the needs of rural communities are acute in some other protected areas which adjoin densely settled lands, e.g., Kilimanjaro National Park and Forest Reserve and Arusha National Park. The adverse impacts of illegal human activities on protected areas are also increasing in regions where human population density is low but growing, e.g., the Tarangire ecosystem, Moyowosi-Kigosi and Ugalla River Game Reserves, Mikumi National Park and the Katavi National Park area (TWCM et al. 1997). The need to integrate conservation with rural development is now widely recognised but has proved difficult to implement. It has proved a major challenge to achieve both adequate law enforcement within protected areas and significant benefits to local people living on adjacent lands, e.g., in Ngorongoro Conservation Area (Perkin 1995). The development of effective solutions to the problem of balancing wildlife law enforcement and the needs of expanding human populations will be essential to the long-term future of Tanzania's wildlife (TWCM et al. 1997). Maintenance of the country's major wildlife concentrations in perpetuity may also depend on the willingness of donor agencies and governments to make a long-term commitment to assisting Tanzania's protected areas, in recognition of their aesthetic, scientific and other values (Sinclair & Arcese 1995).

*31. Rwanda*

Rwanda is one of the most densely populated countries in Africa. Most wildlife species have long been restricted to protected areas, particularly the grasslands, savanna and swamps of Akagera National Park and the adjoining Mutara Hunting Reserve in the northeast, and Volcanoes National Park which protects the Rwandan section of the Virunga Volcanoes in the northwest. Akagera National Park is of international significance in antelope conservation (Fig. 2-1). With assistance from WWF and other international donors, relatively good levels of protection were maintained in both of these national parks during the 1970s and 1980s, despite pressures from surrounding high-density human populations (Monfort 1988; Vande weghe 1990).

Wildlife inevitably suffered during the civil war and genocide which occurred in Rwanda in the early to mid-1990s. Protection of Akagera National Park was abandoned in 1990 because of the guerilla war then raging in northern Rwanda, resumed in 1992-94, and was then abruptly terminated by the catastrophic events which engulfed the country in April 1994. After the genocide had ceased and the Tutsi-dominated Rwandan Patriotic Front (RPF) siezed power in mid-1994, large numbers of cattle herders and their livestock began moving into Akagera National Park from Uganda. These people are ethnic Tutsi who had lived in exile in Uganda for 35 years since fleeing massacres in Rwanda in 1959. By mid-1995, the Mutara reserve and the northwestern half of Akagera National Park had been occupied by large numbers of people and several hundred thousand cattle and had effectively ceased to be a conservation area (Chardonnet & East 1995). The northern part of the protected areas has subsequently been degazetted. Only the southern part of the former Akagera National Park, where the prevalence of tsetse flies is a partial barrier to cattle, appears to have any prospect of rehabilitation.

Volcanoes National Park has come through the events of the 1990s in somewhat better shape than Akagera. While the Virunga Volcanoes were the site of guerilla warfare between the RPF and the

former government during 1990-94, and subsequently between the RPF government and the interahamwe (members and supporters of the previous government who had carried out the genocide in Rwanda), surveys conducted in 1996 revealed that the park's ungulate populations had remained stable or increased slightly since pre-war assessments in 1988-89 (Plumptre & Bizumurenyi 1996). This and the apparent stability of the park's mountain gorilla population over the same period reflect the dedicated efforts of the staff of the Karisoke Research Centre, who maintained anti-poaching patrols throughout the war, and decreased poaching activity in parts of the park where local hunters were excluded by the presence of military forces and mines. By late 1996, security within Volcanoes National Park had improved considerably, but poaching pressures appeared to be increasing (Plumptre 1997). This park is surrounded by a high-density community of subsistence farmers, with about 400 people per sq km. Plumptre & Bizumurenyi (1996) estimated that at least 25% of the available biomass of bushbuck and black-fronted duiker is harvested each year, which suggests unsustainable offtake levels. Economic incentives for poaching are high, given the poverty faced by most people living around the park. It is unlikely that any form of sustainable harvesting of ungulates would be feasible, in view of the small size of the park (150 sq km) and the enormous human population pressure outside (Plumpte & Bizumurenyi 1996).

During 1997, the security situation in Volcanoes National Park deteriorated markedly. Several thousand interahamwe entered the Virunga Volcanoes and commenced regular nightly raids on villages in Rwanda to kill people who witnessed the genocide and are working with the new government. The interahamwe are dependent on bushmeat and are likely to be heavily poaching the wildlife of Volcanoes National Park (Morris 1997; Plumptre et al. 1997). In August 1997, the Office Rwandaise de Tourisme et Parcs Nationaux suspended activities in Volcanoes National Park because it had become too dangerous to patrol the park. The Rwandan army, with support from local villagers, was attempting to deal with the interahamwe.

*32. Burundi*

Burundi is a small, densely populated country. Settlement, intensive agriculture and large herds of livestock now occupy most of the land, and wildlife has largely been eliminated. Two national parks and several nature reserves were established in 1982 to protect the surviving remnants of the country's wildlife. Ruvubu National Park in the valley of the Ruvubu River is the last significant stronghold of savanna wildlife in Burundi, and Kibira National Park and Buriri Forest Reserve contain the last remnants of the country's montane forest and its wildlife (Verschuren 1988).

In 1993, the assassination of Burundi's president was followed by widespread ethnic violence, resulting in the death and displacement of thousands of Burundians. The resulting chaos set back conservation efforts, e.g., plans to habituate chimpanzees for tourist purposes in Kibira National Park were postponed indefinitely. Civil war has continued intermittently over the last 5 years. In 1 996, Kibira and Ruvubu National Parks were used as entry points and bases for guerillas fighting the government. In consequence, they also became operational areas for government troops (Winter 1997b). Unless a sustainable peace returns to the country, it may be just a matter of time before these parks lose most of their remaining wildlife. This had already happened to the former Rusizi Natural Reserve on the floodplain of the Rusizi River, just outside Bujumbura, when this area was upgraded to a national park in 1990 (Verschuren 1988; Winter 1997b).

## SOUTHERN AND SOUTH-CENTRAL AFRICA

*33 & 34. Angola (including Cabinda)*

Large areas of Angola were devastated by civil war between the mid-1970s and 1991, when a cease-fire agreement was signed between the Luanda government and UNITA forces. Sporadic military skirmishes occurred after the cease-fire, and there was resumption of large-scale fighting for a time after the elections which were held in September 1992. Security is still uncertain in extensive regions, and the war has left an estimated 9 to 10 million landmines littered

across the countryside. Prior to the eruption of civil war in 1975, thoughtless destruction of wildlife had occurred widely with little restraint throughout almost 500 years of Portugese colonial rule. By the mid-1970s, most species of large mammals were threatened, at least outside the parks and reserves. Most of these were protected areas in name only and suffered from severe disturbances such as large, resident human populations, encroachment of livestock and agriculture, poaching and/or habitat damage from oil and diamond prospecting (Estes 1989). Some of these areas were nevertheless identified as having international significance in antelope conservation (Figs. 2-1 and 2-2).

During the 15-20 years of civil war, Angolan combatants and civilians and South African and Cuban troops took part in large-scale slaughter of the country's remaining wildlife. The abundant wildlife of Cuando Cubango in the southeast, for example, was largely wiped out between 1975 and 1983 (Yeld 1996). An EU-funded IUCN team travelled extensively within Angola in 1992 to gather information for an assessment of the state of renewable natural resources (IUCN/ROSA 1992). These surveys revealed that most of the country's populations of larger wildlife species had been annihilated during the prolonged civil war, and protected areas had generally been destroyed by uncontrolled hunting, troop movements and the collapse of the former national parks administration and infrastructure. Populations of all large mammal species had been severely reduced or eliminated within and outside former protected areas.

Despite this generally bleak situation, the return of a fragile peace to Angola in the last few years has made it possible to contemplate renewed conservation action to protect what is left of the country's wildlife. It is highly encouraging, for example, that the endemic giant sable antelope survives in viable numbers (Estes 1997). Huge obstacles remain to be overcome in the rehabilitation of protected areas. In Kissama National Park near Luanda in the northwest, for example, most wildlife was shot out during the war, including hunting from helicopters by Cuban troops, and thousands of refugees have settled within the park. In May 1998, the Kissama Foundation (which was established in 1996 by senior Angolan government personnel and staff of the Department of Nature Conservation of the University of Pretoria, South Africa) announced plans to rebuild the infrastructure of Kissama National Park. This includes development of the park as a tourist destination and restoration of wildlife populations by translocating large numbers of game animals, e.g., several hundred buffalo and elephant and at least 1 00 each of giraffe, zebra, waterbuck, wildebeest, roan and sable antelope. It is envisaged that some animals will be captured in Angola, but many will come from private game farms and other sources in countries such as South Africa, Zimbabwe and Zambia. The Angolan government is providing military protection to the park, and the Kissama Foundation plans to have in place an anti-poaching force of ex-soldiers before translocations of wildlife commence in 1999. While the rehabilitation of Angola's parks is an important priority in international conservation efforts, it is of concern to conservationists that many of the species which are proposed for translocation to Kissama National Park did not occur there naturally, e.g., giraffe, zebra, wildebeest and sable.

*35. Zambia*

Zambia has an extensive wildlife estate, mainly in the Luangwa and Zambezi Valleys and parts of the plateau woodlands which are infested with tsetse fly and hence sparsely inhabited. Agricultural settlement has expanded into many of the more fertile floodpains and dambos, and the larger wildlife species are now generally restricted to designated conservation areas. These include 19 national parks which cover 8% of the country and an extensive system of game management areas which cover an additional 21% of the country (Jeffery et al. 1989a, 1996). The game management areas generally adjoin national parks and are utilised for trophy and meat hunting under a permit system. Areas of savanna woodland and floodplain such as the vast Kafue National Park and surrounding game management areas, the Luangwa Valley, Lochinvar and Blue Lagoon National Parks-Kafue Flats Game Management Area, Bangweulu and Kafinda Game Management Areas, and Liuwa Plain, Mweru Wantipa and Nsumbu National Parks are among the most spectacular wildlife areas remaining in Africa and are of outstandingly high international importance for antelope

conservation (Figs. 2-1 and 2-2). In addition, areas such as Lower Zambezi and Sioma Ngwezi National Parks are contiguous with extensive areas of important conservation land in adjoining countries (Fig. 2-1).

Zambia's system of protected areas was formerly among the best administered and managed in Africa. During the last 15-20 years the general integrity of this system has become threatened by a massive upsurge in poaching, encroachment of settlement, illegal grazing by livestock, uncontrolled fires, and shortages of trained staff, equipment and transport in the National Parks and Wildlife Service (NPWS) (Jeffery et al. 1989a, 1996). In the absence of sufficient government funds, external support from international and local NGOs and bilateral donors has provided the main support, in terms of resources and management, for key protected areas (Dublin et al. 1994). As a result, some protected areas continue to be at least moderately well staffed and managed and retain substantial wildlife populations, e.g., Kafue, North and South Luangwa, Kasanka and Lochinvar National Parks, Bangweulu and Lupande Game Management Areas. In others protection and management are poor or non-existent and wildlife populations are severely depleted, e.g., Lavushi Manda, Lusenga Plain, Isangano and Lukusuzi National Parks and many of the game management areas (Jeffery et al. 1996). Encroachment of settlement has occurred in some game management areas, but extensive areas of the country have relatively few people or livestock. Natural habitats remain largely intact in many wildlife areas which have been depleted by poaching. This will facilitate recovery of populations of antelopes and other wildlife if effective protection and management are re-established in these areas.

A community-based wildlife management programme, Administrative Management Design for Game Management Areas (ADMADE), was launched in the mid-1980s and now operates in the majority of Zambia's game management areas. This programme has received significant external support from donors such as USAID, WWF and WCS. It involves joint management of game management areas and sharing of revenues from wildlife by a partnership of community village leaders and NPWS, with the aims of providing local communities with custodianship and management responsibilities for the wildlife resources in these areas, and enhancing the role of the game management areas around the national parks as buffer zones against disruptive land-use practices. This includes training and employment of local people as village wildlife scouts. ADMADE has encountered various implementation problems in some areas (Lane et al. 1994). Examples include uneven distribution of benefits and revenues, and the severely depleted status of wildlife populations in some game management areas which precludes legal hunting until populations recover sufficiently. In other areas, ADMADE has resulted in significant benefits to local communities and reductions of poaching. It continues to be the official mechanism applied by NPWS and its donor partners to community-based natural resource management in protected areas.

An EU-funded report to the government of Zambia in 1993 on the reorganisation and restructuring of NPWS considered that control of natural resources had been overcentralised. In response to this report, the Ministry of Tourism recognised the need to modernise the institution responsible for managing wildlife, on which Zambia's substantial and growing tourism industry is dependent. In 1996, a 3-year EU-funded project "Development of Sustainable Wildlife Management towards the Diversification of the Zambian Economy" commenced with the aim of restoring Zambia's wildlife estate and encouraging investment. Other examples of major, ongoing external support include the NORAD-funded Luangwa Integrated Resource Development Project (South Luangwa National Park and Lupande Game Management Area), the FZS and Owens Foundation-funded North Luangwa Conservation Project (North Luangwa National Park), the USAID-funded Natural Resources Management Project (support to NPWS) and JICA-funded support to Kafue National Park (Lapuyade 1996).

Despite the general decline of wildlife during the last 20 years, Zambia retains some of Africa's most magnificent wildernesses and a spectacular diversity and abundance of antelopes and other wildlife. Developments such as increasing external support to wildlife conservation and management and greater involvement of the private sector in wildlife industries, e.g., through

tourist operators, trophy hunting and the country's small but rapidly growing number of game ranches, provide the opportunity for Zambia to ensure that its wildlife riches will be a significant contributor to the country's economic growth (Jeffery et al. 1996).

*36. Malawi*

Malawi is a small, densely populated country and its wildlife has largely been eliminated outside protected areas. The system of protected areas includes representative examples of most of the country's wildlife habitats and the national parks have been relatively well staffed (Bell 1989; Sayer et al. 1992; Dublin et al. 1994). Areas such as Nyika National Park in the montane grasslands and evergreen forest patches of the Nyika Plateau and Lengwe National Park in the dry deciduous thickets of the Lower Shire Valley protect internationally significant antelope communities (Fig. 2-1). In addition to the national parks and game reserves, which cover 11% of the country's land area, forest reserves cover a similar proportion of the country and provide important habitats for some antelope species. The forest reserves generally receive lower levels of protection than national parks and game reserves, e.g., they do not have anti-poaching personnel (Dublin et al. 1994), and they are threatened by extraction of fuelwood and encroachment of cultivation, especially in the south (Dowsett-Lemaire & Dowsett 1988).

About 90% of Malawi's population is rural. Protected areas are often bordered by dense settlement, e.g., up to 1 50 people per sq km around Lengwe National Park in the south (Munthali 1991). These high human population densities exacerbate the pressures from people entering protected areas illegally to hunt for meat, collect forest products, fish and seek land for settlement and cultivation. Despite active patrolling and relatively high numbers of game scouts within Malawi's national parks and game reserves compared to many other African countries, law enforcement has barely managed to contain poaching and other illegal activities (Mkanda 1991, 1998; Dublin et al. 1994).

Poaching is conducted partly by nationals of adjoining countries, and poaching pressures are particularly high in some protected areas which are adjacent to international borders, e.g., Kasungu National Park and Vwaza Marsh Game Reserve. Poaching offtake of most antelope species in these two areas appears to be at unsustainable levels (Mkanda 1998). Wildlife populations are also severely depleted in Majete Game Reserve, which lost its entire elephant population to poaching following a massive influx of Mozambican refugees into the area in 1986-87 (Sherry & Tattersall 1996). Aerial surveys of the Lower Shire protected areas (Lengwe National Park, Majete and Mwabvi Game Reserves, Matandwe Forest Reserve) in November 1997 revealed that there has recently been large-scale encroachment of settlement and livestock in these areas (D. Gibson, in litt. April 1998). Mwabvi Game Reserve is now almost entirely settled and very little wildlife remains. The steep slopes of Matandwe Forest Reserve are being clear-felled for cultivation. Parts of Majete Game Reserve and Lengwe National Park are now settled and have substantial numbers of livestock, but these two areas retain significant wildlife populations.

The Department of National Parks and Wildlife has been able to maintain effective protection in the country's other protected areas, where substantial, generally stable or increasing wildlife populations persist, viz., Nyika and Liwonde National Parks and Nkhotakota Game Reserve (Mkanda 1998; D. Gibson, in litt. April 1998). The latter two areas benefit from being relatively distant from Malawi's international borders. In addition, Liwonde National Park is surrounded by Muslim communities who prefer fishing to poaching for meat or ivory (Mkanda 1993). Nyika National Park includes the northern and southern foothills of the plateau and is protected to some extent by its geographical location, although poaching pressures are high in the southern foothills (Munthali & Banda 1992).

*37. Mozambique*

Mozambique's wildlife has suffered from more than 75 years of largely uncontrolled destruction. By the early 1980s, substantial wildlife populations were confined to a few protected areas, most notably Gorongosa National Park at the southern end of the Rift Valley and the adjoining Zambezi Valley Wildlife Utilisation Unit and Marromeu Game Reserve (Tello 1989). During the 1980s and early 1990s, increasing guerilla hostilities and civil conflict forced the government's abandonment of most protected areas. All of the parks and reserves apart from the offshore islands of Bazaruto National Park were militarily occupied, and the various armies slaughtered most of the country's remaining wildlife with weapons ranging from assault rifles to helicopter gunships. Uncontrolled hunting for meat by rural civilians also contributed to the destruction of wildlife.

The October 1992 peace accord between the Maputo government and rebel forces brought an end to almost two decades of civil war. The conflict left Mozambique in tatters with a ruined economy, towns and cities battered and isolated, and large stretches of land depopulated. During the mid-late 1990s people have gradually moved back into the countryside after years of being restricted to the vicinity of relatively safe areas around urban centres, and the massive task of rebuilding the economy and the country's infrastructure has commenced. This includes redevelopment of wildlife conservation, which is recognised as a resource of enormous potential in the economic recovery of Mozambique (Anstey 1993). Most of the former protected areas have been resurveyed to assess their wildlife populations (e.g., Anon. 1993; Dutton 1994).

The general approach being adopted to the rehabilitation of these areas is for conceptual plans to be drawn up with external donor support and put out to tender, with the private sector expected to play the major part in implementing these redevelopment plans and the government in an auditing role (J.L. Anderson, in litt. December 1997). In addition to ecotourism, international trophy hunting is seen as a key element in the recovery of Mozambique's wildlife sector. Safari hunting is recognised as a highly profitable and economically sound form of land use, especially for areas lacking other scenic attractions, and it provides a larger return than ecotourism (Pearce 1996). Following the end of the civil war, in 1994 IUCN in conjunction with the National Directorate of Forestry and Wildlife (DNFFB) undertook a 4-month EU-funded project to conduct an aerial survey of the wildlife of Gorongosa-Marromeu and prepare a plan for the rehabilitation of these protected areas. The survey revealed that most of the region's wildlife had been shot out during the war (Dutton 1994). An EU-funded DNFFB/IUCN emergency rehabilitation project operated in Gorongosa-Marromeu in 1995-96, aimed at controlling illegal harvesting of wildlife and timber, re-establishing the park's basic infrastructure, removing land mines and initiating the integration of park management with the local community. Oglethorpe & Oglethorpe (1996) reported that at the completion of the emergency rehabilitation project, Gorongosa's populations of large mammal species were beginning to recover, although still at low levels, and the park was to reopen for tourism. An African Development Bank-funded project to redevelop this park commenced in 1996 with the aim of re-establishing its wildlife as a valuable economic asset, and control is gradually being re-established (Pearce 1996; J.L. Anderson, in litt. December 1997).

A 5-year GEF-funded World Bank project "Transfrontier Conservation Areas and Institutional Strengthening" commenced in 1997 to prepare and implement participatory management plans for wildlife-rich border areas that are contiguous with national parks in neighbouring South Africa and Zimbabwe. Initially this project will focus on the Maputaland area in southern Mozambique (Anderson 1997), where the US-based corporation Blanchard Mozambique Enterprises is managing the implementation of what will be one of the largest privatised game reserves in the world (Anon. 1997). Encompassing 2,340 sq km of Maputaland, the plan includes the rehabilitation of Maputo Game Reserve, where poaching is still rife, the creation of an upmarket tourist resort on Machungulo Peninsula which juts into Maputo Bay from the reserve, expansion of the game reserve southwards to the South African border where it will be contiguous with South Africa's Tembe Elephant Reserve, and extensive reintroductions of large wildlife species. The Transfrontier Conservation Areas project also includes the development of 70,000 sq km of conservation land in Gaza Province on the Mozambique side of South Africa's Kruger National Park, of which 30,000 sq

km will be national park land and the rest will be made up of hunting concessions and cattle/game areas (Anderson 1997). The Gaza component of the project includes the rehabilitation of Banhine and Zinave National Parks, and this new protected area complex will be contiguous with Zimbabwe's Gonarezhou National Park. While areas such as Banhine and Zinave National Parks have lost most of their larger wildlife species, the Coutada 16 hunting concession along the Kruger National Park boundary in Gaza Province still has good numbers of species such as impala, waterbuck, greater kudu and nyala (J.L. Anderson, in litt. December 1997). The establishment of the Kruger-Gaza-Banhine-Zinave-Gonarezhou and Maputaland-Tembe transfrontier conservation areas is being facilitated by the South African-based Peace Parks Foundation which was launched in 1997. These major protected area complexes have the potential to greatly enhance nature-based tourism and associated job creation.

The Niassa Game Reserve and adjoining areas between the Rovuma and Lugenda Rivers near the Tanzania border in northern Mozambique also have major conservation potential. Anti-poaching operations in this region are being conducted by the Mozambican company Madal (Anderson 1997). Substantial wildlife populations also survive in the hunting concessions of Manica Province in west-central Mozambique, including species such as greater kudu, eland and sable, and wildlife populations in this region are beginning to recover strongly (B. Chardonnet, in litt. October 1998).

Overall, despite the destruction of most of the country's wildlife resources during the prolonged civil war, long-term conservation prospects in Mozambique are now much brighter than at any time for the last 30 years. Several of the country's major wildlife areas retain international significance for the conservation of antelope communities (Fig. 2-1). Human population densities are very low over large areas of Mozambique. This will facilitate the recovery of depleted wildlife populations, along with the excellent condition of natural habitats and lack of encroachment of human activities, e.g., in areas such as Gorongosa-Marromeu (Dutton 1994), Gile and Maputo Game Reserves (Anon. 1993) and Zinave National Park (J.L. Anderson, in litt. June 1998).

*38. Namibia*

Namibia has low human population densities and retains major wildlife populations. Political conditions have been stable since independence was attained in 1990, and the government accords considerable priority to the environment and the sustainable utilisation of natural resources. There is an extensive, spectacular system of protected areas, which are managed by the Ministry of Environment and Tourism (MET). These include some of the largest parks and reserves in Africa, e.g., Etosha National Park which protects savanna grassland and bushland around the seasonally inundated Etosha Pan, and the vast Namib-Naukluft Park which contains arid gravel plains, sand dunes, the Kuiseb River valley and the Naukluft Massif. These parks support major populations of wildlife species characteristic of desert and dry savanna habitats. As in the 1970s and 1980s (van der Walt 1989), protection and management of parks and reserves are generally at a level which maintains stable or increasing numbers of most antelope species, e.g., as revealed in a 1995 aerial survey of Etosha National Park (P. Erb, in litt. August 1997). Although it was conducted during a very dry period, this survey revealed substantially higher numbers of most antelope species than recorded in the mid-1980s (van der Walt 1989). Etosha is also notable as one of the very few large protected areas in Africa which retains a healthy, free-ranging black rhino population. In addition, the white rhino was reintroduced to Etosha in 1995. Namib-Naukluft, Etosha and the complex of protected areas in the northeastern savanna woodlands are of major international importance to antelope conservation (Figs. 2-1 and 2-2).

Namibia also has a flourishing wildlife utilisation industry based mainly on private farms (van der Walt 1989). Much of the interior highlands was surveyed into farms for white settlers between the late 19th century and the mid-1950s. These farms range in size from 50 to 400 sq km and cover 357,000 sq km, representing 43% of the country's land area (Barnes & de Jager 1996). Prior to 1967, all large indigenous mammals were state property. This resulted in wild animals being generally afforded little economic value, and wildlife populations decreased steadily outside

protected areas. Pioneering legislation in 1967 granted qualified ownership rights over certain game species to farmers on private land that met specified property size and perimeter fence conditions. This legislation was extended further in the Nature Conservation Ordinance of 1975, e.g., to include additional wildlife species. As a result, game species became regarded as valuable assets and were actively conserved by landowners (van der Walt 1989; Owen-Smith 1996).

Trophy hunting, harvesting for meat, photographic tourism and live-capture of game for export have become important economic activities on many private farms during the last 25 years. By 1990, 359 (6%) of Namibia's private farms, with a total area of 46,000 sq km, were registered as private conservation areas for the purpose of commercial wildlife utilisation (Berry 1990). Use of wildlife on farms has generally developed as a supplementary activity to livestock production, but an increasing number of properties have been converted completely from livestock to wildlife. More recently, some individual landowners have grouped together to share wildlife management activities within conservancies catering for trophy hunters and/or game-viewing tourists. These activities have made a positive contribution to national income and have resulted in a 3% per annum increase in game animal numbers on private farmland since the early 1970s (Barnes & de Jager 1996). Populations on private land now comprise an even higher proportion of total antelope numbers than in the 1980s (van der Walt 1989), and these areas support internationally significant populations (Fig. 2-1). Some species have been introduced widely outside their natural ranges within the country, and exotic species such as black wildebeest and blesbok have been introduced in substantial numbers from South Africa.

Namibia now has a well established wildlife-based tourism industry which is a major sector of the economy (Berry 1990). This includes trophy hunting and game viewing on private land and the latter activity in state-owned protected areas. Whereas wildlife populations have increased dramatically on private land and are generally stable or increasing in protected areas, populations are much lower and decreasing on most communally owned lands (van der Walt 1989). In the early 1990s, for example, a MET team spent 10 days driving through the former Ovamboland communal area in northern Namibia and reported seeing just one steenbok (K. and B. Gasaway, in litt. October 1997). A notable exception is Kaokoland (Kunene) region in the northwest, where wildlife numbers have increased substantially following the implementation of a community-based conservation project in 1982 (Owen-Smith 1996). After independence, the new democratically elected government of Namibia scrapped the former ethnic homeland system and divided the country into 13 regions, each comprising 4 to 6 districts, but all previously designated homelands remained in communal ownership under the traditional leadership of the local tribal groups. The legislative rights to utilise and manage wildlife for consumptive and non-consumptive purposes which have been granted to the predominantly white commercial farming sector since 1967 were not extended to communally owned lands until recently. In 1996, the government amended the Ordinance of 1975 to give people in communal areas the right to form conservancies and gain extensive management rights of their land and wildlife (Burling 1996). This is expected to result in the extension to communal lands of the economic benefits of sustainable wildlife utilisation and the development of effective wildlife conservation and management in these areas.

Namibia's record in nature conservation and innovative policies in wildlife utilisation have earned it the status of one of the most important wildlife countries in Africa. This has attracted substantial assistance from external donors to the country's wildlife sector, e.g., a major USAID-funded project to enhance the capabilities of rural communities to manage natural resources sustainably in areas such as Bushmanland, Western Caprivi and the buffer zone of Etosha National Park, a KfW-funded project to plan the development of the northeastern parks, WWF and Endangered Wildlife Trust support to community game guards in Kaokoland and Damaraland, and ODA support for anti-poaching operations in Etosha National Park and the development of community-based conservation in the northern communal areas. The level of external support to Namibia's conservation efforts is expected to remain relatively high at least until 1999 (Lapuyade 1996).

Recent information on antelope populations is available to the ASG for only a few areas of Namibia,

notably Etosha National Park. Information for most other protected areas dates from the mid-late 1980s, and the most recent information for private farmland is from 1992 (Barnes & de Jager 1996). These estimates are considered to be broadly representative or conservative with regard to the current situation, in view of the generally favourable conditions for antelopes in Namibia's protected areas and private farms.

*39. Botswana*

Large areas of Botswana are thinly populated and the country retains substantial wildlife populations. These are tending to decrease and become more restricted to protected areas as the expansion of settlement and the cattle industry place increasing pressures on natural ecosystems (Spinage et al. 1989; Crowe 1995). In addition, during the last 30 years thousands of km of game and livestock-proof cordon fences have been erected to manage foot and mouth and other livestock diseases. These fences have caused major controversy by restricting the migratory movements of some wildlife species (e.g., Williamson 1994; Hannah et al. 1997; Weaver 1997). Veterinary cordon fences are known to have contributed to a severe reduction of the water-dependent wildebeest population in the Kalahari by denying access to traditional water sources during severe droughts, but these fences are not always detrimental to wildlife. The southern buffalo fence, for example, which was erected along the southern and southwestern perimeter of the Okavango Delta in 1981-82, has not caused the large-scale deaths of wildlife which were predicted by some conservationists, but has benefited the region's wildlife by preventing cattle incursion in the southern Okavango (Anon. 1991). A government decision to remove and realign controversial fences between the Okavango Delta and the Caprivi Strip in Namibia was reported in May 1998 (Bartel 1998).

National parks and reserves cover a relatively large proportion (17%) of Botswana's land area compared to most other African countries. This demonstrates a very substantial commitment to wildlife conservation by the government. This commitment has not always been adequately acknowledged in critical accounts of wildlife conservation in Botswana, e.g., Anon. (1996b), which have implied that the severe declines in the Kalahari wildebeest and hartebeest populations during the 1980s are representative of the overall status of the country's wildlife. In fact, Botswana continues to support globally significant wildlife populations, with the estimated numbers of most species having remained stable or increased in the last 10-20 years, although the buffalo is a notable exception (Ross et al. 1998).

Botswana's major wildlife regions are of outstanding international importance to antelope conservation (Fig. 2-1). The vast northern region comprises about 80,000 sq km of savanna woodlands, open grasslands and the floodplains and swamps of the Okavango Delta and the Kwando-Linyanti-Chobe River system. National parks and game reserves (Chobe, Moremi, Makgadikgadi-Nxai Pan) collectively cover about 25% of the region. Together with contiguous wildlife areas in neighbouring countries, this region forms one of the most important areas of natural savanna and wetland habitats remaining in Africa. Proposed large-scale removal of water from the Okavango for development schemes is a more or less constant potential threat to the region's natural ecosystems (Spinage et al. 1989; Ross et al. 1998). The most recent threat has come from a scheme by Namibia to extract water from the Okavango River upstream of the Delta and pipe it to Windhoek (Hannah et al. 1997).

In central and southwestern regions, expansion of the cattle industry into the Botswana section of the Kalahari and illegal hunting are increasingly restricting wildlife to Central Kgalagadi-Khutse Game Reserves and Gemsbok National Park. These very large protected areas support large, generally stable or increasing antelope populations which would be likely to be viable even if adjoining unprotected areas were no longer available to wildlife (Ross et al. 1998; Thouless, in press). Gemsbok National Park was linked with South Africa's Kalahari Gemsbok National Park to form the Kalahari Transfrontier Conservation Area in 1997. Significant wildlife populations also survive in the Namibia border region of southwestern Ngamiland and on the privately owned Tuli

block farms in the Limpopo River area in the east. In comparison to neighbouring countries such as Namibia, Zimbabwe and South Africa, Botswana has a relatively small area of private farmland and hence a relatively small private wildlife sector.

The Wildlife Conservation and National Parks Act 1992 legislated for nine wildlife management areas to provide for sustainable utilisation of wildlife by trophy hunting, game capture and ecotourism, e.g., in buffer zones around protected areas. The Act also provides the framework for developing community management of wildlife resources. Substantial external support is being provided to assist Botswana to improve wildlife conservation and management, e.g., the USAID-funded Natural Resources Management Project, which includes pilot community-based wildlife management projects, protected area management planning, environmental education and training of wildlife staff. Two major EU-funded projects on Wildlife Conservation and Utilisation in Northern Botswana and Central & Southern Botswana include planning and management of national parks and wildlife management areas. External support to wildlife conservation and protected areas was projected to continue at a relatively high level in the late 1990s (Lapuyade 1996). In 1996, in response to a request from a task force of conservation NGOs, the government established a commission of enquiry into wildlife conservation and management. These developments during the 1990s should provide the opportunity for Botswana to develop and implement policies which will enable the country to maximise the long-term benefits from its rich wildlife resources (Ross et al. 1998).

*40. Zimbabwe*

In the 1970s and 1980s, Zimbabwe assumed a leading role among African countries in having a system of well managed protected areas and treating wildlife as a valuable economic resource (Wilson & Cumming 1989). National parks, and adjoining safari areas which are areas of wilderness set aside for recreational activities such as sport hunting and fishing, cover extensive areas of the lower altitude border regions in the north, west and southeast. These include areas of major international importance for the conservation of antelope communities (Fig. 2-1). Until the mid-1980s, Zimbabwe's protected areas included some of the best managed and most effectively protected conservation areas in Africa. While the national parks have played a key role in the continued growth of the tourism industry over the last 10 years, during this period there has been a noticeable decline in the infrastructure of protected areas. Despite a decline in the levels of protection and management (Dublin et al. 1994), poaching of antelopes has generally remained at low levels within the national parks, which continue to support healthy populations of most wildlife species (Wilson 1997; Anderson & Wilson 1998).

Innovative approaches to wildlife management have been developed and adopted on Zimbabwe's marginal lands outside protected areas, enabling landowners to benefit economically from the sustainable utilisation of wildlife on their land. This is underpinned by the Parks and Wildlife Act (1975), which conferred custodianship to landholders of wildlife on their land. This Act had the effect of making private farms into proprietorial wildlife units, combining ownership and management with cost and benefit. The 1982 amendment to the Act enabled similar benefits to accrue to rural communities on Communal Land. The wildlife industry has subsequently boomed and is a major contributor to Zimbabwe's foreign currency revenue. The rapid growth of game ranching in commercial farming areas and the increase in wildlife utilisation on Communal Land have established an additional wildlife estate which covers a total land area almost as large as the country's national parks and safari areas (Child 1995). In total, wildlife areas now cover more than 30% of Zimbabwe.

CAMPFIRE (Communal Area Management Programme for Indigenous Resources) has given local rural communities responsibility for wildlife resources and the right to retain the benefits gained from the exploitation of these resources. As a result, revenue generated by local communities from wildlife, largely from expatriate trophy hunting, has increased markedly. Since it commenced in 1986-88, CAMPFIRE has extended its operations from 2 to more than 20 rural districts. The

number of participating households was reported to have grown from 9,000 in 1989 to more than 100,000 in 1996 (Anon. 1996c). Many Communal Lands are unsuited for game-viewing tourism because of low wildlife densities, inadequate infrastructure and remoteness, but are well suited to sport hunting. Trophy hunting operations are rapidly becoming the most important economic activity for many rural communities (Bond 1994). Major trophy species such as elephant and buffalo are hunted largely or entirely on Communal Lands and in safari areas. CAMPFIRE is often held up as one of the best examples of community-based resource management and development in Africa. The programme has been successful in some districts, notably in rekindling appreciation of wildlife in rural communities, drastically reducing poaching, improving environmental conservation practices, using wildlife revenues for food security during droughts and increasing household revenues (Murphree 1996). However, the programme has also encountered constraints associated with problems of implementation, e.g., in determining the appropriate scale for establishing community ownership of wildlife (Lane et al. 1994; Anderson & Wilson 1998).

The number of registered private game ranches increased from 50 in 1960 to more than 650 in the mid-1990s (Child 1995), reflecting the relative returns from wildlife and cattle on Zimbabwe's marginal lands. This growth of the private-sector wildlife industry has been accompanied by a marked expansion of the distribution and numbers of most of the larger antelope species in commercial farming areas, reversing their previous widespread eradication to make way for agriculture and cattle. Trophies of antelope species such as sable, greater kudu, eland, tsessebe and wildebeest are taken mainly on private game ranches, which support the bulk of these species' populations (Price Waterhouse 1996). In the southeastern lowveld, neighbouring ranchers have removed cattle fences and converted large land holdings to privately owned wildlife conservancies. Levels of wildlife protection and management are generally substantially higher on private land than in government-managed national parks and safari areas.

Zimbabwe's innovative wildlife policies have attracted substantial support from external donors, e.g., CAMPFIRE has received a high level of assistance from USAID and additional support from other agencies such as ODA, NORAD, USFWS, EU and WWF. A relatively high level of external support to Zimbabwe's wildlife sector is likely to continue (Lapuyade 1996). However, the future trends of the country's wildlife industries are unclear. The government is committed to land reforms and the africanisation of business and industry, and there are increasing pressures to provide more land for resettlement of rural people. Senior government personnel have reportedly commented unfavourably on the conversions of cattle ranches to wildlife areas by white farmers (Meldrum 1996a). Following a recent major transition in the senior staff of the Department of National Parks and Wildlife Management, the department's policy appears to be moving away from facilitation of the game ranching industry towards greater emphasis on regulation and government control. The country seems to be entering a phase where wildlife management is suffering because of political interference and misinformation, including attacks by US animal welfare groups on US government support for CAMPFIRE (Anon. 1996c). It is possible that these trends could lead to a reversal of the legislation which allows landholders custody of most wildlife species on their land, and a return to state ownership of game on private land with extraction of levies for animals utilised. This would effectively reverse a fundamental tenet of Zimbabwe's successful wildlife industry (Child 1995). It is hoped that any changes in the future role of the government in the wildlife sector will enhance and not hinder the benefits of this sector to the country's economy (Anderson & Wilson 1998).

*41. South Africa*

Over the last 50 years, South Africa has developed a depth of expertise in wildlife management and research which is unparalleled in Africa. National parks administered by the National Parks Board of South Africa, equivalent parks administered by the Natal Parks Board (now being amalgamated with the KwaZulu-Natal Department of Nature Conservation to form KwaZulu-Natal Conservation Services) and the numerous reserves under the control of the provincial governments' conservation agencies include world-famous protected areas such as Kruger National Park,

Hluhluwe-Umfolozi Park and many others which are of great international importance to the conservation of antelopes (Figs. 2-1 and 2-2) and other wildlife. The existing 422 protected areas administered by national and provincial conservation agencies cover more than 60,000 sq km or 5% of the country's total land area. South Africa has achieved the most advanced protection and management of wildlife in Africa, e.g., poaching within protected areas has generally been reduced to levels which do not impact significantly on wildlife populations, even highly susceptible species such as rhinos. Wildlife populations of protected areas, especially the smaller parks and reserves, are often managed by culling and/or live-capture and removal of surplus animals. Protected populations also fluctuate in response to natural factors. In Kruger National Park, for example, the populations of buffalo and some antelope species were reduced substantially by the very severe drought of 1991-92 (Anderson et al. 1996). Good rains in Kruger during the mid-1990s assisted the partial recovery of the park's buffalo population, and the numbers of most antelope species appear to have at least stabilised since 1993 (I. Whyte, in litt. February 1998).

Outside protected areas, many parts of the country have suffered moderate to severe environmental degradation from agricultural and industrial development. Rapid human population growth and widespread lack of knowledge of the dangers of overgrazing and soil erosion in a largely semi-arid, drought-prone landscape are long-term threats to the country's conservation achievements. The flow of the formerly perennial rivers which cross Kruger National Park, for example, has been greatly reduced and at times stopped by upstream water extraction to meet the needs of agricultural and industrial development and the growing human population in the region to the west of the park.

The new South Africa became a political reality in 1994 and is a unique mixture of developed first world and developing third world. The new government is facing huge demands from its constituency to meet the needs of the poor and to address issues such as the allocation or redistribution of land. The long-term future of protected areas bordered by impoverished, land-hungry communities is a topic of considerable debate and speculation. Conservation priorities are changing from the former focus on protection of pristine natural areas from which people are largely excluded, to more emphasis on a participative approach which gives local communities greater access to the economic benefits which arise from the conservation of natural resources. The extent to which the development needs of rural people and the conservation requirements of natural ecosystems can be successfully balanced will largely determine the future of South Africa's spectacular system of protected areas. The country's large and growing tourism industry is a major factor which favours wildlife conservation. Wildlife is an important attraction for international visitors to South Africa, and the relatively well developed infrastructure gives the country an advantage as a tourist destination over many other parts of Africa. There is widespread realisation among South Africa's political and commercial leaders that tourism is potentially the country's largest income earner and provider of job opportunities, but this will not happen if wilderness destinations for tourists are not maintained (Anderson et al. 1996; Steenkamp & Hughes 1997).

To date South Africa's conservation achievements have been funded almost entirely from the country's internal resources, through national and provincial government conservation agencies, South Africa's impressive capacity for domestic environmental fund-raising by conservation NGOs, and the efforts of private landowners. Economic uncertainties and changing government priorities are leading to greater financial constraints for nature conservation. The National Parks Board and provincial conservation agencies are increasingly being required to become financially self-sustaining as government funding for conservation is reduced. The capacity of some provincial conservation agencies has declined as many experienced conservation staff have taken early retirement and staffing levels and most conservation budgets have been cut. In this context, the role of the private wildlife sector may become increasingly important. Since 1979, the country's total area of private reserves and game farms has grown more than 8-fold and it now almost matches the total size of the national and provincial conservation areas (Chadwick 1996). South Africa now has more than 10,000 private game ranches and a growing number of private wildlife

conservancies. These private initiatives utilise wildlife for trophy hunting, meat production and/or game-viewing tourism. The 1,300 sq km Waterberg Nature Conservancy, for example, was established in 1989 in the Waterberg Mountains in Northern Province and presently comprises 25 landowners. During the last 15 years there has been a marked shift in land-use practice in the Waterberg away from agriculture to wildlife conservation, tourism development and professional trophy hunting. The conservancy's natural habitats are largely intact, there is no forestry or industry, pollution is absent, mining prospects are zero and the prospects for successful long-term wildlife conservation are bright (Walker 1997). Other examples of major private conservation initiatives include the 3,000 sq km of contiguous conservation land adjoining the western boundary of Kruger National Park between the Sabie and Olifants Rivers, which is the world's largest expanse of privately owned land dedicated to wildlife conservation (Steenkamp & Hughes 1997), the 140 sq km Phinda Izilwane Conservancy in northern KwaZulu-Natal (Anderson et al. 1996) and the 750 sq km Tswalu Private Desert Reserve in Northern Cape Province.

The national parks system has also been enlarged significantly. Many larger game species including antelopes and both rhino species have been reintroduced to the newly established Marakele National Park (399 sq km) in the Waterberg Mountains. It is planned to substantially enlarge this park, which has the potential to eventually rival Kruger as a tourist destination. Similarly, Vaalbos National Park (227 sq km) on the northeastern border of the Karoo has built up substantial populations of species such as red hartebeest and springbok with well-established reintroduced populations of other species such as buffalo, eland, black wildebeest and gemsbok, and there are plans to ultimately enlarge this park to 1,000 sq km. It is planned to enlarge Mountain Zebra National Park in the Eastern Cape from its current size of 65 sq km to 300 sq km, which will facilitate the reintroduction of species such as buffalo and gemsbok. Other parks have already been enlarged, e.g., Addo Elephant National Park was recently extended to link up with Zuurberg National Park, and new national parks are being created, e.g., the Highveld National Park near Potchefstroom in Northwest Province which was established in 1997.

The recently launched Peace Parks Foundation is facilitating the formation of transfrontier conservation areas in regions such as Kruger National Park (South Africa)-Banhine/Zinave National Parks (Mozambique)-Gonarezhou National Park (Zimbabwe), Kalahari Gemsbok National Park (South Africa)-Gemsbok National Park (Botswana) and Maputaland (South Africa, Mozambique and Swaziland). These large "peace parks" have the potential to change the conservation face of southern Africa and create thousands of desperately needed jobs in the subcontinent through the promotion of nature-based tourism. The first of these international parks, the 42,059 sq km Kalahari Transfrontier Conservation Area, was implemented in 1997 when bilateral agreements were signed by the governments of South Africa and Botswana.

As a result of the extensive, generally well managed and effectively protected system of parks and reserves and strong and growing private sector interest in wildlife, most of the larger antelope species probably now occur in greater numbers in South Africa than at any other time in the last 100 years (Anderson et al. 1989, 1996). This situation provides a very good platform for antelopes and other wildlife to contribute strongly to the economic development of the new South Africa.

*42. Swaziland*

Swaziland is a small, relatively densely populated country. It has lost most of its formerly abundant wildlife populations because of intensive subsistence hunting and the expansion of agriculture and settlement. Representative examples of the country's antelope communities survive in protected areas. These include two parastatal nature reserves, Malolotja in the northwestern highveld and Mlawula-Ndzindza in the northeastern lowveld and Lebombo uplands, the Royal-owned Hlane Game Reserve in the northeastern lowveld, and several privately owned or entrusted reserves such as Mlilwane Wildlife Sanctuary (Anderson 1989a; Culverwell 1995). Some antelope species have been reintroduced to these areas from South Africa after becoming extinct in

Swaziland. Most of the larger antelope species now survive only within protected areas, although a few species also survive on some of the larger privately owned cattle ranches.

Protected areas such as Malolotja and Hlane are of international significance to the conservation of antelope communities (Fig. 2-1). Since the 1960s, Swaziland has developed a relatively strong nature conservation programme and the country's reserves and sanctuaries are generally well protected. Management is moderate-high in areas such as Malolotja and Mlawula. In some areas, e.g., Hlane, protectionist policies have allowed some wildlife species to increase to unsustainable levels, with consequent overgrazing and population crashes (Culverwell 1995).

*43. Lesotho*

Lesotho is a small, mountainous enclave surrounded by South Africa. Population density is high, and much of the country has been severely overgrazed by livestock. Uncontrolled hunting had wiped out almost all of the country's larger mammals by 1900, and very little wildlife remains today (Anderson 1 989b). Lesotho has one major protected area, Sehlabathebe National Park, situated on open, hilly grassland in the Drakensberg Mountains. The park was fenced with WWF support in 1972-74 to exclude livestock and to allow the veld to recover from overgrazing. A 1 km stretch on the South African border was left unfenced to provide access for wildlife moving to and from the adjoining Natal Drakensberg.

The ASG's information on Lesotho has not been updated since the report by Anderson (1989b).

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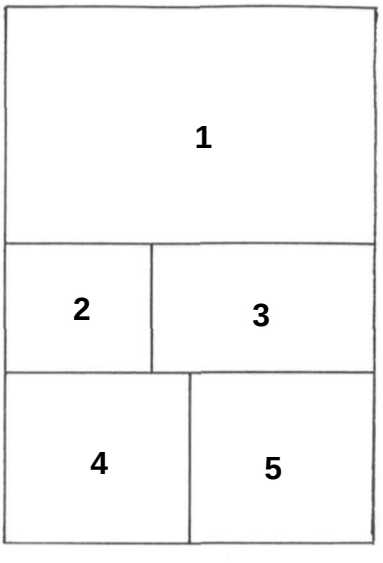
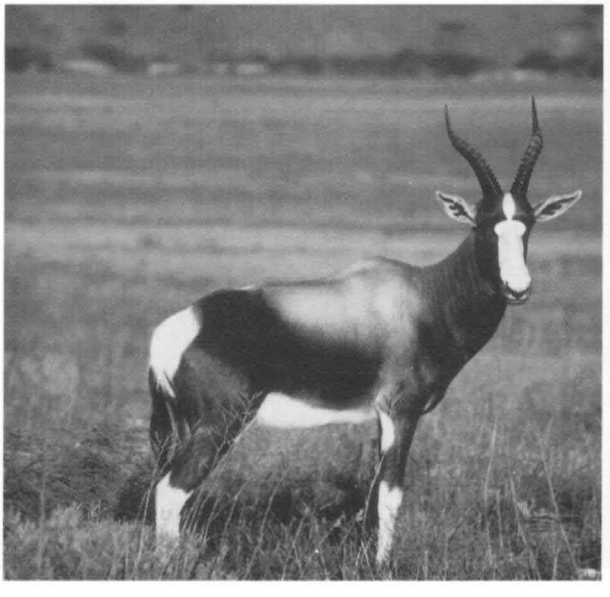



Opposite: Alcelaphine antelopes

1: Western hartebeest, Benoue National Park, Cameroon.
2: Red hartebeest and blesbok, private game farm, Gauteng Province, South Africa.
3: Black wildebeest, private game farm, Gauteng Province, South Africa.
4: Bontebok, Bontebok National Park, South Africa.
5: Coke's hartebeest, Nairobi National Park, Kenya.

photos: Rod East

Plate 3



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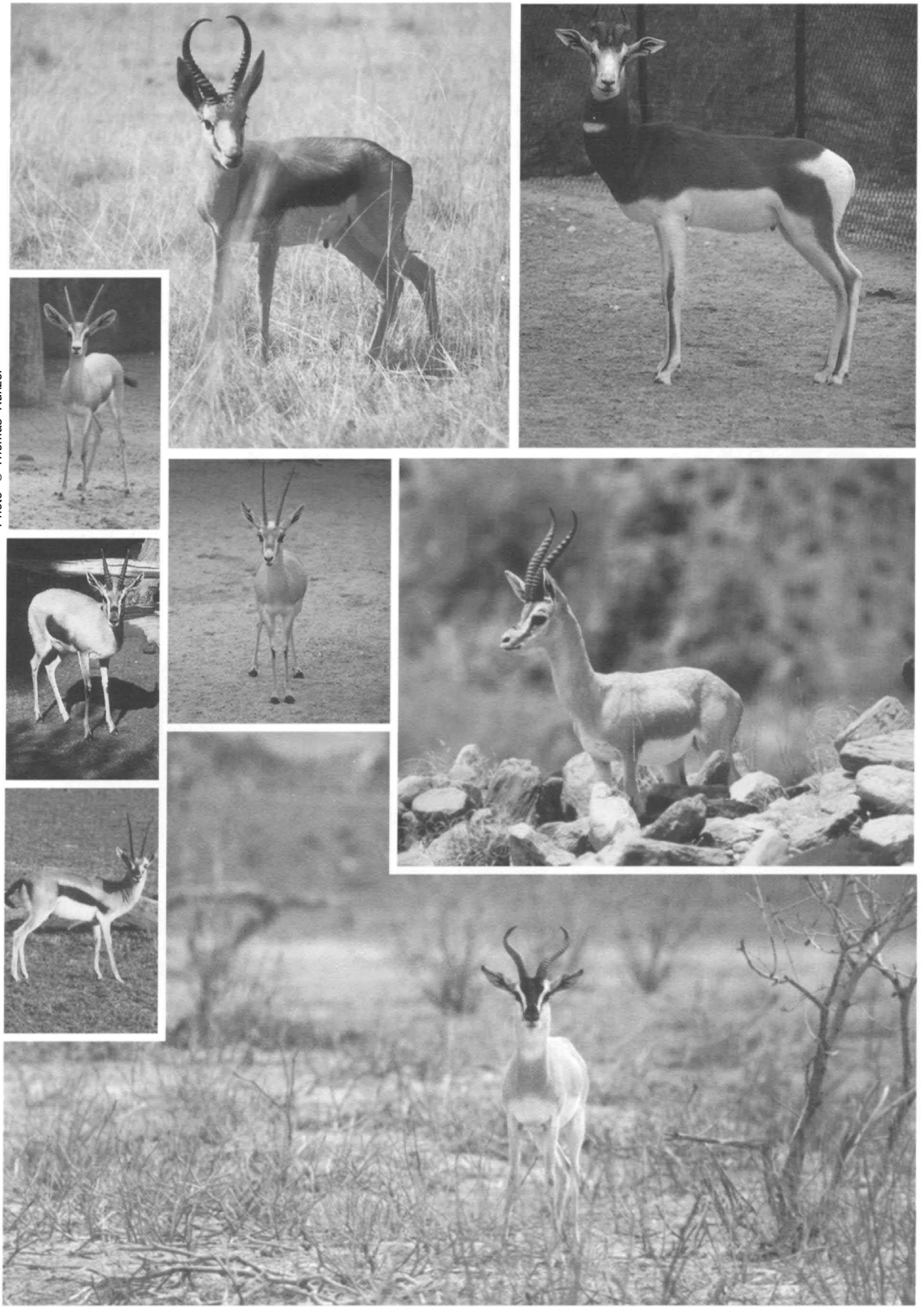

Photo © Thomas Kunzel

Photo © Thomas Kunzel

Photos © Rod East

# 4. Species Accounts

INTRODUCTION

This section summarises the available information on each species' abundance and population trend (see Appendix 4) provided by ASG members and contacts (Appendix 3) in the following format:

*Red List Status*
Red List Categories (IUCN 1994) are from East et al. (1996) and Baillie & Groombridge (1996). These assessments have been updated for three antelopes, scimitar-horned oryx, addax and dorcas gazelle, as described in the accounts of these species.

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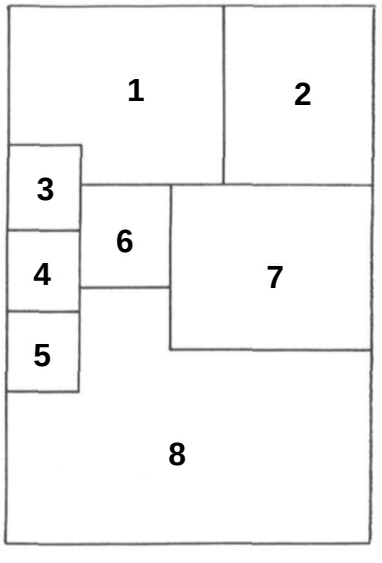



Opposite: Springbok and gazelles

1: Springbok, Krugersdorp Game Reserve, South Africa.
2: Dama gazelle (*Gazella dama mhorr*), The Living Desert, Palm Desert, California.
3: Dorcas gazelle, San Diego Zoo.
4: Speke's gazelle, Los Angeles Zoo.
5: Thomson's gazelle, Masai Mara National Reserve, Kenya.
6: Slender-horned gazelle, The Living Desert, Palm Desert, California.
7: Dorcas gazelle, Djibouti.
8: Soemmerring's gazelle, Djibouti.

photos -

dorcas gazelle (Djibouti) and Soemmerring's gazelle: Thomas Kunzel

others: Rod East

*Distribution*

The distribution map for each species shows, on a continental scale, broad localities where it has been recorded to the ASG's knowledge during the period 1987-98. Different orders of magnitude of abundance (more than 10,000; 1,000 to 10,000; less than 1,000, or present but abundance unknown) are also indicated for the period 1987-98. The number of localities indicated for a species within a particular country is a function of both the species' current distribution and the extent of coverage of that country by the sources of information available to the ASG. For some countries, e.g., Sudan, Congo-Kinshasa, Angola and Mozambique, this coverage is relatively poor, and gaps in the distribution maps of antelope species within these countries reflect the low level of coverage as well as genuine absence. Likewise, in many cases where the antelope population of a locality is indicated as "less than 1,000, or present but abundance unknown", the population may exceed 1,000 or 10,000 but no information on its numbers is available for the period 1987-98. No distinction is made on the distribution maps between records within a species' historical range and extralimital records where it has been introduced to other areas. Countries where a species is suspected to occur but for which there are no definite records (historical or recent) are generally excluded from this database.

No attempt is made here to indicate the overall historical and current (generally reduced and fragmented) distributions of each species (see maps in Kingdon 1997, and also East 1988, 1989, 1990). Accurate definition of the precise distribution of most large African mammals is very difficult, even for a species as large and obvious as the African elephant (Said et al. 1995). It is also questionable whether there is any point in attempting to map the exact distribution of species in those parts of their ranges where they have no prospects of long-term survival, particularly when there are much more urgent conservation priorities such as protection and management of well-known key areas (e.g., Fig. 2-1).

Analysis of distribution patterns can nevertheless provide revealing insights. Boitani et al. (1998) applied GIS methodology in conjunction with knowledge of the ecological requirements of large African mammals to estimate each species' area of occupancy (the area actually occupied within the species' overall range or extent of occurrence). This modelling approach, which was partly validated with field data, indicated areas of occupancy of hundreds of thousands or millions of sq km for most African antelope species. In comparison, the estimates of each species' current range available to the ASG (Appendix 4) indicate considerably smaller areas of occupancy. The estimates of total area occupied in this report are largely informed guesses, are generally minimal and may often be significant underestimates. However, Boitani et al. (1998) acknowledged that many antelope species have been exterminated over substantial parts of their ranges by human actions. Their analyses demonstrate strikingly that large areas of suitable habitat are still available in Africa for most wildlife species. It is only through overhunting and other human-related pressures that most species are now absent from large parts of their former distributions.

*Subspecies*

The species is the taxonomic unit of this database, as for the Antelope Survey and Action Plans (East 1988, 1989, 1990). Subspecies are generally ignored, because the validity and precise distributions of described subspecies are uncertain for most antelopes. A large number of described antelope subspecies merely reflect individual variation and have no scientific validity. In other cases, it is often impossible to clearly define the distribution, abundance and conservation status of subspecies, which in reality represent arbitrary distinctions in a continuously varying population (dine). The information for each species in Appendix 4 can be analysed separately by any reader who prefers to recognise greater subspecific distinctions. In this report, subspecies are only included in a few cases, viz., where they are highly distinctive morphologically, behaviourally and/or geographically, and are usually recognised as distinctive by wildlife managers in the field.

*Estimated Populations/Relative Abundance and Population Trends*

The available information on site-specific populations/relative abundance and population trend for each species (Appendix 4) is summarised for each of its range states by protected areas, private

land (Southern Africa only) and other areas. These summaries are based on a variety of data types and data quality. Quantitative population estimates were obtained from total counts (usually in small areas), statistically based aerial surveys and ground surveys which are sample counts of more extensive areas, questionnaire surveys of wildlife populations on private farmland (including annual returns to wildlife authorities) and informed guesses by knowledgeable observers with extensive experience of the area concerned. Where quantitative population estimates were unavailable, informants were asked to provide estimates of relative abundance and population trend. These were based on direct field observations by the informant, reports obtained from local hunters, pastoralists and other rural people, or informed guesses. The type of information for each area (total count, aerial survey, ground survey, informed guess etc.) is indicated in Appendix 4. Sources of information for each country are given in Appendix 3. This report includes information provided to the ASG up to August 1998.

All tables use the following symbols:

Relative Abundance
Ab: abundant
C: common
U: uncommon
R: rare
V: occurs only as a vagrant
x: definitely present but abundance unknown
?: may occur but current presence not confirmed
-: absent
Ex: extinct
Ex?: probably extinct

Population Trend
I: increasing
S: stable
D: decreasing
?: unknown

*Overview of Conservation Status*
This includes a brief summary of the species' status in each of its historical and current range states, based on the sources of information given in Appendix 3.

*Summary*
The species' overall status is summarised, followed by an attempt to estimate its total numbers and overall population trend from the available information in Appendix 4. A general philosophy underpinning the preparation of this database is that attempts to quantify population status, even where detailed information is lacking, are beneficial to improving the objectivity with which conservation issues for specific taxa can be considered, as espoused by the IUCN/SSC Captive Breeding Specialist Group (e.g., Foose 1992).

The estimation of total numbers is aimed at determining the order of magnitude of each antelope species' current population, i.e., hundreds, thousands, tens of thousands etc., and should not be interpreted as having a higher level of accuracy. In deriving these estimates, extrapolations over the species' entire range are made from recent population density estimates obtained for specific areas by censuses (total counts) and statistically designed aerial and ground surveys. Informed guesses of population levels are generally excluded from these extrapolations. In view of the broad nature of these density extrapolations, no attempt is made to allow for such factors as the effects of soil nutrient and rainfall levels on antelope population densities (East 1984). The data for each species in Appendix 4 can be used to recalculate density extrapolations based on alternative assumptions and/or more information as this becomes available.

Information on captive populations in North America and Europe and on Texas ranches (Shurter 1997; Kingswood 1997) is included for threatened species, i.e., those classed as Extinct in the Wild, Critically Endangered, Endangered or Vulnerable, and for non-threatened species which have one or more threatened subspecies.

An attempt is also made to project the future status of each species in a 20-30 year time frame, assuming that current trends of factors affecting the species continue. These projections should be placed in a longer-term context by noting that most of the Red List criteria (IUCN 1994) are dependent on observed, estimated, inferred or suspected reductions in distribution and abundance over periods of up to 5-20 years or 2-3 generations. If this is followed by a prolonged period of population stability at a reduced level or some recovery, the species' status may subsequently change from threatened to non-threatened. The southern white rhinoceros, for example, suffered a catastrophic reduction during the late 19th and early 20th centuries until it had been reduced to a few survivors within a small pocket of its historical range in southern Africa. Subsequently, many years of strict protection and widespread reintroduction have enabled it to increase to several thousand individuals. It is now classed as Lower Risk (conservation dependent) (Mace & Stuart 1994; Baillie & Groombridge 1996), although its total population is still only a tiny fragment of what it must have been 100-150 years ago. Many African antelopes, particularly forest-dependent species in West and Central Africa, are not yet threatened but probably face marked reductions in their distributions and abundance over the next 20-50 years. This may reduce their status to threatened. Successful conservation of the surviving populations within secure protected areas in the remaining fragments of their habitat may subsequently improve their status to non-threatened, e.g., Lower Risk (conservation dependent), by the mid-late 21st century.

## AERIAL SURVEYS OF ANTELOPE POPULATIONS

Aerial surveys are a major source of information on populations of most savanna antelope species (Appendix 4). Aerial transect sample counts (surveys) or, in a few cases, aerial total counts (censuses) have become standard methodology over the last 25 years for monitoring the distribution and abundance of large wildlife species and domestic livestock in African rangelands. Aerial counts using rigorously standardised techniques have proved a valuable tool for monitoring wildlife population trends, e.g., in South Africa, Tanzania, Kenya and Zimbabwe (Anderson et al. 1996; TWCM et al. 1997; Butynski et al. 1997; Anderson & Wilson 1998). This is despite the fact that population estimates obtained from aerial sample counts often have wide confidence intervals, e.g., standard errors often exceed 20% of the population estimate obtained from aerial sample counts conducted at typical transect spacings of 2.5 to 10 km. Hence only relatively large-scale changes in numbers can be detected reliably by this technique.

In addition to statistical sampling error, aerial counts underestimate the true population sizes of most species because some animals within the counting-strip are missed from the air. This can result from the coloration, size and behaviour of the species, variations in flying height and counting-strip width, and differences between observers (e.g., Pennycuick & Western 1972; Caughley 1974; Norton-Griffiths 1974; Graham & Bell 1989; Mason 1990). The level of undercounting bias in individual aerial surveys is specific to the conditions of that survey, may be highly variable and is usually unknown, but an indication of the order of magnitude of this bias is shown in the examples given in Table 4-1. These data suggest that correction factors for undercounting bias in aerial surveys may frequently be of the order 1.1-2.5 for the larger, more conspicuous savanna ungulates, e.g., giraffe, buffalo, common eland, waterbuck, common hartebeest, tsessebe, wildebeest, roan, sable and oryx. Correction factors can be 4.0-10.0 for species which are smaller and/or inhabit scrubland and woodland where a relatively high proportion of the animals is likely to be obscured by vegetation, e.g., lesser and greater kudu, impala and Grant's gazelle. Hence aerial counts are generally likely to provide substantial underestimates of the true population size of most antelope species. In a few cases, e.g., buffalo and wildebeest in the Serengeti (TWCM 1994a, 1994b), this problem has been overcome by using aerial photography of

herds in open country to obtain a total count. It should be noted that the numbers of the more secretive species which occur in relatively dense vegetation are also likely to be underestimated by ground surveys.

All of the information from aerial surveys included in Appendix 4 is uncorrected for undercounting bias, except for the few cases where this correction was made by the source of the information. Some attempt is made to allow for this source of bias in the estimation of total numbers given in the summary at the end of each species account in this section.

TABLE 4-1. Examples of the Level of Undercounting Bias in Aerial Counts of African Antelopes with Fixed-wing Aircraft, obtained by Comparison with Ground Observations.

| Species | Area | % of Popn Seen from Air | Source of Information |
|---|---|---|---|
| Giraffe | Omo-Mago | 50 | Lamprey (1994) |
| | Amboseli | 52 | Pennycuick & Western (1972) |
| | Hwange | 85 | Wilson (1997) |
| Buffalo | Omo-Mago | 66 | Lamprey (1994) |
| | Amboseli | 99 | Pennycuick & Western (1972) |
| | Serengeti | 40-88 | Norton-Griffiths (1974) |
| | Ruaha | 70 | Norton-Griffiths (1975) |
| Lesser Kudu | Omo-Mago | 14 | Lamprey (1994) |
| Greater Kudu | Ruaha | 10 | TWCM (1994c) |
| | Etosha | 13 | P. Erb (inlitt. Aug. 1997) |
| | Hwange | 35 | Wilson (1997) |
| | Kruger | 55 | Anderson et al. (1989) |
| Common Eland | Omo-Mago | 50 | Lamprey (1994) |
| | Hwange | 60 | Wilson (1997) |
| | Kruger | 85 | Anderson et al. (1989) |
| Waterbuck | Omo-Mago | 14 | Lamprey (1994) |
| | Queen Elizabeth NP | 80 | Eltringham & Din (1 977) |
| | Hwange | 41 | Wilson (1997) |
| | Kruger | 45-50 | Anderson et al. (1989) |
| Common Hartebeest | Omo-Mago | 40 | Lamprey (1994) |
| | Amboseli | 69 | Pennycuick & Western (1972) |
| Tiang/Tsessebe | Omo-Mago | 50 | Lamprey (1994) |
| | Kruger | 80 | Anderson et al. (1989) |
| Wildebeest | Amboseli | 43 | Pennycuick & Western (1972) |
| | Hwange | 37 | Wilson (1997) |
| | Kruger | 85 | Anderson et al. (1989) |
| Roan | Arly | 66 | Barry & Chardonnet (1998) |
| | Hwange | 23 | Wilson (1997) |
| | Kruger | 80 | Anderson et al. (1989) |
| Sable | Hwange | 73 | Wilson (1997) |
| | Kruger | 90-95 | Anderson et al. (1989) |

Table 4-1 (continued)

| Species | Area | % of Popn Seen from Air | Source of Information |
|---|---|---|---|
| Beisa Oryx | Omo-Mago | 40 | Lamprey (1994) |
| Impala | Serengeti | 50-80 | Norton-Griffiths (1974) |
| | Hwange | 25 | Wilson (1997) |
| | Kruger | 60 | Anderson et al. (1989) |
| Thomson's Gazelle | Amboseli | 80 | Pennycuick & Western (1972) |
| Grant's Gazelle | Omo-Mago | 20 | Lamprey (1994) |
| Springbok | Etosha | 54 | P. Erb (in litt. Aug. 1997) |

Note: In some cases, estimated numbers from ground observations are based on informed guesses or temporally different ground surveys. The information from Kruger National Park provided by S.CJ. Joubert (in Anderson et al. 1989), for example, is not based on detailed calibration of aerial counts against simultaneous ground counts (Mason 1990). The information in this table nevertheless provides an indication of the order of magnitude of undercounting bias of different species in various localities.

## ESTIMATES OF FOREST DUIKER POPULATION DENSITIES

For most forest duikers (*Cephalophus* spp.), information on relative abundance is available from extensive areas but there are relatively few estimates of absolute abundance (Appendix 4). Examples of the available information on population densities are summarised in Table 4-2.

These estimates are used in extrapolations from the data on each species' area of occupancy and relative abundance in Appendix 4 to estimate its total numbers in the species accounts in this section. In order to obtain a conservative estimate of each species' total numbers for areas where population estimates are unavailable, it is assumed that small forest duikers occur at average densities of 10.0 per sq km where they are known to be common/abundant and 2.0 per sq km elsewhere, and that equivalent densities are 2.0 and 0.2 per sq km for medium-sized forest duikers and 1.0 and 0.1 per sq km for large forest duikers.

TABLE 4-2. Estimates of Forest Duiker (*Cephalophus* spp.) Population Densities obtained by Drive Counts, Flushing Counts, Pellet and/or Track Counts.

| Location | Species Included in Estimate | No. per sq km | Source |
|---|---|---|---|
| **Small Duikers** | | | |
| Gola (Sierra Leone) | *C. maxwellii* | 10.0-30.0 | Davies (1991) |
| Makoukou (Gabon) | *C. monticola* | 70.0 | Dubost(1980) |
| Gabon (non-hunted) | *C. monticola* | 53.0 | Lahm (1993a, 1993b) |
| Gabon (hunted) | *C. monticola* | 30.0 | Lahm (1993a, 1993b) |
| northern Lope (Gabon) | *C. monticola* | 0.9 | White (1994) |
| northern Lope (Gabon) | *C. monticola* | 6.1 | Tutin et al. (1996) |
| Ituri (Congo-Kinshasa) | *C. monticola* | 15.0 | Hart (1985), Koster & Hart (1988) |
| Ituri (Congo-Kinshasa) | *C. monticola* | 59.0-69.0 | Wilkie & Finn (1990) |
| Ituri (Congo-Kinshasa) | *C. monticola* | 24.2 | Hart et al. (1996) |
| Budongo (Uganda) | *C. monticola* | 5.0-13.0 | Plumptre (1994) |
| **Medium-sized Duikers** | | | |
| Makokou (Gabon) | *C. dorsalis* | 17.0 | Dubost (1979) |
| Gabon (non-hunted) | *C. dorsalis* | 6.7 | Lahm (1993a, 1993b) |
| Gabon (hunted) | *C. dorsalis* | 2.5 | Lahm (1993a, 1993b) |
| Ituri (Congo-Kinshasa) | *C. dorsalis* | 2.4 | Hart et al. (1996) |
| Makokou (Gabon) | *C. callipygus* | 23.0 | Dubost(1979) |
| Gabon (non-hunted) | *C. callipygus* | 6.7 | Lahm (1993a, 1993b) |
| Gabon (hunted) | *C. callipygus* | 0.6 | Lahm (1993a, 1993b) |
| Ituri (Congo-Kinshasa) | *C. callipygus* | 8.7 | Hart et al. (1996) |
| Ituri (Congo-Kinshasa) | *C. leucogaster* | 2.7 | Hart et al. (1996) |
| Korup (Cameroon) | *C. ogilbyi* | 13.0 | Payne (1992) |
| Volcanoes NP (Rwanda) | *C. nigrifrons* | 5.0-22.0 | Plumptre & Harris (1995) |
| Ituri (Congo-Kinshasa) | *C. nigrifrons* | 1.6 | Hart et al. (1996) |
| northern Lope (Gabon) | *C. callipygus, dorsalis* & *leucogaster* | 4.0 | White (1994) |
| Ituri (Congo-Kinshasa) | *C. callipygus, dorsalis* & *leucogaster* | 5.0-10.0 | Hart (1985), Koster & Hart (1988) |
| northern Lope (Gabon) | *C. callipygus, dorsalis, leucogaster* & *ogilbyi* | 11.4 | Tutin et al. (1996) |
| Ituri (Congo-Kinshasa) | *C. callipygus, dorsalis, leucogaster* & *nigrifrons* | 49.0-81.0 | Wilkie & Finn (1990) |
| Gola (Sierra Leone) | *C. dorsalis, niger* & *zebra* | 8.0-30.0 | Davies (1991) |
| **Larae Duikers** | | | |
| northern Lope (Gabon) | *C. silvicultor* | 0.5 | White (1994) |
| northern Lope (Gabon) | *C. silvicultor* | 2.1 | Tutin et al. (1996) |
| Ituri (Congo-Kinshasa) | *C. silvicultor* | <1.0 | Hart (1985), Koster & Hart (1988) |
| Ituri (Congo-Kinshasa) | *C. silvicultor* | 1.6 | Hart et al. (1996) |
| **Mixed Size-Classes** | | | |
| Tai (Ivory Coast) (primary forest) | *C. maxwellii, niger, zebra, dorsalis, ogilbyi, silvicultor* & *jentinki* [plus *Hyemoschus aquaticus* & *Neotragus pygmaeus*] | 1.5-19.4* | Hoppe-Dominik et al. (1998) |

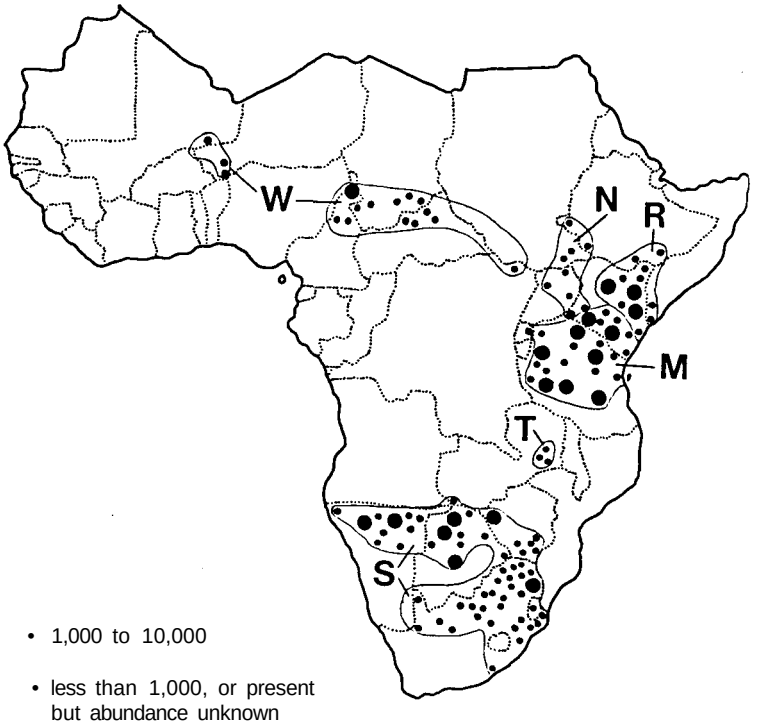
*estimated density varied inversely with hunting pressure

Family Giraffidae

**Giraffe**
*Giraffa camelopardalis* (Linnaeus 1758)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
W: western giraffe (G. *c. peralta, antiquorum, congoensis)*
N: Nubian/Rothschild's giraffe (G. *c. camelopardalis, rothschildi)*
R: reticulated giraffe (G. c. *reticulata)*
M: Masai giraffe (G. *c. tippelskirchi)*
T: Thornicroft's giraffe (G. *c. thornicrofti)*
S: southern giraffe (G. *c. giraffa, angolensis, infumata, capensis, wardi)*




Note: Considerable uncertainty surrounds the validity and geographical limits of most of the described subspecies of the giraffe. Some of these are synonymous, e.g., *antiquorum* with *congoensis*; *wardi, capensis* and probably *angolensis* with *giraffa* (Dagg & Foster 1976). In other cases, there are no major geographical barriers separating the distributions of supposed subspecies, such as *peralta* and *antiquorum* in Central Africa, *camelopardalis* and *rothschildi* in southeastern Sudan, and *angolensis* and *giraffa* in southern Angola/northern Namibia. Hence it is not surprising that intergrades between described subspecies occur commonly, e.g., between *rothschildi* and *reticulata* in Laikipia in central Kenya and between *reticulata* and *tippelskirchi* between the Tana and Galana Rivers in eastern Kenya (Kingdon 1979). Six subspecies/subspecies groups are recognised here but this is arbitrary, like other treatments of giraffe subspecies.

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Western Giraffe | | | | | | | | |
| Mauritania | - | - | - | - | - | - | Ex | - |
| Mali | <10 | D | - | - | - | - | <10 | D |
| Niger | - | - | - | - | 70 | I | 70 | I |
| Senegal | - | - | - | - | - | - | Ex | - |
| Guinea | - | - | - | - | - | - | Ex | - |
| Burkina Faso | - | - | - | - | V | D | V | D |
| Nigeria | - | - | - | - | V | ? | V | ? |
| Chad | >830 | I | - | - | R | D | >830 | I |
| Cameroon | 1,360 | S | - | - | - | - | 1,360 | S |
| CAR | <550 | D | - | - | R | D | >550 | D |
| Congo-Kinshasa | 280 | S | - | - | - | - | 280 | S |
| Sudan | - | - | - | - | x | D | x | D |
| Subsp. Total | >3,000 | S | - | - | R | D | >3,000 | S/D |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Nubian/Rothschild's Giraffe | | | | | | | | |
| Sudan | - | - | - | - | x | D | x | D |
| Eritrea | - | - | - | - | - | - | Ex | - |
| Ethiopia | >160 | D | - | - | ? | ? | >160 | D |
| Uganda | 145 | S/I | - | - | - | - | 145 | S/I |
| Kenya | >140 | S/I | - | - | R | D | >140 | S/I |
| Subsp. Total | >445 | S? | - | - | x | D | x | D |
| Reticulated Giraffe | | | | | | | | |
| Ethiopia | - | - | - | - | >140 | S/D | >140 | S/D |
| Somalia | x | ? | - | - | U/R | D | x | D |
| Kenya | >575 | D | - | - | 26,970 | S | >27,540 | S/D |
| Subsp. Total | >575 | D | - | - | >27,110 | S/D | >27,680 | S/D |
| Masai Giraffe | | | | | | | | |
| Kenya | 2,530 | D | - | - | 14,800 | S | 17,330 | D |
| Tanzania | 21,760 | S/D | - | - | 7,100 | S | 28,860 | S/D |
| Rwanda | 20 | S/D | - | - | - | - | 20 | S/D |
| Subsp. Total | 24,310 | S/D | - | - | 21,900 | S | 46,210 | D |
| Thornicroft's Giraffe | | | | | | | | |
| Zambia | 1,145 | S | 16 | S/I | - | - | 1,160 | S |
| Southern Giraffe | | | | | | | | |
| Angola | - | - | - | - | - | - | Ex? | - |
| Zambia | R | S/D | - | - | - | - | R | S/D |
| Mozambique | - | - | - | - | - | - | Ex? | - |
| Namibia | 1,840 | S | 4,550 | I | >300 | S/I | 6,690 | I |
| Botswana | 5,100 | S | 30 | S/D | 6,570 | S/I | 11,700 | S/I |
| Zimbabwe | 3,380 | S | 2,050 | S/I | - | - | 5,430 | S/I |
| South Africa | 6,250 | S | 1,630 | S/I | - | - | 7,880 | S/I |
| Swaziland | R | S | x | S/I | - | - | x | S/I |
| Subsp. Total | 16,570 | S | 8,260 | I | 6,870 | S/I | 31,700 | I |
| Species Total | >46,045 | S/D | 8,275 | I | > 55,880 | S/D | >110,000 | S? |

OVERVIEW OF CONSERVATION STATUS

Mauritania: The western (sahel) giraffe formerly occurred in southeastern Mauritania, but it is now extinct.

Mali: The western giraffe formerly occurred widely in central Mali, in the sahel zone and northern savanna woodlands. It has been exterminated over almost all of its former range by uncontrolled hunting for meat and hides. By the late 1980s, it had disappeared completely from Boucle du Baoule, Bafing and other areas in the west. In 1996, the country's last surviving giraffe population comprised less than 10 animals in the Ansongo-Menaka Partial Faunal Reserve on the Niger border in the east. This reserve has been severely affected by incursions of large numbers of livestock and encroachment of settlement. The Malian authorities took active steps in the early 1990s to

*Giraffe (continued)*
protect the reserve's giraffe population, including posting a ranger to accompany the giraffes to discourage poachers, but habitat degradation is likely to continue unless part of the reserve can be upgraded legally to a permanent faunal reserve and effective habitat protection implemented.

Niger: The western giraffe formerly occurred in the southwest, on the northern bank of the Niger River from the Mali border to south of Niamey, and in west-central Niger from Agadez southwards to the Zinder area near the Nigeria border. Uncontrolled hunting, the expansion of agriculture into its habitat and consequent land clearance, desertification and the drying-out of sahelian lakes have caused a major contraction in its range. By 1988 the country's estimated total giraffe population had decreased to <100, with the largest numbers in the Boboye region to the south of Niamey. It is now extinct in west-central Niger. In July 1998, a population of 68 giraffes survived in the Koure area, 50 to 70 km east of Niamey. In addition, a few individuals from Mali occasionally wander into Niger (Ayorou area), and a few individuals (possibly wanderers from Koure) are seen occasionally in the Gaya area near the Benin border. Support from EU, FFEM and the "Association pour la Sauvegarde des Girafes au Niger" is assisting the survival of the Koure population, which increased with the birth of 16 young in 1998.

Senegal: Formerly occurred in the savanna woodlands and sahel zone (Ferlo region) of central and eastern Senegal. It suffered severely from uncontrolled hunting, and by the late 1950s only a few survivors persisted in the east. It is now extinct. Attempts to reintroduce the species to Niokolo-Koba National Park from Cameroon in the early 1 970s were unsuccessful.

Guinea: Formerly occurred in the savannas of northern Guinea, but now extinct.

Burkina Faso: The Niger River has generally been regarded as an effective barrier to the extension of the giraffe's geographical range southwards into the apparently suitable savanna woodland habitat of Burkina Faso and adjoining countries such as Ivory Coast and Ghana, which lie to the south of the Niger. It is now known to occur as a rare vagrant in Burkina Faso, e.g., in the early 1 980s a pair of giraffes wandered from the Mali-Niger border area southwestwards across the country and ended up near Nazinga Game Ranch in the south.

Nigeria: The western giraffe has been recorded in the past from scattered localities, mainly to the north of the Niger and Benue Rivers. It is now extinct except for occasional vagrants which wander into northeastern Nigeria from Waza National Park in Cameroon.

Chad: Formerly occurred widely in central and southern Chad. It has been eliminated from substantial parts of its former range by uncontrolled hunting and the effects of drought, but it survives quite widely in the south. The largest surviving population is in Zakouma National Park, where its numbers have increased substantially with the rehabilitation of this park during the 1990s. It is also reappearing in Siniaka Minia Faunal Reserve to the west of Zakouma. Elsewhere its populations are generally low and decreasing.

Cameroon: The western (sahel) giraffe formerly occurred widely in the northern savanna woodlands and sahel zone, but it is now largely restricted to protected areas, i.e., national parks and hunting zones. Waza National Park protects an important population. This was generally estimated to number between 1,000 and 2,000 animals over the period 1962-94, although a 2-day census of wildlife around all of Waza's waterholes in May 1994 produced a lower population estimate of 340. The results of 1995-96 surveys of Waza's wildlife populations are not yet available. The giraffe still occurs widely at lower densities in Bouba Ndjida, Benoue and Faro National Parks and the adjoining hunting zones of North Province, which is the species' natural southern limit in Cameroon.

Central African Republic: The western giraffe formerly occurred widely in the northern savanna woodlands, but it has been reduced to very low densities or eliminated by poaching over a large

part of its former range. The main surviving population, in Manovo-Gounda-St. Floris National Park, numbered in the thousands until recently but has now been reduced to a few hundred.

Congo-Kinshasa: Confined to the Garamba National Park area in the northeast. The western (or Congo) giraffe was formerly widespread in the southern part of the park, but this area has a large elephant population and has become more open in recent decades. Giraffe now tend to use the peripheries of the park and the adjacent reserves, where woodland density has increased. While the Garamba giraffe population is not greatly poached, it is nevertheless more vulnerable at the edges of and outside the park.

Sudan: Formerly occurred widely in southern, central and northeastern Sudan, with the Kordofan race (*antiquorum*) said to occur to the west of the NIle and Nubian/Rothschild's giraffe (*camelopardalis/rothschildi*) to the east. It has been hunted to extinction over most/all of its former range in central and northeastern regions, e.g., the last herd in Dinder National Park was destroyed by poachers in 1985 and it no longer survives in Radom National Park. During the early-mid 1980s, Nubian/Rothschild's giraffe occurred in large numbers in parts of the southeast, e.g., estimated populations of 8,770 in the 22,800 sq km Boma National Park and 4,530 in the 68,000 sq km Jonglei Canal survey area. It still survives in significant numbers in the southeast, e.g., herds of up to 28 were observed recently by UN pilots in Eastern Equatoria. To the west of the Nile, the western (Kordofan) giraffe was reported to be scarce in the 1970s. There is no recent information on this subspecies' status or continued occurrence in Sudan.

Eritrea: The Nubian giraffe formerly occurred in the southwestern savannas but it is now extinct.

Ethiopia: Formerly occurred widely in the western and southern lowlands, with the Nubian giraffe (*camelopardalis*) in the west and southwest and the reticulated giraffe (*reticulata*) in the south. A marked decrease in Ethiopia's giraffe population as a result of overhunting was evident by the early 1970s. Total numbers may now be no more than a few hundred and are probably continuing to decrease. The Nubian giraffe survives in small and declining numbers in Omo National Park-Tama Wildlife Reserve and may survive elsewhere in the west and southwest, e.g., Gambella National Park and the western lowlands. Much of this subspecies' former range has either been heavily encroached by settlement and cultivation (e.g., Gambella) or affected by military activity and insecurity. The species has disappeared from Mago National Park during the 1 990s. The reticulated giraffe survives in smail numbers in Borana and is reported by local people to occur in southwestern Ogaden.

Somalia: The reticulated giraffe formerly occurred in the south, between the Juba River and the Kenya border. In the early 1980s, it survived locally within its former range but its numbers had been greatly reduced by poaching. It survives in at least a few areas, e.g., Bush Bush National Park, probably in declining numbers.

Uganda: Most of Uganda's surviving population of Nubian/Rothschild's giraffe occurs in Murchison Falls National Park, where numbers are gradually increasing. Kidepo Valley National Park formerly supported the country's largest protected giraffe population, but this had decreased to a mere five animals by 1995. Three giraffe (one male, two females) were successfully translocated to Kidepo Valley from Lake Nakuru National Park in Kenya in 1997, in an attempt to promote the recovery of the Kidepo population. The only other giraffe population known to survive in Uganda comprises a very small number in Pian-Upe Game Reserve in the Karamoja region.

Kenya: The reticulated giraffe still occurs widely within its historical range in northern Kenya, north of the Tana River and east of the Rift Valley. The bulk of the subspecies' population occurs on unprotected rangeland, particularly in Wajir, Garissa and Marsabit districts. Relatively small numbers occur in protected areas such as Marsabit and Meru National Parks and the privately owned Lewa Downs Wildlife Conservancy. While Kenya's population of reticulated giraffe appears to be in reasonably good shape at present, large parts of its range in the north of the country are

*Giraffe (continued)*
virtually unadministered and poaching is prevalent. Giraffe meat, hides and tail hair are valued commodities, and little could be done to protect giraffe outside parks and reserves if poaching pressures increased to high levels across northern Kenya.

The Masai giraffe occurs widely in protected areas and unprotected rangeland in southern and eastern Kenya. The largest population occurs in Kajiado district, with major populations in other areas such as the Mara ranches, Tsavo National Park and surrounds, Laikipia and Tana River districts. The Tsavo population has decreased substantially in recent years.

The Nubian/Rothschild's giraffe occurs in western Kenya, where naturally occurring giraffe are now rare. It has been introduced successfully to Lake Nakuru and Ruma National Parks.

Tanzania: The Masai giraffe remains widespread and common over substantial parts of its historical range, which included most of the country north of the Rufiji River, although it has disappeared from extensive areas of central and coastal Tanzania. Large populations survive in the Serengeti, Tarangire and Ruaha ecosystems, Moyowosi-Kigosi, Katavi-Rukwa and the northern sector of Selous Game Reserve. Most of these populations are stable, but the Serengeti population, formerly the largest protected giraffe population in Africa, decreased from an estimated 8,830 in 1989-91 to 6,170 in 1996, possibly because of poaching and/or disease.

Rwanda: The giraffe does not occur naturally in Rwanda, but in 1986 six Masai giraffe from Kenya were introduced into the southern part of Akagera National Park. This population had increased to about 20 by 1994. It has probably been unaffected by the recent invasion of cattle into the northern part of the park.

Angola: Formerly occurred in the mopane/acacia savannas of southern Angola. In the late 1960s a few hundred were reported to survive in the Mupa National Park-Cafima area in the southwest and the Mucosso area in the southeast, but by the early 1 980s it had largely disappeared from these areas. It is now almost certainly extinct.

Zambia: Thomicroft's giraffe, which is endemic to the Luangwa Valley, is currently more numerous than at any time in the last 50 years, e.g., the total population of this subspecies was estimated to be about 250 in the 1950s and 450 in the early 1980s. The bulk of the population occurs in Lupande Game Management Area and South Luangwa National Park. It appears to be expanding its range northwards towards North Luangwa National Park. The giraffe is not subjected to illegal hunting in the Luangwa Valley and its numbers are regulated by environmental factors such as elephant density and the availability of browse. The southern giraffe survives in small numbers in Sioma Ngwezi National Park within its former range in the southwest. This park has been severely affected by poaching for more than 20 years.

Mozambique: Formerly occurred in southern Mozambique, mainly to the south of the Save River. By the early 1970s it had been eliminated from most of its former range, and the few surviving animals were restricted to the area between the Limpopo River and Kruger National Park on the South African border. It may now be extinct, but it should return to Mozambique with the current rehabilitation of the wildlife areas of Gaza Province.

Namibia: Formerly occurred in the northern savannas, extending into semi-desert habitats in Kaokoland in the northwest. It occupies a large part of its former range, mainly in protected areas (especially Etosha National Park) and on private farmland. The largest population on communal land is the unique desert giraffe population of Kaokoland. Its numbers and distribution are continuing to expand on private land in the northern farming districts.

Botswana: Formerly occurred widely in the savannas of northern and central Botswana. It still occupies a substantial part of its former range, with the largest numbers in the northern region. It

is common in Chobe and Makgadikgadi-Nxai Pan National Parks and Moremi Game Reserve, and is widespread and locally common throughout the rest of the northern region, especially in and around the Okavango Delta. There is also a substantial population in Central Kgalagadi Game Reserve.

Zimbabwe: Formerly occurred widely in western and southern Zimbabwe, but naturally absent from the Zambezi Valley and other areas in the east and north. It still occurs widely in wildlife areas within its former range, with the major populations in Hwange National Park and adjoining areas of northwestern Matabeleland, and on private conservancies and game ranches in the southeastern lowveld.

South Africa: Formerly occurred mainly in the northern lowveld and bushveld. It was eliminated from large parts of its former range by overhunting and the expansion of agriculture but survived in Kruger National Park, which now supports a major population. The giraffe has been reintroduced widely to protected areas and private land within its former range. It has also been introduced to extralimital areas, such as Hluhluwe-Umfolozi and other protected areas in KwaZulu-Natal and Double Drift Reserve in the Eastern Cape.

Swaziland: The giraffe may have occurred formerly in northern Swaziland, to the north of the Nkomati River, but any indigenous populations that might have existed are extinct. Six animals from Namibia were introduced to Hlane Game Reserve in the 1970s but have never bred up. A small population from the Kruger National Park area of South Africa has bred up from a mother-son union in Mlilwane Wildlife Sanctuary, and giraffe from South Africa have also been introduced to the privately owned Mkhaya, Mhlosinga and Mbuluzi Nature Reserves.

SUMMARY
The giraffe formerly occurred throughout the drier, more open savanna woodlands of sub-Saharan Africa. Its range has contracted markedly with the expansion of human populations, especially in West Africa. It formerly occurred from Senegal to Lake Chad, but the only viable surviving population within this entire area is the small population in southwestern Niger. The current attempt to protect Niger's remaining giraffes is an important international conservation priority. The western giraffe survives in larger numbers in Central Africa, but only the populations of Waza National Park and North Province (Cameroon) and Zakouma National Park (Chad) are reasonably secure. Nubian/Rothschild's giraffe survives in small numbers in a few protected areas in Uganda and southwestern Ethiopia and in introduced populations in Lake Nakuru and Ruma National Parks in Kenya, with unknown but probably larger numbers in southeastern Sudan. The reticulated giraffe still occurs in relatively large numbers in northern Kenya, mainly outside protected areas. The population of Thomicroft's giraffe in the Luangwa Valley (Zambia) is at an historical high. The Masai and southern giraffes are widespread and locally common within and outside protected areas in parts of their historical ranges. Some of the major protected populations of the Masai giraffe have decreased during the 1990s in national parks such as Serengeti (Tanzania) and Tsavo (Kenya), but large, stable populations of this subspecies occur in other protected areas such as Moyowosi-Kigosi, Tarangire, Katavi-Rukwa, Ruaha and Selous (Tanzania). Major populations of the southern giraffe occur in areas such as Etosha (Namibia), northern and central Botswana, Hwange (Zimbabwe) and Kruger (South Africa). The numbers of this subspecies are increasing on private land in southern Africa, including extralimital populations.

Estimated Total Numbers: Recent estimates are available for most areas which are known to support substantial giraffe populations, with a few exceptions such as southeastern Sudan. Total numbers of each subspecies are of the following order (assuming an average correction factor of 1.3 to allow for undercounting bias in aerial surveys; see p. 90):

western giraffe: 3,500 (decreasing)

Nubian/Rothschild's giraffe: 500 in Uganda, Kenya and Ethiopia, plus unknown but probably larger numbers in Sudan (stable/increasing in Uganda and Kenya, decreasing elsewhere)

*Giraffe (continued)*

reticulated giraffe: 36,000 (stable/decreasing)

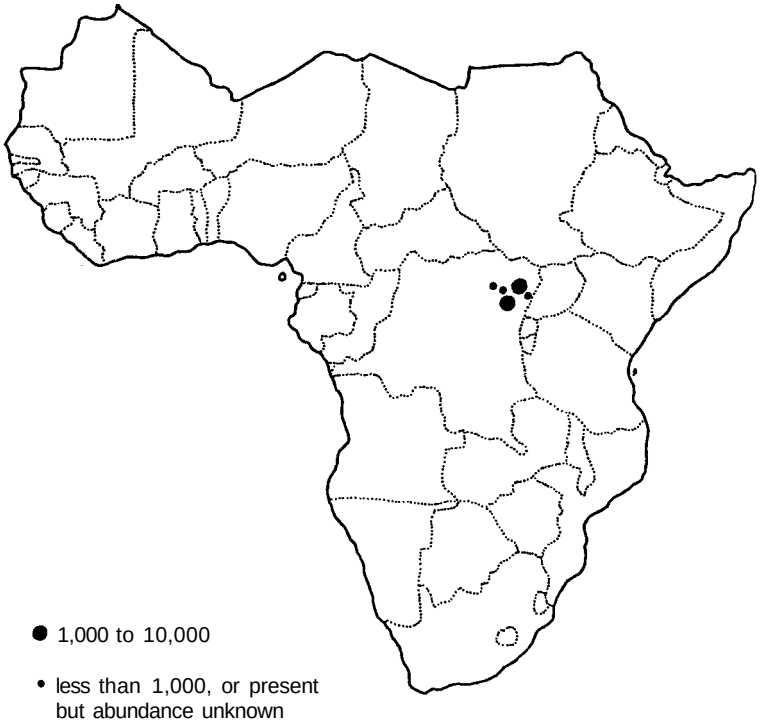
Masai giraffe: 60,000 (stable/decreasing)

Thornicroft's giraffe: 1,200 (stable)

southern giraffe: 40,000 (increasing).

The estimated total population of the species is approximately 141,000 (excluding the Sudanese population), including >50,000 in and around protected areas and >8,000 on private land. Total numbers may be more or less stable, if the increase in numbers of the southern giraffe matches the decline in numbers of the northern and western subspecies.

The Future: The species' Red List status is unlikely to change as long as good populations continue to be effectively protected in a substantial number of parks and reserves and on private land. If present trends continue, the western and Nubian/Rothschild's giraffes and possibly also the reticulated subspecies will eventually be reduced to a few, small protected populations while the abundance of the southern giraffe will continue to increase.




**Okapi**
*Okapia johnstani* (P. L. Sclater 1901)

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Congo-Kinshasa | >5,500 | S | x | S/D | >5,500 | S/D |
| Uganda | - | - | - | - | Ex | - |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Endemic to the Democratic Republic of Congo (Congo-Kinshasa), where it is confined to a relatively restricted area of lowland equatorial forest in the northeast. The Ituri Forest and Maiko National Park continue to support major populations. It is widespread and common within Okapi Faunal Reserve in central Ituri, and the okapi has become the flagship species for the conservation of the Ituri ecosystem. During the 1950s, a capture station for okapi was established at Epulu within the southern part of what is now Okapi Faunal Reserve, and a unique system of locally controlled forest reserves has been established to serve as okapi capture zones. This traditional system of reserve management has assured forest conservation in Ituri up to the present. The Ituri Forest also tends to be protected by its remoteness and inaccessibility. The conservation situation has remained fairly stable during and since the 1 996-97 overthrow of the former government, despite a complete lack of law enforcement in the region. Ituri has recently become a development frontier with growing numbers of agricultural immigrants and prospectors, and the okapi's status could deteriorate rapidly if the region's forests are opened up to organised commercial exploitation.

The species is also widespread and common in Maiko National Park, where it is most abundant in the northeastern third of the park and in the northwest. It is less frequent in the southern half of the park, south of the Maiko River. It does not occur in the extreme south of the park, south of the Oso and Uvia Rivers, which appear to constitute the southern limit of its range. Forests with relatively open understory intermixed with treefalls show the highest frequency of use by the okapi, which

*Okapi (continued)*
prefers older secondary forests.

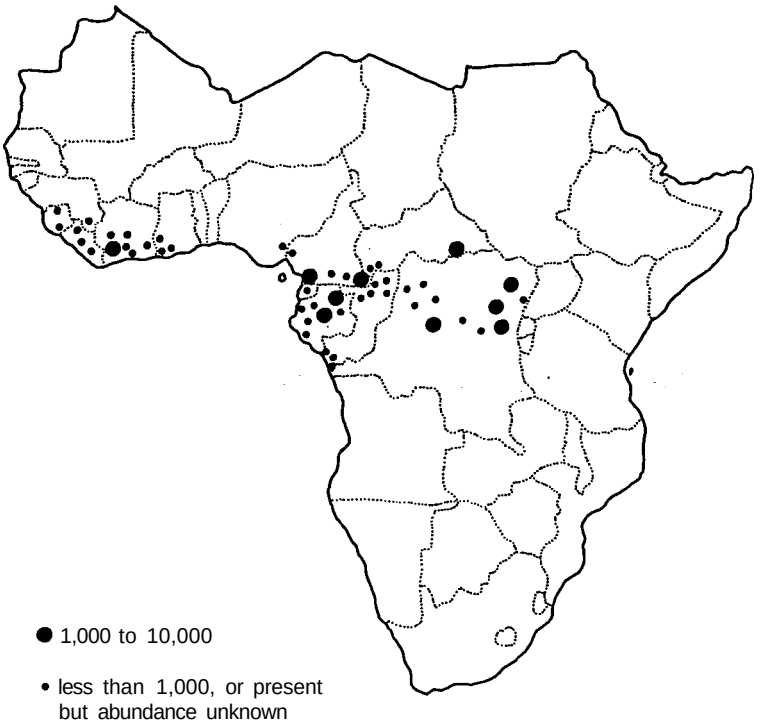
It also occurs in small, declining numbers in equatorial forest along the Semliki River in the northern section of Virunga National Park, where it is poached for its skins by local people. Very little information is available about the current status of the okapi outside protected areas. Its known total range covers an area of about 100,000 sq km, but it may have been eliminated from some areas by overhunting.

Uganda: Formerly occurred in the Semliki Forest, but not known to survive there.

SUMMARY
The okapi inhabits areas of dense, low undergrowth within the equatorial forest. While it remains locally common in Okapi Faunal Reserve and Maiko National Park, little information is available about its status elsewhere within its restricted range. Continuation of the progress made in establishing Okapi Faunal Reserve in the 1980s and 1990s is of major importance to the conservation of this species. The currently satisfactory status of the population in Maiko National Park is a result of the remoteness and very low human population density of this park, rather than active conservation measures.

Estimated Total Numbers: Radio telemetry studies provided population density estimates of 0.33 to 0.50 per sq km for the Okapi Faunal Reserve, indicating a total population of about 5,500 within the reserve (Hart & Hart 1992). Assuming a similar density in the northern half of Maiko National Park would give an estimate of about 2,500 for this park. It may occur at lower densities elsewhere within its area of occupancy, which could exceed 50,000 sq km. Total numbers may be more than 10,000. The major protected-area populations are apparently stable.

The Future: The okapi's future is closely tied to attempts to develop and implement effective conservation and management of Okapi Faunal Reserve and Maiko National Park in Congo-Kinshasa, as human populations, bushmeat hunting and economic development pressures expand in these regions. Reintroduction to Uganda's now well-protected Semliki Forest National Park should be considered (Kingdon 1997).




Family Tragulidae

**Water Chevrotain**
*Hyemoschus aquaticus* (Ogilby 1841)

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Guinea | X | ? | X | ? | X | ? |
| Sierra Leone | X | D | X | D | X | D |
| Liberia | C | ? | X | ? | C/U | ? |
| Ivory Coast | C | S/D | X | D | C/U | D |
| Ghana | X | S/D | ? | ? | X | S/D |
| Nigeria | R | D | ? | ? | R | D |
| Cameroon | C/U | S/D | X | S/D | X | S/D |
| CAR | Ab/R | ? | X | D | X | D |
| Equ. Guinea | X | ? | C | D | C | D |
| Gabon | C | S/D | C | D | C | D |
| Congo-Brazz. | X | S/D | X | D | X | D |
| Congo-Kinshasa | C | S | C/U | D | C/U | D |
| Uganda | - | - | - | - | Ex? | - |
| Angola (Cabinda) | - | - | X | ? | X | ? |

OVERVIEW OF CONSERVATION STATUS

Guinea: Occurs in the Mt. Nimba Biosphere Reserve and other areas of forest in the southeast.

Sierra Leone: Formerly widespread and not uncommon, but its distribution and abundance have been reduced greatly by habitat destruction and hunting for bushmeat. It was recorded in the mid-late 1980s in Outamba-Kilimi National Park and Tiwai Island Game Sanctuary.

Liberia: Probably occurred throughout in the past. It has been eliminated from the more densely settled regions of the country by hunting for bushmeat and habitat destruction. The 1989/90

*Water Chevrotain (continued)*
WWF/FDA survey found that it still occurred widely in the remaining forest blocks in the northwest and southeast, often close to rivers and streams. Its relative frequency in bushmeat sales indicated that it still occurred in reasonably good numbers in these areas. No recent information on its status.

Ivory Coast: Formerly occurred widely in the forest zone. It has been reduced to low population levels or eliminated from substantial parts of its former range by overhunting, but it survives in most of the national parks and forest reserves within this range. It occurs in good numbers in Tai National Park, where it is locally common and frequently observed near rivers, streams and swamps, especially in the west of the park.

Ghana: Formerly occurred throughout the moist lowland forest zone in the southwest, extending into adjacent savanna woodland areas within gallery forests. It has disappeared from extensive areas and now appears to be completely absent from the peripheral parts of its former range. It survives locally in areas such as Bia, Nini-Suhien and Kakum National Parks.

Nigeria: Formerly occurred widely in moist lowland forests in the south. By the 1980s, it had apparently been eliminated from most of its former range by forest destruction and hunting and it was restricted to a few remote forest areas. It survives in Cross River National Park and possibly elsewhere.

Cameroon: Formerly occurred in suitable swamp and streamside habitats throughout the southern rainforests. It remains widespread, especially in the south and southeast, to the south of the Sanaga River, where human population densities are generally much lower than in the southwest. Its overall numbers are decreasing because of uncontrolled hunting, but it remains locally common to abundant in areas with low human population densities such as Campo and Lobeke.

Central African Republic: Probably still occurs widely within its former range in the southern forest zones, but numbers are likely to be decreasing in many areas because of uncontrolled meat hunting. It seems to be rare in the southwest, even in well-protected areas, but it is abundant in Bangassou Forest in the southeast.

Equatorial Guinea: Formerly occurred throughout Mbini. It remains locally common within forested areas and is frequently sold as bushmeat, but its long-term survival is threatened by uncontrolled hunting and degradation of forest habitats by itinerant agriculture.

Gabon: Remains common within suitable habitat near water throughout the country. Its popularity as bushmeat and its habitat specificity, combined with increasing commercialisation of hunting as the human population becomes more urbanised, is placing increased pressure on water chevrotain populations. It occurs in good numbers and stable populations in areas with extensive swamps, rivers and seasonally/permanently inundated forest, such as most of the Minkebe Forest in the northeast and the Petit Loango reserve within the Gamba protected area complex in the southwest, but its overall numbers are probably decreasing.

Congo-Brazzaville: Occurs widely in suitable habitat near water within its former range in the forests of the north and southwest. It is easily trapped and consequently is now generally uncommon or rare and decreasing in the south. It probably still occurs locally at near-pristine densities in areas of the northern forests where subsistence and commercial hunting pressures are low, e.g., Odzala and Nouabale-Ndoki National Parks.

Congo-Kinshasa: Formerly occurred in suitable habitat throughout the equatorial forest. It remains widespread within its former range. It has been reduced to low numbers or eliminated near settlements, roads and major rivers, but it remains common in more sparsely inhabited areas. The water chevrotain is well represented in protected areas which contain extensive areas of suitable

habitat, viz., Salonga, Kahuzi-Biega and Maiko National Parks and Okapi Faunal Reserve. It tends to be localised to preferred habitat within these areas, e.g., upland forests in the vicinity of streams within Maiko National Park. It is also common in the lowland forests to the west of Kahuzi-Biega. It occurs in decreasing numbers in the Semliki Forest in the north of Virunga National Park, where poaching by local people is frequent.

Uganda: Formerly occurred in the Semliki Forest, but not known to survive there.

Angola: Recorded from the forested enclave of Cabinda. No recent information on its status.

SUMMARY

The water chevrotain formerly inhabited the margins of rivers, streams and swamps thoughout the equatorial lowland forests of West and Central Africa. Its range has contracted significantly, and it is now probably uncommon or rare in most areas where it survives. Exceptions include areas where hunting pressures are low because of low human population densities and, in a few cases, effective protection against hunting and habitat destruction, e.g., Sapo National Park and Grebo National Forest (Liberia), Tai National Park (Ivory Coast), the Campo and Lobeke reserves (Cameroon), Bangassou Forest (CAR), Lope Reserve, Minkebe Forest and other sparsely settled areas of Gabon, and Okapi Faunal Reserve, Maiko, Kahuzi-Biega and Salonga National Parks (Congo-Kinshasa).

Estimated Total Numbers: The water chevrotain can reach high densities within areas of suitable habitat, e.g., Dubost (1978) estimated densities of *7.7* to 28.0 per sq km in evergreen forests near water in an area of northeastern Gabon where hunting pressures were low. Ground transect and drive count surveys of forest wildlife have produced lower density estimates, e.g., 0.1 per sq km in Lope Reserve in Gabon (White 1994; Tutin et al. 1996), 1.4 per sq km in the Ituri Forest in Congo-Kinshasa (Hart et al. 1996) and 1.6 per sq km in other areas (Fa & Purvis 1997). Water chevrotain habitat may have been under-represented in some of these surveys. Assuming average population densities of 1.0 per sq km in areas where it is known to be common or abundant and 0.1 per sq km elsewhere and a total area of occupancy of 736,000 sq km (from the information in Appendix 4) gives an estimated total population of 278,000. This suggests that actual numbers may be in the hundreds of thousands. About half the species' estimated total area of occupancy is in Congo-Kinshasa. Its populations are generally in decline, with numbers apparently stable in only a few areas, such as Lobeke, Lope, Minkebe, Maiko, Kahuzi-Biega, Ituri (Okapi reserve), Odzala and Nouabale-Ndoki.

The Future: The water chevrotain's status is likely to decline from Lower Risk to Vulnerable within the next few decades. If present trends continue, most of its remaining populations will gradually decrease and it will eventually disappear outside a few protected forests comprising a total area of perhaps 100,000 sq km.

Family Bovidae

Subfamily Bovinae

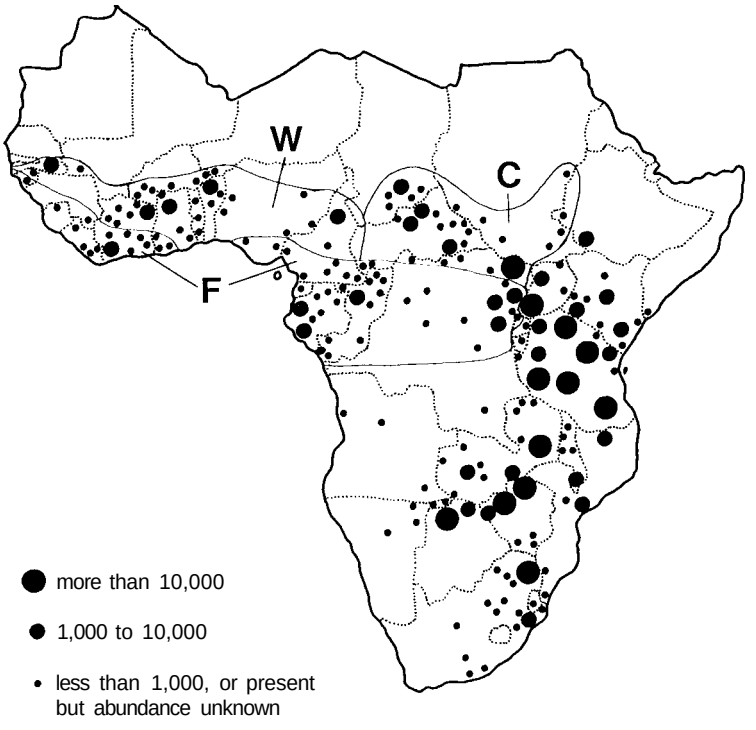
Tribe Bovini

## African Buffalo

*Syncerus caffer* (Sparrman 1779)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
F: forest buffalo (5. *c. nanus*)
W: West African savanna buffalo (*S. c. brachyceros*)
C: Central African savanna buffalo (S. *c. aequinoctialis*)
other areas: southern savanna buffalo (*S. c. caffer*)




The interrelationships are unclear between the various described subspecies of the African buffalo, but there is no doubt about the validity of the four subspecies recognised here. The three forms of the savanna buffalo are at least as distinct from one another as from *nanus.* These subspecies should clearly be distinguished for purposes such as trophy classification and assessment of conservation status. Other subspecies such as the "mountain" buffalo (*mathewsi*) of Eastern Africa may also be valid. Intergrades occur where the distributions of the subspecies meet, including the boundaries between *nanus* and the savanna subspecies.

Status of Subspecies
southern savanna buffalo: Lower Risk (conservation dependent)
Central African savanna buffalo: Lower Risk (conservation dependent)
West African savanna buffalo: Lower Risk (conservation dependent)
forest buffalo: Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| West African Savanna Buffalo | | | | | | | | |
| Mali | 120 | D | - | - | V | D | 120 | D |
| Niger | 500 | D | - | - | | - | 500 | D |
| Senegal | 4,000 | S/D | - | - | X | ? | >4,000 | S/D |
| Gambia | - | - | - | - | | - | Ex | - |
| Guinea-Bissau | - | - | - | - | X | D | X | D |
| Guinea | V | ? | - | - | | - | V | ? |
| Ivory Coast | >8,330 | D | - | - | | - | >8,330 | D |
| Burkina Faso | 1,620 | S/I | - | - | X | D | >1,620 | ? |
| Ghana | C | S/I | - | - | | - | C | S/I |
| Togo | U/R | D | - | - | | - | U/R | D |
| Benin | >2,000 | S/I | - | - | | - | >2,000 | S/I |
| Nigeria | >200 | D | - | - | | - | >200 | D |
| Cameroon | 3,210 | S/D | - | - | ? | ? | 3,210 | S/D |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| West African Savanna Buffalo (continued) | | | | | | | | |
| Subspecies Total | >19,980 | ? | - | - | x | D | >20,000 | ? |
| Central African Savanna Buffalo | | | | | | | | |
| Chad | 1,020 | I | - | - | X | D | >1,020 | ? |
| CAR | 19,000 | ? | - | - | U/R | D | >19,000 | D |
| Congo-Kinshasa | 39,180 | D | - | - | U/R | D | >39,180 | D |
| Sudan | >100 | D | - | - | X | D | X | D |
| Eritrea | - | | - | - | - | - | Ex | - |
| Ethiopia | X | D | - | - | ? | ? | X | D |
| Subspecies Total | 59,300 | D | - | - | U/R | D | >59,0OO | D |
| Southern Savanns Buffalo | | | | | | | | |
| Ethiopia | 2,330 | D | - | - | ? | ? | 2,330 | D |
| Somalia | C | ? | - | - | - | - | U | ? |
| Uganda | >20,220 | S/I | - | - | - | - | >20,220 | S/I |
| Kenya | >11,630 | D | - | - | 7,930 | S | >19,560 | D |
| Tanzania | >245,100 | S? | - | - | 97,350 | S/D | >342,450 | S/D |
| Rwanda | 1,200 | D | - | - | - | - | 1,200 | D |
| Burundi | 500 | S/D | - | - | - | - | 500 | S/D |
| Angola | <500 | D | - | - | X | D | X | D |
| Zambia | >34,280 | S | 10 | S/I | >5,800 | D | >40,090 | S/D |
| Malawi | >3,15O | S | - | - | - | - | >3,15O | S |
| Mozambique | 9,570 | D | - | - | ? | ? | 9,570 | D |
| Namibia | 690 | S | - | - | 310 | D | 1,000 | S/D |
| Botswana | 8,050 | S/D | - | - | 18,840 | D | 26,890 | D |
| Zimbabwe | 37,300 | S/D | 1,500 | I | 11,530 | S | 50,330 | S |
| South Africa | 28,470 | I | >2,500 | I | - | - | >30,970 | I |
| Swaziland | U | S/I | - | | - | - | U | S/I |
| Subspecies Total | >402,990 | S/D | >4,010 | I | >141,760 | D | >548,000 | S/D |
| Forest Buffalo | | | | | | | | |
| Guinea | X | ? | - | - | U/R | D | U/R | D |
| Sierra Leone | R | D | - | - | - | - | R | D |
| Liberia | U | D | - | - | U/R | D | U/R | D |
| Ivory Coast | C/U | D | - | - | - | - | C/U | D |
| Ghana | X | S/D | - | - | - | - | X | S/D |
| Nigeria | R | D | - | - | - | - | R | D |
| Cameroon | C/U | S/D | - | - | X | D | X | D |
| CAR | C | S | - | - | C/U | D | C/U | D |
| Equ. Guinea | X | S | - | - | X | D | X | D |
| *Gabon* | C/U | S | - | - | U | S/D | C/U | S/D |
| Congo-Brazz. | C | S/D | - | - | X | D | C/U | D |
| Congo-Kinshasa | C/U | D | - | - | U/R | D | U | D |

OVERVIEW OF CONSERVATION STATUS

Mali: Formerly widespread in savanna woodlands in the southwest. It has been eliminated from almost all of its former range, including the Boucle du Baoule protected area complex, by commercial and subsistence hunting for meat. The small numbers which survive in the northern part of Bafing Faunal Reserve and to the west of this reserve probably comprise Mali's last resident buffalo population.

*Buffalo (continued)*

Niger: Formerly occurred in the savannas of southwestern Niger and along parts of the Nigeria border in the south. It has disappeared from most of its former range and survives only in W National Park-Tamou Faunal Reserve.

Senegal: The West African savanna buffalo was formerly widespread in the southern savannas, with intermediates with the forest buffalo in the southwestern forests. It has been eliminated from most of its former range by uncontrolled meat hunting. A major population of the savanna buffalo survives in Niokolo-Koba National Park, and it also occurs in the Faleme Hunting Zone to the east of the park. A few buffalo may survive in the Casamance region in the southwest, but the species was exterminated in Basse Casamance National Park in the late 1980s when this park became the site of ongoing armed conflict between government soldiers and separatist rebels.

Gambia: Probably occurred widely in the past, but now extinct.

Guinea-Bissau: Intermediate forms between the West African savanna buffalo and the forest buffalo formerly occurred widely in the forest-savanna mosaic of Guinea-Bissau. The species still occurs widely in the south and is reasonably common in some areas, e.g., Cantanhez Forest. It survives in only a few scattered localities in the north, including the Cacheu River forests.

Guinea: Formerly occurred widely, with the West African savanna buffalo in the north intergrading to the forest buffalo in the southwest and southeast. It has been eliminated from most of its former range by overhunting and habitat destruction. The forest buffalo survives in a few localities in the southeast, e.g., Mount Nimba Biosphere Reserve. The only available information on the presence of the savanna buffalo within Guinea during the last decade is a report of vagrants entering Badiar National Park from Niokolo-Koba National Park in Senegal in the early 1990s. More recent reports suggest that it no longer ocurred in Badiar in 1996-97.

Sierra Leone: The forest buffalo formerly occurred throughout. By the 1980s, it had been eliminated from most of its former range by habitat destruction and widespread, intensive hunting for bushmeat. Its presence was not detected during wildlife surveys of the Gola Forest Reserves in 1984-85, but a few were reported to survive in the northern forest-savanna mosaic. No recent information on its status.

Liberia: The forest buffalo probably occurred throughout in the past. It has been eliminated from most of the central region of the country by the expansion of settlement and agriculture. The 1989/90 WWF/FDA survey recorded this species' presence in the forests of the southeast and northwest. Its distribution was correlated with the distribution of the more remote high forest blocks. Within these areas, it was recorded most frequently in logged and secondary forest areas such as old drag lines and old roads. The contraction of its distribution in recent decades appears to have been caused primarily by human disturbance. It was rarely recorded in bushmeat in 1989/90, and local hunters stated that it was a dangerous species to hunt and infrequently shot. No recent information on its status.

Ivory Coast: Formerly occurred throughout, with the West African savanna buffalo in the north, the forest buffalo in the south and intermediate forms in central regions of the country. Its distribution has become fragmented as a result of the expansion of hunting and other human activities. It survives in and around most national parks and forest reserves, generally in decreasing numbers. The largest populations occur in Comoe National Park (savanna buffalo), where numbers have been reduced substantially by poaching, and Tai National Park (forest buffalo), where it occurs mainly in secondary forests and other areas with open vegetation.

Burkina Faso: The West African savanna buffalo formerly occurred widely in the country's savanna woodlands, but it is now generally confined to the remaining wildlife areas in the south. It survives in moderate to good numbers in areas such as Arly-Singou, Nazinga, W and Diefoula. The population of Arly National Park was greatly reduced by rinderpest during the 1980s but is gradually recovering.

Ghana: Formerly occurred throughout, with the West African savanna buffalo in the northern and eastern savannas and the forest buffalo in the southwestern forests. It is now restricted to protected areas. The major surviving concentrations of the savanna buffalo occur in Mole and Bui National Parks. The forest buffalo still occurs in the southwestern forest parks, but its numbers and status in these areas are unclear.

Togo: The savanna buffalo survived in small to moderate numbers in the country's former protected areas until the early 1990s. It is now probably close to extinction.

Benin: The West African savanna buffalo formerly occurred throughout, but it is now largely confined to national parks, hunting zones and classified forests. The major surviving population is in Pendjari National Park and the adjoining hunting zones.

Nigeria: Formerly occurred very widely, with the West African savanna buffalo in the northern savannas and the forest buffalo in the southern forests. It has been eliminated from most of its former range and reduced to small, generally declining populations in a few protected areas.

Chad: The Central African savanna buffalo formerly occurred throughout the savannas of the southern one-third of Chad. It has been eliminated from most of its former range by the expansion of livestock and agriculture, uncontrolled meat hunting and the effects of drought, but it survives locally in sparsely populated parts of the southeast. The largest surviving population is in Zakouma National Park, where its numbers have increased substantially with the resumption of effective protection during the 1990s. It is reappearing in Siniaka Minia Faunal Reserve to the west of Zakouma.

Cameroon: Formerly occurred more or less throughout, except for the more arid parts of the far north, with the West African savanna buffalo in northern and central Cameroon and the forest buffalo in the south. It is now restricted to regions with low numbers of people and extensive areas of relatively unmodified natural habitats, including protected areas. The savanna buffalo disappeared from Waza National Park in the 1950s but survives in good numbers in the wildlife areas of North Province. The forest buffalo occurs locally in the southwest and more widely in the south and southeast. It is locally common/abundant in areas with extensive natural clearings within the forest, e.g., Lobeke, but uncommon/rare in areas with relatively few natural clearings and hence a reduced food supply for grazers, e.g., Korup.

Central African Republic: Formerly occurred almost throughout, with the Central African savanna buffalo in northern regions, the forest buffalo in the southwest and intermediate forms in central regions and the southeast. It has been eliminated from populated areas and from significant parts of its former range in unpopulated areas by uncontrolled poaching for meat. The savanna buffalo is now uncommon or rare in many areas where it was formerly abundant, such as Bamingui-Bangoran National Park and the Chinko Basin, but it still occurs in good numbers in Manovo-Gounda-St. Floris National Park (population decreasing), Sangba and the hunting concessions to the east and southeast of Bamingui-Bangoran National Park (population increasing). The forest buffalo is common in the Dzanga-Sangha reserve and Dzanga-Ndoki National Park in the southwest. Bangassou Forest in the southeast also supports an apparently healthy buffalo population.

Equatorial Guinea: The forest buffalo formerly occurred throughout Mbini. It has been eliminated from parts of its range but survives locally within the remaining forested areas, including Monte Alen National Park.

Gabon: The forest buffalo formerly occurred in suitable habitat throughout Gabon. It remains widespread except in the immediate vicinity of settlement. It reaches its greatest densities in savanna regions, where it attains herds of 20 or more individuals, and major populations occur in the Lope, Wonga-Wongue and Moukalaba reserves. It has been reduced to very low levels or eliminated by heavy hunting pressure in the extensive savannas around Franceville in the east. It occurs at low densities in continuously forested areas, as solitary animals and in small groups of up

*Buffalo (continued)*
to 5, and may only penetrate deep into continuous forest along major watercourses or logging roads. Since most of Gabon is forested, the buffalo's overall status is uncommon, with numbers stable or slowly decreasing.

Congo-Brazzaville: The forest buffalo formerly occurred throughout the country's forests and savannas. Intensive hunting has eliminated it from substantial areas in southern and central Congo. The surviving populations in these regions are generally small and declining, although it remains relatively common in the coastal forest-savanna mosaic of the Conkouati reserve in the southwest. In contrast to its status in the south, the buffalo is common/abundant in stable or increasing populations in parts of the northern forests, e.g., Odzala and Nouabale-Ndoki-Kabo. In the absence of strong hunting pressure, its densities tend to be highest in areas where forest and savanna adjoin, e.g., Odzala National Park-Lekoli-Pandaka Faunal Reserve- M'Boko Hunting Reserve, which appear to have the greatest abundance of this species in northern Congo.

Congo-Kinshasa: Formerly occurred throughout, with the forest buffalo in the main equatorial forest block, intergrading to the Central African savanna buffalo to the north of the forest and the southern savanna buffalo to the south of the forest. It has been eliminated by meat hunting from substantial parts of its former range and generally reduced to low numbers, except for areas which are effectively protected and/or have very sparse human populations. The major surviving concentration is in Garamba National Park in the northeast, where Sudanese meat hunters reduced the population from 53,000 in 1976-83 to 26,000 in 1995. The buffalo is the most commonly poached species for meat in Garamba, and it has been eliminated from the northern third of the park which adjoins the Sudan border. Another important population survives in the central plains of Virunga National Park, but this population has also been reduced by poaching. The forest buffalo is common in and around Kahuzi-Biega and Maiko National Parks. It is heavily hunted near villages and roads in the Kahuzi-Biega area. Hunting is not yet a major threat to the population in the remote Maiko National Park, where it occurs mainly in open areas of regenerating forest and young secondary growth. Like the forest elephant, it moves into Maiko's *Gilbertiodendron* forest during periods of mast seed fall to feed on the germinating seeds. It is uncommon in Okapi Faunal Reserve, where it occurs widely but at low densities. This probably reflects the general lack of suitable open forest-edge habitats within the Ituri Forest, where natural clearings and open swamps are uncommon. The forest buffalo is naturally rare in Salonga National Park. The savanna buffalo has been reduced to low numbers by poaching in Upemba National Park and apparently eliminated from Kundelungu National Park.

Sudan: The Central African savanna buffalo formerly occurred widely in central and southern Sudan, with intermediate forms with the forest buffalo recorded from the southwestern forests. It has been eliminated from most of its former range in the central parts of the country by uncontrolled poaching, but small, declining, remnant populations survive in Dinder and Radom National Parks. It was common and widespread in southern Sudan in the 1980s, with substantial populations in areas such as Boma (>10,000) and Jonglei (4,500). It has undoubtedly suffered heavily at the hands of meat hunters, but it still occurs locally in the south in unknown numbers.

Eritrea: The Central African savanna buffalo formerly occurred widely in the southwestern savannas, but it is now extinct.

Ethiopia: Occurred in the valleys of the Awash River and the Webi Shabelle in central and eastern Ethiopia prior to the rinderpest epidemic of the 1890s, but now confined to relatively well watered parts of the western and southwestern lowlands. The Central African savanna buffalo occurs in the west and the southern savanna buffalo in the southwest. No recent information is available on the status of the Central African subspecies along the Sudan border in the west, but the southern savanna buffalo survives in substantial but decreasing numbers in Omo-Mago National Parks and adjoining controlled hunting areas. The largest population occurs in Omo National Park. It is common in the area around this park's headquarters but is now almost non-existent in the more remote bushland areas of the park because of poaching.

Somalia: The southern savanna buffalo formerly occurred in areas with permanent water in the south, including riverine bush and forest along the lower Shebelle and lower Juba Rivers. Most of Somalia's natural riverine habitats have been destroyed by the expansion of agricultural settlement. This plus severe hunting pressure have eliminated the buffalo from most of its former range, but it still occurs in good numbers in the Bush Bush National Park area.

Uganda: The southern savanna buffalo was formerly widespread in large numbers, with intermediates with the forest buffalo in the southwest. Large herds are now confined to Queen Elizabeth National Park, where the population has recovered from the intensive poaching of the 1970s and 1980s and continues to increase. Greatly reduced elsewhere, but significant populations survive in Murchison Falls, Lake Mburo and Kidepo Valley National Parks and Pian-Upe Game Reserve. It also occurs in some protected forests.

Kenya: The southern savanna buffalo was formerly widespread throughout the savannas and forests of southern and central Kenya, and on isolated, forested hills and mountains in the north. It is now largely confined to protected areas, except in Laikipia and Lamu districts. The species' two remaining major concentrations in Kenya, in the Mara and Tsavo areas, have both declined substantially in recent years. The Mara population, which occurs mainly within Masai Mara National Reserve, was reduced from 12,240 to 3,130 by the 1993-94 drought and has since shown no measurable recovery. The Tsavo population decreased from an estimated 34,590 in 1991 to 5,490 in 1997. The 1994-95 rinderpest outbreak was the main cause of this decline, with some additional mortality from drought and increasing competition with domestic livestock for a reduced food supply. Smaller but often high-density populations occur in other protected areas. Some of these populations are showing a tendency to decrease because of poaching, e.g., in Meru, Aberdare and Mount Kenya National Parks and Forest Reserves, while others are increasing, e.g., in Lake Nakuru National Park and Shimba Hills National Reserve. The current spread of rinderpest across southern Kenya is a major threat to this species, e.g., this virus is reported to have reduced the buffalo population of Nairobi National Park by two-thirds in 1996-97.

Tanzania: The southern savanna buffalo formerly occurred throughout, but it now occupies less than half of its former range. Tanzania nevertheless possesses Africa's largest remaining national buffalo population. It is abundant/common in most of the country's major wildlife areas, e.g., Selous Game Reserve, Serengeti, Tarangire and Katavi National Parks, the Ruaha ecosystem, and the Katavi-Rukwa and Kilombero Game Controlled Areas. This species is a favourite target of meat hunters and is therefore susceptible to increases in poaching pressure. It is also one of the most susceptible wild ungulate species to drought. Both of these factors contributed to the 72% reduction of the Serengeti buffalo population between 1970 and 1994. Buffalo numbers have also declined in some other areas, e.g., Ruaha and Mount Kilimanjaro. In heavily poached areas such as Kilimanjaro, buffalo have become very wary and largely nocturnal. This species' numbers are increasing in some other areas, e.g., Selous Game Reserve (which has Tanzania's largest buffalo population) and Ngorongoro Crater, and may be stable overall. The recent spread of rinderpest from eastern Kenya into northeastern Tanzania is potentially a major threat to the buffalo.

Rwanda: Formerly occurred at high densities in Akagera and Volcanoes National Parks. The population of Akagera National Park, estimated to number 1 0,000 in 1990, was concentrated in the northern part of the park which has subsequently been overrun with cattle and degazetted. This population has consequently decreased dramatically. Numbers appear to be stable in Volcanoes National Park.

Burundi: Formerly occurred throughout. It has been eliminated from most parts of the country by hunting and habitat destruction associated with the spread of agriculture and high-density settlement. It survived in relatively good numbers in Ruvubu National Park in the 1 980s. There is no recent information on the status of this population, which has undoubtedly suffered during the recent military activity in this park.

*Buffalo (continued)*

Angola: Formerly occurred very widely apart from the arid coastal strip in the southwest, with the southern savanna buffalo in the south and intermediate forms with the forest buffalo in the north. It has been wiped out by uncontrolled hunting throughout most of Angola. Small numbers are known to survive in a few localities, including Kissama National Park where the population of the transitional "red" buffalo has been reduced by more than 90% from its 1975 level of 5,000.

Zambia: The southern savanna buffalo formerly occurred throughout, but it is now confined to national parks and game management areas. It occurs in large numbers in the Luangwa Valley, particularly in North and South Luangwa and Luambe National Parks and Munyamadzi and Lumimba Game Management Areas. Important populations also occur in Kafue National Park and adjoining game management areas, and Lower Zambezi National Park.

Malawi: Formerly occurred widely, but now confined to a few protected areas. The largest surviving population is in Lengwe National Park. It is also relatively common in Nkhotakota and Vwaza Marsh Game Reserves and Kasungu National Park, with smaller numbers in the northern foothills of Nyika National Park.

Mozambique: The southern savanna buffalo formerly occurred throughout. By the early 1980s, it had been exterminated by meat hunters over most of its former range but survived in large numbers in a few areas, e.g., estimated populations of >10,000 in Gorongosa National Park and >30,000 in the floodplain grasslands of Marromeu Game Reserve. These populations have subsequently been depleted severely, but a substantial remnant survives in Marromeu. The buffalo is still abundant in the Mahimba area immediately north of the Zambezi Delta. It has disappeared from areas such as Zinave National Park, but an individual from Ndumu Game Reserve in South Africa recently wandered into Maputo Game Reserve. The largest surviving buffalo population in Mozambique is in Niassa Game Reserve in the north. The rehabilitation and restocking of protected areas which are currently being implemented should lead to a substantial recovery of this species' populations.

Namibia: Naturally confined to a restricted area in the northeastern savannas. Its numbers have increased substantially over the last decade, particularly in Mamili National Park in Eastern Caprivi. Mamili supports Namibia's largest buffalo population, which numbered about 550 prior to the deaths of >100 animals in a severe bushfire in August 1996. It also occurs in a few other areas, such as Western Caprivi Game Reserve and eastern Bushmanland. There is an introduced population in Waterberg Plateau Park.

Botswana: Formerly occurred widely in northern Botswana, as far south as the Boteti River and the fringes of the Makgadikgadi Pans. It has been eliminated from most of the southern and western parts of its former range, although a few may survive on the Boteti River within Makgadikgadi-Nxai Pan National Park. It is now generally restricted to the better watered areas of the northern region, where it is confined by the Okavango buffalo fences and a number of veterinary cordon fences designed to prevent it from mixing with cattle. The main population occurs in the central and southern Okavango Delta, with smaller numbers in Chobe National Park and the Zimbabwe border area in the northeast. The Chobe and northeastern border populations appear to be stable, but the Okavango population has decreased markedly since 1986/87, when the estimated national population exceeded 70,000. The reasons for the pronounced decline in buffalo numbers are unknown, but could include range restrictions imposed by veterinary fences, possible competition for forage with the region's large and increasing elephant population, and/or excessive offtake by illegal hunting. The buffalo is a favourite species with both citizen and non-citizen hunters, but very modest legal hunting quotas have been set in recent years.

Zimbabwe: Formerly occurred widely, but now occurs mainly in the northern, western and southeastern lowveld. The largest populations occur in national parks, safari areas and Communal Lands in the Sebungwe and Middle Zambezi Valley regions, where numbers are stable. There are also substantial populations in Hwange and Zambezi National Parks and the Matetsi area in

northwestern Matabeleland, but estimated numbers in Hwange decreased by more than 50% between 1973 and 1996. The reasons for this decline are unknown, but may be related to the concomitant increase in the park's elephant population, removal of buffalo from Hwange over the years by culling and live-capture, and movements of buffalo across the border into Botswana where they are hunted by local people. The formerly substantial population of Gonarezhou National Park declined by more than 99% during the severe drought of 1992-93. Relatively small numbers of buffalo occur on private farms, partly because of previous veterinary restrictions on the translocation of this species, but it has been reintroduced in significant numbers to some private conservancies in the southeast.

South Africa: The southern savanna buffalo was originally described from South Africa (hence the old name "Cape buffalo"). It formerly occurred widely in the less arid areas of the north, east and south, but it was eliminated from all of its former range except for a few areas such as Kruger National Park where the country's major population now occurs. Numbers in Kruger were maintained at between 25,000 and 30,000 during the 1980s by means of culling. A combination of severe drought and anthrax in the early 1990s reduced this population to less than 15,000, but with the return of average/above average rainfall in the mid-1990s it had increased to 19,500 in 1997. This population has been affected by a severe outbreak of bovine tuberculosis in 1997-98. There is also a large population in Hluhluwe-Umfolozi Park, and the buffalo has been reintroduced to some other parks and reserves and to private land. The main source of these reintroductions has been the population of Addo Elephant National Park. The last surviving population of Africa's southern-most buffalo herds retreated into the thick Addo bush in response to the hunting pressure which had exterminated the species throughout the rest of the Cape by the end of the 19th century. The herd which survived in Addo is also notable as the only population in southern Africa which is free of foot and mouth disease. Hence it has been possible to translocate surplus animals from Addo National Park widely within South Africa to protected areas and private game farms, where buffalo are very sought after.

Swaziland: Formerly occurred widely, but exterminated by the rinderpest epidemic at the turn of the century. A semi-captive population of animals from Addo National Park, South Africa, has been established in Mlilwane Wildlife Sanctuary. The only other buffalo known to occur in recent years is a lone individual around Big Bend in the east, which probably wandered into Swaziland from the nearby Ndumu Game Reserve in South Africa.

SUMMARY
The buffalo formerly occurred throughout sub-Saharan Africa apart from deserts and subdeserts. Savanna buffalo occur in savannas and open grasslands within about 20 km of water, and the forest buffalo occurs in open areas within the equatorial forest such as along watercourses and in grassy glades. The species' distribution and numbers have been greatly reduced by habitat loss and poaching. It is a favourite target of meat hunters in many countries. As a result, it is now generally confined to protected areas, within which it is well represented, and other areas which are sparsely settled. It is also susceptible to drought, which has caused substantial declines in some populations during the 1990s, alone or in combination with diseases such as anthrax or rinderpest, e.g., in Tsavo, Serengeti/Mara, Gonarezhou and Kruger.

Large, stable or increasing populations of the southern savanna buffalo occur in many protected areas in southern and eastern Africa, e.g., Queen Elizabeth and Murchison Falls National Parks (Uganda), Tarangire, Moyowosi-Kigosi, Katavi-Rukwa and Selous-Kilombero (Tanzania), Kafue and North and South Luangwa National Parks (Zambia), Chobe (Botswana), Sebungwe and the Middle Zambezi Valley (Zimbabwe) and Hluhluwe-Umfolozi (South Africa). In contrast, moderate to large, more or less stable numbers are restricted to relatively few protected areas in West and Central Africa, e.g., Mole (Ghana), Pendjari (Benin) and the national parks and hunting zones of North Province (Cameroon) (West African savanna buffalo), Zakouma (Chad) and Sangba (CAR) (Central African savanna buffalo), and Lobeke (Cameroon) - Dzanga-Sangha (CAR) - Nouabale-Ndoki-Kabo (Congo-Brazzaville), Lope, Wonga-Wongue and Gamba (Gabon), Odzala (Congo-Brazzaville) and Maiko (Congo-Kinshasa) (forest buffalo). Poaching has been a major contributor to the recent

*Buffalo (continued)*
decline of buffalo populations in many protected areas, e.g., national parks such as Comoe (Ivory Coast), Garamba (Congo-Kinshasa) and Serengeti (Tanzania), and probably in many other areas, e.g., the Okavango Delta (Botswana).

Estimated Total Numbers: Savanna buffalo populations can reach relatively high densities within small protected areas with particularly favourable habitat, e.g., 1 5.0 per sq km in Lake Manyara National Park (Prins & Douglas-Hamilton 1990) and 10.8 per sq km in Ngorongoro Crater (Runyoro et at. 1995) in Tanzania. Density estimates from aerial surveys of more extensive areas where the southern savanna buffalo is common occasionally reach 3.0-7.5 per sq km, e.g., Kilombero, Katavi-Rukwa, Tarangire and Selous (Tanzania) (TWCM 1992b, 1995a, 1995c; M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Queen Elizabeth National Park (Uganda) (Lamprey & Michelmore 1996), Chizarira (Zimbabwe) (Davies et al. 1996) and Hluhluwe-Umfolozi (South Africa) (Rowe-Rowe 1994), but more frequently lie in the range 0.6 to 3.0 per sq km, e.g., Amboseli and Masai Mara (Kenya) (Butynski et al. 1997), Ruaha and Serengeti (Tanzania) (TWCM 1994c, 1997), North Luangwa and South Luangwa (Zambia) (D. Owens, in litt. October 1995; Jachmann & Kalyocha 1994), Mana Pools and Matusadona National Parks and the Middle Zambezi Valley safari areas (Zimbabwe) (Davies et al. 1996) and Kruger and Ndumu (South Africa) (I. Whyte, in litt. February 1998; Rowe-Rowe 1994).

In West and Central Africa, density estimates of savanna buffalo (*brachyceros, aequinoctialis*) *are* generally in the range 0.3-0.6 per sq km in areas where the species is considered to be common, e.g., Comoe (Ivory Coast) (Fischer 1996), Manovo-Gounda-St. Floris (CAR) (Blom et al. 1995), Arly (Burkina Faso) (Barry & Chardonnet 1998), Niokolo-Koba (Senegal) (Sillero-Zubiri et al. 1997) and Zakouma (Chad) (D. Moksia, in litt. July 1995). Estimated savanna buffalo densities are <0.20 per sq km in areas with depleted or severely depleted populations, e.g., Bafing (Mali) (Pavy 1993), Diefoula (Burkina Faso) (U. Belemsobgo, in litt. February 1998), Bamingui-Bangoran (CAR) (Blom et al. 1995), Omo-Mago (Ethiopia) (Graham et al. 1997), Tsavo (Kenya) (Butynski et al. 1997), Kafue and Lukusuzi National Parks and Luangwa Valley game management areas (Zambia) (Jachmann & Kalyocha 1994; Yoneda & Mwima 1995) and Vwaza Marsh and Kasungu (Malawi) (Mkanda 1998; D. Gibson, in litt. April 1998).

Estimates are available for many savanna buffalo populations, mainly from aerial and ground surveys. Summation of the country estimates given above indicates a total population of >627,000 for the three subspecies of savanna buffalo. This estimated total is likely to be conservative, since it does not allow for undercounting from the air or for the substantial parts of these subspecies' ranges for which population estimates are unavailable, especially the Central African and southern forms. Assuming an average correction factor of 1.2 for undercounting bias in aerial surveys (see Table 4-1, p. 91) and average population densities for areas where no counts are available of 0.6 per sq km where the savanna subspecies are common/abundant and 0.05 per sq km where they are uncommon/rare or their abundance is unknown (see Appendix 4), provides a total population estimate for the three savanna buffalo subspecies of approximately 830,000, of which about 70% occur in and around protected areas. This includes estimated totals of 27,000 West African savanna buffalo, 133,000 Central African savanna buffalo and 670,000 southern savanna buffalo. The highly approximate nature of these estimates of total numbers is increased by the frequent occurrence of savanna buffalo in large herds, which tends to result in very high standard errors for population estimates based on sample surveys, but it is likely that the total number of buffalo remaining in Africa's savannas is in the approximate range 500,000-1,000,000. Only a relatively small number of the southern savanna buffalo (about 4,000) occurs on private land, where the transmission of diseases between cattle and buffalo has been a constraint on the introduction/reintroduction of the species. Savanna buffalo populations are in decline over extensive areas because of meat hunting and continuing loss of habitat, and rinderpest continues to pose a major threat to these subspecies in some regions of Africa.

Few population estimates are available for the forest buffalo. It tends to occur locally at relatively high densities in open, grassy areas within the equatorial forest, but at much lower densities in

extensive areas of continuous forest, e.g., 7.4 per sq km in forest-savanna mosaic and 0.3 per sq km in continuous forest within the northern Lope Reserve (White 1994; Tutin et al. 1996), 6.4 per sq km in secondary forest along roads and 0.01-0.03 per sq km in primary closed-canopy forest within Tai National Park (Hoppe-Dominik et al. 1998). The estimated overall density in Tai National Park in 1996 was 0.4 per sq km. Roth & Hoppe-Dominik (1986) estimated a total forest buffalo population of 23,500 for southern Ivory Coast, with an average population density of 0.2 per sq km. Total numbers have undoubtedly decreased in Ivory Coast since the 1980s, especially in unprotected areas, although the estimated population of the forest buffalo in Tai National Park was broadly similar in 1986 (1,250) and 1996 (1,200-3,000) (Roth & Hoppe-Dominik 1986; Hoppe-Dominik et al. 1998).

Using the available population estimates for areas such as Tai and Wonga-Wongue, and assuming average population densities of 0.3 per sq km in areas where population estimates are unavailable but it is known to be common/abundant and 0.03 per sq km elsewhere, with a total area of occupancy of 710,000 sq km (see Appendix 4), produces a total population estimate for the forest buffalo of about 60,000. This estimate is probably very conservative, but forest buffalo populations are in decline over most of the subspecies' remaining range. About 75% of the estimated total population of this subspecies occurs in nominally protected areas.

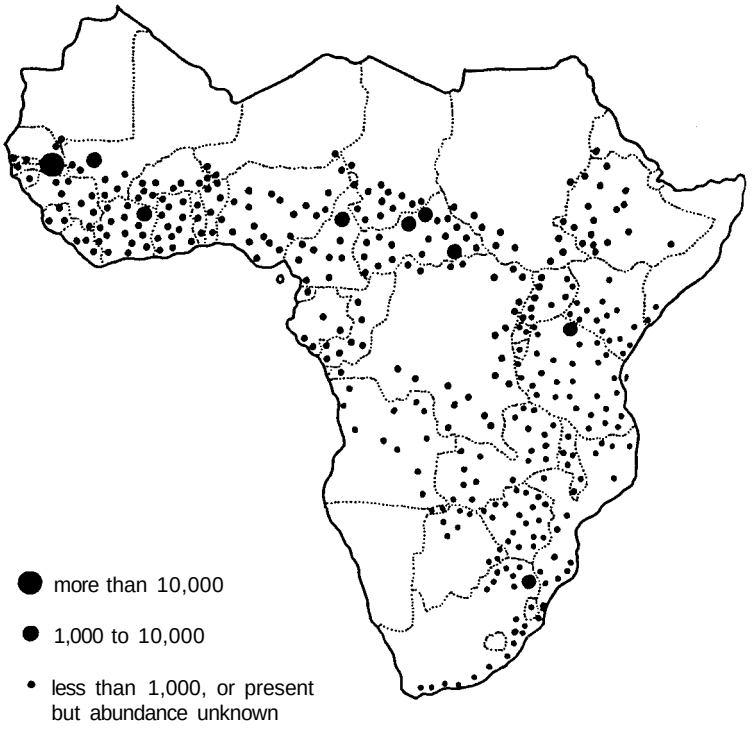
The Future: The future status of this species is closely linked to the future of protected areas and well-managed hunting zones, since it is a frequent target of poachers. The status of the southern savanna buffalo will remain unchanged in the long term if large, healthy populations continue to persist in a substantial number of national parks, equivalent reserves and hunting zones in southern and eastern Africa. If present trends continue, the status of the forest buffalo and the West and Central African forms of the savanna buffalo is likely to decline to threatened or near-threatened, as illegal hunting and habitat destruction reduce their distribution to a small number of effectively protected and managed areas.

Tribe Tragelaphini

## Bushbuck

*Tragelaphus scriptus* (Pallas 1766)

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mauritania | - | - | - | - | R | D | R | D |
| Mali | 2,800 | S/D | - | - | U/R | S/D | >2,800 | S/D |
| Niger | <750 | D | - | - | R | D | R | D |
| Senegal | 50,000 | I | - | - | U | S/D | >50,000 | S/I |
| Gambia | X | ? | - | - | U | D | U | D |
| Guinea-Bissau | - | - | - | - | C | S/D | C | S/D |
| Guinea | U | S/D | - | - | U | S/D | U | S/D |
| Sierra Leone | C | S/D | - | - | U | S/D | C/U | S/D |
| Liberia | C | ? | - | - | C | ? | C | ? |
| Ivory Coast | C | S/D | - | - | U | S/D | C/U | S/D |
| Burkina Faso | >1,600 | S | - | - | C/U | S/D | C/U | S/D |
| Ghana | C | S | - | - | X | S/D | C/U | S/D |
| Togo | U/R | S/D | - | - | U | S/D | U | S/D |
| Benin | C | S/D | - | - | C/U | S/D | C/U | S/D |
| Nigeria | U | S/D | - | - | U/R | D | U | D |
| Chad | >230 | S | - | - | X | S/D | X | S/D |
| Cameroon | >5,300 | S | - | - | X | S/D | X | S/D |
| CAR | >5,500 | S | - | - | C/U | S/D | C/U | S/D |
| Equ. Guinea | U | D | - | - | U/R | S/D | U | D |
| Gabon | C/U | S/D | - | - | U | S/D | C/U | S/D |
| Congo-Brazz. | U | D | - | - | U/R | D | U/R | D |
| Congo-Kinshasa | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Sudan | U/R | S | - | - | X | S/D | X | S/D |
| Eritrea | - | - | - | - | U | ? | U | ? |
| Ethiopia | C/U | S/D | - | - | X | S/D | X | S/D |
| Somalia | X | ? | - | - | R | D | X | D |
| Uganda | >700 | S | - | - | C/U | S/D | C/U | S/D |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Kenya | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Tanzania | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Rwanda | >2,000 | S | - | - | X | S/D | >2,000 | S/D |
| Burundi | C | S | - | - | X | S/D | X | S/D |
| Angola | X | D | - | - | X | D | X | D |
| Zambia | C | S/D | 160 | S/I | X | S/D | C/U | S/D |
| Malawi | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Mozambique | C/U | S/D | - | - | X | S/D | X | S/D |
| Namibia | R/V | ? | - | - | R | S/D | R | S/D |
| Botswana | U/R | S/D | C/U | s | U/R | S | U | S |
| Zimbabwe | C/U | S | 5,720 | s | X | S/D | C/U | S/D |
| South Africa | C | S | C/U | s | C/U | S/D | C/U | S/D |
| Swaziland | U | S | X | S/D | X | S/D | X | S/D |
| Lesotho | - | - | - | - | - | - | Ex? | - |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Recorded in the Senegal River valley in the southwest, where it survived in small numbers in the 1980s. No recent information on its status.

Mali: Formerly occurred widely in the southwestern savanna woodlands. Despite intensive hunting and widespread destruction and degradation of natural habitats caused by the spread of settlement and livestock, the bushbuck still occurs widely within its former range. It is the most numerous antelope species in Boucle du Baoule National Park and Bafing Faunal Reserve.

Niger: Confined to savanna woodlands in the southwest and the Lake Chad area in the southeast. The largest numbers occur in W National Park in the southwest. It suffers throughout its range from habitat degradation resulting from overgrazing by large herds of livestock.

Senegal: Formerly occurred widely in central and southern Senegal, and locally in riverine woodland on the Senegal River in the north. It survives widely within its former range, especially in the south. It is abundant in Niokolo-Koba National Park. The bushbuck remains common and widespread in the Casamance region in the southwest despite severe hunting pressures, although its numbers in this region are greatly reduced from 10-15 years ago.

Gambia: Formerly widespread, and persists locally where there is sufficient cover.

Guinea-Bissau: Formerly occurred almost throughout. It remains very widespread and locally common, including four islands in the Bijagos Archipelago. Its secretive habits enable it to survive in areas with sufficient cover close to human settlement, and it is common in sparsely settled areas such as Corubal River.

Guinea: Historically, the bushbuck probably occurred more or less throughout Guinea. The available information suggests that it remains widespread at low to moderate densities. It occurs in protected areas such as Badiar, Mount Nimba, Ziama and Diecke. It also persists in settled areas.

Sierra Leone: Formerly occurred widely. In the 1980s, it remained widespread and locally common, e.g., it was the most numerous antelope species in Outamba-Kilimi National Park, occurred widely in the Gola Forest Reserves, was common in Western Area Forest Reserve and occurred widely elsewhere in farm bush and forest-savanna mosaic. No recent information on its status.

Liberia: Occurs widely in farm bush and secondary forests. Its distribution is probably expanding with the increases in the areas of these habitats. In 1989/90, it was found to be an important

*Bushbuck (continued)*
component of commercially traded bushmeat. It was locally common in farm bush and was regarded as a significant pest of farm crops, and it was even more highly represented in subsistence bushmeat consumed locally by rural people than in the commercial bushmeat trade. It was also reported from rubber plantations but was not noted in high forest, e.g., it appears to be absent from Sapo National Park. No recent information on its status.

Ivory Coast: Formerly occurred throughout, except for the larger areas of closed-canopy forest in the south. It remains very widespread and has expanded its distribution with the opening up and destruction of most of the country's primary forest. It withstands heavy hunting pressure and frequently survives in dense vegetation in close proximity to settlement. It occurs in most protected areas and is common in areas such as Comoe, Mont Sangbe and Marahoue National Parks and Haut Bandama Game Reserve. It is rare in Tai National Park, where it is confined to secondary forest along open roads and on the periphery of plantations.

Burkina Faso: Formerly occurred throughout, except for the northern sahel zone. It has been reduced to low numbers and eliminated locally in the northern parts of its range, where destruction of natural vegetation and other human activities have been greatest, but its secretive habits and preference for cover have enabled it to survive quite widely elsewhere. It occurs in all protected areas within its range and is common in areas such as Nazinga Game Ranch and the Arly-Singou complex.

Ghana: Formerly occurred throughout, except for extensive areas of closed-canopy forest. It remains very widespread. It has extended its range throughout most of the moist lowland forest zone in the southwest as formerly closed-canopy forests have been opened up by human activities. It withstands heavy hunting pressures and adapts well to farming areas. The bushbuck occurs in all of the country's protected areas, generally in good numbers, including those which are poorly protected and heavily poached, e.g., Digya National Park.

Togo: Formerly occurred throughout. It remains widespread, often surviving in close proximity to settlement. It is one of the few antelope species with reasonable prospects of long-term survival in Togo.

Benin: Formerly occurred throughout and remains widespread, surviving in some quite densely settled areas in the south. It is common in protected areas such as Pendjari and W National Parks and probably occurs in all classified forests.

Nigeria: Formerly occurred almost throughout, although it was absent from extensive areas of closed-canopy forest in the south and confined to riverine forests in the semi-arid north. Unlike most other antelope species, its adaptability to habitat modification and its resilience to hunting pressure have enabled it to remain widespread.

Chad: Formerly occurred in areas with sufficient cover near permanent water throughout the savannas of the southern third of the country, and in the Lake Chad area in the west. It remains widespread and locally common within its former range, within and outside protected areas.

Cameroon: Formerly occurred more or less throughout, apart from the extensive areas of closed-canopy forest in the south. It remains widespread and often survives close to human settlement. It is well represented in regions such as the national parks and hunting zones of North Province. The bushbuck is probably extending its range into the southern forests as these are opened up by human activities, by colonising disturbed areas such as abandoned cultivations and logging sites at or near the forest margins. It occurs in areas such as Dja and Campo Reserves, but is absent from Korup National Park and the Lobeke region.

Central African Republic: Formerly occurred throughout, except for extensive areas of closed-canopy forest in the southwest and the sahel zone in the extreme north. It has retained a very high

proportion of its former range, including settled areas where there is sufficient cover, and it probably occurs in very large numbers overall. It is common in areas such as Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks, Sangba Pilot Zone and Bangassou Forest. It penetrates into the equatorial forest where this has been opened up. It occurs in Dzanga-Sangha Dense Forest Reserve, within several isolated patches of savanna (1 to 5 sq km in area) in the northeast of the reserve. The bushbuck must have crossed undisturbed closed-canopy forest to reach these savanna patches, but it does not occur further to the south in the many marshy clearings which lie deeper within the closed-canopy forest of the Dzanga-Sangha reserve and Dzanga-Ndoki National Park.

Equatorial Guinea: Occurs on the mainland, in secondary forest, forest edge habitats and areas which have been used for itinerant agriculture. It is locally common in Monte Alen National Park, along the Niefang-Bicurga road on the eastern boundary of the park, where there is extensive secondary growth as a result of shifting agriculture. Poaching pressures are high in this part of the park, and excessive offtake by trapping is apparently reducing the bushbuck's numbers.

Gabon: Has a restricted distribution, being confined to areas of savanna and forest-savanna mosaic. It is locally common within savannas in areas such as the Lope and Moukalaba reserves, but its abundance may have been reduced by heavy hunting pressures in some other areas.

Congo-Brazzaville: Formerly found throughout the savannas of the southern and central Congo Republic at least as far north as Odzala National Park, but it does not penetrate far into the dense forests of the north. It has been reduced to very low numbers or eliminated in the more populated and accessible parts of its range, although it still occurs in some small secondary forests near villages in the south. It is common in the forest-savanna mosaic of the reserves adjoining Odzala National Park, where its numbers are stable.

Congo-Kinshasa: Formerly occurred throughout the north, east and south in savanna woodlands and forest-savanna mosaic, but absent from the more extensive tracts of closed-canopy equatorial forest. It survives widely within its former range and is probably expanding its distribution into the equatorial forest zone as forests are partially cleared or destroyed by the advance of settlement. Its secretive habits and preference for thick cover enable it to withstand hunting pressure and survive in settled and intensively hunted regions long after most other antelope species have been eliminated, e.g., in the southeastern savannas and in densely settled areas of the eastern highlands. It is absent from areas of closed-canopy forest such as Maiko National Park, Okapi Faunal Reserve and the lowland forests of Kahuzi-Biega National Park, but it occurs in the montane section of Kahuzi-Biega. It is common in protected areas of savanna such as Garamba National Park and the adjoining reserves and parts of Virunga National Park.

Sudan: Formerly occurred widely within suitable habitat in southern and central Sudan. It has disappeared from substantial areas in the northern part of its former range because of degradation and destruction of its habitat, but it survives in low to moderate, stable numbers in areas such as Dinder and Radom National Parks. It also survives in some settled areas with small amounts of cover in central regions, and probably remains widespread in the wartorn south of the country.

Eritrea: Formerly occurred in the southwestern savannas and the highlands to the north of Asmara. It survives locally within its former range, at least in the southwest.

Ethiopia: Formerly occurred widely in western and central regions, but naturally absent from much of the more arid northeast and east. It remains widespread over much of its former range and is locally common in areas such as Bale Mountains and Nechisar National Parks and the Omo-Mago-Murule region. It occurs locally in small numbers in more arid regions, e.g., in surviving patches of riverine forest along the Awash River and the Webi Shabelle.

Somalia: Formerly occurred in the south, in riverine habitats on the Shebelle and Juba Rivers and in the Lake Badana region in the extreme south. Much of its former range has been lost to agriculture.

*Bushbuck (continued)*
By the 1980s it was rare on the Shebelle and Juba, but a few may survive there. It still occurs quite widely within suitable habitat in the Bush Bush National Park (Lake Badana) area.

Uganda: Remains widespread and common in suitable habitat within and outside protected areas. It is naturally absent from some semi-arid areas in the northeast (eastern Karamoja). The bushbuck is common in protected areas such as Murchison Falls, Lake Mburo and Kibale Forest National Parks, Pian-Upe Game Reserve and Budongo Forest Reserve, and in unprotected areas such as Aswa-Lolim.

Kenya: Still occupies most of its former range, mainly in the south and southwest and coastal strip. It persists in settled areas with sufficient cover and is well represented in protected areas with suitable habitat, e.g., Shimba Hills, Lake Nakuru, Aberdare, Mount Kenya and Kakamega. It is now rare in much of densely settled western Kenya and in other intensively hunted areas such as Arabuko-Sokoke Forest.

Tanzania: Formerly occurred throughout, except for parts of the semi-arid northeast. It remains very widespread and locally common within and outside protected areas. It often survives in good numbers even in areas where hunting pressure is high, e.g., on the northern and western slopes of Kilimanjaro, in Arusha National Park, and in settled areas where there is adequate cover and hunting with dogs is not intensive.

Rwanda: Occurs at high densities in Volcanoes National Park, and locally common in central and southern Akagera National Park. It also survives outside these protected areas.

Burundi: Formerly occurred throughout. In the mid-late 1980s, it remained widespread even in densely settled areas, e.g., it survived in the immediate environs of Bujumbura. It occurred in all of the country's protected areas and was common in Ruvubu National Park. No recent information is available on its status, but this has probably changed little since the 1980s.

Angola: Formerly occurred throughout, except for the arid southwest. It has survived the civil war in much better shape than most other antelope species. It probably still occurs quite widely within its former range and remains an important source of meat in rural areas.

Zambia: Formerly occurred throughout, except for parts of the western plateau. It still occupies a large part of its former range. It is locally common in suitable habitat outside protected areas, as well as within national parks such as Kafue, Mweru Wantipa, Nsumbu and Kasanka.

Malawi: Formerly occurred throughout. It still occurs quite widely outside protected areas. The bushbuck probably still occurs in all of the national parks and game reserves. It is locally common in these areas, e.g., Nkhotakota Game Reserve and the forest margins of Nyika National Park. It also occurs in many forest reserves, although it has been exterminated by meat hunters in some of the smaller forest patches.

Mozambique: Formerly occurred almost throughout. It probably still occupies a large part of its former range. It remains locally common in areas such as Niassa Game Reserve, Manica and Gaza Provinces and Maputaland.

Namibia: Occurs marginally in the Caprivi Strip in the northeast.

Botswana: Confined to riverine woodland and bushland near permanent water in the north and east. It still occupies most of its historical range and is locally common, e.g., along the Chobe River in the northeast of Chobe National Park, in Moremi Game Reserve and along the Limpopo River on the Tuli block farms.

Zimbabwe: Formerly occurred widely, but naturally absent from parts of the west and the highveld

plateau which lack suitable habitat. It remains widespread throughout most of its former range and often persists close to settlement. It is locally common on private farmland and in protected areas such as the national parks and safari areas of the Sebungwe and Middle Zambezi Valley regions.

South Africa: Formerly occurred widely within suitable habitat in the bushveld of Northern and Mpumalanga Provinces, and in the east from northeastern KwaZulu-Natal to the southern coast. It still occurs widely but patchily within this range and is locally common within and outside protected areas. There is a relatively large population in Kruger National Park.

Swaziland: Formerly occurred throughout, apart from the open grasslands of the western highveld. It still occurs locally outside protected areas, where there is sufficient cover and the pressures of hunting with dogs and snares are not severe. It is common within suitable habitat in several protected areas.

Lesotho: Probably occurred in the past, e.g., in riverine thickets. Much of this habitat has been destroyed and it is now probably extinct.

SUMMARY
The bushbuck formerly occurred very widely in sub-Saharan Africa wherever there was adequate cover and access to permanent water, but it was naturally absent from arid and semi-arid regions and from extensive areas of closed-canopy forest. Its ability to survive in human-dominated landscapes and to withstand heavy hunting pressure have enabled it to persist over much of its former range. It has disappeared from some areas in the drier parts of its former range because of habitat destruction and increasing aridity, but it is expanding its distribution within the equatorial forest zone as this is opened up by human activities. It occurs in a larger number of African countries (40) than any other antelope species, and it is one of the few antelopes whose long-term survival prospects are not closely dependent on conservation actions.

Estimated Total Numbers: The bushbuck reaches high densities in localised areas of favourable habitat, e.g., 78 resident individuals were identified within a 2.6 sq km area of open forest within Nairobi National Park (Kenya) giving a population density of 30 per sq km (Allsopp 1978), and faecal counts gave population density estimates of 20 to 44 per sq km in montane forest and adjoining habitats within Volcanoes National Park (Rwanda) (Plumptre & Harris 1995). Aerial surveys of savanna areas frequently produce population density estimates for bushbuck of <0.05 per sq km, e.g., Zakouma (Chad) (D. Moksia, in litt. July 1995) and protected areas in Uganda (Lamprey & Michelmore 1996) and Tanzania (see TWCM et al. 1997). These include areas where the species is known to be common, but aerial surveys undoubtedly grossly underestimate the bushbuck's population density because of its preference for cover and its secretive habits.

Ground surveys in savanna woodlands such as W-Tamou (Niger), Comoe (Ivory Coast), Nazinga and Diefoula (Burkina Faso), Lake Manyara National Park (Tanzania) and Lupande (Zambia) have produced density estimates of 0.2-1.0 per sq km (Grettenberger & Newby 1990; Fischer 1996; U. Belemsobgo, in litt. October 1995, February 1998; Prins & Douglas-Hamilton 1990; Jachmann & Kalyocha 1994). The bushbuck's tendency to remain concealed probably results in significant undercounting in some ground surveys. In Nairobi National Park, for example, attempted total ground counts gave population estimates of 20-30 bushbuck (Foster & Coe 1966; Foster & Kearney 1967) when total numbers may have been several hundred (cf Allsopp 1978).

The bushbuck's estimated total area of occupancy is at least 3,870,000 sq km (of which about 25% is within nominally protected areas) from the information in Appendix 4. Assuming average population densities for areas where estimates are unavailable of 1.5 per sq km where the species is known to be common/abundant and 0.1 per sq km elsewhere produces an estimated total population of 1,340,000. This is probably conservative, e.g., Boitani et al. (1998) estimated that this species' area of occupancy is 13,640,000 sq km. Its numbers are stable over considerable parts of its range but are decreasing in densely settled regions.

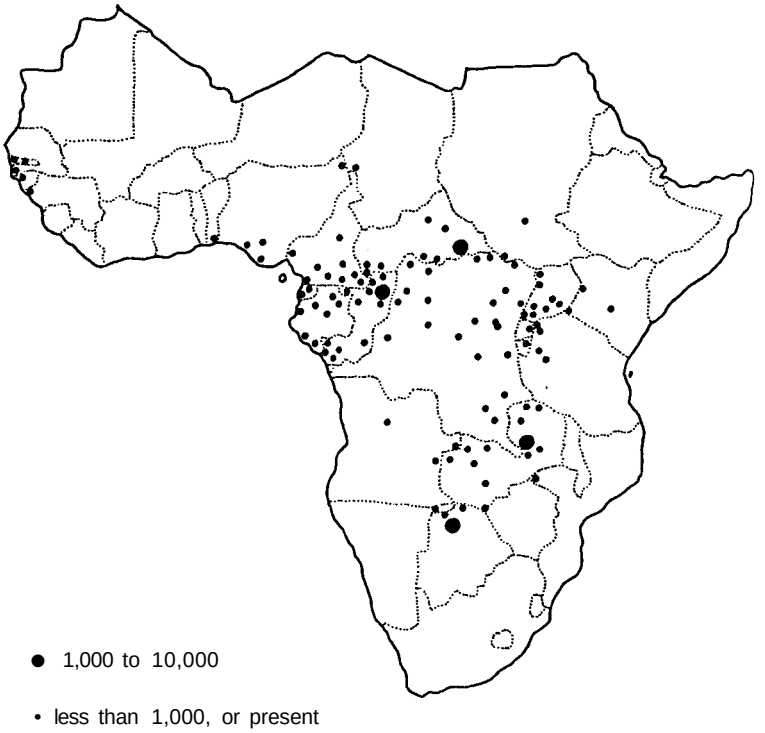
*Bushbuck (continued)*

The Future: The bushbuck's numbers are gradually decreasing as hunting pressures increase in many parts of its range, and it cannot survive indefinitely as human population density increases. Nevertheless, its ability to survive widely in settled areas and successfully utilise habitats modified by human activities should ensure that it survives in substantial numbers outside protected areas for the foreseeable future. It is also well represented within protected areas throughout its range.

## Sitatunga

*Tragelaphus spekii* P.L. Sclater 1864

RED LIST STATUS
Lower Risk (near threatened)

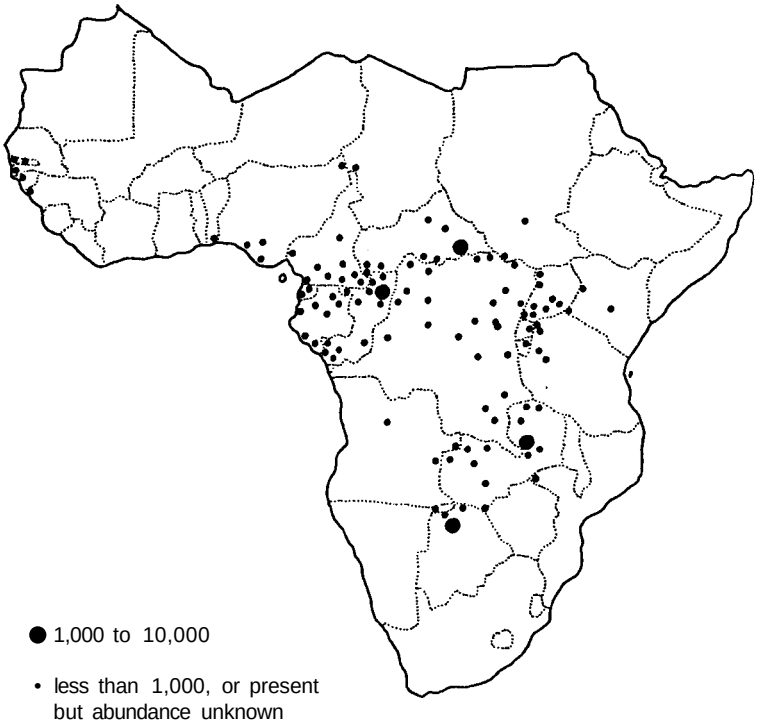


● 1,000 to 10,000

• less than 1,000, or present but abundance unknown

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abuncl. | Trend | Popn/Abund. | "Frend | Popn/Abund. | Trend |
| Niger | - | - | - | - | Ex | - |
| Senegal | ? | ? | R | D | R | D |
| Gambia | X | ? | - | - | X | ? |
| Guinea-Bissau | - | - | R | D | R | D |
| Guinea | - | - | R | D | R | D |
| Ghana | - | - | - | - | Ex? | - |
| Togo | - | - | - | - | Ex? | - |
| Benin | - | - | R | D | R | D |
| Nigeria | R | D | R | D | R | D |
| Chad | - | - | R | D | R | D |
| Cameroon | C/U | S/D | X | S/D | C/U | S/D |
| CAR | C/U | S | U | S/D | C/U | S/D |
| Equ. Guinea | Ab | S | C/U | D | C | D |
| Gabon | C/U | S | C/U | S/D | C/U | S/D |
| Congo-Brazz. | C/U | S/D | X | S/D | C/U | S/D |
| Congo-Kinshasa | C/U | S/D | X | S/D | C/U | S/D |
| Sudan | - | - | U/R | S/D | U/R | S/D |
| Uganda | X | ? | U | S/D | U | S/D |
| Kenya | <50 | D | R | ? | R | ? |
| Tanzania | '410 | S/I | >770 | D | >1,180 | S/D |
| Rwanda | 500 | S/D | - | - | 500 | S/D |
| Burundi | U/R | S/D | ? | ? | U/R | S/D |
| Angola | - | - | U/R | S/D | U/R | S/D |
| Zambia | C/U | S/D | X | S/D | C/U | S/D |
| Mozambique | - | - | R | ? | R | ? |
| Namibia | 20 | S/I | - | - | 20 | S/I |
| Botswana | 260 | s | 4,500 | S/I | 4,760 | S/I |
| Zimbabwe | R/V | ? | - | - | R/V | ? |




## Sitatunga

*Tragelaphus spekii* P.L. Sclater 1864

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abuncl. | Trend | Popn/Abund. | "Frend | Popn/Abund. | Trend |
| Niger | - | - | - | - | Ex | - |
| Senegal | ? | ? | R | D | R | D |
| Gambia | X | ? | - | - | X | ? |
| Guinea-Bissau | - | - | R | D | R | D |
| Guinea | - | - | R | D | R | D |
| Ghana | - | - | - | - | Ex? | - |
| Togo | - | - | - | - | Ex? | - |
| Benin | - | - | R | D | R | D |
| Nigeria | R | D | R | D | R | D |
| Chad | - | - | R | D | R | D |
| Cameroon | C/U | S/D | X | S/D | C/U | S/D |
| CAR | C/U | S | U | S/D | C/U | S/D |
| Equ. Guinea | Ab | S | C/U | D | C | D |
| Gabon | C/U | S | C/U | S/D | C/U | S/D |
| Congo-Brazz. | C/U | S/D | X | S/D | C/U | S/D |
| Congo-Kinshasa | C/U | S/D | X | S/D | C/U | S/D |
| Sudan | - | - | U/R | S/D | U/R | S/D |
| Uganda | X | ? | U | S/D | U | S/D |
| Kenya | <50 | D | R | ? | R | ? |
| Tanzania | '410 | S/I | >770 | D | >1,180 | S/D |
| Rwanda | 500 | S/D | - | - | 500 | S/D |
| Burundi | U/R | S/D | ? | ? | U/R | S/D |
| Angola | - | - | U/R | S/D | U/R | S/D |
| Zambia | C/U | S/D | X | S/D | C/U | S/D |
| Mozambique | - | - | R | ? | R | ? |
| Namibia | 20 | S/I | - | - | 20 | S/I |
| Botswana | 260 | s | 4,500 | S/I | 4,760 | S/I |
| Zimbabwe | R/V | ? | - | - | R/V | ? |

Equatorial Guinea: Formerly occurred widely in Mbini. It remains widespread and locally common, although hunting for bushmeat is reducing its numbers in more accessible areas. It is well represented in Monte Alen National Park.

Gabon: Formerly occurred in suitable swampy habitat almost throughout the country. It remains widespread and locally common. The sitatunga shows a remarkable ability to survive near human habitation, apparently because the swamps and other wet habitats with which it is usually associated are abundant in most provinces of Gabon and serve as refuges from hunters. It also becomes totally nocturnal near villages. Its numbers are probably decreasing in densely settled areas but stable elsewhere.

Congo-Brazzaville: Formerly occurred throughout in suitable swamp habitat, and it still occurs very widely. It is present in large numbers along the Likouala-aux-Herbes River in the northeast. The Lake Tele-Likouala-aux-Herbes protected area contains a very large area of good sitatunga habitat and probably supports a very large population. It is also common in Odzala and Nouabale-Ndoki National Parks and the Kabo/Pokola Forests in the north. Its numbers in the northern protected areas are stable or increasing. In contrast, its populations in the south of the country are generally small and declining because of intensive meat hunting, although the inaccessibility of the interior of the larger swamps protects it from hunting to some extent, e.g., in the Kouilou Basin.

Congo-Kinshasa: Formerly occurred throughout in swampy areas and remains widespread. It is common in the extensive swamps of the Congo Basin, e.g., in Salonga National Park. It is more localised elsewhere, e.g., in swampy areas within the northern and southeastern savannas, in the Ituri Forest where it occurs sparsely along the larger rivers and in fallows on cultivated land, and in Kahuzi-Biega National Park where it occurs locally in swamps in the northwest of the park.

Sudan: Known from two areas, the Sudd swamps where aerial surveys produced a population estimate of 1,100 in the early 1980s, and small areas of swamp in the southwest. Recent information indicates that it survives in these areas.

Uganda: Occurs quite widely in swamps associated with Uganda's extensive lake and river systems. Although it is hunted relentlessly, it can persist close to human settlement as long as its cover is not removed. It probably survives in most of the larger swamps. It is not very well represented in protected areas, but it occurs in small numbers in swamps within areas such as Murchison Falls, Queen Elizabeth, Lake Mburo, Bwindi-Impenetrable and Kibale Forest National Parks.

Kenya: Occurs naturally in only two localities in Kenya, the Lake Victoria swamps (where it is now very rare) and Saiwa Swamp National Park, where the population has been reduced by poaching from >100 in the 1970s to probably <50. Small numbers have recently been introduced to Lewa Downs Wildlife Conservancy in central Kenya.

Tanzania: Occupies about half of its limited former range in swamps and swamp margins in scattered localities in the west and northwest. The major surviving populations are in and around Moyowosi-Kigosi Game Reserves, where numbers are stable, and in the Kagera River swamps adjoining Burigi Game Reserve, where numbers are decreasing because of meat hunting.

Rwanda: Formerly occurred throughout the swamps associated with the extensive river and lake systems in the east and southeast. It has been eliminated from much of its former range by the expansion of settlement and associated poaching pressures and now survives mainly in the southeastern part of Akagera National Park, where it is common.

Burundi: Formerly occurred widely in swamps. By the 1 980s it was increasingly restricted to the more inaccessible swamps, e.g., in Ruvubu National Park. No recent information on its status.

Angola: Formerly occurred locally in swamps in central and eastern Angola. It survives in small numbers in at least a few localities, e.g., Luando-Kangandala.

*Sitatunga (continued)*

Zambia: Formerly occurred widely in swamps and marshy dambos, mainly on the northern and western plateaux. Its secretive habits enable it to survive close to settlement as long as sufficient areas of its swamp habitat remain intact, and it probably still occurs quite widely within its former range. A major population occurs in the Bangweulu swamps, where the population was estimated to be at least 10,000-20,000 in the 1970s and it remains common in stable numbers. It is also common in areas such as the Busanga swamps in the north of Kafue National Park and in Kasanka National Park. It is rare on the Kafue Flats, where it is restricted to dense papyrus swamps on the central flats.

Mozambique: Restricted to a small area on the Zambezi River in western Tete Province, where the estimated population was <50 in the early 1980s. No recent information on its status.

Namibia: Confined to a few areas of swamp in the Caprivi Strip in the northeast, mainly in Western Caprivi Game Reserve and Mahango Game Park.

Botswana: Confined to the Okavango Delta and the Linyanti-Chobe swamps in the north. It is common in both of these areas, with the bulk of the species' total population in the relatively large expanse of perennial and seasonal swamps within the Okavango. Although it is frequently hunted by local people as a preferred source of food, it shows considerable resilience to hunting pressure and occurs close to permanent villages within the Delta. Sustainable trophy hunting by non-residents is an economically important form of utilisation of this species in northern Botswana, which has produced some of Africa's largest sitatunga trophies. The large areas of swamp within the Okavango Delta currently provide the sitatunga with a safe refuge. They should continue to do so, as long as the ecology of the Delta is not altered significantly by factors such as cattle grazing within the swampland, uncontrolled burning, overhunting and hydrological schemes that would affect the water levels in the perennial or seasonal swamps. Moremi Game Reserve contains a limited area of permanent swamp with moderate numbers of sitatunga, but proposals to incorporate the Xo Flats within this reserve would significantly increase the protected population of this antelope.

Zimbabwe: Recorded from the extreme northwest, on islands in the Zambezi River and occasionally on the south bank of the river. No recent information on its status in this area.

SUMMARY

The sitatunga probably occurred formerly alongside waterways throughout the lowland forest zone of West and Central Africa, extending into swamp systems in the savanna zones of Central, East and Southern Africa. It is now rare and localised in West Africa, but it remains widespread and locally common in the Central African forests and in some swamp systems within the savannas of Central, East and Southern Africa. Its secretive habits enable it to persist in settled areas as long as its habitat is intact, but meat hunting and habitat destruction are reducing its distribution and abundance in many parts of its range. Major, generally stable populations occur in sparsely settled areas such as Dja (Cameroon), Lobeke (Cameroon)-Dzanga-Sangha (Central African Republic)-Nouabale-Ndoki-Kabo (Congo-Brazzaville), Bangassou (Central African Republic), Monte Alen (Equatorial Guinea), Wonga-Wongue, Gamba and other areas of Gabon, Lake Tele-Likouala and Odzala (Congo-Brazzaville), Salonga (Congo-Kinshasa), Moyowosi-Kigosi (Tanzania), Bangweulu (Zambia) and Okavango (Botswana).

Estimated Total Numbers: High densities of sitatunga have been recorded within localised areas of swamp, e.g., 50 per sq km in the 2 sq km Saiwa Swamp National Park (Kenya) (Owen 1970). Surveys from boats over more extensive areas of swamp have revealed population densities ranging from 10-15 per sq km in Bangweulu (Zambia) (Grimsdell & Bell 1975; Manning 1976) to 0.5 per sq km in the Okavango Delta (Ross 1992). Aerial surveys tend to grossly underestimate this species' numbers, e.g., possibly by as much as 50-fold in some surveys of the Okavango (see data in Ross et al. 1998).

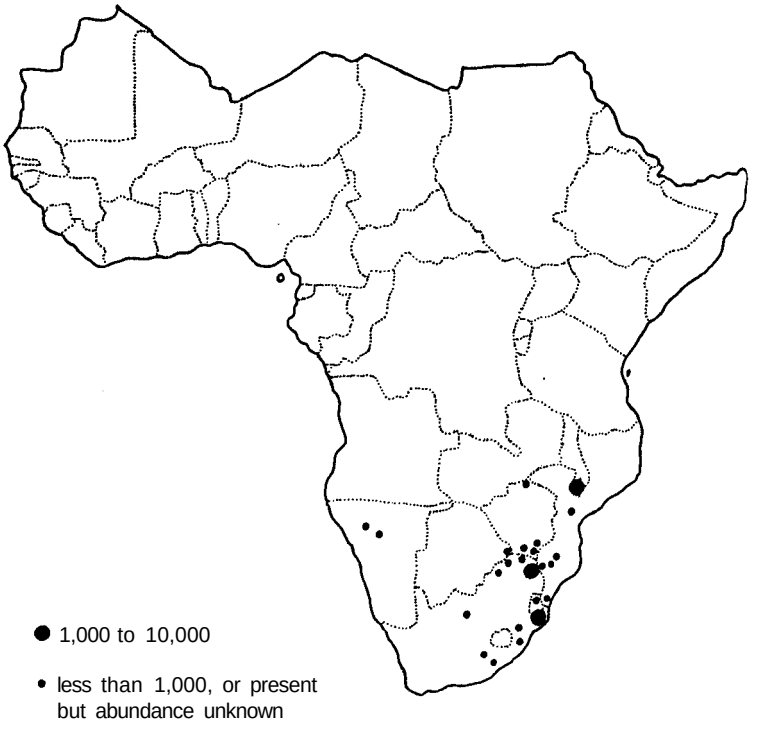
Few estimates of the sitatunga's numbers are available but its relative abundance has been documented within many parts of its area of occupancy, which is estimated to exceed 1,230,000 sq km (see information in Appendix 4). Assuming average population densities of 0.5 per sq km in areas where it is known to be common/abundant and 0.05 per sq km elsewhere produces an estimate of the species' total population of 170,000, of which 40% is in and around protected areas. It numbers are generally in decline except in the core areas of its distribution. These are along forest rivers and streams in parts of southern Cameroon, southwestern and southeastern Central African Republic, Equatorial Guinea, Gabon, northern Congo-Brazzaville and the Congo River Basin region of Congo-Kinshasa, and in the major swamp systems of western Tanzania, Zambia and northern Botswana.

The Future: If present trends continue, the sitatunga will disappear from many areas where it still occurs and viable populations will eventually be largely restricted to those regions which currently support substantial, stable or increasing populations. The long-term survival of the species is dependent on the existence of well-protected areas of natural habitat within these regions. At present, only a few of these areas, e.g., Dzanga-Sangha, Nouabale-Ndoki, Monte Alen and Odzala, receive moderate-high levels of protection and management. The current survival of good sitatunga populations in other areas, such as Lobeke, Bangassou, Salonga, much of Gabon, Bangweulu and Okavango, is a product of low human population densities rather than active conservation. The species' significance as a trophy animal is an important economic incentive for the conservation of its habitat. Hunting zones adjoining national parks and equivalent reserves have the potential to play an increasingly important role in the conservation of the sitatunga.

## Nyala

*Tragelaphus angasii* Gray 1849

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Malawi | >2,880 | I | 100 | I | - | - | >2,980 | I |
| Mozambique | U | D | - | - | X | D | U | D |
| Namibia | - | - | 96 | S/I | - | - | 96 | S/I |
| Botswana | - | - | U/R | I | - | - | U/R | I |
| Zimbabwe | U/R | ? | 420 | I | X | ? | U | ? |
| South Africa | 23,360 | S/I | >3,500 | I | - | - | >26,860 | I |
| Swaziland | C | S/I | X | S/I | - | - | C | S/I |
| Species Total | >26,240 | S/I | >4,120 | I | X | ? | >30,000 | I |

OVERVIEW OF CONSERVATION STATUS

Malawi: Formerly occurred throughout the thicket areas of the Lower Shire Valley, but now confined to protected areas and private land. The main population is in Lengwe National Park, which was established specifically to protect the nyala. This population increased from 350 in the late 1960s to 4,300 in the early 1980s, prior to the commencement of a culling programme which reduced its numbers to the desired level of about 2,000 by the mid-1980s. Suitable thicket habitat and its preferred food plants are restricted to a relatively small area (about 1 30 sq km) in the eastern section of the park, where the nyala population is concentrated. Ongoing management of this population will be necessary to prevent degradation of the park's thicket habitats. A second protected population occurred in Mwabvi Game Reserve, at least until recently, but this reserve has now been overrun by settlement.

Mozambique: Formerly occurred locally in parts of central and southern Mozambique. In the early 1980s, the largest surviving population was in Gorongosa National Park (estimated population 4,000) and adjacent parts of Sofala Province. Its numbers have subsequently been reduced greatly, but it survives in viable populations in areas such as Gorongosa, Zinave and Banhine National Parks

and the Maputo reserve and it is still locally common in a few parts of Gaza Province. Its numbers can be expected to recover as current efforts to rehabilitate wildlife conservation in Mozambique proceed.

Namibia: This species does not occur naturally in Namibia, but it has been introduced to private land in the northern commercial farming districts.

Botswana: It does not occur naturally in Botswana, but some of the Tuli block farms in the east have been colonised as a result of the spread of nyala from populations introduced to farms in the adjacent region of South Africa.

Zimbabwe: Recorded from two separate areas of lowveld, in the Middle Zambezi Valley floor in the north and more extensively in the southeast. It occurs in moderate numbers in Mana Pools National Park and adjoining safari areas in the north, and Gonarezhou National Park and private land in the southeast.

South Africa: Formerly confined to parts of the northeastern lowveld and northeastern KwaZulu-Natal. It has been eliminated from substantial areas of its former range by loss of habitat to the expansion of agriculture, but major populations survive in the protected areas of northern KwaZulu-Natal, particularly Hluhluwe-Umfolozi, Mkuzi and Ndumu. It also occurs in substantial numbers in Kruger National Park and on private land in the lower Mkuzi area of KwaZulu-Natal. It is a popular animal on game farms and has been reintroduced/introduced widely to private farmland within and outside its historical range.

Swaziland: Formerly occurred in the lowveld of eastern Swaziland but it disappeared, probably because of the combined effects of rinderpest and hunting. It has been reintroduced to Hlane Game Reserve and to some cattle ranches. It is common in Hlane and has spread into the adjacent Mlawula Nature Reserve.

SUMMARY
An inhabitant of dense thickets and thicket-open woodland mosaic in southern Africa, the nyala has disappeared from extensive areas of its former range but survives in good numbers in protected areas, e.g., Lengwe in Malawi and Hluhluwe-Umfolozi, Mkuzi, Ndumu, Kruger and other areas in South Africa. It also occurs in substantial numbers on private land in South Africa, including extralimital areas. It responds well to protection, to the point where over-population can become a management problem, e.g., in Lengwe. The current efforts to rehabilitate Mozambique's wildlife areas offer the prospect that the nyala may recover its former abundance in areas such as Gorongosa National Park.

Estimated Total Numbers: Recent estimates are available for most of the species' main populations (see Appendix 4). If it is assumed that areas for which population estimates are unavailable support average densities of 7.0 per sq km where the nyala is known to be common (cf. Hluhluwe-Umfolozi in Appendix 4) and 0.04 per sq km elsewhere (cf. Zinave), then total numbers are estimated to exceed 32,000. Over 80% of the estimated total population occurs in protected areas (including >50% in just three small to moderate-sized protected areas in KwaZulu-Natal, viz., Hluhluwe-Umfolozi, Mkuzi and Ndumu), with a further 10-15% on private land. National populations are generally stable or increasing as the species expands its distribution and/or numbers in protected areas and on private land, with the notable exception of Mozambique (at least until very recently).

The Future: As long as effective protection and management are maintained in the key protected areas for this species and its numbers continue to increase on private land, its Red List status will not change. Its long-term survival will be further enhanced if the current efforts to rehabilitate the wildlife of areas such as Gorongosa, Banhine and Zinave National Parks, Gaza Province and the Maputo reserve in Mozambique are successful.

**Mountain Nyala**
*Tragelaphus buxtoni* (Lydekker 1910)

RED LIST STATUS
Endangered


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Ethiopia | 1,150 | I | 1,500 | ? | 2,650 | ? |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: Endemic to the Ethiopian highlands east of the Rift Valley. It has been eliminated from large parts of its former range and survives in fragmented populations in bushland, woodland/grassland ecotones, heather and Afroalpine moorland in scattered localities at altitudes of 3,000-4,200 m in the Bale and Arsi Mountains. The main surviving concentration occurs in the Gaysay area, which comprises 200 sq km of broad grassy valleys in the north of Bale Mountains National Park. This population increased to at least 1,700 and possibly as many as 4,600 in the late 1980s, in response to more than 1 5 years of effective protection from poachers and the exclusion of cattle from its habitat.

During the political and civil disturbances which were widespread in Ethiopia in 1991, several ranger posts in Bale Mountains National Park were destroyed, settlers returned and there was extensive shooting and persecution of mountain nyala, at least partly in revenge for the forcible eviction of local people from the park by the previous government. The estimated mountain nyala population of Bale Mountains National Park decreased to about 1 50 during this period. Poaching was subsequently brought under control and patrolling resumed in the northern part of the park. This has allowed the mountain nyala population of the Gaysay area to recover rapidly to an estimated 850-970 in February 1997 (park warden's estimate) and about 1,000 in April-August 1997 (transect counts by Philip Stephens). The Gaysay area is now the only part of Bale Mountains National Park which is regularly patrolled. It has consequently suffered much less from livestock incursions and encroachment of settlement than other parts of the park such as Gojera/Simbirro and the Sanetti plateau, which were formerly used by small numbers of mountain nyala. This antelope competes directly with livestock for food, and no nyala are seen in areas where livestock pressure is high.

Predation of calves and juveniles by domestic dogs is also a threat to mountain nyala. However, the species' resilience is indicated by the recovery of the Gaysay population since 1991. This population is continuing to increase, and there is an additional population of approximately 100-200 in the Central Peaks/northern Sanetti plateau area, giving a total population estimate for Bale Mountains National Park of between 1,100 and 1,200. It is nevertheless a major concern that increasing human and domestic livestock populations are now exerting tremendous pressure on parts of Bale Mountains National Park, through livestock grazing, extraction of timber and fuelwood, and the establishment of permanent settlements and associated cultivation in some areas of the park. These areas now have almost no value to mammalian wildlife. Local elders say they appreciate the existence of the park, even though the local community has received no direct benefits from it. The community was involved in measures that were taken to abate the wildlife slaughter in 1991 and continues to be involved in other park management issues, but there is an urgent need to alleviate the negative impacts of settlement on the park.

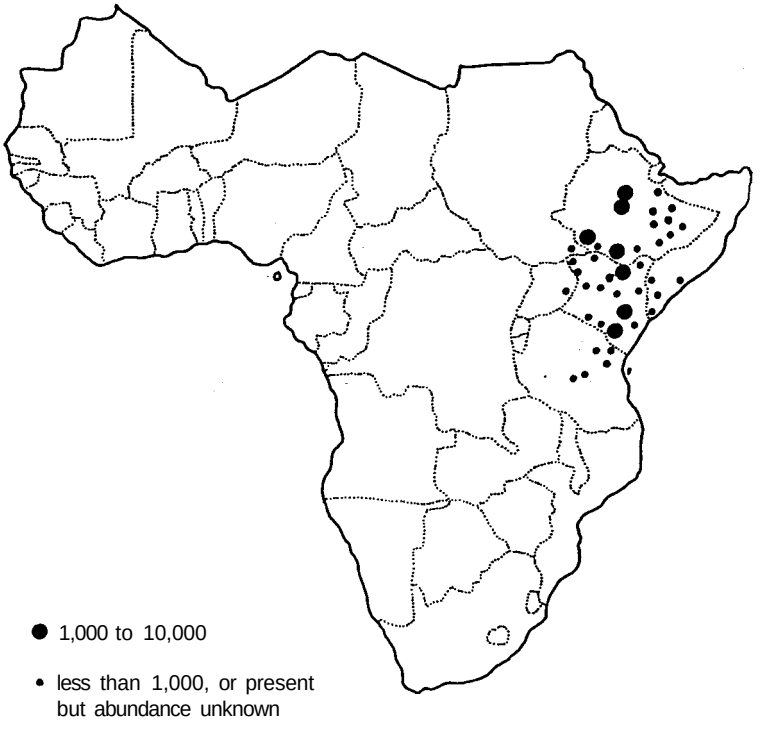
In the mid-1980s, an estimated 700-2,300 mountain nyala survived outside Bale Mountains National Park. In the mid-1990s, the surviving population of mountain nyala in the Bale and Arsi Mountains outside Bale Mountains National Park was estimated to number 1,500. The small Kuni-Muktar Wildlife Sanctuary was established in 1990 as a second protected area for mountain nyala, but by 1996 this sanctuary had suffered severely from poaching, deforestation, cultivation and gully erosion, and the mountain nyala no longer occurred.

SUMMARY
The mountain nyala's restriction to a mosaic of montane bushland, woodland, heather, moorland and valley-bottom grassland within a very localised area of Ethiopia makes it highly vulnerable to both ecological and political upheavals (Kingdon 1997). Its resilience and its current recovery in the Gaysay area of Bale Mountains National Park are hopeful signs for the future, but the species' survival will always be highly precarious, especially while there is only a single major concentration.

Estimated Total Numbers: The recent study by Stephens (1997) indicated that the population of Bale Mountains National Park has recovered to >1,000. Less is known about the numbers of this Ethiopian endemic elsewhere within its very restricted range, but it appears that its overall numbers outside Bale Mountains National Park may not have changed dramatically since the 1980s (Hillman 1988; Malcolm & Sillero-Zubiri 1997). The estimated total population is about two and a half thousand. Numbers are increasing in Bale Mountains National Park but population trends elsewhere are unknown.

Captive Population: No mountain nyala are currently held in captivity.

The Future: The mountain nyala, along with the Ethiopian wolf, is a key flagship species for Bale Mountains National Park and its future will be closely tied to the future of this protected area. It is also very important to spread the risk by establishing effective protection and management of mountain nyala populations elsewhere within its range. Sustainable trophy hunting in some of these areas has very high potential for generating the revenue needed to fund effective conservation of this species and the other endemics which share its habitat. It may also be advisable to establish a self-sustaining captive population in collaboration with the Ethiopian conservation authorities, as an insurance against future adversity for the wild population.




**Lesser Kudu**
*Tragelaphus imberbis* Blyth 1869

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Sudan | - | - | X | ? | X | ? |
| Ethiopia | 5,770 | S | >8,870 | S/D | >14,640 | S/D |
| Djibouti | - | - | - | - | Ex | - |
| Somalia | C | S/D | C/U | S/D | C/U | S/D |
| Uganda | - | - | 880 | S | 880 | S |
| Kenya | 1,170 | D | 4,900 | S/D | 6,070 | D |
| Tanzania | 1,200 | S | X | S/D | X | S/D |
| Species Total | >8,140 | D | >14,650 | S/D | >22,000 | D |

OVERVIEW OF CONSERVATION STATUS

Sudan: Occurs in small numbers in the dry bush country of the southeast, where aerial surveys in the 1970s and 1 980s produced population estimates of several hundred. No recent information on its status.

Ethiopia: Occurs widely in bushland throughout most of its former range in the eastern and southern lowlands, although it has disappeared from the southern Rift Valley. Its shyness and preference for thick cover enable it to withstand considerable hunting pressure, e.g., it is relatively plentiful throughout the Ogaden region wherever there is sufficient dense bush, despite widespread, uncontrolled hunting by local people. It occurs in good numbers in the southern part of the Awash River valley and in the southern lowlands, e.g., it is abundant throughout all of the bushland areas of Omo National Park despite suffering some poaching along the Omo River and in the southern region of the park. It is also widespread and common in other parts of the southern lowlands such as Mago National Park, Yabelo Wildlife Sanctuary, Borana and Murule Controlled Hunting Areas. Its numbers are generally stable, and it was apparently unaffected by the rinderpest outbreak which reduced the numbers of this species in eastern (but not northern) Kenya in 1994-95. Ethiopia's

apparently healthy lesser kudu population represents an important fraction of this species' global population.

Djibouti: Formerly occurred in southern Djibouti, where it is now extinct.

Somalia: Formerly occurred widely in the south, and more locally in central and northwestern Somalia, but naturally absent from the northeast. In the 1980s, it still occurred widely but in reduced numbers within its former range and was one of the most abundant Somali antelopes. This probably still applies, although its numbers may have decreased since the 1980s and there is no recent information that it survives in central or northwestern Somalia. It apparently still occurs quite widely in the south and is common in the thick bush of the Bush Bush National Park area and other parts of Badhadhe District.

Uganda: Formerly occurred widely in thicket vegetation in the semi-arid northeast and east (Kidepo Valley National Park and Karamoja). Surveys in 1995 confirmed its continued presence only in the eastern part of South Karamoja Controlled Hunting Area, where it still occurs in good numbers.

Kenya: Still occurs widely within its historical range in northern and eastern Kenya, but in reduced numbers. Aerial surveys indicated a decline of about 50% in the Kenyan population between the 1970s and early 1990s, and the 1994-95 rinderpest outbreak caused a further decrease in eastern Kenya. The country nevertheless continues to support a major population of this species, with the largest numbers in Wajir, Turkana and Tana River districts and the Tsavo area.

Tanzania: Occurs widely at low to moderate densities within and outside protected areas in its historical range in the semi-arid thornbush of northeastern and central Tanzania.

SUMMARY
The lesser kudu occupies *Acacia-Commiphora* bushland in semi-arid areas of northeastern Africa. Important populations occur in protected areas such as Awash, Omo and Mago National Parks (Ethiopia), Bush Bush National Park (Somalia), Tsavo National Park (Kenya) and Ruaha National Park and adjoining game reserves (Tanzania), but it occurs in larger numbers outside protected areas (see Appendix 4). Its secretive habits and preference for cover often enable it to survive in areas where hunting pressures are high. On the other hand, its susceptibility to rinderpest resulted in a substantial decrease in its numbers in eastern regions of Kenya during the mid-1990s. These populations can be expected to recover following the subsidence of this rinderpest outbreak. There are relatively few parts of the lesser kudu's range where protection against poaching reaches moderate levels or better, and eradication of rinderpest from cattle would be a major step towards reducing current pressures on its populations (Butynski et al. 1997).

Estimated Total Numbers: Population estimates based on recent aerial surveys are available for considerable areas of the lesser kudu's range (see Appendix 4), but aerial surveys substantially underestimate this species' true numbers. In addition, its populations are unknown in the remainder of its range. The sum of the available estimates, about 22,000, is therefore probably a significant underestimate of the species' actual total numbers.

In areas where the species is known to be at least reasonably common, aerial surveys have generally produced density estimates of 0.1-0.3 per sq km, e.g., Omo-Mago (Ethiopia) (Graham et al. 1997), Borana-Yabelo and Awash Valley (Ethiopia) (Thouless 1995a, 1995b), South Karamoja (Uganda) (Lamprey & Michelmore 1996) and Mkomazi (Tanzania) (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), or less than 0.1 per sq km, e.g., Tsavo (Kenya) prior to the 1994-95 rinderpest outbreak (Butynski et al. 1997) and Ruaha (Tanzania) (TWCM 1994c). Ground surveys have produced density estimates of 0.5-3.0 per sq km within areas of favourable, moderate to densely wooded habitat, e.g., in Tsavo (Leuthold 1978, 1979) and Awash (C. Schloeder & M. Jacobs, in litt. August 1996).

Assuming an average correction factor of 5.0 for undercounting bias in aerial surveys, and that

*Lesser Kudu (continued)*

areas for which population estimates are unavailable support average densities of 1.0 per sq km where the lesser kudu is known to be common and 0.05 per sq km elsewhere, gives a total population estimate of 118,000. This is probably a conservative figure (cf. Table 4-1, p. 91). About one-third of the estimated total population occurs in protected areas. Despite the species' ability to persist in the face of uncontrolled meat hunting, its numbers are probably in gradual decline over extensive areas of its range as human settlement expands.

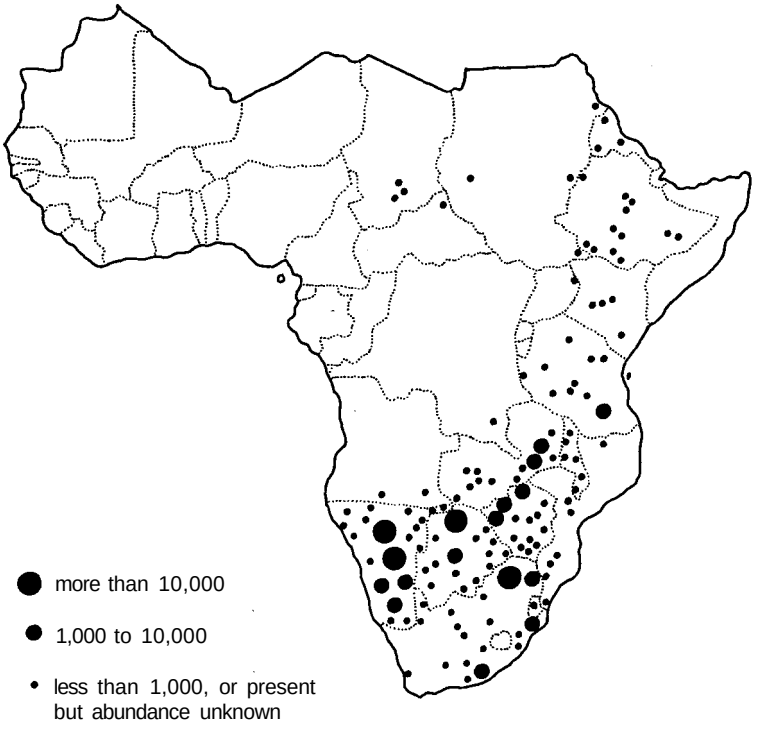
The Future: The lesser kudu will probably persist for a long time to come in the arid scrublands of northeastern Africa, as long as human and livestock densities remain relatively low in extensive parts of its range such as northern Kenya and southern Ethiopia. It nevertheless faces a continuing, long-term population decline as meat hunting and pastoralism increase within its remaining range. Its status may eventually decline to threatened.

The lesser kudu's long-term survival prospects would be enhanced by improved protection and management of the relatively few protected areas which support substantial populations. In addition, its value as a trophy animal gives the species high potential for increased revenue generation in the extensive bushlands where it still occurs in good numbers outside national parks and equivalent reserves.

## Greater Kudu

*Tragelaphus strepsiceros* (Pallas 1766)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Chad | >150 | S/I | - | - | ? | ? | >150 | S/I |
| CAR | - | - | - | - | U/R | S/D | U/R | S/D |
| Congo-Kinshasa | R | D | - | - | ? | ? | R | D |
| Sudan | R | S | - | - | x | ? | x | ? |
| Eritrea | - | - | - | - | U | ? | U | ? |
| Ethiopia | >290 | S/D | - | - | >1,070 | D | >1,360 | D |
| Djibouti | - | - | - | - | ? | ? | ? | ? |
| Somalia | - | - | - | - | - | - | Ex? | |
| Uganda | - | - | - | - | - | - | R | S/D |
| Kenya | >90 | D | - | - | 295 | S/D | >385 | S/D |
| Tanzania | >1,280 | S/I | - | - | >720 | S/D | >2,000 | S? |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Zambia | >3,780 | S | 280 | S/I | x | S/D | >4,060 | S/D |
| Malawi | >290 | S/I | - | - | x | S/D | x | S/D |
| Mozambique | C/U | D | - | | U/R | D | U/R | D |
| Namibia | 1,600 | S/I | 203,090 | I | >1,350 | S/D | >206,040 | I |
| Botswana | 6,850 | I | 1,000 | S/I | 18,230 | S/D | 26,080 | S |
| Zimbabwe | 8,160 | S | 39,910 | S | >1,160 | S/D | >49,230 | S/D |
| South Africa | 13,130 | S | >50,000 | I | C/U | S/I | >63,130 | I |
| Swaziland | C | S | x | S | x | S/D | x | S/D |
| Species Total | >35,620 | S/I | >294,280 | I | >22,820 | S/D | >352,000 | S/I |

OVERVIEW OF CONSERVATION STATUS

Chad: Recorded locally in the south and southeast, where it survives in small numbers. During the civil war, its population was greatly reduced by poaching in Aboutelfan Faunal Reserve, which was

*Greater Kudu (continued)*
established to protect this species. Its numbers have increased substantially in Zakouma National Park and Siniaka Minia Faunal Reserve with the resumption of effective protection of these areas in the 1990s.

Central African Republic: Known only from a rugged mountainous area in the north, to the north of the Ouandjia and Koumbal Rivers. The population was estimated to number 250 in the 1970s, and it seemed to be holding its own in the 1980s. No recent information on its status.

Congo-Kinshasa: Formerly occurred locally in the southeast, where it has never been reported to be common. A small, declining population survives in Kundelungu National Park, but it has apparently been eliminated from Upemba National Park by poaching. There is no information on its survival elsewhere.

Sudan: Formerly occurred locally in the west and southeast, and along the Ethiopia and Eritrea borders in the east and northeast. It survives in parts of its former range, e.g., in small numbers on Jebel Marra and in Dinder National Park, and in unknown numbers in the Red Sea Hills and the southeast.

Eritrea: Formerly occurred locally throughout the western half of the country, but absent from the southern coastal strip. It survives locally, e.g., in the Gash-Setit area in the southwest, Semanawi Bahri and probably in the northwest.

Ethiopia: Occurs patchily within its former range in the western, eastern and southern lowlands and the Rift Valley, e.g., in low to moderate numbers in parts of the Dinder and Awash River valleys, in steep, wooded valleys in the southern Ogaden, and in hilly areas of Nechisar, Omo and Mago National Parks and Murule and Borana Controlled Hunting Areas. Although it is shy and secretive, the greater kudu is a preferred quarry of hunters because of its plentiful yield of meat. Overhunting is probably reducing its numbers in regions such as the Ogaden.

Djibouti: Formerly occurred locally in the south. Hunting reduced it to very low numbers prior to the ban on hunting in the early 1970s, and it has also been affected adversely by habitat degradation. A few were reported to survive near the Ethiopia border in the mid-late 1980s, when it was regarded as being on the verge of extinction in Djibouti. There is no recent confirmation of its presence.

Somalia: Formerly occurred in the northern mountains, eastern Haud and a few scattered localities on the Ethiopia and Kenya borders. It has been heavily poached, and by the early 1980s it was known to survive in only one locality, on the northern slopes of the Gaan Libah in the northwest. It is now probably extinct.

Uganda: A rare species in Uganda, where it is confined to hilly areas in eastern Karamoja. No recent information on its status.

Kenya: Has always been rare and localised in Kenya, occurring mainly on isolated, forested hills. It was probably affected adversely by the 1994-95 rinderpest epidemic in eastern Kenya, but it survives in small numbers in areas such as Tsavo. The largest population, numbering about 250, is on the Laikipia (North) escarpment.

Tanzania: Occupies a substantial part of its former range, mainly in central and southern Tanzania. It is locally common within and outside protected areas in drier regions with sufficient low to medium-height woody vegetation to provide browse and cover, e.g., Ruaha and Selous.

Angola: Formerly widespread in southern and central Angola. Its population is probably greatly reduced, but it survives in small numbers in the south.

Zambia: Formerly occurred throughout the Rift Valley and escarpment regions and on the drier parts of the plateaux, but naturally absent from the wetter savanna woodlands of the northern plateaux. It occurs widely within its former range. The greater kudu's secretiveness and preference for cover enable it to withstand hunting pressure and survive near settlement to a greater extent than most other large antelopes, and it performs best on the secondary vegetation associated with settlement. It is generally well represented in the protected areas within its range, e.g., there is a major population in the national parks and game management areas of the Luangwa Valley and it occurs in substantial numbers in and around Kafue National Park.

Malawi: Formerly occurred almost throughout. It has been eliminated from large parts of its former range but it still occurs in all of the national parks and game reserves and in many of the forest reserves, generally at low densities.

Mozambique: Formerly occurred very widely, but its range had contracted considerably by the early 1980s. Its numbers and distribution have undoubtedly declined further since then, but it survives in low to moderate numbers in areas such as in and around Niassa Game Reserve and in Gorongosa, Banhine and Zinave National Parks. It is locally common in parts of Manica and Gaza Provinces. Greater kudu were translocated to Maputo Game Reserve in 1997 to supplement the reserve's small surviving population.

Namibia: Formerly occurred almost throughout, but absent from the most arid areas such as the coastal Namib. It remains very widespread. It is locally common within Etosha National Park and occurs in low to moderate numbers in most other protected areas. It also occurs widely in low to moderate numbers in communal lands. By far the largest numbers occur on private farmland, where its estimated population increased from 96,000 in 1982 to >200,000 in 1992. The largest numbers are in the northern farming districts but it is also common on private farmland in the south. The greater kudu is of major economic value to Namibia, e.g., it is the most numerous large antelope on private farms and is one of the country's major trophy species.

Botswana: Formerly occurred throughout, except for parts of the southwest. It remains very widespread in scrub and light woodland and is locally common, e.g., within and outside protected areas in the northern region and in Central Kgalagadi Game Reserve. It occurs at low densities in and around Gemsbok National Park in the southwestern Kalahari. The greater kudu is a highly preferred game species by both subsistence and trophy hunters.

Zimbabwe: Formerly occurred throughout, and remains widespread and common. It is very common throughout Hwange National Park and is also well represented in the Sebungwe and Middle Zambezi Valley regions and Gonarezhou National Park. It is the most numerous large antelope on private farms and conservancies.

South Africa: Formerly occurred widely in the bushveld and lowveld of Northwest, Northern, Mpumalanga and Gauteng Provinces, the Northern Cape and northeastern KwaZulu-Natal, and locally in a few parts of Free State. A separate population occurred in the Eastern Cape. It has persisted within its natural range to a greater extent than most other large antelopes and remains widespread and common. It is well represented in national parks, provincial reserves and private land throughout its historical range, with the largest numbers on bushveld and lowveld game farms. Major protected-area populations occur in areas such as Kruger National Park, Hluhluwe-Umfolozi Park and the Andries Vosloo-Sam Knott-Double Drift reserves (Eastern Cape). The population of Kruger National Park suffered heavy mortality from anthrax in 1990-91, but Kruger still supports a large population. The kudu is not easily contained by fences and is expanding both its numbers and its distribution in many regions, including areas close to major urban centres such as Pretoria.

Swaziland: Formerly occurred widely, except in the western highveld. It now occurs locally within its former range, persisting outside protected areas in some less densely settled regions where sufficient natural cover remains. It is common in Hlane Game Reserve and Mlawula-Ndzindza Nature

*Greater Kudu (continued)*

Reserve, and the reintroduced population in Mlilwane Wildlife Sanctuary is well established.

SUMMARY

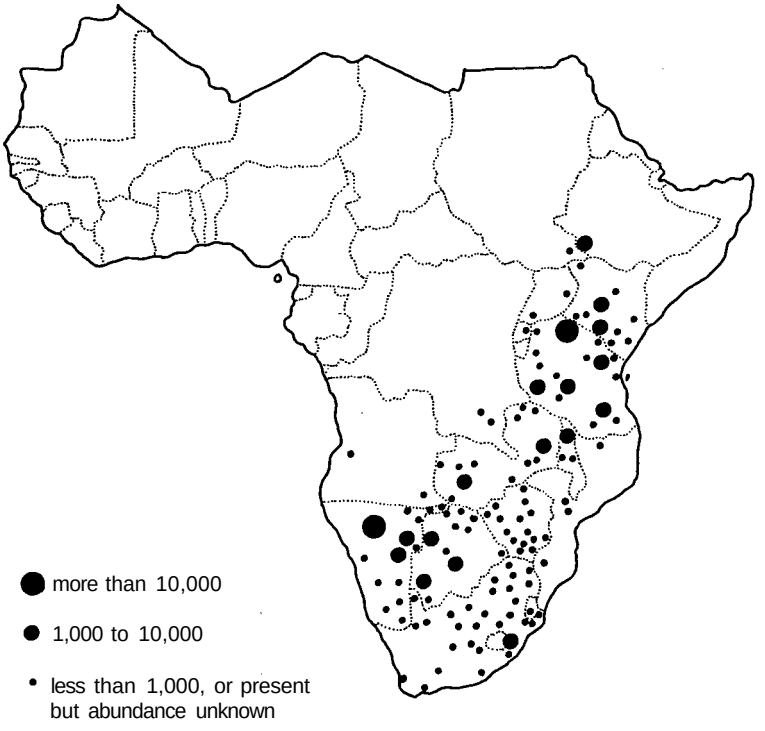
Historically, the greater kudu occurred very widely in the drier savanna zones of Southern and South-central Africa, and more locally (often in hilly areas) in East/Northeast and Central Africa. While it has disappeared from substantial areas, it generally persists in a greater part of its former range than other large antelope species, as a result of its secretiveness and its ability to survive in settled areas with sufficient cover. As in the past, it is much more sparsely distributed and less numerous in the northern parts of its range (from northern Tanzania northwards) than further south. It is generally well represented in protected areas from southern Tanzania to South Africa, with major populations in parks and reserves such as Ruaha-Rungwa-Kisigo and Selous (Tanzania), Luangwa Valley and Kafue (Zambia), Etosha (Namibia), Moremi, Chobe and Central Kgalagadi (Botswana), Hwange, Chizarira, Mana Pools and Gonarezhou (Zimbabwe) and Kruger and Hluhluwe-Umfolozi (South Africa). It also occurs widely outside protected areas, including large numbers on private farms and conservancies in Southern Africa (Namibia, Zimbabwe and South Africa) where it is a mainstay of the trophy hunting industry.

The greater kudu's status is less satisfactory in the northern parts of its range, where it occurs in much smaller and generally decreasing numbers. Key areas where some of the northern populations appear to have reasonable prospects for long-term survival include Zakouma and Siniaka Minia (Chad), Jebel Marra (Sudan), the Awash Valley and southern lowlands (Ethiopia), Baringo, northern Laikipia and Tsavo (Kenya), Tarangire (Tanzania) and probably parts of Eritrea.

Estimated Total Numbers: Population estimates are available for many parts of the greater kudu's range (see Appendix 4), but many of these are based on aerial counts which tend to substantially underestimate this species' actual numbers (see Table 4-1, p. 91). The sum of the available estimates (352,000) is therefore likely to be considerably less than the true total numbers of the species. Greater kudu population densities estimated from aerial surveys are frequently less than 0.1 per sq km, even in areas where this species is known to be at least reasonably common, e.g., Ruaha-Rungwa and Selous (Tanzania) (TWCM 1994c, 1995c), Luangwa Valley game management areas and Kafue National Park (Zambia) (Jachmann & Kalyocha 1994; Yoneda & Mwima 1995), Etosha (Namibia) (P. Erb, in litt. August 1997), northern and central Botswana (DWNP 1995; D. Gibson, in litt. May 1997) and Hwange, Sebungwe and Gonarezhou (Zimbabwe) (Davies et al. 1996). Higher densities of 0.2-0.4 per sq km have been estimated by aerial surveys in some other areas, such as Chete-Chirisa, Matetsi-Zambezi and Chizarira in Zimbabwe (Davies et al. 1996). Recent ground counts in areas where the greater kudu is common have produced population density estimates from 0.3 per sq km in Lupande Game Management Area (Zambia) (Jachmann & Kalyocha 1994) to 2.0 per sq km in Hluhluwe-Umfolozi and Mkuzi (South Africa) (Rowe-Rowe 1994) and 4.1 per sq km in Karoo Nature Reserve (South Africa) (P.H. Lloyd, in litt. November 1996).

If it is assumed that the average correction factor for undercounting bias in aerial surveys of greater kudu is 2.5 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support average densities of 1.0 per sq km where the species is known to be common and 0.05 per sq km elsewhere, then the information in Appendix 4 produces a total population estimate of 482,000. This includes an estimated 294,000 (61% of the estimated global population) on private land, 74,000 (15%) in protected areas and 114,000 (24%) in other areas. Population trends are generally stable or increasing on private land and in protected areas in Southern and South-central Africa and Tanzania, but show a tendency to decline in most other regions.

The Future: The species' overall status will remain satisfactory as long as it continues to be represented by large, stable or increasing populations on private land and in protected areas in Southern and South-central Africa. The high numbers of this species on private land reflect its value as one of Africa's major trophy animals. The safari hunting industry is therefore very important for ensuring the continued existence of large numbers of greater kudu on private land. The status of the northern populations is precarious, and their survival will depend on more effective protection and management in national parks, game reserves and hunting concessions.




**Common Eland**
*Tragelaphus oryx* (Pallas 1766)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private I and | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund1. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Congo-Kinshasa | U/R | D | - | - | ? | ? | U/R | D |
| Sudan | - | - | - | - | X | D | X | D |
| Ethiopia | 2,630 | D | - | - | - | - | 2,630 | D |
| Uganda | 280 | D | - | - | - | - | 280 | D |
| Kenya | 1,960 | D | - | - | 11,030 | S/D | 12,990 | D |
| Tanzania | >20,410 | S/D | - | - | >3,860 | S/D | >24,270 | S/D |
| Rwanda | <50 | D | - | - | - | - | <50 | D |
| Burundi | - | - | - | - | - | - | Ex | - |
| Angola | - | - | - | - | R | D | R | D |
| Zambia | >3,110 | D | 130 | S/I | >410 | D | >3,650 | D |
| Malawi | 2,390 | S/I | - | - | - | - | 2,390 | S/I |
| Mozambique | R | D | - | - | U | D | U/R | D |
| Namibia | 1,440 | S/I | 29,150 | I | 1,000 | D | 31,590 | I |
| Botswana | 10,010 | I | 330 | S/I | 3,330 | S/D | 13,670 | S |
| Zimbabwe | > 1,900 | S/D | 11,840 | S/I | 30 | S | 13,770 | S/I |
| South Africa | 6,710 | S/I | >3,280 | I | - | - | >9,990 | I |
| Swaziland | U/R | D | - | - | - | - | U/R | D |
| Lesotho | V | ? | - | - | - | - | V | ? |
| Species Total | >50,890 | S? | >44,730 | I | > 19,660 | D | >115,280 | S? |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa; Formerly widespread in the savanna woodlands of the southeast. It has probably been eliminated by meat hunting from most or all of its former range, apart from the small, declining populations in Upemba and Kundelungu National Parks.

*CommonEland(continued)*

Sudan: Confined to the southeast, where aerial surveys in the 1970s and 1980s produced a population estimate of 9,340 including 4,000 in Boma National Park. No recent information on its status.

Ethiopia: Known only from the Omo area, where the plains of Omo National Park have been noted for the sporadic occurrence of large concentrations of this species over the last 30 years. Recent observations suggest that it is now generally resident within the park, with distinct wet and dry season habitats. Its numbers are decreasing because of poaching.

Uganda: During the last 20 years, it has been eliminated by poaching from areas such as Kidepo Valley National Park, Katonga, Matheniko and Bokora Corridor Game Reserves, where it was formerly common. The only localities where it is known to survive are Lake Mburo National Park, where numbers appear to be stable, and a very small, declining population in Pian-Upe Game Reserve.

Kenya: Occurs locally within its former range in central, southern and northwestern Kenya, but in decreasing numbers. The major surviving populations occur outside protected areas, in Laikipia, Kajiado and Narok districts, where numbers are stable. The largest protected-area population, in and around Tsavo National Park, decreased dramatically from an estimated 9,960 in 1991 to 760 in 1997, reflecting the effects of rinderpest, drought and increasing competition from livestock. Smaller but significant protected populations occur in areas such as Aberdare, Meru, Nairobi and Amboseli National Parks.

Tanzania: Formerly very widespread in grassland and savanna woodland and still occurs widely, especially in the Serengeti ecosystem, which supports Africa's largest free-living eland population, and in the tsetse-infested western and southern woodlands, e.g., Katavi, Ruaha-Rungwa and Selous-Kilombero. It has declined or disappeared in some smaller protected areas, e.g., Ngorongoro Crater and Biharamulo Game Reserve, reflecting the vulnerability to disturbance of this highly mobile species and its requirement for protected areas to be large enough to accommodate its tendency to undertake large-scale movements.

Rwanda: Formerly occurred in the northwestern and central regions of Akagera National Park and the adjoining Mutara Hunting Reserve. This population has decreased dramatically since 1990, when it was estimated to number 425, because of poaching and loss of most of its former range to encroachment by large numbers of cattle.

Burundi: Formerly occurred in the eastern and southern savannas, but now extinct.

Angola: Formerly occurred widely, except for the far north, northwest and southwest. There were an estimated 3,000 in Kissama National Park in the early 1970s. All populations were severely reduced during the civil war and it is now on the verge of extinction.

Zambia: Formerly occurred throughout, but now eliminated from many areas and generally confined to national parks and game management areas. The largest populations, both of which are stable, occur in North Luangwa National Park and the southern section of Kafue National Park. Its numbers are generally small and declining elsewhere, e.g., in the central and southern Luangwa Valley its numbers have decreased substantially since the 1970s and only a few hundred survive, mainly in Sandwe Game Management Area and South Luangwa National Park. It has disappeared completely from some protected areas, e.g., the Kafue Flats, possibly because the requirement of eland herds for a large home range makes this species particularly susceptible to the effects of expanding human activity.

Malawi: Formerly occurred throughout. It is now confined to four protected areas in northern and central Malawi. The bulk of the country's eland population occurs in Nyika National Park, where it moves seasonally between the plateau grasslands and the *Brachystegia* woodlands of the northern

foothills. There is a smaller population in Kasungu National Park and it occurs in very small numbers in Nkhotakota and Vwaza Marsh Game Reserves.

Mozambique: Formerly occurred very widely. By the early 1980s, it had disappeared from substantial areas of its former range but survived in low to moderate numbers in and around protected areas such as Gorongosa, Zinave, Niassa and Gile. It suffered a further decline during the civil war of the 1980s and early 1990s, but it still occurs in good numbers in parts of Manica Province. Small numbers are reported to survive in a few other areas such as Banhine National Park.

Namibia: Formerly occurred widely in the northeastern savannas. It still occurs quite widely in protected areas, private farmland and communal lands within its former range, and it has been introduced to private farms outside its natural range throughout the farming districts of central and southern Namibia. It is well represented in Etosha National Park and occurs in low to moderate numbers in several other protected areas. The bulk of the population occurs on private land, mainly in the north. The eland is one of the most sought after game species by farmers. Its estimated numbers on farmland increased from 7,800 in 1972 to >29,000 in 1992 and are now probably higher.

Botswana: Formerly occurred throughout. It has been eliminated from the settled regions in the east, except for the Tuli block farms, and from some other areas. The largest numbers of eland survive in the Kalahari, particularly in Central Kgalagadi-Khutse Game Reserves and in and around Gemsbok National Park. The populations of these two areas are now largely separate. In Central Kgalagadi Game Reserve, eland tend to move in an east-west direction between wet and dry seasons with little movement beyond the reserve's borders. In and around Gemsbok National Park, there is a pronounced seasonal movement from the south during the dry season to the north during the rains. Eland numbers have decreased markedly in unprotected areas of the Kalahari, which may be due to competition with livestock and/or excessive illegal hunting. Smaller but significant numbers of eland occur in southwestern Ngamiland and the northern region, where this species occurs mainly outside protected areas.

Zimbabwe: Formerly widespread, but it was eliminated from most of the highveld plateau by the spread of settlement. This restricted it largely to the peripheral lowland regions, but it has subsequently been reintroduced widely to commercial farmland. Moderate numbers of eland occur in the protected areas of northwestern Matabeleland, Sebungwe, the Middle Zambezi Valley and Gonarezhou. These populations are generally stable, but the population of Hwange National Park has decreased substantially over the last 25 years. The largest numbers of eland occur on private ranches and conservancies.

South Africa: Formerly occurred throughout. It was gradually eliminated from most of its former range until it survived in only a few regions, viz., the extreme northern Cape, parts of the northern bushveld and lowveld, and the Natal Drakensberg, but it has subsequently been reintroduced widely to parks and reserves and private land. The largest eland populations within protected areas are in Natal Drakensberg Park, Kruger and Kalahari Gemsbok National Parks and Suikerbosrand Nature Reserve. Many of the reintroduced populations on private farms are small and have not done well, but the total population is gradually increasing.

Swaziland: Formerly widespread, but it became extinct in Swaziland until it was reintroduced to Mlilwane Wildlife Sanctuary in the 1960s. This population has not done well because of ticks and heartwater. It is planned to reintroduce the species to Malolotja Nature Reserve.

Lesotho: A seasonal visitor to Sehlabathebe National Park from the Natal Drakensberg.

SUMMARY

Formerly occurred throughout the savanna woodlands of Eastern and Southern Africa, extending into high altitude grasslands and the arid savannas and scrublands of the Kalahari and Karoo in

*Common Eland (continued)*

Southern Africa. It has been eliminated from more than half of its former range by the expansion of human populations, and its numbers have decreased dramatically since the 1970s as a result of civil wars and their aftermath in countries such as Uganda, Rwanda, Angola and Mozambique. Stable/increasing national populations are now confined to Namibia, Botswana, Zimbabwe, South Africa, Malawi and possibly Tanzania. Its numbers may have the opportunity to recover in parts of Uganda and Mozambique with the current rehabilitation of these countries' wildlife areas. Protected areas which support major populations include Omo (Ethiopia), Serengeti, Katavi, Ruaha and Selous-Kilombero (Tanzania), Kafue and North Luangwa (Zambia), Nyika (Malawi), Etosha (Namibia), Central Kgalagadi and Gemsbok (Botswana) and Natal Drakensberg (South Africa). Most of these populations appear to be stable. Relatively large numbers of the common eland now occur on private land, particularly in Namibia, Zimbabwe and South Africa, reflecting its value as a trophy animal. Important populations also persist outside protected areas, e.g., in the rangelands of southern and central Kenya, Tanzania, Namibia and Botswana.

Estimated Total Numbers: Population density estimates obtained by aerial counts in areas where the species is moderately common generally range from about 0.05 to 0.4 per sq km, e.g., Laikipia ranchlands (Kenya) (Grunblatt et al. 1996), Tarangire, Katavi-Rukwa, Ruaha-Rungwa, Selous and Kilombero (Tanzania) (TWCM 1992b, 1994c, 1995a, 1997; M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), North Luangwa and Kafue (Zambia) (D. Owens, in litt. October 1995; Yoneda & Mwima 1995), Kasungu (Malawi) (Mkanda 1998), Etosha (Namibia) (P. Erb, in litt. August 1997), Central Kgalagadi and Gemsbok (Botswana) (DWNP 1995; D. Gibson, in litt. May 1997), Matetsi, Middle Zambezi Valley and Gonarezhou (Zimbabwe) (Davies et al. 1996) and Kalahari Gemsbok (South Africa) (P.T. van der Walt, in litt. September 1995). Higher density estimates of 0.6-1.0 per sq km have been obtained by aerial counts in areas such as Omo (Ethiopia) (Graham et al. 1997), Lake Mburo (Uganda) (Lamprey & Michelmore 1996) and Nyika (Malawi) (Mkanda 1998). Ground surveys or total counts of areas where the species is common have produced density estimates of 0.5-1.0 per sq km, e.g., Nairobi and Lake Nakuru National Parks (Kenya) (Butynski et al. 1997) and Itala, Vaalbos, Natal Drakensberg and De Hoop (South Africa) (see Anderson et al. 1996), and as high as 2.0-4.0 per sq km, e.g., Mountain Zebra National Park and Suikerbosrand Nature Reserve (South Africa) (Anderson et al. 1996), but most of these areas are relatively small and partially or totally fenced.

Assuming an average correction factor for undercounting bias in aerial surveys of 1.3 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support average densities of 0.5 per sq km where the species is known to be common and 0.01 per sq km elsewhere, produces a total population estimate of 136,000 from the information in Appendix 4. About half of this estimated total population occurs in protected areas and 30% on private land. Population trends vary from increasing to decreasing within individual protected areas, and are generally increasing on private land and decreasing in other areas.

The Future: The common eland's Red List status will not change as long as substantial, stable populations continue to occur in a good number of protected areas and it remains a popular and economically significant species on private land. The requirement for large areas to accommodate its seasonal wanderings is likely to result in further contraction of the distribution and numbers of free-ranging eland populations as human settlement expands. This may be at least partly compensated for by the continued growth of its numbers on private farms and conservancies.

## Giant Eland

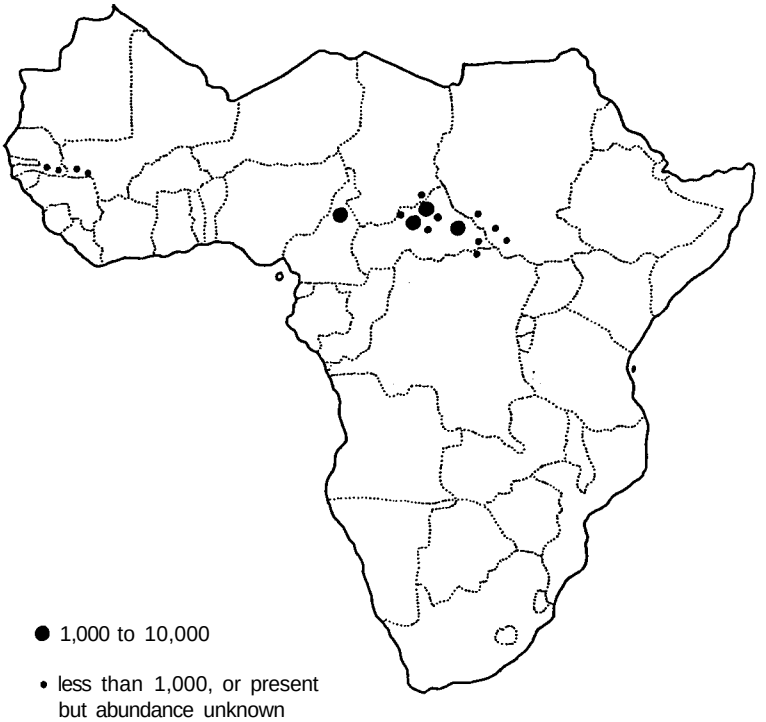
*Tragelaphus derbianus* (Gray 1847)

RED LIST STATUS
Lower Risk (near threatened)

SUBSPECIES
western giant eland (7". *d. derbianus):*
Senegal, Mali
eastern giant eland *(T. d. gigas)*:
Cameroon to Sudan

Note: Reports of the former occurrence of the giant eland in southwestern Togo are now considered to refer to the bongo (Grubbet al. 1998).

Status of Subspecies
western giant eland: Endangered
eastern giant eland: Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND F OPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Popn/Abunc1. | Trend | Popn/Abund. | Trend |
| Western Giant Eland | | | | | | |
| Mali | 30 | D | R | D | >30 | D |
| Senegal | 100 | ? | U/R | ? | >100 | ? |
| Gambia | - | - | - | - | Ex | - |
| Guinea-Bissau | - | - | V | D | V | D |
| Guinea | - | - | - | - | Ex? | - |
| Subspecies Total | 130 | D | R | D | >130 | D |
| Eastern Giant Eland | | | | | | |
| Nigeria | - | - | - | - | Ex? | - |
| Chad | - | - | V | I | V | 1 |
| Cameroon | 2,090 | S | - | - | 2,090 | S |
| CAR | 3,000 | S? | >9,500 | S/D | >12,5OO | S/D |
| Congo-Kinshasa | - | - | U/R | D | U/R | D |
| Sudan | - | - | X | D | X | D |
| Uganda | - | - | - | - | Ex? | - |
| Subspecies Total | 5,090 | S | >9,500 | D | >14,590 | D |
| Species Total | 5,220 | S/D | >9,500 | D | >14,720 | D |

OVERVIEW OF CONSERVATION STATUS

Mali: The western giant eland formerly occurred in savanna woodlands in the west, to the west of the Niger River. It has been reduced to very low numbers by factors such as overhunting for meat and habitat destruction caused by the expansion of human and livestock populations. It has

*Giant Eland (continued)*

apparently disappeared from the Boucle du Baoule region, but a small population survived in the Bafing region in the early 1990s. Reconnaissance surveys and interviews with local people conducted by Bertrand Chardonnet in late 1997 and Brad Mulley in early 1998 indicate that the western giant eland continues to survive in very small numbers in the Korofin area in the northern part of Bafing Faunal Reserve and the Ba-ko/Ouongo area to the northwest of the reserve. Small numbers also survive in the Guinea border area south of Kita, and possibly in the Mandingues Mountains southwest of Bamako. The ASG plans to conduct an aerial survey of these areas during the 1998-99 dry season to determine the distributions and populations of the giant eland and other large wildlife species, as a basis for assisting the development of protective measures (see p. 37).

Senegal: The western giant eland formerly occurred locally in the south, from central Casamance in the west to the Mali border in the east. It has been eliminated from the western part of its former range by expansion of settlement and overhunting for meat. It is now known to survive only in the eastern sector of Niokolo-Koba National Park and the adjoining Faleme Hunting Zone. The Niokolo-Koba population was estimated to number between 400 and 800 in the late 1970s and early 1980s. The accuracy of these estimates of the numbers of this very shy and elusive antelope is unknown, but its population may have decreased in the intervening 15-20 years. Subsequent estimates by national park staff include 230 in 1987, 100-150 in 1993 and 100 in 1997. It is still seen in herds of 15-35 within Niokolo-Koba, and its numbers are currently considered to be stable by the park guards. The giant eland occurs in the remote Assirik area in the southeast of the park and the adjacent area in the northeast of the park to the north of the tarred road from Tambacounda to Kedougou. Information obtained by Bertrand Chardonnet during visits to Senegal in January and December 1997 indicate that the giant eland still occurs sparsely but widely within the thick bushland of the Faleme Hunting Zone, where it is rarely seen. Surprisingly, a quota of two giant eland was permitted in this hunting zone in the 1997 trophy hunting season, although none are known to have been shot. The ASG has proposed an aerial survey of the distribution and abundance of wildlife in the eastern part of Niokolo-Koba National Park and the entire Faleme Hunting Zone, to define the key areas for the protection of the giant eland and to form the basis of improved wildlife management (see p. 37). Improved anti-poaching activity in the Assirik area of the national park and development of a tourist camp in this remote part of the park to enable sightings of giant eland will increase the benefits to the park of conserving this rare and valuable species. Similar remarks apply to the western chimpanzee, which occurs in the same areas of Niokolo-Koba as the giant eland.

Gambia: The western giant eland formerly occurred in the savanna woodlands of eastern Gambia, where the last known specimen was shot in the early 1900s.

Guinea-Bissau: Formerly occurred as a very rare vagrant in the eastern and southern savanna woodlands, presumably through wanderers from Senegal and/or Guinea. Local hunters claimed that it occurred as a rare visitor to southeastern Guinea-Bissau in the 1980s. There are two subsequent reports of its occurrence in the Corubal River area in the south, viz., a carcass of a poached animal found in 1989, and a record of this species' presence within the proposed Dulombi National Park by a member of the wildlife corps in 1992. These records indicate that it still occurred, at least as a rare vagrant, until recently.

Guinea: The western giant eland formerly occurred in the northern savanna woodlands. There is no recent confirmation of its presence within Guinea, e.g., it no longer occurs in Badiar National Park although it occurs in Senegal's adjoining Niokolo-Koba National Park. All of the giant eland known to survive in Niokolo-Koba occur in the eastern part of this park, to the east of the Gambia River, whereas Badiar adjoins the southwestern part of Niokolo-Koba and lies well to the west of the Gambia River. The species may be extinct in Guinea.

Nigeria: The eastern giant eland formerly occurred in savanna woodland near the Cameroon border in the east, to the south of the Benue River. It occurred in the northern part of Gashaka-Gumpti National Park until the 1970s, but it is now apparently extinct in Nigeria. It survives in the Faro

National Park area across the border in Cameroon, and it is possible that occasional vagrants still enter Nigerian territory.

Chad; The eastern giant eland formerly occurred in the savanna woodlands of Logone Oriental and Moyen Chari regions in the south. It was common in Manda National Park (estimated population 800-1,000) and Bahr Salamat and Siniaka Minia Faunal Reserves in the 1970s. By the mid-1980s, it had apparently disappeared completely from Chad as a result of illegal hunting, rinderpest and drought. Since 1995, it has been observed seasonally in small numbers within Chad in hunting blocks on the Aouk and Aoukale Rivers on the Central African Republic border. It is hoped that it will gradually re-establish a permanent presence within its former haunts in Chad, including protected areas.

Cameroon: The savanna woodlands of North Province contain a very important population of the eastern giant eland. It still occupies most of its former range to the north of the Adamaoua Plateau, in Benoue, Bouba Ndjida and Faro National Parks and the adjoining hunting zones. Its numbers have recovered substantially from the mortality caused by the 1982-83 rinderpest epizootic. This recovery is reflected by the high success rates for this highly elusive species by the clients of some professional hunters in northern Cameroon in recent years. Trophy hunting is of major economic importance to North Province and the better-managed hunting concessions currently provide the most secure protection of the giant eland against poaching. In comparison, game-viewing tourism and protection and management of the region's national parks are at low levels. An ASG project is currently investigating the seasonal movements of the giant eland in northern Cameroon (see pp. 36-37).

Further outbreaks of rinderpest spread through infected cattle are a constant threat to the giant eland, which is highly susceptible to this disease, but a more insidious long-term threat is posed by habitat fragmentation caused by expanding settlement. Human population density is increasing within the giant eland's range in Cameroon, mainly as a result of a resettlement policy aimed at translocating people from the densely populated Far North Province to the sparsely populated North Province. Because of its nomadic lifestyle and low population density, the giant eland requires large areas of suitable, undisturbed savanna woodland to support a viable population. Its long flight distance and avoidance of areas where it has recently been disturbed are legendary. Gradual loss of habitat to the encroachment of settlement and increasing human activity within its range may eventually reduce the area of suitable habitat for this species in northern Cameroon to an inadequate level, unless effective protection and management can be developed and maintained throughout North Province's interconnected system of national parks and hunting zones.

Central African Republic: The eastern giant eland still occurs widely in good numbers in the northern and eastern savanna woodlands, but it appears to have been eliminated from its former range in the west where there are many more people and settlements. It suffered heavy mortality during the 1983 rinderpest epizootic, which may have reduced its overall numbers in CAR by about 60%, but its populations have subsequently recovered. This recovery has been facilitated by the bush encroachment which accompanied the severe reduction in elephant numbers by poachers during the 1980s and the prevalence of uncontrolled fires. Aerial surveys indicate a 3-fold increase of the giant eland population of Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks and Sangba Pilot Zone between 1985 and 1995. In early 1998, its status was reported by experienced observers to be excellent in the Bamingui-Bangoran Safari Area, east/southeast of the national park, with sign everywhere and herds of up to 70-80 animals containing many young. Excellent mature trophies continue to be taken each year in all of this species' traditional areas in CAR where safari hunting operates.

The giant eland's mobility, its habit of continually moving through the woodland in search of fresh browse and its highly suspicious nature, plus the fact that it spends relatively little time along watercourses where poachers tend to concentrate, make it less susceptible to poaching (and legal hunting) than more sedentary and less wary antelope species. It is the only large antelope species which still occurs in substantial numbers in the Chinko Basin and other regions of eastern CAR which are subjected to widespread, heavy poaching by Sudanese meat hunters. However, it cannot

*Giant Eland (continued)*

be expected to withstand high levels of disturbance from poachers indefinitely. As other large wildlife species disappear, meat hunters increasingly consider it worthwhile to spend the large amounts of time necessary to track giant eland herds. In the Andre Felix National Park, for example, which lies close to the Sudan border at the northeastern edge of the giant eland's range in CAR, the population which was estimated to number several hundred in 1978 has subsequently disappeared. This park has been abandoned to uncontrolled poaching for more than 20 years. The giant eland's numbers have recently shown a tendency to decrease in the extensive areas of Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks where poaching is heavy, but may be increasing in Sangba Pilot Zone and other hunting concessions in the north where poaching pressures are much less severe.

Congo-Kinshasa: The eastern giant eland formerly occurred in the northern and northeastern savannas. It persisted in small, decreasing numbers in the Bomu reserve in the far north in the late 1980s and early 1990s, but no more recent information is available on its status in this area. There are recent reports that it may still occur as an occasional visitor to the Garamba National Park area in the northeast, but these are unconfirmed.

Sudan: The eastern giant eland is on the verge of local extinction in the northern part of its former range in the southwest, e.g., in Radom National Park in Southern Darfur Province where there has been substantial encroachment of settlement and heavy poaching pressure, but it probably still occurs widely in the vast expanse of tsetse-infested woodland in Bahr el Ghazal and Western Equatoria Provinces. In the 1970s, there were an estimated 17,900 giant eland in this region based on aerial surveys. The region still has very low human population densities and extensive areas of good habitat for this species. It was reported to be holding its own in southwestern Sudan in 1994, and local people indicated that it still occurred in and around Southern National Park in 1994-95. This park is not known to have suffered significantly from the encroachment of settlement or poaching, although hunting pressure from local people may be increasing in the area.

Uganda: Formerly occurred in the northwest, where it was reportedly exterminated in 1970. It is possible that it may still enter Uganda occasionally from southern Sudan.

SUMMARY

In the past, the giant eland probably occurred throughout the relatively narrow belt of savanna woodland which extends across West and Central Africa from Senegal to the Nile. The gap in its recent distribution between Mali and eastern Nigeria contains extensive areas of apparently suitable habitat. Kingdon (1997) considered that it is quite strictly confined to *Isoberlinia doka* woodland, but recent studies indicate that its range includes areas of *Terminalia-Combretum-Afzelia* woodland where there is no *Isoberlinia,* e.g., in parts of Cameroon's North Province such as Boumedje Hunting Concession (Bro-Jorgensen 1997).

The only reasonably secure population of the western giant eland occurs in Senegal's Niokolo-Koba National Park. Here its numbers are small, but apparently healthy breeding herds still occur. Establishment of additional protected populations of this Endangered subspecies is a high priority, e.g., in the Faleme Hunting Zone (Senegal) and the Bafing region (Mali) (see p. 37). The possibility that the western giant eland still occurs in Guinea or Guinea-Bissau requires investigation. The recent inclusion of this subspecies in trophy hunting quotas in Faleme Hunting Zone is clearly inappropriate in view of its fragmented population and low numbers. Legal hunting of the western giant eland should be put on hold until a suitable demographic study has been carried out and effective protection and management implemented (Chardonnet 1997a; Sillero-Zubiri et al. 1997).

The eastern giant eland occurs in good numbers in only two or three countries, viz., Cameroon, Central African Republic and possibly Sudan. Major surviving populations occur in the national parks and hunting zones of Cameroon's North Province and northern and eastern Central African Republic. Surveys are urgently required to assess its current status in Sudan (Winter 1997a). There appears to have been substantial recovery of its populations in Cameroon and Central African

Republic from the rinderpest epizootic of the early to mid-1980s, and its elusiveness will probably enable it to survive well into the 21st century in the vast uninhabited savanna woodlands of Central African Republic and southwestern Sudan despite uncontrolled hunting for meat. However, the eastern giant eland's overall, long-term population trend is probably gradually downwards. Further development and maintenance of sustainable trophy hunting and improved protection and management of national parks in its range states will be essential to ensure this majestic antelope's long-term future in the wild (East 1997b).

Estimated Total Numbers: Total numbers of the western giant eland are unknown but may not exceed 100-200, with most of the surviving animals in Senegal. East (1997b) summarised the available information on the eastern giant eland's populations in Cameroon and Central African Republic, where it occurs at estimated densities of 0.07-0.09 per sq km. Extrapolation of these densities to its total range in Central African Republic suggests a national population of at least 15,000 (East 1997b). The Cameroon population is estimated to number about 2,000 (H. Planton & I. Michaux, in litt. April 1998). The numbers which survive in Sudan are unknown but could be substantial. This suggests a total population of the eastern giant eland of the order of at least 1 5,000-20,000. Its numbers are probably more or less stable over large areas of its range in Central African Republic and Cameroon where human population densities are very low.

Captive Population: No western giant eland are held in captivity. A captive population of the eastern giant eland was established in the USA from nine wild-caught animals imported from Central African Republic in 1986. By 1997, this population had increased to 44 living animals, including seven of the founders (Romo 1997). In addition, two eastern giant eland held in South Africa are the last survivors of a separate line of captive stock that originated from 15 animals captured in Chad in 1967-69.

The Future: The survival of the western giant eland depends on continued protection of the Niokolo-Koba population in Senegal. This subspecies' prospects will remain precarious as long as there is only a single protected population but would be enhanced if additional populations can be protected. In late 1998, plans were being advanced for a capture operation in Senegal with the objective of establishing captive populations of the western giant eland on private land in South Africa and Senegal.

The eastern giant eland occurs in much larger numbers and still has extensive areas of available habitat which are almost uninhabited and are not subjected to development pressures, particularly in northern and eastern Central African Republic and southwestern Sudan. However, political instability and armed conflict are major barriers to the implementation of effective protection and management over large parts of the eastern subspecies' remaining range. If these problems are not overcome, the eastern giant eland's numbers will gradually decline until its survival is eventually threatened and it becomes restricted to a few protected areas. Alternatively, effective long-term management of national parks and hunting zones in regions such as Cameroon's North Province and northern and eastern Central African Republic (see p. 38) would ensure this subspecies' survival.

Safari hunting is the most likely justification for the long-term preservation of the substantial areas of unmodified savanna woodland which this antelope requires, and sustainable trophy hunting is a key to the giant eland's future. Mature bulls are one of the world's most prized big game trophies. The eastern giant eland is now a key factor attracting hunters to Cameroon and Central African Republic, both of which gain significant revenue from safari hunting (Chardonnet et al. 1995).

The recent return of the eastern giant eland to southern Chad is encouraging. If the current attempts to rehabilitate Manda National Park are successful, reintroduction of the subspecies to this park should be considered if it does not re-populate Manda naturally.

## Bongo

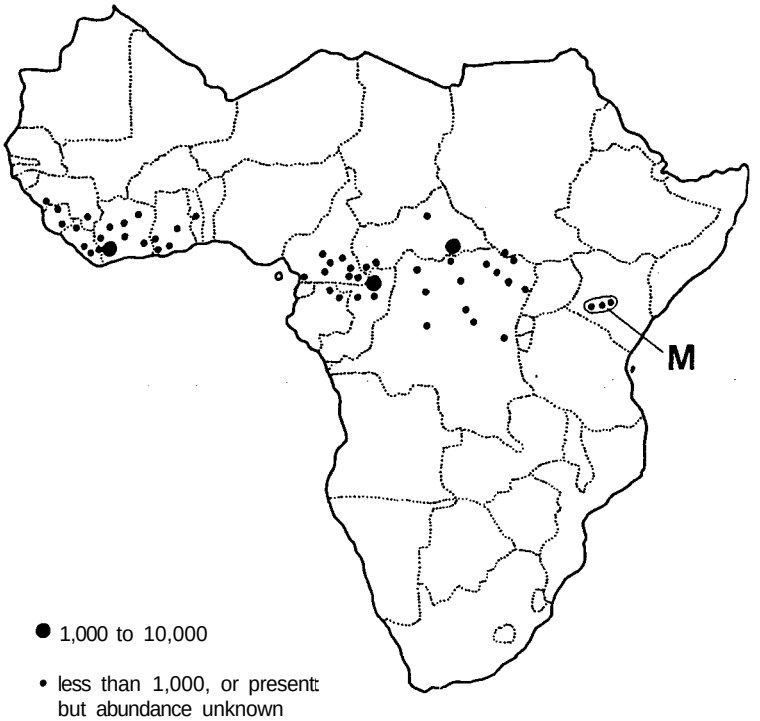
*Tragelaphus eurycerus* (Ogilby 1837)

RED LIST STATUS
Lower Risk (near threatened)

M: mountain or eastern bongo (*T. e. isaaci*)
other areas: lowland or western bongo (*T. e. eurycerus*)

Note: In previous ASG publications, the races of the bongo have been referred to as the western and eastern subspecies, but Kingdon (1997) used the highly appropriate descriptors of "lowland" and "mountain" for the two subspecies.

Status of Subspecies
mountain bongo: Endangered
lowland bongo: Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Lowland Bonqo | | | | | | |
| Guinea | X | ? | X | ? | X | ? |
| Sierra Leone | R | D | R | D | R | D |
| Liberia | C/U | ? | U/R | ? | U | ? |
| Ivory Coast | >1,100 | S/D | - | - | >1,100 | S/D |
| Ghana | U | ? | - | - | U | ? |
| Togo | R | D | - | - | R | D |
| Benin | ? | ? | - | - | ? | ? |
| Cameroon | C/U | S/D | U/R | D | U | D |
| CAR | c | S? | C | S/D | c | S/D |
| Gabon | - | - | U/R | S | U/R | S |
| Congo-Brazz. | C/U | S/I | X | S/D | C/U | S/D |
| Congo-Kinshasa | U | S/D | U | S/D | U | S/D |
| Sudan | - | - | U/R | S/D | U/R | S/D |
| Mountain Bonqo | | | | | | |
| Uganda | - | - | - | - | Ex | - |
| Kenya | >50 | D | U/R | D | U/R | D |

OVERVIEW OF CONSERVATION STATUS

Guinea: Recorded from forest and forest-savanna mosaic in the southwest and southeast, near the Sierra Leone and Liberia borders. It has been recorded during the last decade from Kounounkan Forest in the southwest and Ziama and Diecke Forest Reserves in the southeast.

Sierra Leone: Formerly occurred widely, but by the 1980s it had been reduced to a few small, declining populations in areas such as Outamba-Kilimi National Park and Gola North Forest Reserve.

No recent information on its status.

Liberia: Probably occurred widely in the past. The 1989/90 WWF/FDA survey recorded it quite widely from the high forest areas of Sapo National Park and the Grebo Forest, and local hunters reported its presence in the more remote parts of the Krahn-Bassa Forest in the southeast and the northwestern forests. It generally appeared to be a rare species whose distribution was correlated with remote forest areas. The bongo is one of the few antelope species which was not recorded from farm bush, but the frequency of records from old logged areas of the Grebo Forest indicated its adaptability to secondary forests. It was recorded very rarely in bushmeat and did not appear to be hunted frequently. No recent information on its status.

Ivory Coast: Formerly widespread in the southern forests, extending northwards into the savannas within forest patches as far north as the Comoe National Park area. Its distribution is now fragmented and it occurs in increasingly isolated populations in and around protected areas. In most of these areas its numbers appear to be small and decreasing. The major surviving population is in Tai National Park and the adjoining reserves, where it occurs mainly in primary and old secondary forests.

Ghana: Formerly occurred widely in the southwestern forests, extending northwards and eastwards into forest-savanna mosaic in central and eastern regions of the country. It now appears to be restricted to a few protected areas, including Bia, Nini-Suhien and Kakum National Parks and the adjoining reserves in the southwest. The bongo has generally been regarded as a very rare species in Ghana, but recent observations suggest that its populations are stable in Nini-Suhien National Park-Ankasa Game Production Reserve and increasing in Bia National Park-Game Production Reserve and Kakum National Park-Assin Attandanso Game Production Reserve. There was a flurry of logging activity in the Kakum Forest Reserve prior to its upgrading to national park status in the late 1980s. The resulting abundance of secondary vegetation may have favoured the bongo, which is known to prefer forest margins and areas of unstable, preclimax forest vegetation. A small, decreasing population survives in Digya National Park and a few may also persist in Kalakpa Game Production Reserve, but it has disappeared from other areas of forest-savanna mosaic, e.g., Kogyae Strict Nature Reserve and Bomfobiri Wildlife Sanctuary.

Togo: Recorded from two separate areas of forest, in southwestern and central Togo. The latter population survived within Fazao National Park in the mid-1980s, but the country's protected areas ceased to exist following the political and civil disturbances of 1991. It is possible that a few bongo persist in the remaining forests in and around the former Fazao park, but no recent information on its status is available.

Benin: Formerly occurred in the forest-savanna mosaic of southern and central Benin, but it has suffered severely from uncontrolled hunting and loss of habitat caused by forest destruction. A few may survive in areas such as Monts Kouffe Classified Forest.

Cameroon: Occurs widely within its former range in equatorial forest and forest-savanna mosaic in the southeast. The reported presence of bongo in Campo Reserve in 1994-95 is well to the west of this species' previously known distribution in Cameroon. It is exceptionally abundant in the Lobeke region in the southeast, where it occurs at relatively high densities in both primary and exploited forest. Its abundance appears to be much lower elsewhere, e.g., in the Boumba Bek and Mongokele areas in the southeast, in and around Dja Reserve, to the north of Lobeke in the Yokadouma area, north of Bertoua in the proposed Pangar-Djerem reserve, and in the forest-savanna transition zone around Yoko which appears to be this species' current northern limit in Cameroon. Its numbers are decreasing in many of these areas because of heavy poaching pressure and habitat destruction. Although the bongo is exceptionally abundant at Lobeke, it is experiencing significant hunting pressure in this region because of widespread snaring for forest antelopes by local people, which wounds adult bongo and kills juveniles. Sport hunting has escalated over recent years, and the Lobeke region is becoming world-renowned for its excellent bongo hunting, but this is not yet effectively regulated. Safari hunting has high potential as a generator of revenue in this region,

*Bongo (continued)*

particularly as Lobeke's isolation may hinder ecotourism. The development of sustainable long-term trophy hunting requires several priority issues to be addressed, e.g., more regulation of hunting to prevent unsustainable offtake of adult males, demarcation of a core protected area, establishment of adjoining safari hunting zones which receive year-round protection from commercial meat hunters and separate indigenous-use zones for local people, and increases in the direct economic benefit of trophy hunting to the indigenous Baka and Bandago peoples.

Central African Republic: Probably still occurs widely within its former range, which extends from the southwestern moist lowland forest zone and forest-savanna mosaic in the southeast northwards into the savanna woodland zone within gallery forests and forest patches. It occurs locally as far north as Sangba Pilot Zone. The presence of numerous clearings within the southwestern forest and in the forest-savanna mosaic in the southeast may favour the bongo, which is known to prefer forest-savanna ecotones. It appears to attain high densities in Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park in the southwest, where it is found mainly in upland areas and can be seen in large herds in the numerous clearings which occur throughout this region's forests. Trophy hunting for bongo has now been opened in the southwest. It is also abundant in Bangassou Forest in the southeast. Its numbers appear to be stable over most of these two regions except near settlements where hunting pressures are high. Antelope populations have been hit hard by poaching in some localities of Dzanga-Sangha, particularly close to villages, but large populations of bongo and other species remain intact in the Dense Forest Reserve and Dzanga-Ndoki National Park. Illegal hunting with guns has been drastically reduced by anti-poaching activities which have been assisted by the WWF Dzanga-Sangha project, but hunting with snares by local traditional hunters (aimed mainly at duikers) is still common. In Bangassou Forest, guns are still used widely by local hunters and hunting pressures are high within about 10 km of settlements, roads and rivers. The bongo is hunted regularly by local people, as evidenced by their use of chairs made of bongo skins, but a healthy population of this species seems to persist, especially towards the north of the region where wildlife is generally more abundant. Hunting pressures on bongo and other forest antelopes are unsustainable in some other regions, e.g., meat hunting to feed the workers in the diamond mines around Bakouma, to the north of Bangassou.

Gabon: Rarely seen in Gabon and appears to occur only in the northeast, e.g., in the Minkebe Forest, in remote forest east of the Ivindo River and possibly in Mingouli Forest.

Congo-Brazzaville: Appears to be confined to the northern forests, although there is an unconfirmed record of its presence at Mount Fouari in the south. A major concentration of bongo occurs in Kabo Forest, and it is locally common within the adjoining Pokola Forest and Nouabale-Ndoki National Park. The size of this population is not yet known. Recent observations in Kabo-Pokola indicate that bongo herds are wide-ranging, e.g., moving over distances of up to 75 km in a 2-month period. A pulmonary disease was responsible for the deaths of numbers of bongo, sitatunga and other bovids in the Ndoki region in May-June 1997. While overall numbers of bongo in this region appear to be generally more or less stable, bongo activity in the Mombongo area of northern Kabo decreased markedly for 12 months following the disease outbreak. This probably reflected the effects of disease mortality and southward movement of surviving animals. By June 1998, considerable bongo activity had resumed at Mombongo. The bongo also occurs in other regions of the northern forests, e.g., in Mbomo-Seme and Odzala National Park in the northwest, but it is much less abundant in these regions than in Kabo-Pokola-Ndoki.

Congo-Kinshasa: Formerly occurred widely in the equatorial forests and in the forest-savanna mosaics on the northern and southern fringes of the main forest blocks. It survives at least in scattered localities within its extensive former range. The country's total numbers of bongo are unknown but probably comprise a substantial proportion of the species' global population. It is locally common within suitable habitat in some localities, e.g., in Salonga National Park, along the Lomami River within the Lomami Forests, and in forest-savanna mosaic in the Isiro area in the northeast. It appears to be uncommon or rare in other localities, e.g., in Okapi Faunal Reserve, where it is widespread but occurs very sparsely probably because suitable ecotone habitats are

rare within the reserve, in the Semliki Forest in the north of Virunga National Park where there is considerable poaching by local people, and in the Azande reserve adjoining Garamba National Park in the northeast. It appears to be absent from the extensive closed-canopy forests of Maiko and Kahuzi-Biega National Parks.

Sudan: Restricted to forest-savanna mosaic in the southwest, where it was common in the 1980s. Recent reports suggest that it is still reasonably abundant in this area.

Uganda: The mountain bongo formerly occurred on Mount Elgon, but it was exterminated on the Uganda side of the mountain in 1913-14.

Kenya: Since its extermination on the Uganda side of Mount Elgon more than 80 years ago, the mountain bongo has been endemic to Kenya. It is restricted to isolated montane and bamboo forests. It survives in only three areas, viz., the Aberdares where its numbers have decreased substantially since the 1960s and 1970s, Mount Kenya where it is now very rare and seldom seen, and the Mau Forest which is probably its main remaining stronghold. It was common in the Mau Forest in the 1960s and its continued presence in this area has been reported recently. The Mau Forest has low conservation status and is under increasing pressure from surrounding agricultural communities. Total bongo numbers in Kenya are unknown but may not exceed a few hundred. It is vulnerable to hunting with dogs and is unlikely to survive without specific measures to ensure effective conservation of the remaining populations. Reintroduction of captive-bred animals from US zoos is proposed to boost its numbers in Kenya (see p. 40).

SUMMARY
The bongo is associated with disturbed forest areas and the forest-savanna ecotone in the West and Central African lowlands and the Kenya highlands. It prefers forest margins and areas of unstable, preclimax forest vegetation which have arisen from shifting cultivation, logging or elephant concentration (Kingdon 1982, 1997). It tends to be patchily distributed, with localised concentrations in areas of favourable habitat. Major concentrations occur in areas of Central Africa such as Lobeke (Cameroon)-Dzanga-Sangha (Central African Republic)-Nouabale-Ndoki-Kabo-Pokola (Congo-Brazzaville), Bangassou (Central African Republic), Salonga and Lomami (Congo-Kinshasa), but it tends to be naturally rare or absent over extensive parts of the equatorial forest zone. Its distribution and numbers have declined over large parts of its range because of habitat destruction and overhunting, particularly in West Africa where it is now reasonably common in only a few areas, e.g., Tai National Park (Ivory Coast), Sapo National Park (Liberia) and Kakum National Park (Ghana).

The mountain bongo is in urgent need of more effective protection against poaching in Aberdares National Park and Forest Reserve and against both poaching and habitat destruction in the Mau Forest.

Estimated Total Numbers: Few estimates of bongo population density are available. Greater knowledge of this species' population structure and density is anticipated from Paul Elkan's intensive research programme currently in progress in northern Congo-Brazzaville (see Stockenstroom et al. 1997). Preliminary observations in southern Kabo Forest suggested a density of at least 0.3 per sq km in 1996-97 (E. Stockenstroom, in litt. May 1997). Transect surveys of droppings and other signs gave estimates of about 0.2-0.4 lowland bongo per sq km in primary and old secondary forest in Tai National Park in 1978-83 and 1995-96 (Hoppe-Dominik et al. 1998). The estimated density was about 0.4 per sq km within 4,600 sq km of forest-savanna mosaic in southwestern Sudan in the mid-1980s (Hillman & Fryxell 1988). Densities are much lower in areas where the species is rare, e.g., an estimated 0.02 per sq km at the northern edge of the lowland bongo's range in Sangba Pilot Zone, northern Central African Republic (J. L. Tello, in litt. September 1995).

Assuming average population densities of 0.25 per sq km where it is known to be common/abundant and 0.02 per sq km elsewhere and a total area of occupancy of 327,000 sq km (see Appendix 4)

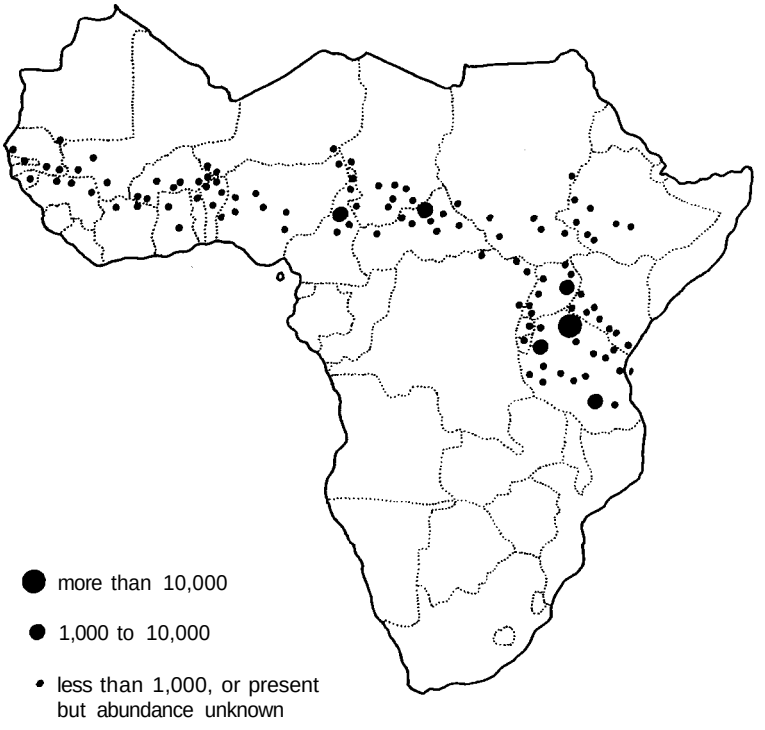
*Bongo (continued)*
gives a total population estimate of approximately 28,000, of which about 60% is in protected areas. This suggests that actual numbers of the lowland subspecies, which are unknown, may be in the low tens of thousands. The population trend of the lowland bongo is generally downwards except in the few areas where it receives effective protection, e.g., the western part of Tai National Park, Dzanga-Sangha Dense Forest Reserve-Dzanga-Ndoki National Park, Nouabale-Ndoki National Park-Kabo Forest and Odzala National Park, and in some other areas where settlement is sparse and hunting pressures are low.

As noted in the account for Kenya above, total numbers of the mountain bongo probably do not exceed a few hundred animals and are decreasing.

Captive Population: In 1996, 214 bongo were held in captivity by North American zoos and 82 by European zoos, with an additional 70 in private hands in the USA, and the captive population was increasing. All of the animals held in captivity are mountain bongo which originated from animals imported from Kenya. In addition, there is a small group of captive bongo at the Mount Kenya Game Ranch in Kenya.

The Future: The lowland bongo faces an ongoing population decline as habitat destruction and meat hunting pressures increase with the relentless expansion of human settlement. Its long-term survival will only be assured in areas which receive active protection and management. At present, such areas comprise about 30,000 sq km in total and several are in countries where political stability is fragile. There is therefore a realistic possibility that its status could decline to threatened in the not too distant future. As the largest and most spectacular forest antelope, the lowland bongo is both an important flagship species for protected areas such as national parks, and a major trophy species which has been taken in increasing numbers in Central Africa by international sport hunters during the 1990s. Both of these factors are strong incentives to provide effective protection and management of lowland bongo populations. Trophy hunting has the potential to provide economic justification for the preservation of larger areas of bongo habitat than national parks, especially in remote regions of Central Africa where possibilities for commercially successful tourism are very limited.

The mountain bongo's survival in the wild is dependent on more effective protection of the surviving remnant populations in Kenya. If this does not occur, it will eventually become extinct in the wild. The existence of a healthy captive population of this subspecies offers the potential for its reintroduction (see p. 40). The total number of mountain bongo held in captivity (>370) may already be similar to or exceed the total number remaining in the wild.




Subfamily Reduncinae

**Bohor Reedbuck**
*Redunca redunca* (Pallas 1767)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend |
| Mauritania | - | - | R | D | R | D |
| Mali | <600 | D | <400 | D | <1,000 | D |
| Niger | <350 | D | 500 | D | <850 | D |
| Senegal | U | D | X | ? | U | D |
| Gambia | X | ? | R | D | X | ? |
| Guinea-Bissau | - | - | U | S/D | U | S/D |
| Guinea | - | - | X | D | X | D |
| Ivory Coast | R | S/D | - | - | R | S/D |
| Burkina Faso | >370 | S/D | U/R | S/D | >370 | S/D |
| Ghana | R | ? | - | - | R | ? |
| Togo | R | D | - | - | R | D |
| Benin | U/R | S/D | U/R | D | U/R | D |
| Nigeria | R | D | R | D | R | D |
| Chad | >220 | S | X | S/D | X | S/D |
| Cameroon | 3,890 | D | U/R | D | >3,890 | D |
| CAR | 3,450 | D | U | S/D | >3,450 | S/D |
| Congo-Kinshasa | >270 | S/D | X | D | X | D |
| Sudan | >280 | D | X | D | X | D |
| Eritrea | - | - | ? | ? | ? | ? |
| Ethiopia | >1,000 | S/I | X | S/D | >1,000 | S/D |
| Uganda | >2,160 | S | 1,180 | S/D | >3,340 | S/D |
| Kenya | >810 | S/D | X | ? | X | S/D |
| Tanzania | 34,370 | S | >2,800 | S/D | >37,170 | S/D |
| Rwanda | 150 | D | - | - | 150 | D |
| Burundi | - | - | R | D | R | D |
| Species Total | >47,920 | D | >4,880 | D | >52,000 | D |

*Bohor Reedbuck (continued)*
OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly widespread in the grasslands of the Senegal River valley in the southwest. By the 1 980s, it had been eliminated from most of its former range by hunting and loss of habitat to the expansion of settlement, but it still occurred near the Mali border in the extreme south, at least as a seasonal visitor. No recent information on its status.

Mali: Small and generally declining populations survive locally within its former range in the southwestern savanna woodlands, where it has been affected adversely by overhunting and habitat destruction. It survives in viable but greatly depleted numbers in the Boucle du Baoule and Bafing protected areas.

Niger: Formerly occurred in the southwestern savannas and along parts of the Nigeria border in the south. It has been eliminated from most of its former range but survives locally in areas such as W National Park-Tamou Faunal Reserve.

Senegal: Formerly occurred widely in the savannas of central and southern Senegal, and locally in the Senegal River valley in the north. It has been eliminated from large parts of its former range by hunting, drought and the expansion of settlement and livestock. It survives only in the south, mainly in Niokolo-Koba National Park and Faleme Hunting Zone.

Gambia: Formerly occurred in the eastern savanna woodlands, where it survives in small numbers in some less densely settled areas.

Guinea-Bissau: Occurs in the savanna woodlands of the Corubal River and Boe upland areas in the southeast and in a more restricted area in the north. It is locally common within this restricted distribution.

Guinea: Formerly occurred in the northern savannas. According to information provided by local rural people, it still occurs locally in unknown numbers within its former range. It appears to be absent from Badiar National Park.

Ivory Coast: Formerly occurred sparsely at low densities in the northern savannas. It is now restricted to a few protected areas. It is unclear whether this species survives in Comoe National Park, where it formerly occurred in small numbers.

Burkina Faso: Formerly occurred throughout the savanna woodlands of central and southern Burkina Faso. It has probably been eliminated from extensive areas in the northerly parts of its former range by overhunting, competition with cattle and increasing aridity. It still occurs widely at low densities within the sparsely settled parts of the southern savanna woodlands, including small but stable populations in the Arly-Singou protected areas and Nazinga Game Ranch.

Ghana: Formerly widespread in savanna woodlands. It has disappeared from most of its former range as a result of meat hunting and habitat destruction and it is now very rare. A few still occur in Mole and Digya National Parks, but it seems to have disappeared from other protected areas where it formerly occurred such as the Gbele and Shai Hills reserves.

Togo: Formerly widespread in northern Togo. By the mid-1980s, it was largely confined to a small population within Keran National Park. It must now be at grave risk of extinction in Togo, if not already extinct, following the invasion of this park by large numbers of settlers in the early 1990s.

Benin: Formerly widespread and survives quite widely in the northern half of the country. It occurs at low to moderate densities in the northern protected areas and larger classified forests.

Nigeria: Formerly occurred widely in the savannas of northern and central Nigeria. It has been eliminated from most of its former range. By the 1980s, it was reduced to scattered remnant populations, mainly within protected areas. Its distribution and abundance are probably continuing to decline.

Chad: Formerly occurred throughout the savannas of the southern third of the country and in the Lake Chad area in the west. It has been eliminated from some parts of its former range by the expansion of agriculture and livestock, drought and uncontrolled hunting, but it survives quite widely at low densities. It occurs in small to moderate populations in Zakouma National Park and Siniaka Minia Faunal Reserve, where its numbers are stable, and Manda National Park, where its numbers are likely to increase as effective protection is resumed.

Cameroon: Formerly widespread in savanna and floodplain grasslands from the Adamaoua Plateau northwards. It survives locally within protected areas and outside protected areas in regions with low to moderate numbers of people and livestock. It was formerly abundant on the Waza-Logone floodplain within Waza National Park. The estimated population in Waza decreased from 2,000 in the early 1960s to <100 in 1977-94 as its habitat dried out, because of droughts and reduction of the annual flooding regime by the construction of the Maga dam. The major surviving concentration occurs in Bouba Ndjida National Park, where numbers are estimated at about 3,000. It occurs widely at lower densities throughout the savanna woodlands of North Province.

Central African Republic: Formerly occurred throughout the savanna woodlands. It remains widespread within this range, including some localities in the settled regions of the country in the west. It is locally abundant on the wide floodplains in the north of Manovo-Gounda-St. Floris National Park. Elsewhere it occurs at much lower densities and is relatively uncommon. Its wariness enables it to survive in heavily poached areas in the east and north to a much greater degree than less wary species such as the kob, which is usually far more numerous than the reedbuck in undisturbed areas.

Congo-Kinshasa: Confined to savanna grasslands and floodplains in the north and northeast, where it survives locally in small numbers in areas such as the southern and eastern sectors of Garamba National Park and the central plains of Virunga National Park.

Sudan: Formerly occurred widely in savanna and floodplains in central and southern Sudan. Exceptionally large concentrations of this species occurred in the 1970s and 1980s, e.g., a migratory population of >33,000 on the floodplain grasslands of the Jonglei area, a separate migratory population of 13,000 in the Boma ecosystem and lower densities in the surrounding savanna woodlands on both sides of the Nile, with an estimated total population of >78,000. It has disappeared from most of the northern part of its former range but survives at low to moderate densities in areas such as Dinder and Radom National Parks. Its numbers are undoubtedly reduced in southern Sudan, but it still occurs locally in significant numbers.

Eritrea: Formerly occurred in the southwestern savannas. There is no recent confirmation of its presence in Eritrea, but it may survive in small numbers.

Ethiopia: Occurs widely within its former range in western and central Ethiopia, in gradually decreasing numbers. It generally occurs at low to moderate densities, but it is relatively common in Bale Mountains National Park where it occurs in open grassland at altitudes of up to 3,750 m.

Uganda: Formerly occurred throughout, except for dense forests and the semi-arid northeast. It has been eliminated from the more densely settled regions but still occurs widely in low to moderate numbers elsewhere. The largest populations are in Murchison Falls National Park, Pian-Upe, Toro-Semliki and South Karamoja. Numbers are generally stable, at least in protected areas.

Kenya: Occurs in scattered areas in southern and western Kenya, where it remains reasonably common within suitable habitat in protected areas such as Masai Mara National Reserve, Ruma and

*Bohor Reedbuck (continued)*
Aberdare National Parks.

Tanzania: Occurs widely within its former range, and it remains patchily distributed in savanna and floodplain grasslands throughout the country. Its numbers have been greatly reduced in some regions by the spread of settlement and cultivation and increased subsistence hunting pressure. It occurs at low to moderate densities in most protected areas within its range, with major populations in the Serengeti, Moyowosi-Kigosi and Selous. In the south and west, where its distribution overlaps that of the southern reedbuck, the bohor reedbuck tends to dominate on larger areas of open grassland.

Rwanda: Confined to Akagera National Park, where it was formerly locally abundant on the grassy hills in the north of the park and in the adjoining Mutara Hunting Reserve. Its numbers have decreased dramatically since 1990, when the estimated population was 1,600, as a result of the invasion of its preferred habitat by large numbers of people and several hundred thousand cattle, and subsequent degazettement of the Mutara reserve and the northern part of Akagera National Park.

Burundi: Formerly occurred widely in floodplains and savannas in the east and south. It has been displaced from most of its former range by the expansion of settlement and agriculture, but it was still present in a few localities in the 1980s. No recent information on its status.

SUMMARY
The bohor reedbuck formerly occurred widely in woodlands and floodplain grasslands throughout the savanna zones of West, Central and East Africa. Its distribution and numbers are in gradual attrition as human settlement and associated pressures of habitat destruction and meat hunting expand, although it tends to survive for longer in over-exploited areas than less secretive and more easily hunted species.

It is now generally uncommon/rare where it survives in West Africa, but viable populations persist in areas such as Boucle du Baoule (Mali), Niokolo-Koba (Senegal), Corubal River (Guinea-Bissau) and Arly-Singou and Nazinga (Burkina Faso). It is more numerous in Central and East Africa, with major populations in areas such as Bouba Ndjida (Cameroon), Manovo-Gounda-St. Floris (Central African Republic), Bale Mountains (Ethiopia), Murchison Falls and Pian-Upe (Uganda), Mara (Kenya) and Serengeti, Moyowosi-Kigosi and Selous (Tanzania). Some of these key populations are decreasing because of poaching, especially in West and Central Africa. The species formerly reached its greatest abundance in southern Sudan, but no quantitative information is available on its current status there.

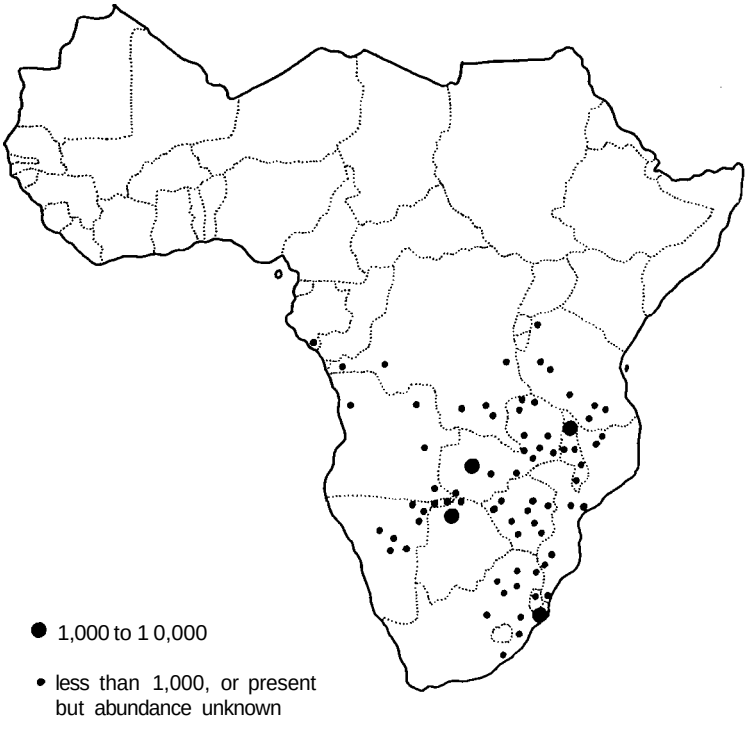
Estimated Total Numbers: Recent aerial survey estimates are available for populations of this species in many parts of its range, particularly in Central and East Africa (Appendix 4). These surveys have generally given density estimates of 0.1-0.2 per sq km, e.g., Manovo-Gounda-St. Floris (Central African Republic) (J. L. Tello, in litt. September 1995), Murchison Falls (Uganda) (Lamprey & Michelmore 1996) and Moyowosi-Kigosi (Tanzania) (TWCM 1995b), or less than 0.1 per sq km, e.g., Zakouma (Chad) (D. Moksia, in litt. July 1995), Sangba and Bamingui-Bangoran (Central African Republic) (J. L. Tello, in litt. September 1995), Garamba (Congo-Kinshasa) (Hillman Smith et al. 1995), Aswa Lolim, Lake Mburo and Kidepo (Uganda) (Lamprey & Michelmore 1996) and Tarangire, Biharamulo-Burigi, Ugalla River, Katavi-Rukwa, Ruaha-Rungwa and Selous (Tanzania) (TWCM 1991, 1992a, 1992b, 1994c, 1995a, 1995c). Aerial surveys have provided higher density estimates in a few instances, e.g., 0.3 per sq km in Toro-Semliki and Pian-Upe (Uganda) (Lamprey & Michelmore 1996) and 1.0 per sq km in Serengeti (Campbell & Hofer 1995). Aerial counts undoubtedly tend to underestimate reedbuck numbers, by an unknown but probably substantial amount.

Population densities of this species estimated by ground surveys include 0.1 per sq km in Nazinga and 0.3 per sq km in Arly (Burkina Faso) (Belemsobgo and Chardonnet 1996) and 5.6 per sq km in

Ruma (Kenya) (Butynski et al. 1997). Densities of over 100 per sq km can occur in exceptional concentrations (Kingdon 1997).

Assuming an average correction factor for undercounting bias in aerial surveys of 2.0, and that areas for which population estimates are unavailable support 0.3 per sq km where it is known to be common and 0.03 per sq km elsewhere, gives a total population estimate of 101,000. This includes only 4,500 in Sudan, which is probably a substantial underestimate. About three-quarters of the estimated total occurs in protected areas. Its numbers are in gradual decline over most of its remaining range, apart from some protected areas in East Africa.

The Future: If current trends persist, the bohor reedbuck should continue to survive in reasonable numbers in national parks, equivalent reserves and hunting concessions in East Africa, but it will become increasingly uncommon in West and Central Africa until its survival in these regions is eventually threatened. More active protection and management of areas which retain viable populations will be necessary to reverse this trend.




**Southern Reedbuck**
*Redunca arundinum* (Boddaert 1785)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Gabon | - | - | - | - | U/R | D | U/R | D |
| Congo-Brazz. | - | - | - | - | - | - | Ex? | - |
| Congo-Kinshasa | C | S/D | - | - | X | D | C/U | D |
| Tanzania | >370 | S/D | - | - | X | S/D | >370 | S/D |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Zambia | >2,250 | S/D | 220 | S/I | >860 | S/D | >3,330 | S/D |
| Malawi | >6,680 | S/D | - | - | X | D | >6,680 | S/D |
| Mozambique | >960 | S/D | - | - | U/R | D | >960 | D |
| Namibia | 40 | I | 2,300 | I | R | D | >2,340 | I |
| Botswana | 500 | S/I | - | - | 1,690 | S/I | 2,190 | S/I |
| Zimbabwe | U | S | 3,860 | s | R | D | >3,860 | S/D |
| South Africa | >10,270 | S/I | >3,000 | I | U | D | >13,270 | I |
| Swaziland | U | S/I | - | - | - | - | U | S/I |
| Species Total | >21,070 | S | 9,380 | I | >2,550 | D | >33,000 | S |

OVERVIEW OF CONSERVATION STATUS

Gabon: Formerly occurred in the savannas which extend into Gabon from the adjoining Congo Republic (Congo-Brazzaville). It appears to have been hunted out of much of its former range in Gabon. It survives in unknown but probably small and declining numbers in the southwestern and coastal savannas, from Tchibanga south to the Congo border. The reedbuck's distribution along the coast is unknown, and it may occur as far north as the Petit Loango and Iguela reserves within the Gamba protected area complex.

Congo-Brazzaville: Formerly occurred locally in the savannas of southern Congo, but it may now be extinct as a result of intensive meat hunting. Its presence was last confirmed in 1974 in Mount

Fouari Faunal Reserve.

Congo-Kinshasa: Formerly occurred widely in the southern savannas. Its populations have generally been reduced to low levels and it has been exterminated locally by hunting for meat. It was formerly abundant on the high plateaux grasslands of Upemba and Kundelungu National Parks. It is still common in these areas, but its numbers are gradually decreasing because of widespread poaching and encroachment of settlement.

Tanzania: Still occurs reasonably widely within its former range in the miombo woodlands of the south and west. It generally occurs at low densities, in small groups in grassy valleys and glades within the woodlands, and it tends to be replaced by the bohor reedbuck on larger areas of open grassland. The southern reedbuck's range includes protected areas such as Selous (mainly in the southeast), Biharamulo-Burigi, Moyowosi-Kigosi, Ugalla River and Rungwa-Kisigo Game Reserves and Ruaha National Park.

Angola: Formerly occurred very widely, except for the arid southwest. It was still widespread and locally common in the mid-1970s. Its numbers are now much reduced, but it survives locally within its former range.

Zambia: Formerly occurred very widely, except in the low-lying Luangwa and Zambezi Valley floors. It has been eliminated from considerable parts of its former range by the expansion of settlement, but it survives widely in national parks and game management areas and in some other areas where suitable habitat persists. It tends to be inconspicuous because of its shy nature and consequently survives in reasonable numbers within heavily poached areas for longer than most other antelope species, e.g., Lavushi Manda, Sioma Ngwezi and Mweru Wantipa National Parks, Kafue Flats Game Management Area and the depleted areas of the Luangwa Valley such as Lukusuzi National Park. It is well represented in Kafue National Park. The largest population occurs in Bangweulu, where there were estimated to be >5,000 reedbuck in the 1970s. More recent estimates of this population are unavailable, but it remains common in Bangweulu-Kafinda Game Management Areas, apparently in stable numbers.

Malawi: Formerly occurred throughout. It has been eliminated from large parts of its former range but still occurs widely in national parks, game reserves and forest reserves. It persists outside protected areas in parts of central and northern Malawi where suitable *Brachystegia* woodland habitat remains. There is an exceptionally high density of this species in Nyika National Park, where the population has increased steadily since the park was proclaimed in 1959 and is now estimated by National Parks and Wildlife staff to exceed 6,000. It occurs mainly in the grasslands of the Nyika Plateau and the woodlands of the northern foothills, and shows marked seasonal movements between these two areas of the park. It occurs at much lower, stable or declining densities in other protected areas.

Mozambique: Formerly occurred widely, especially in central and northern regions. In the early 1980s it remained widespread and locally common in and around Gorongosa National Park and some other parts of central and northern Mozambique, but it had been reduced to isolated relic populations elsewhere. It has suffered a further decline during the 1980s and 1990s. A substantial population survives in Gorongosa National Park and it still occurs in low to moderate numbers in areas such as Marromeu and Maputo Game Reserves and Banhine National Park. Its numbers should recover as the current rehabilitation of Mozambique's wildlife areas progresses.

Namibia: This species' natural range is largely restricted to the northeastern savannas, where it still occurs at low densities in protected areas and the communal lands of Kavango, Bushmanland and Eastern Caprivi. It has been introduced to private land outside its natural range in the northern farming districts, where it is now relatively numerous.

Botswana: Formerly occurred locally in the north and northeast. It has been eliminated from some areas of its former range but occurs at low to moderate densities in the Okavango Delta and the

*Southern Reedbuck (continued)*
Linyanti area in the north. It is quite common in Moremi Game Reserve, but apparently declined to low levels or disappeared from the Savuti area in the southwest of Chobe National Park as a result of the droughts of the late 1980s.

Zimbabwe: Formerly widespread, but naturally absent from the Zambezi Valley, parts of the west and most of the southern lowveld. Naturally occurring populations have persisted on the private farms of the central highveld to a greater degree than most other medium-sized and larger antelopes. It occurs locally in moderate numbers in most protected areas within its range.

South Africa: Formerly occurred widely, except for the drier western regions of the country. It was eliminated from most of its former range except in KwaZulu-Natal, where it has remained widespread on private farmland. It is also well represented in KwaZulu-Natal's protected areas, occurring in 34 of this province's parks and reserves with the largest concentrations on the Eastern Shores and Western Shores of Lake St. Lucia. There is a moderate-sized population in Kruger National Park. Elsewhere it occurs at scattered localities in provincial reserves and on private land and is generally uncommon/rare.

Swaziland: Formerly occurred widely, but reduced to a few scattered remnant populations by subsistence hunting and the expansion of settlement. Small numbers occur in Mlawula Nature Reserve and Mlilwane Wildlife Sanctuary, and there is an expanding population in Malolotja Nature Reserve.

SUMMARY
The southern reedbuck formerly occurred widely in savanna woodlands from Gabon and Tanzania to South Africa. It remains widespread in protected areas and other areas with low to moderate levels of settlement, including significant populations on private land in Zimbabwe, South Africa and Namibia (the Namibian population is largely extralimital). Other major populations occur in areas such as Upemba and Kundelungu (Congo-Kinshasa), Selous (Tanzania), Kafue (Zambia), Nyika (Malawi), Gorongosa (Mozambique), Okavango (Botswana) and Kruger and Eastern Shores (South Africa). Most of these populations are stable or increasing.

Estimated Total Numbers: As with the bohor reedbuck, aerial counts of the southern reedbuck tend to result in density estimates of 0.1-0.2 per sq km, e.g., Lukusuzi (Zambia) (Jachmann & Kalyocha 1994) and the Okavango Delta (Botswana) (DWNP 1995), or less than 0.1 per sq km, e.g., Selous (Tanzania) (TWCM 1995c), Kafue, Luangwa Valley and Sioma Ngwezi (Zambia) (Jachmann & Kalyocha 1994; Tembo 1995; Yoneda & Mwima 1995), Linyanti (Botswana) (DWNP 1995) and Kruger (South Africa) (Anderson et al. 1996). Aerial surveys have produced density estimates of up to 1.9 per sq km in Nyika National Park (Malawi), where the species is exceptionally abundant (Mkanda 1998). Aerial surveys undoubtedly tend to underestimate its true numbers. The southern reedbuck can occur at much higher densities within areas of exceptionally favourable habitat, e.g., 35.0 per sq km in Eastern Shores State Forest (South Africa) (Rowe-Rowe 1994).

Assuming an average correction factor for undercounting bias in aerial surveys of 2.0, and that areas for which population estimates are unavailable support 0.3 per sq km where it is known to be common and 0.03 per sq km elsewhere, gives a total population estimate from the information in Appendix 4 of 73,000. About 60% of this estimated total occurs in protected areas and 13% on private land. Overall population trends are generally stable in protected areas, increasing on private land and decreasing elsewhere.

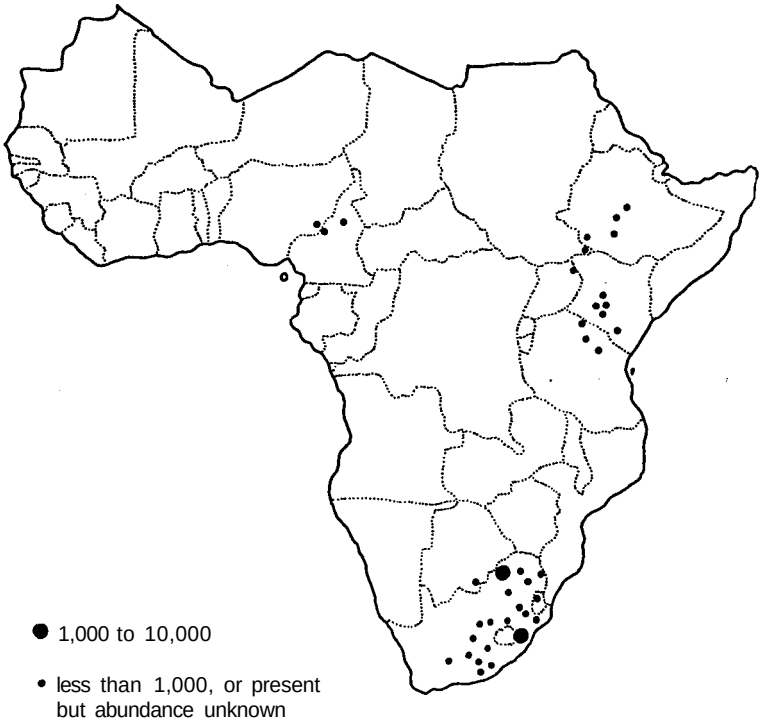
The Future: The southern reedbuck's overall status will remain unchanged as long as it continues to be well represented in protected areas and on private farms and conservancies. Some peripheral populations face an uncertain future, e.g., in Gabon and southern Congo-Kinshasa, but its numbers should increase significantly in Mozambique over the next decade and it is also likely to become more numerous on private land in Southern Africa.

**Mountain Reedbuck**
*Redunca fulvorufula* (Afzelius 181 5)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
southern mountain reedbuck (*R. f. fulvorufula):* South Africa to Botswana
Chanler's mountain reedbuck (*R. f. chanleri*)*:* Ethiopia to Tanzania
western mountain reedbuck (*R. f. adamauae*)*:* Cameroon, Nigeria

Status of Subspecies
southern mountain reedbuck: Lower Risk (conservation dependent)
Chanler's mountain reedbuck: Lower Risk (near threatened)
western mountain reedbuck: Endangered




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Western Mountain Reedbuck | | | | | | | | |
| Nigeria | U/R | S/D | - | - | - | - | U/R | S/D |
| Cameroon | 240 | ? | - | - | U/R | D | U/R | D |
| Chanler's Mountair Reedbuck | | | | | | | | |
| Sudan | - | | | | U/R | ? | U/R | ? |
| Ethiopia | >300 | S/I | - | - | X | D | X | ? |
| Uganda | - | - | - | - | R | D | R | D |
| Kenya | U/R | S | - | - | U | D | U | D |
| Tanzania | U/R | S/D | - | - | ? | ? | U/R | S/D |
| Southern Mountain Reedbuck | | | | | | | | |
| Mozambique | - | - | - | - | ? | ? | ? | ? |
| Botswana | X | ? | - | | U/R | ? | U/R | ? |
| South Africa | 6,880 | S | >25,000 | S/D | U | D | >31,880 | S/D |
| Swaziland | C/U | S | - | - | - | - | C/U | S |
| Lesotho | ? | ? | - | - | R | D | R | D |

OVERVIEW OF CONSERVATION STATUS

Nigeria: The western mountain reedbuck occurs in montane grasslands in the southern sector of Gashaka-Gumpti National Park and in the Gotel Mountains which adjoin the park's southern boundary. The Nigerian population of this antelope has probably never been large. In the late 1980s it was considered to be seriously threatened by illegal hunting and widespread disturbance by cattle herders and their livestock. No recent information on its status is available, but it may have benefitted to some extent from attempts to improve the protection and management of Gashaka-Gumpti National Park during the 1990s.

*Mountain Reedbuck (continued)*

Cameroon: The presence of the western mountain reedbuck within Cameroon was discovered in 1961 in the high altitude grasslands of the Adamaoua Mountains. More recently it has been found to occur rarely in hilly areas between Faro and Bouba Ndjida National Parks within the savanna woodlands of North Province. Observations by Gilles Nicolet in the Tchabal Mbabo Mountains in early 1997 revealed that the mountain reedbuck still occurs at low densities (2 seen in 5 days walking) on grass-covered rocky ridges, but in much reduced numbers according to local people. It does not seem to be exposed to significant hunting pressure in this part of the Adamaoua Mountains. Competition with the large numbers of cattle which occur throughout its habitat, even on very steep slopes, may be the main cause of its decline. Local people indicated that it is more common on some of the isolated massifs around Galim and Tignere to the east of Tchabal Mbabo, where huge rocky boulders restrict the movements of herders and hunters and provide a refuge for the species. It also survives in small numbers in the hunting zones of North Province, below the Adamaoua Plateau. These hunting zones are the only part of its range in Cameroon where it receives some protection from poaching.

Sudan: Known from hilly areas in the southeast. No recent information on its status.

Ethiopia: Chanler's mountain reedbuck has always had a very restricted distribution in Ethiopia, where it is confined to broken country and rocky hillsides in scattered localities within the Rift Valley and the southern lowlands. It still occurs in some of these localities, e.g., Awash, Nechisar, Omo and Mago National Parks, and in some localities outside protected areas.

Uganda: Occurs in low to moderate numbers on rocky hillsides in eastern Karamoja. No recent information on its status.

Kenya: Chanler's mountain reedbuck occurs in limited areas of suitable habitat in broken, hilly country and on mountain slopes in central and southern Kenya. It is present in small to moderate numbers in several protected areas such as Aberdare, Nairobi and Lake Nakuru National Parks, with numbers stable at least in the former two areas. Overall numbers in unprotected areas are decreasing because of the expansion of settlement and poaching.

Tanzania: Occurs at low densities in isolated areas of high altitude grassland and rocky hillsides in the north. In the 1980s, unprotected populations in areas such as the Hanang, Mbulu, Lolkisale and Loliondo Mountains were highly endangered or extinct, but it survived in small numbers within a few protected areas such as Arusha National Park and the highland areas and crater walls of Ngorongoro Conservation Area. It was observed in Tarangire National Park in 1996, but no other recent information on its status is available.

Mozambique: Restricted to the Lebombo Mountains on the South Africa border in the southwest, where two small relic populations survived in the early 1980s. No recent information on its survival or status.

Botswana: Confined to a small area of rocky hillsides in the southeast, including the 1.5 sq km Mannyelanong Hill Game Reserve. No recent information on its status.

South Africa: The southern mountain reedbuck was formerly widespread on steep, hilly terrain with open grassland or lightly wooded savanna in Northwest, Northern, Mpumalanga, Gauteng, western KwaZulu-Natal and eastern and southern Free State provinces, and in parts of the Eastern Cape. It still occurs widely but locally in moderate numbers within its former range, mainly on private farms. The largest protected populations occur in Natal Drakensberg Park, Pilanesberg National Park and Doornkloof Nature Reserve, with lower numbers (a few hundred or less) in other protected areas such as Kruger, Karoo, Mountain Zebra and Golden Gate Highlands National Parks and numerous provincial reserves. Populations of this species tend to be stable in the medium-long term but undergo short-term fluctuations in response to factors such as variations in rainfall, e.g., its populations frequently decrease during droughts and subsequently recover.

Swaziland: Formerly occurred locally on grassy hillsides with some tree or bush cover. It has been eliminated from parts of its former range but is common in the Lebombo uplands within Mlawula-Ndzindza Nature Reserve and fairly common in the highveld in Malolotja Nature Reserve.

Lesotho: Survived in small numbers outside protected areas in the 1980s. No recent information on its status.

SUMMARY
The mountain reedbuck formerly occurred locally on ridges and hillsides in broken rocky country in separate populations in East and Southern Africa, and in a restricted area of eastern Nigeria and north-central Cameroon. The southern mountain reedbuck still occurs locally in good numbers in the core of its range in South Africa, but the status of the other two subspecies is less satisfactory. Chanler's mountain reedbuck generally occurs in low to moderate numbers where it survives in East Africa, at least in protected areas, and its numbers appear to be decreasing in many areas. Little recent information is available to the ASG on the status of Chanler's mountain reedbuck in most of its range states, and surveys are required to clarify its current distribution, numbers and population trend. The western mountain reedbuck has been reduced to small, declining remnant populations within its relatively restricted range.

Estimated Total Numbers: Densities of mountain reedbuck within protected areas vary greatly according to factors such as the extent of suitable habitat. Estimated densities of the southern subspecies in protected areas in South Africa (Anderson et al. 1996) vary from 0.1 per sq km or less in areas such as Karoo, Addo-Zuurberg and Marakele National Parks to 0.8 per sq km in Natal Drakensberg Park, 3.0-3.5 per sq km in Golden Gate Highlands and Royal Natal National Parks and 7.5 per sq km in Mountain Zebra National Park. Irby (1977) reported a density of 4.9 per sq km of Chanler's mountain reedbuck on ranchland in Kenya's Rift Valley. Assuming that areas for which population estimates are unavailable support average population densities of 3.0 per sq km where the species is known to be common and 0.03 per sq km elsewhere, the information in Appendix 4 gives total population estimates of 33,000 southern mountain reedbuck, 2,900 Chanler's mountain reedbuck and 450 western mountain reedbuck. The estimate for Chanler's mountain reedbuck may be very conservative if this subspecies still occurs in significant numbers on private land in Kenya, e.g., studies in the 1970s revealed a population of 750-1,000 on a single ranch near Gilgil (Irby 1977). Overall population trends are more or less stable for the southern mountain reedbuck but decreasing for the other two subspecies.

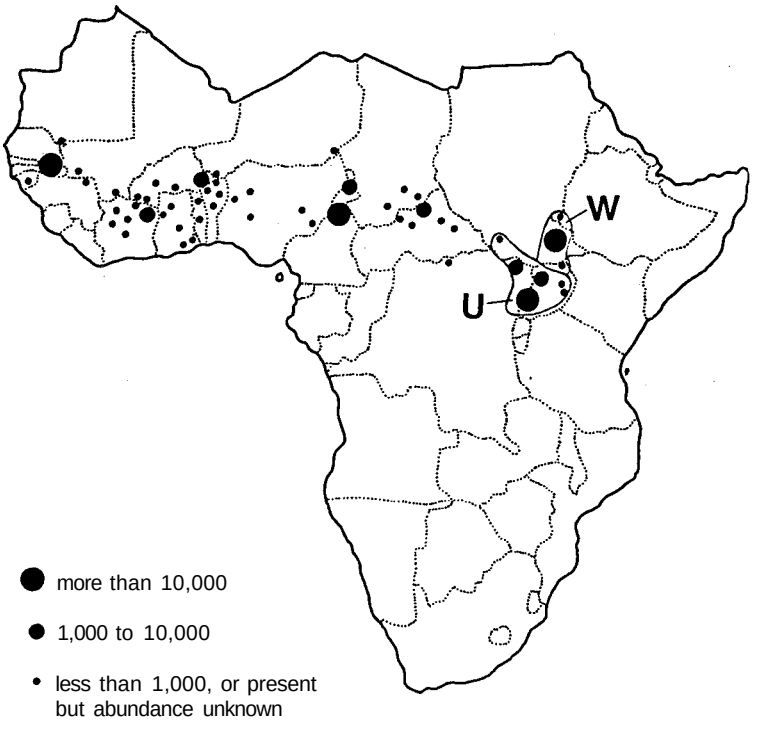
The Future: The southern mountain reedbuck's status will remain secure as long as it continues to be represented by good-sized, stable or increasing populations on private land and in protected areas in South Africa. If current trends continue, Chanler's mountain reedbuck may become threatened in the short to medium term, and the western mountain reedbuck may decline to extinction. Effective protection and management of viable populations in areas such as Nechisar and Omo-Mago (Ethiopia), the Aberdares (Kenya) and Ngorongoro Conservation Area (Tanzania) for Chanler's mountain reedbuck, and Gashaka-Gumpti National Park (Nigeria) and the hunting zones of North Province (Cameroon) for the western subspecies, will be necessary to reverse these trends.

**Kob**
*Kobus* tob (Erxleben 1777)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
W: white-eared kob (*K. k. leucotis*)
U: Uganda kob (*K. k. thomasi*)
remainder of range: Buffon's kob (*K. k. kob*)

Status of Subspecies
white-eared kob: Lower Risk (near threatened)
Uganda kob: Lower Risk (conservation dependent)
Buffon's kob: Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Poon/Abund | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Buffon's Kob | | | | | | |
| Mauritania | - | - | V | D | V | D |
| Mali | <100 | D | <100 | D | <200 | D |
| Niger | <400 | D | R | D | 400 | D |
| Senegal | 26,000 | S/I | x | ? | >26,000 | S/I |
| Gambia | - | - | - | - | Ex | - |
| Guinea-Bissau | - | - | R | D | R | D |
| Guinea | - | - | R | D | R | D |
| Sierra Leone | - | - | - | - | Ex? | - |
| Ivory Coast | >9,430 | D | - | - | >9,430 | D |
| Burkina Faso | >1,190 | D | R | D | >1,190 | D |
| Ghana | C | S/I | - | - | C | S/I |
| Togo | U | D | - | - | U | D |
| Benin | x | D | - | - | x | D |
| Nigeria | R | D | - | - | R | D |
| Chad | 390 | S/I | U/R | D | >390 | D |
| Cameroon | 13,800 | D | U/R | D | >13,800 | D |
| CAR | <5,350 | D | R | D | >5,350 | D |
| Congo-Kinshasa | - | - | R | D | R | D |
| Subspecies Total | 56,660 | D | U/R | D | >56,700 | D |
| White-eared Kob | | | | | | |
| Sudan | - | - | C | D | C | D |
| Ethiopia | U | D | - | - | U | D |
| Uganda | R/V | ? | - | - | R/V | ? |

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Uganda Kob | | | | | | |
| Congo-Kinshasa | >7,650 | S | - | - | >7,650 | S |
| Sudan | - | - | x | D | x | D |
| Uganda | >38,000 | I | 1,710 | ? | >39,710 | I |
| Kenya | - | - | - | - | Ex | - |
| Tanzania | - | - | - | - | Ex | - |
| Subspecies Total | >45,650 | I | >1,710 | D | >47,360 | I |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Buffon's kob has been recorded from the grasslands of the Senegal River valley in the southwest. By the 1980s, it had been eliminated from most of its former range by hunting and loss of habitat to the expansion of settlement, but it still occurred near the Mali border in the extreme south at least as a seasonal visitor. No recent information on its status.

Mali: Probably occurred widely in the past on the extensive floodplains of the Niger delta and in the southwestern savannas. It has been eliminated from almost all of this range by meat hunting and the expansion of settlement, cultivation and livestock. A few small, declining populations survive in areas such as Bafing Faunal Reserve and the proposed Nienendougou Faunal Reserve.

Niger: Buffon's kob formerly occurred in savanna and floodplain grasslands in the southwest and the southeast. By the late 1980s, it had been eliminated from most of its former range. It survived in low to moderate numbers in W National Park-Tamou Faunal Reserve and possibly in a few other areas such as the Lake Chad region in the southeast. No recent information on its status.

Senegal: Buffon's kob formerly occurred widely in floodplain and riverine grasslands. It is now confined to the Niokolo-Koba National Park area in the southeast, where it is abundant. The small reintroduced population in Basse Casamance National Park was exterminated by poachers in 1989.

Gambia: Buffon's kob formerly occurred in riverine grasslands but is now extinct.

Guinea-Bissau: Buffon's kob was formerly abundant in riverine areas, especially in the coastal region. Habitat destruction and widespread hunting have eliminated it from most of its former range and reduced the surviving populations to low levels. It survives in small numbers in the Lake Cufada area and a few other scattered localities on the mainland and on Galinhas Island in the Bijagos Archipelago.

Guinea: Buffon's kob probably occurred widely in savanna and riverine grasslands in the past, but it now appears to be very rare and localised. It is absent from Badjar National Park.

Sierra Leone: Buffon's kob formerly occurred locally on floodplain grasslands, but it is apparently extinct.

Ivory Coast: Buffon's kob was formerly widespread and abundant in grasslands near water throughout the northern and central savannas. It has been eliminated from most of its former range and is now restricted to protected areas, where it generally occurs in decreasing numbers. Poaching reduced the major surviving population, in Comoe National Park, by 80% between the late 1970s and the mid-1990s, and this population continues to decline rapidly.

Burkina Faso: Buffon's kob formerly occurred widely in floodplains and savanna woodland. It has been eliminated from extensive areas of its former range by overhunting and agricultural

*Kob* (*continued*)
development. It survives largely or entirely in the south, generally in small numbers. The only substantial surviving population is in the Arly-Singou protected area complex, but the important population of Arly National Park has decreased since the 1980s. It can be expected to recover rapidly with the enhanced protection which is currently being implemented in Arly, since the kob responds very well to effective protection.

Ghana: Formerly widespread in savanna grasslands and floodplains. It has disappeared from most of its former range and is now confined to protected areas. It responds well to protection and is well represented in Mole and Bui National Parks and Kalakpa Game Production Reserve, but it is vulnerable to poaching and has been reduced to low levels or eliminated from other protected areas.

Togo: Formerly widespread and common. By the mid-1980s it was mainly confined to protected areas, with good numbers in and around Keran and Fazao National Parks. It has undoubtedly been reduced to small, declining populations following the breakdown of the country's protected area system in the early 1990s.

Benin: Buffon's kob formerly occurred widely throughout most of the country. It is now generally restricted to national parks, hunting zones and classified forests. The largest population occurs in Pendjari National Park, where its numbers exceeded 6,000 in the late 1980s and have remained stable. It occurs in much lower and generally decreasing numbers elsewhere, e.g., it is now rare in W National Park because of excessive offtake by poachers.

Nigeria: Buffon's kob formerly occurred widely on savanna and floodplain grasslands in central and northern Nigeria. It has been eliminated from most of its range by habitat destruction, overhunting and displacement by cattle. By the 1980s it was confined to protected areas, where its numbers were generally decreasing because of poor or non-existent protection against poaching and agricultural encroachment. Its distribution and abundance are probably continuing to decline, but it persists in a few areas such as the northern sector of Gashaka-Gumpti National Park.

Chad: Buffon's kob was formerly abundant in riverine and floodplain grasslands within the savanna zone of southern Chad. It has been eliminated from most of its former range by uncontrolled hunting, the expansion of cattle and agriculture, and the effects of drought. It survives in moderate numbers in Zakouma National Park and some other areas in the southeast. A viable remnant population persists in Manda National Park and should recover its former abundance if this park is successfully rehabilitated.

Cameroon: Buffon's kob formerly occurred widely in floodplain and savanna grasslands close to water in the savanna woodland and sahel zones of central and northern Cameroon. It has been eliminated from large parts of its former range and reduced to low numbers elsewhere by uncontrolled meat hunting. It still occurs in substantial numbers in Waza National Park and the savanna woodlands of North Province, and probably survives locally in small numbers within the southern parts of its range. The population of Waza National Park decreased from 25,000 in 1962 to 2,000 in 1988-94. This resulted from a general drying out of its habitat caused by droughts and disruption of the natural flooding regime from 1979 by the construction of the Maga dam on the Logone floodplain, which formed Lake Maga. Additional mortality of the Waza population was caused by poaching and the 1 982-83 rinderpest outbreak. Since 1 994, the Netherlands-funded IUCN/CML Waza-Logone project has investigated rehabilitation of the floodplain by release of excess water from Lake Maga and the Logone River. By 1997, the kob population was increasing in response to the reflooding activities of this project. While large-scale rehabilitation of the Waza-Logone floodplain is contemplated, this may not be possible unless increasing security problems and a degenerating social climate in the region are overcome. The largest surviving population of kob in Cameroon is in the savanna woodlands of North Province, where this species occurs at relatively high densities in areas such as Benoue National Park and along the Faro River in Faro West Hunting Zone. Its overall numbers are decreasing in North Province because of poaching and the

encroachment of settlement.

Central African Republic: Buffon's kob formerly occurred widely on seasonal floodplains and grasslands near water within the savanna woodlands. By the 1980s, it had been eliminated from the more densely settled areas within its former range in the west of the country but was still widespread in the east and north. Aerial surveys in the mid-1980s indicated a population of >23,000 in and around Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks in the north, and a total population of about 135,000. During the last 10 years, kob populations throughout northern and eastern Central African Republic have been diminished greatly by poaching. This species is a prime target of meat hunters because it occurs in large concentrations and is easy to shoot. As a result, by 1995 the population in and around the two northern parks had been reduced to <5,350, and only small remnants of the formerly prolific herds of kob remained in the Chinko Basin and other areas in the east. The country's total kob population may now be less than 10% of the mid-1980s estimate. Its numbers are continuing to decrease everywhere, with the possible exception of the relatively small population in the central sector of Sangba Pilot Zone.

Congo-Kinshasa: Formerly occurred in grasslands near water in the north, with Buffon's kob in the north and northwest and the Uganda kob in the northeast. It has probably been eliminated from most of its former range by meat hunters. The Uganda kob survives in good numbers in Garamba and Virunga National Parks. The Garamba population increased steadily between 1984, when external assistance to this park was initiated, and 1995, when it had reached an estimated 7,650. Most of this population occurs in the southern and central sections of Garamba National Park. The population of the Rwindi-Rutshuru and Semliki plains within Virunga National Park numbered about 10,000 in 1981. There are no more recent estimates of this population, but the kob is still abundant in Rwindi-Rutshuru where it does not appear to have been affected greatly by poaching.

Sudan: Formerly occurred widely in open and wooded grasslands in the southwest (Uganda kob) and southeast (white-eared kob). There were an estimated 50,000 Uganda kob in southwestern Sudan in the 1970s, but this subspecies has since been severely reduced or eliminated from large parts of its former range by hunting for meat. It survives locally in unknown numbers.

In the early 1980s, the Boma ecosystem supported an estimated 840,000 white-eared kob which undertook seasonal migrations as spectacular as those of the Serengeti wildebeest. The white-eared kob also occurred in significant numbers in other areas to the east of the Nile, such as Jonglei and Badingilo National Park. Locally heavy offtake by meat hunters has undoubtedly affected the white-eared kob's numbers during the last 1 5 years, e.g., aid workers travelling with the Sudan People's Liberation Army between 1989 and 1992 reported heavy slaughter of migratory white-eared kob at Pibor. As well as the ubiquitous AK47, some hunting has been conducted with heavy weapons such as tripod-mounted machine guns. The extent of reduction of the white-eared kob's numbers is unknown but substantial populations are known to survive, e.g., it was reported to be numerous between Bor and Kongor in 1991 and thousands of kob were observed from the air in Eastern Equatoria in 1 994-96. In addition, parts of its range in Boma and Badingilo National Parks and adjacent areas have remained largely inaccessible to people. The white-eared kob's prospects of surviving the civil war may be reasonably good at present, in view of its large numbers, the vast plains on which it roams, e.g., between Boma and Badingilo, and the cover provided by tall grasses for much of the year in these areas.

Ethiopia: The white-eared kob was formerly numerous in the Gambella area in the southwest, at least seasonally when migrants entered Ethiopia from Sudan. It was observed in small numbers in Gambella National Park in 1990, but there is little information on its current status. It has probably been affected adversely by the expansion of human activities such as cultivation and hunting in the Gambella region. This has arisen partly from the settlement of people from the highlands within and around Gambella National Park after the 1984-85 famine and the settlement of many southern Sudanese refugees within the park. By 1998, the extent of encroachment on to Gambella National Park included a large agricultural development scheme and a dam constructed inside the "park".

*Kob (continued)*

Uganda: The Uganda kob formerly occurred widely in savanna grasslands close to permanent water but it has been displaced from most of its former range by agricultural development and the expansion of cattle ranching. Since the 1970s it has survived in three main concentrations, in Murchison Falls and Queen Elizabeth National Parks and Toro-Semliki. It still occurs in substantial numbers in these three areas. Its numbers in Murchison Falls National Park, the adjoining Aswa-Lolim area and in Toro-Semliki are much lower than in the 1960s and 1970s, but the current population in Queen Elizabeth National Park is substantially higher than previous estimates. The Uganda kob also survives in small numbers in Ajai's Game Reserve, Kaiso-Tonya Controlled Hunting Area and southern Karamoja. Small numbers of the white-eared kob occur sporadically in Kidepo Valley National Park in the northeast.

Kenya: The Uganda kob formerly occurred in southwestern Kenya, where it was eliminated by the expansion of settlement. The last survivors died in the 1960s.

Tanzania: The Uganda kob formerly occurred in grasslands alongside Lake Victoria in the northwest, where it was exterminated by the spread of settlement and agricultural development.

SUMMARY

The kob formerly occurred throughout West and Central Africa in floodplain and savanna grasslands close to permanent water. Its sedentary nature and tendency to occur in relatively large concentrations make it highly susceptible to hunting. It has been eliminated from large parts of its former range by poaching for meat and it survives mainly in and around protected areas. Poaching has caused large-scale declines of key populations in areas such as Comoe National Park (Ivory Coast) and northern and eastern Central African Republic during the last decade.

On the other hand, it has the ability to recover its numbers rapidly from very low levels with effective protection and its populations have increased recently in some areas, e.g., Queen Elizabeth National Park (Uganda). Critical areas for the long-term survival of the three subspecies include Niokolo-Koba (Senegal), Comoe (Ivory Coast), Arly-Singou (Burkina Faso), Mole and Bui (Ghana), Pendjari (Benin), Waza and North Province (Cameroon) and Manovo-Gounda-St. Floris and Sangba (Central African Republic) for Buffon's kob, Boma-Badingilo (southeastern Sudan) for the white-eared kob, Garamba and Virunga (Congo-Kinshasa) and Murchison Falls-Aswa Lolim, Queen Elizabeth and Toro-Semliki (Uganda) for the Uganda kob.

Estimated Total Numbers: The kob can reach high densities when it is well protected in areas of favourable habitat, e.g., an estimated 12.9 per sq km from an aerial survey of Queen Elizabeth National Park by Lamprey & Michelmore (1996), but such densities are now rare. Recent aerial and ground surveys of areas where it was formerly abundant and remains common but in depleted numbers have generally produced population density estimates of the order 0.5-1.2 per sq km, e.g., Comoe (Ivory Coast) (Fischer 1996), Arly (Burkina Faso) (Barry & Chardonnet 1998), Waza (Cameroon) (Scholte et al. 1995), Garamba (Congo-Kinshasa) (Hillman Smith et al. 1995), and Murchison Falls and Toro-Semliki (Uganda) (Lamprey & Michelmore 1996). In severely depleted areas, kob densities are generally less than 0.1 per sq km, e.g., Bafing (Mali) (Pavy 1993), W-Kourtiago (Burkina Faso) (Belemsobgo & Chardonnet 1996), Manda (Chad) (Chai 1996), Bamingui-Bangoran (Central African Republic) (J. L. Tello, in litt. September 1995) and Kaiso-Tonya (Uganda) (Lamprey & Michelmore 1996).

Assuming an average correction factor for undercounting bias in aerial surveys of 2.0, and that areas for which population estimates are unavailable support 1.0 per sq km where the kob is known to be common/abundant and 0.05 per sq km elsewhere, produces total population estimates from the information in Appendix 4 of 95,000 Buffon's kob (85% in and around protected areas), 100,000 Uganda kob (98% in protected areas) and >100,000 white-eared kob (<1% in protected areas). Overall population trends are stable or increasing for the Uganda kob but decreasing for the other two subspecies.

Captive Population: The small number of kob held in captivity (31 in USA in 1996) are all of the Uganda subspecies.

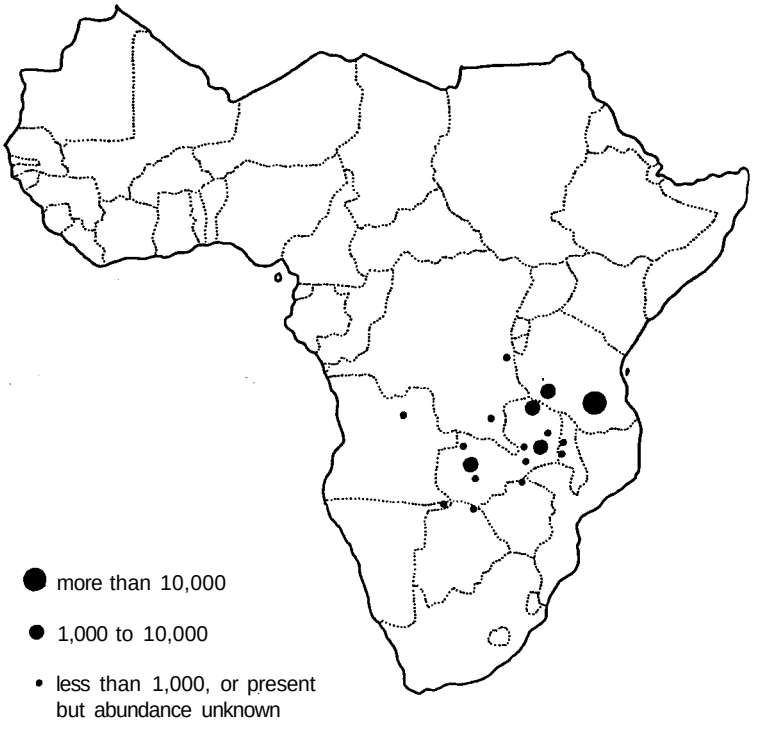
The Future: The kob's vulnerability to poaching and its capacity to respond rapidly to protection make the status of its populations a useful indicator of the effectiveness of conservation measures. Populations of Buffon's kob are in decline over most of this subspecies' remaining range, with a few exceptions such as Niokolo-Koba, Diefoula, Mole, Bui and Waza (see Appendix 4). If current trends continue, the status of Buffon's kob will decline to threatened in the near future. In fact, it may have already done so, e.g., the estimated total numbers of this subspecies exceeded 225,000 in the late 1980s (East 1990). Comparison with the above estimate of 95,000 suggests that the Red List status of Buffon's kob may now meet the criteria for Vulnerable (20% population reduction) or Endangered (50% population reduction), but these population estimates are order-of-magnitude only and are too imprecise to allow such a categorisation to be made with confidence. The key point is that Buffon's kob, formerly one of the most abundant antelopes in West and Central Africa, will become threatened in the near future unless attempts to implement more effective, long-term protection in areas such as Niokolo-Koba, Comoe, Arly, Manda, Waza, Benoue, Faro and Manovo-Gounda-St. Floris National Parks are successful.

In contrast, the status of the Uganda kob will not change as long as effective protection and management are developed and maintained for areas such as Queen Elizabeth and Murchison Falls National Parks. Its status is likely to improve as the rehabilitation of other areas of Uganda proceeds in the next few years, e.g., Aswa-Lolim and Toro-Semliki, although the recent political disturbances in Congo-Kinshasa may adversely affect the important populations of Garamba and Virunga National Parks.

The white-eared kob faces an uncertain future and at least a gradual population decline as long as civil war continues in southern Sudan. It is possible that this subspecies' numbers are already decreasing at a rate which threatens its survival. Surveys are urgently required to clarify the white-eared kob's current status and investigate possible conservation actions (Winter 1997a, 1997b).

**Puku**
*Kobus vardoni* (Livingstone 1857)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abunc1. | Trend | Popn/Abund1. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Congo-Kinshasa | X | D | - | - | ? | ? | X | D |
| Tanzania | 120 | S | - | - | 54,470 | S/D | 54,590 | S/D |
| Angola | - | - | - | - | X | D | X | D |
| Zambia | >17,840 | S/D | 190 | S/I | >3,010 | D | >21,040 | D |
| Malawi | 140 | S/I | - | - | - | - | 140 | S/I |
| Namibia | - | - | - | - | V | ? | V | ? |
| Botswana | <100 | S/D | - | - | - | - | <100 | S/D |
| Zimbabwe | V | ? | - | - | - | - | V | ? |
| Species Total | >18,200 | S/D | 190 | S/I | >57,480 | D | >75,870 | D |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Formerly occurred locally in riverine and lakeside grasslands in the southeast. It has probably been eliminated from most of its former range by uncontrolled hunting for meat, but it survives in unknown numbers in a few localities such as Kundelungu National Park.

Tanzania: Known formerly from only three localities in southern Tanzania. It has been exterminated on the grasslands at the northern end of Lake Malawi but survives in substantial populations at the other two localities, Kilombero Game Controlled Area, which supports Africa's largest puku population, and Lake Rukwa. The Kilombero population has increased since the 1970s-80s and currently appears to be stable despite poaching pressure, but it remains largely unprotected. A small outlier of this population occurs in Selous Game Reserve where the Kilombero River enters the reserve. The status of the smaller Rukwa population is uncertain and it may have been affected adversely by poaching.

Angola: Formerly occurred on floodplain grasslands in the northeast, with small numbers in the

Luando reserve and larger populations reported in Lunda Norte province. Its numbers are now greatly reduced.

Zambia: Formerly occurred widely in suitable grassland habitat, but it has been eliminated from most of its former range outside national parks and game management areas. It remains common within suitable habitat in parts of the Luangwa Valley (North and South Luangwa National Parks, Lupande Game Management Area), the northern region of Kafue National Park and Nsumbu National Park-Tondwa Game Management Area, with populations stable at least in Luangwa and Kafue. Elsewhere it occurs in smaller populations in only a few protected areas, viz., Kasanka, West Lunga and Mweru Wantipa National Parks and some game management areas. The population of Kasanka National Park increased from 300 to >600 between 1989 and 1994, as a result of the ongoing efforts of the private Kasanka Trust to improve the protection and management of this park.

Malawi: Probably occurred quite widely in former times in dambo grasslands within the savanna woodlands of central and northern Malawi. It is relatively easily hunted and has been eliminated from almost all of its former range. Small populations survive in Kasungu National Park and Vwaza Marsh Game Reserve, and occasional vagrants occur in Nyika National Park. Males were translocated from Zambia in 1984 to improve the breeding prospects of the Kasungu population, which has subsequently undergone a 4-fold increase.

Namibia: Recorded from communal land in Eastern Caprivi, where it probably occurs only as a vagrant.

Botswana: Formerly numerous along the Chobe/Linyanti River, but now confined to a relic population on the Chobe River floodplain in the northeast of Chobe National Park.

Zimbabwe: Occurs as a rare vagrant in the protected areas of the Middle Zambezi Valley, presumably through dispersal of animals from the Luangwa Valley in eastern Zambia.

SUMMARY
The puku formerly occurred widely in grasslands near permanent water within the savanna woodlands and floodplains of South-central Africa. It has been eliminated from large parts of its former range and reduced to fragmented, isolated populations but some of these are still numerous. Large numbers now occur in only two countries, Tanzania and Zambia. The key areas for the puku's long-term survival are Kilombero and Katavi-Rukwa in southern Tanzania and Kafue, the Luangwa Valley and Nsumbu-Tondwa-Mweru Wantipa in Zambia. In view of the relatively small number of protected areas which support viable populations of this species, other protected areas with smaller populations such as Kasanka and West Lunga (Zambia), Kasungu (Malawi) and Chobe (Botswana) are also important for its conservation.

Estimated Total Numbers: Recent aerial survey estimates are available for most of the puku's major populations (Appendix 4). Estimated overall population densities in areas where the species is common include 1.5 per sq km in North Luangwa and Kasanka National Parks (D. Owens, in litt. October 1995; Goldspink et al. 1998), 3.5 per sq km in Tondwa Game Management Area (Kapungwe 1994b) and 7.6 per sq km in Kilombero Game Controlled Area (TWCM 1995c). It occurs locally at higher densities within these areas. Assuming an average correction factor for undercounting bias in aerial surveys of 1.5, and that areas for which population estimates are unavailable support 1.0 per sq km where the puku is known to be common/abundant and 0.05 per sq km elsewhere, gives a total population of 1 30,000 of which about one-third is in reasonably well protected areas. The major populations in Kilombero, North and South Luangwa, Lupande and Kafue are stable, but most other populations are in decline because of poaching and loss of habitat.

The Future: If present trends continue, the puku's status should remain unchanged, but its restricted distribution makes it potentially at risk. The Kilombero population, for example, comprises over half of the estimated total numbers and any future changes in the status of this population could have a major impact on the species' overall status.

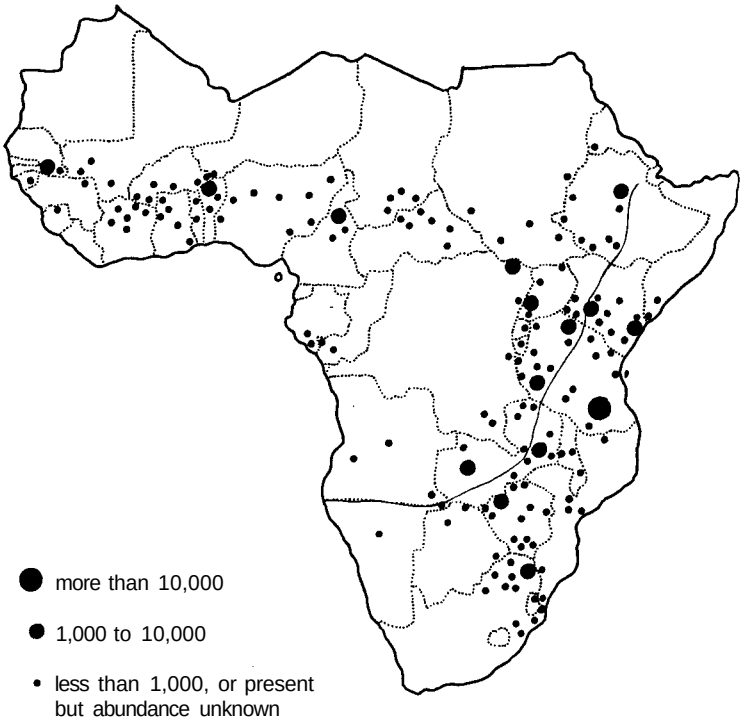
## Waterbuck

*Kobus ellipsiprymnus* (Ogilby 1833)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
north and west of line: defassa waterbuck (*K. e. defassa*)
east and south of line: ellipsen waterbuck (*K. e. ellipsiprymnus*)

Status of Subspecies
defassa waterbuck: Lower Risk (conservation dependent)
ellipsen waterbuck: Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Defassa Waterbuck | | | | | | | | |
| Mali | 100 | D | - | - | U/R | D | >100 | D |
| Niger | <300 | D | - | - | - | - | <300 | D |
| Senegal | 3,300 | D | - | - | X | ? | >3,300 | ? |
| Gambia | - | - | - | - | - | - | Ex | - |
| Guinea-Bissau | - | - | - | - | C | D | C | D |
| Guinea | - | - | - | - | U | D | U | D |
| Sierra Leone | U | D | - | - | - | - | U | D |
| Ivory Coast | >780 | D | - | - | - | - | >780 | D |
| Burkina Faso | 550 | S | - | - | U/R | D | >550 | D |
| Ghana | C/U | S/D | - | - | - | - | C/U | S/D |
| Togo | U/R | D | - | - | - | - | U/R | D |
| Benin | > 1,000 | S/D | - | - | - | - | >1,000 | S/D |
| Nigeria | >200 | D | - | - | - | - | >200 | D |
| Chad | 360 | S | - | - | U/R | D | U | S/D |
| Cameroon | 2,760 | D | - | - | R | D | >2,760 | D |
| CAR | <1,340 | D | - | - | U/R | D | >1,340 | D |
| Gabon | C/U | S/D | - | - | U | D | U | D |
| Congo-Brazz. | U/R | D | - | - | - | - | U/R | D |
| Congo-Kinshasa | >2,500 | S/D | - | - | ? | ? | >2,500 | S/D |
| Sudan | 100 | D | - | - | X | D | X | D |
| Eritrea | - | - | - | - | U | ? | U | ? |
| Ethiopia | >1,140 | S/D | - | - | >1,800 | S/D | >2,940 | S/D |
| Uganda | >2,720 | S/D | - | - | 50 | D | >2,770 | S/D |
| Kenya | >510 | S | - | - | 140 | D | 650 | D |
| Tanzania | >3,060 | S | - | - | >2,730 | S/D | >5,790 | S/D |
| Rwanda | 300 | D | - | - | - | - | 300 | D |

| Country | Protected Areas Poon/Abund. | Trend | Private Land Poon/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Defassa Waterbuck (continued) | | | | | | | | |
| Burundi | 500 | S/D | - | - | - | - | 500 | S/D |
| Angola | - | - | - | - | R | D | R | D |
| Zambia | >1,400 | S/D | 160 | S/I | U/R | D | >1,560 | S/D |
| Subspecies Total | >22,920 | D | 160 | S/I | >4,720 | D | >27,000 | D |
| Ellipsen Waterbuck | | | | | | | | |
| Ethiopia | - | - | - | - | - | - | Ex? | - |
| Somalia | X | ? | - | - | X | ? | X | ? |
| Kenya | >3,110 | D | - | - | 4,250 | S/D | >7,360 | S/D |
| Tanzania | >11,920 | S/I | - | - | >1,460 | S/D | >13,380 | S |
| Zambia | 5,640 | S/D | 150 | S/I | >2,180 | D | >7,970 | S/D |
| Malawi | >780 | D | - | - | - | - | >780 | D |
| Mozambique | >680 | D | - | - | X | D | >680 | D |
| Namibia | - | - | >160 | S/I | R | D | >160 | ? |
| Botswana | 160 | S/I | 230 | S/D | 610 | S/I | 1,000 | S/I |
| Zimbabwe | >3,040 | s | 3,960 | S/I | 1,180 | S | >8,180 | S/I |
| South Africa | 4,180 | S/I | 8,700 | I | - | - | 12,880 | I |
| Swaziland | >50 | s | X | I | - | - | >50 | S/I |
| Subspecies Total | 29,560 | S/D | 13,200 | I | >9,680 | D | >52,000 | S/D |
| Species Total | >52,480 | D | 13,360 | I | >14,400 | D | >79,000 | D |

OVERVIEW OF CONSERVATION STATUS

Mali: Formerly occurred widely in the southwest, but now reduced to a few small, isolated, declining populations in areas such as the Boucle du Baoule and Bafing protected areas.

Niger: Formerly occurred in savanna woodlands in the southwest and south. By the late 1980s, it had been eliminated throughout its former range except for W National Park-Tamou Faunal Reserve where its population was small and decreasing. No recent information on its status.

Senegal: The defassa waterbuck formerly occurred widely in the southern savannas. It has been eliminated from most of its former range by meat hunters, and it is now largely or entirely restricted to the Niokolo-Koba National Park-Faleme region in the southeast. It still occurs in good numbers in Niokolo-Koba.

Gambia: Formerly occurred widely, but it was exterminated by loss of habitat and overhunting.

Guinea-Bissau: Formerly occurred very widely, but it has disappeared from most of northern and northeastern Guinea-Bissau. It still occurs widely in the Cantanhez Forest, Corubal River and Boe regions in the southwest, south and southeast, where it is locally common.

Guinea: Formerly widespread in the northern savannas, but the little available information suggests that it is now confined to decreasing populations in a few scattered localities. It is absent from Badiar National Park.

Sierra Leone: Formerly occurred widely in the northern savannas and in adjoining areas of farm bush. By the 1980s it had been reduced to a few remnant populations, with the largest numbers in Outamba-Kilimi National Park. No recent information on its status.

Ivory Coast: Formerly widespread within the northern and central savannas. It is now restricted to

*Waterbuck (continued)*
protected areas, generally in small, decreasing populations. The only area where it is still reasonably common is Comoe National Park, where poaching is estimated to have reduced its numbers by 40% since the 1970s.

Burkina Faso: Formerly occurred widely within savanna woodland. It has been largely or entirely eliminated from the northern and central parts of its former range, but survives in low to moderate numbers in most of the protected areas in the south. The population of Arly National Park decreased markedly between 1981 and 1991, probably because of poaching, but has subsequently stabilised.

Ghana: Formerly occurred widely in savanna woodlands. It has disappeared from most of its former range and is now confined to protected areas. Healthy populations persist in Mole and Bui National Parks and Gbele Game Production Reserve in the northwest, but elsewhere its populations are small and decreasing.

Togo: Formerly occurred locally near permanent water. By the mid-1980s it was largely or entirely restricted to the Keran-Oti Valley and Fazao protected areas, with total numbers in the hundreds and increasing. It has since been reduced to small, rapidly declining populations by the destruction of the country's protected areas in the early 1990s.

Benin: Formerly occurred more or less throughout. It has been eliminated from large parts of its former range, especially in the south, and survives mainly in national parks, hunting zones and classified forests in northern and central regions. The major surviving population is in Pendjari National Park, where its numbers are stable.

Nigeria: The defassa waterbuck formerly occurred widely in central and northern Nigeria. By the 1980s, it was largely or entirely confined to nominally protected areas where its populations were generally small and decreasing. Its numbers and distribution have probably continued to decline.

Chad: The defassa waterbuck formerly occurred widely near permanent water in the savanna zone of southern Chad. It has been eliminated from a substantial part of its former range by uncontrolled hunting, the expansion of livestock and agriculture, and the effects of drought. It persists in moderate numbers in the southeast, including Zakouma National Park. The viable remnant population which survives in Manda National Park should recover its numbers if this park is successfully rehabilitated.

Cameroon: Formerly widespread in grassland close to permanent water within the savanna and sahel zones of northern and central Cameroon. It has been eliminated from large areas of its former range by poaching and the expansion of settlement, but survives in substantial numbers in Bouba Ndjida, Benoue and Faro National Parks and the adjoining hunting zones in the savanna woodlands of North Province. There was a population of about 200 waterbuck in Waza National Park in the early 1960s, but it had disappeared from this park by the late 1970s.

Central African Republic: Formerly widespread near water in savanna woodlands throughout most of the country and in forest-savanna mosaic along the northern edge of the moist lowland forest zone in the south. It has disappeared from large areas of its former range but survives locally in the north and east, in greatly reduced numbers. This decline has been caused by uncontrolled hunting for meat. The largest surviving populations are in and around Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks in the north, where aerial surveys indicate a population decrease of more than 40% since the mid-1980s. It seems to have disappeared completely from areas such as the hunting concessions to the east and southeast of Bamingui-Bangoran National Park, for unknown reasons which may be unrelated to poaching. It is uncommon or rare and declining in other regions where it was common until recently and there are still extensive areas of good waterbuck habitat, e.g., the Chinko Basin and Bangassou.

Gabon: Formerly occurred widely in the savannas of southern Gabon and the adjoining Congo Republic, but hunting for meat has eliminated it from much of its former range. It survives mainly in the open savannas of Moukalaba Faunal Reserve within the Gamba protected area complex. This population probably comprises a few hundred individuals and is regularly poached for meat. It occurs in unknown numbers southwards to the Congo border, where it is hunted by villagers.

Congo-Brazzaville: Formerly occurred widely in the southern savannas, but it has been eliminated from most of its former range by overhunting for meat. It is reported to survive in Mount Fouari and Tsoulou Faunal Reserves and a few may also survive in the Conkouati reserve, but it may be on the verge of extinction in Congo-Brazzaville.

Congo-Kinshasa: The defassa waterbuck formerly occurred widely in the north, east and south. It has probably been eliminated from most of its former range by uncontrolled hunting for meat. A substantial population survives in Garamba National Park and it is also common in the central plains of Virunga National Park.

Sudan: The defassa waterbuck was formerly widespread at low to moderate densities over most of southern Sudan and along the Ethiopia border in the east. Aerial surveys in the 1970s and early-mid 1980s gave population estimates of 2,500 in Southern National Park, 8,900 in Jonglei, <1,000 in Boma and a total population estimate of 34,910. It is often hunted for meat and has now disappeared from some parts of its former range, e.g., Radom National Park, but it survives locally at least in small numbers in areas such as Dinder National Park and in parts of the southwest and southeast.

Eritrea: Formerly occurred in the southwestern savannas. It survives locally in small numbers, e.g., in the Gash-Setit area.

Ethiopia: The defassa waterbuck formerly occurred widely in the better-watered regions of western and central Ethiopia. This subspecies has been eliminated from substantial parts of its former range but remains locally common in some areas, e.g., Awash National Park, the floodplains of the central Awash River valley, Nechisar, Omo and Mago National Parks and Murule Controlled Hunting Area. The ellipsen waterbuck formerly occurred locally in riverine vegetation in the southeast, mainly on the Webi Shabelle which is the only permanent river in the eastern lowlands, but a recent survey found no evidence of its survival there. The large swamps along the Shabelle, which were probably important wildlife habitats in the past for water-dependent species, are now drained and extensively cultivated. Much of the riverine forest has also been destroyed.

Somalia: The ellipsen waterbuck formerly occurred on the riverine grasslands of the Shebelle and Juba Rivers and in the Lake Badana area in the extreme south. By the 1980s, most of its riverine habitats had been lost to agriculture but it was still common in a few places on the lower Shebelle and in the Lake Badana area. It probably survives in these areas, at least in Bush Bush (Lake Badana) National Park.

Uganda: Eliminated from a large part of its former range. It still occurs in most of the remaining savanna wildlife areas of northwestern and southwestern Uganda, generally in low to moderate numbers. The largest surviving populations, all of which are stable, are in Queen Elizabeth, Murchison Falls and Lake Mburo National Parks.

Kenya: Formerly widespread within suitable habitat close to permanent water in central and southern Kenya, but it has been eliminated from large parts of its former range in central and southwestern districts. The defassa waterbuck occurs to the west and the ellipsen waterbuck to the east of the Rift Valley, with intermediate forms in the areas where the two subspecies meet. It occurs in moderate numbers in most protected areas within its range and outside protected areas in districts such as Kajiado and Laikipia. The largest surviving populations occur in the coastal rangelands of Lamu district and in Lake Nakuru National Park. The population of Tsavo National Park has decreased markedly since the 1970s. Numbers are also decreasing in areas such as Amboseli and Meru National Parks and the Mara ranches.

*Waterbuck (continued)*

Tanzania: Occurs widely but locally within its former range, which included grasslands close to permanent water throughout most of the country. The defassa waterbuck occurs on the western side and the ellipsen waterbuck on the eastern side of the Rift Valley wall. It has been eliminated from settled areas but occurs widely in protected areas with suitable habitat. The largest populations are in the Serengeti, Moyowosi-Kigosi and Katavi-Rukwa (defassa) and Selous Game Reserve, which supports Africa's largest surviving population of the ellipsen waterbuck.

Rwanda: Confined to Akagera National Park, where its numbers have decreased from an estimated 1,890 in 1990 because of poaching and loss of the northern part of the park to the encroachment of large numbers of pastoralists and their cattle.

Burundi: The defassa waterbuck formerly occurred throughout the savanna grasslands of the east and south. Hunting for meat and loss of habitat to the spread of intensive cultivation have eliminated it from most of its former range. It survived in good numbers in Ruvubu National Park in the 1980s, but this park has recently been the site of fighting between government troops and guerilla forces.

Angola: The defassa waterbuck formerly occurred locally in central and southern Angola. Very small populations survived in areas such as Kangandala and Bikuar National Parks and the Luando reserve in the mid-1970s. It is probably now on the verge of extinction.

Zambia: Formerly occurred over most of Zambia, with the ellipsen waterbuck in the Luangwa and Zambezi Valleys, the eastern plateau and parts of the southern plateau, and the defassa waterbuck on the western and northern plateaux. It has been eliminated from large parts of its former range and is now restricted to national parks and game management areas. The major surviving populations are in the Luangwa Valley (ellipsen) and the Kafue National Park area (defassa). The species occurs in small, stable or decreasing populations in most other protected areas.

Malawi: The ellipsen waterbuck formerly occurred widely. It is now confined to a few protected areas, with the main populations in Liwonde National Park and Nkhotakota Game Reserve.

Mozambique: The ellipsen waterbuck formerly occurred very widely. In the early 1980s, the floodplain grasslands of Marromeu Game Reserve and surrounds supported one of Africa's largest waterbuck concentrations, estimated to number 45,000. It also survived in substantial numbers in Gorongosa National Park (estimated population 2,000) but had been reduced to scattered remnant populations elsewhere. Its numbers decreased dramatically during the civil war of the 1980s and early 1990s, with estimated population declines of >99% in Marromeu and >95% in Gorongosa by 1994. It survives in low to moderate numbers in other areas such as Niassa Game Reserve and parts of Manica and Gaza Provinces, and it has been reintroduced to Maputo Game Reserve. Its numbers can be expected to recover as the current rehabilitation of the country's major wildlife areas proceeds.

Namibia: Occurs marginally in Namibia, where it is naturally confined to Eastern Caprivi. It has been introduced to private land in the northern farming districts.

Botswana: The ellipsen waterbuck formerly occurred locally near permanent water in the north and east. It still occurs quite widely within its restricted former range, with the largest numbers in the Okavango Delta. It occurs in small numbers in Moremi Game Reserve, the north of Chobe National Park and on the Tuli block farms in the east.

Zimbabwe: The ellipsen waterbuck formerly occurred very widely. It was largely eliminated from the highveld by the expansion of livestock ranching and agriculture but has subsequently been reintroduced to game ranches. Natural populations persist in moderate numbers in the protected areas of northwestern Matabeleland, Sebungwe and the Middle Zambezi Valley. The largest population occurs on Communal Land in the Sebungwe region. It is well represented on private

farmland.

South Africa: The ellipsen waterbuck formerly occurred in the bushveld and lowveld of Northwest, Northern and Mpumalanga Provinces and in a few areas in northeastern KwaZulu-Natal. It is now widespread on private game farms and provincial reserves in the bushveld and lowveld and occurs in good numbers in Kruger National Park and the protected areas of northeastern KwaZulu-Natal. The severe drought of 1991-92 reduced the largest population, in Kruger National Park, by more than 50% from the population levels of the 1980s. In contrast, total numbers in protected areas controlled by the KwaZulu-Natal Parks Board increased by 10% per annum during the early-mid 1990s.

Swaziland: Large herds formerly occurred in the northeast, but the population crashed as a result of large-scale habitat destruction caused by the expansion of the sugarcane industry. It has been reintroduced to private land in the northeastern lowveld where it is doing well. Small populations survive in Mlawula Nature Reserve and Hlane Game Reserve.

SUMMARY
The waterbuck formerly occurred near permanent water in savanna woodlands and forest-savanna mosaics throughout most of sub-Saharan Africa. It has been eliminated widely within its former range but survives in many protected areas and in some other areas which are sparsely populated by humans.

Important populations of the defassa waterbuck persist in areas such as Niokolo-Koba (Senegal), Comoe (Ivory Coast), Arly-Singou and Nazinga (Burkina Faso), Mole and Bui (Ghana), Pendjari (Benin), the national parks and hunting zones of North Province (Cameroon), Manovo-Gounda-St. Floris (Central African Republic), Moukalaba (Gabon), Garamba and Virunga (Congo-Kinshasa), the Awash Valley and Omo-Mago-Murule (Ethiopia), Murchison Falls and Queen Elizabeth National Parks (Uganda), Serengeti, Moyowosi-Kigosi, Ugalla River and Katavi-Rukwa (Tanzania) and Kafue (Zambia), but about half of these populations are in decline because of poaching.

Important populations of the ellipsen waterbuck occur in areas such as Tsavo, Laikipia, Kajiado, Lake Nakuru and the coastal rangelands (Kenya), Tarangire and Selous-Mikumi (Tanzania), the Luangwa Valley (Zambia), northwestern Matabeleland, Sebungwe, the Middle Zambezi Valley and private farmland (Zimbabwe) and Kruger, Hluhluwe-Umfolozi and private land (South Africa). About 40% of these key populations of the ellipsen waterbuck have decreased during the last 10 years but others have increased, e.g., in Selous-Mikumi and on private land in South Africa.

Intermediates between the two subspecies occur where their distributions meet along the Rift Valley.

Estimated Total Numbers: Waterbuck population densities can reach high levels within localised areas of favourable habitat, e.g., >10.0 per sq km in Lake Nakuru National Park (Butynski et al. 1997). More typical density estimates obtained by aerial surveys of areas where the species is reasonably common are of the order 0.05-0.15 per sq km, e.g., Arly (Barry & Chardonnet 1998), Pendjari (Chardonnet 1995), Zakouma (D. Moksia, in litt. July 1995), Manovo-Gounda-St. Floris (J. L. Tello, in litt. September 1995), Omo-Mago-Murule-Chew Bahir (Thouless 1995a; Graham et al. 1997), Murchison Falls and Lake Mburo (Lamprey & Michelmore 1996), Serengeti (TWCM 1997), Biharamulo-Burigi (TWCM 1991), Ugalla River (TWCM 1992a), Katavi-Rukwa (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Kafue (Yoneda & Mwima 1995), South Luangwa and Luambe (Jachmann & Kalyocha 1994), Matetsi, Mana Pools, Middle Zambezi Valley and Sebungwe (Davies et al. 1996) and Kruger (P. Viljoen, in litt. February 1995).

Higher densities of 0.2-0.9 per sq km have been recorded in aerial surveys of a few areas, e.g., Queen Elizabeth National Park (Lamprey & Michelmore 1996), Selous-Mikumi (TWCM 1995c), North Luangwa (D. Owens, in litt. October 1995) and Chizarira (Davies et al. 1996). Ground surveys have provided density estimates of the order 0.4-1.5 per sq km in areas where the

*Waterbuck (continued)*
species is common, e.g., Nazinga (U. Belemsobgo, in litt. October 1995), Ruma (Butynski et al. 1997), Hluhluwe-Umfolozi, Eastern Shores and Itala (Rowe-Rowe 1994).

Assuming an average correction factor for undercounting bias in aerial surveys of 2.0 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.5 per sq km where the species is known to be common and 0.05 per sq km elsewhere, the information in Appendix 4 gives a total population estimate of about 200,000 (more than half in protected areas). This includes approximately 95,000 defassa waterbuck (about 60% in protected areas) and 105,000 ellipsen waterbuck (more than half in protected areas plus 13% on private land). Overall population trend is decreasing for both subspecies.

The Future: The decline of a significant proportion of waterbuck populations probably reflects the species' susceptibility to poaching, since it occurs mainly along watercourses where poaching activities are often concentrated. If current trends continue, both subspecies but particularly the defassa will disappear from substantial areas where they still occur and hence the distributions of the surviving populations will become more fragmented. However, the species' overall status may not change as long as significant parts of its range continue to receive adequate protection and its numbers continue to increase on private land.

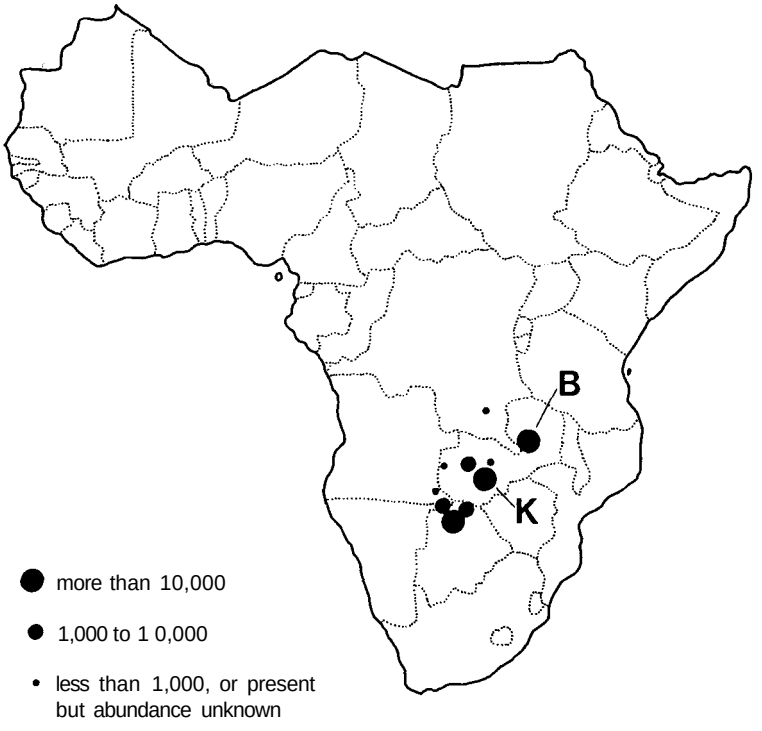
**Lechwe**
*Kobus leche* Gray 1850

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
B: black lechwe (*K. l. smithemani*)
K: Kafue lechwe (*K. l. kafuensis*)
all other locations: red lechwe (*K. l. leche*)

Status of Subspecies
black lechwe: Vulnerable
Kafue lechwe: Vulnerable
red lechwe: Lower Risk (conservation dependent)

An additional subspecies, Roberts' lechwe (*K. l. robertsi*) of northwestern Zambia, is extinct.




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Red Lechwe | | | | | | | | |
| Congo-Kinshasa | V | D | - | - | R | D | R | D |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Zambia | >4,500 | I | - | - | U/R | ? | >4,500 | ? |
| Namibia | 170 | I | - | - | 4,300 | D | 4,470 | D |
| Botswana | 6,000 | S/D | - | - | 65,830 | S/D | 71,830 | S/D |
| Subspecies Total | >10,670 | S | - | - | 70,130 | D | >80,800 | D |
| Kafue Lechwe | | | | | | | | |
| Zambia | 65,000 | I | 185 | S/I | - | - | >65,000 | I |
| Black Lechwe | | | | | | | | |
| Zambia | 30,000 | S | - | - | - | - | 30,000 | S |
| Species Total | >105, 670 | S/I | 185 | S/I | 70,130 | D | >175, 800 | S/D |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: The red lechwe formerly occurred locally on floodplains in the southeast. By the 1970s, it had been exterminated in most of its former range but a substantial population occurred along the Lualaba River to the west of Upemba National Park, where it was heavily poached by commercial meat hunters. It is reported to still occur in small, decreasing numbers in this area.

Angola: The red lechwe formerly occurred on floodplains in central, eastern and southeastern Angola. Its numbers are now severely reduced but it survives in at least a few localities, e.g., in the southeast.

*Lechwe (continued)*

Zambia: Formerly occurred locally on floodplain grasslands, with the red lechwe on the Upper Zambezi and Kafue Rivers and scattered locations elsewhere in the north and west, the Kafue lechwe in a single large population on the Kafue Flats, the black lechwe in the Bangweulu Basin and upper Chambeshi River, and Roberts' lechwe on the Luongo and Luena Rivers and Pambashye Swamps in the northwest. The largest surviving population of the red lechwe is on the Busanga Plain in the northwest of Kafue National Park, where numbers have increased steadily since 1950. This population has now spread into the adjacent Kasonso-Busanga Game Management Area. The red lechwe also survives in unknown but smaller numbers in the Lukanga Swamps of the upper Kafue River system in central Zambia and in parts of the upper Zambezi floodplains in the west.

The other two surviving subspecies are endemic to Zambia. Most of the Kafue Flats are included in two national parks, Lochinvar and Blue Lagoon, and the adjoining Kafue Flats Game Management Area. Water flow on the Kafue floodplain has been regulated almost entirely by human needs since the construction of hydroelectric dams at the eastern and western ends of the Flats in the 1970s. The Kafue Flats are also used for livestock grazing and the peripheral area is densely settled, particularly in the south. The population of the Kafue lechwe decreased from 90,000-100,000 in the early 1970s, before the closure of the dams, to 40,000-50,000 in the early to mid-1980s. It has subsequently shown a general trend of slow increase from an estimated 47,000 in 1989 to about 65,000 in the mid-1990s. Most of the lechwe are concentrated in and immediately south of Blue Lagoon National Park on the north bank of the Kafue River and in Lochinvar National Park on the south bank, extending into the game management area in diminishing numbers up to 14 km west of Lochinvar. Protection of these areas and maintenance of a semi-natural seasonal flooding regime are critically important to the future of the Kafue lechwe. Lochinvar National Park, in particular, benefitted from the WWF-Zambia Wetlands Project. This project operated from 1986 to 1994 with the aims of maintaining the natural productivity of Zambia's two major wetlands (Kafue Flats and Bangweulu) and improving and broadening the benefits which local people derive from them.

The black lechwe may now be confined to the Bangweulu Basin, where its population increased from 16,000-17,000 in the late 1960s to about 40,000 in 1980 and subsequently decreased to 30,000, where it seems to have stabilised since the late 1980s. This is well below the population which could be supported by the available habitat in Bangweulu. Black lechwe numbers appear to be closely balanced between population stability and decline through illegal overhunting. Poaching is implicated in apparent large-scale changes in the dry season distribution of this subspecies, with a dramatic decrease in the numbers occupying the western end of the main Bangweulu Swamps where poaching is intense. In contrast, its numbers appear to be stable or increasing in the central section of the main swamp, and there has been a steady increase in the dry season population on the 100 sq km Chimbwi Plain in southeastern Bangweulu where the WWF-Zambia Wetlands Project established effective protection against poaching.

Namibia: The red lechwe occurs in the northeast, where it is confined to floodplains within the Caprivi Strip. The largest numbers occur on communal land in Eastern Caprivi, with small numbers in Western Caprivi Game Reserve and Mahango Game Park.

Botswana: The red lechwe still occupies most of its former range in northern Botswana, occurring in two separate populations in the Okavango Delta (estimated numbers >68,000) and along the Linyanti-Chobe River. It is common throughout the floodplains of the Okavango, including Moremi Game Reserve. The bulk of the smaller Linyanti-Chobe population occurs in the Linyanti swamps. Estimated total numbers have increased substantially since the mid-late 1980s but have shown a tendency to decline in recent years. This may reflect the effects of low annual flood levels in the Okavango during the early to mid-1990s.

SUMMARY

The lechwe is restricted to the margins between swamps and floodplains on the flat, silted-up river basins of the Central African plateau. It formerly occurred in large numbers in the larger, flatter basins with extensive areas of favourable habitat, reaching densities of 1,000 per sq km in

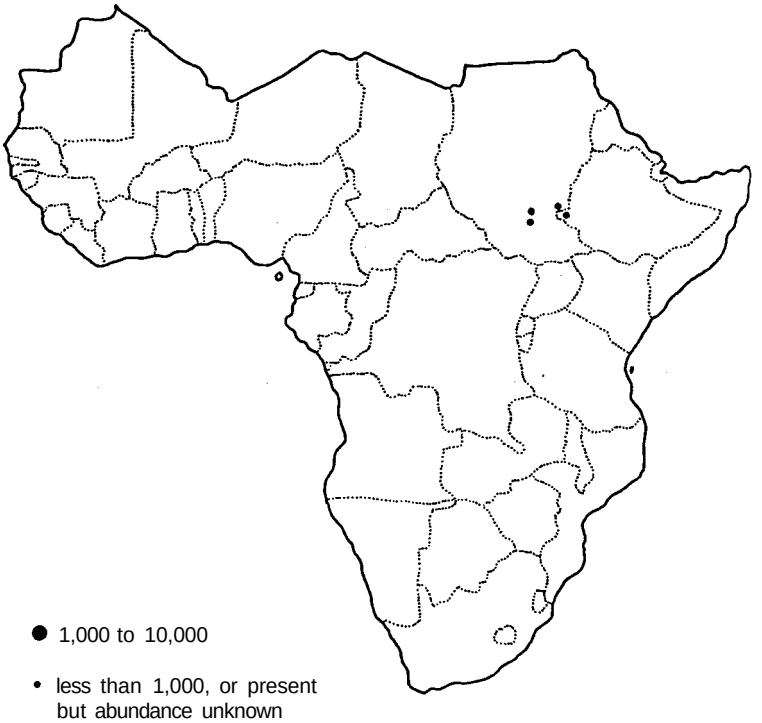
seasonal concentrations (Kingdon 1997). The distributions and populations of all three surviving subspecies have suffered substantial declines. Major concentrations are now confined to three areas: Okavango (red lechwe), Kafue Flats (Kafue lechwe) and Bangweulu (black lechwe). In addition, the red lechwe still occurs in scattered localities in other parts of Zambia and Botswana and in Namibia, Congo-Kinshasa and Angola, including significant populations in areas such as Busanga, Eastern Caprivi and Linyanti.

Estimated Total Numbers: Population estimates based on aerial surveys are available for all of the major surviving lechwe populations (see Appendix 4). The levels of undercounting bias in these surveys are unknown, but they provide estimated overall population densities of 4.0-10.8 per sq km in Bangweulu, Okavango, Busanga and Kafue Flats (Jeffery et al. 1989b; Jeffery 1994; Thirgood et al. 1994; DWNP 1995; D. Gibson, in litt. May 1997). Estimated densities are lower in other areas, e.g., 0.7 per sq km in Linyanti and 0.06 per sq km on the Chobe River floodplains (DWNP 1995).

The information in Appendix 4 includes total population estimates for the black and Kafue lechwes, and for the red lechwe in all areas where this subspecies is known to still be common. Assuming an average correction factor for undercounting bias in aerial surveys of 1.2, and that areas for which population estimates are unavailable support 0.06 red lechwe per sq km, gives total population estimates of 98,000 red lechwe (85% in the Okavango Delta), 78,000 Kafue lechwe and 36,000 black lechwe. Overall population trends are stable or increasing for the black and Kafue lechwes and for the red lechwe in protected areas but are decreasing for the red lechwe outside protected areas.

Captive Population: In 1996, 262 lechwe (157 Kafue lechwe, 42 red lechwe and the remainder of unknown subspecific status) were held in European zoos and 60 Kafue lechwe in North American zoos. There is an additional, large, non-zoo captive population of the Kafue lechwe in USA, including >500 held on Texas ranches.

The Future: The long-term survival of the lechwe in the wild is totally dependent on the effective protection and management of its remaining populations and their wetland habitats in a few critical areas, in particular Bangweulu (black lechwe), Kafue Flats (Kafue lechwe) and Okavango, Linyanti, Busanga and Caprivi (red lechwe). The species' conservation status should not deteriorate further as long as its habitats are maintained in these key areas and illegal hunting is adequately controlled. A significant proportion of the species' total numbers occurs outside national parks and game reserves (>80% for the red lechwe). It is therefore likely that both revenue generation through sustainable offtake by sport hunters which capitalises on the species' value as a trophy animal and the development of sustainable harvesting to provide meat for local people, e.g., in Bangweulu and Kafue Flats (Jeffery et al. 1996), will play an increasingly important role in the conservation of lechwe populations.




## Nile Lechwe

*Kobus megaceros* (Fitzinger 1855)

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Sudan | - | - | x | S/D | x | S/D |
| Ethiopia | >100 | ? | ? | ? | >100 | ? |

OVERVIEW OF CONSERVATION STATUS

Sudan: Known from only two localities in Sudan, with the bulk of the population in the Sudd swamps and smaller numbers in the Machar marshes near the Ethiopia border. In the 1980s, the population of the Sudd swamps was estimated to exceed 32,000 and was concentrated mainly within the swamps on the west bank of the Nile, where the inaccessibility of its habitat provides considerable protection against hunting. Recent reports indicate that this population seems to be surviving. No recent information is available on the status of the smaller Machar population, which was estimated to number about 900 in the early 1980s.

Ethiopia; Occurs marginally in the southwest, in the proposed Gambella National Park, where its survival is probably highly precarious because of expanding human activities.

SUMMARY
The Nile lechwe is confined to seasonally flooded swamps and grasslands within the Sudd and Machar-Gambella wetlands of southern Sudan and southwestern Ethiopia. The wildlife of these regions has been severely affected by civil war, the displacement and resettlement of human populations, proliferation of firearms and increased hunting for meat (Falchetti 1998). Nevertheless, the population of the Nile lechwe in the vast Sudd swamps has probably remained stable despite some hunting and the constraints to its seasonal movements imposed by settlement and the presence of large herds of livestock in the areas immediately surrounding the swamps (Kingdon 1997).

Estimated Total Numbers: No estimate of the Nile lechwe's population is available since 1983, when

aerial surveys of the Sudd region estimated a population of 30,000-40,000 with probably less than 1,000 animals in Machar-Gambella (Hillman & Fryxell 1988; Hillman 1988; Falchetti 1998). The inaccessibility of its habitat and the fragmentary recent information which is available on its status (e.g., Winter 1996) suggest that its numbers may still be of this order, but surveys are required urgently to clarify this (Falchetti 1998).

Captive Population: An increasing population of 160 Nile lechwe is held in 19 zoos (Falchetti 1998), with more than 80% of these animals in North America and the remainder in Europe. Inbreeding is a major problem and new founder stocks are required by capture of wild individuals.

The Future: The protection afforded by its habitat will probably enable the major concentration of the Nile lechwe in the Sudd swamps to persist, at least in the short to medium term, but its survival will eventually be threatened (if it is not already) in the complete absence of conservation measures. Falchetti (1998) outlined the priorities for both *in situ* and *ex situ* conservation of this species.

The urgent need to address these priorities as opportunity permits is underlined by plans to resuscitate the construction of the Jonglei canal, introduce irrigation and exploit oil reserves in southern Sudan, which could result in a dramatic deterioration of the Nile lechwe's status (Kingdon 1997).


Subfamily Peleinae

**Grey Rhebok**
*Pelea capreolus* (Forster 1790)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Botswana | - | - | - | - | - | - | Ex | - |
| South Africa | >4,640 | S | >5,000 | S/D | U | D | >9,640 | S/D |
| Swaziland | C/U | S | - | - | X | S/D | C/U | S/D |
| Lesotho | 200 | I | - | - | X | D | >200 | ? |
| Species Total | >4,840 | S/I | >5,000 | S/D | U | D | >9,840 | S/D |

OVERVIEW OF CONSERVATION STATUS

Botswana: This species is believed to have occurred formerly in hilly country around Gaborone in the southeast, but it no longer occurs in Botswana.

South Africa: Formerly occurred on rocky hills, grassy mountain slopes and plateaux in southern Northwest, Gauteng, western Mpumalanga, eastern Free State, western and central KwaZulu-Natal, Western Cape and Eastern Cape Provinces, the southern part of Northern Province and the western part of Northern Cape Province. It still occurs widely at low to moderate densities within its historical range, on private land and in protected areas. It occurs in 29 provincial reserves in Western, Eastern and Northern Cape Provinces, smaller numbers of provincial reserves in other provinces and at least six national parks. The largest protected population occurs in Natal Drakensberg Park. Overall numbers are generally stable, with localised reductions on some private farms and the periphery of some protected areas because of poaching and harassment by uncontrolled dogs.

Swaziland: Formerly occurred widely in the highveld of western Swaziland. It has disappeared from parts of its former range, but it is fairly common in Malolotja Nature Reserve and still survives locally in unprotected areas.

Lesotho: Probably occurred widely in the past, but it has been reduced to a few scattered remnant populations. It responded well to protection in Sehlabathebe National Park in the 1980s. No recent information on its status.

SUMMARY
The grey rhebok formerly occurred widely in montane and plateau grasslands in southern Africa. It has been eliminated from substantial parts of its former range, but it remains locally common in protected areas and on private land. It often co-exists with livestock.

Estimated Total Numbers: Summation of the available population estimates gives a total of >9,800, but this excludes substantial areas for which estimates are unavailable. Estimated population densities of the grey rhebok in protected areas are generally in the range 0.5-1.7 per sq km, e.g., in Mountain Zebra, Golden Gate Highlands and Royal Natal National Parks, Natal Drakensberg Park and Sterkfontein Dam Nature Reserve, but occasionally lower, e.g., 0.2-0.3 per sq km in Addo-Zuurberg and Karoo National Parks, or higher, e.g., 4.3 per sq km in Bontebok National Park (Anderson et al. 1996).

Assuming a low population density (0.1 per sq km) for areas where the species occurs but its abundance is unknown, the information in Appendix 4 suggests a total population of about 18,000, of which at least one-quarter is in protected areas and more than 30% on private land. Population trend is generally stable in protected areas but decreasing in some other parts of its range.

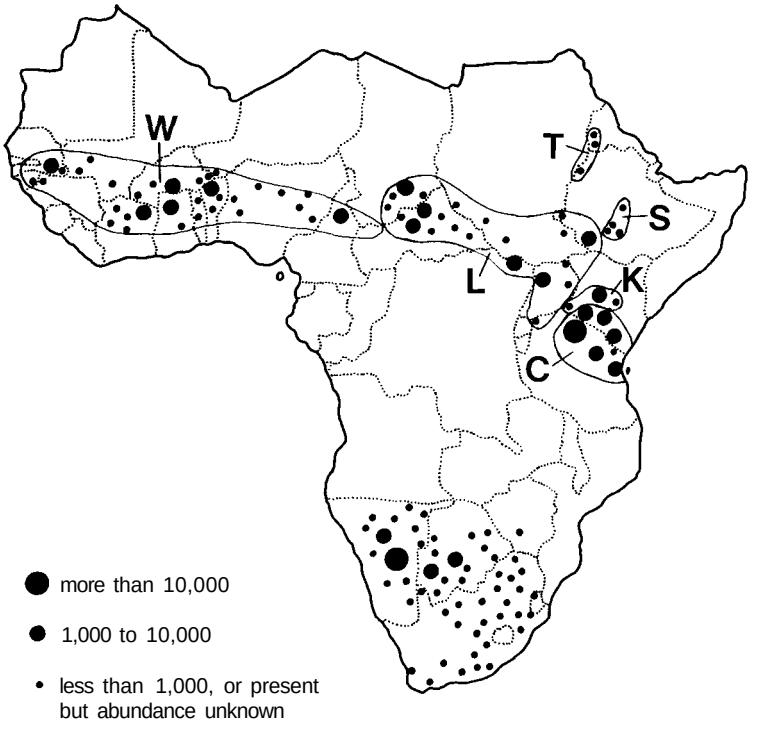
The Future: The status of the grey rhebok will remain satisfactory as long as it continues to be well represented by stable populations in a good number of protected areas and on substantial tracts of private land.

Subfamily Alcelaphinae

**Common Hartebeest**
*Alcelaphus buselaphus* (Pallas 1766)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
W: western hartebeest (*A. b. major*)
L: lelwel hartebeest *(A. b. lelwel)*
T: tora hartebeest (*A. b. tora*)
S: Swayne's hartebeest (*A. b. swaynei*)
K: Kenya hartebeest (*A. b. cokei* x *lelwel*)
C: Coke's hartebeest (*A. b. cokei*)
southern Africa: red hartebeest (*A. b. caama*)




Status of Subspecies
western hartebeest: Lower Risk (conservation dependent)
lelwel hartebeest: Lower Risk (conservation dependent)
tora hartebeest: Endangered
Swayne's hartebeest: Endangered
Kenya hartebeest: Lower Risk (conservation dependent)
Coke's hartebeest: Lower Risk (conservation dependent)
red hartebeest: Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Western Hartebeest | | | | | | | | |
| Mali | >190 | D | - | - | <100 | D | 290 | D |
| Niger | 320 | D | - | - | 100 | D | 420 | D |
| Senegal | 2,650 | S | - | - | X | ? | >2,650 | ? |
| Gambia | - | - | - | - | - | - | Ex? | - |
| Guinea-Bissau | - | - | - | - | R | D | R | D |
| Guinea | - | - | - | - | R | D | R | D |
| Ivory Coast | >6,580 | ? | - | - | - | - | >6,580 | D |
| Burkina Faso | >4,500 | S/D | - | - | X | D | >4,500 | ? |
| Ghana | C/U | D | - | - | - | - | C/U | S/D |
| Togo | U/R | S | - | - | - | - | U/R | D |
| Benin | >2,000 | D | - | - | U/R | S/D | >2,000 | S/D |
| Nigeria | >200 | - | - | - | - | - | >200 | D |
| Chad | - | D | - | - | - | - | Ex? | - |
| Cameroon | 7,970 | - | - | - | U/R | D | >7,970 | D |
| CAR | - | - | - | - | - | - | Ex? | - |
| | | S/D | - | - | | | | |
| Subspecies Tota | >24,410 | - | - | - | U/R | D | >24,500 | D |

| Country | Protected Areas Poon/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Poon/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Lelwel Hartebeesi | | | | | | | | |
| Chad | 1,920 | S/I | - | - | C/U | D | >1,920 | S/D |
| CAR | <8,000 | S/D | - | - | U/R | D | >8,000 | D |
| Congo-Kinshasa | 2,950 | I | - | - | ? | ? | 2,950 | I |
| Sudan | R | D | - | - | X | D | X | D |
| Ethiopia | >1,380 | D | - | - | ? | ? | >1,380 | D |
| Uganda | 3,230 | S/D | - | - | 140 | D | 3,370 | S/D |
| Kenya | - | - | - | - | - | - | Ex | - |
| Tanzania | U/R | D | - | - | - | - | U/R | D |
| Subspecies Total | 17,480 | S/D | - | - | >140 | D | >17,620 | D |
| Tora Hartebeest | | | | | | | | |
| Sudan | - | - | - | - | - | - | Ex? | - |
| Eritrea | - | - | - | - | U/R | D | U/R | D |
| Ethiopia | - | - | - | - | X | ? | X | ? |
| Swavne's Hartebeest | | | | | | | | |
| Ethiopia | 195 | D | - | - | 15 | D | 210 | D |
| Somalia | - | - | - | - | - | - | Ex | - |
| Kenya Hartebeest | | | | | | | | |
| Kenya | 220 | S/D | - | - | 2,200 | S | 2,420 | S |
| Coke's Hartebeesi | | | | | | | | |
| Kenya | 5,520 | D | - | - | 6,740 | S | 12,260 | D |
| Tanzania | 14,210 | D | - | - | >I,950 | S/D | >16,160 | D |
| Subspecies Total | 19,730 | D | - | - | >8,690 | S/D | >28,420 | D |
| Red Hartebeest | | | | | | | | |
| Angola | - | - | - | - | - | - | Ex? | - |
| Namibia | 1,000 | S/I | 50,800 | I | 150 | D | 51,950 | I |
| Botswana | 16,700 | S/I | 50 | S/I | 27,600 | S | 44,350 | S/I |
| Zimbabwe | - | - | 50 | I | - | - | 50 | I |
| South Africa | 5,340 | S/I | >6,000 | I | - | - | >11,340 | I |
| Swaziland | C | S | - | - | - | - | C | S |
| Lesotho | - | - | - | - | - | - | Ex | - |
| Subspecies Total | >23,040 | S/I | >56,900 | I | 27,750 | S | >107,690 | I |
| Species Total | >85,000 | s? | >56,900 | I | >38,700 | S/D | >180,000 | S? |

OVERVIEW OF CONSERVATION STATUS

Mali: The western hartebeest has been eliminated from most of its former range in the southwestern savannas where it was formerly common, including the Boucle du Baoule protected area complex. Small, declining populations survive in Bafing Faunal Reserve and the area between Bamako, Bougouni and Sikasso.

*Common Hartebeest (continued)*

Niger: The western hartebeest formerly occurred widely in the savanna woodlands of the southwest. By the late 1980s, it was confined to W National Park-Tamou Faunal Reserve and a few other areas in the southwest and its numbers were decreasing because of illegal hunting and habitat degradation. No recent information on its status.

Senegal: The western hartebeest formerly occurred throughout the savanna woodlands of southern Senegal, extending northwards to the central Ferlo region. It has been exterminated throughout most of its former range by hunting for meat and the expansion of settlement. It survives mainly in Niokolo-Koba National Park and Faleme Hunting Zone in the southeast. Niokolo-Koba supports an important population. A few hartebeest may survive in the central Casamance region in the south where it is on the verge of local extinction because of overhunting.

Gambia: The western hartebeest formerly occurred in the savanna woodlands of eastern Gambia, but it is now probably extinct.

Guinea-Bissau: The western hartebeest is confined to the southern and southeastern savanna woodlands, where it survived in small numbers in the Corubal River area in the early 1990s.

Guinea: The western hartebeest probably occurred throughout the northern savanna woodlands in the past, but information from local rural people suggests that it survives in only a few parts of its former range. It is absent from Badiar National Park.

Ivory Coast: The western hartebeest formerly occurred throughout the savannas in the northern half of the country. It is now restricted to protected areas and is still common in a few of these, e.g., Comoe and Marahoue National Parks and Haut Bandama Game Reserve. These populations have been affected adversely by poaching, e.g., its numbers decreased by 60% in Comoe National Park between 1978 and 1995-96.

Burkina Faso: The western hartebeest formerly occurred throughout the savanna woodlands of central and southern Burkina Faso. It has been eliminated widely in the central region of the country but survives in most of the protected areas in the south. It occurs in good, stable or increasing numbers in Diefoula Classified Forest and Nazinga Game Ranch, but the population of Arly National Park has been reduced to low levels by poaching.

Ghana: The western hartebeest formerly occurred in savanna woodland throughout northern, central and southeastern Ghana. It has disappeared from most of its former range as a result of overhunting and the expansion of cultivation, settlement and livestock grazing. It survives in a few protected areas, with the major population in Mole National Park where it has responded well to protection.

Togo: Formerly occurred widely in the central and northern savanna woodlands. By the mid-1980s it was restricted to the Keran-Oti Valley and Fazao protected areas, with total numbers in the hundreds and increasing. It was subsequently reduced to small, rapidly decreasing populations by the destruction of the country's protected areas in the early 1990s.

Benin: The western hartebeest formerly occurred widely in savanna woodland, but it is now confined to national parks, hunting zones and the larger classified forests in northern and central regions. The major surviving population is in Pendjari National Park and the adjoining Pendjari and Atakora Hunting Zones. Elsewhere it is generally uncommon or rare and in decline.

Nigeria: The western hartebeest formerly occurred widely in the savanna woodlands of central Nigeria. By the late 1980s, it was largely or entirely confined to nominally protected areas where its numbers were generally small and decreasing, although it was still fairly common in a few areas such as the northern section of what is now Gashaka-Gumpti National Park. No recent information is available on its status, but its overall numbers and distribution have probably

continued to decline.

Chad: Formerly occurred widely in the savanna zone of southern Chad, with the western uartebeest in the southwest to the west of the Logone River and the lelwel hartebeest in south-central and southeastern areas. It has disappeared from substantial parts of its former range because of uncontrolled hunting, the expansion of livestock and agriculture, and the effects of drought. The western hartebeest's former range included Binder Lere Faunal Reserve. A recent aerial survey did not detect this species' presence in this reserve, where the wildlife populations are now severely depleted. The lelwel hartebeest still occurs widely in Salamat, including areas such as Aouk Hunting Zone, Zakouma National Park and Siniaka Minia Faunal Reserve. The Zakouma population has increased significantly since the 1980s as a result of the improved protection of this park. The viable remnant population which survives in Manda National Park should recover its former abundance if current attempts to rehabilitate this park are successful.

Cameroon: The western hartebeest formerly occurred widely in the savanna woodlands of northern Cameroon, where it was generally the most abundant large antelope. It has probably been reduced to very low densities or eliminated over large parts of its range by uncontrolled poaching and the expansion of settlement, but a major concentration survives in Bouba Ndjida, Benoue and Faro National Parks and the adjoining hunting zones of North Province.

Central African Republic: Formerly occurred in savanna woodlands throughout much of the country, with the western hartebeest in the west and the lelwel hartebeest in the north and east. There is no recent information that the western hartebeest survives in CAR, and extensive areas of its former habitat are now settled. The lelwel hartebeest still occurs widely in the north and east but its numbers have declined steeply as a result of uncontrolled meat hunting, which is mainly performed by poachers from Sudan and Chad. The main surviving population occurs in and around Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks, but numbers in these areas decreased by >70% between 1985 and 1995 and are continuing to decline, except for the population of Sangba Pilot Zone and adjoining hunting concessions to the east and southeast of the Bamingui-Bangoran park. Elsewhere in the north and east, e.g., in the Chinko Basin, the lelwel hartebeest has been reduced to a few small, scattered, remnant populations or eliminated. The total population is probably now only a small fraction of the 100,000 estimated to occur in the 1980s.

Congo-Kinshasa: The lelwel hartebeest formerly occurred in the northern and northeastern savannas. It survives in good numbers in the southern and central sections of Garamba National Park, where its population increased with effective protection between 1984 and 1995, but it has been reduced to very low densities or eliminated by Sudanese meat hunters in the northern section of the park and the adjoining reserves. There is no recent information on its status elsewhere in the country.

Sudan: The lelwel hartebeest was formerly widespread in savanna woodlands in the southwest and southeast, with its range extending northwards to Southern Darfur in the west. In the the 1970s and early 1980s it occurred in large numbers, including an estimated 8,000 in Southern National Park, >17,000 in Boma National Park and a total population of 150,000. Its numbers have undoubtedly been reduced substantially since then. It survives locally in unknown numbers in some of the more remote areas of the southwest and southeast, and in small, decreasing numbers in Radom National Park in the west.

The tora hartebeest formerly occurred in the Ethiopia and Eritrea border region in the east. It has been eliminated from most or all of its former range in Sudan by overhunting and loss of habitat to agricultural development and the expansion of livestock grazing and settlement, e.g., it was reported to have disappeared from Dinder National Park before 1960. Sightings of hartebeest reported by local people in the 1980s and 1990s in the southeast of Dinder National Park near the Ethiopia border have not been confirmed during recent surveys in this area.

Eritrea: The tora hartebeest formerly occurred widely in the western and southwestern savannas

*Common Hartebeest (continued)*

and grasslands. It survives locally in small numbers. Local people indicate that a few may survive in the more remote parts of the Gash-Setit area in the southwest, including a few in the vicinity of Mount Bobo to the south of the former Gash-Setit Wildlife Reserve, but it apparently does not persist in areas where there are people and livestock. It is said to occur in larger numbers further to the north, in the Hawashait area of western Eritrea.

Ethiopia: Three subspecies occur. The tora hartebeest formerly occurred widely in the northwestern lowlands. Parts of its former range are inaccessible for security reasons and very little is known about its current status, but a few were observed from the air in the Dinder River valley near the Sudan border in early 1996. The lelwel hartebeest still occurs in reasonable but declining numbers in the southwestern lowlands, with the largest population in Mago National Park-Murule Controlled Hunting Area.

Swayne's hartebeest formerly occurred throughout the Rift Valley eastward into northwestern Somalia. It is now reduced to isolated populations in four known localities in the southern Rift Valley of Ethiopia. The main population occurs in Senkelle Wildlife Sanctuary. Despite the unfavourable location of this sanctuary, which is unfenced and situated on a heavily settled and cultivated plain, the Senkelle population increased from 400-500 in the early 1970s to about 1,700 in the mid-1980s and 2,400 in 1989 under the protection of EWCO. During the 1991 disturbances when law and order broke down widely in Ethiopia, the facilities and infrastructure for protecting the Senkelle sanctuary were destroyed almost completely, cultivators settled within the sanctuary, livestock grazing and tree felling became very common and the hartebeest were persecuted and scattered widely.

By 1995, about 200 hartebeest survived at Senkelle and poaching was continuing. Attempts were being made to reinstate protection of the sanctuary in collaboration with the local community but the conflict between conservation and the activities of local people remained unresolved. In mid-1998, there appeared to have been no further decline in the Senkelle hartebeest population since 1995 and poaching did not appear to be a major problem, but there was little patrolling of the sanctuary and it had been invaded by large numbers of cattle. The effective size of the sanctuary has been reduced from 59 sq km to 36 sq km by the encroachment of settlement and agriculture, and local people fell trees within the sanctuary and extract fuelwood without restriction. A management plan for the Senkelle sanctuary is being prepared with Italian assistance and Japanese researchers are investigating the sanctuary's vegetation and hartebeest population with support from JICA.

Smaller numbers of Swayne's hartebeest survive in Nechisar National Park, where the estimated population decreased from 150 in 1991 to 40 in 1995 but may have stabilised at this lower level, Maze Controlled Hunting Area and Awash National Park. Maze Controlled Hunting Area has now been taken over for farming. The Awash population, which originated from the reintroduction of animals from Senkelle in 1974, numbered 30 in 1985 but had decreased to only 5 animals in 1995. Swayne's hartebeest also persisted in small numbers in Yabelo Wildlife Sanctuary at least until 1990 when a group of 4 was seen, but repeated searches during 1990-94 did not produce any further sightings. Action to prevent the extinction of Swayne's hartebeest is a high international priority in antelope conservation (see p. 39).

Somalia: Swayne's hartebeest formerly occurred in the northwest, where it was common. It suffered severely from overhunting once guns became freely available in the former British protectorate in the early 1900s and it was exterminated before 1930.

Uganda: The lelwel (Jackson's) hartebeest was formerly widespread in the northern savannas of Uganda, where it was the most abundant large antelope. It has been eliminated from almost all of its Ugandan range and there is now only a single population in which this species approaches its former abundance, viz., in Murchison Falls National Park. Greatly reduced populations survive in a few other areas, e.g., Kidepo Valley National Park and Pian-Upe Game Reserve.

Kenya: This species has lost much of its range in southwestern Kenya to agricultural expansion and development, but it remains widespread in substantial numbers in Laikipia district in central Kenya and Narok, Kajiado, Taita Taveta and southwestern Kwale districts in the south. The main surviving concentrations of Coke's hartebeest occur in Kajiado, the Mara and Tsavo. The estimated total Kenyan population of this subspecies has decreased from 30,000 in the 1970s. The Tsavo population declined from an estimated 15,960 in 1991 to 4,120 in 1997 because of factors such as rinderpest and drought. The Kenya hartebeest, which is an intermediate form between *cokei* and *lelwel,* still occurs in good numbers on ranchland in Laikipia district and is represented by a healthy population in Ruma National Park, but the numbers of this endemic form have decreased to low levels in Meru National Park where poaching and encroachment by cattle are prevalent. The lelwel hartebeest formerly occurred in the northwest but is now extinct in Kenya.

Tanzania: The lelwel hartebeest occurs in the extreme northwest, in Rumanyika Orugundu-Ibanda Arena Game Reserves, but no recent information is available from this remote area. Coke's hartebeest has been eliminated from more than half of its former range in northern and northeastern Tanzania by the spread of settlement, but it remains common in areas such as the Serengeti, Tarangire, Mkomazi and Sadani. Estimated numbers in the Serengeti decreased slightly but significantly between 1988-91 and 1996, from 13,770 to 11,120, but the reason for this decline is unknown. Illegal hunting by local people appears to have little effect on the Serengeti population which occurs in parts of the protected area well away from villages, but this species may have been affected by the offtake from unregulated safari hunting in Loliondo Game Controlled Area.

Angola: The red hartebeest formerly occurred in a small area of southern Angola near the Namibia border. A few survived in and around Mupa National Park in the early 1970s, but it may now be extinct.

Namibia: The red hartebeest formerly occurred widely in the northern and eastern savannas, but it was naturally absent from the more arid savannas of the west and south and from most of the relatively well-watered far northeastern savanna woodlands. It survives widely in protected areas and private farmland within its historical range, but it has been reduced to small, remnant populations on communal lands. The largest protected-area population is in Etosha National Park. Hartebeest distribution and numbers on private farmland have expanded greatly during the last 25 years. Estimated total numbers on private land increased from 16,300 in 1972 to >50,000 in 1992. It has been introduced widely to farming districts outside its natural range. It is a commercially important species in these areas, e.g., substantial numbers have been sold for export to South African game farms.

Botswana: The red hartebeest formerly occurred throughout central, southern and southwestern Botswana but was absent from the north and parts of the east. Historically, there was a movement of hartebeest from the central Kalahari to Makgadikgadi Pans during the dry season, but this is no longer possible because of veterinary fences and human settlement. Small numbers persist in southwestern Ngamiland and within and to the east of Makgadikgadi-Nxai Pan National Park but the bulk of the remaining population occurs in the southwest. Estimated numbers in southwestern Botswana decreased dramatically from 270,000 in 1979 to <50,000 in 1987. This decrease presumably reflects the effects of game-proof veterinary fences in cutting off access to ancestral sources of surface water in the north during severe drought, but this is not as well documented for this species as for the Kalahari blue wildebeest population. Hartebeest numbers in the southwest have remained more or less stable since 1987. Recent aerial survey results indicate that this species appears to undergo extensive seasonal movements, concentrating within Gemsbok National Park and Central Kgalagadi Game Reserve during the dry season and occurring mainly outside protected areas in the wet season. Effective conservation of the Kalahari hartebeest population in its current abundance may therefore depend on maintaining access to its wet season range as well as continued protection of its dry season range within existing protected areas.

Zimbabwe: Occasional vagrants of the red hartebeest have been recorded in the past in western

*Common Hartebeest (continued)*
Zimbabwe, in and around Hwange and Kazuma Pan National Parks, but it has not been seen in areas such as Hwange since the 1970s. Small numbers have been introduced to private game farms.

South Africa; The red hartebeest formerly occurred throughout Northern Cape, Western Cape and Eastern Cape Provinces, parts of Free State, Northwest and Gauteng Provinces, and western KwaZulu-Natal. It was eliminated from all of these regions except the Northern Cape. It has subsequently been reintroduced widely to private land, provincial reserves and national parks at scattered localities throughout its historical range. It has also been introduced widely to extralimital areas, e.g., considerable numbers have been translocated from Namibia to game farms in the northern bushveld and lowveld of South Africa during the 1980s and 1990s. The largest protected populations occur in Vaalbos and Kalahari Gemsbok National Parks and provincial reserves such as Tussen-die-Riviere Game Farm and Sandveld Nature Reserve in the Free State.

Swaziland: Swaziland is probably outside this species' natural range, but an introduced population of the red hartebeest has become well established on the highveld grassland of Malolotja Nature Reserve.

Lesotho: The red hartebeest probably occurred prior to 1900, but it has been extinct in Lesotho this century.

SUMMARY
The common hartebeest formerly occurred in large numbers throughout the savannas and grasslands of sub-Saharan Africa, except for the miombo woodland zone of South-central Africa where it is replaced by Lichtenstein's hartebeest. The bubal hartebeest (*A. b. buselaphus*) occurred in North Africa until its extermination in the 1 920s. The sub-Saharan populations of the species have decreased markedly and its distribution has been increasingly fragmented as a result of overhunting for meat and the expansion of settlement and livestock.

While most subspecies are often common where they still occur, tora and Swayne's hartebeests are now in danger of extinction. Surveys are urgently required to determine the distribution and status of the remaining tora hartebeest populations in areas such as western Eritrea, as a precursor to the development and implementation of protective measures. The survival of Swayne's hartebeest in Ethiopia depends on improved protection of the remaining populations in Senkelle and Nechisar. It may also be necessary to establish other protected populations.

The largest numbers of the more abundant subspecies occur in the following areas -
western hartebeest: Niokolo-Koba (Senegal), Comoe (Ivory Coast), Nazinga and Diefoula (Burkina Faso), Mole (Ghana), Pendjari (Benin) and the national parks and hunting zones of North Province (Cameroon);
lelwel hartebeest: Zakouma and eastern Salamat (Chad), Manovo-Gounda-St. Floris and Sangba (Central African Republic), Garamba (Congo-Kinshasa), Mago-Murule (Ethiopia) and Murchison Falls (Uganda);
Kenya hartebeest: Laikipia ranchland;
Coke's hartebeest: Tsavo, Masai Mara, Kajiado and coastal hinterland (Kenya) and Serengeti, Tarangire and Sadani (Tanzania);
red hartebeest: private farmland (Namibia), central and southwestern protected areas and adjoining rangelands (Botswana) and protected areas and private farmland (South Africa).

The hartebeest is often targeted by meat hunters. As has already occurred over much of the rest of the species' former range, some key populations are currently decreasing because of poaching, and/or other factors such as drought and disease in some cases, e.g., in Comoe, northern Cameroon, Manovo-Gounda-St. Floris, Omo-Mago-Murule, Tsavo and Serengeti. On the other hand, populations have increased with effective protection during the 1990s in areas such as Nazinga, Diefoula, Pendjari, Zakouma, Sangba and Garamba, and on private farmland and in some protected areas in Namibia and South Africa.

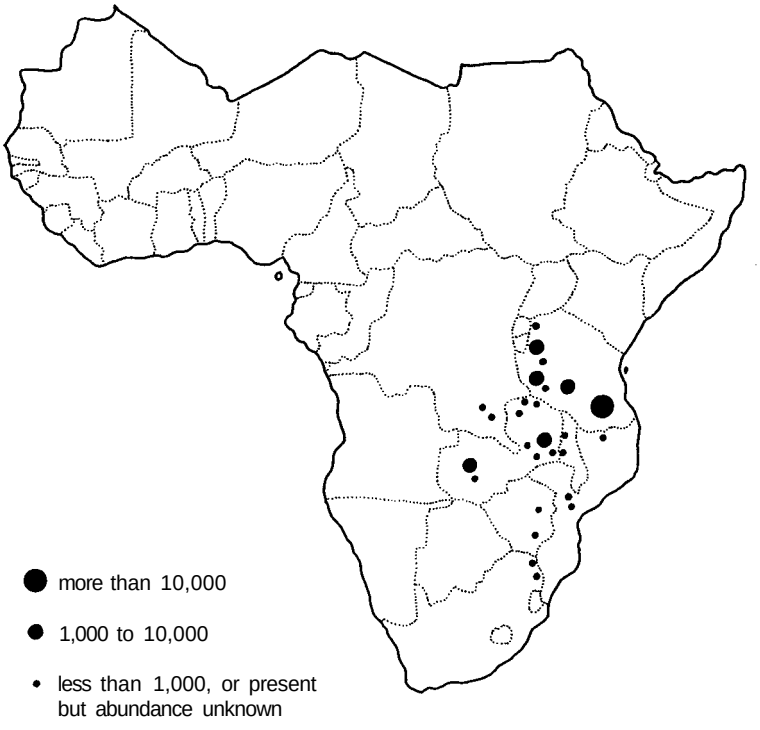
Estimated Total Numbers: Recent estimates of population density obtained by aerial surveys of areas where the species is common are generally of the order 0.2-0.7 per sq km, e.g., Arly (Barry & Chardonnet 1998), Pendjari (Chardonnet 1995), Zakouma (D. Moksia, in litt. July 1995), Manovo-Gounda-St. Floris and Sangba (J. L. Tello, in litt. September 1995), Garamba (Hillman Smith et al. 1995), Murchison Falls (Lamprey & Michelmore 1996), Laikipia (Grunblatt et al. 1996), Masai Mara (Broten & Said 1995), Serengeti (TWCM 1997), Tarangire (TWCM 1995a) and Sadani (TWCM 1993b). Densities estimated by aerial surveys are generally less than 0.1 per sq km in severely depleted areas, e.g., Bamingui-Bangoran (J. L. Tello, in litt. September 1995), Kidepo Valley and Aswa Lolim (Lamprey & Michelmore 1996). Recent ground surveys of areas where the species is common have provided population density estimates of 0.3-3.6 per sq km, e.g., Niokolo-Koba (Sillero-Zubiri et al. 1997), Comoe (Fischer 1996), Nazinga (Belemsobgo & Chardonnet 1996), Diefoula (U. Belemsobgo, in litt. February 1998), Ruma and Nairobi National Parks (Butynski et al. 1997) and Vaalbos, Tussen-die-Riviere and Soetdoring (Anderson et al. 1996).

Assuming an average correction factor for undercounting bias in aerial surveys of 1.5 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.5 per sq km where the species is known to be common/abundant and 0.05 per sq km elsewhere, the information in Appendix 4 gives estimated total populations of 36,000 western hartebeest (>95% in and around protected areas), 70,000 lelwel hartebeest (about 40% in protected areas), 3,500 Kenya hartebeest (6% in protected areas and most of the rest on ranchland), 42,000 Coke's hartebeest (about 70% in protected areas) and 130,000 red hartebeest (about 40% on private land and 25% in protected areas). About 250 Swayne's hartebeest survive in Ethiopia, with 80% of the population in the Senkelle sanctuary (Wilhelmi 1998). The surviving number of tora hartebeest is unknown but may not exceed a few hundred. The estimated total number of all subspecies of the common hartebeest is approximately 280,000 (about 45% in protected areas and 20% on private land). Overall population trend is decreasing, except for the Kenya hartebeest (stable) and the red hartebeest (stable or increasing, especially on private land and in protected areas).

Captive Population: Small numbers of red hartebeest (26 in 1996) and lelwel hartebeest (53 in 1996) are held in captivity in European and/or North American zoos. No individuals of the Endangered Swayne's and tora hartebeests are held in captivity.

The Future: If current trends continue, the overall status of the species will probably not change, since the numbers of the most numerous subspecies, the red hartebeest, are increasing on private land in Namibia and South Africa. Apart from the Kenya hartebeest, which occurs in stable numbers mainly on Laikipia ranches, populations of all other subspecies are in decline over substantial parts of their ranges. The lelwel hartebeest, in particular, may have undergone a major decline since the 1980s, when its total numbers were estimated to be >285,000, mainly in CAR and southern Sudan (East 1988, 1990), but very little information is available on its current status in Sudan.

The distributions of most hartebeest subspecies are likely to become increasingly fragmented until they are confined to those areas where there is effective control of poaching and encroachment by livestock and settlement. At present, such areas contain the following approximate proportions of the estimated total numbers of each declining subspecies: 33% of the western hartebeest, 10% of the lelwel hartebeest, 50% of Coke's hartebeest and no Swayne's or tora hartebeests. This suggests that if present trends continue, the numbers of western, lelwel and Coke's hartebeests will decrease to substantially below current levels before they eventually stabilise, and that Swayne's and tora hartebeests will become extinct.




**Lichtenstein's Hartebeest**
*Alcelaphus lichtensteinii* (Peters 1852)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Congo-Kinshasa | U | D | - | - | - | - | U | D |
| Tanzania | >13,850 | S | - | - | >12,090 | S/D | >25,940 | S/D |
| Burundi | - | - | - | - | - | - | Ex | - |
| Angola | - | - | - | - | - | - | Ex? | - |
| Zambia | >6,810 | S/D | 270 | S/I | >2,630 | D | >9,710 | D |
| Malawi | 310 | ? | - | - | - | - | 310 | ? |
| Mozambique | >160 | D | - | - | U | S/D | U | S/D |
| Zimbabwe | 15 | D | 50 | I | - | - | 65 | I |
| South Africa | 40 | ? | 15 | S | - | - | 55 | ? |
| Species Total | >21,185 | S/D | 335 | I | >14,720 | S/D | >36,000 | S/D |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Formerly occurred widely in savannas in the southeast. It has been affected severely throughout its former range by uncontrolled hunting for meat. Small, declining populations survive in Upemba and Kundelungu National Parks. There is no recent confirmation of its survival elsewhere in the country.

Tanzania: Formerly occurred throughout the miombo woodlands of western and southern Tanzania. It has been eliminated from settled areas but remains widespread and common in major wildlife areas such as Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa, Ruaha-Rungwa-Kisigo and Selous. Africa's largest population of this species is the estimated 20,000 in 81,800 sq km of the Selous ecosystem. This population occurs mainly within Selous Game Reserve and on adjoining land to the southeast of the reserve.

Burundi: Formerly occurred in the southeastern savanna woodlands but now extinct.

Angola: Formerly occurred in a limited area of northeastern Angola. It is probably extinct.

Zambia: Formerly occurred throughout, except for the southwestern plateau and most of the Zambezi Valley floor. The miombo woodlands of Zambia's plateaux were formerly a major stronghold of this species, but it has been eliminated from large areas of the country and is now restricted to national parks and game management areas. Within these areas, the only large, more or less stable populations which remain are those of the northern section of Kafue National Park and parts of the Luangwa Valley (North Luangwa National Park, Lumimba and Munyamadzi Game Management Areas). The smaller populations of Kasanka National Park and private game ranches are stable or increasing but its status is less satisfactory elsewhere. Generally decreasing populations which number in the hundreds or less occur in areas such as South Luangwa National Park, Lupande and other Luangwa Valley Game Management Areas, and Nsumbu, Mweru Wantipa, Lusenga Plain, Lavushi Manda and Lukusuzi National Parks. Lichtenstein's hartebeest was formerly common in these areas, most of which now receive relatively low levels of protection. Nsumbu, Mweru Wantipa and Lusenga Plain National Parks in the north, for example, have been severely affected by illegal hunting by Zambians and Congolese, Lavushi Manda's wildlife was poached to low levels even in the 1970s, and lack of law enforcement has allowed poaching and illegal mining activities to proceed unchecked in Lukusuzi. Poaching is also a major problem in some areas where this antelope is still common, e.g., poaching activities in Lumimba and Munyamadzi Game Management Areas increased in the mid-1990s. This followed the southward movement of illegal hunters formerly operative in North Luangwa National Park, where they had been excluded by the rigorous and successful law enforcement measures practised under the North Luangwa Conservation Project.

Malawi: Formerly widespread in *Brachystegia* woodland. It is now largely or entirely restricted to two protected areas, Kasungu National Park and Vwaza Marsh Game Reserve, where its numbers appear to have decreased substantially since the 1980s. Poaching is a major problem in both of these areas, as in adjoining regions of Zambia.

Mozambique: Formerly occurred very widely. By the early 1980s, it had been exterminated in southern Mozambique but survived in scattered localities in central and northern regions, to the north of the Buzi River, with the largest population in Gorongosa National Park-Zambezi Valley Wildlife Utilisation Unit (estimated numbers 2,700). It suffered a further major decline during the civil war of the 1980s and early 1990s, e.g., the Gorongosa population was reduced by about 90% between 1980 and 1994. It also survives in Niassa Game Reserve in the north and in some of the hunting concessions in Manica Province. The current attempts to rehabilitate these wildlife areas should enable this species to recover its former numbers to some extent.

Zimbabwe: This species has always been uncommon and localised in Zimbabwe. By the late 1960s it was largely restricted to a few private ranches in the southeast, with a total population of about 150. There had been no increase in its total numbers by the mid-1980s, including small introduced populations in Gonarezhou National Park and Mushandike Sanctuary. The species' range in the southeastern lowveld was badly affected by the 1992-93 drought and some animals were moved to the Carolina Wilderness Area near Harare as an insurance. By 1996, fewer than 50 individuals remained in the country, in seven small populations of which only two were increasing. In 1996-97, breeding nuclei were imported from Zambia to ranches in the southeast and the midlands.

South Africa: The hartebeest which formerly occurred locally in what is now the northern part of Kruger National Park and on the Pongola River in southeastern Mpumalanga and northern KwaZulu-Natal are believed to have been this species. These animals were shot out in the late 19th or early 20th century. A total of 18 Lichtenstein's hartebeest from Malawi were translocated to Kruger National Park in 1985-86. Following a period of multiplication in breeding enclosures within the park, 91 animals were released in northern Kruger in the period 1990-94 and an additional 31 were released in southern Kruger in 1994. About 40 free-living Lichtenstein's hartebeest survived in the park in 1995-98, with lion predation known to have caused some of the initial mortalities of the released animals. Small numbers of this species have also been imported from Malawi to

*Lichtenstein's hartebeest (continued)*
private farms.

SUMMARY
Lichtenstein's hartebeest formerly occurred very widely in the vast miombo (*Brachystegia-Julbernardia*) woodlands of the South-central African plateaux. It has been eliminated from large parts of its former range by meat hunters. It now occurs in substantial numbers in only two countries, Tanzania and Zambia. The largest surviving populations occur in the Selous ecosystem, Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa and Ruaha-Rungwa-Kisigo (Tanzania) and in Kafue National Park and the Luangwa Valley (Zambia). Most of these populations are stable.

Estimated Total Numbers: Wildlife densities are generally low in miombo woodland, even in unexploited areas. Population density estimates of Lichtenstein's hartebeest obtained by aerial surveys are typically of the order 0.04-0.16 per sq km, e.g., in Biharamulo-Burigi (TWCM 1991), Moyowosi-Kigosi Game Reserves (TWCM 1995b), Ugalla River Game Reserve (TWCM 1992a), Katavi-Rukwa (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), the Ruaha ecosystem (TWCM 1994c), Kilombero (TWCM 1995c), Kafue (Yoneda & Mwima 1995), the southern and central Luangwa Valley (Jachmann & Kalyocha 1994) and Vwaza Marsh and Kasungu (Mkanda 1998). Higher densities of 0.2-0.4 per sq km were estimated by aerial surveys of the Selous ecosystem (TWCM 1995c) and North Luangwa National Park (D. Owens, in litt. October 1995).

Summation of the available population estimates gives a total population of about 36,000, but this does not allow for undercounting from the air or the areas for which estimates are unavailable. Assuming an average correction factor of 2.0 for undercounting bias of this species in aerial surveys (possibly a substantial underestimate since it often occurs in relatively dense miombo woodlands), and that areas for which population estimates are unavailable (see Appendix 4) support an average density of 0.04 per sq km, gives an estimated total population of about 82,000, of which about 60% is in protected areas.

The Future: Lichtenstein's hartebeest is highly vulnerable to poaching. Its long-term survival is closely linked to the continuation of effective protection of its populations in areas such as Selous Game Reserve (the Selous ecosystem contains about half of the estimated global population) and the other key areas for this species in western and southern Tanzania and Zambia. The species' Red List status will not change as long as these areas generally continue to support healthy, stable populations. There is also a reasonable prospect that its numbers will recover in areas such as Gorongosa National Park and Niassa Game Reserve in Mozambique, where it was formerly common, if current attempts to rehabilitate these areas are successful. A significant population may also develop on private farmland in Zambia if that country's private-sector wildlife industry continues to grow.

## Bontebok & Blesbok

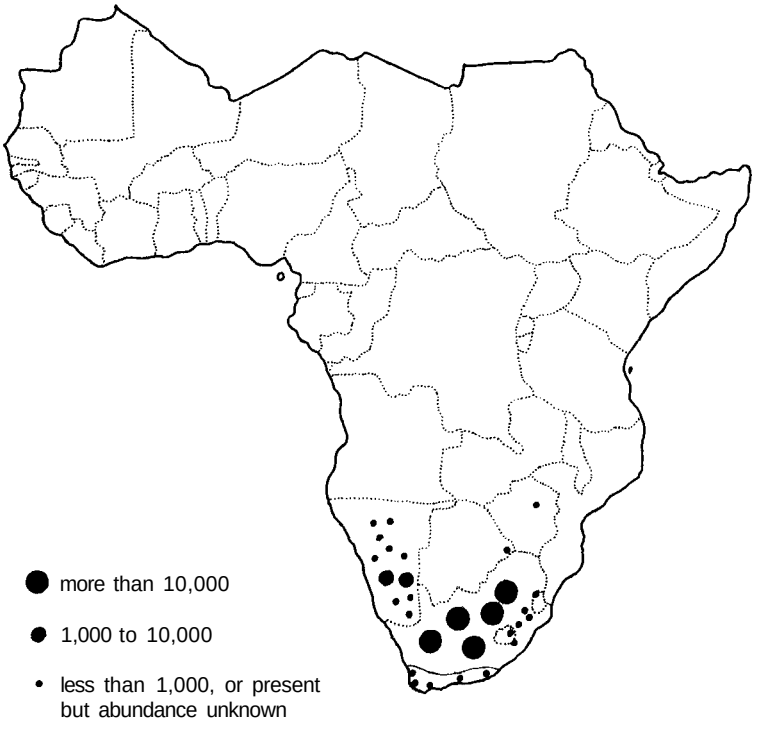
*Damaliscus dorcas* (Pallas 1766)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
south of line: bontebok (D. *d. dorcas)*
north of line: blesbok (D. *d. phillipsi*)

Note: The blesbok has been widely introduced within the bontebok's natural range, and some bontebok have been introduced into the blesbok's range.

Status of Subspecies
bontebok: Vulnerable
blesbok: Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Poon/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Poon/Abund. | Trend | Total Poon/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Bontebok | | | | | | | | |
| South Africa | >1,100 | S/I | >1,200 | I | - | - | >2,300 | I |
| Blesbok | | | | | | | | |
| Namibia | - | - | >6,000 | I | - | - | >6,000 | I |
| Botswana | - | - | >150 | S/I | - | - | >150 | S/I |
| Zimbabwe | - | - | 50 | S/I | - | - | 50 | S/I |
| South Africa | 6,560 | S/I | >225,000 | S/I | ? | ? | >231,560 | S/I |
| Swaziland | C | S | - | - | - | - | C | S |
| Lesotho | X | S/I | - | - | - | - | X | S/I |
| Subspecies Total | >6,560 | S/I | >231,200 | S/I | ? | ? | >237,760 | S/I |
| Species Total | >7,660 | S/I | >232,400 | S/I | ? | ? | >240,000 | S/I |

OVERVIEW OF CONSERVATION STATUS

Namibia: This species does not occur naturally in Namibia but the blesbok has been introduced to privately owned game farms throughout most of the country's farming districts. The largest numbers occur in the southern farming districts.

Botswana: This species does not occur naturally in Botswana but the blesbok has been introduced to private farmland in the east.

Zimbabwe: The blesbok does not occur naturally in Zimbabwe but it has been introduced to private

*Bontebok & Blesbok (continued)*
farms in the midlands.

South Africa: The bontebok was historically confined to the coastal plain of the southwestern Cape, where overhunting reduced it from locally abundant to the verge of extinction. It was saved from extinction in the mid-19th century by a few Cape farming families who protected the small remnant populations. From a low of less than 20 animals in the original Bontebok National Park when it was established near Bredasdorp in 1931, the population of this antelope has gradually recovered. The population of Bontebok National Park had reached 84 when the animals were translocated to the more suitable site of the current Bontebok National Park near Swellendam in 1961, and increased to a maximum population of 320 in 1981. The park's bontebok population has subsequently been maintained at 200-300. Surplus animals removed from this national park have formed the nucleus of reintroduced populations in other protected areas such as provincial and local authority nature reserves. Extralimital populations have been established in West Coast National Park and at least two local authority reserves. Animals moving across from De Hoop Nature Reserve have established a substantial population on the Overberg Test Range. Bontebok populations have also been established on private farms both within its natural range and elsewhere, e.g., in Eastern Cape and Free State Provinces. Interbreeding with the conspecific blesbok has produced numerous hybrids on private land. A photographically based statistical technique is used to differentiate between true bontebok and bontebok/blesbok hybrids for the purpose of identifying registered bontebok herds.

The blesbok's historical distribution included the highveld of Free State and Gauteng Provinces, parts of western and northwestern KwaZulu-Natal, and the northern Karoo in Eastern and Northern Cape. It was separated by more than 300 km from the bontebok's historical range. Although the blesbok occurred in enormous populations in regions such as the highveld when the South African hinterland was first explored by Europeans, excessive hunting had reduced its numbers to about 2,000 by the late 19th century. Since then it has made a spectacular recovery, mainly on private farmland, and it has been translocated to many parts of the country both within and outside its natural range. The largest numbers occur on private farms in Gauteng, Free State and Northern Cape, and it is one of the most commercially important game species in South Africa. Smaller numbers occur in more than 30 provincial reserves, with the largest populations in areas such as Suikerbosrand Nature Reserve in Gauteng and Tussen-die-Riviere Game Farm, Willem Pretorius Game Reserve and Sterkfontein Dam Nature Reserve in Free State. It also occurs in small to moderate numbers in three national parks.

Swaziland: The blesbok was formerly abundant in the western highveld, but it was exterminated by excessive hunting. It has been reintroduced to Malolotja Nature Reserve and Mlilwane Wildlife Sanctuary, where good populations occur.

Lesotho: The blesbok formerly occurred in western Lesotho but it was exterminated before 1900. A few were reintroduced in the 1980s.

SUMMARY
This species is highly characteristic of the open plateau grasslands of the southern African highveld (blesbok) and coastal Cape fynbos (bontebok). The economic value and popularity of the blesbok on private farms has enabled this subspecies to re-occupy large areas of its original range. Substantial extralimital populations of the blesbok have also been established on private land in South Africa and Namibia. The survival of the bontebok is more dependent on protected areas, viz., Bontebok National Park and provincial and local authority reserves. While the bontebok's numbers are gradually recovering, this subspecies is threatened by hybridisation with the much more numerous blesbok.

Estimated Total Numbers: Estimates of the numbers of this species are available for almost all of its current range from questionnaire surveys (private land) and total counts (protected areas) (see Appendix 4). Hence its total numbers can be estimated reasonably accurately by summation of the

available population estimates for each country.

This indicates total populations of at least 235,000-240,000 blesbok (stable or increasing), of which 97% occur on private farms and 3% in protected areas, and at least 2,300 bontebok (increasing), of which about half occur in protected areas and half on private land.

Captive Population: In 1996, 313 individuals of this species were held in captivity in North American and European zoos, comprising 94 bontebok and 219 blesbok. There were an additional 38 bontebok and 57 blesbok on Texas ranches. Other animals are held in South African zoos.

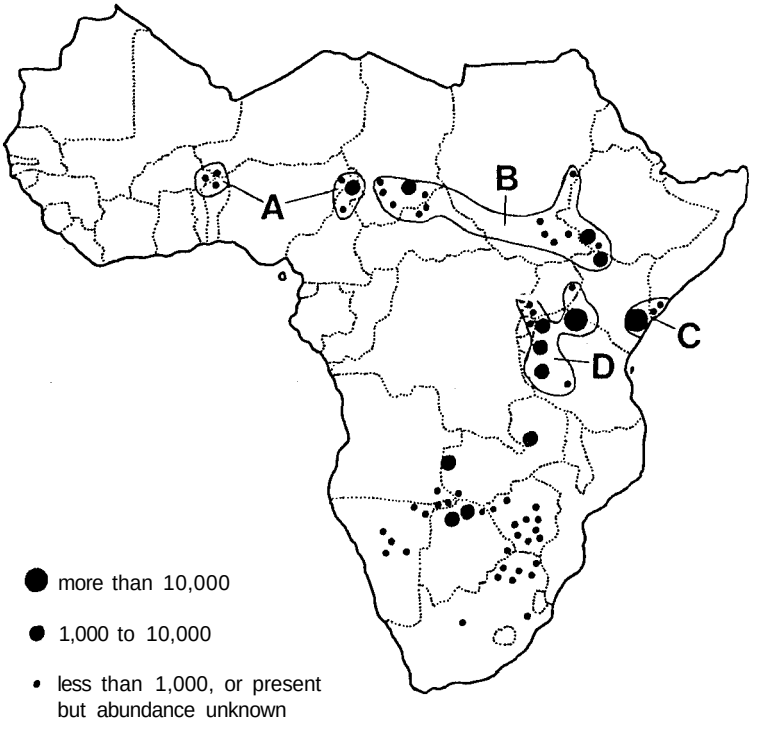
The Future: The future of the blesbok is secure as long as it continues to occur in large numbers on private farmland in Southern Africa. The future of the bontebok is dependent on continued protection of key areas such as Bontebok National Park and effective management of the remaining pure populations to prevent hybridisation with the blesbok.

**Tsessebe, Topi, Tiang & Korrigum**
*Damaliscus lunatus* (Burchell 1824)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
A: korrigum (D. /. *korrigum)*
B: tiang (D. /. *tiang)*
C: coastal topi (*D. I. topi*)
D: topi (*D. /. jimela*)
remainder of range: tsessebe (D. /. *lunatus*)

Status of Subspecies
korrigum: Vulnerable
tiang: Lower Risk (near threatened)
coastal topi: Lower Risk (conservation dependent)
topi: Lower Risk (conservation dependent)
tsessebe: Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend |
| Korriqum | | | | | | | | |
| Mauritania | - | - | - | - | - | - | Ex | - |
| Mali | - | - | - | - | - | - | Ex | - |
| Niger | 50 | D | - | - | - | - | 50 | D |
| Senegal | - | - | - | - | - | - | Ex | - |
| Gambia | - | - | - | - | - | - | Ex | - |
| Burkina Faso | >500 | S/I | - | - | - | - | >500 | S/I |
| Ghana | - | - | - | - | - | - | Ex | - |
| Togo | - | - | - | - | - | - | Ex? | - |
| Benin | >100 | S/D | - | - | - | - | >100 | S/D |
| Nigeria | V | D | - | - | R | D | R | D |
| Cameroon | 1,830 | S/D | - | - | - | - | 1,830 | S/D |
| Subspecies Total | >2,480 | S/D | - | - | R | D | >2,480 | S/D |
| Tiang | | | | | | | | |
| Chad | >1,100 | S/I | - | - | U | D | >1,100 | S/D |
| CAR | <700 | D | - | - | R | D | >700 | D |
| Sudan | 100 | I | - | - | C | D | C | D |
| Ethiopia | 10,090 | ? | - | - | - | - | 10,090 | ? |
| Kenya | 2,600 | S | - | - | - | - | 2,600 | S |
| Subspecies Total | 14,590 | ? | - | - | C/U | D | >14,500 | D |
| Coastal Topi | | | | | | | | |
| Somalia | X | ? | - | - | X | D | X | ? |
| Kenya | C | - | - | - | 76,600 | S | 76,600 | S |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Poon/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Topi | | | | | | | | |
| Congo-Kinshasa | C | D | - | - | - | - | C | D |
| Uganda | 580 | D | - | - | - | - | 580 | D |
| Kenya | 5,440 | D | - | - | 5,680 | D | 11,120 | D |
| Tanzania | 57,360 | ? | - | - | 1,150 | S | 58,510 | ? |
| Rwanda | <500 | D | - | - | - | - | <500 | D |
| Burundi | - | - | - | - | - | - | Ex | - |
| Subspecies Total | >63,880 | D | - | - | 6,830 | D | >70,710 | D |
| Tsessebe | | | | | | | | |
| Congo-Kinshasa | - | - | - | - | - | - | Ex? | - |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Zambia | 10,000 | S | 30 | S/I | - | - | 10,030 | S |
| Mozambique | - | - | - | - | - | - | Ex | - |
| Namibia | 80 | I | 1,560 | I | 80 | D | 1,720 | I |
| Botswana | 1,600 | S | U/R | ? | 8,420 | S | 10,020 | S |
| Zimbabwe | 320 | S/D | 3,940 | I | - | - | 4,260 | I |
| South Africa | 1,040 | ? | 500 | I | - | - | 1,540 | S/I |
| Swaziland | - | - | - | - | - | - | Ex? | - |
| Subspecies Total | 13,040 | S | 6,030 | I | 8,500 | S/D | 27,570 | I |
| Species Total | >93,990 | D | 6,030 | I | >91,930 | D | >192,000 | D |

OVERVIEW OF CONSERVATION STATUS

Mauritania: The korrigum formerly occurred in southern Mauritania, where it was exterminated by uncontrolled hunting and habitat degradation.

Mali: The korrigum was formerly abundant in central Mali, moving seasonally between the sahel grasslands and the floodplains of the Niger Delta. It was wiped out by competition for grazing with large numbers of cattle, and by uncontrolled hunting. The last survivors disappeared in the mid-late 1970s.

Niger: The korrigum was formerly abundant in the sahelian grasslands and savannas of southern Niger, but it has been exterminated widely by competition with cattle and uncontrolled hunting. By the late 1980s, it survived only in W National Park-Tamou Faunal Reserve, where the small population was gradually decreasing. No recent information on its status.

Senegal: The korrigum was formerly widespread in central and northern Senegal in the semi-arid grasslands of the northern savanna zone and the southern sahel. It died out before 1930 because of overhunting and competition with cattle for grazing.

Gambia: The korrigum formerly occurred in savanna grasslands, but it died out in the early 1 900s.

Burkina Faso: The korrigum formerly occurred throughout, apart from the southwest. It has been eliminated from almost all of its former range by the expansion of cattle and illegal hunting. The last survivors occur in the Arly-Singou protected area complex and W National Park in the southeast. Its numbers appear to have increased in Arly National Park betwen 1991 and 1998, although they are still less than the estimated population in this area in the 1970s.

Ghana: The korrigum formerly occurred in the northern savannas, but it had been exterminated by the mid-1970s.

*Tsessebe, Topi, Jiang & Korrigum (continued)*

Togo: The korrigum formerly occurred in northern Togo. It survived in very small numbers (perhaps 20-25 individuals) within Keran National Park in the late 1980s. It has probably been exterminated by the uncontrolled poaching and large-scale encroachment of settlement which has affected this area since 1991.

Benin: The korrigum formerly occurred widely in floodplains and dry savanna grasslands in the north. It survives locally within its former range, with the largest numbers in Pendjari National Park and the adjoining hunting zones. This population was estimated to number about 180 in the 1970s and late 1980s. It is still relatively easy to observe korrigum in Pendjari, where its population appears to be stable. Its numbers are small and decreasing in W National Park-Djona Hunting Zone.

Nigeria: The korrigum formerly occurred widely in the northern savanna and floodplain grasslands. It has been eliminated from almost all of its former range by uncontrolled hunting and the encroachment of cattle and agriculture. It still occurs in small numbers in the northeast, mainly through seasonal immigration from Cameroon.

Chad: The tiang formerly ranged throughout the southern half of Chad where it undertook extensive seasonal movements. It has disappeared from a large part of its former range but it still occurs locally in the south and southeast. The population of Zakouma National Park has increased substantially during the 1990s as a result of the improved protection of this park. Elsewhere it generally occurs in small and declining numbers, e.g., east of the Chari River in Chari-Baguirmi from Dourbali towards Bousso and further east towards Siniaka Minia, in Manda National Park in northern Moyen Chari, and in the hunting zones of eastern Salamat.

Cameroon: The korrigum formerly occurred widely north of the Adamaoua Plateau, but it is now largely or entirely restricted to Waza National Park and North Province. It was formerly abundant in Waza, where there were an estimated 20,000 in 1962. This population has subsequently decreased markedly because of drought, poaching, rinderpest, competition with domestic livestock for food and water, and ecological degradation of the Waza-Logone floodplain because of the disruption of the natural flooding regime which has occurred since the construction of the Maga dam at the southern edge of the floodplain in the 1970s. Aerial surveys of Waza National Park in 1977 produced population estimates of only 600-800 korrigum. Its population in this park subsequently increased to an estimated 1,680 in 1994. It occurs in small but apparently stable numbers in Benoue, Bouba Ndjida and Faro National Parks and some of the adjoining hunting zones in North Province.

Central African Republic: The tiang formerly occurred in large numbers in open, seasonally inundated grasslands in northern Central African Republic, but it has been reduced to low levels during the last 10-20 years by uncontrolled poaching for meat, mainly by hunters from Sudan and Chad. The total population estimated from aerial surveys decreased from 55,900 in 1978 to 5,400 in 1985 and is now probably less than 1,500. In 1985 there were an estimated 640 tiang in Bamingui-Bangoran National Park, which is at the southern limit of its range. This population, which has received no protection from poaching, numbered less than 20 in 1994. No tiang were seen during aerial surveys of the Bamingui-Bangoran park in 1995. Most of the surviving tiang in Central African Republic occur in Manovo-Gounda-St. Floris National Park, where the estimated population decreased by more than 50% between 1 985 and 1995 despite the anti-poaching efforts of the PDRN project. If these trends continue, this antelope may not survive for much longer in Central African Republic.

Congo-Kinshasa: The tsessebe formerly occurred marginally on the Zambia and Angola borders in the south and southeast, but it is unlikely to have survived in these areas because of uncontrolled hunting for meat. The topi occurs in a single population, on the Rwindi-Rutshuru plain to the south of Lake Edward within Virunga National Park. This population numbered in the thousands in the 1950s-1980s, but it has apparently decreased substantially since then because of poaching and/or a major

increase in *Acacia sieberiana* woodland in this area.

Sudan: The tiang was formerly widespread in savanna and floodplain grasslands in southern and central Sudan. By the 1970s and early 1980s, it had been reduced to low numbers or eliminated in the northern parts of its former range, but southern Sudan still supported Africa's largest population of *D. lunatus,* estimated to number 712,000. This included a migratory population of 360,000 which spent the dry season in the Jonglei area and moved eastwards in the wet season, and a population of 28,000 in Boma National Park. The tiang occurred in much lower numbers in the woodlands of the southwest. It has now been eliminated from most of the northern part of its former range by habitat degradation and overhunting, but a small population survives in Dinder National Park. There is no information on its current status or survival in the southwest, but it still occurs in large numbers in the southeast despite the civil war and pressures of meat hunting. An additional threat is posed by the partly constructed Jonglei canal, which cuts across the seasonal migration route of the Jonglei tiang population. Construction of the canal was partially completed before it was halted in 1982. The vertical sides and few access points of the incomplete, dry canal may be a more formidable barrier than if it was full of water, particularly to the new season's calves when the population returns from its wet season calving grounds. However, by 1995 trees and bushes were growing in the canal basin and its banks were showing signs of erosion. The vast area of grassland between Badingilo and Boma National Parks is largely devoid of human inhabitants and continues to provide a wet season habitat for hundreds of thousands of tiang as well as white-eared kob and Mongalla gazelle, but the recent construction of new vehicle tracks through this area for the passage of rebels and relief trucks has improved access for hunters.

Ethiopia: The tiang formerly occurred in the southwestern lowlands and on the Sudan border in the west. There is no recent confirmation of its survival in the west but it still occurs in good numbers in the southwest, in the Omo-Mago National Parks area and the contiguous Murule Controlled Hunting Area-Chew Bahir Wildlife Reserve. Tiang probably undergo considerable seasonal or irregular movements within this region, and possibly to and from the adjoining region of Kenya. It is subjected to considerable poaching pressure in Ethiopia, e.g., in Omo National Park where the availability of modern weaponry to local people during the last 10 years has led to large-scale poaching of all of the larger wild herbivores.

Somalia: The coastal topi formerly occurred locally in the south, in riverine grasslands on the lower Shebelle and Juba Rivers and in the Lake Badana (Bush Bush National Park) area. By the 1980s, it had lost most of its riverine habitat to agriculture and was confined to very restricted pockets of its former range. No recent information on its status is available.

Uganda: The topi has always had a very localised distribution in Uganda. It survives in only three areas, in all of which its numbers have decreased dramatically in recent years. The largest population, which occurs in the southern section of Queen Elizabeth National Park and the adjoining Kigezi Game Reserve, declined from an estimated 5,000 in the early 1970s to 510 in 1995. This decrease reflects the effects of poaching and the massive regeneration of *Acacia sieberiana* woodland in its preferred grassland habitat following the destruction of most of the area's elephants by poachers in the 1970s. A parallel decline in topi numbers has occurred in the Rwindi-Rutshuru plain of the contiguous section of Virunga National Park (Congo), as noted above. The topi population of Lake Mburo National Park in southwestern Uganda has apparently decreased during the 1990s as a result of excessive illegal offtake in the wet season, when part of the population moves into adjoining ranchland. This species was formerly common in central Karamoja but an aerial survey in 1995 revealed only a small number of survivors, all in Pian-Upe Game Reserve.

Kenya: Confined to three geographically distinct regions: the tiang occurs in the Sibiloi National Park area of Marsabit district, the topi in southwestern Narok and the coastal topi in Lamu and adjoining southern Garissa and Tana River districts. The Narok population is decreasing for unknown reasons and the other two populations are stable. It occurs at moderate to high densities in four protected areas: Sibiloi National Park (tiang), Boni-Dodori National Reserves (coastal topi) and Masai Mara National Reserve and Ruma National Park (topi).

*Tsessebe, Topi, Tiang & Korrigum (continued)*

Tanzania: The topi was formerly widespread in northwestern and western Tanzania on seasonally inundated grasslands within *Acacia* and *Combretum* savannas, and in *Brachystegia* woodlands. It has lost over half of its former range to expanding settlement but still occurs in good numbers in the Serengeti and in most of the major wildlife areas in the west, e.g., Biharamulo-Burigi, Moyowosi-Kigosi and Katavi-Rukwa. The Serengeti population, which is the country's largest, increased from an estimated 30,000 in the 1960s to 55,000 in the late 1970s and 95,190 in 1989-91, but the 1996 TWCM aerial survey produced a lower population estimate of 41,890. While poaching is a major problem in the Serengeti, it is unclear whether the 1996 estimate represents a real decline. This uncertainty is a result of the shortcomings of systematic reconnaissance flights to count species which are clumped into large herds. The Serengeti topi population comprises a small number of very large herds (up to 2,000 individuals) and a large number of small groups, mainly in the western corridor and northern savanna woodlands of Serengeti National Park. The 1996 aerial census missed all but one of the large concentrations. Topi populations in other areas of Tanzania are generally stable or increasing.

Rwanda: The topi was formerly very common in central and northern Akagera National Park and the adjoining Mutara Hunting Reserve. Estimated numbers were 7,500 in 1990, but the population has subsequently crashed because of poaching and the loss of its preferred habitat to massive encroachment of cattle.

Burundi: The topi formerly occurred in the eastern floodplains and savanna grasslands, but it is now extinct.

Angola: The tsessebe formerly occurred locally over a wide area of eastern Angola. Its numbers are now probably greatly reduced, but a few survive in Cuando-Cubango province in the southeast.

Zambia: The tsessebe was formerly restricted to open plains and woodland edges west of the Zambezi, the southeastern Bangweulu floodplain, and floodplains of the upper Chambeshi and Isoka Kalungu Rivers in the northeast. It has disappeared from parts of its former range but survives in good numbers in Liuwa Plain National Park and Bangweulu, and in small numbers in Sioma Ngwezi National Park and on private game ranches. The tsessebe formerly occurred widely in the vast West Zambezi Game Management Area which occupies most of Zambia to the west of the Zambezi River, extending from Sioma Ngwezi National Park in the south to beyond the Liuwa Plain in the north, but illegal hunting has destroyed most of this game management area's wildlife.

Mozambique: The tsessebe formerly occurred locally in parts of southern Mozambique to the south of the Zambezi River, including Banhine National Park where it was abundant. It is now extinct.

Namibia: The tsessebe was confined naturally to the Caprivi Strip and adjoining areas in the extreme northeast. It survives in small numbers within its former range, in protected areas and the Kavango and Eastern Caprivi communal lands. Larger numbers now occur outside the species' natural range, following introductions to private land in the northern farming districts.

Botswana: The tsessebe formerly occurred quite widely in the north and more locally in the east. It has been eliminated from parts of its former range but persists in good numbers in the north, especially in the Okavango Delta. It is common in suitable habitat throughout the delta, including Moremi Game Reserve. The range of the Okavango population extends northwards to the Linyanti swamps, where it occurs in small numbers. There is also a substantial population in Savuti Marsh in the southwest of Chobe National Park. It occurs in smaller numbers along the Zimbabwe border in the northeast and on some of the Tuli block farms in the eastern region.

Zimbabwe: The tsessebe formerly occurred locally on parts of the highveld plateau and in the south, southeast and northwest. Its numbers are increasing steadily on private land and it now occurs quite widely on game farms in the highveld and southeastern lowveld. It occurs in only small numbers in protected areas, e.g., Chizarira-Chirisa and Matobo. The small population which

formerly occurred on the Shumba Plains in the north of Hwange National Park has largely disappeared during the last 25 years.

South Africa: The tsessebe formerly occurred in the bushveld and lowveld of Northwest, Northern, Mpumalanga, Northern Cape and northern KwaZulu-Natal Provinces. It was eliminated from most of its former range by hunting and habitat degradation associated with the expansion of cattle. The largest surviving population is in Kruger National Park where numbers decreased from about 1,000 in the 1980s to approximately 400 in the mid-1990s. The tsessebe occurs mainly on the basalt plains of northern Kruger, where the effects of drought and competition with increasing numbers of zebra are believed to be responsible for the decline in its numbers. Smaller, increasing, reintroduced populations occur in Vaalbos and Marakele National Parks, provincial reserves and private land.

Swaziland: The tsessebe formerly occurred in parts of the lowveld, where it was exterminated. Attempts to reintroduce this species to Hlane Game Reserve in the 1980s were unsuccessful, but it may have been reintroduced recently to the privately owned Mkhaya Nature Reserve.

SUMMARY
This species formerly occurred widely on floodplains and other grasslands in sub-Saharan Africa, often in large concentrations. It was one of the most numerous large antelope species in Africa, but it has been eliminated from much of its former range. The korrigum, in particular, was formerly very abundant from Senegal to Cameroon but it has undergone a dramatic decline since the early 1900s because of displacement by cattle and uncontrolled hunting for meat.

Substantial populations of the species survive in scattered localities, e.g., Arly-Singou (Burkina Faso)-Pendjari (Benin) and Waza (Cameroon) (korrigum); Zakouma (Chad), Manovo-Gounda-St. Floris (Central African Republic), southern Sudan, Omo-Mago-Tama (Ethiopia) and Sibiloi (Kenya) (tiang); coastal Kenya (coastal topi); Virunga (Congo-Kinshasa)-Queen Elizabeth (Uganda), Mara (Kenya), Serengeti, Biharamulo-Burigi, Moyowosi-Kigosi and Katavi-Rukwa (Tanzania) (topi); Bangweulu-Kafinda and Liuwa Plain (Zambia), Okavango and Savuti (Botswana) and private land (Zimbabwe, Namibia and South Africa) (tsessebe). Some of the remaining populations are in decline because of poaching, e.g., in Queen Elizabeth, Virunga, Manovo-Gounda-St. Floris and possibly Serengeti National Parks. Others are currently stable or increasing but are at significantly lower levels than 20 years ago, e.g., Arly-Singou and Waza, or occur in areas where hunting pressures are low because of low human population densities rather than a high level of protection, e.g., Sibiloi, Biharamulo-Burigi, Moyowosi-Kigosi, Katavi-Rukwa, Bangweulu-Kafinda and Okavango. Apart from the tsessebe, none of the subspecies occurs widely in well-protected and well-managed areas.

Estimated Total Numbers: Recent population estimates are available for substantial parts of the species' range, mainly from aerial surveys (Appendix 4). These often give population density estimates of about 0.4-0.7 per sq km in areas where the species is common, e.g., Bangweulu-Kafinda (Jeffery et al. 1989c), Savuti and Okavango (DWNP 1995), Biharamulo-Burigi and Moyowosi-Kigosi Game Reserves (TWCM 1991, 1995b) and Zakouma (D. Moksia, in litt. July 1995). Densities of more than 1.0 per sq km were estimated for Serengeti (TWCM 1997), Omo-Tama-Mago (Graham et al. 1997) and Sibiloi (Grunblatt et al. 1995b). Local densities can exceed 6.0 per sq km (formerly much higher) in areas such as the southern section of Queen Elizabeth National Park (Lamprey & Michelmore 1996). Aerial surveys have produced density estimates of 0.04-0.08 per sq km in depleted areas such as Lake Mburo (Lamprey & Michelmore 1996), Manovo-Gounda-St. Floris (J. L. Tello, in litt. September 1995) and Arly-Singou (Barry & Chardonnet 1998).

Assuming an average correction factor for undercounting bias in aerial surveys of 1.3 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.5 per sq km where the species is known to be common or abundant and 0.05 per sq km elsewhere, the information in Appendix 4 gives total population estimates of 30,000 tsessebe (40% in protected

*Tsessebe, Topi, Tiang & Korrigum (continued)*

areas, 20% on private land), 93,000 topi (more than 90% in protected areas), 100,000 coastal topi (mainly outside protected areas), 75,000 tiang (25% in protected areas) and 3,000 korrigum (98% in and around protected areas), and a species total of about 300,000. This includes an estimated 50,000 tiang in southern Sudan, which is a guess and could be a gross underestimate of the actual population. Population trends are increasing for the tsessebe (especially on private land) but decreasing for most or all of the other subspecies.

Captive Population: The small number of individuals of this species held in captivity (31 in North American zoos in 1996) are all of the subspecies *jimela* and *topi.*

The Future: As indicated by its dramatic decrease during the 20th century, this species is highly vulnerable to competition with cattle and hunting for meat. The survival of the korrigum is already threatened. If current trends continue, the status of most or all other subspecies apart from the tsessebe will decline to threatened within the next few decades as more populations are eliminated. The numbers of some of these subspecies, e.g., the tiang, may already be decreasing at a rate where their survival is threatened.

This trend will only be reversed by more effective protection and management of the remaining populations. About 25% of the species' estimated total population currently occurs in areas which receive at least reasonably good levels of protection and management.


**Hirola**
*Damaliscus hunteri* (P. L. Sclater 1889)

RED LIST STATUS
Critically Endangered

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Somalia | ? | ? | C | ? | C | ? |
| Kenya | >90 | I | >400 | S/D | >490 | S/D |

OVERVIEW OF CONSERVATION STATUS

Somalia: Formerly occurred in the Lake Dere-Badhadhe region near the Kenya border in the south. By the 1980s its range had contracted considerably, but recent reports indicate that it occurs in good numbers in some areas of Badhadhe District.

Kenya: This species' natural range in Kenya comprises a narrow strip of grassy plains in southern Garissa and adjacent Lamu districts, lying between waterless thornbush to the north and coastal forest-savanna mosaic to the south. Its survival within this very restricted range is threatened by poaching, lack of effective protection and development of the cattle industry, compounded by rinderpest and drought. Estimated numbers decreased from 12,500 in the early to mid-1970s to about 7,000 in 1977-83, prior to a sudden decrease of more than 80% following the severe drought of 1984. Aerial surveys by Kenya's Department of Resource Surveys and Remote Sensing (DRSRS) in 1985-93 gave population estimates of about 1,800. Only 302 hirola were seen in 32,000 sq km during an attempted total aerial count by KWS in 1995. In a 1996 aerial survey by DRSRS, 385 hirola were seen on and off transect and the population was estimated to number 1,500. It can therefore be concluded that in 1995-96 the hirola population of Garissa and Lamu districts was at least about 400 and may have exceeded 1,000. Even if the higher estimate is correct, the population decrease since the 1970s meets the criteria for a Red List status of Critically Endangered, at least for the Kenyan population.

In 1963, about 14 hirola were translocated from Garissa and released in Tsavo National Park to the south of the species' natural range. This translocation was successful and resulted in the establishment of a small population in the southern part of Tsavo East National Park, where it

*Hirola (continued)*
receives reasonable protection from poaching. The Tsavo population has held its own in the face of predation by relatively high densities of large carnivores and competition from a greater variety of other wild herbivore species (but much lower numbers of cattle) than occur within the species' natural range. Intensive ground surveys conducted in 1995-96 revealed 56-76 hirola in Tsavo East, which is probably substantially less than before the 1994-95 rinderpest outbreak.

The potentially grave plight of the hirola has been of major concern to the ASG since Hillman et al. (1988) drew attention to the marked decrease in the estimates of the Garissa population following the 1984 drought. ASG members Dick Estes, Mark Stanley Price, Rod East and Chris Hillman discussed the rapidly deteriorating status of the hirola with senior representatives of Kenya's then Wildlife Conservation and Management Department in 1987, and a grant to the ASG from the Peter Scott Memorial Fund was eventually used to fund the preparation by Chris Magin of a recovery plan for the species. This includes the translocation of additional animals from the species' insecure natural range to Tsavo. In August 1996, 29 hirola were captured by KWS in Garissa and released in Tsavo East National Park. Continued monitoring of the Tsavo population by Kenyan researcher Sam Andanje has revealed that 12 of the animals released in 1996 were known or suspected to have died by April 1997, when the total number of hirola in this population had increased to 93. A total of 23 calves were bom into the Tsavo population between September 1996 and April 1997 and a further 25 calves were expected to be born during the 1997-98 calving season. The number of hirola in this population may therefore have exceeded 100 by April 1998.

SUMMARY
The decline of this antelope's numbers since the 1970s within its very restricted natural range suggests that it is in danger of extinction in the short to medium term. Security problems preclude the development of effective conservation measures over most of its natural range, with a few possible exceptions such as parts of Badhadhe District in Somalia. Establishment of additional extralimital populations to the one in Tsavo National Park, in areas where high levels of protection and management can be assured, is an urgent priority to reduce the risk of extinction.

Estimated Total Numbers: The results of the 1995-96 aerial counts in Kenya and recent reports that the hirola is locally common in Badhadhe District of Somalia suggest that its total numbers are in the hundreds to low thousands. Within its restricted range (see Appendix 4), its numbers are probably continuing to decline outside the few areas where it receives adequate protection, such as Tsavo.

Captive Population: In 1996, a single hirola (adult female) was held in captivity, in the USA.

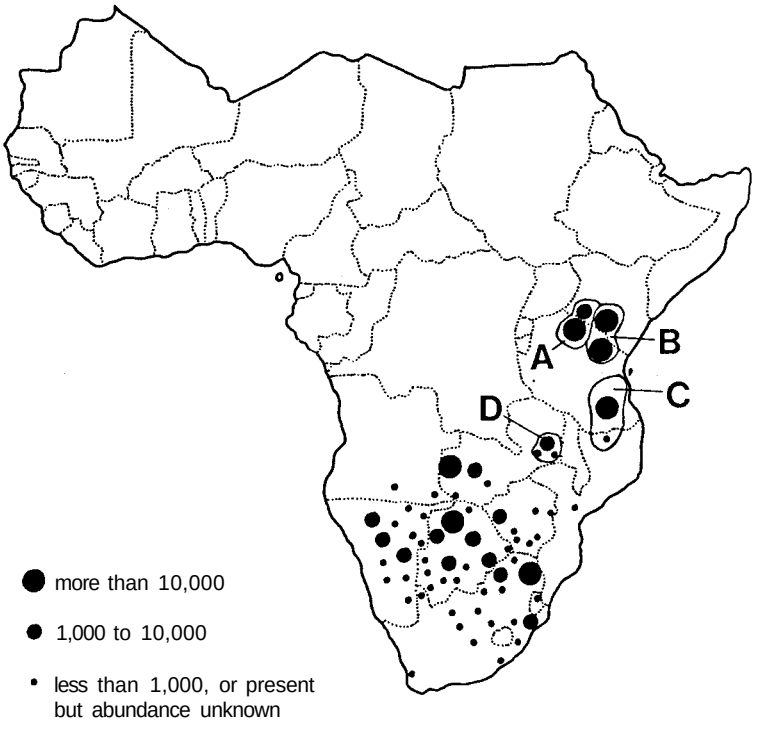
The Future: If present trends continue, the hirola will eventually be exterminated outside those areas where it receives effective protection. Its survival will remain highly precarious until secure populations have been established in a greater number of areas within or outside its natural range.

## Blue & White-bearded Wildebeest

*Connochaetes taurinus* (Burchell 1823)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
A: western white-bearded wildebeest (C. r. *mearnsi)*
B: eastern white-bearded wildebeest (*C. t. albojubatus)*
C: Nyassa wildebeest (*C. t. johnstoni)*
D: Cookson's wildebeest (*C. t. cooksoni)*
other areas: blue wildebeest (C. t. *taurinus)*




Status of Subspecies
western white-bearded wildebeest: Lower Risk (conservation dependent)
eastern white-bearded wildebeest: Lower Risk (conservation dependent)
Nyassa wildebeest: Lower Risk (conservation dependent)
Cookson's wildebeest: Lower Risk (conservation dependent)
blue wildebeest: Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Western White-bearded Wildebeest | | | | | | | | |
| Kenya* | 680 | S | - | - | 11,640 | D | 12,320 | D |
| Tanzania | 925,870 | D | - | - | - | - | 925,870 | D |
| Subspecies Total | 926,550 | D | - | - | 11,640 | D | 938,190 | D |
| Eastern White-bearded Wildebeest | | | | | | | | |
| Kenya | 5,170 | S | - | - | 22,010 | S | 27,180 | S |
| Tanzania | 45,240 | S | - | - | X | ? | >45,240 | S |
| Subspecies Total | 50,410 | S | - | - | >22,010 | S | >72,420 | S |
| Nvassa Wildebeest | | | | | | | | |
| Tanzania | 47,840 | S | - | - | >25,210 | S/D | >73,050 | S/D |
| Malawi | | - | - | - | - | - | Ex | |
| Mozambique | 400 | S/D | - | - | ? | ? | 400 | S/D |
| Subspecies Total | 48,240 | S | - | - | >25,210 | S/D | >73,450 | S/D |
| Cookson's Wildebeest | | | | | | | | |
| Zambia | >6,900 | S/D | - | - | 4,950 | S/D | >11,850 | S/D |

*population estimate for western white-bearded wildebeest in Kenya includes only resident animals

*Blue & White-bearded Wildebeest (continued)*

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Poon/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Blue Wildebeest | | | | | | | | |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Zambia | 30,460 | D | 50 | S/I | X | D | >30,510 | D |
| Mozambique | R | D | - | - | - | - | R | D |
| Namibia | 3,330 | S | 4,940 | I | 790 | D | 9,060 | S/I |
| Botswana | 8,940 | S | 10,050 | S/I | 22,650 | S | 41,640 | S |
| Zimbabwe | >1,750 | S | 8,850 | S/I | 40 | S | >10,640 | S/I |
| South Africa | 24,060 | S/I | 11,600 | I | - | - | 35,660 | I |
| Swaziland | C | ? | - | - | - | - | C | ? |
| Subspecies Total | >68,540 | S | 35,490 | I | 23,480 | S/D | >127,510 | S/I |
| Species Total | 1,100,640 | D | 35,490 | I | >87,290 | D | >1,223,420 | D |

OVERVIEW OF CONSERVATION STATUS

Kenya: This species still occupies substantial parts of its former range in Narok and Kajiado districts in southern Kenya, with the western and eastern white-bearded races separated by the western wall of the Rift Valley. The largest resident population of the western white-bearded wildebeest occurs on the Mara ranches, where numbers are decreasing because of the expansion of agriculture. The relatively small resident population of this subspecies in Masai Mara National Reserve is augmented each dry season by several hundred thousand migrants from the Serengeti in northwestern Tanzania. Kenya's population of the eastern white-bearded wildebeest occurs mainly on unprotected rangelands in Kajiado district, with Amboseli and Nairobi National Parks acting as dry season concentration areas for parts of this population. The recent spread of rinderpest into southern Kenya from infected cattle in eastern Kenya is a major threat to the wildebeest.

Tanzania: *C. taurinus* occurs in three separate populations in Tanzania, with the eastern white-bearded wildebeest in eastern Masailand separated by the western wall of the Gregory Rift Valley from the western white-bearded wildebeest in western Masailand, and the Nyassa wildebeest in the southeast. All three subspecies still occupy large parts of their historical ranges and occur in large numbers. The migratory western white-bearded wildebeest population of the Serengeti ecosystem is Africa's largest extant, discrete antelope population, rivalled only (at least until recently) by the white-eared kob population of the Boma ecosystem in southeastern Sudan. Following the elimination of rinderpest by a cattle vaccination programme in the region, the migratory Serengeti wildebeest population increased markedly in the 1960s and 1970s from an estimated 260,000 in 1961 and stabilised at about 1,250,000 during the 1980s. During this period, the population's dry season range extended increasingly northwards across the Kenya border into the Masai Mara National Reserve. By the early 1990s, poaching pressures had increased to high levels and the area available to migratory wildebeest in the west and northwest of the Serengeti ecosystem had decreased markedly because of the expansion of settlement and agriculture. During a pronounced drought in late 1993, many wildebeest wandered into settled areas outside the northwestern boundary of Serengeti National Park and large numbers were killed by local villagers for meat. An estimated 300,000 wildebeest perished from the combination of opportunistic hunting and drought-induced starvation. The migratory population was reduced to an estimated 917,000 in the subsequent wet season (March 1994) when it had returned to the Serengeti Plains in the southeast of the ecosystem. The future of the Serengeti wildebeest population remains precarious because of illegal offtake for meat by the increasing human population living immediately west of the national park. The recent spread of the rinderpest virus from eastern Kenya into northern Tanzania is also a major potential threat.

The population of the eastern white-bearded wildebeest in Tarangire-Manyara has remained stable, but this population's future is threatened by the loss of its wet-season habitat. The Tarangire

population concentrates within the 2,600 sq km Tarangire National Park in the dry season, but is largely or completely absent from the park in the wet season when it moves eastwards across the Simanjiro Plains. Preservation of the integrity of the 20,000 sq km Tarangire ecosystem requires protection of the migration routes of wildebeest and zebra in a region of increasing human populations and expanding agriculture.

The Nyassa wildebeest occurs mainly in Selous Game Reserve. It is common throughout the reserve, but major concentrations occur during the dry season in two restricted areas on the reserve's northern and northeastern boundaries. Overall numbers in the Selous region are stable, but there may have been a recent decline in the wildebeest population of the adjoining Mikumi National Park.

Angola: The blue wildebeest was formerly widespread and locally abundant in southern and southeastern Angola. Its numbers are now greatly reduced but it survives in a few localities, e.g., near the Zambia border in the southeast. The population of Zambia's Liuwa Plain still enters Angola seasonally.

Zambia: The blue wildebeest was formerly widespread on the plateaux west of the Kafue River, with Cookson's wildebeest endemic to the Luangwa Valley. The blue wildebeest is now restricted to four national parks and their surrounds, viz., Liuwa Plain, Sioma Ngwezi, Kafue and Lochinvar, plus small numbers on private land. The largest population occurs in Liuwa Plain, where it migrates seasonally between the national park and lightly wooded country to the west. This population receives minimal protection and is heavily poached by Angolan and Zambian meat hunters. Smaller but substantial populations of the blue wildebeest occur in the northwest and south of Kafue National Park, with the former migrating between the Busanga Plain (dry season range) and the adjacent woodlands (wet season range).

Cookson's wildebeest still occupies most of its historical distribution, which lies mainly within national parks and game management areas. The largest population of this subspecies occurs in the valley floor areas of North Luangwa National Park, where it has benefitted from the high levels of protection established by the North Luangwa Conservation Project. It also occurs in good numbers in other parts of the Luangwa Valley, mainly in relatively poorly protected game management areas such as Lumimba and Munyamadzi with only moderate numbers in South Luangwa and Luambe National Parks. Its estimated numbers in the central Luangwa Valley have decreased since the 1970s.

Malawi: The Nyassa wildebeest formerly occurred on the Palombe Plains in the southeast. It was exterminated in the 1930s and this region is now densely settled. Vagrants of Cookson's wildebeest may wander rarely into western Malawi from the Luangwa Valley in eastern Zambia.

Mozambique: Formerly occurred widely, with the blue wildebeest in central and southern regions to the south of the Zambezi River and the Nyassa wildebeest to the north of the Zambezi. By the early 1980s, it had been eliminated from most of its former range and reduced to scattered remnant populations. These were generally small and declining, with the notable exception of Gorongosa National Park which supported an estimated 14,000 blue wildebeest in 1980. Since then, the Gorongosa population has been reduced to very low levels and the populations of blue wildebeest in areas such as Banhine and Zinave National Parks and western Gaza Province have been exterminated by uncontrolled hunting. The Nyassa wildebeest survives in Niassa Game Reserve in the north.

Namibia: The blue wildebeest formerly occurred widely in the northern and eastern savannas. It was eliminated from much of its former range during the development of the intensive cattle industry which commenced in the 1920s. A large migratory population of about 30,000 wildebeest survived in and around Etosha National Park, but this population crashed after migration was prevented by the erection of game-proof fences between 1960 and 1973. This left a smaller, sedentary population within the national park. The Etosha population continued to decrease because

*Blue & White-bearded Wildebeest (continued)*

of factors such as anthrax but has now stabilised at about 10% of its former migratory level. Smaller numbers occur in a few other protected areas, such as Kaudom Game Park, and it also occurs at low densities in some communal lands within its historical range. It has staged a gradual comeback on private farmland, both within its former range and through introductions to farming districts in the west and south of the country, outside its natural range.

Botswana: The blue wildebeest formerly occurred throughout. It remains widespread but is now absent from the more densely settled areas, e.g., in the southeast. In the late 1970s, the Botswana section of the Kalahari supported an estimated 260,000 wildebeest, outnumbered only by the Serengeti-Mara population in East Africa. Historically, most of the Kalahari wildebeest moved northwards to the Boteti River, Lake Ngami and Lake Xau in northern Botswana to seek water and forage during periods of drought. Such movement is no longer possible because of the lack of water in these areas as well as the proliferation of veterinary cordon fences and human settlement. The Kalahari wildebeest population now moves only as far north as Central Kgalagadi Game Reserve in the dry season, and occurs mainly outside protected areas during the wet season. Some animals move southwest into Gemsbok National Park during the dry season. Following heavy mortality of the migratory population during the droughts of the early 1980s, wildebeest numbers in the Botswana section of the Kalahari had decreased to <15,000 by 1986-87. This population has subsequently remained more or less stable. Aerial surveys indicate the possible establishment of a resident population of several thousand wildebeest within Central Kgalagadi Game Reserve since the population crash of the 1980s. This may have resulted from the establishment of watering points for wildlife within this reserve in the late 1980s. Alternatively, it is possible that the intense selection pressures operating on the Kalahari wildebeest population in the early 1980s have led to a population that is more sedentary and drought-resistant. Some wildebeest were known to have remained permanently in the Kalahari prior to the erection of veterinary fences. Good populations of wildebeest, generally in stable numbers, still occur in and around the Okavango Delta and Makgadikgadi-Nxai Pan National Park in the northern region, in the Namibia border region of western and southern Ngamiland and on the Tuli block farms in the east.

Zimbabwe: The blue wildebeest formerly occurred widely in the west and in the southern lowveld. It is still quite widespread within its former range and it has been introduced to some other areas, e.g., Nyanga National Park in the eastern highlands. It is well represented on private game ranches and conservancies and survives in reasonable numbers in some protected areas, e.g., Hwange National Park. It is now concentrated in the eastern section of Hwange and its numbers appear to have decreased markedly in this park's northern grasslands and mopane woodlands, possibly because these areas have dried out considerably during the last 25 years.

South Africa: The blue wildebeest formerly occurred throughout the bushveld, lowveld and Kalahari thornveld of Northern Cape, Northwest, Northern, Mpumalanga and northern KwaZulu-Natal Provinces. It was eliminated from large parts of its former range but survived in good numbers in a few protected areas. It has subsequently been reintroduced widely to parks and reserves and private game farms and conservancies, in some cases extralimitally. Legislation restricting the translocation of wildebeest in order to control the spread of malignant catarrh has recently been changed, allowing much freer transportation and re-establishment of this species. This will assist the increase of wildebeest numbers on private land. The largest population occurs in Kruger National Park, where its numbers are stable and were not affected by the severe drought of 1991-92. It also occurs in good numbers in Kalahari Gemsbok National Park, where the resident population is occasionally augmented by large numbers of dry season immigrants from southern Botswana. Pilanesberg National Park in Northwest Province, Pongola Nature Reserve in southeastern Mpumalanga and Hluhluwe-Umfolozi Park, Mkuzi and Itala Game Reserves in northern KwaZulu-Natal also support substantial numbers. Smaller populations occur in at least three other national parks and 15 other provincial reserves. The largest numbers on private land occur in Northern, Mpumalanga and KwaZulu-Natal Provinces.

Swaziland: The blue wildebeest was formerly widespread in the lowveld but it is now confined to

protected areas. The population of Hlane Game Reserve increased to high levels in the 1970s in response to effective control of poaching, then crashed because of overpopulation. This population has subsequently gone through similar boom and bust cycles. The blue wildebeest also occurs in Mlawula Nature Reserve and it has been reintroduced to Mlilwane Wildlife Sanctuary. The ill-advised introduction of this species to Malolotja Nature Reserve in the western highveld may have resulted in hybridisation with the reserve's black wildebeest population. The blue wildebeest is now being eliminated from Malolotja.

SUMMARY

This species formerly occurred in short grasslands and open bushland and woodland in drier areas from southern Kenya to northern South Africa, often in large concentrations. Its numbers and distribution have been reduced by the spread of settlement and livestock, poaching for meat and loss of the seasonal ranges of some migratory populations, but it remains locally abundant in and around protected areas in parts of its former range.

The migratory Serengeti-Mara population of the western white-bearded wildebeest represents about 70% of the species' estimated total numbers. Smaller but substantial populations occur in areas such as Kafue and Liuwa Plain (Zambia), Etosha (Namibia), Okavango, Makgadikgadi-Nxai Pan, Ngamiland and the central and southern Kalahari (Botswana), Hwange (Zimbabwe), Kruger, Hluhluwe-Umfolozi and Mkuzi (South Africa), Hlane (Swaziland) and private farmland (Namibia, Botswana, Zimbabwe and South Africa) (blue wildebeest), the Luangwa Valley (Zambia) (Cookson's wildebeest), the Selous ecosystem (Tanzania) (Nyassa wildebeest), Ngorongoro Crater (Tanzania) (western white-bearded wildebeest) and Tarangire (Tanzania) and Kajiado (Kenya) (eastern white-bearded wildebeest). Most of these populations are currently stable or increasing with a few notable exceptions such as Serengeti and Liuwa Plain. Some populations have decreased substantially from historical levels because of the loss of their former migration routes, e.g., Etosha, Kalahari.

Estimated Total Numbers: Recent estimates of numbers are available for all of the major surviving populations of this species, mainly from aerial surveys (see Appendix 4). Summing these estimates gives a total population in excess of 1,200,000, but this does not allow for an unknown level of undercounting bias in aerial surveys.

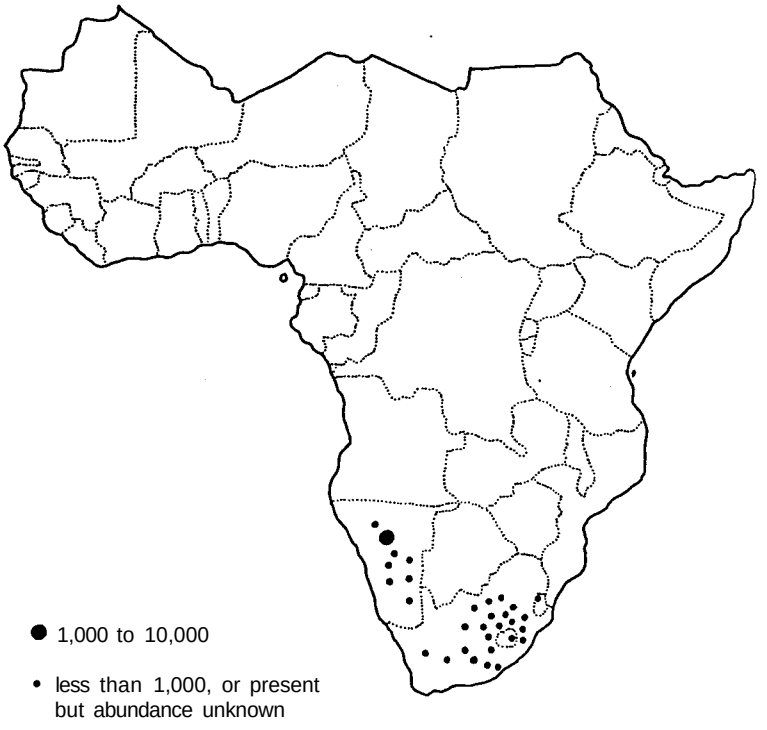
Population densities estimated by aerial surveys range from less than 0.15 per sq km in areas such as Kafue (Yoneda & Mwima 1995), Etosha (P. Erb, in litt. August 1997), Hwange (Davies et al. 1996) and the central and southern Kalahari (DWNP 1995; D. Gibson, in litt. May 1997) to 0.6-1.3 per sq km in areas such as Kruger (P. Viljoen, in litt. February 1995), North Luangwa (D. Owens, in litt. October 1995), Selous (TWCM 1995c) and Kajiado (Grunblatt et al. 1996), and 3.6 per sq km in Tarangire (TWCM 1995a). Recent total counts in areas where the species is abundant have produced population density estimates as high as 34.0-35.0 per sq km, e.g., Serengeti (TWCM 1994a) and Ngorongoro Crater (Runyoro et al. 1995).

Assuming an average correction factor for undercounting bias in aerial surveys of 1.3 (see Table 4-1, p. 91) and an average population density of 0.1 per sq km for areas where the species is known to still occur but no population estimates are available, the information in Appendix 4 gives total population estimates of 150,000 blue wildebeest (about half in protected areas and one-quarter on private farms and conservancies), 1 6,000 Cookson's wildebeest (60% in protected areas), 96,000 Nyassa wildebeest (two-thirds in protected areas), 942,000 western white-bearded wildebeest (98% in and around protected areas), 94,000 eastern white-bearded wildebeest (about two-thirds in and around protected areas) and a species total of 1,298,000 (88% in and around protected areas, 3% on private land). Population trends are generally stable in protected areas, increasing on private land and in long-term decline elsewhere.

The Future: The vulnerability of this species to illegal hunting and loss of habitat caused by the encroachment of settlement is increased by the dependence of some migratory populations on seasonal access to unprotected rangelands. In these cases, e.g., Liuwa Plain, Tarangire and Kajiado,

*Blue & White-bearded Wildebeest (continued)*
effective protection and management of national parks which contain only part of the population's annual range may be insufficient to prevent major population declines. Loss of range outside protected areas may result in the replacement of migratory populations with much smaller (but nevertheless substantial) resident populations within protected areas, as has occurred in areas such as Etosha National Park and Central Kgalagadi Game Reserve. Some wildebeest populations are naturally relatively sedentary and/or their seasonal movements are generally accommodated within protected areas, e.g., Kafue, Luangwa, Hwange and Selous. The overall status of the species may not change in the long term if it continues to be well represented in protected areas and on private land, but if current trends continue its populations will become increasingly sedentary within fenced parks, reserves and farms.

The future of the enormous migratory wildebeest population of the Serengeti-Mara ecosystem will have a major impact on the species' status. If this population does not recover from its decline in the early 1990s, for example, this reduction alone would be sufficient to meet the criteria for a Red List status of Vulnerable for the species as a whole. The results of the most recent census of the Serengeti wildebeest population, which was conducted by Tanzania Wildlife Conservation Monitoring in 1997, had not been released at the time this report went to press. What happens to this population will determine the viability of the spectacular Serengeti-Mara ecosystem (see TWCM et al. 1997). Conservation of the Serengeti wildebeest population is one of the most important challenges facing wildlife conservation in Africa in the 21st century.




## Black Wildebeest

*Connochaetesgnou* (Zimmermann 1780)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Namibia | - | - | 7,180 | I | - | - | 7,180 | I |
| South Africa | 3,670 | S/I | 7,400 | S/I | - | - | 11,070 | S/I |
| Swaziland | C | S | - | - | - | - | C | S |
| Lesotho | R | S/I | - | - | - | - | R | S/I |
| Species Total | >3,670 | S/I | 14,580 | I | - | - | >18,250 | I |

OVERVIEW OF CONSERVATION STATUS

Namibia: This species does not occur naturally but it has been introduced widely to private farmland. Importations from South Africa led to a dramatic increase in its estimated total numbers on Namibian game farms from \150 in 1982 to >7,000 in 1992. It now occurs throughout Namibia's farming districts.

South Africa: Formerly occurred in vast numbers throughout the highveld of Free State and Gauteng Provinces, extending northwards into Northwest Province and the eastern and central Cape and eastwards into KwaZulu-Natal. By the end of the 19th century, excessive hunting had reduced it to a few surviving animals on two farms in the Free State. Protection by concerned farmers and subsequently by provincial and national conservation agencies has enabled the species to recover gradually from the brink of extinction. It has been reintroduced widely to conservation areas and private farmland within its former range, and to farmland outside its natural range. The largest numbers occur on private farms. It is also well represented in provincial reserves within its former range, mainly in Free State and Gauteng Provinces, with the largest numbers in areas such as Willem Pretorius Game Reserve, Koppies Dam and Suikerbosrand Nature Reserves. It occurs in small to moderate numbers in three national parks, Vaalbos, Mountain Zebra and Golden Gate Highlands.

*Black Wildebeest (continued)*

Several populations have decreased recently in protected areas, e.g., Golden Gate Highlands National Park and Free State reserves, due to the removal of animals to prevent overgrazing and also because of recent droughts. The black wildebeest tends to concentrate on flat areas and areas with the shortest grass, and it can cause serious overgrazing if overstocked. Hybridisation between this species and the blue wildebeest is a problem in some areas. Tussen-die-Riviere Game Farm in the southern Free State supported the largest protected population in the 1980s, but the entire black wildebeest population of this provincial reserve has been removed temporarily while the reserve's extralimital blue wildebeest population is removed.

Swaziland: Formerly occurred in the western highveld where it was exterminated by overhunting. A reintroduced population has become well established in Malolotja Nature Reserve.

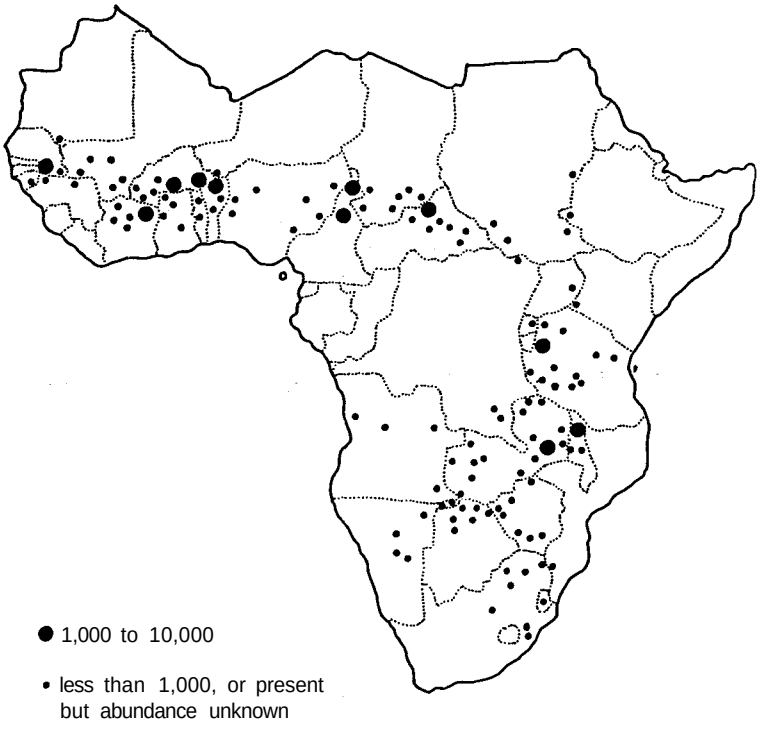
Lesotho: Exterminated before 1900. It has been reintroduced to Sehlabathebe National Park.

SUMMARY

The black wildebeest formerly occurred in large migratory concentrations within its seasonal ranges in the highveld grasslands and Karoo shrublands of Southern Africa. It is now reduced to small sedentary populations within fenced areas, but it has been reintroduced widely within its former range and also extralimitally.

Estimated Total Numbers: Recent estimates are available for almost all of this species' populations, including total counts for protected areas and questionnaire surveys for private land (Appendix 4). Summation of these estimates gives a total population estimate of more than 18,000, of which about 80% is on private farms and conservancies and 20% in protected areas. Population trend is increasing, especially on private land, with a large extralimital population now established in Namibia.

The Future: If current trends continue, the black wildebeest's numbers will increase substantially above present levels, particularly on private farms. The only significant threat to the species is the problem of hybridisation with the blue wildebeest. This can occur when the two species are mixed unnaturally on fenced land. Continued vigilance by wildlife managers will be necessary to ensure that the gene pool of the less numerous black wildebeest is not seriously corrupted by hybridisation.




Subfamily Hippotraginae

**Roan Antelope**
*Hippotragus equinus* (Desmarest 1804)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mauritania | - | - | - | - | V | D | V | D |
| Mali | <1,290 | D | - | - | 250 | D | <1,540 | D |
| Niger | <350 | D | - | - | <350 | D | <700 | D |
| Senegal | 2,400 | S | - | - | X | ? | >2,400 | ? |
| Gambia | - | - | - | - | - | - | Ex? | - |
| Guinea-Bissau | - | - | - | - | C/U | S/D | C/U | S/D |
| Guinea | X | ? | - | - | R | D | R | D |
| Ivory Coast | >1,330 | D | - | - | - | - | >1,330 | D |
| Burkina Faso | >7,370 | ? | - | - | X | S/D | >7,370 | S/D |
| Ghana | C/U | S/D | - | - | - | - | C/U | S/D |
| Togo | U/R | D | - | - | - | - | U/R | D |
| Benin | >1,500 | S | - | - | X | S/D | >1,500 | S/D |
| Nigeria | U/R | D | - | - | - | - | U/R | D |
| Chad | >1,500 | S | - | - | U | D | >1,500 | D |
| Cameroon | 6,070 | S/D | - | - | U/R | D | >6,070 | S/D |
| CAR | 2,500 | S/D | - | - | U | D | >2,500 | D |
| Congo-Kinshasa | U/R | S/D | - | - | ? | ? | U/R | S/D |
| Sudan | 300 | S/D | - | - | X | D | X | D |
| Eritrea | - | - | - | - | - | - | Ex | - |
| Ethiopia | U/R | D | - | - | ? | ? | U/R | D |
| Uganda | 15 | D | - | - | - | - | 15 | D |
| Kenya | 22 | D | - | - | - | - | 22 | D |
| Tanzania | >3,010 | S | - | - | >1,300 | S/D | >4,310 | S/D |
| Rwanda | <20 | D | - | - | - | - | <20 | D |
| Burundi | - | - | - | - | - | - | Ex | - |
| Angola | - | - | - | - | R | D | R | D |
| Zambia | >3,270 | S/D | 30 | S/I | >1,780 | D | >5,080 | D |

*Roan Antelope (continued)*

| Country | Protected Areas Popn/Abund. | Trend | Private Land Poon/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Malawi | 1,790 | S/I | - | - | - | - | 1,790 | S/I |
| Mozambique | R/V | ? | - | - | - | - | R/V | ? |
| Namibia | 390 | I | 630 | I | 120 | D | 1,140 | I |
| Botswana | 140 | S/D | - | - | 1,220 | S/D | 1,360 | S/D |
| Zimbabwe | >410 | S/D | 80 | S/I | - | - | >490 | S/D |
| South Africa | 190 | S | 160 | S/I | - | - | 350 | S/I |
| Swaziland | - | - | R | ? | - | - | R | ? |
| Species Total | >33,870 | S/D | 900 | I | >5,020 | D | >39,000 | D |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred in southern Mauritania. By the 1980s it was on the verge of extinction, occurring seasonally in small numbers near the Mali border. No recent information on its status.

Mali: Formerly occurred widely in the southwestern savanna woodlands, extending northwards into the southern sahel zone. It has disappeared from substantial areas of its former range because of illegal hunting and habitat degradation which has resulted from overgrazing by livestock and agricultural expansion. Its suspicious nature enables it to withstand hunting pressure better than most other large herbivores, and it survives in reasonable numbers in the Boucle du Baoule and Bafing protected areas and in scattered localities elsewhere.

Niger: Formerly occurred widely in the savanna woodland zone of southwestern Niger. It has been eliminated from most of its former range by illegal hunting and human occupation of its habitat. By the late 1980s, it had persisted in slightly larger numbers than other large antelope species in areas such as W National Park, probably because roan are less tied to riparian areas where most poaching takes place. No recent information on its status.

Senegal: Formerly occurred widely in the savanna woodlands of central and southern Senegal, extending northwards to the central Ferlo region. It had disappeared from the central regions of the country by the 1970s. It is now largely or entirely restricted to the southeast, where it occurs in good numbers in Niokolo-Koba National Park and in unknown numbers in Faleme Hunting Zone.

Gambia: Occurred in the eastern savannas at least until the 1970s. It may now be extinct, although tracks of this species were reportedly observed in 1989.

Guinea-Bissau: Formerly occurred throughout most of the savannas of the interior of the country. It has been eliminated from more than half of its former range in the north but it still occurs widely in the south and east. It is locally common in areas such as Corubal River.

Guinea: Probably occurred widely in the northern savanna woodlands in the past. It survives locally within its former range, e.g., there are recent reports of this species from Badiar National Park and N'Dama Forest Reserve in the northwest and from the Mali border area in the north.

Ivory Coast: Formerly widespread in the northern savannas. It is now confined to protected areas, generally in small and declining populations. Poaching has reduced the largest surviving population, in Comoe National Park, by an estimated 35% since 1978.

Burkina Faso: Formerly occurred more or less throughout. It has been eliminated from most of the northern half of the country, where only a few small remnant populations may survive. It still occurs widely in the south, including some agricultural areas, and is well represented in the southern protected areas. The roan antelope occurs at high densities in Nazinga Game Ranch and in

good numbers in the Arly-Singou and Diefoula protected areas.

Ghana: Formerly occurred widely in savanna woodland but now confined to a few protected areas. It is common in Mole National Park and Gbele Game Production Reserve, where its populations are stable.

Togo: Formerly occurred in savanna woodlands throughout most of the country. By the mid-1980s it occurred mainly in Keran and Fazao National Parks, where it was reasonably common. It has probably been reduced to small, decreasing populations by the breakdown of the country's protected area system during the 1 990s.

Benin: Formerly occurred throughout the savanna woodlands of northern and central Benin, but now generally confined to national parks, hunting zones and classified forests. It is well represented in Pendjari National Park and the adjoining hunting zones, where its numbers are stable or increasing.

Nigeria: Formerly occurred widely in central and northern Nigeria. It is now confined to protected areas, where its numbers are generally small and decreasing.

Chad: Formerly occurred throughout the savanna zone of southern Chad. It has been eliminated from the more densely settled parts of its former range, e.g., Logone Occidental and Tandjile regions in the southwest, but it still occurs quite widely elsewhere. It occurs in good numbers in Zakouma National Park and Siniaka Minia Faunal Reserve which have benefitted from improved protection in recent years. Elsewhere it generally occurs at low densities, e.g., Binder Lere Faunal Reserve and other parts of Mayo Kebi region in the southwest, Manda National Park in Moyen Chari region, and Aouk Hunting Zone in eastern Salamat region in the southeast. Most of these populations are unprotected and in gradual decline, but the small surviving population in Manda National Park should recover if current attempts to reinstate the protection of this park are successful.

Cameroon: Formerly distributed widely from Lake Chad to the Adamaoua Plateau, but now generally restricted to protected areas and other areas with low human population densities. The main surviving populations are in Waza National Park, where its numbers are stable or increasing, and in the savanna woodlands of North Province, where it is still locally common in Bouba Ndjida, Benoue and Faro National Parks and the adjoining hunting zones. Its overall numbers in North Province are in decline because of poaching and the expansion of settlement.

Central African Republic: Formerly occurred widely in savanna woodlands over much of the country. It remains widespread at low to moderate densities in northern, central and eastern regions. It survives in good numbers in the north, in Manovo-Gounda-St. Floris National Park (numbers more or less stable), Bamingui-Bangoran National Park (decreasing) and Sangba Pilot Zone and adjoining hunting concessions (increasing). Elsewhere its numbers are generally declining because of uncontrolled poaching for meat by hunters from Sudan and Chad, although the roan antelope's suspicious nature has enabled it to withstand poaching pressure to some extent. It occurs as far south as Bangassou, where it is uncommon.

Congo-Kinshasa: Formerly occurred in the northern and southern savannas. It has probably been eliminated from extensive areas of its former range by uncontrolled hunting for meat. It is known to survive in at least three localities, viz., a small but stable population in the central section of Garamba National Park in the northeast, and small, declining populations in Upemba and Kundelungu National Parks in the southeast.

Sudan: Formerly occurred widely in southern Sudan and along the Ethiopia border in the east. It has disappeared from most of the northerly parts of its former range, e.g., it was apparently exterminated by poachers in Radom National Park between 1976 and 1994, but a viable population survives in Dinder National Park in the east. The estimated total population in southern Sudan exceeded 50,000 in the 1970s, and aerial surveys in the early-mid 1980s gave population estimates of >4,000 in Jonglei, 2,000 in Boma National Park and 1,000 in Southern National Park.

*Roan Antelope (continued)*
It survives in scattered localities in the southwest and southeast, but probably in greatly reduced numbers.

Eritrea: Formerly occurred in the southwestern savannas. It is now extinct.

Ethiopia: Formerly widespread in the western lowlands. It had become very localised by the 1980s and was threatened by habitat destruction and increasing settlement. These threats have probably increased during the intervening decade. No recent information is available on its status, apart from its continued presence in Gambella National Park.

Uganda: Formerly occurred locally in small numbers in the northeast and southwest. During the last 10-15 years it has disappeared from Kidepo Valley and Lake Mburo National Parks and Bokora Corridor Game Reserve. The only known survivors in Uganda in 1995 were 15 animals seen from the air in Pian-Upe Game Reserve.

Kenya: Formerly occurred in scattered localities in southern Kenya, mainly in the southwest, but it has been eliminated from almost all of this range. The only known surviving population is in Ruma National Park, where numbers decreased from 150-200 in the early 1970s to 22 in 1995 as a result of persistent poaching. The roan antelope's survival in Kenya is dependent on the implementation of KWS plans to establish a fenced breeding sanctuary at Ruma.

Tanzania: It has disappeared from extensive areas of its former range in the north and west, but it still occurs widely at low densities throughout most of the wildlife areas of western Tanzania from Biharamulo-Burigi Game Reserves in the northwest to Katavi and Ruaha-Rungwa in the south. It is naturally absent from the southeast. The largest populations are stable or increasing in Moyowosi-Kigosi, Katavi-Rukwa and Ruaha-Rungwa-Kisigo, but the smaller populations of Biharamulo-Burigi in the northwest and Serengeti-Maswa in the north are decreasing.

Rwanda: Confined to Akagera National Park, where a small population (150-200) persisted until 1990, mainly in the northern half of the park. It has subsequently been reduced to very low levels by poaching and the invasion of its habitat by large numbers of cattle.

Burundi: Formerly occurred in the eastern and southern savannas but now extinct.

Angola: Formerly occurred widely except in the arid southwest. By the early-mid 1970s, it had been eliminated from large parts of its former range but survived in good numbers in a few areas, e.g., an estimated 1,500 in Kissama National Park. These populations have now been severely reduced or eliminated.

Zambia: Formerly occurred throughout. It has been eliminated from large areas of its former range and survives mainly within national parks and game management areas. Its main strongholds are the Luangwa Valley and the Kafue National Park area. Relatively large numbers occur in South Luangwa National Park. The roan population of this park has increased substantially since the 1970s, apparently because of an influx from the Muchinga Escarpment to the west where poaching pressures are higher. It also occurs in significant numbers in North Luangwa National Park, which is well protected, and in relatively poorly protected parts of the Luangwa Valley, viz., West Petauke and Chisomo Game Management Areas, where most other wildlife populations are depleted or severely depleted. It occurs widely at low densities in Kafue National Park and the adjoining game management areas. It also occurs in most other national parks and game management areas but only in small populations, many of which are decreasing.

Malawi: Formerly occurred widely but now confined to four protected areas in northern and central Malawi. The largest population occurs in Nyika National Park, where it moves seasonally between the plateau and the northern foothills. Since the mid-1980s, estimated numbers have increased in Nyika National Park and Nkhotakota Game Reserve but decreased in Kasungu National Park and

Vwaza Marsh Game Reserve.

Mozambique: Formerly occurred locally in western, central and southern regions. By the early 1980s it was reduced to two small, endangered relic populations in western Tete Province. The only recent information on the occurrence of roan in Mozambique is a sighting of an individual in western Gaza Province in 1996, in the hunting concession bordering South Africa's Kruger National Park.

Namibia: Formerly confined to the northeastern savannas, where it survives locally in low to moderate numbers in protected areas such as Kaudom Game Park and Western Caprivi Game Reserve and in some communal lands. A relatively large population has been established in Waterberg Plateau Park, which is outside the species' natural range, by the introduction of animals from Kavango in the northeast. It has also been introduced to private land in the northern farming districts, where its numbers increased more than 10-fold between 1982 and 1992.

Botswana: Confined to the northern savannas, where it still occurs widely at low densities within its historical range. Small numbers occur, at least sporadically, in Chobe National Park and Moremi Game Reserve, but the bulk of the population occurs outside protected areas.

Zimbabwe: Formerly widespread. It was largely eliminated from the highveld plateau and survives mainly in the south and west and scattered areas of the Zambezi Valley, generally at low densities. The largest estimated population occurs in Hwange National Park. Its numbers have decreased in the east of Hwange but increased in the north of this park during the last 25 years. The small population in the Middle Zambezi Valley protected areas appears to be stable. It was formerly widespread in the southeast, but it has disappeared from most of its former range in this region as a result of habitat changes caused by cattle ranching.

South Africa: Formerly occurred widely in the bushveld and lowveld of Northwest, Northern and Mpumalanga Provinces and in the northeastern Cape. It has been eliminated from most of its former range and is now a rare species in South Africa. The population in Kruger National Park decreased from 450 in 1986 to 50 in 1994 as a result of habitat degradation initiated by drought and overgrazing, mainly by zebras. The introduction of artificial water points into the roan's core range on the park's northern basalt plains has allowed zebra numbers to increase to high levels, which in turn has allowed lion prides to take up permanent residence. As a result, Kruger's roan population has faced both greater competition for food and increased predation pressure. A 260 hectare breeding enclosure for roan was established in the northeast of Kruger National Park in 1994 to assist this population's recovery. There is a small reintroduced population in Marakele National Park. The largest numbers now occur on provincial reserves and private land, including extralimital populations in Free State and KwaZulu-Natal Provinces.

Swaziland: Formerly occurred in the northeastern lowveld, but it was eliminated by hunting and the destruction of its habitat for sugarcane. It has been reintroduced to the privately owned Mkhaya Nature Reserve.

SUMMARY
The roan antelope formerly occurred very widely in the savanna woodlands and grasslands of West, Central and South-central Africa and more locally in East and Southern Africa. It has been eliminated from large parts of its former range and survives mainly in and around protected areas and in other areas with low densities of people and livestock. The largest surviving populations occur in areas such as Niokolo-Koba (Senegal), Comoe (Ivory Coast), Arly-Singou and Nazinga (Burkina Faso), Mole (Ghana), Pendjari (Benin), Waza National Park and the national parks and hunting zones of North Province (Cameroon), Manovo-Gounda-St. Floris (Central African Republic), Moyowosi-Kigosi and Katavi-Rukwa (Tanzania), the Luangwa Valley (Zambia), Nyika National Park (Malawi) and northern Botswana. Most of these populations are stable or increasing but some, e.g., in Comoe, Arly-Singou and Cameroon's North Province, are in decline despite the roan antelope's ability to withstand illegal hunting pressures better than most other large herbivores.

*Roan Antelope (continued)*

Estimated Total Numbers: Summation of the available population estimates suggests a total population of about 40,000 roan, but this does not allow for undercounting bias in aerial surveys or the extensive areas of the species' current distribution for which estimates are unavailable (see Appendix 4). Population densities estimated by aerial surveys are often low, e.g., 0.01-0.10 per sq km in Binder Lere (Chad) (Dejace 1996), Manovo-Gounda-St. Floris, Bamingui-Bangoran and Sangba (Central African Republic) (J. L Tello, in litt. September 1995), Biharamulo-Burigi, Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa and the Ruaha ecosystem (Tanzania) (TWCM 1991, 1992a, 1994c, 1995b; M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Kafue, Lower Zambezi, Sioma Ngwezi, Tondwa, Luangwa Valley game management areas and Lukusuzi (Zambia) (Jachmann & Kalyocha 1994; Kapungwe 1994b; Mwima & Yoneda 1995; Tembo 1995; Yoneda & Mwima 1995), Kasungu and Vwaza Marsh (Malawi) (Mkanda 1998; D. Gibson, in litt. April 1998), northern Botswana (DWNP 1995) and the Middle Zambezi Valley (Zimbabwe) (Davies et al. 1996). Roan populations are depleted in some of these areas, e.g., Binder Lere, Bamingui-Bangoran, Lower Zambezi, Sioma Ngwezi, Lukusuzi, Kasungu and Vwaza Marsh, but population densities are naturally low over large parts of the species' range such as the miombo woodlands of South-central Africa. Estimated population densities of 0.2-0.4 per sq km were obtained in aerial surveys of Pendjari (Benin) (Chardonnet 1995), Zakouma (Chad) (D. Moksia, in litt. July 1995), South Luangwa National Park (Zambia) (Jachmann & Kalyocha 1994) and Nyika National Park (Malawi) (Mkanda 1998). Aerial surveys of Arly-Singou (Burkina Faso) gave an overall density estimate of about 0.6 per sq km, with 1.1 per sq km in Arly National Park where the species is common (Barry & Chardonnet 1998).

Estimates of population density obtained by ground surveys have ranged from 0.03 to 0.10 per sq km in depleted areas such as Manda (Chad) (Chai 1996), Comoe (Ivory Coast) (Fischer 1996) and Dinder (Sudan) (Hashim et al. 1998) to 0.3 per sq km in Niokolo-Koba (Senegal) (Sillero-Zubiri et al. 1997), 0.7-1.1 per sq km in Waza (Cameroon) (Scholte et al. 1995) and Diefoula (Burkina Faso) (U. Belemsobgo, in litt. February 1998) and 3.0 per sq km in Nazinga (Burkina Faso) (U. Belemsobgo, in litt. October 1995).

Assuming an average correction factor for undercounting bias in aerial surveys of 1.5 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.3 per sq km where the species is known to be common and 0.03 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 76,000, of which about 60% occurs in and around protected areas. Overall population trend is generally stable or decreasing in protected areas and decreasing elsewhere, apart from the small numbers on private land in Southern Africa which are increasing.

The Future: If present trends continue, the roan antelope's status will eventually decline to threatened as it disappears from large parts of its current range because of poaching and loss of habitat to the expansion of settlement. This trend will only be reversed if more of the surviving populations receive adequate protection and management. At present, about one-third of the species' total population occurs in areas where its numbers are stable or increasing as a result of effective protection and/or low pressures of illegal hunting and habitat loss.

## Bluebuck

*Hippotragus leucophaeus* (Pallas 1767)

RED LIST STATUS
Extinct

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| South Africa | - | - | - | - | - | - | Ex | |

OVERVIEW OF CONSERVATION STATUS

South Africa: This species was confined historically to a limited area of the southwestern Cape, where it was apparently uncommon. It was soon wiped out by early European settlers, the last known specimen being shot in 1799 or 1800.

SUMMARY
The bluebuck has the dubious distinction of being the only antelope species of sub-Saharan Africa which has been exterminated in historical times.

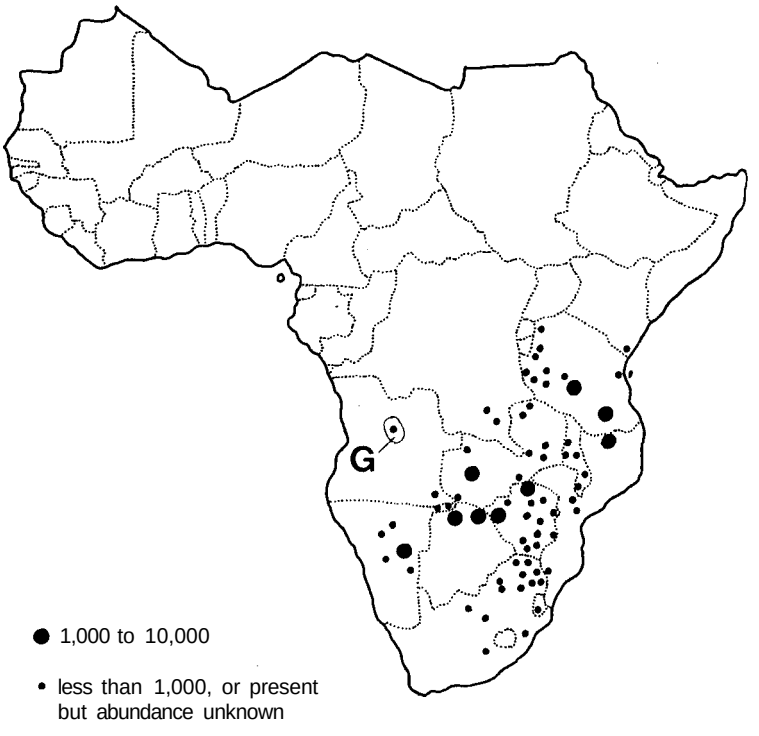
## Sable Antelope

*Hippotragus niger* (Harris 1838)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
G: giant sable (*H. n. variani*)
other areas: common sable (*H. n. niger, kirkii, roosevelti*)

As for many other antelope species, the validity and precise distribution of most of the described subspecies of the common sable are uncertain, e.g., the conservation status of the subspecies *roosevelti* of coastal Kenya and northern Tanzania depends on whether it is synonymous with the large sable population of Selous Game Reserve in southern Tanzania (Estes 1987), which is usually ascribed to *kirkii.* This possibility is currently being investigated by DNA analysis (R. Baldus, in litt. September 1998).




Status of Subspecies
common sable: Lower Risk (conservation dependent)
giant sable: Critically Endangered

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Common Sable | | | | | | | | |
| Congo-Kinshasa | U | D | - | - | ? | ? | U | D |
| Kenya | 150 | S | - | - | 15 | D | 165 | S/D |
| Tanzania | >5,460 | S | - | - | >5,220 | S/D | >10,680 | S/D |
| Angola | - | - | - | - | R | D | R | D |
| Zambia | >3,650 | D | 260 | S/I | >180 | D | >4,090 | D |
| Malawi | 1,140 | S/I | - | - | - | - | 1,140 | S/I |
| Mozambique | 4,270 | S/D | - | - | ? | ? | 4,270 | S/D |
| Namibia | 260 | I | 6,800 | I | 40 | D | 7,100 | I |
| Botswana | 730 | S/D | - | - | 2,550 | S/D | 3,280 | S/D |
| Zimbabwe | >9,260 | S/I | 9,830 | I | 600 | S | >19,690 | I |
| South Africa | >I,450 | D | >I,500 | I | - | - | >2,950 | ? |
| Swaziland | R | ? | - | - | - | - | R | ? |
| Subspecies Total | >26,370 | S/D | >18,390 | I | >8,605 | S/D | >53,365 | S/I |
| Giant Sable | | | | | | | | |
| Angola | >250 | ? | - | - | ? | ? | >250 | ? |
| Species Total | >26,620 | S/D | >18,390 | I | >8,605 | S/D | >53,600 | S/I |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Formerly occurred in the southeastern savanna woodlands. It has probably been eliminated from most of its former range by meat hunting. Poaching threatens the surviving populations in Upemba and Kundelungu National Parks.

Kenya: Historically confined to a narrow strip of coastal hinterland in the southeast, from most of which it has been eliminated. The main surviving population is in Shimba Hills National Reserve, where numbers are stable. This reserve could probably support a substantially larger sable population if there was better control of poaching on the reserve's periphery, an effective burning policy to control ticks and bush encroachment, and provision of mineral supplements.

Tanzania: Formerly occurred widely in the west, northeast and southeast. It has been eliminated from most of its former range in the northeast (a few survive in areas such as Sadani) but it still occurs widely at low to moderate densities in the tsetse-infested miombo woodlands of western and southern Tanzania. Numbers are probably decreasing outside protected areas because of overhunting for meat and encroachment of settlement, but it is well represented in and around protected areas, e.g., Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa, Ruaha-Rungwa-Kisigo-Muhesi and Selous Game Reserve. The population of the Selous ecosystem is probably the largest free-ranging sable population remaining in Africa. Although this species is generally relatively sedentary, aerial survey results suggest that the Selous population undertakes significant local movements, occurring mainly within the game reserve during the wet season and showing a tendency to move outside the reserve to the south and southeast in the dry season.

Angola: The common sable formerly occurred marginally in the east and southeast. It survives in small numbers in the southeast.

The giant sable occurs only in central Angola, between the Cuanza and Luando Rivers and immediately north of the Luando. This endemic subspecies' total population was estimated to number 2,000-3,000 in 1969-70. The bulk of the population was in the Luando reserve with smaller numbers in Kangandala National Park. From the mid-1970s until the mid-1990s, civil war and widespread lawlessness affected this area of Angola, and the giant sable's limited range was occupied repeatedly by the country's rival armies. The fragments of information emerging from the war zone during this period varied from reports that it survived in good numbers to other reports that it had been shot out or was perilously close to extinction. Trophies were reportedly obtained by South African and Cuban military personnel. The main part of the giant sable's range remained off-limits to visitors until the mid-late 1990s, because of security problems.

In 1997, a team from the Kissama Foundation conducted a ground survey of part of the giant sable's range and found that it survives in relatively good numbers. The survey covered about 1 0% of the giant sable's range and obtained evidence for the existence of 253 specimens in this area, all in good shape, with indications that there are substantially more. Some reports indicate that their survival throughout the prolonged civil war has resulted from active protection by the local Songo people against the threat of poaching by military forces and local hunters. Other reports indicate that the giant sable's survival has resulted from depopulation of its range through the emigration of local people as a result of the war. Its survival may also have been assisted by the fact that this antelope is Angola's state symbol. The severe penalties for killing a giant sable introduced by the Portugese colonial administration have led to a long-term inhibition among local hunters against poaching the species. Other local people apparently also have a taboo against hunting it. Further surveys of the giant sable's range during the 1 998 dry season were planned by the Kissama Foundation but were postponed because of resumed hostilities in the region. The development and implementation of effective measures to ensure this antelope's long-term survival are a very high international priority in antelope conservation (see p. 40).

Zambia: Formerly occurred throughout, except for parts of the western plateau west of the Zambezi. It has disappeared from large areas of its former range and is now generally restricted to

*Sable Antelope (continued)*
national parks, game management areas and private game ranches. Its main stronghold is Kafue National Park and the adjoining game management areas. It occurs in good numbers throughout this park and is a major attraction to tourists, although the Kafue population was affected adversely by game capture operations which took place in 1991-94. It occurs in scattered localities within the national parks and game management areas of the Luangwa Valley, mainly along the base of the Muchinga Escarpment where it is relatively exposed to poaching from settlements on the adjacent plateau. The sable antelope also occurs in most of Zambia's other national parks and game management areas, but generally in small, declining populations.

Malawi: Formerly occurred throughout most of Malawi but now confined to protected areas. Its main stronghold is Liwonde National Park. The two largest populations, in Liwonde and Nkhotakota Game Reserve, appear to be increasing. Elsewhere its numbers are small and decreasing.

Mozambique: Formerly occurred widely. By the early 1980s, it had disappeared from most of southern Mozambique but survived widely at low densities in central and northern regions. Its numbers decreased further in areas such as Gorongosa National Park during the 1 980s. It survives in small numbers in scattered localities, including Manica Province in west-central Mozambique and western Gaza Province in the south. The largest surviving population is in the Niassa Game Reserve area in the north. The current attempts to develop effective protection and management of the country's major wildlife areas should benefit this species.

Namibia: Naturally confined to the Caprivi Strip in the extreme northeast, where it survives in low to moderate numbers in protected areas such as Western Caprivi Game Reserve and Mahango Game Park and on communal land. An introduced population was established in Waterberg Plateau Park, outside the species' natural range, by the translocation of animals from Caprivi. It has been introduced widely to private land in the northern farming districts, where its numbers have grown spectacularly during the last 1 0 years.

Botswana: Confined to the northern and northeastern savannas. It still occurs quite widely within its historical range, mainly in Okavango-Linyanti (including moderate numbers in Moremi Game Reserve), the eastern half of Chobe National Park and the adjoining Zimbabwe border area.

Zimbabwe: Formerly occurred throughout. It was eliminated from some areas by the spread of cattle ranching and agriculture, especially on the highveld plateau, but more recently it has been reintroduced widely on private game farms. Its total numbers have increased from an estimated 14,000 in the mid to late 1980s, with most of this increase occurring on private land. It also occurs widely in protected areas, generally in stable numbers. There is a major concentration of sable in the relatively well watered eastern area of Hwange National Park and the adjoining Ngamo-Sikumi forest areas. It is also locally common in areas such as the Matetsi region of northwestern Matabeleland, Zambezi National Park, the Sebungwe region, the Middle Zambezi Valley and Matobo National Park.

South Africa: Formerly occurred in the bushveld and lowveld of Northwest, Northern and Mpumalanga Provinces in the north of the country. It was eliminated from most of its former range but has subsequently been reintroduced/introduced widely to protected areas and private game farms, including small extralimital populations in Free State, KwaZulu-Natal, Northern Cape and Eastern Cape Provinces. The largest population occurs in Kruger National Park, where its estimated numbers decreased from 2,240 in 1980 to 910 in 1993, apparently because of a sequence of dry years during the 1980s culminating in the severe drought of 1991-92. In contrast, total numbers of sable on provincial reserves and private land increased markedly between the mid-1980s and mid-1990s. Its distribution continues to expand on private land because of its high value as a trophy animal.

Swaziland: There are no reliable records of this species having occurred naturally in Swaziland. It has been introduced to Mlilwane Wildlife Sanctuary.

SUMMARY

The sable antelope formerly occurred widely in the savanna woodlands of Southern and Eastern Africa, with an isolated population (giant sable) in central Angola. The common sable has been eliminated from large areas of its former range by meat hunting and loss of habitat to the expansion of agricultural settlement and livestock. It survives in good and generally stable numbers in areas such as Moyowosi-Kigosi, Katavi-Rukwa and the Ruaha and Selous ecosystems (Tanzania), Kafue (Zambia), Liwonde (Malawi), Okavango and Chobe (Botswana), Hwange, Matetsi, Sebungwe and the Middle Zambezi Valley (Zimbabwe) and Kruger (South Africa). In addition, there are relatively large, increasing numbers of the common sable on private farms and conservancies in Namibia (extralimital), Zimbabwe and South Africa. The survival of the giant sable through 20 years of civil war is highly encouraging, but its survival will remain precarious until genuine peace and political stability return to Angola and adequate measures are taken to ensure its protection.

Estimated Total Numbers: Summation of the available population estimates gives a total population of about 54,000 sable, but this does not allow for undercounting bias in aerial surveys or parts of the species' range for which estimates of numbers are unavailable (see Appendix 4). Population densities estimated by aerial surveys are usually in the range 0.01-0.10 per sq km, e.g., Sadani, Biharamulo-Burigi, Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa and the Ruaha and Selous ecosystems (Tanzania) (TWCM 1991, 1992a, 1993b, 1994c, 1995b, 1995c; M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Kafue, Lower Zambezi, Sioma Ngwezi and the Luangwa Valley (Zambia) (Jachmann & Kalyocha 1994; Mwima & Yoneda 1995; D. Owens, in litt. October 1995; Tembo 1995; Yoneda & Mwima 1995), Okavango and Chobe (Botswana) (DWNP 1995), Hwange, Kazuma Pan, Chizarira, Chete, and Dande and Sebungwe communal lands (Zimbabwe) (Davies et al. 1996) and Kruger (South Africa) (P. Viljoen, in litt. February 1995). Higher densities of 0.2-0.5 per sq km have been estimated from recent aerial surveys of Matusadona, Matetsi and Zambezi National Park (Zimbabwe) (Davies et al. 1996). Densities estimated from aerial surveys can reach 1.2-1.3 per sq km in areas where the sable is particularly common, such as Liwonde (Malawi) (Mkanda 1998) and Ngamo-Sikumi Forest adjoining Hwange National Park (Zimbabwe) (Davies et ai. 1996). Assuming an average correction factor for undercounting bias in aerial surveys of 1.4 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.1 per sq km, the information in Appendix 4 gives an estimated total population of 75,000, of which about half occurs in and around protected areas and one-quarter on private land. Overall population trends are more or less stable in protected areas, increasing on private land and decreasing elsewhere.

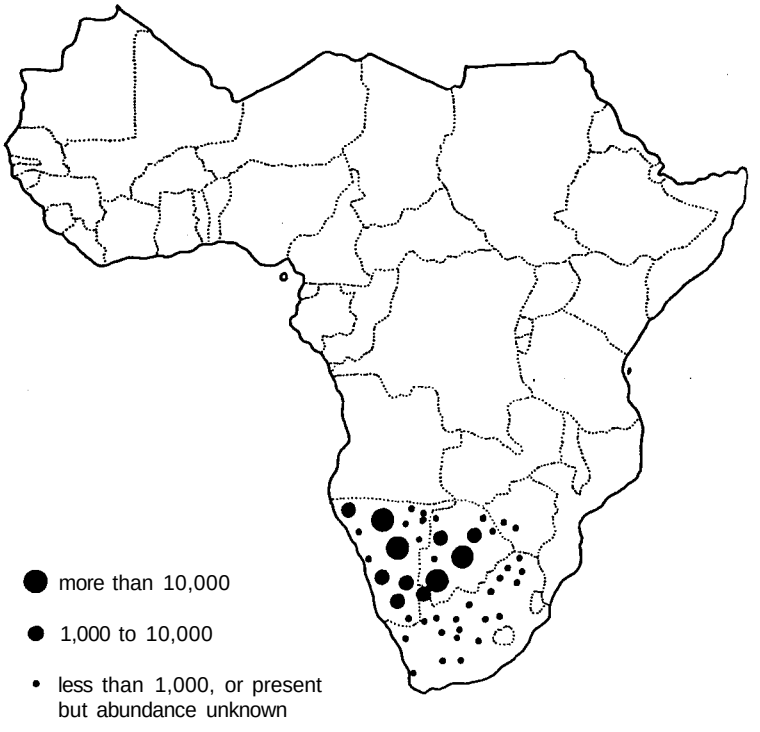
Captive Population: All of the sable held in captivity, e.g., 408 in North American and European zoos and 216 on Texas ranches in 1996, are common sable. No giant sable from the Angolan population are held in captivity. Sable which originated from the Kafue National Park area of western Zambia are currently being bred on private land in South Africa. Some of these animals have reportedly been sold to US zoos as "giant sable". The sable population of the Kafue area, including Sichifulo and other game management areas adjoining the national park, is well known for producing exceptional trophies, with some individuals showing similar dark facial markings to the Angolan giant sable population (e.g., see opposite p. 45), but this population is usually ascribed to *kirkii* not *variant.*

The Future: Further decline in the distribution and numbers of the sable antelope may occur in the more northerly parts of its range in future, unless the expansion of human populations and livestock is countered by the implementation of higher levels of protection and management of wildlife in countries such as Tanzania, Zambia, Malawi and Mozambique. The common sable's overall conservation status is unlikely to change, however, since any further decrease in the free-living population may be compensated by the continued growth of its numbers on private farms and conservancies. The latter should continue in view of this spectacular antelope's aesthetic appeal and its high value as a trophy animal. The giant sable has apparently survived the prolonged Angolan civil war in better shape than was feared, but the fragility of peace in Angola and this subspecies' very restricted range make it unlikely that its conservation status will improve significantly without stronger *in situ* and/or *ex situ* protection and management.

## Gemsbok

*Oryx gazella* (Linnaeus 1758)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Angola | | | | | | | Ex? | |
| Namibia | 20,110 | S/I | 164,310 | I | 2,800 | ? | 187,220 | I |
| Botswana | 72,900 | I | | | 52,850 | S | 125,750 | I |
| Zimbabwe | 100 | S | 150 | S/I | - | - | 250 | S/I |
| South Africa | 7,430 | S/I | >6,000 | I | - | - | >13,430 | I |
| Species Total | 100,540 | I | >170,460 | I | 55,650 | S | >326,650 | I |

OVERVIEW OF CONSERVATION STATUS

Angola: Formerly occurred in the arid southwest, where there were an estimated 3,000 in Iona National Park in 1975. It has probably been eliminated since then throughout its former range.

Namibia: Formerly occurred very widely, but naturally absent from the Caprivi Strip and some other areas in the far north and northeast and from some coastal deserts. It remains very widespread and locally common. Large populations occur in protected areas such as Namib-Naukluft Park, Etosha National Park and Skeleton Coast Park, with lower numbers in the smaller parks and reserves within its range. It occurs in good numbers in Kaokoland, with smaller, generally decreasing populations in most other communal lands. The largest numbers occur on private farmland, where the estimated population increased from 55,000 in 1972 to > 164,000 in 1992. It is especially abundant in the northern farming districts but also occurs in large numbers on private farms in the south. The gemsbok is of major economic value to the country's wildlife industry. It is a key trophy species on game farms and an important component of game-capture activities, e.g., substantial numbers have been sold for export to South Africa.

Botswana: Formerly occurred very widely but generally absent from the less arid areas in the east and southeast and from the swamps of the Okavango Delta. It still occurs widely within its

historical range. Its ability to meet its survival needs within a relatively small area of semi-arid or arid savanna, even during severe droughts, enable it to occupy much smaller mean annual ranges than migratory species such as blue wildebeest and red hartebeest. The gemsbok's independence of surface water and non-migratory behaviour have enabled it to largely escape the adverse effects of veterinary cordon fencing, e.g., its estimated numbers in the Kalahari have increased significantly over the last 20 years. Despite this favourable trend, its distribution in the southwest is increasingly restricted to protected areas, to the point where there are now two discrete concentration areas within this region, in Central Kgalagadi-Khutse Game Reserves and within and to the north and east of Gemsbok National Park. Outside these protected areas, it occurs mainly in areas of the Kalahari without cattle. Significant gemsbok populations also survive in northern Botswana, including the Namibia border region of southwestern Ngamiland and in and around Makgadikgadi-Nxai Pan National Park.

Zimbabwe: Naturally occurring gemsbok are restricted to a small area in the west, mainly on areas of Kalahari sand in the east and south of Hwange National Park. It has been introduced in small numbers to private game ranches.

South Africa: Formerly occurred widely in the more arid regions, mainly in the Karoo and Kalahari thornveld of Northern Cape Province, extending into Western Cape, Eastern Cape, northwestern Free State, Northwest and Northern Provinces. It was eliminated from substantial parts of its former range but has subsequently been reintroduced widely to protected areas and private game farms. It is in great demand among farmers because of its trophy value. It has been introduced widely to areas outside its natural range, e.g., gemsbok numbers have increased dramatically on bushveld farms in the north of the country, mainly due to introductions from Namibia. Kalahari Gemsbok National Park supports South Africa's largest gemsbok population. Smaller, reintroduced populations occur in five other national parks. It is well represented in provincial reserves within its historical range.

SUMMARY
The gemsbok formerly occurred widely in the semi-arid and arid bushland and grassland of the Kalahari and Karoo and adjoining regions of Southern Africa. The extensive contraction of its distribution and decline of its numbers which accompanied the expansion of human activities in Southern Africa during the 19th and 20th centuries have been partly compensated in the last 10-20 years by the widespread reintroduction of gemsbok to private land and protected areas. It now occurs in moderate to large numbers in its three main range states, Namibia, Botswana and South Africa. The largest numbers occur on private land, especially in Namibia, and in protected areas such as Namib-Naukluft and Etosha (Namibia), Central Kgalagadi-Khutse Game Reserves and Gemsbok National Park and surrounds (Botswana) and Kalahari Gemsbok National Park (South Africa). All of these populations are stable or increasing.

Estimated Total Numbers: Population estimates are available for almost all of this species' range (see Appendix 4). Summation of these estimates gives a total population of 326,000, but actual numbers are probably higher because of an unknown level of undercounting bias in aerial surveys. Assuming an average correction factor for undercounting bias of 1.3 would give a total population estimate of 373,000, of which 45% occurs on private land and 35% in and around protected areas. Overall population trend is increasing in private farms and conservancies and protected areas, and stable elsewhere.

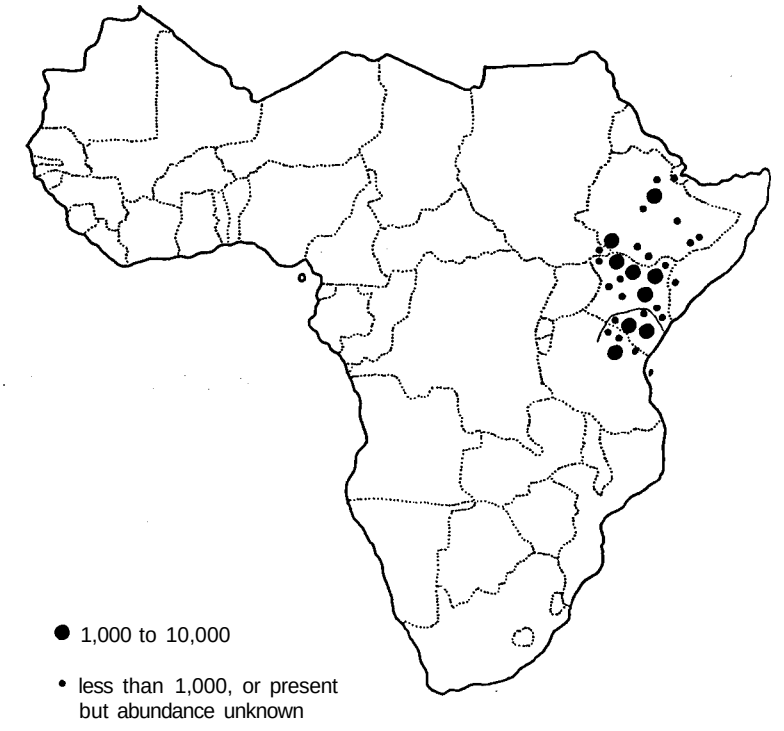
The Future: The gemsbok's future is secure as long as it continues to occur in large numbers on private land and in protected areas in Southern Africa. Its high value as a trophy animal should ensure further increases in its numbers on private land.

**Beisa & Fringe-eared Oryx**
*Oryx beisa* (Ruppell)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
north of line: beisa oryx (0. *b. beisa)*
south of line: fringe-eared oryx (0. *b. callotis)*

Status of Subspecies
beisa oryx: Lower Risk (conservation dependent)
fringe-eared oryx: Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Beisa Oryx | | | | | | |
| Sudan | - | - | X | D | X | D |
| Eritrea | - | - | ? | ? | ? | ? |
| Ethiopia | 3,220 | D | >1,650 | D | >4,870 | D |
| Djibouti | - | - | U/R | D | U/R | D |
| Somalia | - | - | R | D | R | D |
| Uganda | - | - | - | - | Ex? | - |
| Kenya | >1,670 | S/D | 18,980 | S/D | >20,650 | S/D |
| Subspecies Total | >4,890 | D | >20,630 | D | >25,520 | D |
| Frinae-eared Orvx | | | | | | |
| Kenya | 2,380 | D | 2,810 | S | 5,190 | D |
| Tanzania | 2,860 | S | X | S/D | >2,860 | S/D |
| Subspecies Total | 5,240 | D | >2,810 | S/D | >8,050 | D |
| Species Total | >10,130 | D | >23,440 | D | >33,570 | D |

OVERVIEW OF CONSERVATION STATUS

Sudan: Formerly occurred in the bushland of the southeast and on the Eritrea border in the northeast. There is no recent information on its survival in the northeast, but it survives in unknown numbers in the southeast where it was formerly quite common (estimated numbers >10,000inthe 1970s).

Eritrea: The beisa oryx has been recorded in the past from various localities, mainly in the north and west. There is no recent confirmation of its continued occurrence and its status is uncertain.

Ethiopia; The beisa oryx formerly occurred widely in the northeastern, eastern and southern lowlands. It still occurs widely within its former range, but its numbers are greatly reduced because of overhunting. In the mountains north of Karinka Eegy in the southern Ogaden, for example, the few surviving oryx hide during the day in caves and in the shade of rocks on steep slopes to avoid subsistence hunters. The largest surviving populations occur in the Awash Valley from Awash National Park northwards to the Danakil region, and in the Omo-Mago-Murule region in the south where this species probably undertakes extensive seasonal movements.

Djibouti: The beisa oryx formerly occurred widely, but it was reduced to the point of extinction by overhunting prior to the implementation of the hunting ban in the early 1970s. By the mid-late 1980s, the few surviving animals in Djibouti were restricted to the Gammari Plateau on the Ethiopia border in the west. These oryx were probably part of a larger population in adjacent Ethiopia. It may still occur in very small numbers in this part of Djibouti.

Somalia: The beisa oryx formerly occurred very widely. By the 1980s, it had been exterminated over most of its former range by excessive hunting and reduced to isolated remnant populations which were constantly sought after by poachers. It survives in the Kenya border area in the south but it may now be extinct in central and northern Somalia.

Uganda: Formerly occurred in the semi-arid northeast, where it was common in Bokora Corridor and Matheniko Game Reserves. Since the late 1970s, these reserves have been overrun by large numbers of cattle and uncontrolled poaching has been rife throughout the region. The failure to locate any oryx during a 1995 aerial survey of Bokora Corridor, Matheniko and adjoining areas of Karamoja suggests that it has either disappeared completely from Uganda or at best survives in very small numbers.

Kenya: It occupies large parts of its historical range in northern and eastern Kenya, with the Tana River separating the beisa and fringe-eared races. Kenya's northern rangelands contain the largest surviving populations of the beisa oryx. The major populations occur in the rangelands of Marsabit and Wajir districts and in Sibiloi National Park. The largest numbers of the fringe-eared oryx occur in the rangelands of Kajiado and Kilifi districts, and in and around Tsavo National Park where numbers have decreased substantially since the 1970s.

Tanzania: The fringe-eared oryx occurs locally in small to moderate numbers over a substantial part of its former range in the north and northeast. The largest population, in and around Tarangire National Park, is stable or increasing, and it is also well represented in Mkomazi Game Reserve. Its numbers may be decreasing in some other parts of its range.

SUMMARY
This species formerly occurred widely in the semi-arid and arid bushland and grasslands of Northeast Africa. It has declined markedly in numbers and distribution, especially at the margins of its range, e.g., Uganda and Somalia, but it still occurs quite widely in areas of Ethiopia, northern and eastern Kenya and northeastern Tanzania where human and livestock densities are low. The largest populations occur in the Awash Valley and Omo-Mago-Murule-Chew Bahir (Ethiopia) and Sibiloi National Park and the unprotected northern rangelands (Kenya) (beisa oryx), and Tsavo, Kajiado and Kilifi (Kenya) and Tarangire (Tanzania) (fringe-eared oryx). Effective protection against poaching and competition from livestock occurs in only a few parts of the species' current distribution.

Estimated Total Numbers: Population estimates are available from aerial surveys of large parts of the species' range (Appendix 4). Summation of these estimates suggests total populations of about 25,000 beisa and 8,000 fringe-eared, but this makes no allowance for unknown levels of undercounting bias and areas for which no estimates of numbers are available.

*Beisa & Fringe-eared Oryx (continued)*
Population densities estimated from aerial surveys are typically low, e.g., 0.05-0.10 per sq km in areas such as the Awash Valley (Thouless 1995b) and Tsavo (Butynski et al. 1997) and 0.15-0.20 per sq km in areas such as Omo-Mago-Murule-Chew Bahir (Thouless 1995a; Graham et al. 1996; C. Schloeder & M. Jacobs, in litt. June 1995), Mkomazi (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998) and Tarangire (TWCM 1995a).

Assuming an average correction factor for undercounting bias in aerial surveys of 2.0 (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support an average density of 0.05 per sq km, the information in Appendix 4 gives estimated total populations of about 50,000 beisa oryx (17% in protected areas) and 17,000 fringe-eared oryx (60% in protected areas). Population trends are probably gradually downward over most of the species' current range, with exceptions in areas such as Sibiloi and Laikipia (beisa oryx) and Kajiado, Tarangire and Mkomazi (fringe-eared oryx).

The Future: If current trends continue, the species' conservation status will eventually decline to threatened. The beisa oryx is particularly susceptible since most of its remaining populations occur outside protected areas. Continuation of present trends would result in this subspecies' eventual disappearance from its remaining strongholds in Ethiopia and reduction to a few surviving populations in parts of Kenya, e.g., protected areas such as Sibiloi and Marsabit, Laikipia ranchland and possibly a few remote parts of the unprotected northern rangelands. Current trends will eventually result in the fringe-eared oryx becoming confined to areas such as Tarangire and Mkomazi in Tanzania and parts of southeastern Kenya, where pressures of poaching and encroachment by settlement and livestock are controlled sufficiently to enable viable oryx populations to persist.

More effective protection and management of the remaining populations in areas where the species still occurs in substantial numbers but its populations are in decline, such as the Awash Valley, Omo-Mago-Chew Bahir, northern Kenya and Tsavo, would greatly enhance its long-term survival prospects.

**Scimitar-horned Oryx**
*Oryx dammah* (Cretzschmar 1826)

RED LIST STATUS
Extinct in the Wild

Note: This species' status was given as Critically Endangered in the 1996 IUCN Red List of Threatened Animals on the basis of unconfirmed reports that a few animals survived in the wild in Chad. No definite evidence of its survival in the wild was obtained by Scholte (1997) or during the compilation of information from its range states for the CMS Workshop on the Conservation and Restoration of Sahelo-Saharan Antelopes held at Djerba, Tunisia in February 1998 (Smith 1998). Its Red List status is therefore changed to Extinct in the Wild.

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mauritania | - | - | - | - | Ex | - |
| Mali | - | - | - | - | Ex? | - |
| Niger | - | - | - | - | Ex? | - |
| Senegal | - | - | - | - | Ex | - |
| Burkina Faso | - | - | - | - | Ex? | - |
| Nigeria | - | - | - | - | Ex | - |
| Chad | - | - | - | - | Ex? | - |
| Sudan | - | - | - | - | Ex? | - |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred widely in the west and south, but it was exterminated by uncontrolled hunting. It had probably died out by the 1960s.

Mali: Formerly occurred in the sahel zone in central Mali, extending northwards into parts of the desert zone. It has been eliminated from its former range by uncontrolled hunting and the spread of livestock into areas previously unoccupied by pastoralists. A few may have survived into the 1970s on the Niger border in the east and there was a reliable sighting of a pair on the Burkina Faso border in 1986. These areas are subjected to considerable human activity, rangeland degradation and hunting, and there is little prospect that it survives.

Niger: Formerly occurred widely in the subdesert and sahelian zones of central and southern Niger. By the early 1980s, it had been reduced to precariously low levels by illegal hunting, competition with livestock for sparse food supplies, and exclusion from prime habitat by the increasing extension of deep permanent-water bore holes for livestock into areas which were formerly hot season feeding grounds for oryx. Small numbers occurred as vagrants in the area of Air and Tenere National Nature Reserve up until 1982, but this area is slightly too arid for permanent occupation

*Scimitar-horned Oryx (continued)*

by this species. The last reported observations of the scimitar-horned oryx in Niger were in 1986. It was presumed extinct by the end of the 1980s. Plans by the Zoological Society of London, WWF and IUCN to establish a regional captive breeding/reintroduction centre for this species and other sahelo-Saharan wildlife in the late 1980s did not eventuate. The site proposed initially, Gadabedji Faunal Reserve, was lost to overgrazing by sheep, goats and camels. An alternative site, Ekrafane Ranch, was identified in the early 1990s but the project was abandoned because of civil unrest.

Senegal: Formerly occurred in the sahel zone of northern Senegal. It was hunted to extinction before 1914. Proposals to upgrade at least 6,000 sq km of the Northern and Southern Ferlo Faunal Reserves in the northeast to national park status have the potential to provide a highly suitable site for the reintroduction of this species. These reserves contain sahelian savanna grassland and bushland on flat and gently rolling sandy terrain. They have been moderately to severely overgrazed by livestock and very little wildlife survives, but there is still an abundance of *Acacia* trees. If Ferlo National Park is to become a reality, exclusion of nomadic herdsmen and the large numbers of livestock which currently occupy the reserves will be necessary along with practical, cost-effective means of protection.

Burkina Faso; Formerly occurred in the sahel zone in the north. It was believed to have been exterminated in the 1950s by uncontrolled hunting, but a reliable sighting was reported in the Mali border area in 1986. There is no further evidence that this species survives in Burkina Faso, but the establishment of an effective protected area in the north of the country would provide a potential site for its reintroduction.

Nigeria: Formerly occurred in the extreme northeast, possibly only as a seasonal vagrant. It is extinct.

Chad: Formerly abundant in the subdesert and northern sahel zones of central Chad, extending northwards into the desert zone. By the 1 970s, it had been eliminated from most of its former range by decades of uncontrolled hunting and the increasingly detrimental effects of drought, desertification and competition with livestock. A major population, representing >95% of the then global population of several thousand scimitar-horned oryx, survived in Ouadi Rime-Ouadi Achim Faunal Reserve until 1978, when protection of this reserve was withdrawn because of military activity. Its numbers subsequently decreased drastically and the last reported sighting was that of a small herd in northeastern Kanem in the late 1980s. Surveys conducted in north-central Chad between 1990 and 1996 failed to locate the species. It is thought that recent reports by local people of sporadic sightings of "large, white antelopes" in this region refer to the dama gazelle. It is possible but increasingly unlikely that a few scimitar-horned oryx survive in the more remote parts of north-central Chad, e.g., Ouadi Rime-Ouadi Achim, the Ennedi region to the northeast and the Djourab region in the west.

Sudan: Formerly occurred widely in the subdeserts and deserts of the northwest. It was apparently exterminated by hunting with firearms.

SUMMARY

The scimitar-horned oryx formerly ranged over several million sq km of semi-arid sahelian grassland and scrubland on the northern and southern fringes of the Sahara Desert, between the true desert and the savanna woodland zone. Its range included Morocco, Algeria, Tunisia, Libya and Egypt in North Africa, as well as the countries listed above for sub-Saharan Africa. The catastrophic decline in its distribution and numbers caused by uncontrolled hunting and increasing penetration of livestock into its range has apparently resulted in its extermination in the wild.

Captive Population: This species is well represented in captivity. In 1996 there were at least 1,250 scimitar-horned oryx in managed captive spaces in zoos and parks around the world (see *Gnusletter 16* (1): 10-11) and an additional 2,145 on Texas ranches.

The Future: The healthy and increasing captive population of the scimitar-horned oryx offers the opportunity to reintroduce this species into its natural range. This has already commenced in North Africa. A captive population was established in Bou-Hedma National Park, Tunisia with the introduction of 10 individuals into a fenced 20 sq km enclosure in 1985-86. This population had increased to 81 animals in 1997 (Smith et al. in press). A similar exercise was initiated in Souss-Massa National Park, Morocco in 1995 (Aulagnier et al. in press).

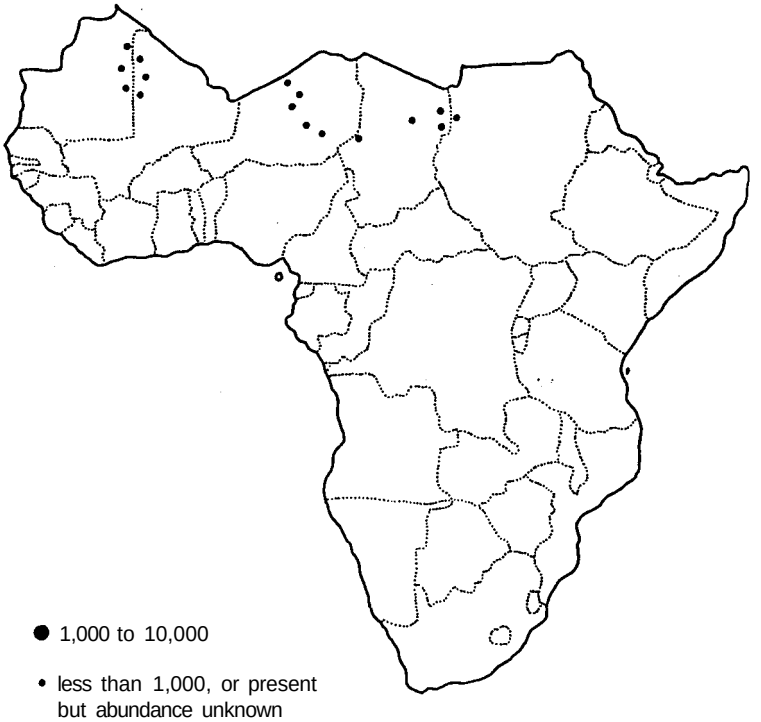
With the impetus provided by the CMS Workshop in Tunisia in February 1998 and the resulting Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes, it is hoped that similar reintroduction efforts will be made in the species' former range states in sub-Saharan Africa, e.g., Ferlo (Senegal) and northern Burkina Faso. This will require secure areas of suitable habitat to be identified and protected, which should also benefit other threatened sahelo-Saharan antelope species.

**Addax**

*Addax nasomaculatus* (Blainville 1816)

RED LIST STATUS
Critically Endangered

Note: This species' status was given as Endangered, rather than Critically Endangered, in the 1996 IUCN Red List of Threatened Animals, on the basis that most of its population decline occurred prior to the 1980s and the small, remnant populations which survive in remote parts of the Sahara may have decreased much more slowly in the last 20 years. However, the status Critically Endangered is probably more appropriate (Smith 1998).




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Poon/Abund. | Trend | Pocn/Abund. | Trend |
| Mauritania | - | - | <150 | S/D | <150 | S/D |
| Mali | - | - | <150 | S/D | <150 | S/D |
| Niger | <20 | D | <150 | D | <170 | D |
| Chad | - | - | R | D | R | D |
| Sudan | - | - | R | D | R | D |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred widely in the deserts of central and northern Mauritania. It remained widespread until the 1940s and persisted throughout much of the north and east until 1960. Motorised illegal hunting then began to have a catastrophic effect on its distribution and abundance. By 1980 the few surviving animals were restricted to the remote eastern deserts of the Mreyye area in the eastern part of Majabat al Koubra along the Mali border. This population was considered to have decreased from several hundred animals in the early 1980s to <50 in 1990, but recent information indicates that it may have numbered a few hundred individuals in the late 1990s. These animals move seasonally over distances of up to several hundred kilometres within their range in eastern Mauritania and adjacent parts of western Mali. This region is remote and largely inaccessible, but poaching nonetheless remains a threat. Implementation of protective measures for addax in the vast deserts of Majabat al Koubra would be an enormous logistical, financial and political task. More practical conservation measures for this species in Mauritania may involve the establishment of a suitable protected area in a more accessible part of the country, followed by reintroduction of captive-bred animals.

Mali: Formerly occurred widely in the northern deserts. It has been exterminated in most of its former range by hunting and competition for food with livestock. The last known remnant population occurs along the Mauritania border in the northwest, where illegal hunting remains a major threat to its survival.

Niger: Formerly occurred throughout the deserts and subdeserts of the northern two-thirds of the country. Motorised poaching rapidly reduced the distribution and abundance of the addax during the 1960s and 1970s. By the mid-late 1980s, it survived only in small numbers in dune areas which are inaccessible to motorised hunting parties, mainly in the Tenere Desert, in the northwest and east of the Termit region and in a few other areas of central and northern Niger. In the early-mid 1990s it persisted in small numbers, including a very small population within and around Air and Tenere National Nature Reserve, and poaching was a major threat to the surviving animals. Plans made in the early 1990s to reinforce the very low numbers remaining in the wild by reintroducing captive-bred animals to the 12,806 sq km Addax Sanctuary within the Air and Tenere reserve have not eventuated because of the armed rebellion in this region. Two addax (a female and young) were seen in March 1998 south of the Tenere Desert during a forest department mission.

Chad: Formerly occurred widely in the deserts of northern Chad. By the 1980s it had been reduced to a remnant population of probably only a few hundred individuals, as a result of excessive hunting, drought, competition for food with domestic herbivores and the effects of the 20-year war in the north. The addax was not observed directly during wildlife surveys conducted in parts of north-central Chad between 1990 and 1996. However, good evidence was obtained from local people that it still occurs in small numbers on the Ouadi Achim and in several parts of eastern and southern Ennedi in the northeast, viz., in the Mourdi Depression, on the Ouadi Chili, between Kalait and Fada, and between Bao Bilia and the Sudan border. It is also reported to survive near the Niger border in northern Kanem, to the west of Bodele. Uncontrolled hunting is a major threat to all of the surviving animals.

Sudan: Formerly occurred widely in the northern deserts to the west of the Nile. It has been reduced to the point of extinction by excessive hunting. A few addax were reported to survive in the northwest in the mid-1980s. Recent information from the Wildlife Administration in Northern Darfur indicates that addax were seen in 1992 near the border with Chad. These animals ran westward across the Chad border when disturbed. It is unclear whether they enter Sudan seasonally or only as occasional vagrants.

SUMMARY
The addax formerly occurred thoughout most of the Sahara, including Morocco, Algeria, Tunisia, Libya and Egypt in North Africa. Vast areas of the Sahara continue to provide suitable habitat (Boitani et al. 1998), but uncontrolled hunting has reduced the species to a few small remnant populations in remote areas of sand dunes which are inaccessible to motorised hunting parties. Only the inaccessibility of its last desert refuges has prevented the addax from a similar fate to the scimitar-horned oryx. In addition to its occurrence in Mauritania, Mali, Niger, Chad and Sudan, a few addax may occasionally wander from Niger into Hoggar National Park in southern Algeria (De Smet in press) and into southwestern Libya (Khattabi & Mallon in press). It is extinct in the wild in Morocco (Aulagnier et al. in press), Tunisia (Smith et al. in press) and Egypt (Saleh in press).

Estimated Total Numbers: The little information which is available (Appendix 4) suggests that the total number of addax remaining in the wild does not exceed a few hundred.

Captive Population: Good numbers of addax occur in captivity, e.g., in 1996 there were 321 in North American zoos, 207 in European zoos and 1,824 on Texas ranches.

The Future: Effective protection of the remaining wild addax is generally unlikely to be feasible because of the remoteness and inaccessibility of most of the species' last refuges. More likely prospects for preventing the species' eventual extinction in the wild may involve reintroduction of captive-bred animals to securely protected areas within its natural range. Reintroduction was initiated in North Africa in 1985-88 with the relase of 14 addax within a 20 sq km fenced enclosure in Bou-Hedma National Park, Tunisia. This population had increased to 50 in 1997 (Smith et al. in press). In 1994-95, 53 addax were released in an enclosure in Souss-Massa National Park, Morocco (Aulagnier et al. in press). It is hoped that reintroduction efforts will also be made in the southern parts of the species' former range.

**Subfamily Aepycerotinae**

## Impala

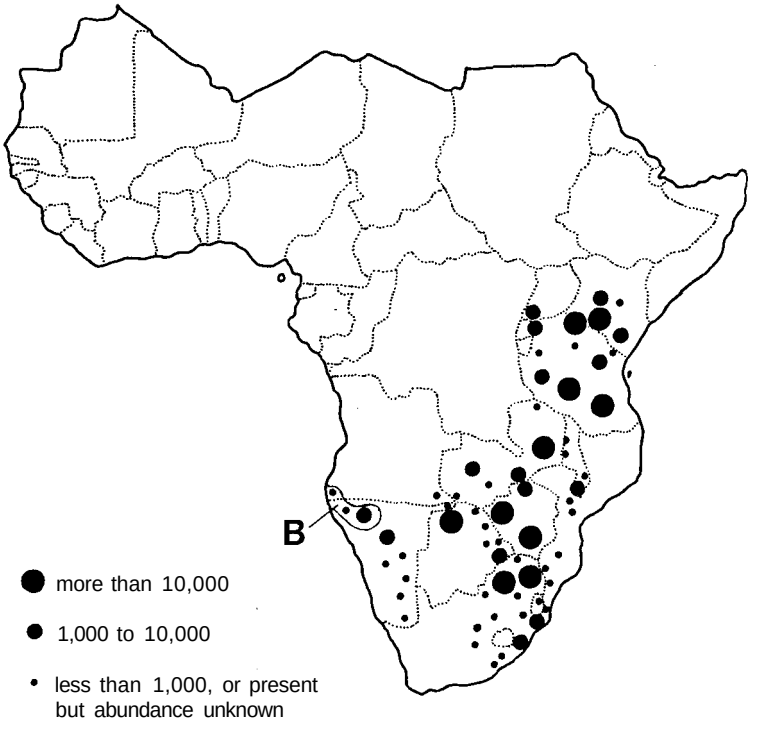
*Aepyceros melampus* (Lichtenstein 1812)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
B: black-faced impala (*A. m. petersi*)
remainder of range: common impala *(A. m. melampus*)

Note: Both the black-faced and common impala have been introduced widely to private farms in Namibia, often in mixed herds.

Status of Subspecies
common impala: Lower Risk (conservation dependent)
black-faced impala: Vulnerable




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Common Impala | | | | | | | | |
| Congo-Kinshasa | - | - | - | - | - | - | Ex? | - |
| Uganda | 6,700 | D | - | - | - | - | 6,700 | D |
| Kenya | 17,730 | S/D | - | - | 56,150 | S | 73,880 | S/D |
| Tanzania | 130,790 | S | - | - | >16,930 | S/D | >147,720 | S/D |
| Rwanda | 5,000 | D | - | - | - | - | 5,000 | D |
| Burundi | - | - | - | - | - | - | Ex | - |
| Angola | - | - | - | - | R | D | R | D |
| Zambia | >32,570 | S | 940 | S/I | >7,000 | S/D | >40,510 | S/D |
| Malawi | >2,510 | S/I | - | - | - | - | >2,510 | S/I |
| Mozambique | C/U | S/D | - | - | - | - | C/U | S/D |
| Namibia | 20 | I | 7,000 | I | 100 | D | 7,120 | I |
| Botswana | 25,000 | S/D | 16,250 | S/I | 20,260 | S | 61,510 | S |
| Zimbabwe | >38,950 | S | >250,000 | S | 48,150 | S | >337,100 | S |
| South Africa | 141,560 | S | >760,000 | S/I | - | - | >901,560 | S/I |
| Swaziland | >1,000 | S/I | X | S/I | - | - | > 1,000 | S/I |
| Subspecies Total | >401,830 | S/D | >1,034,190 | S/I | >148,590 | S/D | >1,584,610 | S/I |
| Black-faced Impala | | | | | | | | |
| Angola | - | - | - | - | R | D | R | D |
| Namibia | 1,000 | I | 1,200 | I | R | ? | >2,200 | I |
| Species Total | >402,830 | S/D | >1,035,390 | S/I | >148,590 | S/D | >1,586,810 | S/I |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Formerly occurred marginally in the extreme southeast, where it has probably been exterminated by meat hunters.

Uganda: Only known from the northeast and southwest. It survives only in the latter area, viz., Lake Mburo National Park and the adjoining Ankole Ranching Scheme. Although it still occurs at relatively high densities, its population is decreasing because of excessive offtake from illegal hunting on the Ankole ranchlands during the wet season when large numbers of impala disperse out of the national park.

Kenya: Occupies about half of its former range in central and southern Kenya, which continues to support a major population of this species. The main concentrations occur on the Mara ranches and in Kajiado and Laikipia districts. The largest populations in protected areas occur in Masai Mara National Reserve and Lake Nakuru and Tsavo National Parks. Numbers are generally stable but the Tsavo population has decreased markedly during the 1990s.

Tanzania: It still occupies large parts of its historical range and is well represented in most of the country's wildlife areas. The largest populations occur in the Serengeti and Selous ecosystems. It also occurs in substantial numbers in areas such as the Tarangire and Ruaha ecosystems, Burigi and Ugalla River Game Reserves and Katavi-Rukwa. These populations are generally stable.

Rwanda: Confined to Akagera National Park, where its population has decreased from an estimated 30,000 in 1990 because of poaching and the loss of the northern part of the park to cattle grazing.

Burundi: Formerly occurred in the eastern savannas but now extinct.

Angola: Formerly occurred locally in the southwest (black-faced impala) and southeast (common impala). Its populations are now greatly reduced but it is believed to survive in small numbers, including a few black-faced impala in Iona National Park.

Zambia: Formerly occurred in the Luangwa and Zambezi Valleys and in scattered localities elsewhere, especially on the western and northwestern plateaux. It has been eliminated from large parts of its former range and survives mainly in national parks and game management areas. Large, stable populations occur in the core areas of its range, viz., the Luangwa Valley (especially North and South Luangwa and Luambe National Parks and Lupande Game Management Area) and Kafue and Lower Zambezi National Parks. It occurs in small numbers in a few other protected areas. The impala is the most numerous antelope species in the country's private game ranches.

Malawi: Probably occurred widely in the past but now confined to protected areas. The largest populations occur in Lengwe and Liwonde National Parks, with only small numbers elsewhere.

Mozambique: Formerly occurred widely. By the early 1980s, it had been eliminated from large parts of its former range but survived in good numbers in a few localities such as Gorongosa National Park, where there were an estimated 30,000 in 1980. It suffered a further major reduction from poaching during the prolonged civil war of the 1980s and early 1990s, but it survives in low numbers in a few localities such as Gorongosa and Zinave National Parks and parts of Manica Province. It is common in western Gaza Province in the hunting concession adjoining South Africa's Kruger National Park. The current efforts to rehabilitate wildlife conservation in Mozambique should benefit this species.

Namibia: Formerly confined to Eastern Caprivi in the far northeast (common impala) and Kaokoland in the northwest (black-faced impala). The common impala survives in small numbers on communal land within its former range and was introduced to Waterberg Plateau Park. The black-faced impala has been reduced to very low numbers in Kaokoland by poaching and competition with livestock. To guard against this subspecies' possible extinction, 180 black-faced impala were translocated from

*Impala (continued)*
Kaokoland to Etosha National Park, immediately east of its natural range, in the 1970s. The Etosha population has gradually increased to its current estimated level of about 1,000. In 1993, 16 black-faced impala from western Etosha were translocated to Kaokoland to supplement the small surviving population in the subspecies' natural range, then estimated to number a mere 7 individuals. Some of the translocated animals moved northwards across the Kunene River into Angola, but by 1996 the population of Kaokoland had doubled. This population remains severely threatened by poaching and habitat fragmentation caused by the expansion of human communities and livestock.

Both subspecies of impala have been introduced widely to private farmland throughout Namibia. Almost all of the common impala on private farms are of South African origin. Interbreeding of the subspecies is now a major problem, e.g., in 1996 about one-third of the black-faced impala on private farms were in mixed herds with common impala. It is possible that the introduction of common impala to game farms bordering Etosha National Park could result in interbreeding with the only protected-area population of the black-faced race. Prevention of this possibility and development of methods for identifying and registering pure herds are high priorities in the conservation of the threatened black-faced impala.

Botswana: Formerly occurred widely in the semi-arid savannas of northern and eastern Botswana. It has been eliminated from settled areas but still occurs widely in the northern and eastern regions. In the north, it is concentrated in and around the Okavango Delta. It is distributed sparsely at lower densities over the rest of the northern region. It is common in Moremi Game Reserve and in the western section of Chobe National Park. In the eastern region, the impala occurs at high densities in the Tuli block farms.

Zimbabwe: Formerly occurred widely, but naturally absent from most of the plateau *Brachystegia* woodlands. It remains widespread and common within its former range, especially in the west, the southeastern lowveld and the Zambezi Valley. It is abundant in areas such as Hwange National Park, the Sebungwe region, the Middle Zambezi Valley, Gonarezhou and on private game farms and conservancies. In Hwange National Park, the impala occurred mainly in the northern mopane woodlands 25 years ago, but it has since spread throughout Hwange and now occurs in larger numbers in Kalahari sand woodland and bushland in the south and east of the park than in the north.

South Africa: Formerly occurred in the bushveld and lowveld of Northwest, Northern and Mpumalanga Provinces, northern KwaZulu-Natal and parts of the northeastern Cape. It was eliminated from many areas, but through reintroduction to private land and conservation areas it is again widespread and abundant throughout much of its historical range. It has also been introduced widely to private farms and provincial reserves which are extralimital to its natural range, e.g., in the Free State, throughout much of KwaZulu-Natal and in a very limited area of Eastern Cape Province. It is one of the country's three most commercially important game species on private land. Kruger National Park continues to support one of Africa's largest impala populations. It also occurs in substantial numbers in Hluhluwe-Umfolozi Park, Mkuzi Game Reserve and many other provincial reserves.

Swaziland: Formerly occurred widely, except in the western highveld. It has been eliminated from most of its former range and survives only in protected areas and on some privately owned cattle ranches. It occurs in large numbers in Hlane Game Reserve and Mlawula Nature Reserve, and it has been reintroduced to Mlilwane Wildlife Sanctuary. Surplus animals from Hlane have been introduced to Malolotja Nature Reserve, which is outside the species' natural range.

SUMMARY
The impala formerly occurred widely in Southern and East Africa, favouring the ecotone between savanna woodland and open grassland. It has been eliminated from substantial parts of its former range by hunting for meat and the spread of settlement, but it remains common or abundant in many protected areas, on private land and in some other areas where human population densities are low.

The largest numbers of the common impala occur in areas such as the Mara and Kajiado (Kenya), Serengeti, Ruaha and Selous (Tanzania), Luangwa Valley (Zambia), Okavango (Botswana), Hwange, Sebungwe and the Zambezi Valley (Zimbabwe), Kruger (South Africa) and on private farms and conservancies (South Africa, Zimbabwe, Botswana and Namibia). The main surviving populations of the black-faced impala occur in Etosha National Park and private farms in Namibia. Most of the species' largest populations are stable or increasing.

Estimated Total Numbers: Population estimates are available for most of the impala's current range (see Appendix 4). Summation of these estimates gives a total population of 1,584,000 common impala and 2,200 black-faced impala, but the former does not allow for undercounting in aerial surveys or those areas for which population estimates are unavailable. Estimates of population density obtained by aerial surveys of areas where the impala is common or abundant range from 0.2-0.7 per sq km in areas such as Tarangire (TWCM 1995a), Ugalla River Game Reserve (TWCM 1992a), Mkomazi and Katavi-Rukwa (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Ruaha-Rungwa (TWCM 1994c), Selous Game Reserve (TWCM 1995c), Kafue (Yoneda & Mwima 1995) and Hwange, Matetsi, Sebungwe and Middle Zambezi Valley (Davies et al. 1996), to 1.5-7.6 per sq km in areas such as Lake Mburo (Lamprey & Michelmore 1996), Mara (Broten & Said 1995; Grunblatt et al. 1995b), Serengeti (TWCM 1997), Biharamulo-Burigi (TWCM 1991), North Luangwa (D. Owens, in litt. October 1995) and Kruger (P. Viljoen, in litt. February 1995). Density estimates from recent aerial surveys of areas where the impala's populations are depleted have been less than 0.03 per sq km in areas such as Tsavo (Butynski et al. 1997) and Vwaza Marsh (Mkanda 1998). Ground surveys have revealed population densities as high as 25.0-30.0 per sq km in small protected areas with favourable habitat, e.g., Lake Nakuru National Park (Butynski et al. 1997) and Mkuzi Game Reserve (Rowe-Rowe 1994).

Assuming an average correction factor of 1.5 for undercounting bias in aerial surveys (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 0.5 per sq km where the impala is known to be common and 0.05 per sq km elsewhere, increases the estimate of total numbers of the common impala to 1,990,000, of which about half is on private land and one-quarter in protected areas. Population trends of the common impala are generally stable in protected areas, stable or increasing on private land and stable or decreasing elsewhere. The black-faced impala's numbers are increasing in Etosha National Park and on private land, but are very low elsewhere.

Captive Population: Significant numbers of the common impala are held in captivity, but only small numbers of the black-faced impala (mainly in South Africa).

The Future: The common impala is one of the most abundant antelopes in Africa. Its future is secure as long as it continues to occur in large, adequately protected and managed populations in protected areas and private farms and conservancies. The numbers of the black-faced impala should continue to increase in protected areas and on private land, but this subspecies' survival will continue to be threatened unless hybridisation with the common impala is managed and controlled effectively.

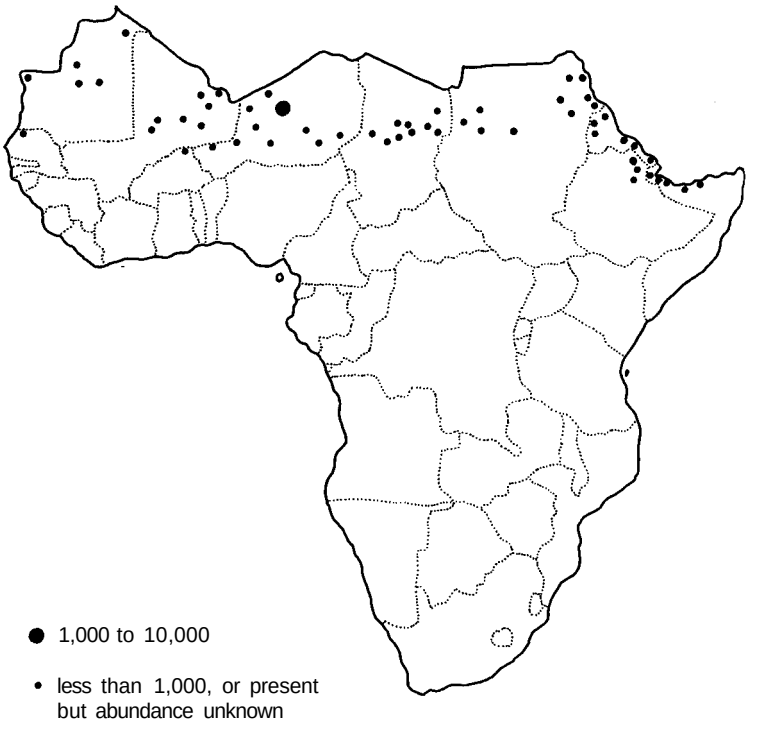
Subfamily Antilopinae

Tribe Antilopini

**Dorcas Gazelle**

*Gazella dorcas* (Linnaeus 1758)

RED LIST STATUS
Vulnerable




Note: At the time the 1996 IUCN Red List of Threatened Animals was in preparation, the status of the dorcas gazelle was assessed as on the borderline between Lower Risk (near threatened) and Vulnerable, but the former category was adopted (East et al. 1996; Baillie & Groombridge 1996). More recent information indicates that the numbers of this gazelle have decreased dramatically as a result of overhunting. The formerly large populations of Egypt's western and eastern deserts, for example, have suffered a catastrophic decline and now number no more than 1,000-2,000, as a result of the general annihilation of wildlife by military-style hunting expeditions from the Gulf States (Saleh in press). The status of this species is therefore re-assessed as Vulnerable (population reduction of at least 20% over the last 10 years).

SUBSPECIES

Various subspecies of the dorcas gazelle have been described, e.g., *G. d. dorcas* (eastern Sahara), *G. d. massaesyla* (western Sahara), G. *d. isabella* (east of the River Nile), G. *d. becarii* (Eritrea) and G. *d. pelzelni* (northern Somalia). The ASG has previously recognised *pelzelni* as a distinct subspecies (East 1990; East et al. 1996), on the basis that it was considered to be geographically distinct and its survival is threatened (Red List status of Vulnerable). Subspecies of the dorcas gazelle are not distinguished in this account, since it is now apparent that the species as a whole is Vulnerable (the populations of coastal Somalia, Djibouti, Eritrea and northern Ethiopia may now be less threatened than those in most other parts of the dorcas gazelle's range), and it may be impossible to define precisely the boundaries between the subspecies *becarii* (said to occur in "the uplands of Eritrea"), *pelzelni* and *isabella.*

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | "Trend | Popn/Abund. | Trend |
| Mauritania | <200 | S | R | D | R | D |
| Mali | - | - | >2,250 | S/I | >2,250 | S/I |
| Niger | 5,000 | S/D | 15,CCO | S/D | 20,000 | S/D |
| Senegal | <50 | D | - | - | <50 | D |
| Burkina Faso | - | - | R | D | R | D |
| Nigeria | - | - | - | - | Ex? | - |
| Chad | C | D | C/U | D | C/U | D |
| Sudan | - | - | U | D | U | D |
| Eritrea | - | - | C | ? | C | ? |

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Djibouti | - | - | C | S | C | S |
| Ethiopia | - | - | C/U | S | C/U | S |
| Somalia | - | - | C | S | C | S |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred throughout most of the country, but naturally absent from the better watered parts of the southern sahel zone and from the most arid parts of the deserts such as the heart of the Majabat al Koubra in the east. It was formerly abundant, but by the 1980s intensive hunting had eliminated it from most of its former range and it survived only in small, isolated populations in remote desert regions. It still occurs in a few areas, e.g., in the Maqteir in the northwest and probably in the Areg Chach and Hank Escarpment in the northeast. The remnant population in Banc d'Arguin National Park was reduced greatly by poaching in the 1970s and early 1980s but is currently reported to be stable.

Mali: Formerly occurred widely in the northern deserts and sahel zone, but naturally absent from the very arid deserts which cover extensive areas of northern Mali. Uncontrolled hunting and the severe drought of 1974-84 have taken a severe toll on its numbers, but it still occurs widely at low densities in the northern sahel zone, in the regions of Tombouctou, Gao and Kidal. It also survives at Adrar des Iforhas and the associated plains of Tilemsi and Tamesna in the northeastern desert. Its numbers apparently increased during the northern rebellion in 1991-95, presumably because of restrictions on guns and movements of poachers.

Niger: Formerly occurred widely in the desert and subdesert of the northern three-quarters of Niger, but naturally absent from the most arid deserts such as the interior of the Tenere. Although its numbers have been reduced greatly by uncontrolled hunting, habitat degradation and competition with domestic herbivores for food and shade, it still occurs widely within its historical range. It is locally common in suitable habitat, such as parts of Air and Tenere National Nature Reserve and the Termit region. The population of the Air and Tenere reserve increased noticeably during the 1980s, probably in response to both reduced hunting pressure and the good rainfalls of the late 1980s. In 1998, the overall numbers of this species were apparently stable despite heavy hunting pressure.

Senegal: Formerly occurred in the extreme north, probably only as a vagrant or seasonal visitor. It was extinct by the mid-1970s, when it was reintroduced from Mauritania to Djoudj National Park in the northwest. Since the late 1980s, the reintroduced population has been affected adversely by the impacts of the Diama dam on its habitat and lack of surveillance, but the species is reported to still occur in this area.

Burkina Faso: Formerly occurred in the sahel zone in the extreme north. It may survive in small numbers in the proposed Seno-Mango Biosphere Reserve, as in the 1980s.

Nigeria: Recorded rarely in the past in the Lake Chad region in the northeast, but it is now probably extinct.

Chad: Formerly occurred widely in the desert and subdesert zones of the northern half of the country. Its numbers have been greatly reduced and it has been exterminated locally by uncontrolled hunting and the effects of war, drought and competition with livestock, but it has generally been affected less severely than other sahelo-Saharan antelopes. It remains widespread in north-central Chad, where aerial and ground surveys conducted in the early-mid 1990s found that it still occurs locally in good numbers in some areas. These include parts of southern Ennedi and the northern and northwestern sections of Ouadi Rime-Ouadi Achim Faunal Reserve and its environs in eastern Kanem and western Batha, where local concentrations of >80 dorcas gazelles are still observed occasionally. It is less common in areas frequented by people and in very arid

*Dorcas Gazelle (continued)*

areas, such as Fada-Archi in central Ennedi in the northeast and the area to the north of Salal in northern Kanem in the west. Although it has resisted motorised hunting with automatic weapons better than other antelope species, its numbers are generally in decline. This will continue unless effective protective measures are implemented in areas such as the northern (Ouadi Achim) section of Ouadi Rime-Ouadi Achim Faunal Reserve.

Sudan: Formerly occurred widely throughout the northern deserts on both sides of the Nile, but now reduced to scattered remnant populations. It has disappeared during the last 15 years from areas where it was formerly abundant such as Bara Province in Northern Kordofan, as a result of overhunting and severe land degradation caused by drought, firewood gathering and cultivation in extremely arid conditions. The dorcas gazelle survives in reasonable numbers in areas such as Northern Darfur, the northern and western edges of the Red Sea Hills where they merge with the surrounding desert and probably elsewhere, e.g., parts of Northern Kordofan. Uncontrolled hunting is a major threat to the surviving populations. The Mohammed Gol-Gebeit Maadin region of the Red Sea Hills, for example, still supports substantial numbers of dorcas gazelles but they are subjected to intensive, uncontrolled hunting by motorised parties of hunters from the Middle East, personnel of international mining companies and heavily armed Zubedia pastoralists.

Eritrea: Formerly occurred widely, except in the southwest. It still occurs locally in fairly good numbers, e.g., it is quite common in the southern coastal plain where its numbers appear to be stable, and it is said to occur in herds of up to 50 animals in the Djibouti border area in the south. It is less numerous than Soemmerring's gazelle in the Buri Peninsula area on the central coast. It occurs in reasonable numbers in the Cheru-Agordat area in the west, and is probably more numerous to the north of this area.

Ethiopia: Occurs widely within its historical range in the arid northeastern lowlands, from the area of the Mille-Serdo Wildlife Reserve northwards into the Danakil Desert. It is locally common to abundant in the Serdo area, where it occurs in valleys with vegetation of *Acacia mellifera* and *A. Senegal* trees, herbs and grasses. This area is used seasonally by Afar pastoralists and their camels. The dorcas gazelle occurs at slightly higher densities to the north of Serdo in the Afrera area, which appears to have very few people and domestic livestock, and it probably occurs throughout the Dallol Depression northwards to Eritrea.

Djibouti: Formerly occurred throughout, except in highland areas. It still occurs widely and is locally common. Its adaptation to very dry conditions may allow it to survive habitat degradation and drought conditions better than most other antelope species. Its numbers gradually increased following the implementation of the hunting ban in the early 1970s, although this increase was limited by competition with goats. By 1990 its status was regarded as satisfactory. Its numbers now appear to be stable, at least in the southeast.

Somalia: Formerly occurred in the northern coastal strip. It still occupies a large part of its historical range and is locally common.

SUMMARY

The dorcas gazelle formerly occurred over a vast area of the Sahara and other arid regions of North and Northeast Africa. It is the only African antelope species which extends its range into the Middle East. As well as occurring in the Negev Desert of southern Israel, the suspected extension of its range into adjacent parts of southwestern Jordan (East 1992b) has recently been confirmed (Kiwan et al. in press). It does not penetrate the interior of the most arid deserts.

Despite massive reductions in its distribution and numbers because of overhunting and degradation of subdesert rangelands by human misuse, the dorcas gazelle survives, albeit in greatly reduced numbers, in all of its range states with the probable exception of Nigeria (where its former presence was marginal). This reflects its small size, high fecundity rate and capacity to survive in localised areas of favourable habitat. These attributes have enabled it to withstand uncontrolled

hunting and habitat degradation better than other sahelo-Saharan antelope species. The dorcas gazelle's remaining strongholds include areas where hunting pressures are low, e.g., Djibouti, Eritrea and northern Ethiopia, and current/former protected areas such as Ouadi Rime-Ouadi Achim (Chad) and the Air and Tenere reserve (Niger). It also occurs in relatively large numbers in a few parts of North Africa, e.g., Hoggar National Park (450,000 sq km) and Tassili National Park (114,000 sq km) which adjoin the Niger border in southern Algeria (De Smet in press).

Estimated Total Numbers: Ground surveys in areas where the dorcas gazelle is common have produced density estimates of 0.2 per sq km (up to 4.0-5.0 per sq km within localised areas of favourable habitat) in the Air and Tenere reserve (Grettenberger 1987; Grettenberger & Newby 1990) and an average of 1.1 per sq km (range 0.3-3.2) in the Serdo region and 1.1-1.7 per sq km in the Afrera region (Ethiopia) (Moehlman & Kebede 1998). The latter authors pointed out that their survey transects were not randomly chosen and were biased towards preferred dorcas gazelle habitat. Densities are much lower in areas where populations are depleted, e.g., <0.04 per sq km in Banc d'Arguin National Park (Mauritania) (Sournia & Verschuren 1990).

If it is assumed that areas for which population estimates are unavailable support an average of 0.2 per sq km where the species is known to be common and 0.02 per sq km elsewhere, the information in Appendix 4 suggests a total population for the countries of sub-Saharan Africa of 35,000-40,000, with the largest numbers in Niger and Chad. This estimate, together with information from North Africa and the Middle East (Aulagnier et al. in press; De Smet in press; Smith et al. in press; Khattabi & Mallon in press; Saleh in press; Clark & Frankenberg in press; Kiwan et al. in press) indicates that the global population of the dorcas gazelle is probably in the tens of thousands. Numbers are generally in decline, except for the relatively small parts of the species' range where hunting pressures are low.

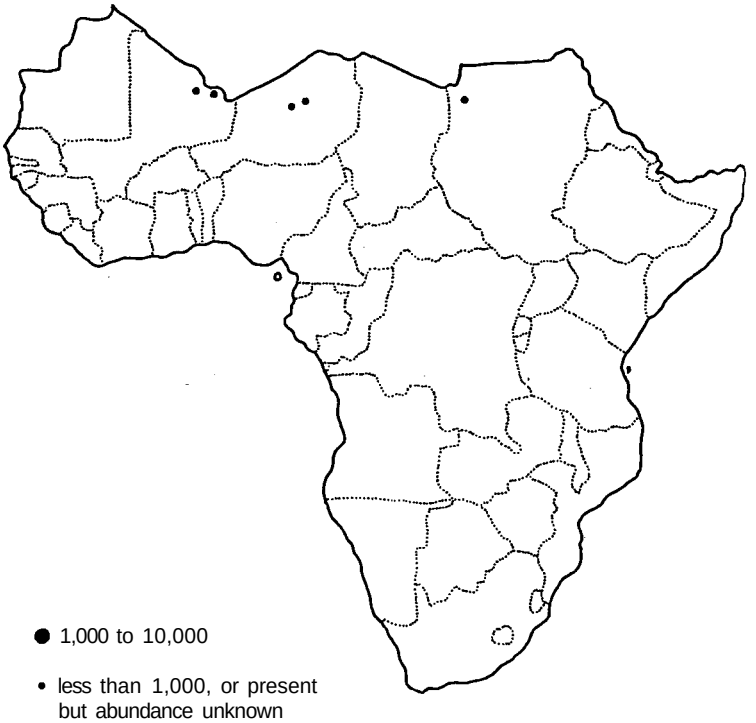
Captive Population: The dorcas gazelle is reasonably well represented in captivity, with a total population of >100 in North American and European zoos.

The Future: If present trends continue, the dorcas gazelle will decline further until it is eventually confined to the relatively small parts of its current range where its survival is not threatened by overhunting and habitat degradation, e.g., parts of Djibouti, Eritrea, northern Ethiopia and the Negev Desert (Israel). These trends will only be reversed by more effective protection of the species' remaining populations in other areas, e.g., through implementation of the CMS Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes.

## Slender-horned Gazelle

*Gazella leptoceros* (F. Cuvier 1842)

RED LIST STATUS
Endangered




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Mali | - | - | R | D | R | D |
| Niger | <1,000 | D | ? | ? | <1,000 | D |
| Chad | - | - | ? | ? | ? | ? |
| Sudan | - | - | U/R | D | U/R | D |

OVERVIEW OF CONSERVATION STATUS

Mali: Anecdotal information indicates that this species occurred rarely in the past in parts of the northern deserts. It is reported to survive in very small numbers in the vicinity of Adrar des Iforhas and the associated plains of Tilemsi and Tamesna in the northeast.

Niger: Recorded from deserts bordering the Air Massif within Air and Tenere National Nature Reserve. It was apparently rare in the 1980s, but its status was uncertain because it is easily confused in the field with the more abundant dorcas gazelle. The slender-horned gazelle may have occurred formerly throughout the northern half of Niger. It is possible that it survives in additional areas besides the Air and Tenere reserve, e.g., the Great Bilma Erg to the east of this reserve, the Admer Erg to the north, and the Termit Massif region. No recent information is available on its status.

Chad: Recorded in the past from the extreme north, below the northern edge of the Tibesti Massif and east of Tibesti. It may occur or have occurred formerly in other areas of apparently suitable habitat in the deserts of northern Chad, such as the Mourdi Depression and Erdi in the northeast. No recent information is available on its occurrence or status.

Sudan: Formerly occurred in the northwestern desert, although the limits of its former range are unclear. Recent information indicates that it still occurs in the northwest, where it is threatened by illegal hunting.

SUMMARY
Primarily an inhabitant of the sandy deserts (ergs) of the Sahara, the slender-horned gazelle has been exterminated by overhunting in the more accessible parts of its former range. It has apparently been reduced to small, fragmented populations confined to a few highly inaccessible areas, but detailed survey information is unobtainable from the remote areas of Mali, Niger, Chad and Sudan where it may still occur.

Its status is equally precarious in the northern Saharan countries where it survives, viz., Algeria (De Smet in press), Tunisia (Smith et al. in press), Libya (Khattabi & Mallon in press) and Egypt (Saleh in press). It occurs in unknown numbers in a few protected areas, e.g., Air and Tenere National Nature Reserve (Niger), Tassili National Park (Algeria) and Djebil National Park (Tunisia).

Estimated Total Numbers: This species' numbers are unknown, but it occurs naturally at very low densities. An informed guess by Grettenberger & Newby (1990) suggested that the population in Niger was <1,000 in the 1980s. Its total numbers at present are unlikely to exceed several thousand and could be as low as a few hundred.

Captive Population: Despite some inbreeding problems, the captive population of the slender-horned gazelle in North American and European zoos had reached 187 in 1996 and is continuing to increase.

The Future: This species' remaining populations are relentlessly pursued by hunters whenever possible (e.g., Saleh in press) and its numbers are probably continuing to decrease. It may persist for some time in small numbers in some of the largest and most inaccessible areas of sand dunes in the Sahara, but if current trends continue it faces eventual extinction in the wild. This trend will only be reversed by active management of viable populations within securely protected areas of its natural range, e.g., through implementation of the CMS Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes. This may include reintroduction of the species to areas of suitable habitat.

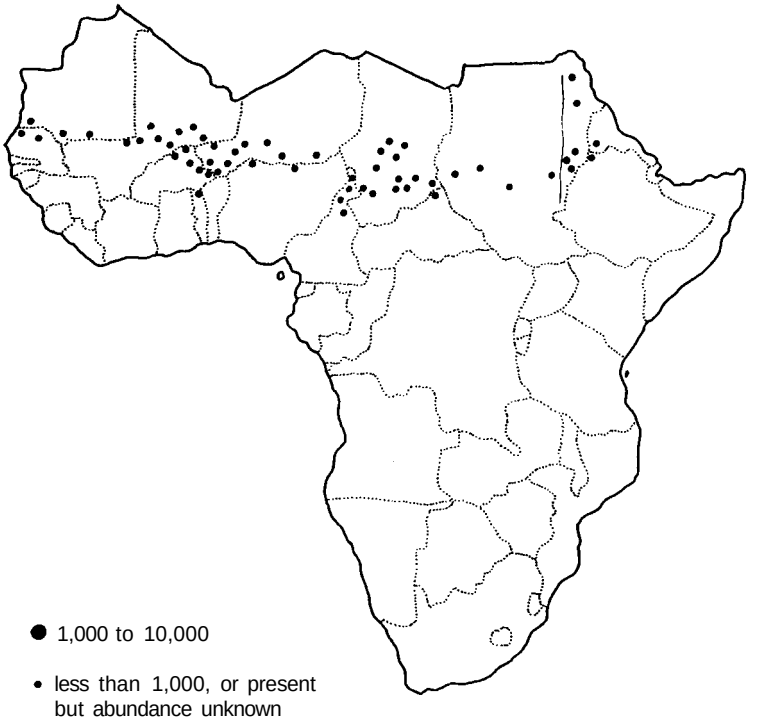
## Red-fronted Gazelle

*Gazella rufifrons* Gray 1846

RED LIST STATUS
Vulnerable

SUBSPECIES
west of line: nominate subspecies (*G. r. rufifrons*)
east of line: Heuglin's gazelle (6. *r. tilonura*)

Status of Subspecies
nominate subspecies: Vulnerable
Heuglin's gazelle: Vulnerable




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Nominate Subspecies | | | | | | |
| Mauritania | - | - | R | D | R | D |
| Mali | <400 | D | 3,000 | D | <3,400 | D |
| Niger | C/U | S/D | <4,000 | D | 4,000 | D |
| Senegal | R | D | R | D | R | D |
| Burkina Faso | U/R | ? | >1,220 | S/D | >1,220 | S/D |
| Ghana | - | - | - | - | Ex? | - |
| Togo | V | ? | - | - | V | ? |
| Nigeria | - | - | R | D | R | D |
| Chad | >750 | S/I | C/U | S/D | C/U | S/D |
| Cameroon | >1,120 | I | X | S/D | >1,120 | ? |
| CAR | <20 | D | R | D | R | D |
| Sudan | - | - | U/R | D | U/R | D |
| Heuqlin's Gazelle | | | | | | |
| Sudan | R | D | U/R | D | U/R | D |
| Eritrea | - | - | C/U | S/D | C/U | S/D |
| Ethiopia | - | - | U/R | ? | U/R | ? |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred widely in the southern sahel zone. It has been eliminated from most of its former range by uncontrolled hunting and habitat degradation. By the late 1980s, it had been reduced to small, scattered remnant populations. No recent information on its status.

Mali: Formerly widespread in the sahel zone and northern savanna woodlands in central Mali, but now very localised within this overall range. Its populations suffered from the 1974-84 drought

and it continues to be heavily poached. It remains reasonably common in the Mopti-Tombouctou-Gao region. Small populations persist in the Ansongo-Menaka and Elephant reserves but these areas have been degraded by large numbers of livestock, like most of the rest of the species' range.

Niger: Formerly occurred widely in the sahelian grasslands and savannas of the southern third of the country. It has been affected adversely by uncontrolled hunting, rangeland degradation caused by overgrazing of livestock and clearance of land for agriculture. It is able to adapt to human occupation of its habitat to some extent, e.g., it is known to re-occupy fallow land if sufficient cover is available. It is also protected to some extent by its skulking habits. In the late 1980s it still occurred quite widely at low densities within its former range, including small populations in W National Park-Tamou Faunal Reserve and Gadabedji Faunal Reserve, and it was quite common in some unprotected areas. In 1998, it was reported to be quite common in W National Park but uncommon or rare elsewhere.

Senegal: Formerly widespread in the northern half of the country, where it was common in the sahelian grasslands and the northern savanna woodlands. It has suffered from illegal hunting and habitat destruction caused by overgrazing by livestock and severe drought. Only small, scattered remnant populations survive.

Burkina Faso: Formerly occurred widely in the sahel zone and the northern and eastern savanna woodlands. It probably still occurs widely but locally within its former range, generally in small remnant populations. In the mid-late 1980s it was locally common in the Seno-Mango region in the north and the Sirba area in the east. More recent information is unavailable from these areas, but it still occurs in small and apparently stable numbers in and around W National Park in the southeast.

Ghana: Recorded in the past from northern Ghana. It is now either extinct or reduced to the status of a rare vagrant from Burkina Faso or Togo.

Togo: Formerly occurred as a dry season visitor to the Oti River in the north. It was observed in this area in 1977 and again in the dry season of 1988. No more recent information on its occurrence or status is available.

Nigeria: Formerly occurred widely in the northern savannas. It has disappeared from most of its former range during the past 30 years. By the 1980s, it was apparently restricted to a few survivors along the Niger border in the north. No recent information on its status.

Chad: Formerly occurred widely in the subdesert and sahel zones and the northern savanna zone of central and south-central Chad. Although it has suffered from illegal hunting, drought, habitat degradation and competition with livestock, it persists in many parts of its former range. It still occurs widely in the sahelian rangelands of central Chad, where it is locally common and is the most widespread gazelle species. Its distribution overlaps that of the dorcas gazelle for more than 100 km in a north-south direction, as far north as the 250 mm isohyet. It is locally common in the southern and western parts of the Lake Fitri region, where extensive parts of the rangelands are only marginally exploited by livestock because of lack of dry-season water supplies. The natural vegetation is relatively intact throughout the Lake Fitri region, but most of the region is suffering from increasingly extensive exploitation by agriculture and livestock. The red-fronted gazelle also occurs locally in small to moderate numbers in areas of largely unexploited rangeland in the Dourbali-Bousso region east of the Chari River in Chari Baguirmi, in parts of Mayo Kebi in the southwest, and in Ouaddai and northern Salamat in the southeast. There is a healthy population in Zakouma National Park, where its numbers have grown substantially since the 1980s. It occurs at lower densities in Siniaka Minia Faunal Reserve. These populations are greatly exceeded by its numbers outside protected areas. Its overall numbers are gradually decreasing as livestock grazing and other human activities penetrate deeper into formerly unexploited rangelands.

Cameroon: Formerly widespread in the sahel zone of Far North Province, extending southwards into the northern part of North Province. It formerly occurred in large numbers in undisturbed regions

*Red-fronted Gazelle (continued)*

of Far North Province, but it is becoming increasingly confined to protected areas. While it is able to co-exist with human activities to some extent, human population densities now exceed 100 per sq km over large parts of Far North Province. Former red-fronted gazelle habitat has been degraded or destroyed by the expansion of livestock, agriculture and cotton. The important populations of this species in Waza and Kalamaloue National Parks appear to be increasing, possibly because of increasing aridity in the floodplain of the Logone River since the construction of the Maga dam at the southern end of the floodplain in the 1970s. Greater long-term security of these two parks will be essential for the long-term survival of the red-fronted gazelle in Cameroon. Waza National Park is affected adversely by poaching, incursions of cattle and insufficient staff and equipment. The small Kalamaloue National Park is situated close to major population centres such as N'Djamena in adjoining Chad, has a very low level of protection and is crossed daily by many villagers, traders and other travellers. A few red-fronted gazelles (estimated number 50) survive towards the southern limits of its range in North Province, where its numbers have decreased as human activities have expanded, e.g., it has disappeared from the area to the east of Garoua (where it was formerly abundant) as a result of habitat destruction.

Central African Republic: Confined to the sahel zone and northernmost savanna woodlands in the far north. Its numbers had been reduced greatly by the 1980s as a result of drought and cattle grazing. No recent information is available on its status, apart from the continued presence of a very small population in the northern section of Manovo-Gounda-St. Floris National Park at the southern limit of its distribution.

Sudan: Formerly occurred widely in central Sudan with the nominate subspecies to the west of the Nile and Heuglin's gazelle to the east. It has been reduced to scattered remnant populations by overhunting and habitat degradation. The nominate subspecies survives precariously in Jebel Marra and other scattered localities in Southern Darfur and Southern Kordofan, generally in small and declining populations. Heuglin's gazelle occurs locally in small numbers in areas such as the drier northern and western parts of Dinder National Park, Abu Kabo Forest Reserve in Kassala province, and southeastern Haya and Gebeit Maadin in the Red Sea Hills. It does not receive effective protection in Dinder National Park, where the open sites which it prefers are utilised intensively by camel herders who trespass into the park in the dry season and destroy the gazelle's favourite shade trees to feed their camels and goats. Poaching is also a threat to these gazelles, which are hunted on adjoining agricultural schemes when they leave Dinder National Park during the wet season. This species' survival can be aided by its adoption of secretive habits in areas where it is subjected to disturbance, e.g., the population of the small Abu Kabo Forest Reserve shelters in the forest during the day and feeds on adjoining agricultural lands during the morning and evening. Its presence is generally undetected by local people. However, poaching of this population by motorised parties of high ranking officials was reported in 1997. Intensive poaching and habitat destruction to clear land for cultivation of crops are major threats to the remnant populations of the red-fronted gazelle throughout most of its remaining distribution in Sudan, e.g., in areas such as Abu Kabo, Dweira Forest and the Red Sea Hills.

Eritrea: Heuglin's gazelle formerly occurred in the west. It survives locally within its former range and is still present in fair numbers in areas such as Gash-Setit.

Ethiopia: Heuglin's gazelle occurs in the northwestern lowlands. No recent information is available on its status in Ethiopia.

SUMMARY

This species formerly occurred throughout dry grasslands and sahelian bushlands from Senegal to Eritrea, between the deserts to the north and the moister savanna woodlands to the south. Its populations have been reduced to scattered remnants over most of its range by illegal hunting, competition with domestic herbivores and habitat degradation resulting from drought and overgrazing by livestock. The expansion of agricultural settlement has also contributed to its decline. Important populations survive in central and southern Chad and in some other countries,

e.g., Mali, Niger, Cameroon, Sudan and Eritrea, but its numbers generally continue to decrease except in a few protected areas such as Zakouma and Siniaka Minia (Chad) and Waza (Cameroon).

Estimated Total Numbers: The available information on this species' numbers is based mainly on informed guesses (see Appendix 4). Aerial surveys in areas where it is reasonably common have produced density estimates of 0.2-0.7 per sq km, e.g., Zakouma (D. Moksia, in litt. July 1995), Seno-Mango and Sirba (Burkina Faso) (Bousquet 1982). Ground surveys produced estimates of 0.3-0.4 per sq km in Waza National Park (Scholte et al. 1995) and 1.0 per sq km in the northern and western areas of Dinder National Park (Hashim, in preparation).

Assuming an average correction factor of 1.25 for undercounting bias in the relatively small part of the species' overall range for which aerial counts are available, and that areas for which population estimates are unavailable support 0.3 per sq km where it is known to be common and 0.03 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of about 25,000, of which 15% is in protected areas. This total includes an estimated 3,500-4,000 Heuglin's gazelles. As noted above, population trends are generally downwards.

Captive Population: This gazelle is held in captivity in only very small numbers, e.g., there were 5 individuals in North American zoos in 1996.

The Future: If present trends continue, the red-fronted gazelle's distribution and numbers will probably decline further until its status becomes Endangered or Critically Endangered, e.g., at present less than 10% of its total numbers occur in populations which are known to be stable or increasing. This trend will only be reversed by the extension of effective protection and management to additional populations besides those in areas such as Zakouma and Waza National Parks. Development and implementation of land use plans which allow for the needs of wildlife outside protected areas in countries such as Chad and Sudan would also be of major benefit to many of the remaining populations of the red-fronted gazelle.

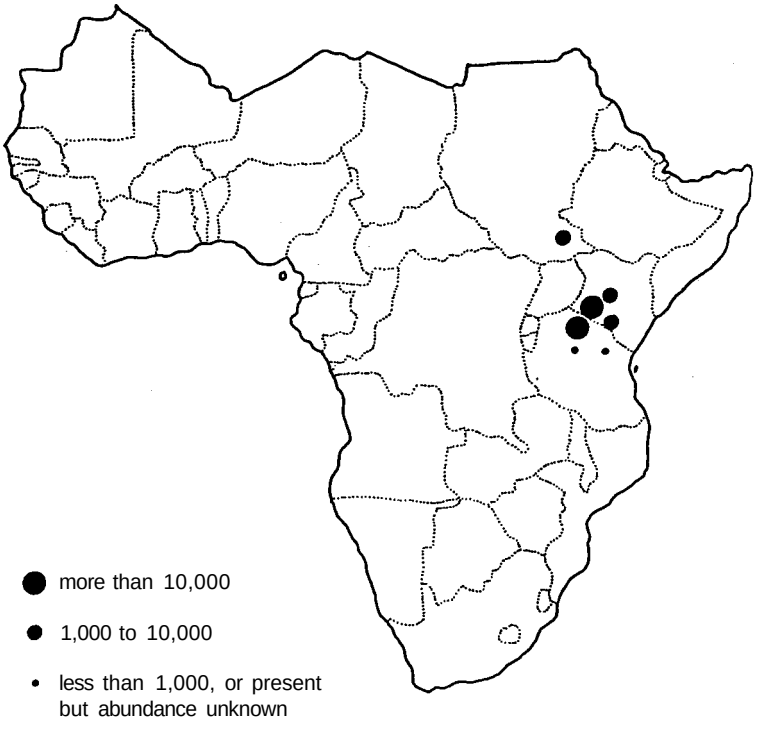
**Thomson's Gazelle**
*Gazella thomsonii* Gunther 1884

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
Kenya & Tanzania: nominate subspecies (*G. t. thomsonii*)
Sudan: Mongalla gazelle (G. *t. albonotata*)

Status of Subspecies
nominate subspecies: Lower Risk (conservation dependent)
Mongalla gazelle: Lower Risk (near threatened)

Note: Thomson's gazelle is now widely treated as conspecific with the red-fronted gazelle (G. *rufifrons*), e.g., Groves (1969, 1985), Kingdon (1997).




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Nominate Subspecies | | | | | | |
| Kenya | 15,380 | S | 32,850 | D | 48,230 | D |
| Tanzania | 390,220 | S/D | >200 | D | >390,420 | S/D |
| Subspecies Total | 405,600 | S/D | >33,050 | D | >438,650 | D |
| Monqalla Gazelle | | | | | | |
| Sudan | - | - | C | D | C | D |
| Ethiopia | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Sudan: The Mongalla gazelle formerly occurred widely in large numbers in floodplain and savanna grasslands in the southeast, to the east of the Nile. Aerial surveys in the 1970s and early-mid 1980s produced a total population estimate of about 300,000, including migratory populations of 66,000 in the Jonglei canal region and 20,000 in Boma National Park. It still occurs widely within its former range and survives in substantial but unknown numbers, e.g., on its wet season range in the extensive grasslands between Boma and Badingilo National Parks. Its timid behaviour and tendency to avoid contact with people probably enable it to avoid exposure to serious hunting pressure, at least to some extent.

Ethiopia: The Mongalla gazelle has been recorded from the Omo region in the southwest, but there is no recent information on its occurrence in Ethiopia. There is no evidence that it occurs at present in Omo National Park.

Kenya: Occurs widely within its historical range in the grasslands of southern and central Kenya. The largest populations occur in the Mara ranches, Masai Mara National Reserve and the Laikipia

and Kajiado rangelands. Numbers are decreasing on the Mara ranches and in Kajiado but are stable elsewhere.

Tanzania: Occupies about half of its former range in *Acacia* savannas and grasslands in the north. The migratory population of the Serengeti ecosystem, which is Africa's largest and most spectacular gazelle population, has stabilised at an estimated 340,000-350,000 since the late 1980s. It follows a broadly similar pattern of seasonal movements to the Serengeti's migratory wildebeest and zebra populations, but remains for longer in the wet season range on the open plains in the southeast of the ecosystem and does not migrate as far north as the Masai Mara reserve in Kenya during the dry season. Thomson's gazelle also occurs in areas such as Ngorongoro Crater, where its numbers have decreased since the removal of Masai cattle in the 1970s, and Tarangire.

SUMMARY
This species formerly occurred locally in large concentrations in the grasslands of East Africa. It has lost ground to the expansion of settlement in parts of its former range, but it retains its former abundance in a few areas such as the Serengeti-Mara ecosystem in Tanzania and Kenya. Other important populations occur in Ngorongoro Crater (Tanzania), Laikipia and Kajiado (Kenya) and southeastern Sudan.

Estimated Total Numbers: Recent population estimates, mainly from aerial surveys, are available for most of this species' current range except for the Mongalla gazelle in Sudan (Appendix 4). Population densities estimated by aerial surveys range from 0.08 per sq km in the Eyasi region of Tanzania (TWCM 1993c) to 6.5 per sq km in the Mara (Broten & Said 1995; Grunblatt et al. 1995b) and 12.6 per sq km in the Serengeti (Campbell & Borner 1995; TWCM 1997). Ground counts have given estimates of 1.0-7.2 per sq km in Nairobi and Lake Nakuru National Parks (Butynski et al. 1997) and Ngorongoro Crater (Runyoro et al. 1995).

Assuming an average correction factor of 1.25 for undercounting bias in aerial surveys (see Table 4-1, p. 91), and that areas for which population estimates are unavailable support 1.0 per sq km where the species is known to be common and 0.1 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 550,000 for the nominate subspecies. About three-quarters of this subspecies' estimated total numbers occur in a single population in the Serengeti ecosystem of Tanzania, with an additional 15% in and around other protected areas. The same assumptions give an estimated total population of 100,000 for the Mongalla gazelle, but this is simply a guess. The populations of Thomson's gazelle are stable in areas such as the Serengeti, Masai Mara National Reserve, Laikipia, Lake Nakuru and Amboseli, but appear to be decreasing in some other areas, e.g., the Mara ranches and unprotected areas of Kajiado. No recent quantitative information is available on the population trend of the Mongalla gazelle, but it is probably downwards.

Captive Population: Significant numbers of this species are held in captivity, e.g., in 1996 there were 289 individuals in North American and European zoos and an additional 143 on Texas ranches. None of these animals are known to be of the subspecies *albonotata.*

The Future: The occurrence of a large proportion of this gazelle's global population in the Serengeti means that the future status of the species is closely linked to the future of the Serengeti ecosystem. At present, the Thomson's gazelle population of the Serengeti is stable and it does not appear to have been affected by the poaching problems which have occurred recently in parts of Serengeti National Park and adjoining protected areas (TWCM et al. 1997). If this and other key populations in areas such as Masai Mara National Reserve and Laikipia remain stable as at present, the overall status of Thomson's gazelle should not change in the long term. Its status could nevertheless deteriorate rapidly if the future of the Serengeti population became threatened for any reason. The Mongalla gazelle will probably survive for longer in southeastern Sudan than more easily hunted antelope species, but this subspecies' status may eventually decline to threatened if there continues to be a complete lack of wildlife protection in this region.

**Speke's Gazelle**
*Gazella spekei* Blyth 1863

RED LIST STATUS
Vulnerable


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Ethiopia | - | - | - | - | Ex? | - |
| Somalia | - | - | C | S/D | C | S/D |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: There is a single certain record of this species' occurrence, from the northern Ogaden. There is no evidence that it still occurs in Ethiopia.

Somalia; Formerly widespread in the open barren grasslands of north-central and northeastern Somalia and the central coastal region. It occurred widely within its historical range in the 1980s, although its numbers had been reduced greatly by hunting, drought and overgrazing of its habitat by domestic livestock. It was common on the central coastal plain in the mid-1980s, e.g., it co-existed in good numbers with livestock on the moderately grazed rangeland of the open plains and coastal sand dunes of Ceel Dhere District. There is no recent information on the status of Speke's gazelle in the central coastal region, but surveys conducted in the mid-late 1990s have found that it is locally common on the northern plateau and in the eastern and central Nugal Valley.

SUMMARY
Speke's gazelle formerly occurred in large numbers in the semi-desert grasslands of north-central and northeastern Somalia. In the 1980s, it remained one of the most widespread and abundant Somali gazelles (Simonetta 1988). Recent observations indicate that this is still the case, e.g., in the Nugal Valley (P. Moehlman, in litt. November 1997). It is under intense competition from livestock in some areas, and its overall status meets the Red List criteria for the category Vulnerable (East et al. 1996; Baillie & Groombridge 1996).

Estimated Total Numbers: Population densities of Speke's gazelle estimated during vehicle surveys conducted in Somalia in April 1997 were 2.0 per sq km in the eastern Nugal Valley (41 seen in 20.8

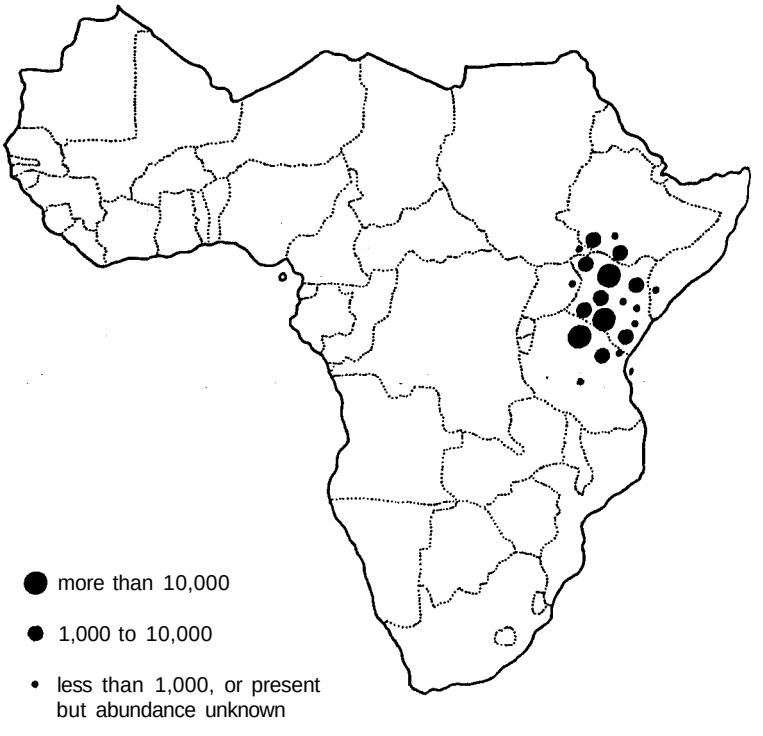
sq km census strip) and 0.2 per sq km in the central Nugal Valley (18 seen in 80 sq km census strip) (Patricia Moehlman, in litt. November 1997). This valley in north-central Somalia is considered to be the centre of the species' range (Kingdon 1997). Thurow (1996) recorded an average density of 3.9 per sq km by vehicle surveys of a 66 sq km census zone in the coastal grasslands of Ceel Dhere in central Somalia in 1985-88. The extent to which these density estimates can be extrapolated to other parts of the species' range is unknown. However, with a total range (area of occupancy) of at least 26,000 sq km (Appendix 4) and possibly as high as 170,000 sq km (Boitani et al. 1998), it is likely that the total numbers of Speke's gazelle are in the tens of thousands. There are no protected areas within the species' range and its numbers are probably in decline, at least in areas with high densities of livestock.

Captive Population: Despite some problems with inbreeding associated with a small number of founders, the captive population of Speke's gazelle held in North American zoos had grown to 32 in 1996 and was continuing to increase.

The Future: Speke's gazelle persists in apparently healthy populations in some parts of Somalia, despite the country's recent history of civil war and interclan hostilities. Nevertheless, this gazelle probably faces continued, gradual attrition of its distribution and numbers if the current absence of protective measures continues throughout its range. Its conservation status is therefore likely to decline further unless effective protection and management of representative populations and their habitat can be developed and implemented.

**Grant's Gazelle**
*Gazella granti* Brooke 1872

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Sudan | - | - | X | ? | X | ? |
| Ethiopia | 5,210 | S | 1,130 | S/D | 6,340 | S/D |
| Somalia | - | - | X | D | X | D |
| Uganda | 120 | D | 30 | ? | 150 | D |
| Kenya | 10,000 | D | 90,080 | D | 100,080 | D |
| Tanzania | 27,690 | S/D | >7,090 | S/D | >34,780 | S/D |
| Species Total | 43,020 | S/D | >98,330 | S/D | >141,350 | D |

OVERVIEW OF CONSERVATION STATUS

Sudan: Formerly occurred in open grassland and bushland in the southeast. The population was estimated to number about 15,000 in the 1970s and 1980s, including 3,000 in the southern section of Boma National Park. No recent information on its status.

Ethiopia: It has largely disappeared from the northern part of its range in the southern Rift Valley but still occurs widely in the southwestern lowlands. It is locally common, e.g., in Omo and Nechisar National Parks, Omo West and Murule Controlled Hunting Areas and Chew Bahir Wildlife Reserve. It probably undertakes considerable seasonal movements within this region.

Somalia: Formerly occurred widely in the lower Juba region of Somalia, between the Juba River and the Kenya border. It has suffered from poaching and competition with livestock, but it probably still occurs locally within its former range as in the 1980s.

Uganda: Formerly widespread in the semi-arid northeast. A 1995 aerial survey failed to locate this species in the northern part of its historical range where it was formerly common (Kidepo Valley National Park, North Karamoja Controlled Hunting Area, Matheniko Game Reserve) and only small,

declining remnant populations were observed in the southern part of its range (Bokora Corridor and Pian-Upe Game Reserves, South Karamoja Controlled Hunting Area).

Kenya: Occurs throughout much of its historical range in the north, east and south. Kenya continues to support the largest numbers of this gazelle. However, the country's estimated total numbers have decreased by >50% since the 1970s. The largest populations occur outside protected areas, on the rangelands of Marsabit, Turkana, Wajir, Isiolo, Narok and Kajiado districts. Aerial survey results suggest that the numbers of Grant's gazelle are continuing to decline in some districts, e.g., Turkana, Marsabit and Narok, but are stable in others, e.g., Kajiado, Samburu and Laikipia. The largest protected populations are in Sibiloi and Amboseli National Parks and Masai Mara National Reserve, where numbers are stable, and Tsavo National Park, where numbers have decreased during the 1990s.

Tanzania: Occupies substantial parts of its former range in the *Acacia* savannas and thombush of northern, northeastern and central Tanzania. The largest population occurs in the Serengeti, where it shows a preference for flat, open grasslands. It is one of the few herbivores which occurs in significant numbers throughout much of the year on the Serengeti Plains in the southeast of the national park and adjacent parts of Ngorongoro Conservation Area. Consequently, the bulk of the Serengeti Grant's gazelle population occurs well away from the western boundary of the protected area where most poaching activity occurs. Another major population occurs in the Tarangire ecosystem, with smaller numbers in areas such as Ngorongoro Crater and Mkomazi Game Reserve. Most of these populations are stable, but the population of Ngorongoro Crater has decreased for unknown reasons since the removal of Masai pastoralists and their livestock in the 1970s.

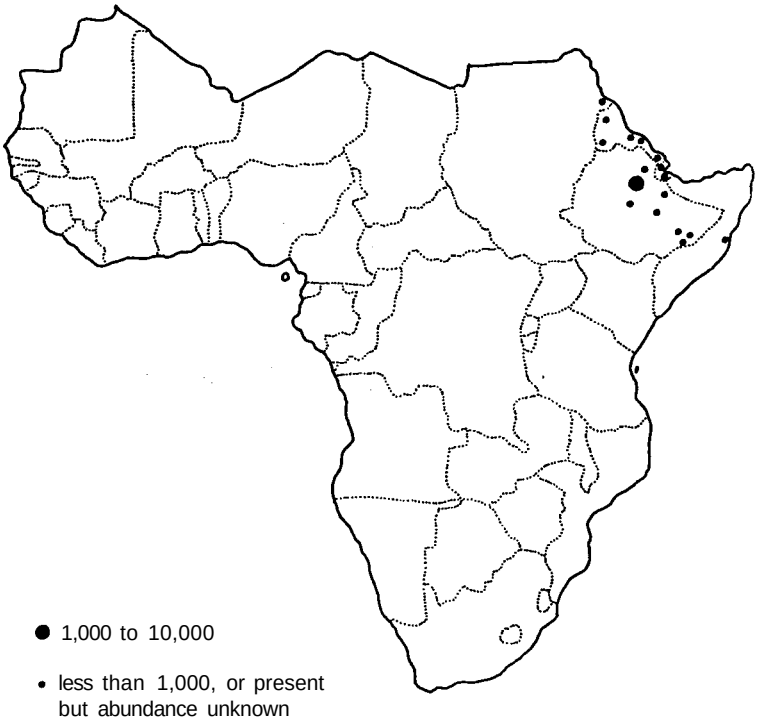
SUMMARY
Grant's gazelle formerly occurred widely in grasslands and semi-arid scrubland from southern Ethiopia to central Tanzania. It remains widespread within and outside protected areas, despite the loss of parts of its range to the expansion of agriculture and the decline of some populations because of poaching and competition with increasing numbers of livestock. The largest surviving populations occur in Omo-Mago-Murule-Chew Bahir and Borana (Ethiopia), the northern rangelands, Kajiado, Mara, Tsavo and Laikipia (Kenya) and Serengeti and Tarangire (Tanzania). Most of these populations are in gradual decline.

Estimated Total Numbers: Recent population estimates are available for most of this species' current range, mainly from aerial surveys (Appendix 4). Summation of these estimates gives a total of about 140,000, but this is probably an underestimate of the species' total numbers because of undercounting in aerial surveys and the lack of population estimates for some areas. Population densities estimated from aerial surveys range from <0.04 per sq km in areas such as Borana (Thouless 1995a) and South Karamoja (Lamprey & Michelmore 1996) to 0.5-0.6 per sq km in Sibiloi (Grunblatt et al. 1995b) and Tarangire (TWCM 1995a), 1.0 per sq km in Serengeti-Mara (Broten & Said 1995; Campbell & Borner 1995) and 3.8 per sq km in Amboseli (Butynski et al. 1997). Estimates obtained by ground counts in areas where the species is common range from 1.0 to 3.7 per sq km in Nairobi and Lake Nakuru National Parks (Butynski et al. 1997) and Ngorongoro Crater (Runyoro et al. 1995). Assuming an average correction factor of 2.5 for undercounting bias in aerial surveys (which may be conservative; see Table 4-1, p. 91), and that areas for which population estimates are unavailable (Appendix 4) support an average density of 0.1 per sq km, gives an estimated total population of about 350,000, of which about 30% occurs in protected areas. Population trend is downward, with some exceptions such as Sibiloi and Marsabit National Parks, some of Kenya's northern rangeland districts, Laikipia, Masai Mara National Reserve, Amboseli, Serengeti, Tarangire and Mkomazi.

The Future: The conservation status of Grant's gazelle will probably remain satisfactory in the long term as long as moderate to large, stable populations occur in areas such as Serengeti, Tarangire, Mkomazi, Amboseli, Sibiloi, the Masai Mara reserve and Laikipia. It is nevertheless of concern that its numbers appear to be in decline over large parts of its range (e.g., Tsavo) and that populations which are known to be stable or increasing comprise only about 25% of the species' total numbers.

**Soemmerring's Gazelle**
*Gazella soemmerringii* (Cretzschmar 1828)

RED LIST STATUS
Vulnerable




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Poon/Abund. | 'Frend | Popn/Abund. | Trend |
| Sudan | - | - | R | D | R | D |
| Eritrea | - | - | C/U | ? | C/U | ? |
| Djibouti | - | - | U | S | U | S |
| Ethiopia | 215 | S/D | >6,230 | S/D | >6,450 | S/D |
| Somalia | - | - | U/R | D | U/R | D |
| Kenya | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Sudan: It has been eliminated by uncontrolled hunting and habitat destruction from almost all of its former range in the northeast, e.g., it disappeared from Dinder National Park (where it was formerly abundant) in the 1970s. Local people reported seeing this species in the Red Sea Hills in 1992. Surveys of its former range in 1996/97 failed to locate any definite evidence that it survives elsewhere in Sudan. Reports of a specimen killed by a hunter in 1994 and information provided by local people suggest that a few small populations may still exist near the Eritrea and Ethiopia borders. These areas could not be surveyed in 1996/97 for security reasons.

Eritrea: Formerly occurred widely except for highland areas. It still occurs in good numbers in parts of its historical range, e.g., it is common in the Buri Peninsula area on the central coast, where its population appears to be stable, and it occurs in reasonable numbers throughout the southern half of the coastal plain. It has also been observed recently in the Gash-Setit area in the southwest, and local people indicate that it occurs further north in the area around Agordat. It probably occurs quite widely in the northwest. A "dwarf" form of this species still occurs on Dahlac Island.

Ethiopia: Formerly widespread in semi-arid grasslands and *Acacia* savannas in the northeastern, eastern and southeastern lowlands. It still occupies substantial parts of its historical range. Good

numbers occur in the Awash River Valley, from Awash National Park in the south to the Serdo region in the north, in herds of up to 300. The largest concentrations occur in the Alledeghi Plains, the central part of Awash West Controlled Hunting Area, Yangudi Rassa National Park and the Serdo region. The Soemmerring's gazelle population of the Awash Valley/Danakil region may be in long-term decline because of poaching, but recent information suggests that it is currently stable. This species' numbers are probably decreasing elsewhere, e.g., in the eastern lowlands. Local people indicate that in the 1960s it occurred in thousands on the plains and open bushland of the Ogaden region, but it was slaughtered in large numbers with automatic weapons during subsequent political unrest and now occurs only in small, remnant herds in this region.

Djibouti: Formerly occurred widely in semi-arid and arid bushland and grassland. Its numbers were substantially reduced by hunting prior to the implementation of the hunting ban in the early 1970s. This may have arrested further population decline, but the recovery of its numbers has been limited by competition with sheep and goats on degraded rangelands. By the mid-1980s, it was confined to localised areas of its former range, e.g., the northern coastal plains and the southeast. It has subsequently maintained its numbers, at least in the southeast.

Somalia: Formerly occurred widely in northern Somalia and the central coastal plain, and locally between the Shebelle and Juba Rivers. It has suffered severely from poaching and habitat degradation, e.g., by the early 1980s it had been eliminated from most of its former range. In the mid-1980s, it was still present in reasonable numbers in parts of the central coastal hinterland and occurred seasonally in mixed herds with Speke's gazelle on the coastal grasslands in Ceel Dhere District. Soemmerring's gazelle may still occur in this region, but no recent information is available on its status.

Kenya: Reported sporadically from northeastern Kenya near the Ethiopia border. There is no recent information on its occurrence in this area.

SUMMARY
Soemmerring's gazelle formerly occurred widely in *Acacia/Commiphora* bushland and open grassland in Northeast Africa. It has suffered a major decline in parts of its range, e.g., Sudan and Somalia, as a result of uncontrolled slaughter and degradation of rangeland by large numbers of livestock. The major surviving concentrations occur in Ethiopia (particularly the Awash Valley), Eritrea (especially the coastal plain) and Djibouti.

Estimated Total Numbers: Recent population estimates are available from the Awash Valley, where an aerial survey of most of the valley gave an average population density estimate of 0.3-0.4 per sq km (Thouless 1995b). Ground counts in Awash National Park at the southern end of the valley gave an estimate of 0.2-0.3 per sq km (C. Schloeder & M. Jacobs, in litt. June 1995, August 1996). Assuming an average correction factor of 2.0 for undercounting bias in aerial surveys, and that areas for which population estimates are unavailable support an average density of 0.3 per sq km where the species is known to be common and 0.03 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of about 14,000. The only protected-area population (excluding "paper parks") is the one of about 200 in Awash National Park. Numbers are probably decreasing over most of this gazelle's remaining distribution, with some exceptions in parts of Eritrea, Ethiopia and Djibouti.

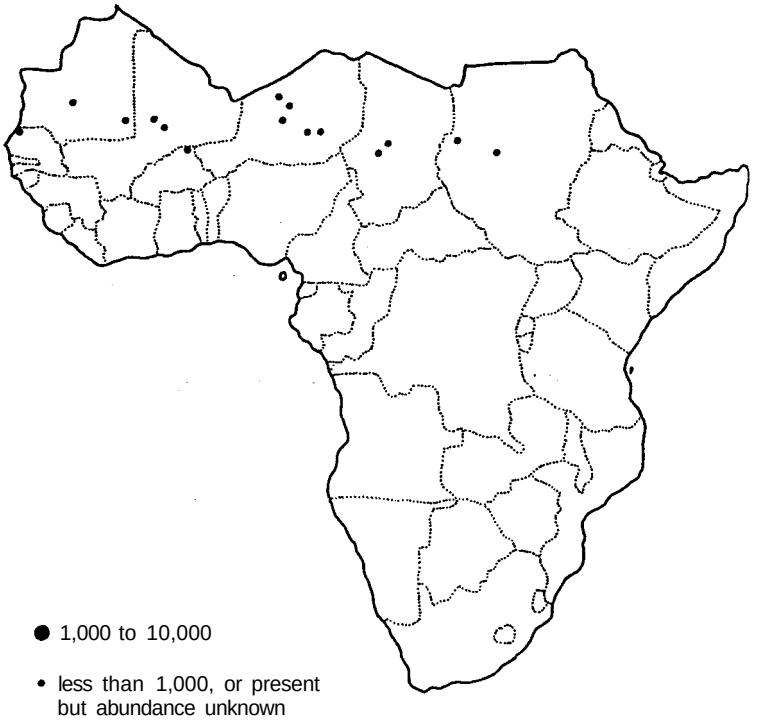
Captive Population: There was an increasing population of 29 Soemmerring's gazelles in North American zoos in 1996.

The Future: The overall distribution and numbers of this gazelle will continue to decline unless effective protection and management can be implemented in much larger areas of its range than at present. The apparently healthy, stable populations which persist in areas with few people and livestock and/or effective control of hunting, e.g., the coastal plains of Eritrea and Djibouti and parts of the Awash Valley in northern Ethiopia, will increasingly become the core surviving populations of Soemmerring's gazelle if current trends continue.

**Dama Gazelle**
*Gazella dama* (Pallas 1766)

RED LIST STATUS
Endangered

SUBSPECIES
Various subspecies of this gazelle have been described, reflecting factors such as variation in the extent of rufous coloration. This is confined to the neck and upper shoulders in the red-necked or addra gazelle (*G. d. ruficollis*) from the eastern part of the species' range, but is much more extensive in the mhorr gazelle (G. *d. mhorr*) from the western Sahara. In reality, there was a gradual decline in the extent of rufous coloration from west to east across the species' former range with a high degree of local variability. Any delimitation of the distributions of the subspecies is purely arbitrary.




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mauritania | - | - | R | D | R | D |
| Mali | - | - | 400 | S/I | 400 | S/I |
| Niger | 175 | S | 350 | D | 525 | D |
| Senegal | 25 | I | - | - | 25 | I |
| Burkina Faso | - | - | R | D | R | D |
| Nigeria | - | - | - | - | Ex? | - |
| Chad | - | - | U/R | D | U/R | D |
| Sudan | - | - | R | D | R | D |
| Species Total | 200 | S | >750 | D | >950 | D |

OVERVIEW OF CONSERVATION STATUS

Mauritania: Formerly occurred widely throughout the southern half of the country and in the northwest. It has suffered a catastrophic decline since the 1960s because of relentless hunting combined with habitat degradation. It was thought to be extinct in the late 1980s, but recent reports indicate that it still occurs in the remote southeast and that a few may survive in the vicinity of Tidjika to the west. Illegal hunting is a major threat to any surviving animals.

Mali: Formerly widespread in the sahel and on the southern fringe of the Sahara. It has been eliminated from most of its former range, including Ansongo-Menaka Partial Faunal Reserve and Elephant Faunal Reserve, by uncontrolled hunting and the expansion of livestock. It survives in small numbers northeast of Mopti and in rocky areas north of Tombouctou. The rebellion in northern Mali in the early-mid 1990s may have reduced hunting pressures on wildlife and allowed a slight increase in this species' remnant population.

Niger: Formerly occurred widely in the sahel and subdesert zones of central and southern Niger, extending northwards into the desert zone in the region of the Air Massif. Since the 1960s, illegal hunting, habitat destruction and drought have eliminated the dama gazelle from most of its former range and reduced the surviving populations to low levels. By the mid-late 1980s, it survived mainly in the Termit region and in and around Air and Tenere National Nature Reserve, with total numbers estimated to be <1,000. The population of the Air and Tenere reserve had increased noticeably during the 1980s, apparently in response to both reduced hunting pressure and the good rainfalls of the late 1980s. The reserve's population appeared to be at least stable in the early 1990s, but the species' numbers were continuing to decrease elsewhere. More recent information on its status is unavailable, apart from reports of its continued presence in the Air and Termit regions in the mid-1990s and a sighting of a lone individual south of the Tenere Desert during a forest department mission in March 1998.

Senegal: Occurred as an occasional visitor to the northern sahel zone until the 1970s, but it is now extinct in Senegal in the wild state. Seven individuals from the captive population of the mhorr gazelle at Almeria, Spain were reintroduced to Gueumbeul Faunal Reserve in the northwest in 1984, to establish a semi-captive population. Reproduction has been good but high mortality of adults and juveniles restricted the growth of this population, which numbered 13 animals in 1992. After being moved to a larger enclosure and separated into breeding and bachelor groups, the population had increased to 25 in 1997, including 3 animals translocated to the privately owned Bandia Nature Reserve near Dakar.

Burkina Faso: Formerly occurred in the northern sahel zone. It has been eliminated from most/all of its former range by overhunting and the expansion of livestock grazing, aggravated by drought. It occurred in very small, decreasing numbers in the Seno-Mango region in the extreme north in the mid-1980s. More recent information on its status is unavailable, but it could now be extinct.

Nigeria: Recorded rarely from the sahel zone of northeastern Nigeria in the past, but it is now apparently extinct.

Chad: Formerly occurred throughout the sahelian and subdesert rangelands of central Chad and sporadically in the northern deserts. By the 1970s, it had disappeared from most of its former range but survived in large numbers in Ouadi Rime-Ouadi Achim Faunal Reserve. This population was also annihilated after the reserve became part of a war zone in the late 1970s. The species was observed in the extreme western part of Ouadi Rime-Ouadi Achim Faunal Reserve in 1992 and 1993, and local pastoralists indicated that it was not uncommon in surrounding areas of eastern Kanem and western Batha. Surveys conducted in 1990-96 in some other parts of north-central Chad, such as Ennedi, did not locate any evidence for its continued presence. The dama gazelle is highly susceptible to the activities of motorised hunting parties, and hunting is a major threat to the remaining animals. This underlines the importance of re-establishing effective protection of the area where the species is known to still occur.

Sudan: Formerly occurred widely in arid and semi-arid grasslands in the northwest, to the west of the Nile. By the 1970s, it numbers had been reduced greatly by overhunting and its distribution was becoming fragmented. Its decline has continued. A hunting expedition by Saudi royalty in Northern Kordofan and Northern Darfur in 1989 reportedly killed 2 dama gazelles as well as >1,600 dorcas gazelles. The only evidence of the dama gazelle's survival in the 1990s is anecdotal information from local people who indicate that it still occurs quite widely at low densities in Northern Darfur and Northern Kordofan.

SUMMARY
The dama gazelle formerly occurred throughout the semi-desert grasslands and bushland fringing the Sahara, moving into the desert to seek wet-season grazing. Its distribution and numbers have declined catastrophically since the 1950s and 1960s because of senseless, uncontrolled slaughter by hunting parties and degradation of its rangeland habitats through overgrazing combined with severe droughts. It is now reduced to a few isolated, generally decreasing remnant populations

*Dama Gazelle* (*continued*)
scattered across its former range from Mauritania to Sudan. The same applies in North Africa, where it is probably extinct in Libya (Khattabi & Mallon in press) but survives in very small numbers in Hoggar National Park in southern Algeria (De Smet in press) and possibly in Western Sahara (Aulagnier et al. in press).

Estimated Total Numbers: The dama gazelle's remnant populations occur at very low densities, e.g., an estimated overall density of 0.002 per sq km in Air and Tenere National Nature Reserve (Niger) including parts of the reserve which are unsuitable for this species (Grettenberger & Newby 1986). The available information (Appendix 4) suggests that its total numbers may now be in the low thousands and are continuing to decline.

Captive Population: This species occurs in good numbers in captivity. The captive population is managed as two separate subpopulations comprising the red-necked gazelle (originating from animals captured in Chad in the 1960s) and the mhorr gazelle (originating from animals captured in Western Sahara and transported to Almeria, Spain in 1971). In 1996, there were 196 mhorr gazelles and 200 red-necked gazelles in European and North American zoos, with some additional animals in zoos elsewhere (e.g., Australasia and South Africa). At that time there were also 91 dama gazelles (subspecies not indicated) on Texas ranches.

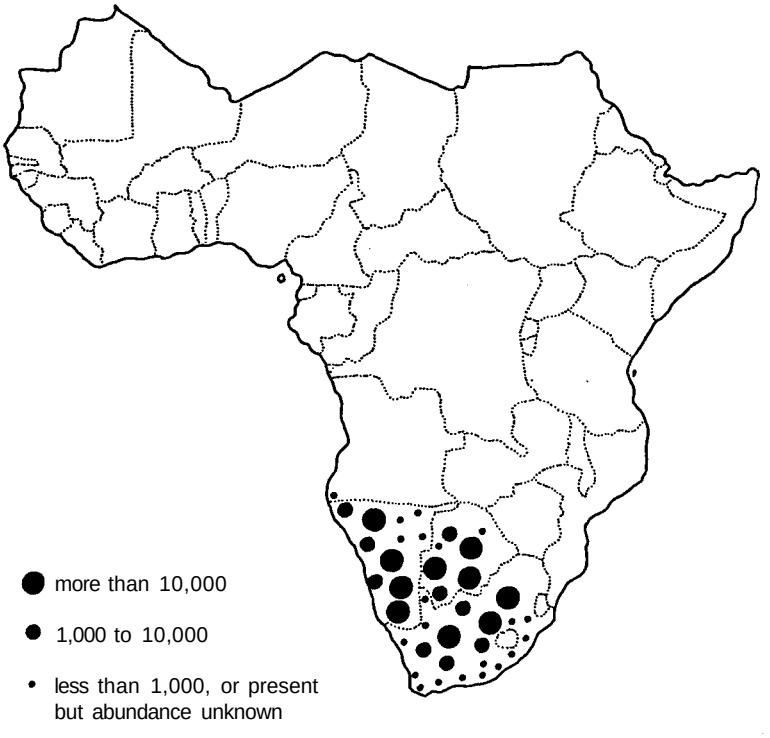
The Future: If current trends continue, it is probably only a matter of time before the dama gazelle becomes extinct in the wild. This could be prevented if effective protection and management can be implemented for the viable populations which persist in areas such as the Termit region and Air and Tenere reserve (Niger), central Mali and possibly Ouadi Rime-Ouadi Achim (Chad).

The existence of an increasing captive population provides the opportunity for reintroduction of the species to securely protected areas of natural habitat. In addition to the Gueumbeul reserve in Senegal, this has been attempted at two localities in North Africa. As at Gueumbeul, the introduced semi-captive population which is held within a 20 sq km enclosure in Bou-Hedma National Park (Tunisia) has shown little or no increase. This population numbered 21 in 1997 (Smith et al. in press). Eleven captive-bred dama gazelles were released into an enclosure in Souss-Massa National Park (Morocco) in 1994-95 (Aulagnier et al. in press). These and similar reintroduction efforts in other parts of the species' historical range, e.g., as part of the implementation of the CMS Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes, may offer the best opportunity for reversing the decline of the dama gazelle.

## Springbok

*Antidorcas marsupialis* (Zimmermann 1780)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Angola | - | - | - | - | U/R | D | U/R | D |
| Namibia | 16,720 | I | 286,110 | I | 13,500 | S | 316,330 | I |
| Botswana | 26,100 | S | - | - | 94,450 | S | 120,550 | S |
| South Africa | 14,100 | S/I | >220,000 | S/I | - | - | >234,100 | S/I |
| Species Total | 56,920 | I | >506,110 | I | 107,950 | S | >670,980 | I |

OVERVIEW OF CONSERVATION STATUS

Angola: Confined to the arid coastal strip in the southwest where it was formerly common, e.g., there was an estimated population of 2,500 in Iona National Park in 1975. It survives in greatly reduced numbers.

Namibia: Formerly occurred widely in the deserts and semi-arid savannas of western and central regions, but absent from the savanna woodlands of the far northeast. It still occurs very widely within its historical range. There is a major population in Etosha National Park. It also occurs in good numbers in Namib-Naukluft Park and in Kaokoland, and in smaller numbers in most other protected areas and communal lands within its natural range. It is the most numerous antelope species on private farmland, particularly in the Karroid shrublands of southern farming districts. The springbok is one of the key species in Namibia's wildlife utilisation industry. It comprises a major component of trophy hunting, game meat production and live-capture for sale.

Botswana: Formerly occurred throughout the arid savannas of the Kalahari, but absent from less arid regions in the north and east. It still occupies much of its historical range and remains widespread and common in the Kalahari. While there is no evidence of large-scale seasonal migration by the springbok in the northern Kalahari, it undergoes local movements and tends to range over greater distances than more sedentary species such as the gemsbok. Unlike other

*Springbok (continued)*
antelope species in this region, the springbok occurs in larger numbers throughout the year in areas occupied by people than in protected areas. This is probably a result of its preference for short grass around pans. It is also locally common in two separate areas of the northern region, viz., within and to the east of Makgadikgadi-Nxai Pan National Park and in southern Ngamiland district.

South Africa: Formerly occurred widely in what are now Northern Cape, Western Cape, Eastern Cape, Free State, Northwest, Gauteng and northwestern KwaZulu-Natal Provinces, often in enormous herds. It was exterminated over much of its natural range, but it has subsequently been reintroduced widely to private land and protected areas. The largest numbers occur on private game farms, mainly in the highveld of Free State and Gauteng Provinces and the Karoo and Kalahari thornveld of Western, Eastern and Northern Cape Provinces. It is one of the three most commercially important game species in South Africa. Smaller, introduced populations occur widely in extralimital areas, e.g., on private land and provincial reserves in parts of KwaZulu-Natal and the northern bushveld. Its susceptibility to factors such as the tick-borne disease heartwater has limited its introduction to regions such as the bushveld. It is well represented in national parks and provincial reserves within its historical range. The largest protected populations occur in Kalahari Gemsbok, Vaalbos and Karoo National Parks and in provincial reserves such as Tussen-die-Riviere Game Farm and Verwoerd Dam Nature Reserve in the Free State.

SUMMARY
The springbok formerly occurred in huge numbers in the dry grasslands, bushland and shrubland of Southwestern and Southern Africa, migrating sporadically in vast herds (treckbokken) in some of the southern parts of its range. These migrations no longer occur, but some indication of the species' former abundance can still be seen in seasonal concentrations on the areas of short vegetation which it prefers, e.g., in parts of the section of the Kalahari which lies in central and southern Botswana. The largest numbers of the springbok now occur on fenced farmland in Namibia and South Africa. It is also well represented in protected areas, and it still occurs widely in unprotected areas in the Botswana section of the Kalahari.

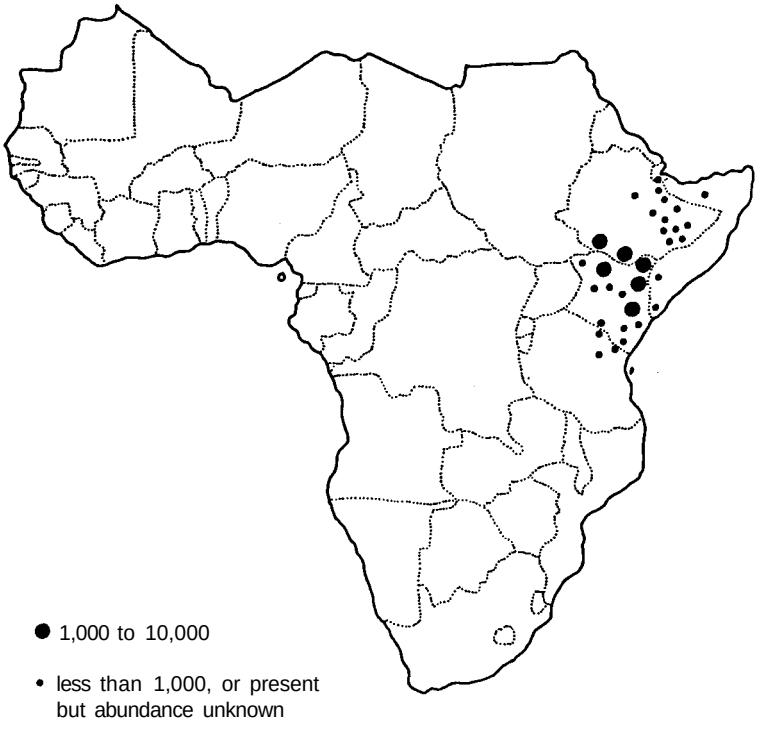
Estimated Total Numbers: Population estimates are available for almost all of the springbok's current range from aerial surveys and ground counts, and from questionnaire surveys of private game farms (see Appendix 4). Summation of these estimates gives a figure of 670,000, but this is probably an underestimate of the species' total population because of unknown levels of undercounting in aerial surveys. Assuming an average correction factor of 2.0 for undercounting bias in aerial surveys (see Table 4-1, p. 91) increases the estimate of total numbers to 820,000. About 60% of the total population occurs on private land and 12% in protected areas. Numbers are generally increasing on private land and in protected areas and stable elsewhere.

The Future: The conservation status of the springbok will not change as long as effective protection and management are continued for the populations on private land and in protected areas.

## Gerenuk

*Litocranius walleri* (Brooke 1879)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Ethiopia | >1,340 | S | >2,950 | S/D | >4,290 | S/D |
| Djibouti | - | - | U | S | U | S |
| Somalia | C/U | ? | R | D | U/R | D |
| Kenya | >1,330 | D | 18,480 | D | >19,810 | D |
| Tanzania | >80 | S/I | U | S/D | U | S/D |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: It still occurs widely within its historical range in the Awash Valley and the eastern and southern lowlands. It is absent from Awash National Park but occurs at low densities in the central and southern parts of the Awash Valley to the east of the Awash River. It is widespread in the eastern lowlands, e.g., it is still quite common in bushland and thickets throughout the Ogaden region despite being hunted frequently by local people. In the southern lowlands, it is common in Mago National Park and Murule Controlled Hunting Area and occurs at lower densities in Borana Controlled Hunting Area, Yabelo Wildlife Sanctuary and Chew Bahir Wildlife Reserve.

Djibouti: The gerenuk reaches the northern limit of its continental distribution in the arid thombush of southern Djibouti. It apparently still occurs in this area in stable numbers. The total population was estimated to be no more than 200 individuals in the mid-1980s.

Somalia: Formerly occurred very widely. By the early-mid 1 980s, it had been eliminated locally and reduced to low or very low numbers over most of its range, but it still occurred in fair numbers in parts of the south, e.g., the lower Shebelle region and the lower Juba region between the Juba River and the Kenya border. It survives in small, decreasing numbers on the northern plateau and probably in reasonably good numbers in the thick bushland of Bush Bush National Park and other localities in Lower Juba. There is no recent confirmation of its presence in central Somalia, where it formerly occurred more or less throughout, but it probably still occurs locally in

*Gerenuk (continued)*
this region.

Kenya: The northern rangelands of Kenya continue to be a major stronghold of this antelope, although its estimated total Kenyan population has decreased by about 50% since the 1970s. It still occurs throughout most of its historical range in the semi-arid thornbush of northern and eastern regions. The largest populations occur in Marsabit, Wajir and Garissa districts. Estimated numbers in the northern part of its Kenyan range (Turkana, Marsabit, Wajir, Mandera) have remained stable during the 1980s and 1990s. It occurs in significant and generally stable numbers in most protected areas within its range, e.g., Sibiloi and Marsabit National Parks and Samburu-Buffalo Springs-Shaba and Losai National Reserves, but the largest protected population, in Tsavo National Park, has been reduced by rinderpest and drought.

Tanzania: Occurs widely at low to moderate densities within its historical range in the semi-arid thornbush of the northeast. It occurs in two protected areas, Tarangire National Park and Mkomazi Game Reserve. Outside protected areas, it may have benefitted to some extent from the expansion of bush vegetation on rangelands overgrazed by domestic livestock.

SUMMARY
The gerenuk formerly occurred widely in the semi-arid bushland of Northeast Africa. It still occupies large parts of its historical range in Ethiopia, Kenya and Tanzania, but little information is available on its current distribution in Somalia. The largest surviving populations occur in southwestern Ethiopia and the northern and eastern rangelands of Kenya. Important protected-area populations occur in areas such as Mago National Park (Ethiopia), Sibiloi and Tsavo National Parks (Kenya) and Mkomazi Game Reserve (Tanzania).

Estimated Total Numbers: Recent population estimates are available for substantial parts of the gerenuk's range, mainly from aerial surveys (see Appendix 4). Summation of the available estimates gives a total of 24,000. This is probably a substantial underestimate of actual numbers, because of undercounting from the air and the lack of population estimates for regions such as the Ogaden in eastern Ethiopia. Estimates of gerenuk population density obtained by aerial surveys are generally low, e.g., 0.01-0.06 per sq km in areas such as the Awash Valley (Thouless 1995b), Borana and Chew Bahir (Thouless 1995a), Tsavo (Butynski et al. 1997) and Mkomazi (M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), and 0.2-0.3 per sq km in Sibiloi (Grunblatt et al. 1995b), Samburu (Butynski et al. 1997) and Murule (Thouless 1995a). Ground surveys in areas where the species is common have produced density estimates of 0.3-1.4 per sq km, e.g., Leuthold (1978).

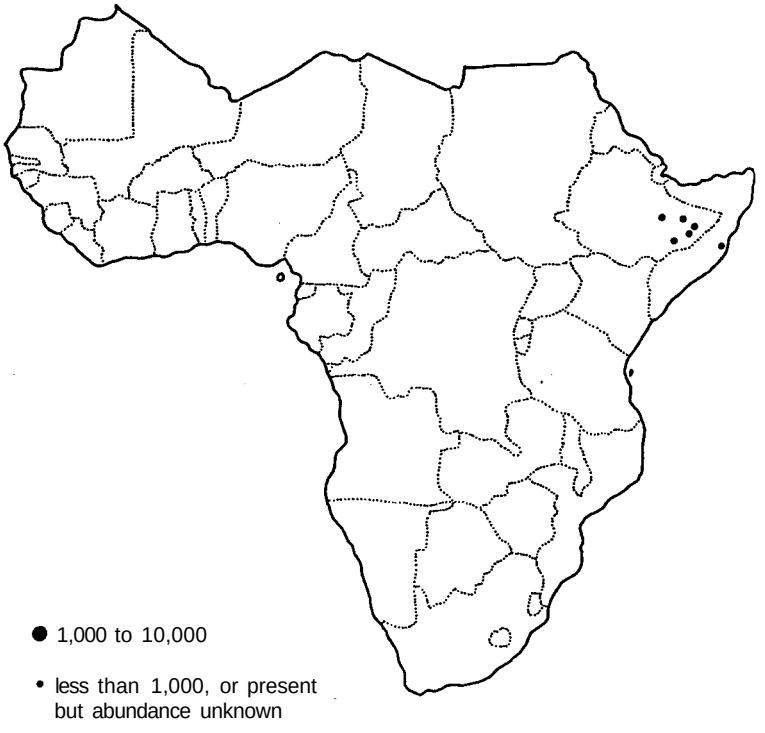
Assuming an average correction factor of 3.5 for undercounting bias in aerial surveys, and that areas for which population estimates are unavailable support an average density of 0.5 per sq km where the species is known to be common and 0.05 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 95,000, of which about 10% is in protected areas. Population trend is generally stable in protected areas, with a few notable exceptions such as the declining population of Tsavo National Park, and gradually decreasing elsewhere.

The Future: The gerenuk's shyness and preference for cover enable it to withstand hunting pressures to some degree, and it can be favoured by the spread of thickets which occurs when grasslands are overgrazed by livestock. These attributes have enabled it to survive widely in regions such as the Ogaden in the complete absence of protection. Nevertheless, it cannot persist indefinitely as human and livestock populations increase and subsistence hunting pressure escalates. If current trends continue, it may eventually disappear from large parts of its present distribution until it is largely restricted to effectively protected and managed areas of suitable habitat. Such areas currently comprise only a small part of its remaining range.

Tribe Ammodorcadini

**Dibatag**
*Ammodorcas clarkei* (Thomas 1891)

RED LIST STATUS
Vulnerable




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | Trend |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | D |
| Ethiopia | - | - | U/R | D | U/R | D |
| Somalia | - | - | x | D | x | |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: Formerly occurred widely in the vast, semi-arid to arid plains of the Ogaden region in the eastern lowlands. Political unrest made this region inaccessible to field investigations of wildlife from the 1970s until very recently. In 1997, an extensive ground survey revealed that the dibatag is now rare or absent in the northern Ogaden but still occurs locally within a reasonably large area in the southern Ogaden, where it appears to be quite common in some localities. In contrast to the northern Ogaden, which has a relatively high density of settlements and concentrations of armed pastoralists and their herds, the southern Ogaden has lower human densities and extensive areas where the natural flora and fauna appear to be largely intact. Wildlife populations are generally depleted because of overhunting. While the dibatag's status appears to be precarious, its alertness and the difficulty of hunting it in dense bush have enabled it to survive locally in viable numbers. Local people consider that it is very shy and more alert than any other antelope species, and that it is almost impossible to hunt dibatag intentionally, even though its meat is preferred because of its excellent taste. Areas where it survives, e.g., around Madeedle and Tayen, are characterised by dense bush, numerous termite mounds, and a relatively high proportion of green bushes and trees which presumably reflects better underground water supplies. Local people indicate that the dibatag strongly prefers such habitats, where it feeds on flowers and fruits as well as leaves.

Somalia: Formerly occurred widely in central Somalia and on the Haud Plateau. It has been affected severely by overhunting, drought and habitat degradation caused by excessive numbers of livestock. By the early 1980s, it had disappeared from large parts of its former range but still occurred locally in reasonable numbers in parts of the central coastal hinterland. Local people indicated that it was still present in this region in the late 1980s, but no more recent information is

*Dibatag (continued)*
available on its status.

SUMMARY
The dibatag is confined to a single type of evergreen bushland in eastern Ethiopia and central Somalia (Kingdon 1997). It has probably disappeared from the substantial parts of its former range where human and livestock numbers are now high, but Friedrich Wilhelmi's recent survey of the southern Ogaden has shown that it persists in viable numbers in some localities. There are no protective measures for wildlife anywhere within its very restricted distribution, which has been affected by more than 20 years of armed conflict and civil unrest. Initiation of action to conserve this species is a very high international priority in antelope conservation.

Estimated Total Numbers: The surviving population of the dibatag is unknown, but is clearly not large. Assuming a total remaining range of 10,000 sq km (cf. Appendix 4) and an average population density of 0.1-0.3 per sq km, for example, would suggest a total population in the low thousands. Boitani et al. (1998) estimated its area of occupancy as >200,000 sq km. This may be unrealistically high since it probably now continuously occupies only a small fraction of its historical distribution. Its numbers are continuing to decrease.

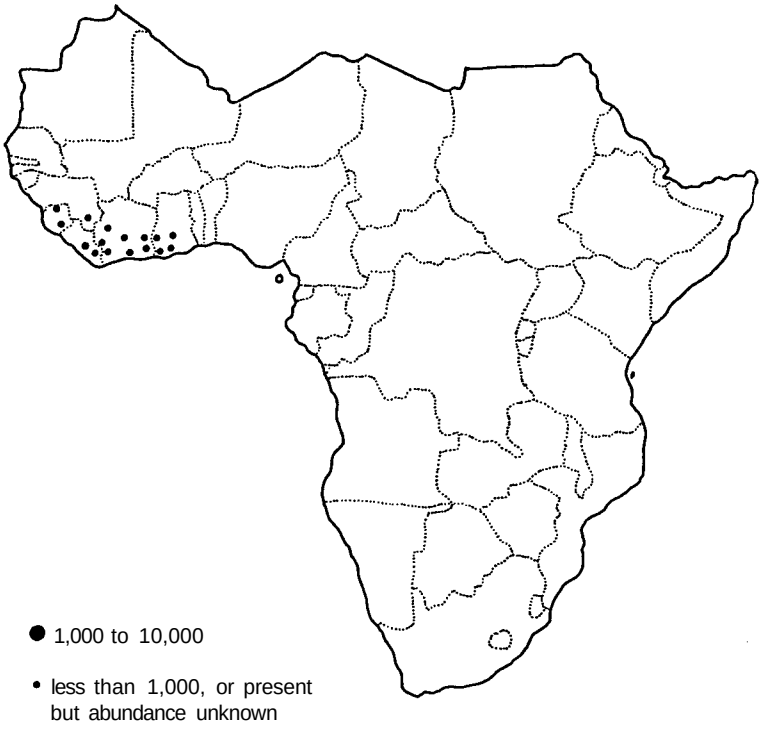
Captive Population: No dibatag are known to be held in captivity.

The Future: While it still occurs in viable numbers in a few parts of its former range, the dibatag's status will decline to extinction if current trends persist and it continues to be unrepresented in protected areas or in captivity. Hence there is urgency in initiating conservation action in those parts of its range where this is feasible, e.g., the southern Ogaden.

Tribe Neotragini

**Royal Antelope**
*Neotragus pygmaeus* (Linnaeus 1758)

RED LIST STATUS
Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Guinea | X | ? | X | D | X | D |
| Sierra Leone | C | S/D | C | S/D | C | S/D |
| Liberia | - | - | C | S/D | C | S/D |
| Ivory Coast | U | S/D | X | S/D | U | S/D |
| Ghana | U | S/D | X | S/D | U | S/D |

OVERVIEW OF CONSERVATION STATUS

Guinea: Occurs in the southeastern forests, including Ziama and Diecke Forest Reserves.

Sierra Leone: Probably occurred widely but locally in the past, wherever there was sufficient dense undergrowth. It may have benefitted from forest destruction, e.g., it is encountered more often in logged forest with some undergrowth than in primary forest and it is frequently encountered in farm bush. It is nocturnal, very timid, secretive and seldom seen. It often survives in farming areas, despite heavy hunting pressures. It is rarely shot, but is occasionally caught in snares set for duikers. In the 1980s it was reported from protected areas such as Tiwai Island Game Sanctuary and Gola West Forest Reserve, where it was locally common in logged areas and in farm bush near coffee and cacao plantations. It was also reported from Outamba-Kilimi National Park. No recent information is available on its status.

Liberia: This species was reported to be widespread and locally common in the early 1980s, mainly in secondary bush. The 1989/90 WWF/FDA survey made only one record of its distribution, in Grebo National Forest, and one record of the species in the bushmeat trade, but reports were obtained that it was common within farm bush in some areas. The small number of definite records was attributed to the difficulty of detecting this species, which is the world's smallest antelope species and is nocturnal and very secretive. It is regarded as the epitome of cunning by rural Liberians. There are widespread taboos on the hunting or consumption of the royal antelope among

*Royal Antelope (continued)*
the country's clans and ethnic groups. No recent information is available on its status.

Ivory Coast: Formerly occurred throughout the southern rainforest zone and more locally in forest patches to the north of this zone. It still occurs widely within its historical range. Although affected by habitat destruction it can persist in relatively small forest patches within agriculturally developed areas. It forms a significant component of bushmeat, which indicates substantial populations in some parts of its range. It is present in most of the national parks and forest reserves within its range, it is common in areas such as Songan-Tamin-Mabi-Yaya Forest Reserves in the southeast and Tai National Park and adjoining forest reserves in the southwest. The royal antelope can be observed at night throughout the forests of Tai National Park including primary and old secondary forests, but it is more abundant in the western and central areas of the park than in the heavily poached eastern area. In the areas surrounding Tai National Park its occurrence seems to be strongly correlated with remaining small isolated forest patches. It appears to be rare in most other protected areas where it occurs, e.g., Mont Sangbe, Marahoue, Mont Peko and Azagny National Parks, although it is often difficult to detect even in areas where it may be common because of its small size and shy, nocturnal habits.

Ghana: Formerly occurred widely in the moist lowland forest zone in the southwest, extending into the adjoining forest-savanna transitional zone. It adapts well to secondary vegetation and still occurs widely within its historical range. Assessment of the abundance of this small, secretive antelope is often difficult, but its populations appear to be stable in the major forest parks. It is common in at least some of these protected areas, e.g., Kakum-Assin Attandanso.

SUMMARY
This tiny antelope formerly occurred in clearings, forest edges and other areas with dense undergrowth in the lowland rainforest zone of West Africa, extending into forest-savanna mosaic to the north of the main forest block. Its ability to utilise secondary vegetation has enabled it to withstand the fragmentation and destruction of most of the primary rainforest of West Africa which has occurred during the last 30 years. The limited information which is available suggests that this species is not particularly threatened by the widespread hunting of wildlife for bushmeat in this region.

It is well represented in several protected areas, e.g., the Gola Forest Reserves (Sierra Leone), Tai National Park, Haut Dodo-Rapide Grah-Hana and Songan-Tamin-Mabi-Yaya Forest Reserves (Ivory Coast) and Kakum National Park-Assin Attandanso Game Production Reserve (Ghana), but only a few of the protected areas in which it occurs receive any protection against poaching, logging and agricultural encroachment.

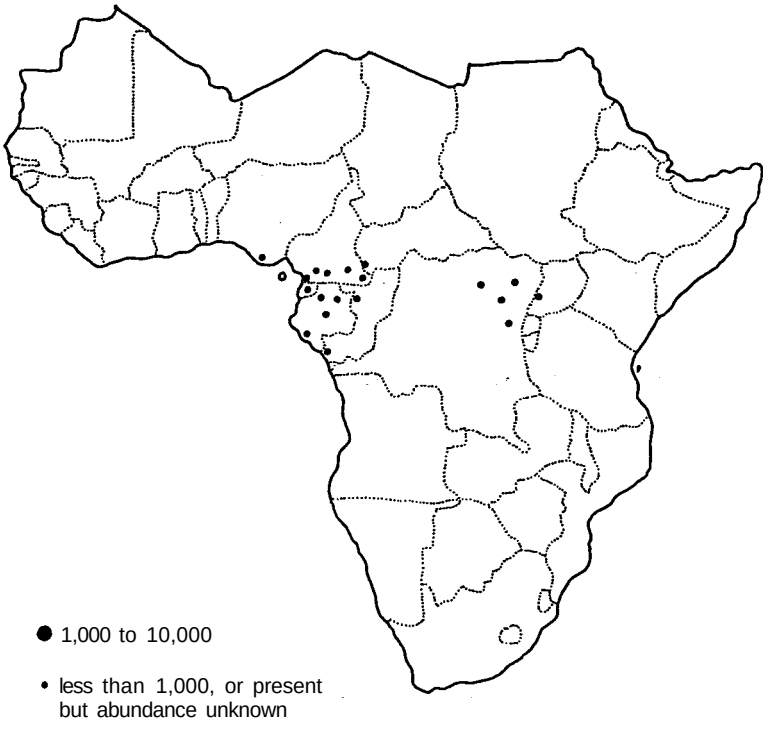
Estimated Total Numbers: No population estimates are available for the royal antelope. Assuming that it occurs at similar densities to Bates' pigmy antelope, viz., an average of 2.0 per sq km where it is common and 0.2 per sq km elsewhere, and that its area of occupancy is 62,360 sq km from the information in Appendix 4, gives an estimated total population of 62,000. This may be a significant underestimate, e.g., Boitani et al. (1998) estimated this species' area of occupancy to be 394,000 sq km. Population trend is difficult to assess but is apparently stable at least in some protected areas. Overall population trend is probably decreasing as human populations and associated pressures on natural habitats and wildlife continue to grow over most of its range.

The Future: The royal antelope's secretive nature and ability to utilise secondary vegetation should enable it to persist in substantial numbers despite the high-density, increasing human populations over large parts of its range. Its survival will probably become increasingly dependent on effective protection in protected areas such as Tai National Park in Ivory Coast and the forest parks in Ghana.

## Bates' Pigmy Antelope

*Neotragus batesi* De Winton 1903

RED LIST STATUS
Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | frend | Popn/Abund. | Trend |
| Nigeria | - | - | U | D | U | D |
| Cameroon | C | S | C/U | S/D | C/U | S/D |
| CAR | R | ? | C | ? | C/U | ? |
| Equ. Guinea | C | S | U/R | S/D | U | S/D |
| Gabon | U/R | S | C | S | C/U | S |
| Congo-Brazz. | C | S | C | S/D | C | S/D |
| Congo-Kinshasa | C | S | X | S/D | X | S/D |
| Uganda | R | S/D | - | - | R | S/D |

OVERVIEW OF CONSERVATION STATUS

Nigeria: Known only from the southeastern forest zone, between the Niger and Cross Rivers. It has disappeared from some parts of its former range but it is still quite common in the Yae Forest and a few other locations in Ogoniland between Port Harcourt and the Imo River, on the eastern side of the Niger Delta.

Cameroon: Occurs widely within its historical range in the equatorial forest zone in the south and southeast, south of the Sanaga River. This small antelope is easily overlooked in the field because of its nocturnal habits and preference for dense undergrowth. It is locally common in suitable habitat, including tree falls and dense undergrowth along rivers within mature forests, areas regenerating after logging, and plantations. It is common in the Dja Reserve and the proposed Lobeke-Mongokele Reserve, where its populations appear to be stable, but its numbers may be decreasing in areas such as the Campo Reserve, where there is heavy hunting pressure and inadequate protection against poaching.

Central African Republic: Confined to the southwestern moist lowland forest zone, where it is limited to the area west of the Sangha River. It is locally common within this restricted range. It

*Bates' Pigmy Antelope (continued)*
occurs rarely in the northwestern section of Dzanga-Sangha Dense Forest Reserve in the southern part of its range.

Equatorial Guinea: This species probably still occurs quite widely in Mbini but it generally appears to be uncommon. It occurs at low frequencies in commercial bushmeat, but it is not a prime target of hunters. It is well represented in Monte Alen National Park.

Gabon: Recorded from northern, northeastern, central and southwestern Gabon, and it probably occurs more widely. It is common in the extreme northeast, where it occurs in village gardens and plantations, but it is rare in the Lope Reserve and uncommon to rare in the Gamba protected area complex.

Congo-Brazzaville: Recorded from the northwestern forests, where it probably occurs quite widely to the west of the Sangha River. It is common in the Odzala National Park area. Local people report its occurrence in the southwest, within Conkouati Faunal Reserve. It was reported to occur in the Lefini Reserve in the southeast in 1994, but this has not been confirmed.

Congo-Kinshasa: Recorded from the northeastern equatorial forest, north and east of the Congo (Zaire)-Lualaba River. It remains widespread and locally common within this range. It appears to be associated with forest openings, where its small size enables it to utilise relatively small habitat patches created by tree-falls within the forest. It regularly enters plantations and gardens near settlements. Bates' pigmy antelope is common in lowland forest in and around Kahuzi-Biega and Maiko National Parks and Okapi Faunal Reserve. It occurs frequently in bushmeat, but it is probably maintaining its numbers reasonably well outside densely settled and intensively hunted areas.

Uganda: Restricted to a few protected low and medium altitude forests in the southwest, where it is very scarce. It occurs in Kibale Forest and Semliki Forest National Parks.

SUMMARY
Bates' pigmy antelope formerly occurred patchily in areas with dense, low undergrowth in two separate regions, southwestern Nigeria to Central African Republic/Congo-Brazzaville, and northeastern Congo-Kinshasa extending marginally into Uganda. It still occurs quite widely in both of these regions. It readily adapts to plantations and village gardens and is often common in cacao plantations, e.g., in southern Cameroon (Dragesco et al. 1977). Major protected-area populations include those of parks and reserves such as Dja and Lobeke-Mongokele (Cameroon), Monte Alen (Equatorial Guinea), Odzala (Congo-Brazzaville) and the Okapi reserve, Maiko and Kahuzi-Biega (Congo-Kinshasa), all of which are stable.

Estimated Total Numbers: This species can reach very high densities within localised areas of favourable habitat, e.g., >35.0 per sq km in an area of coffee and cocoa plantations bordered by secondary forest in northeastern Gabon (Feer 1979). Typical densities over more extensive areas are of the order 1.5-2.2 per sq km (Hart et al. 1996; Fa & Purvis 1997).

Assuming average population densities of 2.0 per sq km in areas where it is known to be common and 0.2 per sq km elsewhere, and a total area of occupancy of 250,000 sq km from the information in Appendix 4, gives a total population estimate of 219,000. Population trend is stable over the extensive parts of its range where human population densities are low, but shows a tendency to decrease in areas where hunting pressures are very high.

The Future: The conservation status of Bates' pigmy antelope should not change as long as extensive areas of the Central African equatorial forests remain sparsely settled, but the prospect of rapid human colonisation of these areas during the next few decades could result in greatly increased pressures of hunting and forest destruction.

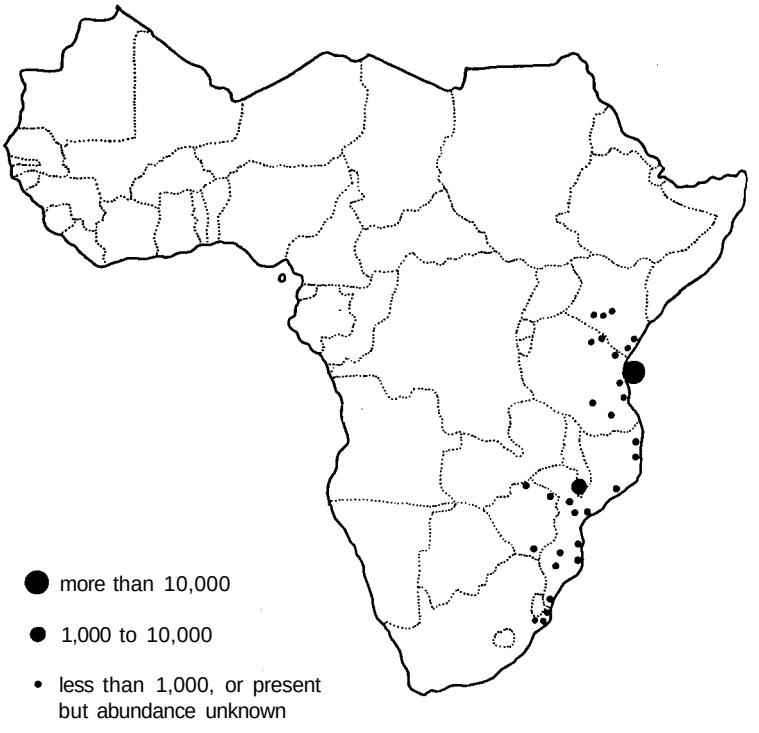
This species' dependence on secondary growth and ability to utilise plantations should enable it to

withstand degradation of primary forests better than species which are dependent on undisturbed forests. Its long-term survival may nevertheless become increasingly dependent on protected areas.

At present, several of the protected areas within which it occurs receive moderate to high levels of protection and management, viz., Dja (Cameroon), Dzanga-Sangha (Central African Republic), Monte Alen (Equatorial Guinea), Lope (Gabon), Odzala (Congo-Brazzaville) and Kibale and Semliki (Uganda), but it is rare in some of these areas.

**Suni**
*Neotragus moschatus* (Von Dueben 1846)

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Kenya | C/U | S/D | X | S/D | C/U | S/D |
| Tanzania | C/U | S/D | C/U | S/D | C/U | S/D |
| Malawi | >1,790 | D | - | - | >1,790 | D |
| Mozambique | U/R | S/D | X | S/D | X | S/D |
| Zimbabwe | U/R | ? | X | ? | U/R | ? |
| South Africa | >870 | S/D | <250 | D | 1,120 | S/D |

OVERVIEW OF CONSERVATION STATUS

Kenya: Occurs locally in south-central and southeastern Kenya. Overhunting has probably reduced its numbers over much of its range, as in Arabuko-Sokoke Forest, but it is common in some protected areas, e.g., the Aberdare and Mount Kenya forests.

Tanzania; Probably still occurs widely within its historical range in the eastern half of the country, occurring in coastal forests and thickets, montane forests and other areas with thick undergrowth. It remains common outside protected areas, e.g., on Zanzibar Island where its population (estimated numbers 20,000) has been stable over the last 15 years. It has probably benefitted from the expansion of secondary thicket habitat which has resulted from human activity on Zanzibar, and it readily colonises degraded forests. It also withstands moderately high hunting pressure, although localised overhunting causes low densities in areas such as the immediate vicinity of villages. It is less abundant in western Zanzibar than in the east, which is less densely settled. Its status is probably similar in the coastal regions of the mainland, where it occurs quite widely and shows a similar ability to tolerate human pressures. The suni is also widespread in areas such as the Udzungwa Mountains where it persists in all remaining forest patches, even in the tiny 54 hectare Kawemba Forest Reserve which is surrounded by cultivation and villages. Its status in the Udzungwas ranges from common and stable in areas where hunting pressure is low, e.g., in parts of Udzungwa Mountains National Park, to rare and decreasing in many of the forests of the Udzungwa

plateau. It is common in the forests of the northern and western slopes of Kilimanjaro, but is uncommon and seldom seen in Selous Game Reserve where it is localised to suitable areas such as hilltop forests. It also occurs in Arusha and Lake Manyara National Parks and in isolated hilltop forests within and around Mkomazi Game Reserve.

Malawi: Formerly occurred locally in areas of dry deciduous thicket in the Shire Valley and in the Shire highlands around Blantyre. It is now confined to protected areas in the Lower Shire Valley. The main population occurs in the eastern section of Lengwe National Park, where it is potentially threatened by degradation of its thicket habitat by an overabundance of nyala. It has been reported to occur in small numbers in Majete and Mwabvi Game Reserves. The latter area has recently been overrun by settlement, and encroachment of settlement is also a problem in Majete and Lengwe.

Mozambique: Formerly occurred widely. It probably still occupies a substantial part of its historical range, including coastal thickets from Cabo Delgado Province in the north to Maputaland in the south. It also occurs in inland areas such as Gorongosa, Zinave and Banhine National Parks and parts of Manica Province.

Zimbabwe: Confined to the southeastern lowveld and the northeastern border region, possibly extending westwards to the Middle Zambezi Valley. It is generally scarce within this range. It was formerly common within localised areas of dry thicket in Gonarezhou National Park, but this population was probably reduced by the 1992-93 drought.

South Africa: Confined to coastal woodland, bushland and thicket in northeastern KwaZulu-Natal Province, from the Lake St. Lucia area northwards, with a marginal presence in southeastern Mpumalanga Province and the northeast of Kruger National Park. Loss of habitat to the expansion of agriculture and settlement and hunting by poachers and uncontrolled dogs have eliminated the suni from much of its former range. It is now a rare species in South Africa. It is also threatened by reduction of shrub cover caused by increasing numbers of nyala in some protected areas and private game farms. In KwaZulu-Natal, it occurs in four protected areas, with the largest populations in Tembe Elephant Park and Mkuzi Game Reserve, and on five private game farms. There is also a very small population in Pongola Nature Reserve in southeastern Mpumalanga. The status of naturally occurring suni in Kruger National Park is uncertain. In 1995, a total of 39 captive-bred suni were released in an area of dense bush in northeastern Kruger which is believed to comprise suitable habitat, but by early 1998 there was no evidence that this reintroduction had been successful.

SUMMARY
The suni formerly occurred widely in forests and thickets in coastal regions and the hinterland from Kenya to South Africa. Substantial areas of its range have been encroached by settlement, but it persists widely and readily adapts to secondary, degraded vegetation, especially in Tanzania and Mozambique. Important protected populations occur in areas such as Aberdare and Mount Kenya (Kenya), Kilimanjaro and Udzungwa (Tanzania), Lengwe (Malawi), Maputo (Mozambique) and Tembe, Mkuzi and Ndumu (South Africa).

Estimated Total Numbers: This species occurs at relatively high population densities in areas where it is common, e.g., ground surveys have revealed densities of 13.0-17.0 per sq km in areas such as Zanzibar Island (Williams et al. 1996) and Lengwe National Park (Mkanda 1998). It occurs at lower densities in South Africa, e.g., 0.9 per sq km in Mkuzi Game Reserve (Rowe-Rowe 1994). Assuming average densities of 1 0.0 per sq km in areas where it is known to be common and 1.0 per sq km elsewhere, the information in Appendix 4 gives a total population estimate of 365,000. Population trend is probably stable over large parts of its range, but decreasing in settled areas where hunting pressures are very high and in some protected areas with an overpopulation of nyala.

The Future: The suni's ability to adapt to secondary vegetation and its resilience to hunting should enable it to persist in satisfactory numbers within substantial parts of its current range for the foreseeable future.


**Cape Grysbok**
*Raphicerus melanotis* (Thunberg 1811)

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| South Africa | C | S | C/U | S | C/U | S/D | C/U | S/D |

OVERVIEW OF CONSERVATION STATUS

South Africa: Endemic to the southern and southwestern Cape. It has disappeared from some areas but remains widespread and locally common within its historical range in Western Cape and Eastern Cape Provinces. It occurs in small numbers in at least three national parks, viz., Addo-Zuurberg, Bontebok and the forest section of Tsitsikamma. The Cape grysbok is also known to occur in 27 provincial nature reserves. In addition, it occurs widely in local authority and forestry reserves and on private land, where it enters developed areas such as vineyards.

SUMMARY
A South African endemic, the Cape grysbok still occurs widely and is locally common in thickets and shrublands within its restricted range. It is well represented in protected areas and occurs quite widely in agricultural areas.

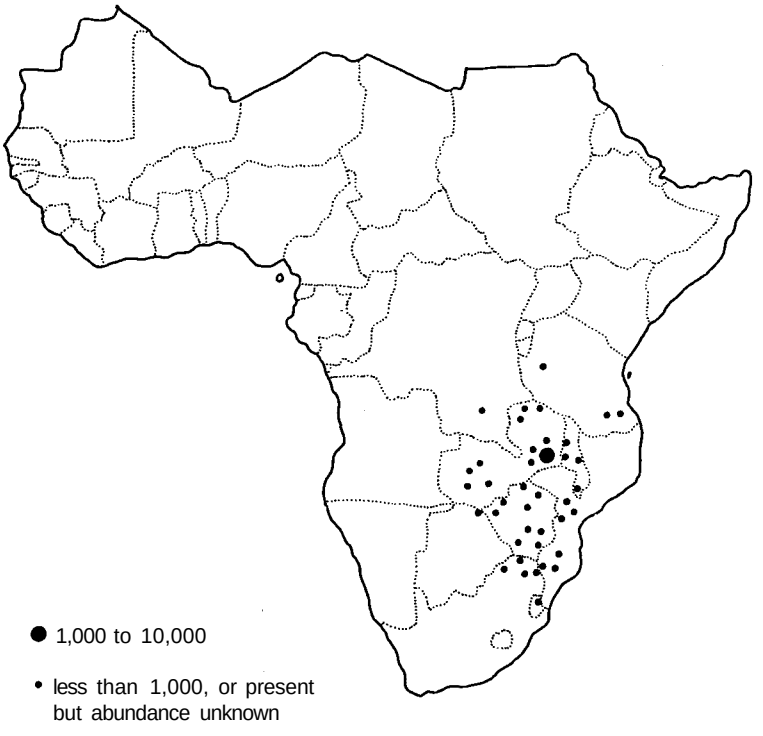
Estimated Total Numbers: Estimates of the Cape grysbok's population density obtained by ground surveys in areas such as Addo, Bontebok and Tsitsikamma National Parks range from 0.2 to 1.0 per sq km (Anderson et al. 1996). Assuming an average density of 0.5 per sq km and an area of occupancy of 61,000 sq km from the information in Appendix 4 gives an estimated total population of 30,500. Population trend is generally stable in protected areas and on private land but decreasing in some other areas where human population densities and subsistence hunting pressures are high.

The Future: The status of this species should not change as long as it is well represented in protected areas and occurs in good numbers on private farms where it can adapt to the predominant forms of land use.

## Sharpe's Grysbok

*Raphicerus sharpei* Thomas 1897

RED LIST STATUS
Lower Risk (conservation dependent)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Congo-Kinshasa | X | ? | - | - | ? | ? | X | ? |
| Tanzania | U | S | - | - | X | ? | U | ? |
| Zambia | c | S/D | ? | ? | C/U | S/D | C/U | S/D |
| Malawi | c/u | S | - | - | X | S/D | C/U | S/D |
| Mozambique | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Botswana | R | ? | - | - | - | - | R | ? |
| Zimbabwe | U | S/D | >30,000 | S | U/R | D | >30,000 | S/D |
| South Africa | R | S | U | S | U/R | D | U/R | S/D |
| Swaziland | U/R | S | - | - | - | - | U/R | S |

OVERVIEW OF CONSERVATION STATUS

Congo-Kinshasa: Recorded from scattered localities in the southeast. Little is known about the past or present occurrence of this small, secretive, nocturnal species in Congo-Kinshasa. It occurs in unknown numbers in Upemba National Park.

Tanzania: Little is known about this species in Tanzania. It has been recorded from scattered localities in the west and south, mainly in areas with low thicket or secondary growth. It has been observed recently in areas such as Selous Game Reserve, where it occurs locally but is seldom seen. It is considered to be uncommon, but it is nocturnal and secretive and may be more abundant than generally supposed.

Zambia: Formerly occurred more or less throughout, apart from the western plateau. It still occurs widely within its historical range, both inside and outside national parks and game management areas. It is common in many protected areas, e.g., Kafue, North Luangwa, South Luangwa and Nsumbu National Parks and Lupande Game Management Area. It withstands hunting pressure better than most larger, more conspicuous antelope species. Sharpe's grysbok is relatively common in

*Sharpe's Grysbok (continued)*
heavily poached areas such as Lavushi Manda, Mweru Wantipa and Lusenga Plain National Parks.

Malawi: Formerly occurred throughout, except in montane grassland. It still occurs widely in national parks, game reserves and forest reserves, and also in other wooded areas where settlement is sparse. It has been eliminated from the rest of its former range. It is locally common, e.g., in Lengwe National Park.

Mozambique: Formerly occurred widely in central and southern regions, and in scattered localities in the north. It was locally common in areas such as Gorongosa and Banhine National Parks in the early 1980s. It persists in low to moderate numbers in protected areas such as Gorongosa, Banhine and Zinave, and it probably survives over a large part of its historical range. It is common in western Gaza Province in the hunting concession adjoining South Africa's Kruger National Park. It occurs in moderate numbers within suitable habitat in the hunting concessions of Manica Province.

Botswana: Known from only one small area, within Chobe National Park in the extreme northeast of the country. No recent information on its status.

Zimbabwe: Formerly widespread except in the drier western regions. It still occurs quite widely outside densely settled areas, e.g., on commercial farming land and in protected areas such as the Sebungwe and Middle Zambezi Valley regions, Zambezi, Matobo and Gonarezhou National Parks and the northern section of Hwange National Park.

South Africa: Confined to the bushveld and lowveld of Northern and Mpumalanga Provinces. It still occurs quite widely but patchily within suitable habitat, on private land, in the northern and central districts of Kruger National Park and in at least four provincial nature reserves.

Swaziland: Confined to the northern Lebombo Mountains in the northeast. It occurs in low numbers in Mlawula Nature Reserve.

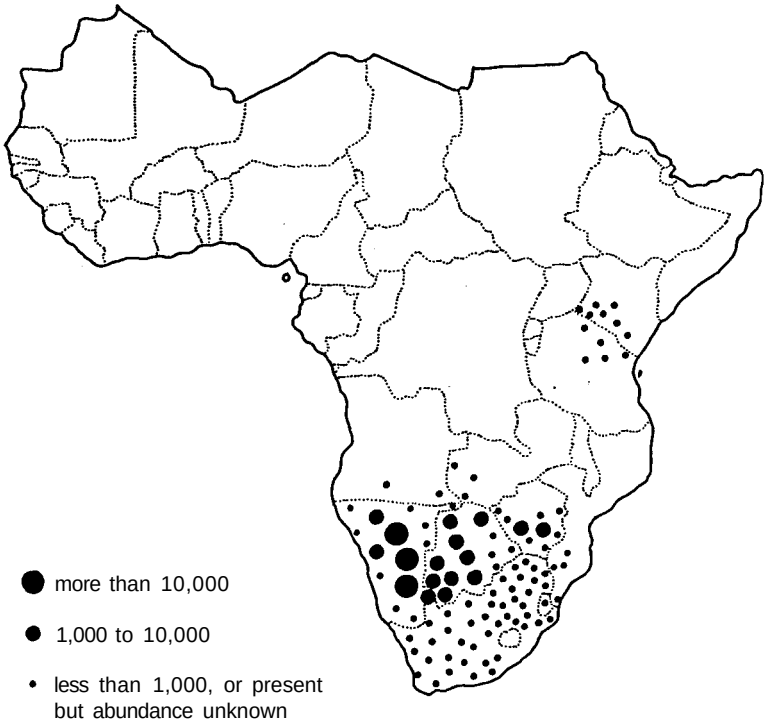
SUMMARY
Sharpe's grysbok formerly occurred locally within savanna woodlands from western Tanzania to Southern Africa. It has been eliminated from some parts of its former range by the spread of settlement and associated habitat destruction and hunting for meat. It nevertheless persists quite widely, and its secretive habits enable it to withstand considerable hunting pressure. Its major strongholds include areas such as Kafue National Park, other areas of the plateau miombo woodlands and the Luangwa Valley (Zambia), Lengwe National Park and other protected areas (Malawi), Gaza Province (Mozambique) and Sebungwe, Middle Zambezi Valley and private farmland (Zimbabwe).

Estimated Total Numbers: Ground surveys in Lupande Game Management Area (Zambia) and Lengwe National Park (Malawi), where this species is common, produced population density estimates of 0.3-0.7 per sq km (Jachmann & Kalyocha 1994; Mkanda 1998). A density of 0.02 per sq km was estimated for Nkhotakota Game Reserve (Malawi) (Mkanda 1998). Assuming average population densities of 0.5 per sq km where it is known to be common and 0.05 per sq km elsewhere, the information in Appendix 4 gives a total population estimate of 95,000, of which about one-third occurs in protected areas, one-third on private land and one-third in other areas. Population trend is generally stable in protected areas and on private farms but gradually decreasing elsewhere as hunting pressures increase with the growth of human populations.

The Future: The conservation status of Sharpe's grysbok is unlikely to change in the long term if it continues to be well represented in protected areas and on private land. It will probably continue to persist in other areas where settlement is sparse.

**Steenbok**
*Raphicerus campestris* (Thunberg 1811)

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Uganda | - | - | - | - | - | - | Ex? | - |
| Kenya | C/U | S | - | - | X | S/D | C/U | S/D |
| Tanzania | C/U | S | - | - | X | S/D | C/U | S/D |
| Angola | - | - | - | - | X | D | X | D |
| Zambia | U | S/D | - | - | X | S/D | U | S/D |
| Mozambique | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Namibia | C/U | S | 138,940 | I | U/R | S/D | >138,940 | S/I |
| Botswana | 18,700 | I | 350 | S | 53,350 | I | 72,400 | I |
| Zimbabwe | C | S | >50,000 | S | U/R | S/D | >50,000 | S/D |
| South Africa | C | S | C/U | S/D | C/U | S/D | C/U | S/D |
| Swaziland | C/U | S | X | S | - | - | C/U | S |

OVERVIEW OF CONSERVATION STATUS

Uganda: Formerly occurred in a small area of eastern Uganda which is now intensively settled. Probably extinct.

Kenya: Remains widespread within its historical range in southern Kenya. It is locally common outside protected areas in some localities, e.g., in parts of Laikipia district, and it has probably benefitted from the partial clearance of bush for cultivation. It occurs in most protected areas within its range and is reasonably common in areas such as Tsavo National Park and Masai Mara National Reserve.

Tanzania: Occurs widely within its historical range in northern and central Tanzania. It remains common within protected areas such as Serengeti and Tarangire National Parks and the crater highlands of Ngorongoro Conservation Area, and outside protected areas in regions such as the cultivated zone and bushland at lower altitudes on the northern and western slopes of Kilimanjaro.

*Steenbok (continued)*

Angola: Formerly widespread and locally common in southern Angola. It still occurs locally within its historical range.

Zambia: Confined to parts of the western and southwestern plateaux, where it probably still occurs quite widely. It survives in low to moderate numbers in the southern section of Kafue National Park and in Liuwa Plain and Sioma Ngwezi National Parks.

Mozambique: Formerly occurred widely in southern Mozambique. It probably survives quite widely within its former range, e.g., it still occurs in reasonable numbers in Zinave and Banhine National Parks and Maputo Game Reserve despite the breakdown in protection of these areas during the 1980s and early 1990s. It is reasonably common in western Gaza Province, in the hunting concession adjoining South Africa's Kruger National Park.

Namibia: Formerly occurred almost throughout, but absent from the most arid coastal deserts. It remains very widespread. It is common in Etosha National Park and occurs in low to moderate numbers in most other protected areas. It occurs widely in communal lands, generally at low densities, and is common in all of the country's farming districts.

Botswana: Formerly occurred throughout. It remains very widespread and locally common, within and outside protected areas. Its estimated numbers in the Kalahari increased significantly over the period 1979-1994.

Zimbabwe: Formerly widespread in western, central and southern Zimbabwe, but naturally absent from most of the Zambezi Valley and other areas in the north. It remains widespread and locally common within its historical range, persisting in good numbers in commercial farming areas and in protected areas such as Hwange and Gonarezhou National Parks.

South Africa: Formerly occurred almost throughout, although it was largely confined to the northern and northwestern parts of KwaZulu-Natal Province. It is no longer present in densely settled areas, but it remains very widespread within its historical range on private land, in conservation areas and elsewhere. Its numbers are generally stable. Populations may be decreasing in some areas because of the loss of natural habitat and increased predation by uncontrolled dogs which often accompany increases in human population density. The steenbok occurs in most of South Africa's national parks, with large populations in Kruger and Kalahari Gemsbok National Parks. It also occurs very widely in provincial reserves, within which it is often common.

Swaziland: Formerly occurred throughout much of the country, but human population pressures have reduced it to scattered remnant populations outside protected areas. It is well represented in Hlane Game Reserve and Mlilwane Wildlife Sanctuary and occurs in low numbers in Mlawula Nature Reserve.

SUMMARY

The steenbok occurs widely in drier savannas, grasslands and scrublands in two separate regions, southern Kenya/northern Tanzania and from southern Angola and western Zambia to South Africa. It has been eliminated locally from densely settled areas but remains widespread and common over large parts of its range. This includes unprotected rangeland, private farms and numerous protected areas.

The largest numbers occur in areas such as Serengeti-Mara and Tarangire (East Africa), Etosha National Park and private farmland (Namibia), northern, central and southwestern rangelands (Botswana), Hwange and private farmland (Zimbabwe) and Kruger and private farmland (South Africa).

Estimated Total Numbers: Population densities estimated from aerial surveys are of the order 0.1

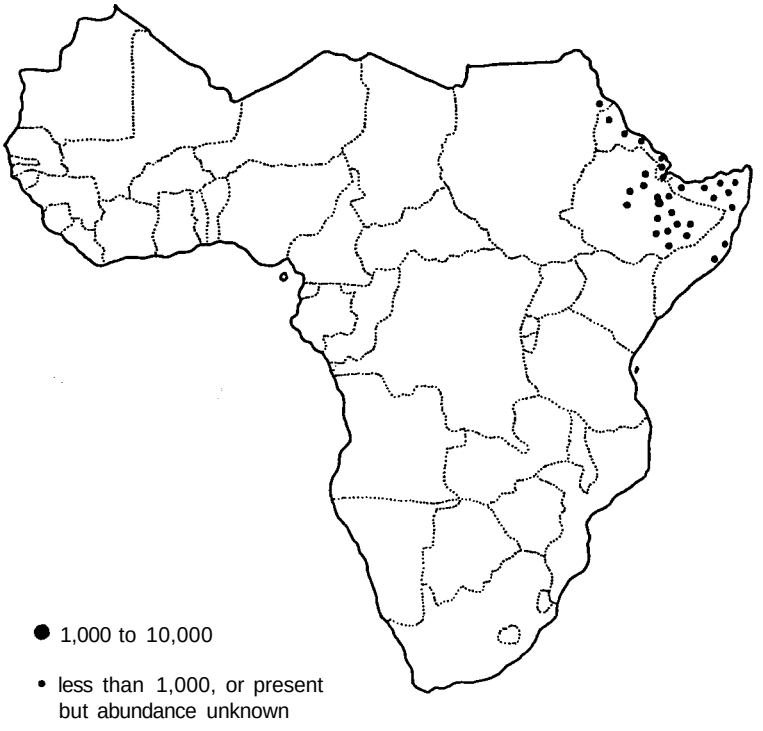
per sq km, e.g., in Botswana (DWNP 1995) and Kalahari Gemsbok National Park (South Africa) (Anderson et al. 1996), but steenbok numbers may be substantially underestimated by aerial counts. Ground surveys in areas where the species is common have produced density estimates in the range 0.3-1.0 per sq km, e.g., Serengeti National Park (Tanzania) (Hendrichs 1970), Lake Nakuru National Park (Kenya) (Wirtz 1978) and Mountain Zebra and Bontebok National Parks, Hluhluwe-Umfolozi Park and Mkuzi Game Reserve (South Africa) (Anderson et al. 1996).

Assuming an average correction factor of 5.0 for undercounting bias in aerial surveys, and that areas for which population estimates are unavailable support average population densities of 0.5 per sq km where the species is known to be common and 0.05 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 663,000. About one-quarter of this estimated population occurs in protected areas and 30% on private land. Population trend is generally stable or increasing in protected areas and on private land, but varies from decreasing to increasing elsewhere.

The Future: If current trends continue, the steenbok's status should remain secure for the foreseeable future. Its numbers are declining in some unprotected areas where settlement densities and hunting pressures are high, but it is very well represented in protected areas and private farmland, and in sparsely populated, unprotected rangelands in countries such as Botswana.

**Salt's Dikdik**
*Madoqua saltiana* (Blainville 1816)

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Sudan | - | - | X | ? | X | ? |
| Eritrea | - | - | C/U | ? | C/U | ? |
| Ethiopia | C | S | C | S | C | S |
| Djibouti | - | - | C | S | C | S |
| Somalia | - | - | C | S/D | C | S/D |
| Kenya | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Sudan: Recorded from the Eritrea border area in the northeast. No recent information on its status.

Eritrea: Formerly occurred widely, except in highland areas. It probably still occupies a substantial part of its historical range. It is quite common locally, e.g., on the southern coastal plain.

Ethiopia: Remains widespread and common within its historical range in the northern and eastern lowlands, e.g., it is common in bushland in the Awash Valley, within and outside protected areas such as Awash and Yangudi Rassa National Parks. It is also common throughout the Ogaden region, where it is the most numerous antelope species despite being hunted regularly by local people. It is frequently seen in these'regions, and its dung heaps and footprints can be found almost everywhere in the bush.

Djibouti: Formerly occurred very widely in arid thornbush. It still occupies most of its historical range and is locally common. It may have benefitted from bush encroachment in some areas following overgrazing by livestock.

Somalia: Formerly occurred throughout, except for southern Somalia to the south of the Juba River. It probably remains widespread and common throughout most of its former range, e.g., it is

still very widespread and numerous in northern Somalia and it is the numerically dominant dikdik species in the bushland of the Haud Plateau.

Kenya: Reputed to occur in the extreme northeast but there is no recent confirmation of its occurrence.

SUMMARY
Salt's dikdik occurs widely in the arid bushlands of Northeast Africa. It remains widespread and common throughout much of its range despite the offtake by subsistence hunting. There are relatively few protected areas within its range, but it is one of the few African antelope species which does not appear to depend on protection from overhunting and habitat destruction for its long-term survival.

Estimated Total Numbers: Recent estimates of this species' population density from road counts are 11.6 per sq km in bushland on the Haud Plateau, Somalia (P. Moehlman, in litt. November 1997; it was considered that this may have been an overestimate of the true density because of road bias) and 1.8 per sq km in the Ogaden, Ethiopia (Wilhelmi 1997; Schloeder et al. 1997; this is probably an underestimate).

Assuming an average density of 2.0 per sq km and an area of occupancy of 242,800 sq km from the information in Appendix 4 gives a total population estimate of 485,600. This suggests that the order of magnitude of this dikdik's total numbers is in the hundreds of thousands. It could be higher, e.g., Boitani et al. (1998) estimated that this species' area of occupancy is 943,000 sq km. Population trend is generally stable.

The Future: If current trends continue, the status of Salt's dikdik will remain secure.


## Silver Dikdik

*Madoqua piacentinii* Drake-Brockman 1911

RED LIST STATUS
Vulnerable

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Somalia | - | - | U | D | U | D |

OVERVIEW OF CONSERVATION STATUS

Somalia: Confined to the central coastal plain, where its range does not appear to extend for more than 10 km inland from the coast. Its past and present range and abundance are poorly known, but its skins are highly valued for handcraft products.

Its habitat is threatened by increased human presence and activity, e.g., during the worst period of the civil war many people fled along the coastal roads which were also used by large numbers of heavily armed fighters and their vehicles. Plans to build a new airport and port between Mogadishu and Warshek would impact directly on the silver dikdik's habitat, and would also result in further immigration of people into the area in search of shelter and employment.

SUMMARY
The silver dikdik is endemic to a unique biotic community of very low, dense thickets growing along the central Somali coastal littoral on fertile, sandy soils under a powerful offshore wind which has a cooling and moisturising effect (Kingdon 1997). Wildlife and natural habitats are completely unprotected in this area.

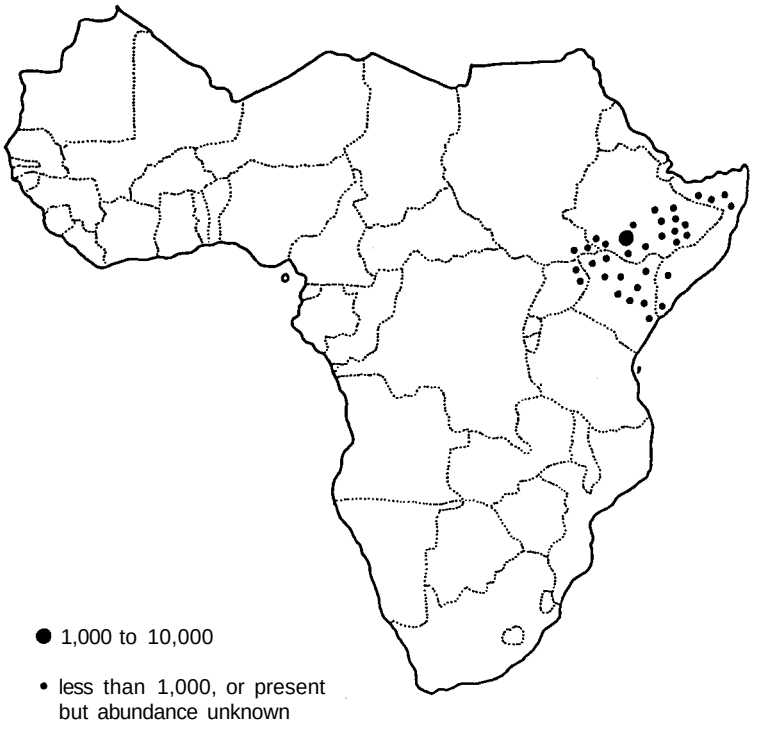
Estimated Total Numbers; No population estimates are available for the silver dikdik. Assuming a similar population density to Salt's dikdik (2.0 per sq km) and an area of occupancy of 15,000 sq km (Appendix 4) gives an estimated total population of 30,000. This may be an overestimate, since hunting pressures and other disturbances are relatively high within the silver dikdik's restricted range.

Captive Population: No silver dikdiks are known to be held in captivity.

The Future: If current trends continue, the silver dikdik's population will continue to decrease until the species is eventually extinct. This trend can only be reversed by the establishment of secure protected areas within its range and/or the establishment of a secure, self-sustaining captive population.

**Guenther's Dikdik**
*Madoqua guentheri* Thomas 1894

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Sudan | - | - | X | ? | X | ? |
| Ethiopia | >9,700 | S/ I | C | S | C | S |
| Somalia | - | - | C | S/D | C | S/D |
| Uganda | X | ? | C | S/D | C | S/D |
| Kenya | C | S | C | S | C | S |

OVERVIEW OF CONSERVATION STATUS

Sudan: Occurs in bushland in the southeast, where it was common in the 1980s. No recent information on its status.

Ethiopia: It remains widespread and common within its historical range in the eastern and southern lowlands. Its range overlaps that of Salt's dikdik in the Ogaden region, where both species occur in healthy populations. Guenther's dikdik is generally less numerous than Salt's in this region, but Guenther's is dominant in some areas of bushland on sandy soils. Guenther's dikdik is common to abundant in the southern lowlands, e.g., in and around Omo, Mago and Nechisar National Parks and Borana Controlled Hunting Area.

Somalia: Formerly occurred widely, but absent from the central coastal strip and the extreme northwest and northeast. It probably still occurs widely within its former range but there is no recent information on its status in central Somalia. It is common in the bushland of the Haud Plateau in the north but is less abundant in this region than Salt's dikdik, occurring in a ratio of about 1 Guenther's to 10 Salt's.

Uganda: It probably still occurs widely within its historical range in the northeast, from Kidepo Valley National Park to southern Karamoja. Although it is hunted widely, it has benefited from the expansion of evergreen scrub which results from overgrazing and from the fallow and secondary

vegetation that accompanies the spread of human settlement.

Kenya: Widespread and common in suitable habitat throughout its historical range in northern and eastern Kenya. The southern limit of its distribution in eastern Kenya is unclear, but it occurs at least as far south as the north bank of the Tana River. It is common in protected areas within its range, e.g., Sibiloi and Meru National Parks, Marsabit National Park and National Reserve, and Samburu-Buffalo Springs-Shaba National Reserves.

SUMMARY
The range of Guenther's dikdik is centred on the driest, hottest arid and semi-arid scrublands in Northeast Africa (Kingdon 1997). It remains widespread and common throughout much of its historical range. Protected areas such as Omo, Mago, Yabelo and Nechisar (Ethiopia), Kidepo Valley (Uganda) and Sibiloi, Marsabit, Samburu and Meru (Kenya), in which it is common, form only a small part of its area of occupancy. The bulk of its population occurs in unprotected rangelands.

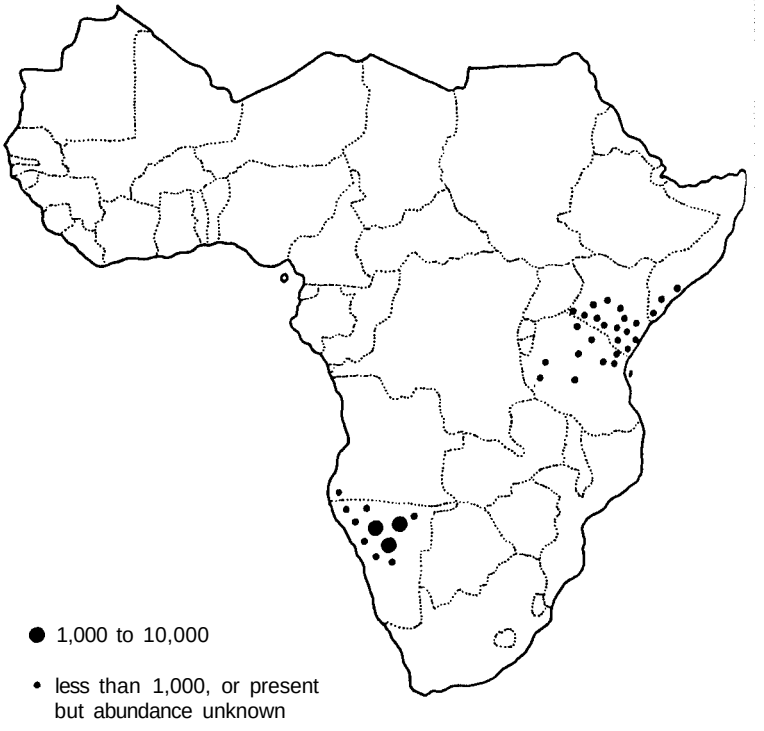
Estimated Total Numbers; Recent estimates of this species' population density obtained from road counts were 0.7-1.1 per sq km in the Haud Plateau, Somalia (P. Moehlman, in litt. November 1997) and the Ogaden region, Ethiopia (Wilhelmi 1997; Schloeder et al. 1997). Local densities can be much higher within favourable habitat, e.g., Ono et al. (1988) observed a density of 23.8 per sq km within a 75 hectare study area in Omo National Park.

Guenther's dikdik is common throughout most of its range. Assuming an average population density of 1.0 per sq km gives an estimated total population of 511,000, equivalent to the area of occupancy (see Appendix 4). This is less than half the area of occupancy estimated by Boitani et al. (1998). Population trend is generally stable.

The Future: If current trends continue, the status of Guenther's dikdik will remain secure.

**Kirk's Dikdik**
*Madoqua kirkii* (Gunther 1 880)

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Somalia | C | S | - | - | C | ? | C | ? |
| Kenya | C | S | - | - | C | S | C | S |
| Tanzania | C | S | - | - | X | S/D | C | S/D |
| Angola | | | | | X | S/D | X | S/D |
| Namibia | C | S | 15,780 | S/I | X | S/D | C | S |

OVERVIEW OF CONSERVATION STATUS

Somalia: Formerly occurred widely in the southern coastal region, at least as far north as the Shebelle River. It probably remains common throughout most of its historical range, e.g., in 1996 it was observed to be commonly on sale as bushmeat in Mogadishu's Bakaaro market.

Kenya: It is widespread and locally abundant within most of its historical range in central and southern Kenya, including protected areas such as the Masai Mara reserve, Tsavo, Samburu, Meru, Amboseli, Tana River and Lake Nakuru, and unprotected rangelands.

Tanzania: It occurs widely within its historical range in semi-arid thicket and bush country in northern, central and western Tanzania, extending southwestwards to Katavi and Ruaha National Parks. It is widely hunted but is locally common and persists in some settled areas. It is common/abundant in protected areas such as Serengeti, Tarangire and Mkomazi.

Angola: Confined to the southwestern arid zone, where it was formerly abundant in Iona National Park. Its numbers are now probably reduced from former levels.

Namibia: Formerly occurred on thicket-covered broken ground in northwestern and central regions. It remains widespread and locally common within its historical range. It is common in Etosha National Park and occurs in smaller numbers in Waterberg Plateau Park. It is widespread at low

densities in communal lands and is common on private land in northern commercial farming districts.

SUMMARY
Kirk's dikdik occurs in two separate regions, from southern Somalia to central Tanzania and in northern Namibia and adjoining Angola. It occurs in a wide variety of habitats, from dry scrubland to thickets within moister savanna woodlands and grasslands. It has been affected adversely by the expansion of agricultural settlement and excessive hunting in some areas, but it remains widespread and locally common throughout much of its historical distribution. Its range includes protected areas such as Bush Bush (Somalia), Samburu, Meru, Tsavo, Masai Mara, Amboseli and Lake Nakuru (Kenya), Serengeti, Arusha, Tarangire and Mkomazi (Tanzania) and Etosha (Namibia), within which it is common or abundant. It is also common on private farmland in Namibia.

Estimated Total Numbers: Population density estimates of Kirk's dikdik were reviewed by Kingswood & Kumamoto (1997). Ground counts have produced estimates (number per sq km) of 0.3-3.2 in Tarangire (Lamprey 1964), 5.0-33.0 in Serengeti (Hendrichs 1975; Estes 1991), 15.0-25.0 in the Kedong Valley, Rift Valley and Tsavo West National Park (Hofmann 1973), 55.0-63.0 in Arusha National Park (Amubode & Boshe 1990) and 109.0 in Tsavo East National Park (Komers 1996). The higher density estimates generally refer to patches of particularly favourable habitat.

Assuming average population densities of 5.0 per sq km where the species is known to be common/abundant and 0.5 per sq km elsewhere, the information in Appendix 4 gives a total population estimate of 971,000. This suggests that its total numbers may be in the hundreds of thousands or millions. Population trend is stable over large parts of the species' area of occupancy, but is decreasing in some densely settled areas.

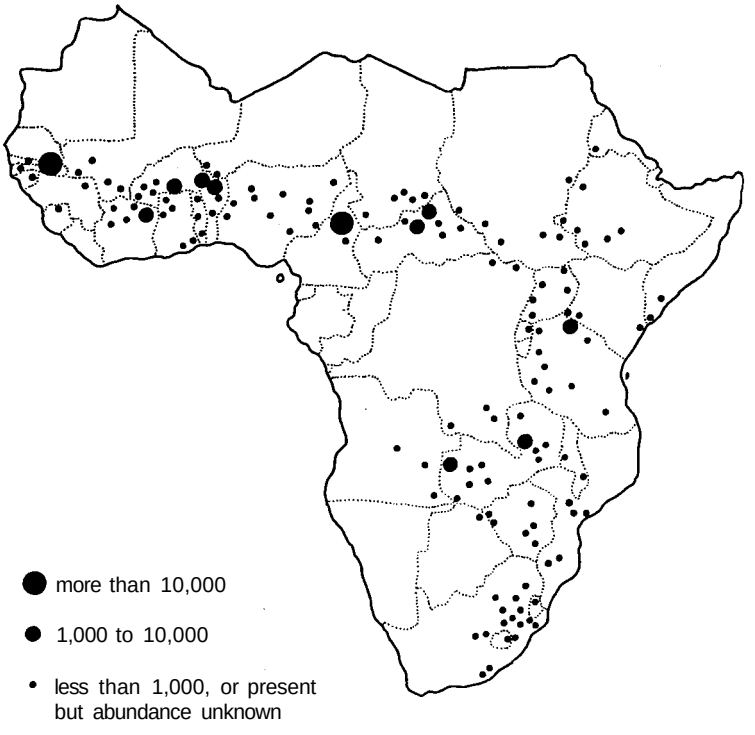
The Future: If current trends continue, the conservation status of Kirk's dikdik is unlikely to deteriorate. It should persist in the long term in large numbers in extensive areas of Kenya, Tanzania and Namibia.

## Oribi

*Ourebia ourebi* (Zimmermann 1783)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
Numerous subspecies of the oribi have been described but most of these reflect individual variation and have no validity. Haggard's oribi (0. *o. haggardi*) of eastern coastal Kenya and adjacent Somalia is a geographically isolated subspecies which is well differentiated in size and colour from other oribi. Its status is Vulnerable. Another distinctive subspecies from East Africa, the Kenya oribi (0. *o. keniae)* from the lower slopes of Mount Kenya, is now apparently extinct.




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mali | <1,510 | D | - | - | >2,500 | D | 4,010 | D |
| Niger | 500 | S/D | - | - | U | D | >500 | D |
| Senegal | 12,000 | I | - | - | X | ? | >12,000 | ? |
| Gambia | X | ? | - | - | X | D | X | D |
| Guinea-Bissau | - | - | - | - | U/R | S | U/R | S |
| Guinea | - | - | - | - | U | S/D | U | S/D |
| Sierra Leone | R | D | - | - | - | - | R | D |
| Ivory Coast | >5,600 | D | - | - | X | D | C/U | D |
| Burkina Faso | >3,160 | S | - | - | X | D | C/U | S/D |
| Ghana | C | S | - | - | C/U | S/D | C/U | S/D |
| Togo | U | D | - | - | C/U | S/D | C/U | S/D |
| Benin | >2,000 | S | - | - | X | S/D | C/U | S/D |
| Nigeria | U | S/D | - | - | U/R | D | U | D |
| Chad | >400 | D | - | - | C | S/D | c | S/D |
| Cameroon | 11,620 | D | - | - | X | D | >11,620 | D |
| CAR | >3,800 | S/D | - | - | C/U | S/D | C/U | S/D |
| Congo-Kinshasa | C | S/D | - | - | X | S/D | X | S/D |
| Sudan | >160 | S/D | - | - | X | S/D | X | S/D |
| Eritrea | - | - | - | - | U | S/D | U | S/D |
| Ethiopia | C/U | S/D | - | - | X | S/D | X | S/D |
| Somalia | X | ? | - | - | U/R | D | U/R | D |
| Uganda | C | S | - | - | X | ? | C | S |
| Kenya | C/U | S | - | - | X | S/D | C/U | S/D |
| Tanzania | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Rwanda | 200 | D | - | - | - | - | 200 | D |
| Burundi | - | - | - | - | - | - | Ex? | - |
| Angola | - | - | - | - | U/R | D | U/R | D |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Poon/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Zambia | C/U | S/D | 70 | S/I | X | S/D | C/U | S/D |
| Malawi | R | ? | - | - | - | - | R | ? |
| Mozambique | U/R | D | - | - | X | D | U/R | D |
| Botswana | R | ? | - | - | R | ? | R | ? |
| Zimbabwe | U/R | ? | 1,450 | S | - | - | >1,450 | S |
| South Africa | U/R | S/D | U/R | S/D | - | - | U/R | S/D |
| Swaziland | U/R | S | - | - | - | - | U/R | S |
| Lesotho | V | ? | - | - | - | - | V | ? |

OVERVIEW OF CONSERVATION STATUS

Mali: Formerly occurred throughout the southwestern savanna woodlands. It occurs widely but sparsely within its historical range and often persists near settlement. It occurs in moderate numbers in the Boucle du Baoule and Bafing protected areas.

Niger: Formerly occurred throughout the savanna woodland zone in the southwest. It has suffered from illegal hunting and habitat destruction. In the late 1980s it still occurred quite widely within its historical range, including W National Park, Tamou Faunal Reserve and unprotected areas. No recent information on its status.

Senegal: Formerly occurred widely in savanna woodland in the south. There is a large population in Niokolo-Koba National Park and it also occurs in the adjoining Faleme Hunting Zone. Elsewhere it has generally been reduced to low numbers or eliminated by intensive hunting for meat.

Gambia: Formerly common in the eastern savanna woodlands. It survives locally but in decreasing numbers because of loss of habitat to the expansion of settlement and agriculture.

Guinea-Bissau: Confined to savanna grasslands on rocky terrain in sparsely settled regions of the south and east, where it occurs at low densities.

Guinea: Probably occurred widely in the northern savannas in the past. Its status was regarded as satisfactory in the mid-late 1980s and it probably still occurs quite widely in the north, but no recent information is available on its distribution and abundance.

Sierra Leone: Recorded from savanna grasslands in the north. By the 1980s, it was known to survive only in and around Outamba-Kilimi National Park, where it occurred in small numbers and was threatened by hunting for bushmeat. No recent information on its status.

Ivory Coast: Formerly occurred throughout the northern savanna woodlands. It still occurs locally within its former range, but its numbers are decreasing because of uncontrolled hunting. It is present in all of the protected areas within its range, with a major population in Comoe National Park. As elsewhere the Comoe population has suffered from poaching, which caused an estimated 85% decrease in this population between 1978 and 1995-96.

Burkina Faso: Formerly occurred throughout the savanna woodlands of central and southern regions. It has been eliminated from the more densely settled parts of its former range but remains widespread in the south. It occurs in good numbers in the Arly-Singou protected area complex and Nazinga Game Ranch.

Ghana: Formerly widespread and numerous in the savanna woodlands of northern, central and southeastern Ghana. It has disappeared from marginal and densely settled parts of its former range, but it persists outside protected areas to a greater extent than most other savanna antelope species. It is common in Mole and Bui National Parks and Gbele and Kalakpa Game Production Reserves.

*Oribi (continued)*

Togo: Formerly occurred throughout most of the country. In the 1980s, it survived widely outside protected areas in regions which were not densely settled and it was common in Keran and Fazao National Parks. It is likely to have been affected adversely by the breakdown of the country's protected areas in the 1990s, but it probably still occurs quite widely.

Benin: Formerly occurred throughout the savanna woodlands of northern and central regions. It remains widespread within and outside protected areas. It occurs in good numbers in Pendjari National Park and the adjoining hunting zones and remains common in heavily poached areas such as W National Park.

Nigeria: Formerly occurred widely in the central and northern savannas. In the 1980s it had disappeared from some areas but persisted quite widely within its historical range, but its numbers and distribution were declining because of uncontrolled hunting and the expansion of agriculture. It was generally well represented in the gazetted game reserves, although most of these were only nominally protected. No recent information is available on its status.

Chad: Formerly occurred widely within the southern half of the savanna zone in southern Chad. Its populations have been reduced or eliminated locally by overhunting, the expansion of livestock and agriculture and the effects of drought, but it still occurs quite widely within its historical range especially in the southeast. It is common in Aouk Hunting Zone in eastern Salamat and occurs in low to moderate numbers in protected areas such as Zakouma National Park and Siniaka Minia Faunal Reserve.

Cameroon: Occurs widely within its historical range in the savanna woodlands of northern Cameroon, but it has been reduced to low numbers or eliminated from densely settled and intensively hunted areas. Its main stronghold is the savanna woodlands of North Province where it is widespread and common in Benoue, Bouba Ndjida and Faro National Parks and the adjoining hunting zones.

Central African Republic: Formerly occurred throughout the savanna woodland zone which covers most of Central African Republic, but absent from the sahel zone in the far north and the dense forests of the southwest and southeast. It still occurs widely and persists in settled areas in the west of the country to a greater extent than most other antelopes. It is common throughout the extensive unmodified savanna woodlands in the north and east, with substantial populations in areas such as Manovo-Gounda-St. Floris National Park and Sangba Pilot Zone. Its overall numbers are probably more or less stable.

Congo-Kinshasa: Formerly occurred widely in the northeastern and southeastern savannas. It still occurs locally within and outside protected areas in its former range. It is common in areas such as Garamba, Upemba and Kundelungu National Parks.

Sudan: Formerly occurred widely in savanna and floodplain grasslands in the south and more locally in central Sudan. It has been reduced to low numbers or eliminated in the more northerly parts of its range as a result of drought and habitat destruction by large numbers of domestic livestock, but it survives in viable numbers in areas such as Dinder and Radom National Parks. It probably still occurs widely at low to moderate densities in southern Sudan, although its numbers may have decreased since the 1970s and 1980s when aerial surveys produced a total population estimate for this region of 35,000 oribi, including 6,000 in the Jonglei region and 2,000 in Boma National Park.

Eritrea: Formerly occurred in central and southwestern Eritrea. It survives locally in low to moderate numbers, e.g., in the Gash-Setit area in the southwest.

Ethiopia: Occurs mainly within and to the west of the Rift Valley. It survives quite widely in open habitats within its historical range, including some settled areas. It occurs in low to moderate numbers in areas such as Senkelle Wildlife Sanctuary, Mago and Gambella National Parks and Omo

West, Maze and Akobo Controlled Hunting Areas. It is common in Omo National Park, where it occurs throughout the park's northern grasslands and on hills in the south.

Somalia: Haggard's oribi occurs in riverine grassland on the Shebelle and Juba Rivers and in wooded savanna in the Lake Badana region in the south. By the mid-1980s it was threatened by loss of habitat to the expansion of agriculture and heavy hunting with snares. There is no recent information on its status.

Uganda: Formerly very widespread in savannas. It has been eliminated from densely settled areas but remains common in protected areas such as Murchison Falls, Lake Mburo and Kidepo Valley National Parks. No recent information is available on its status outside protected areas.

Kenya: Hunting for meat and displacement by settlement have eliminated the oribi from substantial areas of its former range and reduced its distribution to scattered localities in the southwest and southeast. In the southwest, it survives in reasonable numbers in some unprotected areas, e.g., the Mara ranchlands, and is well represented in Masai Mara National Reserve and Ruma National Park. In the southeast, Haggard's oribi occurs in Boni-Dodori National Reserves and adjoining areas of Lamu district but no recent information is available on its abundance.

Tanzania: Eliminated from the more densely settled parts of its former range in the north, west and southeast, but it still occurs widely in the extensive wildlife areas within its range. It is common in *Combretum-Terminalia* woodland in the northwest of Serengeti National Park and occurs in most of the protected areas of northwestern, western and southern Tanzania, viz., Burigi, Moyowosi-Kigosi, Ugalla River, Katavi-Rukwa and Ruaha. It also occurs in Selous Game Reserve, where it is rare and localised.

Rwanda: Restricted to Akagera National Park, where it occurred in substantial numbers until the early 1990s. The population has decreased from an estimated 2,650 in 1990 because of the escalation of poaching during the political disturbances of 1990-94 and the encroachment of large numbers of cattle on to the northern part of the park in 1994-95.

Burundi: Formerly occurred in savanna and floodplain grasslands in the east and south, but it is now probably extinct.

Angola: Formerly widespread in central and southern Angola but absent from the arid southwest. It survives locally within its historical range, probably in greatly reduced numbers.

Zambia: Formerly widespread on the western plateaux but much more localised in the eastern half of the country. It has been eliminated from considerable parts of its former range but survives quite widely within and outside protected areas. It occurs in good numbers in and around Kafue National Park, e.g., it is very common on the Nanzhila Plains in the southern region of this park. Good populations also occur on the Bangweulu and Kafue Flats floodplains and in Liuwa Plain National Park. There are no recent population estimates from these areas, but its numbers are probably similar to those estimated in the 1960s and 1970s, e.g., >5,000 in Bangweulu and about 2,000 on the Liuwa Plain. On the Kafue Flats it is especially common within Lochinvar National Park and still occurs widely around the periphery of the entire Flats.

Malawi: Formerly occurred widely in central regions. It is now confined to Kasungu and Liwonde National Parks, where it persists in small numbers.

Mozambique: Formerly occurred widely in central regions. It was locally common to abundant in the early 1980s, including an estimated 16,000 on the floodplains of the Rift Valley floor within Gorongosa National Park. Its numbers subsequently decreased during the country's prolonged civil war. It survives in low to moderate numbers in areas such as Gorongosa, Zinave and Banhine National Parks. The oribi should benefit from the recently initiated attempts to rehabilitate these protected areas. It is quite common in the hunting concessions of Manica Province.

*Oribi (continued)*

Botswana: Restricted to a relatively small area in the northeast, from the eastern part of Chobe National Park to the Zimbabwe border. It is uncommon or rare within this restricted range.

Zimbabwe: Formerly occurred locally in the eastern highveld, the southeastern lowveld and in the west. It persists widely in moderate numbers within its historical range, mainly in commercial farming areas. It occurs in small numbers in a few protected areas, e.g., Hwange National Park, where its presence was confirmed in 1996 by sightings on open grassland in the west of the park near the Botswana border.

South Africa: Formerly occurred patchily in Northern, Mpumalanga, northeastern and southern Free State and Eastern Cape Provinces, and much of KwaZulu-Natal but especially in the northwestern, central and southern regions of this province, mainly in open grassland. It has disappeared from many parts of its former range, but small, scattered remnant populations still occur quite widely. The largest numbers occur outside protected areas. Many of its populations are decreasing because of loss of its grassland habitat to the expansion of agriculture and commercial afforestation, increasing rural human populations and lack of cover on farms which are heavily grazed by cattle and/or burnt annually. The oribi's fragmented distribution heightens its vulnerability, with numerous small, isolated populations which are susceptible to human interference and natural catastrophes. Small, generally stable populations totalling a few hundred animals occur in one national park (Golden Gate Highlands), 24 provincial reserves and some other areas such as Amersfoort town lands in southern Mpumalanga Province. Attempts to introduce/reintroduce this species to Kruger National Park have been unsuccessful.

Swaziland: Formerly distributed patchily in Swaziland. It is now extinct over much of its former range. It survives in two nature reserves, Malolotja, where it is doing well, and Mlawula, where it is threatened by poaching.

Lesotho: Occurs in Sehlabathebe National Park, possibly only as a seasonal visitor from the Natal Drakensberg.

SUMMARY

The oribi formerly occurred in savanna woodlands, floodplains and other open grasslands over a vast area from Senegal to South Africa. It has been eliminated from substantial parts of its former range by the spread of agricultural settlement, livestock and increased hunting for meat. It nevertheless shows considerable resilience to hunting in some parts of its range, although generally not to the extent of highly resilient species such as bushbuck and grey duiker. It still occurs widely within its former distribution but its populations are becoming increasingly fragmented as it is gradually eliminated from moderately to densely settled areas.

Its distribution and abundance are increasingly centred on protected areas and some other areas where human population densities are very low, such as Niokolo-Koba (Senegal), Comoe (Ivory Coast), Arly-Singou and Nazinga (Burkina Faso), Mole and Bui (Ghana), Pendjari (Benin), eastern Salamat (Chad), Bouba Ndjida, Benoue, Faro and adjoining hunting zones (Cameroon), Manovo-Gounda-St. Floris, Sangba and adjoining hunting zones (Central African Republic), Garamba, Upemba and Kundelungu (Congo-Kinshasa), Omo (Ethiopia), Murchison Falls, Lake Mburo and Kidepo Valley (Uganda), Masai Mara and Ruma (Kenya), Serengeti (Tanzania), Kafue, Bangweulu and Liuwa Plain (Zambia) and private farmland in Zimbabwe.

Estimated Total Numbers: Aerial surveys, which probably underestimate oribi numbers by a large amount, are available for a few oribi populations (Appendix 4). These generally produce population density estimates for this species of 0.05-0.2 per sq km in areas where it is reasonably common, such as Zakouma and Siniaka Minia (Chad) (D. Moksia, in litt. July 1995) and Murchison Falls (Uganda) (Sommerlatte & Williamson 1995). Densities estimated from ground counts range from 0.1-0.4 per sq km in areas where it is uncommon or depleted, e.g., Bafing (Mali) (Pavy 1993), Comoe (Ivory Coast) (Fischer 1996), Diefoula (Burkina Faso) (U. Belemsobgo, in litt. February

1998) and Golden Gate Highlands National Park (South Africa) (Anderson et al. 1996), to 1.4-1.7 per sq km in areas where it is (or was) common, e.g., Arly and Nazinga (Burkina Faso) (Belemsobgo & Chardonnet 1996) and Mutara (Rwanda) (Spinage et al. 1972). Recent ground counts have revealed densities of 5.0-10.0 per sq km in areas where it is very common, viz., Ruma National Park (Kenya) (Butynski et al. 1997) and northwestern Serengeti National Park (Tanzania) (Mduma 1995).

Assuming average densities of 2.0 per sq km where it is known to be common or abundant and 0.2 per sq km elsewhere, the information in Appendix 4 gives a total population estimate of 750,000, of which about half occurs in and around protected areas. Population trend is stable in many protected areas but decreasing in some others which receive minimal or no protection. Outside protected areas, population trend is gradually downwards in many parts of the oribi's range as human populations increase and settlement expands, although its populations are stable in some thinly settled, unprotected regions where hunting pressures are relatively low.

The total numbers of Haggard's oribi are probably in the thousands.

Captive Population: No individuals of the threatened Haggard's oribi are known to be held in captivity.

The Future: If current trends continue, some of the oribi's marginal populations may face eventual extinction, e.g., in Sierra Leone, Somalia and parts of Southern Africa, and it will be eliminated from many other areas where it presently occurs. The long-term survival of Haggard's oribi, for example, will probably depend on effective protection in areas such as the Boni-Dodori reserves (Kenya) and Bush Bush National Park (Somalia). However, the species' overall conservation status should remain satisfactory as long as it continues to exist in healthy, stable populations in a large number of protected areas and hunting zones and in some other areas with low densities of settlement.

**Beira**
*Dorcatragus megalotis* (Menges 1894)

RED LIST STATUS
Vulnerable


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Ethiopia | - | - | R | ? | R | ? |
| Djibouti | - | - | R | ? | R | ? |
| Somalia | - | - | U/R | S/D | U/R | S/D |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: Known from a small area in the Marmar Mountains on the Djibouti border, where it was observed in Ethiopian territory in 1899 and 1972. No recent information is available on its status in this part of the country, where large numbers of armed pastoralists and their livestock now reside.

Djibouti: The suspected occurrence of this species in Djibouti was confirmed by the observations of T. and S. Kunzel in 1993-94. The beira was observed on hillsides with sparse woody and herbaceous vegetation at two sites in the extreme southeast, close to the borders with Ethiopia and Somalia. This area is about 50 km from the Marmar Mountains in Ethiopia, where the beira has been recorded in the past, and it may still occur in the arid hill country between these localities. The Kunzels' 1993-94 observations indicated that the beira is able to live in hills which are occupied by herdsmen and their goats, suggesting that traditional goat herding does not jeopardise its survival.

Somalia: Recorded locally from mountains and arid stony hills in the north. In the 1980s it still occupied large parts of its historical range, but in greatly reduced numbers as a result of drought, uncontrolled hunting and habitat deterioration caused by overpopulation of livestock. A survey of the northern mountains in 1993-94 indicated that it still occurred locally in areas with sparse vegetation cover. Its inconspicuousness and extremely shy behaviour probably afford it some protection from shooting. During a field survey in 1997, Patricia Moehlman obtained good reports with accurate descriptions of beira in the eastern Nugal region.

SUMMARY
This little known species is confined to sparsely vegetated, rocky hillsides in Northeast Africa. There are no protective measures for natural habitats or wildlife within its limited distribution, but its small size and extreme wariness have apparently enabled it to survive quite widely within its historical range.

Estimated Total Numbers: No quantitative information is available on the size of the beira's population. Based on their field observations of group size and spacing, Kunzel & Kunzel (1998) estimated that there may be about 50 individuals within an area of about 250 sq km in southern Djibouti. Assuming that this population density of 0.2 per sq km applies throughout the species' range, and that its area of occupancy is about 35,000 sq km from the information in Appendix 4, the estimated total population is 7,000. This suggests that the order of magnitude of its total numbers may be in the thousands. Boitani et al. (1998) estimated an extent of occurrence for this species of about 78,000 sq km and a similar area of occupancy, based on the distribution map in Kingdon (1997), but it has probably disappeared from parts of this area because of overhunting, drought and localised competition with large numbers of livestock. Its population trend is unknown. Its numbers may be decreasing in some parts of its range where settlement is expanding and livestock densities are high, but its populations are probably stable in areas with few settlements.

Captive Population: This species is not held in captivity in North America or Europe, but a viable breeding group is held in a private collection at Al Wabra (Qatar) (Kingdon 1997).

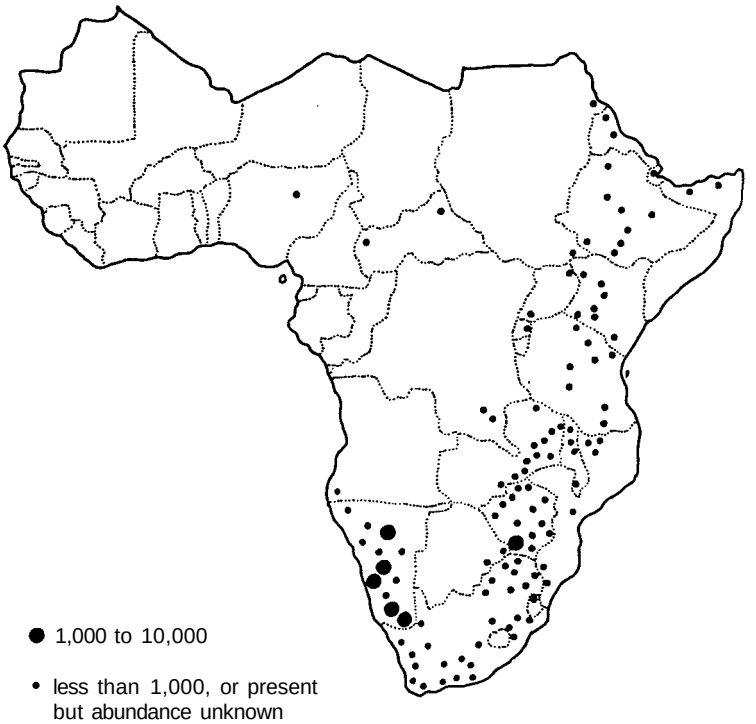
The Future: Although it apparently survives over substantial areas of its historical distribution, the beira is unlikely to persist indefinitely without active conservation efforts. In the current political climate in the Horn of Africa, Djibouti may offer the best opportunities for such actions. If no attempt is made to protect some of its remaining populations, the beira's secretive habits and specialisation for a difficult and marginal habitat (see Kingdon 1997) may enable it to survive for some time, but it will probably decline gradually towards extinction as pressures increase from growing human and livestock populations.

## Klipspringer

*Oreotragus oreotragus* (Zimmermann 1783)

RED LIST STATUS
Lower Risk (conservation dependent)

SUBSPECIES
Numerous subspecies of the klipspringer have been described. The only one recognised as valid by the ASG for the purpose of assessing conservation status is the isolated western klipspringer (0. o. *porteousi)* of Nigeria and Central African Republic, which is classed as Endangered.




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Nigeria | R | S/D | - | - | R | S/D | R | S/D |
| CAR | - | - | - | - | U/R | ? | U/R | ? |
| Congo-Kinshasa | U/R | S/D | - | - | ? | ? | U/R | S/D |
| Sudan | - | - | - | - | X | ? | X | ? |
| Eritrea | - | - | - | - | X | ? | X | ? |
| Djibouti | 250 | S | - | - | U/R | S | U/R | S |
| Ethiopia | U | S | - | - | C/U | S/D | C/U | S/D |
| Somalia | - | - | - | - | U | ? | U | ? |
| Uganda | U/R | S/D | - | - | R | S/D | U/R | S/D |
| Kenya | C/U | S | - | - | X | S/D | C/U | S/D |
| Tanzania | C/U | S | - | - | X | S/D | C/U | S/D |
| Rwanda | U/R | S/D | - | - | - | - | U/R | S/D |
| Burundi | - | - | - | - | - | - | Ex? | - |
| Angola | - | - | - | - | U/R | S/D | U/R | S/D |
| Zambia | C/U | S/D | - | - | C/U | S/D | C/U | S/D |
| Malawi | C | S/I | - | - | X | S/D | C | S |
| Mozambique | X | S/D | - | - | X | S/D | X | S/D |
| Namibia | C/U | S | 22,880 | S/D | U/R | S/D | >22,880 | S/D |
| Botswana | - | - | C/U | S | R | S/D | U | S/D |
| Zimbabwe | C/U | S | 830 | S | U/R | S/D | U | S/D |
| South Africa | C/U | S | C/U | S/D | C/U | S/D | C/U | S/D |
| Swaziland | U | S | - | - | - | - | U | S |
| Lesotho | - | - | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Nigeria: The western klipspringer occurs in rocky habitats in and around the Jos Plateau in east-

central Nigeria. In the 1970s and 1980s, its overall numbers were considered to be depleted and in further decline. Its range includes Lame Game Reserve, which provides good habitat in the form of numerous inselbergs. It was still present in reasonable numbers in this reserve in the mid-late 1980s. Like most of Nigeria's protected areas, Lame has received minimal protection. No recent information is available on the western klipspringer's status.

Central African Republic: Recorded from two separate areas of rugged topography in the northern and western uplands. No recent information on the status of these isolated populations.

Congo-Kinshasa: Confined to rocky terrain in the southeast. It occurs in small numbers in Kundelungu and Upemba National Parks. No recent information on its status elsewhere.

Sudan: Recorded from hilly areas in the northeast and southeast. No recent information on its status.

Eritrea: Formerly occurred in rocky areas in central and northern regions. It still occurs locally within its former range, e.g., Semanawi Bahri, and it may be widespread in the Red Sea Hills in the northwest.

Ethiopia: Occurs widely in suitable rocky habitats within its historical range in the highlands and Rift Valley, with a few isolated populations in the southern lowlands. There are extensive areas of good klipspringer habitat in the highlands on both sides of the Rift Valley. This species probably still occurs widely in these areas, as in the 1980s. It is common in Simien Mountains and Bale Mountains National Parks and occurs in smaller numbers in other parks and reserves which have less extensive areas of rocky habitat, e.g., Awash, Nechisar, Omo and Mago National Parks and Yabelo Wildlife Sanctuary.

Djibouti: Recorded from the Goda and Mabla massifs in central Djibouti where it occurs at altitudes above 600 m. It survived in low to moderate but apparently stable numbers in both of these areas in the mid-late 1980s, including the Foret du Day National Park on the Goda massif. The klipspringer's adaptation to the inaccessible hillsides and cliffs in these areas enables it to avoid most competition from domestic herds. No recent information is available on its status but this is probably unchanged.

Somalia: Recorded from the northern mountains. In the early 1980s it still occupied most of its historical range. No recent information on its status.

Uganda: Confined to rocky hillsides in the southwest and northeast, where it occurs in small numbers. It still occurs in Lake Mburo National Park in the southwest. No recent information is available on its status in the northeast.

Kenya: Suitable habitat such as the Rift Valley escarpments is largely restricted to the western half of the country. It probably remains widespread and locally common within these areas, as in the 1980s, but recent information is available only for protected areas. It is common within rocky habitats in areas such as Tsavo, Aberdare and Nairobi National Parks and Masai Mara and Shaba National Reserves.

Tanzania: It still occurs widely on rocky outcrops, hillsides, screes and escarpments in scattered localities throughout, especially in the Rift Valley area in central Tanzania where suitable habitat is extensive. Its habitat is of little value to humans and it persists outside protected areas in regions where subsistence hunting pressure is not intense. It is generally common in rocky habitats within protected areas, such as Serengeti, Tarangire and Ruaha National Parks and the south and southeast of Selous Game Reserve. Its abundance within each protected area is restricted by the extent of suitable habitat.

Rwanda: Confined to the central and southern parts of Akagera National Park, where it is locally

*Klipspringer (continued)*
common on rocky outcrops.

Burundi: Formerly occurred locally on rocky outcrops in the east and southeast, but now probably extinct.

Angola: Confined to escarpment and rocky hillsides in the southwest. It occurred in good numbers in Iona National Park in the mid-1970s. It survives in unknown numbers. The klipspringer has probably been affected less adversely than most other antelope species by the prolonged civil war.

Zambia: Formerly occurred throughout the Zambezi and Luangwa Valley Escarpments and more locally in other regions. It still occupies large parts of its historical range, at least in the valley escarpments. It occurs in most protected areas with sufficient rocky habitat and is locally common in areas such as North and South Luangwa National Parks and some of the Luangwa Valley game management areas.

Malawi: Formerly widespread wherever suitable rocky outcrops occur. Such outcrops are very common throughout most of Malawi and the klipspringer still occurs quite widely within and outside protected areas. It is common in suitable habitat within areas such as Nyika National Park, the northwestern section of Lengwe National Park, the mainland and Domwe Island sections of Lake Malawi National Park, and some forest reserves.

Mozambique: Formerly occurred quite widely in northern and central regions, and more locally in the Lebombo Mountains of western Gaza and Maputo Provinces in the south. It probably survives over a substantial part of its historical range, e.g., it still occurs in Niassa Game Reserve and Gorongosa National Park and it is common in western Gaza in the hunting concession which adjoins South Africa's Kruger National Park.

Namibia: Formerly occurred throughout the mountainous escarpment and broken plateau regions of northwestern, western, central and southern Namibia, where there are extensive areas of good klipspringer habitat. It remains widespread and locally common within its historical range. The largest protected-area population occurs in Namib-Naukluft Park, where it is common on the Naukluft Massif and in the Kuiseb River canyon. It occurs in substantial numbers on private land in northern, central and southern farming districts and generally at lower densities in communal lands.

Botswana: Suitable habitat is confined to the eastern region and a small area in the southeast. It remains quite common locally within this range, e.g., on the Tuli block farms.

Zimbabwe: Formerly occurred widely on suitable rocky outcrops and hillsides. It remains widespread within its historical range and is locally common where there are extensive areas of rocky terrain, e.g., in Matobo National Park and on parts of the Zambezi Valley Escarpment. In other areas its abundance is restricted by the extent of available habitat, e.g., in Hwange National Park it is confined to an area of broken country and rocky outcrops in the northeast of the park where its distribution and status appear to have remained stable for the last 25 years.

South Africa: Formerly occurred locally in rocky terrain in Northwest, Northern and Mpumalanga Provinces, a limited area of central and eastern Free State Province, the higher slopes of the Drakensberg (above 2,500 m) and a few other areas in KwaZulu-Natal, and the west, northwest, Orange River Valley and southern coastal mountains of the Cape. It still occurs locally on private land and in protected areas throughout most of its historical range. It is common in suitable habitat within Kruger, Augrabies Falls and Karoo National Parks. It occurs in at least three other national parks and at least 46 provincial reserves.

Swaziland: Formerly occurred locally in rocky habitat throughout the country. It survives in a few localities, e.g., Mlawula and Malolotja Nature Reserves.

Lesotho: Probably occurred historically in areas such as the Drakensberg but no information is available on its recent occurrence.

SUMMARY
The klipspringer formerly occupied rocky hillsides, kopjes and steep escarpments from Northeast to Southern Africa, with a few isolated populations in Central Africa. The Rift Valleys and the Southern African escarpments provide extensive suitable habitat and are central to its distribution. It persists widely within its historical range, including many unprotected areas where its habitat is inaccessible to people and livestock. Small, isolated populations within relatively small areas of rocky habitat are more vulnerable to hunting and competition from goats, and many of these populations have been eliminated in settled regions.

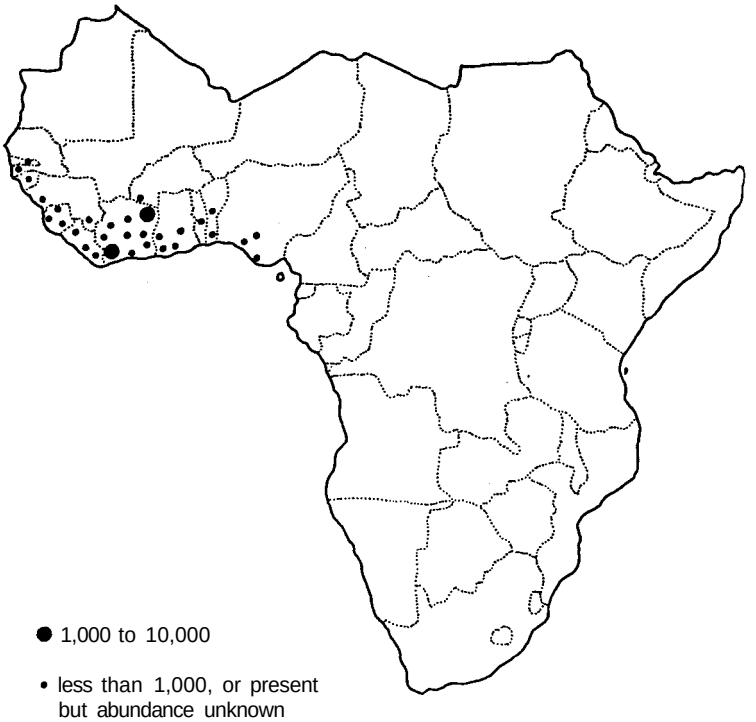
Countries which have large areas of suitable habitat generally retain good numbers of this species, e.g., Ethiopia, Kenya, Tanzania, Zambia, Malawi, Namibia, Zimbabwe and South Africa. It survives in healthy populations in the more extensive tracts of rocky habitat within its range, such as valley escarpments, both within and outside protected areas. This includes large numbers on private farmland in Namibia. Major protected populations occur in areas such as Simien and Bale Mountains (Ethiopia), Tsavo (Kenya), North and South Luangwa (Zambia), Nyika (Malawi), Namib-Naukluft (Namibia) and Matobo (Zimbabwe). It occurs in lesser numbers in a large number of other protected areas throughout its range which contain smaller areas of suitable habitat.

Estimated Total Numbers: The klipspringer can reach relatively high population densities within continuous areas of favourable habitat, e.g., 10.0-14.0 per sq km in a 9.6 sq km area of escarpment, ridge top and gorge in Simien Mountains National Park (Ethiopia) (Dunbar 1978). More typically, the klipspringer's habitat is discontinuous within a given area and its abundance is closely related to the extent of suitable rocky terrain. Its overall population density is frequently in the range 0.01-0.1 per sq km in protected areas within which it is common in restricted areas of suitable habitat, e.g., Serengeti (Tanzania) (Hendrichs 1970), Lupande (Zambia) (Jachmann & Kalyocha 1994) and Kruger, Addo-Zuurberg, Marakele, Itala, Mkuzi and Umfolozi (South Africa) (Pienaar 1963, 1969; Rowe-Rowe 1994; Anderson et al. 1996). Higher densities occur in areas with more extensive klipspringer habitat, e.g., 0.15-0.30 per sq km in Lengwe (Malawi) (Mkanda 1998) and Karoo, Mountain Zebra and Royal Natal National Parks and Giant's Castle Game Reserve (South Africa) (Rowe-Rowe 1994; Anderson et at. 1996).

Assuming average population densities in areas for which no population estimates are available of 0.1 per sq km where it is known to be common or abundant within suitable habitat and 0.01 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of about 42,000, of which one-quarter occurs in protected areas. This estimate is probably conservative. Population trend is stable in many protected areas and on private land, but tending to decrease in areas where small, isolated populations are subjected to uncontrolled hunting and competition with livestock. The numbers of the western klipspringer are unknown but are unlikely to exceed a few thousand at most, in view of its very restricted distribution. This subspecies' population is probably decreasing, at least in Nigeria.

Captive Population: Small numbers of klipspringer are held in captivity in North America (17 in 1996) and additional animals at the Chipangali Wildlife Trust in Zimbabwe, but these do not include any specimens of the threatened western klipspringer.

The Future: This species' conservation status should not change and its future should be secure as long as it continues to receive active protection in national parks and equivalent reserves, hunting concessions and private farmland. It should also continue to survive in substantial numbers in extensive, inaccessible areas of unprotected habitat. The western klipspringer and some other peripheral populations may eventually decline to extinction if current trends continue and no attempts are made to implement protective measures and/or captive breeding.




Subfamily Cephalophinae

**Maxwell's Duiker**
*Cephalophus maxwellii* (H. Smith 1827)

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Senegal | U | D | C | D | C | D |
| Gambia | X | ? | U | D | U | D |
| Guinea-Bissau | - | - | C | S/D | C | S/D |
| Guinea | X | ? | C | S/D | C | S/D |
| Sierra Leone | C/U | S/D | C | S/D | C | S/D |
| Liberia | Ab/C | ? | Ab/C | 7 | Ab/C | ? |
| Ivory Coast | C | S/D | C | D | C | D |
| Burkina Faso | U | S/D | - | - | U | S/D |
| Ghana | C | S/D | C | S/D | C | S/D |
| Togo | R | D | U/R | D | U/R | D |
| Benin | X | D | U/R | D | U/R | D |
| Nigeria | - | - | X | S/D | X | S/D |

OVERVIEW OF CONSERVATION STATUS

Senegal: Confined to the southwest, where it formerly occurred widely within forest-savanna mosaic. It is heavily hunted throughout its range but shows considerable resilience to hunting pressure and remains locally common. Its numbers have been reduced substantially in areas such as Basse Casamance National Park.

Gambia: Formerly occurred widely in the forest-savanna mosaic of western Gambia. It still occurs locally in areas with thick undergrowth or other suitable cover, but its distribution and abundance are declining because of loss of habitat to agricultural expansion and hunting pressure.

Guinea-Bissau: Formerly occurred very widely in forest patches and other areas with sufficient cover but absent from the drier northeast of the country. It continues to occupy a large part of its historical range, including Canhabaque and Caravela Islands in the Bijagos Archipelago. It is common

in many localities.

Guinea: Probably occurred widely in forest and forest-savanna mosaic in the past, and it may still occupy substantial areas of southwestern, central and southeastern Guinea. It appears to be quite resilient to hunting pressure. Its status was regarded as satisfactory in the mid-late 1980s, but more recent information on its distribution and abundance is fragmentary. It occurs in Mount Nimba Biosphere Reserve and Ziama and Diecke Forest Reserves.

Sierra Leone: Formerly occurred more or less throughout. In the 1980s, it remained widespread and locally common despite considerable hunting pressure. It was common in areas such as the Gola Forest Reserves and Western Area Forest Reserve and it was generally the most abundant duiker species in both forest and farm bush. No recent information on its status.

Liberia: Formerly occurred throughout and retains almost all of its original distribution. The 1989/90 WWF/FDA survey confirmed that it is the most numerous and widespread duiker species in Liberia. It was locally common/abundant in all of the habitats surveyed, occurring widely in the northwestern and southeastern forest blocks and being particularly adaptable to farm bush habitats. It was found to be the most frequent wildlife species sold as bushmeat and its frequency was even higher in subsistence bushmeat consumed locally by rural people, but it appeared to be highly resilient to hunting pressure. There is no more recent information on its status.

Ivory Coast: Formerly occurred throughout the southern forests and central forest-savanna mosaic, and more locally within riverine forests and forest patches in the northern savannas. It adapts well to disturbed habitats and remains widespread, occurring in primary and secondary vegetation and often surviving in close proximity to settlement. It withstands heavy hunting pressure, but its numbers are decreasing in very densely settled areas. It is a major component of bushmeat. Maxwell's duiker occurs in most protected areas, in many of which it is common. In Tai National Park, for example, it is the most frequently encountered duiker species and occurs in primary and secondary forests and plantations. It is more abundant in the west of the park than in the east, reflecting differences in poaching pressure.

Burkina Faso: Recorded from dense woodland in the southwest, including Diefoula-Logoniegou Classified Forests. No recent information on its status.

Ghana: Formerly occurred throughout the southern half of the country. It withstands heavy offtake by meat hunters and remains widespread and common throughout much of southwestern and central Ghana, although it may have disappeared from some areas at the margins of its range. It occurs in primary forest, secondary forest, dense thickets and farm bush, and has probably benefitted from the destruction of primary forests. It is common in most of the protected areas which contain forest, e.g., Bia, Nini-Suhien and Kakum National Parks and the adjoining reserves and Digya National Park.

Togo: Formerly occurred widely in central and southern Togo. In the mid-1980s it survived locally in small numbers in the Fazao and Togo mountains in the west and southwest and possibly elsewhere, and its numbers appeared to be decreasing because of pressures of forest destruction and hunting. These pressures have escalated rapidly during the 1990s and its survival is probably now under serious threat.

Benin: Formerly occurred throughout the centre and south of the country. Its distribution is now more localised because of intensive hunting for bushmeat and the expansion of high-density settlement. There are no effective protected areas within its range, although it occurs in some classified forests.

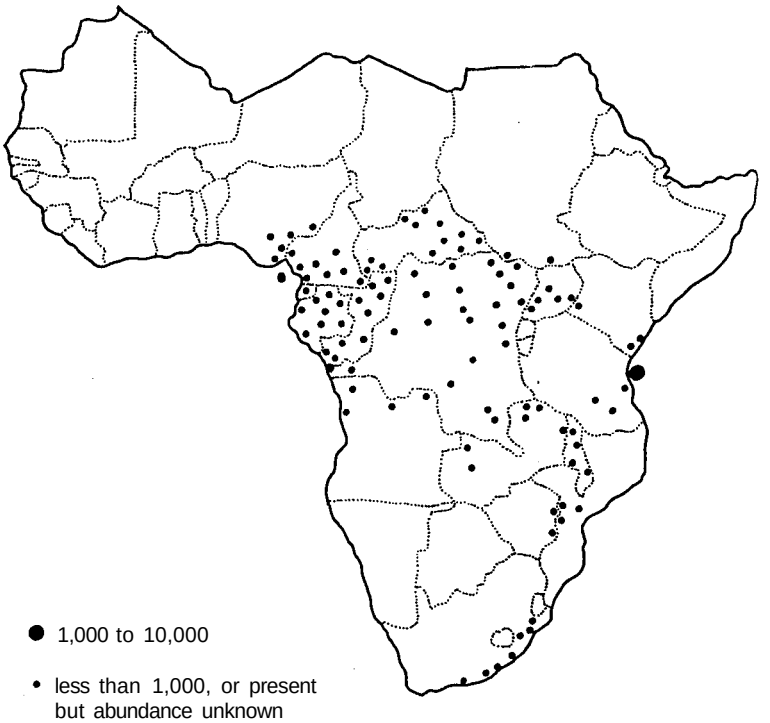
Nigeria: Formerly occurred throughout the moist lowland forests of the southwest. Most of its original habitat has been destroyed by the spread of settlement and agriculture. It is also intensively hunted and is a major component of bushmeat. It probably persists widely in secondary

*Maxwell's Duiker (continued)*
forests and other degraded habitats with sufficient undergrowth, as in the 1980s. It appears to occur throughout the Niger Delta, which suggests that the boundary with the blue duiker is well to the east of the Niger River.

SUMMARY
Maxwell's duiker formerly occurred throughout the moist lowland forests of West Africa, extending into the adjoining savannas. Much of its original habitat has been modified or destroyed by the spread of agricultural settlement, but it adapts well to derived savannas and farm bush and remains widespread and locally common within and outside protected areas. It is a major component of bushmeat throughout its range states. It occurs in virtually all protected areas within its range and is well represented in areas such as Sapo (Liberia), Tai and Comoe (Ivory Coast) and Kakum, Bia and Nini-Suhien (Ghana).

Estimated Total Numbers: Assuming average population densities of 10.0 per sq km where it is known to be common or abundant and 2.0 per sq km elsewhere (see p. 92), and an area of occupancy of 236,000 sq km from the information in Appendix 4, gives an estimated total population of 2,137,000. This may be conservative, e.g., Boitani et al. (1998) estimated that the area of occupancy of Maxwell's duiker is of the order 1,000,000 sq km. Despite its resilience to hunting pressure and its adaptability to degraded forest habitats, its numbers show a general tendency to decrease in many areas. There are few protected areas within its range which receive effective levels of protection and management.

The Future: Maxwell's duiker will probably continue to exist in large numbers well into the 21st century, but even this abundant and resilient species cannot withstand increasing human populations and hunting pressures indefinitely. It has already been severely reduced in numbers or eliminated in those parts of its range with very high human population densities. This foretells its ultimate fate if unrestricted human population growth continues, unless current unrestricted hunting practices are replaced by some form of management which ensures sustainable offtake rates. This would also ensure its continued availability as bushmeat.




**Blue Duiker**
*Cephalophus monticoia* (Thunberg 1789)

RED LIST STATUS
Lower Risk (least concern)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | trend | Popn/Abund. | Trend | Poon/Abund. | Trend |
| Nigeria | C | S/D | U | S/D | C/U | S/D |
| Cameroon | Ab/C | S/D | C/U | S/D | C | S/D |
| CAR | Ab/C | S | C/U | S/D | C | S/D |
| Equ. Guinea | C | I | C | S/D | C | S/D |
| Gabon | Ab/C | S | Ab/C | S | Ab/C | S |
| Congo-Brazz. | Ab/C | S | C/U | S/D | C | S/D |
| Congo-Kinshasa | Ab/C | S | C/U | S/D | C | S/D |
| Sudan | - | - | U | S/D | U | S/D |
| Uganda | C/U | ? | X | S/D | X | S/D |
| Kenya | U/R | ? | - | - | U/R | ? |
| Tanzania | U/R | S/D | >8,000 | D | >8,000 | D |
| Angola | C | S/D | X | D | X | D |
| Zambia | X | S/D | X | S/D | X | S/D |
| Malawi | U/R | S | C/U | S/D | U | S/D |
| Mozambique | R | D | X | S/D | U/R | S/D |
| Zimbabwe | U | S/D | R | D | U/R | S/D |
| South Africa | >400 | S | >2,200 | D | >2,600 | D |

OVERVIEW OF CONSERVATION STATUS

Nigeria: Formerly occurred throughout the lowland forests of the southeast, to the east of the lower Niger River, and in montane forest on the Cameroon border. It has probably been eliminated from parts of its range in the very densely settled region between the Niger and Cross Rivers, but it remains widespread and locally common east of the Cross River. It occurs in Cross River National Park and in montane forest in Gashaka-Gumpti National Park and the adjacent Gotel Mountains.

*Blue Duiker (continued)*

Cameroon: Occurs widely within its historical range in the southern forests, extending northwards within forest patches and galleries into the southern savannas. It is locally common within and outside protected areas and is an important component of the bushmeat trade. Its populations may be decreasing in heavily populated parts of southwestern Cameroon where hunting pressures are intense, but it remains common to abundant in generally stable numbers in the more sparsely populated forests of the southeast. It is common or abundant in all of the protected areas within the forest zone. It is noticeably less abundant in Korup National Park in the southwest than in areas such as Dja and Lobeke in the southeast, probably because of long-term differences in hunting pressure.

Central African Republic: Occupies most of its historical range, which extends northwards from the equatorial forests of the southwest and southeast to gallery forests and other forest patches in the north. In spite of widespread hunting for bushmeat, it persists close to human settlement in some parts of its range. It is abundant in Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park in the southwest and Bangassou Forest in the southeast, and locally common elsewhere, e.g., in Sangba Pilot Zone and the southern section of Manovo-Gounda-St. Floris National Park in the north.

Equatorial Guinea: Formerly occurred throughout the mainland (Mbini) and Bioko Island. Although heavily hunted and extirpated locally in areas with very high human population densities, it remains very widespread. It still occupies about 80% of Bioko, for example, where it occurs in undisturbed forest, secondary forest, forest edge and abandoned plantations from altitudes of 10 m to at least 2,000 m, including areas close to villages. It is a major component of bushmeat in both Mbini and Bioko but appears able to sustain high offtake rates. The blue duiker is locally common in relatively undisturbed areas, e.g., Monte Alen National Park in Mbini and Picole Basile and Gran Caldera de Luba on Bioko.

Gabon: Formerly occurred almost throughout and remains very widespread. It is a major component of bushmeat but shows strong resilience to hunting and maintains sizeable populations near villages. It is common to abundant elsewhere and occurs in large numbers in areas such as the Lope Reserve, Gamba protected area complex and Minkebe Forest.

Congo-Brazzaville: Formerly occurred throughout and remains very widespread. It is common to abundant throughout the northern forests. Its populations in the north are stable, at least in protected areas such as Odzala and Nouabale-Ndoki National Parks and adjoining areas where subsistence hunting is managed, e.g., Kabo Forest. Its exceptional resilience to severe hunting pressure has enabled it to survive much better than other antelope species in the southern forests, and it is a mainstay of bushmeat markets throughout the country. It still occurs very widely in the south, even in small fragments of secondary forest near villages. It is common/abundant in southern protected areas such as Conkouati Faunal Reserve and Dimonika Biosphere Reserve, despite low to moderate levels of protection.

Congo-Kinshasa: Formerly occurred throughout the country's vast equatorial lowland forest zone and more locally in gallery forests, forest patches and secondary bush within the northern and southern forest-savanna mosaics and savanna woodlands. It remains very widespread and locally common/abundant within the equatorial forests, including disturbed forests and secondary growth. It is a major item of human diets throughout the forest zone but persists widely near settlement where there is sufficient cover. The blue duiker is generally the numerically dominant antelope species in lowland forest in areas such as Okapi Faunal Reserve, Kahuzi-Biega, Maiko and Salonga National Parks. It is less numerous to the north and south of the central forest zone, e.g., it occurs in small numbers in the Azande reserve adjoining Garamba National Park in the northeast and in gallery forests within Kundelungu and Upemba National Parks in the southeast.

Sudan: Restricted to forest areas in the southwestern border region, where it was common in the 1980s, and the Imatong and Dongotona Mountains on the southeastern border. No recent information

on its status.

Uganda: Occurs in most of Uganda's remaining low and medium altitude forests including most of the forest reserves. It is locally common, e.g., in Kibale Forest National Park and Budongo Forest Reserve.

Kenya: Recorded from restricted areas of forest in the west and southeast. It is generally uncommon and is threatened by habitat destruction and overhunting. It still occurs in at least three protected areas, viz., Shimba Hills National Reserve, Kakamega Forest National Park and Arabuko-Sokoke Forest Reserve.

Tanzania: Occurs locally in montane and lower altitude forests and dense coastal scrub. No recent information is available on its occurrence within its former range in the northwest. It still occurs locally in central and southeastern Tanzania, e.g., the Udzungwa Mountains and Selous Game Reserve, where it is uncommon/rare. It is common on Zanzibar Island, where it is under pressure from habitat destruction and overhunting but continues to hold its own in areas well away from villages. Its current status in the coastal regions of the mainland is probably similar to that on Zanzibar. Intense exploitation and encroachment pressures are now major threats to most of Tanzania's remaining coastal forests. The same applies to the blue duiker's montane forest habitats.

Angola: Formerly occurred locally in the northern half of the country and in Cabinda. It probably survives quite widely within the northern part of this range. It is common in Kissama National Park.

Zambia: Formerly occurred locally in forests and thickets, mainly in the higher rainfall areas of the western and northern plateaux. No recent information is available on its status outside protected areas, but it still occurs in all of the national parks from which it has been recorded in the past, viz., Kafue, West Lunga, Mweru Wantipa, Nsumbu, Lusenga Plain and Nyika. It has probably suffered from poaching in all of these parks, in which protection and management have been low (Mweru Wantipa, Lusenga Plain, Nyika) or low to moderate (Kafue, West Lunga, Nsumbu) in recent years.

Malawi: Formerly widespread in forest and thicket. Forest destruction and meat hunting have eliminated it from many areas. It survives at low to moderate densities where its habitat is protected, viz., in Nyika National Park and at least 10 forest reserves.

Mozambique: Recorded from scattered localities in central Mozambique, where it probably survives in reduced numbers.

Zimbabwe: Confined to evergreen forests in the eastern highlands. It is generally scarce and its numbers are decreasing because of poaching with snares and nets. It occurs in low to moderate numbers in a few protected areas, e.g., Chimanimani, Mtarazi Falls and Nyanga National Parks.

South Africa: Confined to dense evergreen forest and scrub in eastern and southern coastal areas, in KwaZulu-Natal and Eastern Cape Provinces. It has been eliminated from large parts of its former range by habitat destruction resulting from the expansion of agriculture and settlement, but it still occurs widely within suitable habitat in the coastal lowlands and hinterland of KwaZulu-Natal up to an altitude of 1,370 m and in the coastal region of Eastern Cape Province. Its overall numbers are continuing to decrease because of fragmentation and destruction of its habitat, poaching and in some areas competition with introduced nyala populations. The blue duiker persists in viable numbers in protected areas, including Tsitsikamma National Park and at least 28 provincial reserves.

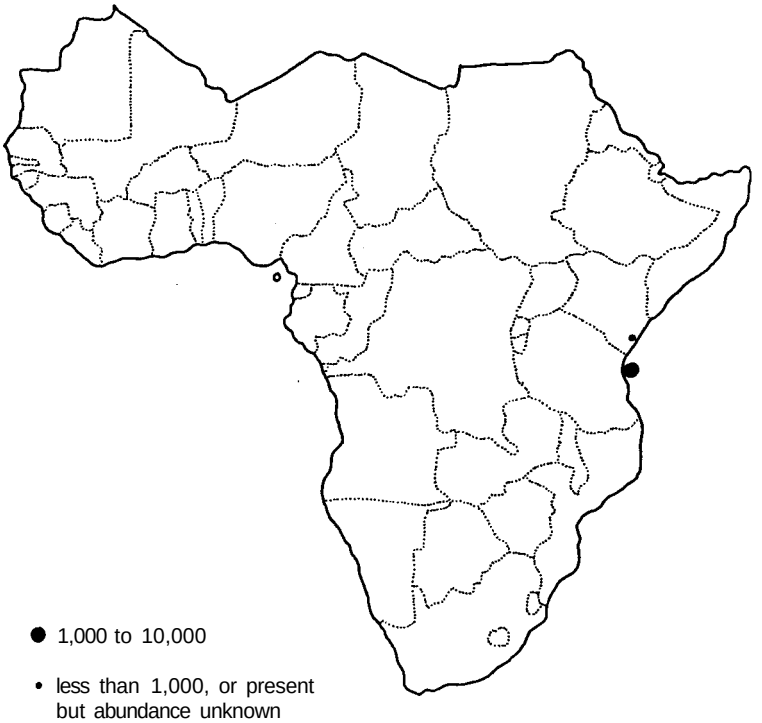
SUMMARY
The blue duiker remains very widespread within its historical range throughout the equatorial forests of Central Africa, extending into riverine and montane forests and coastal thickets in East and Southern Africa. The survival of some peripheral populations is threatened, e.g., in Kenya, Zimbabwe and South Africa, but its overall abundance makes it one of the most numerous antelope

*Blue Duiker (continued)*
species in Africa. It is locally common in primary and secondary forests within and outside protected areas and is a major component of bushmeat throughout the forest regions of Central Africa. It often maintains sizeable populations near villages despite high hunting pressures.

It occurs in large, generally stable numbers in many protected areas within the core of its range, e.g., Dja and Lobeke (Cameroon), Dzanga-Sangha and Dzanga-Ndoki (Central African Republic), Monte Alen (Equatorial Guinea), Lope and Gamba (Gabon), Odzala, Nouabale-Ndoki, Lake Tele-Likouala and Conkouati (Congo-Brazzaville) and the Okapi reserve, Maiko, Kahuzi-Biega and Salonga (Congo-Kinshasa).

Estimated Total Numbers: Assuming average population densities of 10.0 per sq km where it is known to be common/abundant and 2.0 per sq km elsewhere (see p. 92), and an area of occupancy in excess of 2,000,000 sq km from the information in Appendix 4, gives an estimated total population of more than 7,000,000. This may be a conservative figure, e.g., Boitani et al. (1998) estimated that the blue duiker's area of occupancy is 5,430,000 sq km. Protected areas comprise only a small part of its total range, but its core populations are generally stable apart from areas where subsistence and commercial meat-hunting pressures are exceptionally high.

The Future: The blue duiker should continue to survive in large numbers and provide an important source of protein to human populations in the Central African forest zone, as long as human population densities remain low to moderate over extensive parts of its range. Its ability to withstand hunting pressure and habitat degradation enable it to adapt to increasing human colonisation of its forest habitats, although even this abundant, highly resilient species is suffering some decline in its distribution and numbers as human populations continue to grow and expand. However, this is unlikely to threaten the blue duiker's overall survival in the foreseeable future.




## Aders' Duiker

*Cephalophus adersi* Thomas 1918

RED LIST STATUS
Endangered

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Kenya | R | D | - | - | R | D |
| Tanzania | - | - | 1,400 | D | 1,400 | D |

OVERVIEW OF CONSERVATION STATUS

Kenya: Known only from Arabuko-Sokoke Forest, where there has been a marked growth in the extraction of forest resources by the rapidly increasing human population in surrounding settlements. As a result, Arabuko-Sokoke's populations of antelopes and most other wildlife have apparently been reduced to very low densities by habitat destruction and illegal trapping. Recent research by Erustus Kanga has confirmed the continued presence of Aders' duiker in very small numbers within *Cynometra* thicket and woodland but it is in danger of immediate extinction. It is unlikely to survive in Kenya unless more effective protection and management of Arabuko-Sokoke Forest Reserve is implemented in the near future.

Tanzania: Occurs on Zanzibar Island, where a survey conducted in 1995 revealed that this species had declined in range and numbers by an estimated 50-75% since 1982-83. Long-term, widespread habitat loss through forest destruction is the critical factor in its decline on Zanzibar, compounded by recent overhunting. Its habitat has been fragmented by uncontrolled harvesting of forest products for firewood, building poles and charcoal, plus shifting cultivation, and it is regularly hunted by local people for meat. It survives mainly in the thickets of eastern Zanzibar's coral rag country, with populations now limited to the central Jozani-Chwaka Bay area, Mtende in the south and Kiwengwa Forest in the north. Conservation of the remaining coral rag forests is essential to prevent this duiker's extinction on Zanzibar. There are plans to enhance the protection of Aders' duiker in Jozani Forest Reserve and other areas, and set up a captive breeding centre. In the meantime its numbers continue to decrease, e.g., by early 1998 its population was apparently further reduced from 1995. Proposed protective measures for this species are a very high international priority in antelope conservation (see p. 39).

*Aders' Duiker (continued)*

SUMMARY
This species is now confined to thicket forest on waterless coral rag on Zanzibar Island and *Cynometra* thicket and woodland in Arabuko-Sokoke Forest in coastal Kenya. The factors which threaten its survival in these two locations, viz., habitat destruction and hunting for meat, continue unabated. There are no effectively protected populations of Aders' duiker. Attempts to develop and implement effective protection of its remaining populations and to establish viable numbers in captivity are a very high priority.

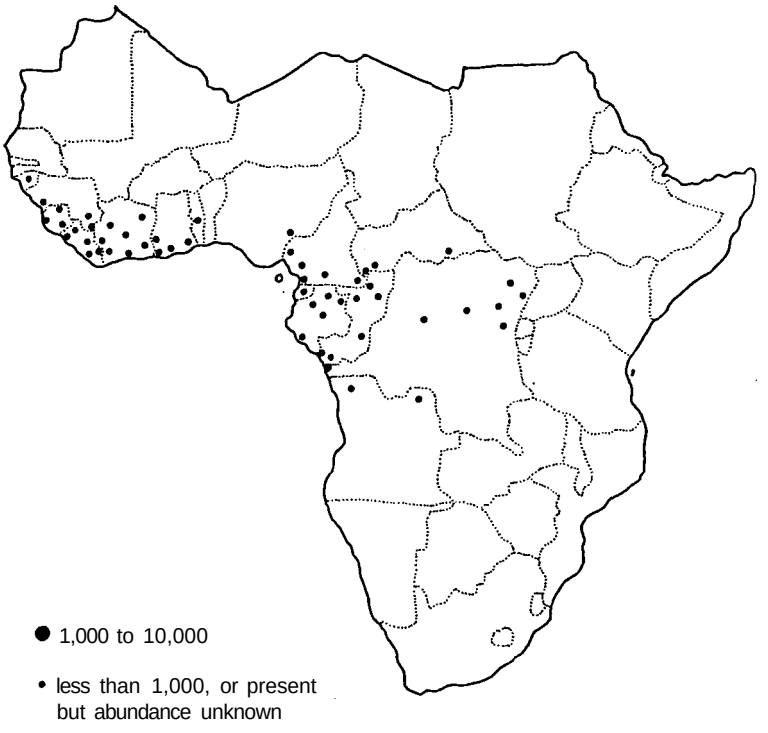
Estimated Total Numbers: The estimated population of Aders' duiker on Zanzibar had declined to 5,000 in 1983 (Rodgers & Swai 1988) and 1,400 in 1995 (Williams et al. 1996). It is now probably even smaller as a result of continued hunting for meat (S. Riedmiller, in litt. March 1998). The Kenyan population in Arabuko-Sokoke is probably even closer to extinction. This duiker is undoubtedly among the most threatened antelope species.

Captive Population: No Aders' duikers are known to be held in captivity, but a translocation programme to Chumbe Island is being initiated (see p. 39).

The Future: If current trends continue, the remaining populations of Aders' duiker (Appendix 4) will decline to extinction in the short to medium term. This highlights the urgency of implementing effective conservation measures for this species.

**Bay Duiker**
*Cephalophus dorsalis* Gray 1846

RED LIST STATUS
Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund., | Trend | Popn/Abund. | Trend |
| Guinea-Bissau | - | - | R | D | R | D |
| Guinea | X | ? | R | D | R | D |
| Sierra Leone | U/R | D | R | D | R | D |
| Liberia | C | ? | X | ? | X | ? |
| Ivory Coast | U | S/D | - | - | U | S/D |
| Ghana | c | S | - | - | C | S |
| Togo | R | D | - | - | R | D |
| Nigeria | U/R | S/D | X | D | U/R | S/D |
| Cameroon | Ab/C | S/D | X | D | C | D |
| CAR | C | S | C | S/D | c | S/D |
| Equ. Guinea | C | I | C | D | c | D |
| Gabon | C | S | C | S | c | S |
| Congo-Brazz. | C/U | S/D | X | S/D | C/U | S/D |
| Congo-Kinshasa | Ab/C | S | X | S/D | c | S/D |
| Uganda | - | - | - | - | Ex | - |
| Angola | - | - | X | D | X | D |

OVERVIEW OF CONSERVATION STATUS

Guinea-Bissau: The occurrence of this species in Guinea-Bissau was established during the detailed wildlife surveys conducted with technical assistance from CECI in 1988-89. It was found to occur in small numbers within forest patches in five restricted areas of the mainland, including Cacheu River and Lake Cufada. Its survival is threatened by the destruction of forests caused by the spread of agriculture and settlement.

Guinea; Recorded from closed-canopy forest in the southwest and southeast, including Mount Nimba Biosphere Reserve and Ziama and Diecke Forest Reserves. It is probably severely threatened by

*Bay Duiker (continued)*
forest destruction.

Sierra Leone: Formerly occurred widely in moist lowland forest. By the 1980s it had become confined to isolated forest patches. Some reports indicate that it depends largely on primary forest in Sierra Leone, but it has also been recorded from dense secondary forest, old farm bush and in denser forest patches on the edge of the northern savannas. There is no recent information on its status.

Liberia: Probably occurred throughout formerly. By the 1980s its distribution was increasingly restricted to the larger blocks of relatively undisturbed forest in the northwest and southeast. The 1989/90 WWF/FDA survey confirmed its general dependence on these forests, although it was recorded occasionally as a crop pest in adjoining areas of farm bush. It was locally common, as reflected in its occurrence as the third most frequent wildlife species in bushmeat sales. There is no recent information on its status.

Ivory Coast: Formerly widespread and common in the southern forests and occurred locally within forest patches in the northern and central savannas. It has suffered substantial reduction of its range and fragmentation of its population and is now confined to protected areas (national parks and forest reserves). It appears to be susceptible to the destruction of primary forest and does not adapt well to young secondary vegetation, e.g., in Tai National Park it is confined to primary and old secondary forests.

Ghana: Formerly occurred throughout the moist lowland forest zone in the southwest, extending into transitional forest within the adjoining savannas. It does not appear to tolerate intensive hunting pressure or to adapt well to secondary vegetation such as highly disturbed forest, thickets and farm bush, and it has disappeared from most of its former range. This duiker is now largely confined to protected areas. It remains common and is frequently observed in the protected forests of Bia, Nini-Suhien and Kakum.

Togo: Recorded rarely in the forests of the Fazao and Togo mountains. By the mid-1980s, it was under threat from habitat destruction and meat hunting but a small population survived in Fazao National Park. These threats have escalated during the 1990s, inside and outside protected areas.

Nigeria: Known only from moist lowland forest in the southeast, to the east of the Cross River. It survives in at least some of the remaining forest blocks within its former range, including Cross River National Park.

Cameroon: It remains widespread within its historical range in the southern equatorial forests. Its numbers are probably decreasing in the southwest because of heavy hunting pressure. In Korup National Park in the southwest, for example, it is common but noticeably less abundant than in relatively undisturbed areas such as Dja and Lobeke in the southeast.

Central African Republic: It remains widespread and common in the southwestern forests. Its presence has recently been confirmed in Bangassou Forest in the southeast, where it is abundant.

Equatorial Guinea: Formerly occurred throughout Mbini. It remains widespread and common in forested areas and is the most frequent medium-sized or large duiker species in bushmeat. Its overall numbers are decreasing as hunting pressures increase. It is well represented in Monte Alen National Park and occurs in all of the other designated protected areas in Mbini.

Gabon: Formerly occurred in forests throughout the country and remains very widespread. It is common in many areas, e.g., Minkebe Forest and the Lope Reserve. It seems to be more adaptable to human presence than the other species of medium-sized "red" duikers which occur in Gabon, possibly because it more readily enters secondary vegetation or more likely because its solitary, nocturnal habits facilitate its survival near villages.

Congo-Brazzaville: Formerly occurred widely in forests. It retains much of its historical distribution and remains common in the northern forests, with populations stable in areas such as Odzala National Park and the adjoining reserves and Nouabale-Ndoki National Park and the contiguous Kabo Forest. Overhunting has greatly reduced its numbers in the south, but its nocturnal habits enable it to withstand hunting pressure better than diurnal medium-sized and large duikers. In the Kouilou region in the southwest, for example, although its numbers are greatly reduced it occurs more widely than most other medium-sized "red" duiker species. The bay duiker's presence was recently confirmed in the forest-savanna mosaic of Lefini Faunal Reserve in the southeast.

Congo-Kinshasa: Formerly occurred widely in the equatorial forest zone and recorded from montane forest in the east. It probably remains widespread within this extensive range. It is common in and around Salonga National Park and common/abundant in stable populations in and around Maiko and Kahuzi-Biega National Parks and Okapi Faunal Reserve. It occurs at lower densities in the Semliki Forest in the north of Virunga National Park. It is often the most frequent medium-sized or large duiker species in bushmeat, e.g., on both sides of the Congo (Zaire) River in the Kisangani region.

Uganda: There is a single record from western Uganda, from an area which is now densely cultivated. It no longer occurs in the country.

Angola: Formerly occurred locally in forests in northern Angola, including Cabinda. No recent information on its status.

SUMMARY
The bay duiker formerly occurred throughout the equatorial lowland forests of West and Central Africa, extending to a limited extent into forest patches in the adjoining forest-savanna mosaic. It shows a preference for high primary rainforest (Kingdon 1997) and has probably suffered more than most other duiker species from the widespread degradation and destruction of primary forest. This applies particularly in West Africa, where forest destruction is most advanced and the bay duiker is now generally uncommon or rare except in a few protected areas such as Sapo (Liberia) and Bia, Nini-Suhien and Kakum (Ghana).

It remains widespread and locally common within and outside protected areas in Central Africa, with important populations in areas such as Campo, Dja and Lobeke (Cameroon), Dzanga-Sangha and Bangassou (Central African Republic), Monte Alen (Equatorial Guinea), Lope, Minkebe and other forests (Gabon), Odzala and Nouabale-Ndoki-Kabo (Congo-Brazzaville) and Ituri, Kahuzi-Biega, Maiko and Salonga (Congo-Kinshasa). Its numbers are generally stable in these areas.

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km where it is known to be common/abundant and 0.2 per sq km elsewhere (see p. 92), and an area of occupancy of 880,000 sq km from the information in Appendix 4, gives an estimated total population of 725,000. While its numbers are generally stable in the less disturbed forests where hunting pressures are relatively low, its overall numbers are in decline because of loss of habitat and overhunting for meat in other parts of its range.

The Future: The bay duiker's nocturnal habits tend to make it less susceptible to hunting pressure than diurnal medium-sized duikers. On the other hand, its generally high level of dependence on relatively unmodified forest probably makes it more susceptible to forest destruction. It may therefore be particularly vulnerable to the effects of increasing human colonisation of the equatorial forest zones of Africa. If current trends continue, it is likely to suffer a substantial decline in its distribution and numbers until its survival is threatened. Its long-term future will be closely linked to the preservation of substantial areas of relatively unmodified equatorial forest.

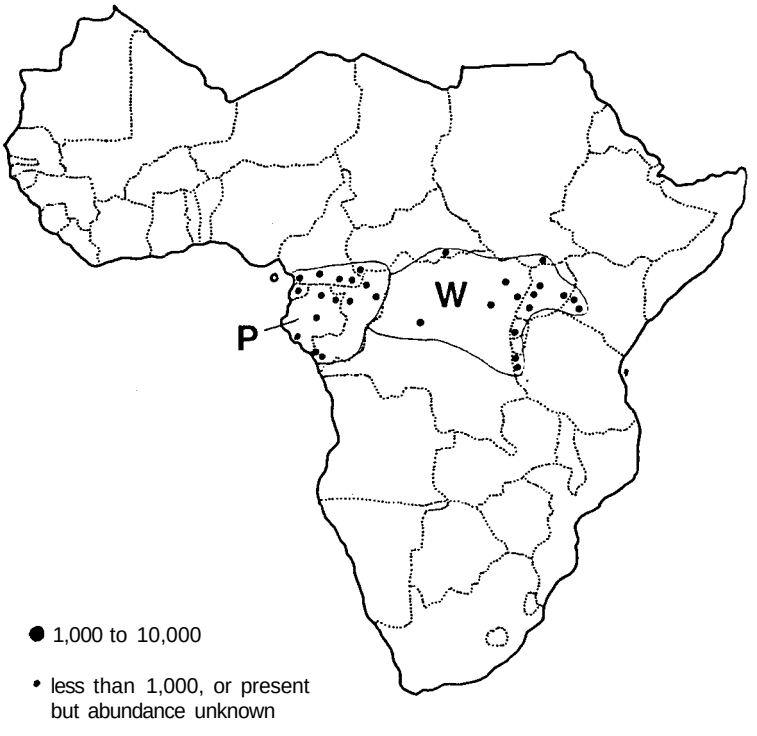
## Peters' Duiker

*Cephalophus callipygus* Peters 1876

RED LIST STATUS
Lower Risk (near threatened)

SUBSPECIES
P: nominate subspecies (C. *c. callipygus*)
W: Weyns' duiker (*C. c. weynsi*)

Status of Subspecies
nominate subspecies: Lower Risk (near threatened)
Weyns' duiker: Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Nominate Subspecies | | | | | | |
| Cameroon | C | S/D | X | D | C | S/D |
| CAR | C | S | C | S/D | C | S/D |
| Equ. Guinea | Ab | S | U | D | U | D |
| Gabon | C | S | C | S | C | S |
| Congo-Brazz. | C/U | S/D | X | S/D | C/U | S/D |
| Wevns' Duiker | | | | | | |
| CAR | - | - | C | ? | C | ? |
| Congo-Kinshasa | Ab/C | S | X | D | C | S/D |
| Sudan | - | - | R | ? | R | ? |
| Uganda | C | S | ? | ? | C | S |
| Kenya | X | ? | X | ? | X | ? |
| Tanzania | R | ? | - | - | R | ? |
| Rwanda | R | D | - | - | R | D |

OVERVIEW OF CONSERVATION STATUS

Cameroon: Peters' duiker is widespread within its historical range in the south and southeast, to the south of the Sanaga River. It may also occur immediately north of the Sanaga, where it has been recorded in the past. It is common in the Dja Reserve and especially abundant in both primary and exploited forest in the Lobeke region in the southeast, where it appears to be the most numerous of the medium-sized duiker species.

Central African Republic: Attains high densities in Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park in the southwest, where it tends to be the most numerous medium-sized

duiker, and Bangassou Forest in the southeast. Its populations may be decreasing in other areas with greater human population densities as a result of hunting for meat. The nominate subspecies occurs in the southwest but the subspecific status of the Bangassou population (treated here as Weyns' duiker) is uncertain.

Equatorial Guinea: Formerly occurred throughout Mbini. It has been eliminated from substantial parts of its former range by hunting and the expansion of agriculture and is now largely associated with the remaining blocks of relatively undisturbed forest. There is a good population in Monte Alen National Park.

Gabon: The nominate subspecies probably occurred formerly throughout Gabon. It remains very widespread in primary forest and in logged forest with dense undergrowth. It is common in stable populations in areas such as the Lope Reserve, but its diurnal habits make it relatively susceptible to hunting pressure near settlements.

Congo-Brazzaville: The nominate subspecies formerly occurred widely in the forests of the northern half of the country and in the southwest. It remains widespread in the north where it is common/abundant in and around protected areas (Odzala, Nouabale-Ndoki-Kabo, Lake Tele-Likouala-aux-Herbes) and tends to be the most numerous of the medium-sized "red" duiker species. Its diurnal habits make it relatively susceptible to hunting with shotguns, and it is now rare and continuing to decline in the south, e.g., in the Kouilou Basin, Mayombe Forest and Conkouati Faunal Reserve.

Congo-Kinshasa: Weyns' duiker has been recorded from widespread localities in the lowland forests and more locally in the eastern montane forests. It probably still occurs widely in the vast equatorial forest zone. It is common/abundant and its populations are generally stable in Salonga and Maiko National Parks and Okapi Faunal Reserve. Elsewhere its numbers are probably decreasing in intensively hunted areas near villages, roads and rivers.

Sudan: Weyns' duiker occurs in montane forest on the Imatong and Dongotona Mountains in the southeast. No recent information on its status.

Uganda: Weyns' duiker occurs in most protected areas (mainly forest reserves) which contain low and medium altitude forest. It is locally common in areas such as Kibale Forest National Park and Budongo Forest Reserve.

Kenya: Weyns' duiker reaches the eastern limits of its continental distribution in western Kenya, where it is known from Mount Elgon and Kakamega Forest. The "red" duiker of the Mau Escarpment forest is also treated as Weyns' duiker for the purposes of this compilation, but this identification is unconfirmed. It has probably benefitted from recent improvements to the protection of Mount Elgon National Park and Forest Reserve and Kakamega Forest National Park by KWS and the Kenya Forest Department.

Tanzania: Recorded from Gombe Stream and Mahale Mountains National Parks in the west. No recent information on its status in these areas.

Rwanda: Weyns' duiker occurs in Nyungwe Forest Reserve, where it is threatened by uncontrolled poaching and habitat destruction.

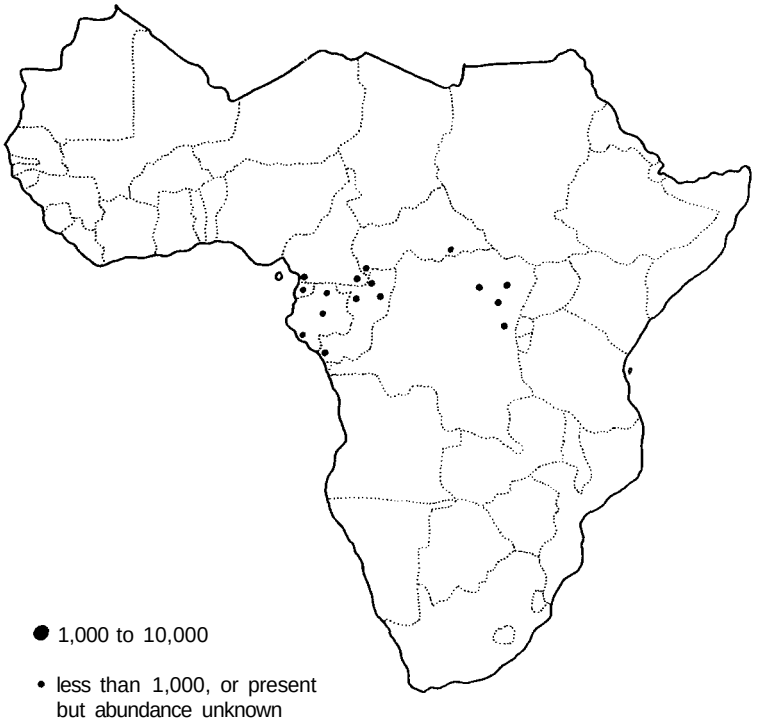
SUMMARY
This duiker formerly occurred throughout the equatorial forests of Central Africa from Cameroon to western Kenya. It remains widespread and locally common and is probably favoured by logging activities in some areas because of its preference for dense undergrowth. On the other hand, its diurnal habits make it relatively susceptible to the increases in hunting pressure which often accompany the opening up and human colonisation of the forest. It is frequently the most abundant medium-sized duiker species in undisturbed areas, but its populations are generally reduced to very

*Peters' Duiker (continued)*
low levels where hunting pressure is high.

Major and generally stable populations occur in areas such as Dja and Lobeke (Cameroon), Dzanga-Sangha and Bangassou (Central African Republic), Monte Alen (Equatorial Guinea), Lope, Minkebe and other relatively undisturbed forests (Gabon), Odzala, Nouabale-Ndoki and Lake Tele-Likouala (Congo-Brazzaville), the Okapi reserve, Maiko and Salonga (Congo-Kinshasa) and Kibale Forest (Uganda).

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km where it is known to be common or abundant and 0.2 per sq km elsewhere (see p. 92), and an area of occupancy of 755,000 sq km from the information in Appendix 4, gives an estimated total population of 570,000. This includes an estimated 382,000 of the nominate subspecies and 188,000 Weyns' duikers. Population trends are generally stable in the core areas of its range where human densities are low, but declining elsewhere as meat hunting increases.

The Future: This species is likely to be eliminated eventually from large parts of its current range as the human population of the Central African forest zone expands and increases. Even if all of the protected areas in which it occurs are effectively protected and maintained, these areas represent only 18% of the species' estimated current area of occupancy.




## White-bellied Duiker

*Cephalophus leucogaster* Gray 1 873

RED LIST STATUS
Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Cameroon | U | S/D | X | D | X | D |
| CAR | U | S | R | D | U/R | S/D |
| Equ. Guinea | R | ? | U/R | D | U/R | D |
| Gabon | C | S | C | S | C | S |
| Congo-Brazz. | R | S/D | X | D | R | S/D |
| Congo-Kinshasa | Ab/C | S | X | D | X | S/D |

OVERVIEW OF CONSERVATION STATUS

Cameroon: Recorded from high forest south and immediately north of the Sanaga River in the south and southeast. It occurs in areas such as Campo and Lobeke and probably remains widespread within its historical range, but generally in smaller numbers than other medium-sized duiker species. In the Lobeke region in the southeast, for example, it appears to be the least abundant medium-sized duiker.

Central African Republic: Occurs in moist lowland forests in the southwest and southeast. It is uncommon and much less numerous than Peters' duiker or the bay duiker in .Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park in the southwest, where its numbers are probably stable. Its populations may be decreasing elsewhere because of meat-hunting and habitat destruction, e.g., in Bangassou Forest in the southeast where it is rare.

Equatorial Guinea: Recorded from Monte Alen National Park and other forested areas of Mbini, where it generally appears to be rare. It occurs at low frequencies in bushmeat. Its survival is probably threatened outside protected areas by uncontrolled hunting and forest degradation.

Gabon: It remains widespread within Gabon's extensive forests, at least in the northern half of the country, generally at lower densities than Peters' and bay duikers. It appears to be locally common

*White-bellied Duiker (continued)*
in gallery forests and forest patches within the savannas in the northern part of the Lope Reserve and in mature closed-canopy forest in the south of this reserve.

Congo-Brazzaville: Formerly occurred widely in forests in the north and southwest. It probably still occurs widely in the northern forests and is common in the Mbomo-Sembe area in the northwest, but it generally appears to be less abundant than other species of medium-sized "red" duikers. It is rare in Odzala National Park and Kabo Forest. It may have been affected adversely by habitat modifications resulting from logging in the latter area. It is now extremely rare in the south, and its numbers continue to decrease in areas such as the Kouilou Basin, Mayombe Forest and Conkouati Faunal Reserve.

Congo-Kinshasa: Probably still occurs widely in its historical range within lowland equatorial forests in the northwest, north and northeast, to the north and east of the Congo (Zaire) and Lomami Rivers. It is possible that it also occurs rarely to the south of the Congo River, e.g., to the west of Salonga National Park, but this is unconfirmed. It appears to be among the least abundant duiker species in some regions, e.g., in bushmeat samples in villages east and south of Kisangani. It is common/abundant in at least a few areas, e.g., in lowland forests in and around Kahuzi-Biega National Park, and in *Gilbertiodendron* forests in Maiko National Park and Okapi Faunal Reserve. Its numbers are probably decreasing in more intensively hunted areas in the vicinity of settlements and roads.

SUMMARY
The white-bellied duiker formerly occurred widely in the equatorial forest zone to the north of the Congo River, from Cameroon to eastern Congo-Kinshasa. It generally occurs at lower densities than other medium-sized duikers, although it is common in some areas, e.g., the Lope Reserve (Gabon) and Kahuzi-Biega National Park, Okapi Faunal Reserve and Maiko National Park (Congo-Kinshasa). It appears to prefer monodominant stands of *Gilbertiodendron* forest in areas such as Nouabale-Ndoki in Congo-Brazzaville and Ituri and Maiko in Congo-Kinshasa (Hart & Sikubwabo 1994).

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km where it is known to be common/abundant and 0.2 per sq km elsewhere (see p. 92), and an area of occupancy of 395,000 sq km from the information in Appendix 4, gives an estimated total population of 287,000. Like most other duikers of the Central African lowland equatorial forests, its numbers are generally stable in areas remote from settlement but decreasing elsewhere because of forest degradation and overhunting for meat.

The Future: Since it frequently occurs at relatively low densities compared to other medium-sized duikers, the white-bellied duiker may be particularly susceptible to the increases in meat hunting pressure which accompany the expansion of human settlement in the equatorial forests. If current trends continue, this species will become increasingly restricted to areas where pressures of forest degradation and hunting are low. Protected areas in which it is known to occur comprise about 20% of its estimated area of occupancy. While some of these areas receive moderate to high levels of protection and management, e.g., Dzanga-Sangha-Dzanga-Ndoki, Monte Alen, Lope, Odzala and Nouabale-Ndoki, others offer little or no protection against the expansion of logging, settlement and meat hunting.

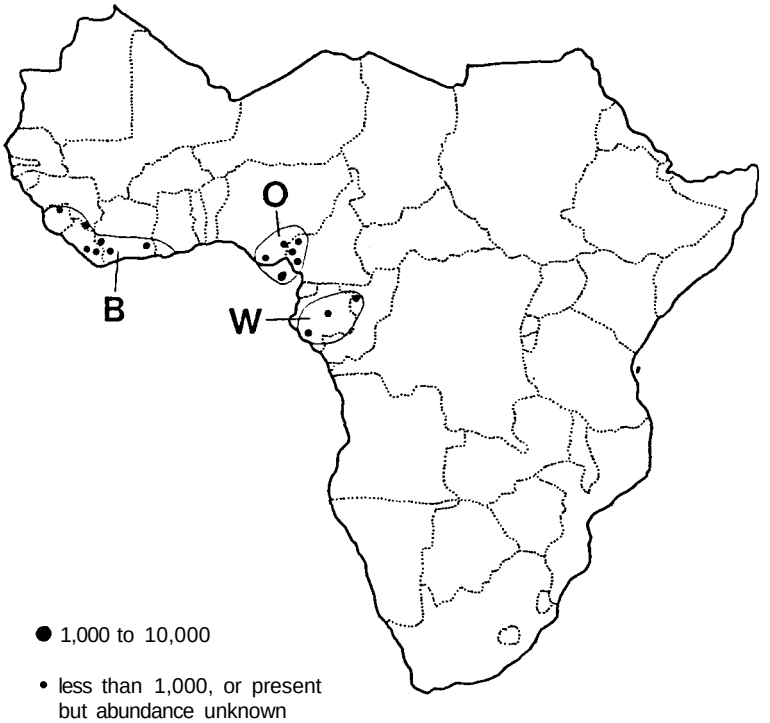
## Ogilby's Duiker

*Cephalophus ogilbyi* (Waterhouse 1838)

RED LIST STATUS
Lower Risk (near threatened)

SUBSPECIES
B: Brooke's duiker (*C. o. brookei*)
0: nominate subspecies (C. *o. ogilbyi*)
W: white-legged duiker (*C. o. crusalbum*)

Note: The ASG follows Grubb et al. (in press) in considering southeastern Nigeria, southwestern Cameroon and Bioko Island (Equatorial Guinea) as the range of *C. o. ogilbyi.* Kingdon (1997) treated the nominate subspecies as confined to Bioko and regarded the Nigeria/Cameroon border specimens as *C. o. brookei.* Grubb et al. (in press) considered that Brooke's duiker is sufficiently distinct to warrant full species status.




Status of Subspecies
Brooke's duiker: Vulnerable
nominate subspecies: Lower Risk (near threatened)
white-legged duiker: Lower Risk (near threatened)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| Country | Protected Areas Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|
| Nominate Subspecies | | | | | | |
| Nigeria | R | S/D | U/R | S/D | U/R | S/D |
| Cameroon | U | S/D | X | S/D | U | S/D |
| Equ. Guinea (Bioko) | - | - | C | D | C | D |
| Brooke's Duiker | | | | | | |
| Guinea | X | S/D | - | - | X | S/D |
| Sierra Leone | R | D | - | - | R | D |
| Liberia | U/R | ? | X | ? | U/R | ? |
| Ivory Coast | U/R | S/D | - | - | U/R | S/D |
| Ghana | ? | ? | - | - | ? | ? |
| White-leaaed Duiker | | | | | | |
| Gabon | C | S | U | S | C/U | S |
| Congo-Brazz. | ? | ? | X | ? | X | ? |

OVERVIEW OF CONSERVATION STATUS

Guinea: The suspected occurrence of this species in southeastern Guinea seems to have been confirmed by a recent record from the area of the Ziama-Diecke Forest Reserves, although this cannot be taken as definite until a specimen has been examined.

Sierra Leone: There are few confirmed records of this species from Sierra Leone and it may have

*Ogilby's Duiker (continued)*
always been rare and localised. In the 1980s it was reported from Outamba-Kilimi National Park, where it was threatened by habitat destruction and hunting for bushmeat. There is no recent information on its status.

Liberia: Details of this species' current and former distribution are scarce. It was observed in and around Sapo National Park and Krahn-Bassa National Forest in the early 1 980s, and the 1989/90 WWF/FDA survey obtained records of several specimens from Grebo National Forest. These specimens were obtained from areas with a mix of high forest and logged forest, or high forest and secondary forest. Ogilby's duiker is easily confused with the bay duiker and it probably occurs more widely within Liberia's major forest blocks than the available records indicate. There is no recent information on its status.

Ivory Coast: The presence of Brooke's duiker has been confirmed in Tai National Park, forest reserves contiguous with this park, and Cavally-Gouin Forest Reserve in the southwest. It is suspected to occur in Songan-Tamin-Mabi-Yaya Forest Reserves in the southeast. It may also occur or have formerly occurred in other parts of the southern forests. It is rarely observed but appears to prefer primary forest, e.g., in Tai National Park it occurs mainly in primary forest and seems to be very rare in highly modified secondary forest.

Ghana: Recorded from moist lowland forest in the southwest. Very little is known about this species' former distribution and abundance in Ghana. There is no definite confirmation of its continued presence, but recent observations by Ghana Wildlife Department staff indicate that it may survive in very small numbers in the protected forests of Kakum-Assin Attandanso, where it has been recorded historically, and Nini-Suhien-Ankasa. It has disappeared from Bomfobiri and Owabi Wildlife Sanctuaries where it occurred formerly.

Nigeria: Restricted to moist lowland forest in the southeast, where it survives in some of the remaining forest blocks including Cross River National Park. Its known range was extended to the west of the Cross River by the recent discovery of a population in Upper Orashi Forest Reserve on the eastern flank of the Niger Delta.

Cameroon: Known only from forests in the southwest, where it is reasonably common in a few areas such as Korup National Park and the Etinde Forest on the southwestern side of Mount Cameroon. It is uncommon and declining elsewhere because of intense hunting pressure, mainly by snaring. Hunting pressure within Korup National Park is lower but still significant, but this duiker's population within the park seems to be more or less holding its own. Anti-poaching efforts through the WWF Korup project have reduced poaching pressures in some parts of the national park and the park's infrastructure is becoming relatively well developed, but voluntary relocation of several villages which are currently within Korup National Park has yet to take effect.

Equatorial Guinea: Occurs in forested areas of Bioko Island. It probably formerly occupied all of Bioko. Although it is a favourite target of bushmeat hunters it still occurs over more than half of the island, primarily in relatively undisturbed areas some distance from places of high human density. In the absence of all other species of medium-sized and large duikers on Bioko, Ogilby's duiker appears to reach unusually high densities in areas where hunting is infrequent or absent. It is not only present in lowland forest but also in the island's montane forest (800-1,400 m) and in the higher altitude *Schefflera* forest zone, habitats which are normally occupied by other duiker species on the mainland. The offtake of Ogilby's duiker by bushmeat hunters on Bioko appears to have reached unsustainable levels but it is still common in the island's designated protected areas, especially Gran Caldera de Luba. Effective management of these areas for conservation would be of international importance for improving the conservation status of this duiker.

Gabon: The white-legged duiker was first collected and described from western Gabon. It is now known to have a less restricted distribution than previously thought. Within the Gamba protected area complex, its presence has been confirmed in the Moukalaba and Petit Loango Faunal Reserves,

Iguela Hunting Zone and the proposed Monts Doudou Faunal Reserve, and it is probably fairly common in this complex. It is common in forest patches within the forest-savanna mosaic of the northern part of the Lope Reserve and in the adjoining Foret des Abeilles, and it is the most abundant of the medium-sized duikers in southern Lope. It also occurs in the area of Lastoursville and Koulamoutou, east-southeast of the Lope Reserve, and it may occur in north-central and northwestern Gabon. Its numbers are generally stable.

Congo-Brazzaville: The occurrence of the white-legged duiker has recently been confirmed in the northwest, to the west of Odzala National Park. Specimens have also been observed in the Brazzaville bushmeat market, which suggests that it may occur in areas such as Chaillu Forest in the southwest.

SUMMARY
Ogilby's duiker is known from three separate localities within the equatorial forest zone: Sierra Leone to Ghana (Brooke's duiker), Nigeria, Cameroon and Bioko Island (nominate subspecies) and Gabon and Congo-Brazzaville (white-legged duiker). It appears to be a high forest duiker (Kingdon 1997) and is found mainly in primary forest. Brooke's duiker has probably suffered a severe reduction in its distribution and numbers because of habitat destruction and hunting for bushmeat. It is now known to exist in reasonable numbers in only a few areas, such as Sapo National Park and some other forests in eastern Liberia and Tai National Park in southwestern Ivory Coast. The mainland population of the nominate subspecies is undergoing similar decline and fragmentation of its range and has only a few remaining strongholds, e.g., Korup National Park (Cameroon), but this subspecies is relatively numerous on Bioko Island (Equatorial Guinea). Information on the status of the mainland populations of *C. o. ogilbyi* and *C. o. brookei* is qualified by the difficulty of distinguishing them from the more common bay duiker in the field. The distinctive white-legged duiker is now known to be relatively widespread and numerous in Gabon, including protected areas such as Lope and Gamba, and it also occurs in adjoining Congo-Brazzaville.

Estimated Total Numbers: Assuming average population densities of 10.0 per sq km on Bioko Island, 2.0 per sq km in other areas where the species is known to be common and 0.2 per sq km elsewhere (see p. 92), and an area of occupancy of 81,000 sq km from the information in Appendix 4, gives an estimated total population of 35,000. This suggests a population of the order of magnitude tens of thousands for the species as a whole and includes an estimated 5,000 Brooke's duikers, 12,000 *C. o. ogilbyi* and 18,000 white-legged duikers. Populations are probably decreasing throughout the ranges of Brooke's duiker and the nominate subspecies, with a few possible exceptions such as Korup National Park and the western section of Tai National Park. The white-legged duiker's numbers are probably stable in considerable parts of its range in Gabon and northwestern Congo-Brazzaville where human population densities are very low.

Captive Population: No specimens of Ogilby's duiker are known to be held in captivity.

The Future: This species' restricted distribution and relatively high level of dependence on mature forest compared to most other duiker species make it particularly susceptible to the effects of habitat degradation and destruction and overhunting. If current trends continue, the status of Brooke's duiker and the nominate subspecies will decline further on the African continent and Bioko Island, until both subspecies are threatened with extinction and/or confined to a few effectively protected areas such as Tai and Korup. Development of the Gran Caldera de Luba protected area on Bioko Island would be of major significance to the long-term survival of Ogilby's duiker.

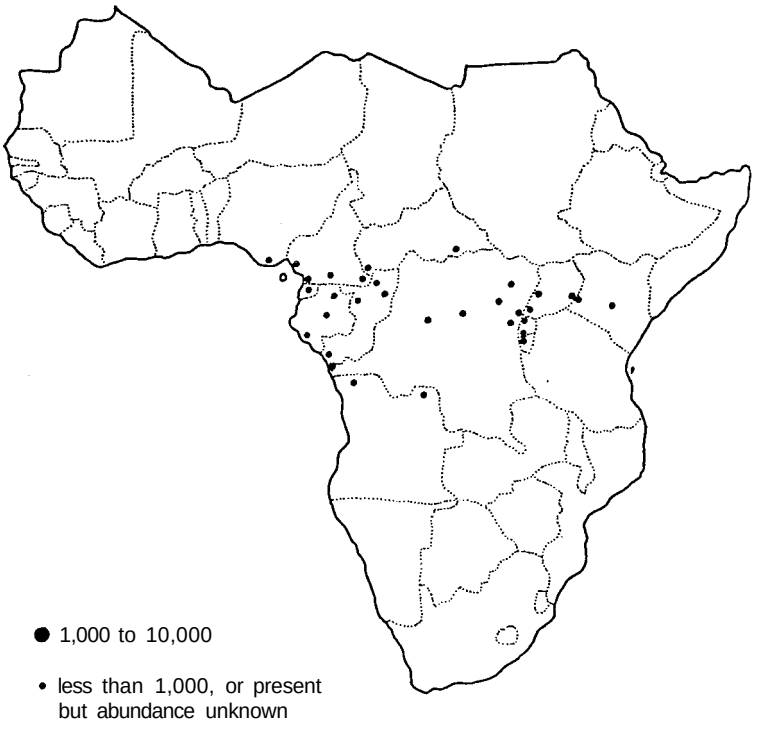
The white-legged duiker is under less immediate threat than the other two subspecies and will probably persist in significant numbers as long as its range remains thinly populated. Increasing human occupation of its distribution in Gabon and Congo-Brazzaville may eventually reduce it to protected populations in areas such as Lope and Gamba.

## Black-fronted Duiker

*Cephalophus nigrifrons* Gray 1871

RED LIST STATUS
Lower Risk (near threatened)

SUBSPECIES
A highly distinctive subspecies, the Rwenzori black-fronted duiker (C. *n. rubidus*), which may be a separate species, occurs in the alpine and subalpine zones of the Rwenzori Mountains on the Uganda/ Congo-Kinshasa border. This subspecies is classed as Endangered.




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Nigeria | - | - | U | S/D | U | S/D |
| Cameroon | C/U | S/D | X | D | C/U | S/D |
| CAR | C/U | S | C | S/D | C/U | S/D |
| Equ. Guinea | U/R | S | ? | ? | U/R | S |
| Gabon | X | S | U | S/D | U | S/D |
| Congo-Brazz. | C/U | S/D | X | S/D | C/U | S/D |
| Congo-Kinshasa | c | S | X | D | C | S/D |
| Uganda | C/U | S | - | - | C/U | S |
| Kenya | U/R | S | - | - | U/R | S |
| Rwanda | C/U | S | - | - | C/U | S |
| Burundi | U/R | ? | - | - | U/R | ? |
| Angola | - | - | X | D | X | D |

OVERVIEW OF CONSERVATION STATUS

Nigeria: Unknown from Nigeria prior to its recent discovery in the forests of the south-central Niger Delta. It probably occurs elsewhere in the Delta, e.g., in the west. It is common in some parts of the Delta, including the proposed Apoi Creek Forest Reserve. The Nigerian population is probably disjunct from the nearest known population in Cameroon.

Cameroon: Occurs in high forest in the south and southeast, south of the Sanaga River, mainly in marshy areas, and in montane forest in the southwest. Its survival is probably threatened by hunting and habitat destruction in the relatively densely populated southwest. It remains widespread and locally common within suitable poorly drained habitat in the south and southeast. It is particularly common in the Lobeke region in the southeast.

Central African Republic: Occurs in good numbers in swamp forest and forest with permanently

saturated soils in the southwest and southeast. It is fairly frequently encountered along all streams throughout Dzanga-Sangha Dense Forest Reserve and Dzanga-Ndoki National Park in the southwest. It is particularly common in the Sangha River area in the western part of the Ndoki sector of the national park, where there is a large number of marshy clearings. Its numbers appear to be stable in the southwestern protected areas and Bangassou Forest in the southeast, but may be decreasing in other areas with higher human populations and greater hunting pressures for bushmeat.

Equatorial Guinea: The suspected occurrence of this species in Equatorial Guinea has recently been confirmed in Monte Alen National Park, where it occurs at low densities. It may also occur elsewhere on the mainland (Mbini).

Gabon: In addition to its localisation to suitable streamside habitats, the black-fronted duiker appears to have a restricted distribution within Gabon. It is known to occur in Minkebe Forest and other areas in the northeast. It appears to be locally common within the extensive swamps and seasonally inundated forests in the Petit Loango reserve within the Gamba protected area complex in the southwest. It also occurs to the south of, and probably within, the Lope Reserve. Its overall numbers are gradually decreasing with increasing human access to remote areas and the growth of organised commercial meat-hunting for urban markets.

Congo-Brazzaville: Formerly occurred widely in streamside and swampy habitats in the northern and southwestern forests. It still occurs over much of its historical range and is locally common in the north. It appears to be the most numerous medium-sized duiker species in the Lake Tele-Likouala area, where there are extensive areas of pristine, permanently or seasonally inundated forests and swamps. It is common in Nouabale-Ndoki National Park and the adjoining Kabo Forest, where its numbers are stable. Intensive hunting for meat continues to reduce its populations throughout the south of the country, but it remains common in the extensive swamps and flooded forests of Conkouati Faunal Reserve. It is one of only three duiker species (together with the blue and bay duikers) that still occur reasonably widely in southern regions such as the Kouilou Basin.

Congo-Kinshasa: Formerly occurred widely in swamp forests within the equatorial forest zone and in montane forest in the east. It remains widespread and locally common, e.g., in Salonga, Maiko and Kahuzi-Biega National Parks and Okapi Faunal Reserve. It also occurs in the three separate areas of montane forest within Virunga National Park, viz., the western side of the Rwenzori Mountains, the isolated Mount Tshiaberimu to the northwest of Lake Edward, and the Congo section of the Virunga volcanoes. The subspecies *C. n. rubidus* presumably occurs on the section of the Rwenzori Mountains which lies within Virunga National Park, but the presence of this form within the Democratic Republic of Congo has not been confirmed. The black-fronted duiker's habitat on Mount Tshiaberimu has been affected adversely by extensive agricultural encroachment and this population has been reduced by heavy hunting pressure from surrounding, high-density settlements. Populations of this species are decreasing for similar reasons in other densely settled and intensively hunted regions, but it probably still occurs in large numbers in the vast, sparsely inhabited swamp forests of the central Congo basin.

Uganda: Known only from montane areas, viz., Mount Elgon, Rwenzori Mountains, Bwindi-Impenetrable Forest and Mgahinga Gorilla National Parks. The improved conservation status of these four areas, all of which were elevated to national park status in the early 1990s, has enhanced this species' survival prospects in Uganda. In the Bwindi-Impenetrable Forest, for example, it is once again common and its numbers are increasing as a result of reduced poaching pressure. The black-fronted duiker from the subalpine and alpine zones of the Rwenzori Mountains (*C. n. rubidus*) may be a separate species (Kingdon 1982, 1997). The Rwenzori black-fronted duiker's status has been assessed as Endangered because of the severe illegal hunting pressure which occurred throughout its range from the 1960s to the early 1990s and the lack of effective protection. This duiker's range is now included in Rwenzori Mountains National Park. The conservation and tourism infrastructure has improved substantially since this park was established in 1991, but no recent information is available on the status of Rwenzori's wildlife populations.

*Black-fronted Duiker (continued)*

Kenya: Known only from montane forest, bamboo and moorland on Mounts Elgon and Kenya and the Aberdares. There are no recent records from the Aberdares but it survives in Mount Kenya and Mount Elgon National Parks. It is common on Mount Kenya. No recent information is available on its abundance on Mount Elgon.

Rwanda: Formerly occurred throughout the montane forests of western Rwanda but now restricted to Volcanoes National Park, where it is common in the forest, bamboo and subalpine vegetation zones, and Gishwati and Nyungwe Forest Reserves.

Burundi: Formerly occurred widely in the montane forests of the Congo-Nile Divide in the northwest and west. it has been eliminated from most of its former range by habitat destruction and meat hunting, but it survives in Kibira National Park. No recent information is available on its status.

Angola: Formerly occurred locally in forests in northern Angola, including Cabinda. No recent information on its status.

SUMMARY

The black-fronted duiker occurs widely in swamp forests and alongside watercourses within the equatorial forest zone, from Nigeria to eastern Congo-Kinshasa, and in isolated montane forests in East Africa. Like most other forest duikers, the distribution and numbers of this species have been reduced markedly in areas of dense human settlement and intensive hunting for bushmeat, but it survives in good numbers in areas where the level of human activities is relatively low. This includes areas such as Lobeke (Cameroon), Dzanga-Sangha and Bangassou (Central African Republic), Lake Tele-Likouala and Nouabale-Ndoki (Congo-Brazzaville), Virunga, Ituri, Maiko, Kahuzi-Biega and Salonga (Congo-Kinshasa), Bwindi (Uganda), Volcanoes National Park (Rwanda) and Mount Kenya. Most of these key populations are stable. The Ugandan range of the Rwenzori black-fronted duiker is included within Rwenzori Mountains National Park.

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km in areas where the species is known to be common/abundant and 0.2 per sq km elsewhere (see p. 92), and an area of occupancy of 513,000 sq km from the information in Appendix 4, gives an estimated total population of about 300,000. Population trends are probably downwards over large parts of the species' range, except for areas where hunting pressures are low because of low human population densities and/or active protection. Estimates of this species' population densities in montane and submontane habitats in Volcanoes National Park, Rwanda (Plumptre & Harris 1995) suggest that the population of the Rwenzori black-fronted duiker may number at least in the thousands.

Captive Population: No black-fronted duikers are known to be held in captivity.

The Future: This species' numbers will continue to decrease as human populations and bushmeat hunting increase within the equatorial forest zone. If current trends continue, it will eventually disappear from large parts of its present range until it is confined to isolated fragments of forest which are effectively protected from hunting and the encroachment of settlement. Such areas currently comprise about 12% of its estimated area of occupancy. The survival of the Rwenzori black-fronted duiker will depend on effective protection in Rwenzori Mountains National Park. This subspecies may have benefitted from recent attempts to improve the protection and management of this park.

## Harvey's Red Duiker

*Cephalophus harveyi* (Thomas 1893)

RED LIST STATUS
Lower Risk (conservation dependent)


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Ethiopia | U/R | ? | - | - | U/R | ? |
| Somalia | R | ? | - | - | R | ? |
| Kenya | C/U | S/D | x | D | C/U | D |
| Tanzania | C/U | S/D | x | D | C/U | D |

OVERVIEW OF CONSERVATION STATUS

Ethiopia: An expedition to the Harenna forest in the southern part of Bale Mountains National Park in 1986 produced positive sightings of a "red" duiker. This was the first confirmed sighting of a *Cephalophus* duiker from Ethiopia. There has also been a subsequent sighting of this duiker in the same area. While identification of the species awaits confirmation, it is considered highly likely to be Harvey's red duiker. This species occurs in southern Somalia and could have entered the Bale forests up the Juba and Genale valleys, a route which has been used by forest primates. In 1996, the presence of an unidentified species of "red" duiker was confirmed in dense bush around and north of the headquarters of Omo National Park in the southwest. The Omo population is treated as an isolated population of *C. harveyi* for the purposes of this compilation, but it could be Weyns' duiker (*C. callipygus weynsi*), which occurs in the Imatong Mountains of southeastern Sudan 400 km to the southwest of Omo, or some other, possibly undescribed form.

Somalia: Recorded from riverine habitats on the lower Shebelle and Juba Rivers and in coastal scrub and forest in the Lake Badana (Bush Bush National Park) region. By the mid-1980s, it had lost almost all of its habitat on the Juba and Shebelle Rivers to agricultural expansion and survived in only a few remaining patches of riverine forest on the lower Juba. It may now be extinct on the Juba but it probably survives in Bush Bush National Park.

Kenya: Occurs locally in central and southeastern Kenya. Its numbers are decreasing outside protected areas because of habitat destruction and hunting. It is well represented in Aberdare and

*Harvey's Red Duiker (continued)*
Mount Kenya National Parks and Forest Reserves and occurs in some other protected areas, e.g., Tana River Primate and Boni-Dodori National Reserves.

Tanzania: Occurs locally in northeastern and central Tanzania within lowland and montane forests, coastal scrub, thickets and other habitats with thick cover. Timber extraction, encroachment of settlement and uncontrolled hunting have substantially reduced its abundance in many coastal and montane forests. It continues to be heavily hunted throughout most of its range. It remains common in some protected areas, e.g., on Mount Kilimanjaro in the drier forest and lower parts of the ericaceous zone of the northern and western slopes, and in the remoter parts of the Udzungwa Mountains where hunting pressure is low. The red forest duiker of the higher altitude sections of the Udzungwas appears to differ from the typical Harvey's red duiker and may be an intermediate form with the Natal red duiker or possibly a unique, undescribed taxon.

SUMMARY
Harvey's red duiker formerly occurred widely in isolated forest patches, riverine forest, coastal thickets and montane forest in East Africa. It has lost ground to habitat destruction and intensive hunting for meat in many parts of its range, but it remains locally common. It is well represented in protected areas such as Aberdare, Mount Kenya and Boni-Dodori (Kenya) and Kilimanjaro and Udzungwa (Tanzania), most of which support stable populations.

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km in areas where the species is known to be common and 0.2 per sq km elsewhere, as for medium-sized forest-dwelling *Cephalophus* duikers (see p. 92), and a total area of occupancy of 43,000 sq km from the information in Appendix 4, gives an estimated total population of 20,000. This may be a substantial underestimate, e.g., its area of occupancy could be several hundred thousand sq km (Boitani et al. 1998). Overall population trend is downwards as pressures of habitat destruction and subsistence hunting increase with expanding human populations.

The Future: The long-term survival of Harvey's red duiker is likely to become increasingly dependent on the maintenance of viable populations within national parks and reserves which are effectively protected against habitat destruction and illegal hunting.

**Natal Red Duiker**
*Cephalophus natalensis* A. Smith 1834

RED LIST STATUS
Lower Risk (conservation dependent)


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Private Land | | Other Areas | | Total | |
|---|---|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Tanzania | C/U | S | - | - | X | D | C/U | S/D |
| Zambia | R | S/D | - | - | - | - | R | S/D |
| Malawi | U/R | S/D | - | - | - | - | U/R | S/D |
| Mozambique | >3,000 | S/D | - | - | X | D | X | D |
| South Africa | 1,500 | S/D | 1,000 | S/D | 4,000 | D | 6,500 | D |
| Swaziland | U/R | S | - | - | U/R | S | U/R | S |

OVERVIEW OF CONSERVATION STATUS

Tanzania: Occurs locally in forest patches and coastal scrub in the southeast. Its overall numbers are probably decreasing because of the general over-exploitation of forest resources in Tanzania. Its population is stable in Selous Game Reserve, where it is locally abundant within habitats such as riverine thickets but absent from extensive areas of the reserve which lack suitable habitat.

Zambia: Known only from the Nyika Plateau in the northeast. It still occurs in Nyika National Park but probably in reduced numbers because of uncontrolled poaching. Most of the plateau's surviving wildlife occurs in the adjoining national park in Malawi, where it is relatively safe from poachers.

Malawi: Formerly occurred widely in forest areas but now confined to the remaining protected forests. Apart from a small population in the forest patches of Nyika National Park, its survival is largely dependent on the status of forest reserves which contain isolates of evergreen forest. The largest population occurs in the forest patches of the relatively large South Viphya Forest Reserve in northern Malawi. It also occurs in at least six other forest reserves.

Mozambique: Formerly occurred widely in the coastal zone and in scattered localities inland. In the early 1980s it remained locally common to abundant within forest patches and thickets over much of its historical range despite being trapped widely for meat. This situation may still generally

*Natal Red Duiker (continued)*
apply. Despite the effects of the prolonged civil war of the 1980s and early 1990s and continued intensive hunting pressure, it still occurs widely along the coast with high densities in areas such as Maputo Game Reserve.

South Africa: Confined to low-lying coastal regions of KwaZulu-Natal Province and escarpment forests and lowveld riverine scrub and thicket in Mpumalanga and Northern Provinces. Large areas of its former range are no longer available to this species, e.g., much of its coastal habitat has been fragmented or destroyed by agricultural and urban development. Small, isolated populations are vulnerable to harassment and depletion by poachers and dogs, but it remains locally common where substantial areas of suitable habitat persist, e.g., in protected areas and on private land. The Natal red duiker occurs in at least 16 provincial reserves. It has been recorded in the past from Kruger National Park, where it was last sighted in 1992. Its best prospects for long-term survival lie with the larger protected populations, e.g., in Greater St. Lucia Wetland Park and Hluhluwe-Umfolozi Park in KwaZulu-Natal Province.

Swaziland; Formerly occurred widely within suitable habitat, such as riverine forest and wooded slopes in the lowveld and Lebombo uplands and on wooded valleys in the middleveld and highveld. Much of its habitat has now been destroyed, but it survives locally within and outside protected areas. It is widespread but uncommon in Mlawula Nature Reserve. It has also been recorded from Malolotja Nature Reserve.

SUMMARY
The Natal red duiker formerly occurred widely in coastal and riverine forests and thickets, escarpments and montane forests from southern Tanzania to South Africa. Despite widespread loss of habitat to the expansion of agricultural settlement and intensive hunting for meat, it remains locally common within its historical range. It is well represented in protected areas such as Selous Game Reserve (Tanzania), Maputo Game Reserve (Mozambique) and Greater St. Lucia Wetland Park (South Africa).

Estimated Total Numbers: Assuming that areas for which no population estimates are available support an average population density of 0.2 per sq km and that its total area of occupancy is > 170,000 sq km gives a total population estimate from the information in Appendix 4 of about 42,000. Actual numbers could be considerably greater, e.g., Boitani et al. (1998) estimated that this species' area of occupancy is 446,000 sq km. Population trend is gradually downwards over much of the species' range.

The Future: If current trends persist, the Natal red duiker may eventually disappear from substantial parts of its present area of occupancy, but its survival should not be threatened in the long term if it continues to be represented by healthy populations in protected areas such as Selous, Nyika, South Viphya, Maputo, St. Lucia, Hluhluwe-Umfolozi and others. A substantial part of this species' range and more than half of its estimated total population is in Mozambique. It should benefit from current attempts to rehabilitate wildlife conservation in that country.

**Black Duiker**
*Cephalophus niger* Gray 1846

RED LIST STATUS
Lower Risk (near threatened)


ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Guinea | X | ? | U | D | U | D |
| Sierra Leone | X | D | X | S/D | X | D |
| Liberia | C | ? | C | ? | C | ? |
| Ivory Coast | C/U | S/D | X | D | C/U | D |
| Ghana | C | S | C/U | S/D | C/U | S/D |
| Togo | - | - | R | D | R | D |
| Nigeria | - | - | R | D | R | D |

OVERVIEW OF CONSERVATION STATUS

Guinea: Recorded from the southwest and southeast, including Mount Nimba Biosphere Reserve and Ziama and Diecke Forest Reserves.

Sierra Leone; Formerly widespread and common. It has been eliminated from parts of its range and greatly reduced where it survives by hunting for bushmeat. It inhabits the edge of primary forest, thicket, and riverine and deciduous forest patches within savannas, and it has adapted quite well to the replacement of primary forest by farm bush. In the 1980s, it was the commonest duiker species after Maxwell's in areas such as Loma Mountains and Western Area Forest Reserves. No recent information is available on its status.

Liberia: Formerly occurred widely and still occupies a large part of its historical range. It is diurnal and was the most widely sighted and recorded duiker species during the 1989/90 WWF/FDA survey, and it was the second most frequently recorded bushmeat species after Maxwell's duiker. It appears to be the most adaptable of the medium-sized duiker species in Liberia and it was noted in a range of habitats throughout the surveyed areas. These included high forest, logged forest, secondary forest and farm bush, and it is among the most successful antelopes in colonising farm bush. The black duiker was observed to be the predominant species in the large amounts of

*Black Duiker (continued)*
bushmeat which were on sale along the main road in the Sapo National Park area in March 1997.

Ivory Coast: Formerly occurred throughout the southern forest zone and more locally in forest patches within the northern and central savannas. It still occurs quite widely within its historical range but generally in declining numbers. The widespread destruction of primary forest appears to have affected it less than species such as the bay duiker, presumably because the black duiker is more adaptable to secondary forest. In Tai National Park, for example, where it is reasonably common, it is found in both primary and secondary forests and even (rarely) in plantations. It occurs widely in other protected areas, as far north as the forest reserves adjoining Comoe National Park in the northeast.

Ghana: Formerly widespread in the southwestern forests and within forest patches in adjoining savanna areas. It now occurs much more locally in the marginal parts of its range but remains widespread and common in the southwestern forest zone. It is found in primary and secondary forests, thickets, riverine vegetation and farm bush. It is the second-most abundant forest duiker species in Ghana, after Maxwell's duiker, and it is well represented in protected areas such as Bia, Nini-Suhien and Kakum National Parks and the adjoining reserves.

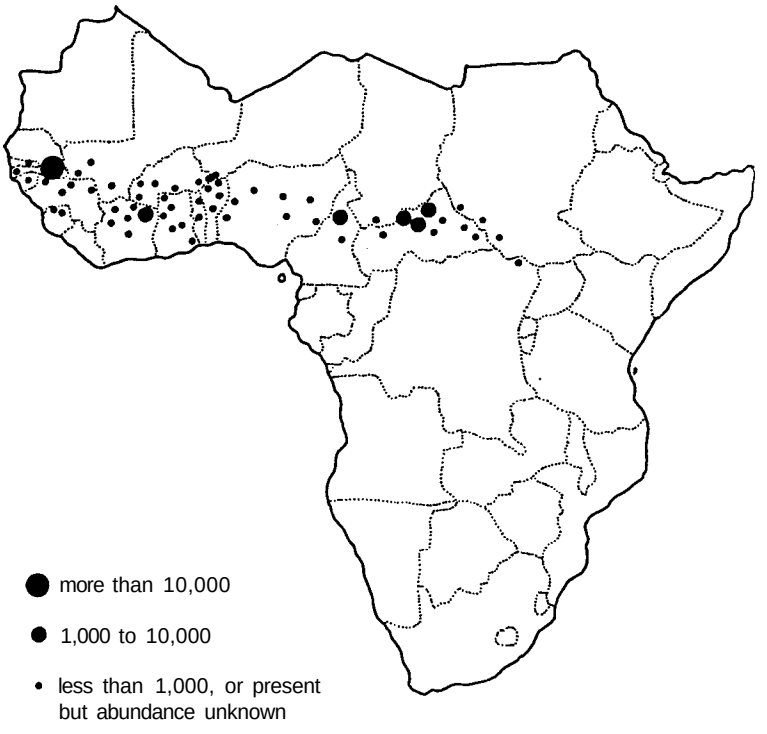
Togo: Formerly occurred in the Togo mountains along the Ghana border in the southwest, where it was reported to survive in the 1980s. Deforestation of the southwestern mountains was increasing rapidly by 1990. This plus the political and civil upheavals in Togo since 1991 make it likely that forest antelope populations have been reduced greatly in this region. The black duiker may now be close to extinction, if not already extinct.

Nigeria: Recorded from the southwestern forest zone, to the west of the Niger River. Little is known about the current or former status of this duiker in Nigeria, where it appears to have always been rare.

SUMMARY
The black duiker formerly occurred throughout the lowland rainforest of West Africa, from Guinea to southwestern Nigeria, although its former or present occurrence in Benin has not been confirmed. Its range extended into gallery forests and other forest patches in the adjoining savannas. Its adaptability to degraded and secondary forests and farm bush have enabled it to withstand the advance of settlement better than other medium-sized forest duiker species in West Africa and it still occurs quite widely within its historical range. Although it is a common component of bushmeat, it shows resilience to hunting and remains locally common. It is well represented, generally in stable numbers, in protected areas such as Sapo (Liberia), Tai (Ivory Coast) and Bia, Nini-Suhien and Kakum (Ghana).

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km where it is known to be common/abundant and 0.2 per sq km elsewhere (see p. 92), and a total area of occupancy of 206,000 sq km from the information in Appendix 4, gives an estimated total population of about 100,000. Population trend is probably gradually downwards over large parts of its range.

The Future: The black duiker is likely to persist in substantial numbers for considerably longer than most other medium-sized and large duiker species in West Africa, because of its greater tolerance of forest destruction and its resilience to bushmeat hunting. Nevertheless, it has already disappeared from the more densely settled parts of its former range. Its long-term survival will probably depend on the protection of viable populations within parks and reserves and/or management of sustainable offtake from areas set aside for bushmeat production. If current trends continue, including a complete lack of effective protection and management over most of its range, its status will eventually decline to threatened.




## Red-flanked Duiker

*Cephalophus rufilatus* Gray 1846

RED LIST STATUS
Lower Risk (conservation dependent)

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Popn/Abund. | Trend | Poon/Abund. | Trend |
| Mali | <710 | S/D | 10,000 | D | > 10,000 | D |
| Niger | <100 | D | - | - | <100 | D |
| Senegal | 40,000 | I | X | D | >40,000 | ? |
| Gambia | R | ? | R | D | R | D |
| Guinea-Bissau | - | - | C | S/D | C | S/D |
| Guinea | U | S/D | C | S/D | C/U | S/D |
| Sierra Leone | U | S/D | U/R | D | U/R | D |
| Ivory Coast | C | D | X | D | C/U | D |
| Burkina Faso | X | S/D | X | S/D | X | S/D |
| Ghana | C | S | C/U | S/D | C/U | S/D |
| Togo | U | D | U | D | U | D |
| Benin | C | S/D | C/U | S/D | C/U | S/D |
| Nigeria | U/R | D | U/R | D | U/R | D |
| Chad | - | - | R | D | R | D |
| Cameroon | 7,830 | D | X | S/D | C/U | D |
| CAR | >5,500 | ? | C/U | S/D | C/U | S/D |
| Congo-Kinshasa | C | ? | X | D | C/U | S/D |
| Sudan | R | S/D | X | S/D | X | S/D |
| Uganda | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Mali: Occurs widely within its historical range in the southwestern savanna woodlands despite heavy hunting pressures. It is reasonably common in the Boucle du Baoule and Bafing protected areas.

Niger: Restricted to localised parts of the savanna woodland zone in the southwest. It has been

*Red-flanked Duiker (continued)*
affected adversely by widespread habitat destruction caused by human activities. By the late 1980s, it was largely or entirely confined to W National Park and the contiguous Tamou Faunal Reserve, where there was a small, declining population. No recent information on its status.

Senegal: It remains widespread within its historical range in the southern savanna woodlands, but it is much less abundant than previously in regions such as Casamance because of intensive hunting for meat. It is abundant in Niokolo-Koba National Park and also occurs in Faleme Hunting Zone.

Gambia: Formerly widespread but reduced to scattered remnant populations by habitat destruction and hunting.

Guinea-Bissau: Formerly occurred throughout most of the mainland portion of the country. It still occupies almost all of its historical range and is locally common.

Guinea: Probably occurred widely in the past in the northern savanna woodlands. The little recent information which is available on the status of antelopes in Guinea suggests that this species remains widespread and locally common, at least within parts of its former range. It occurs in moderate numbers in Badiar National Park.

Sierra Leone: Formerly the commonest duiker species in the northern savanna and in farm bush on its southern edges. The replacement of primary forest with farm bush and other secondary vegetation has enabled this species to expand its range southwards to some extent, but its numbers have generally been reduced by increased hunting pressure. In the 1980s, it was one of the commonest antelope species in Outamba-Kilimi National Park. No recent information on its status.

Ivory Coast: Formerly occurred throughout the savanna woodlands in the northern half of the country. It persists in the face of human disturbance and hunting to a greater degree than most other antelopes in the savanna zone and still occurs quite widely within its historical range. It is common in Comoe and Marahoue National Parks, Haut Bandama Game Reserve and most of the forest reserves within its range, but its numbers are generally in decline because of severe meat hunting pressures.

Burkina Faso: Formerly occurred throughout the southern savanna woodlands. It probably persists widely within its historical range where suitable habitat remains, e.g., it occurs in most protected areas within its range, generally at low to moderate densities.

Ghana: Formerly occurred throughout the savanna woodlands of northern, central and southeastern Ghana. It withstands heavy hunting pressure and remains common throughout much of its historical range. It is common in most of the protected areas within its range, including Digya National Park where poaching has greatly reduced or eliminated most other antelope species.

Togo: Formerly occurred throughout most of the country. In the mid-1980s, it still occurred widely and was common in protected areas such as Keran and Fazao National Parks. It probably still occurs quite widely but in reduced numbers because of uncontrolled, locally intensive hunting for meat.

Benin: Formerly occurred throughout northern and central Benin. It probably still occurs widely, except for areas of dense settlement and very intensive hunting pressure. It is common in the northern protected areas, with numbers stable at least in Pendjari National Park and the adjacent hunting zones.

Nigeria: Formerly occurred very widely in savanna woodland. It probably still occurs reasonably widely but in greatly reduced abundance as a result of hunting for bushmeat. It occurs in derived savannas and forest-savanna mosaic in areas such as Gashaka-Gumpti National Park and the Gotel Mountains.

Chad: Recorded in small numbers from savanna woodland in Logone Oriental and Moyen Chari regions in the extreme south. No recent information on its status.

Cameroon: Occurs widely within its historical range in the savanna woodlands of northern and central Cameroon. Its main stronghold is the national parks (Bouba Ndjida, Benoue and Faro) and contiguous hunting zones of North Province, where it occurs widely in good numbers. Its population is gradually decreasing as pressures of meat hunting and habitat destruction increase.

Central African Republic: Formerly occurred throughout the savanna woodland zone but absent from the sahel zone in the far north and the dense forests of the southwest and southeast. It remains widespread and common within its historical range and appears to maintain its numbers well despite widespread hunting for meat. It occurs in good numbers in areas such as Manovo-Gounda-St. Floris (southern sector) and Bamingui-Bangoran National Parks and the adjoining hunting concessions in the north.

Congo-Kinshasa: Known from savanna woodland in the northeast where it still occurs locally, e.g., it is common in wooded areas in the north of Garamba National Park and in the adjoining Azande and Mondo-Missa reserves.

Sudan: Formerly widespread and common in the woodlands of the southwest. It survives in localities such as Radom National Park in the north of its former range, and it probably still occurs widely elsewhere.

Uganda: Formerly widespread in the northwest, to the west of the Albert Nile. Much of its Ugandan range is densely settled, with consequent high pressures of hunting and habitat destruction. There is no recent information on its status or continued occurrence.

SUMMARY
This duiker formerly occurred throughout the band of savanna woodlands which stretches across West and Central Africa from Senegal to the Nile. It is often described as an inhabitant of forest edges, forest relics and patches of thicket (e.g., Kingdon 1997; Grubb et al. in press), but in reality it occurs widely throughout these savanna woodlands, e.g., in northern Cameroon and northern and eastern Central African Republic (R. East, personal observations; B. Lubin, pers. comm.). It survives widely within its historical range and shows considerable resilience to hunting and the spread of settlement. It is well represented in protected areas, generally in stable populations, with relatively large numbers in areas such as Niokolo-Koba (Senegal), Comoe, Haut Bandama and Marahoue (Ivory Coast), Mole, Bui and Digya (Ghana), Pendjari and W (Benin), Bouba Ndjida, Benoue and Faro (Cameroon), Manovo-Gounda-St. Floris, Bamingui-Bangoran and Sangba (Central African Republic) and Garamba (Congo-Kinshasa).

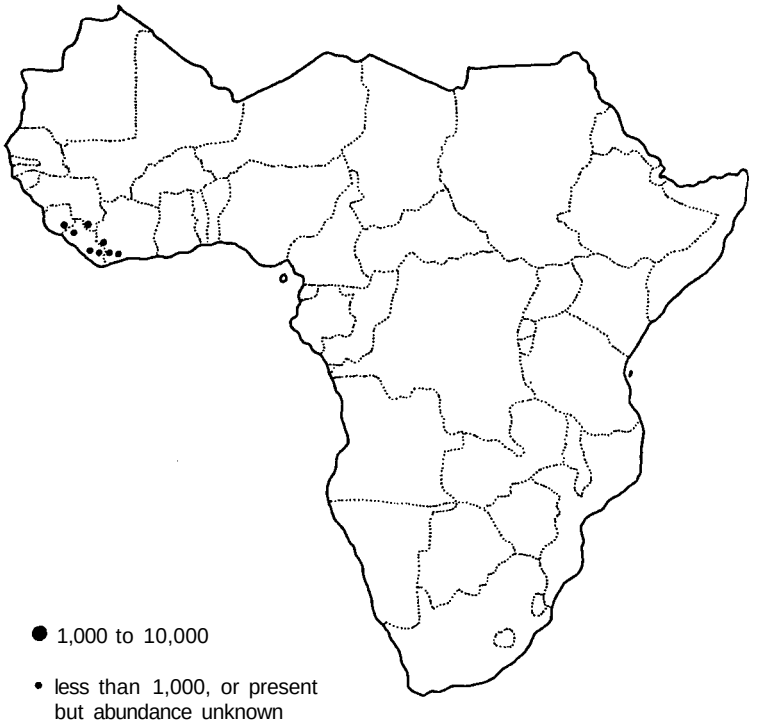
Estimated Total Numbers: Most of the recent population estimates which are available for this species are from informed guesses (see Appendix 4). Estimates of its density from ground transect surveys in areas where it is common range from 0.5 to 2.0 per sq km, e.g., in Comoe (Roth et al. 1979; Fischer 1996) and Marahoue (Roth & Hoppe-Dominik 1990). Density estimates from ground surveys in areas where it is uncommon are generally less than 0.1 per sq km, e.g., Bafing (Pavy 1993) and Nazinga (Heringa et al. 1990). Assuming that areas for which population estimates are unavailable support an average density of 0.5 per sq km where it is known to be common/abundant and 0.05 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 170,000. About half of this estimated population occurs in and around protected areas. Population trend is gradually decreasing as human populations and hunting pressures continue to grow.

The Future: While the overall distribution and abundance of the red-flanked duiker will inevitably decline further with the expansion of settlement and increased hunting for bushmeat, its resilience will probably enable it to persist widely where hunting pressures are not severe. Its long-term conservation status should not deteriorate as long as it continues to be well represented in protected areas and hunting concessions throughout most parts of its range.

## Zebra Duiker

*Cephalophus zebra* (Gray 1838)

RED LIST STATUS
Vulnerable




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Guinea | X | ? | - | - | X | ? |
| Sierra Leone | R | D | ? | ? | R | D |
| Liberia | C | ? | C/U | ? | C/U | ? |
| Ivory Coast | C | S/D | - | - | C | S/D |

OVERVIEW OF CONSERVATION STATUS

Guinea: The suspected occurrence of this species in southeastern Guinea seems to have been confirmed by a recent probable record from the area of the Ziama-Diecke Forest Reserves.

Sierra Leone: Probably occurred quite widely in the moist lowland forests of southern and central Sierra Leone in the past. It appears to be dependent on undisturbed primary forest and has been forced to retreat as the forest has been cut down and converted to farmland. By the 1980s, it was very rare and localised and known to occur in only a few localities, such as Gola North Forest Reserve, where it was threatened by hunting for bushmeat. There is no recent information on its status.

Liberia: Probably occurred widely in primary forest in the past. In the early 1980s, it was common in Sapo National Park and persisted in other blocks of high forest such as Krahn-Bassa, Grebo and Gola. The 1989/90 WWF/FDA survey found that it still occurred quite widely within high forest in the southeast (Sapo, Krahn-Bassa, Grebo and surrounds). It comprised a significant component of bushmeat sales, indicating that it is not uncommon within the high forest. Its continued presence was also confirmed in the northwestern forests. This included appreciable numbers in areas of high hunting pressure such as southern Gola, where primates had been reduced to very low densities. The zebra duiker was not recorded from farm bush during the 1989/90 survey and it is probably the least adaptable of all of Liberia's duiker species to deforestation. Its continued presence in Sapo National Park was confirmed in 1997.

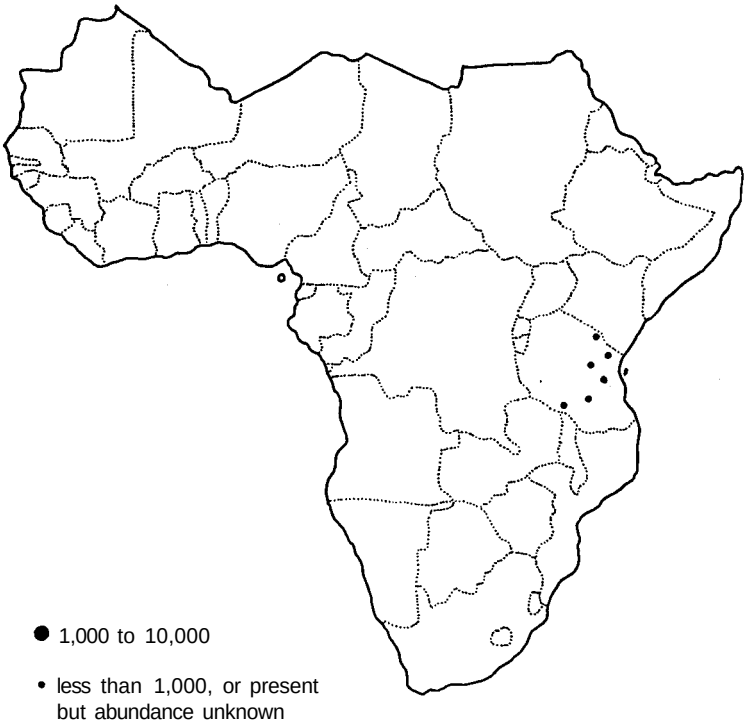
Ivory Coast: Confined to primary rainforest in the southwest, to the west of the Niouniourou River. This region of Ivory Coast was sparsely populated until the early to mid-1970s. Since then there has been large-scale immigration, and timber extraction, forest clearance and agricultural settlement have proceeded rapidly. The zebra duiker is now confined to the remaining areas of primary forest within its former range, viz., Tai National Park and the adjoining Haut Dodo-Rapide Grah-Hana Forest Reserves, and Cavally-Gouin, Scio and Niegre Forest Reserves. It is reasonably common in most of these areas. Its main stronghold is Tai National Park, where it is seen regularly in primary forest and its abundance varies from common in the west to uncommon in the centre and rare in the east. This reflects the gradation of poaching pressure across the park.

SUMMARY
The zebra duiker occurs in primary forest from eastern Sierra Leone to southwestern Ivory Coast. Its distribution and numbers have declined markedly because of forest destruction and excessive hunting for bushmeat. Its remaining strongholds are Sapo National Park and other forests of southeastern Liberia, and Tai National Park and adjacent forest reserves in Ivory Coast.

Estimated Total Numbers: Assuming average population densities of 2.0 per sq km where it is known to be common and 0.2 per sq km elsewhere (see p. 92), and a total area of occupancy of 30,000 sq km from the information in Appendix 4, gives an estimated total population of about 28,000. Population trend is generally downwards because of poaching for meat and continuing destruction of West Africa's few remaining primary forests. The only exceptions are a few localities where hunting pressures are low and/or there is effective protection against logging and poaching, e.g., the western section of Tai National Park.

Captive Population: There is a small but increasing captive population of the zebra duiker in North America which numbered 11 individuals in 1996.

The Future: The existence of good numbers of zebra duiker in regions such as the reasonably extensive remaining high forests of Liberia offers the potential for effective conservation of this species, but if present trends continue its status will decline to Endangered or Critically Endangered. Its long-term survival is dependent on the protection of its habitat and control of poaching in areas such as Tai and Sapo National Parks and other protected forests within its restricted range.




**Abbott's Duiker**
*Cephalophus spadix* True 1890

RED LIST STATUS
Vulnerable

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Tanzania | U | S/D | U/R | D | U/R | D |

OVERVIEW OF CONSERVATION STATUS

Tanzania: This rare and little known species is confined to isolated montane forests, including Kilimanjaro, the Usambara, Uluguru and Udzungwa Mountains, and Mount Rungwe in the southern highlands. It is threatened by habitat destruction and overhunting. Much of its habitat is in poorly protected forest reserves where encroachment of settlement and logging occur. It is under severe hunting pressure throughout most of its range and is particularly under threat in the Uluguru and Usambara Mountains. It is uncommon or rare on Mount Kilimanjaro, where its numbers appear to have declined on the southern slope because of very heavy poaching. It may persist in reasonable numbers in steep-sided valleys with dense vegetation on the northern slope of Kilimanjaro, where poaching pressure is less severe. In the Udzungwa Mountains, it is heavily hunted in some areas but still reasonably common in areas where hunting is less intense, viz., in parts of West Kilombero Forest Reserve and the contiguous highland forest areas of Udzungwa Mountains National Park. It occurs in reduced numbers in several other forest reserves in the Udzungwas. More effective protection of the remaining populations in areas such as Kilimanjaro National Park and Forest Reserve and Udzungwa Mountains National Park-West Kilombero Forest Reserve will be critically important to prevent this species' eventual extinction.

SUMMARY
This large duiker is endemic to Tanzania, where it is restricted to a few isolated mountains. Poaching and loss of habitat to the encroachment of settlement have greatly reduced its numbers in some areas and threaten its long-term survival throughout its very restricted range. The protected areas in which it occurs, such as Kilimanjaro National Park and Forest Reserve and Udzungwa Mountains National Park-West Kilombero Forest Reserve, receive only very low, low or moderate levels of protection and management.

Estimated Total Numbers: No estimates of this species' populations are available and its numbers can only be guessed, but there is little doubt that it is one of the rarest duiker species. Assuming average population densities of 1.0 per sq km where it is known to be common and 0.1 per sq km elsewhere (see p. 92), and a total area of occupancy of about 10,000 sq km from the information in Appendix 4, gives a total population estimate of about 2,500. Population trend is decreasing except in a few areas where hunting pressures are low, e.g., the highland forests of Udzungwa-West Kilombero.

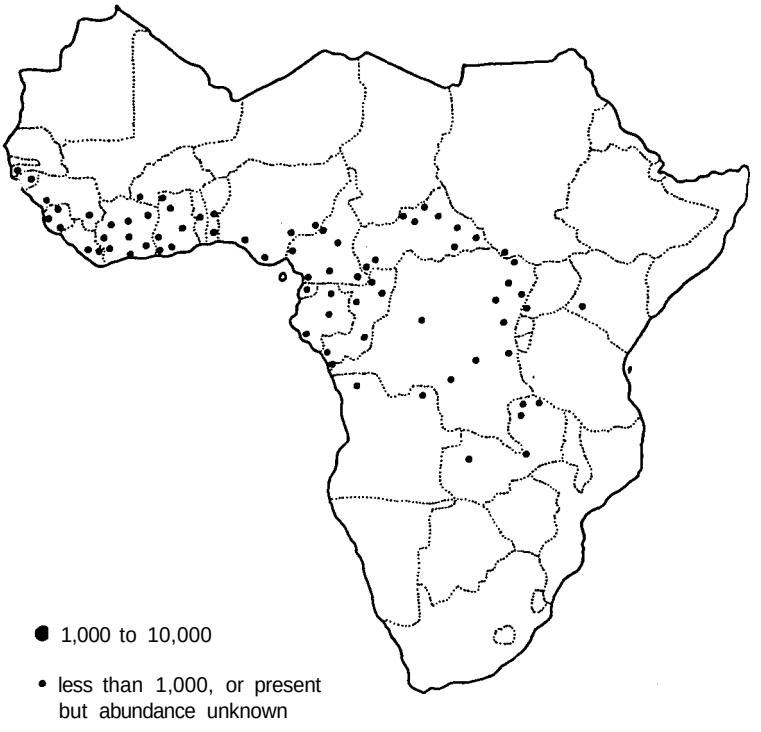
Captive Population: Apart from one or two individuals held in captivity in Tanzania, there is no captive population of this species.

The Future: If current trends continue, the status of Abbott's duiker may decline to Critically Endangered as it disappears from most of its current range and becomes confined to a few remote forests where hunting pressures are low. This trend will only be reversed by active protection and management of its remaining strongholds, such as Udzungwa Mountains National Park and adjoining forests and Kilimanjaro National Park and Forest Reserve.

## Yellow-backed Duiker

*Cephalophus silvicultor* (Afzelius 1815)

RED LIST STATUS
Lower Risk (near threatened)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Poon/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Senegal | U/R | D | R | D | R | D |
| Gambia | - | - | - | - | Ex | - |
| Guinea-Bissau | - | - | C | S/D | C | S/D |
| Guinea | X | S/D | R | D | R | D |
| Sierra Leone | U | D | R | D | U/R | D |
| Liberia | R | ? | R | ? | R | ? |
| Ivory Coast | U/R | S/D | - | - | U/R | S/D |
| Burkina Faso | R | S/D | - | - | R | S/D |
| Ghana | U/R | S/D | - | - | U/R | S/D |
| Togo | R | D | - | - | R | D |
| Benin | U/R | S/D | - | - | U/R | S/D |
| Nigeria | U | S/D | R | D | U/R | D |
| Chad | - | - | ? | ? | ? | ? |
| Cameroon | C/U | S/D | X | D | X | D |
| CAR | U/R | S/D | C | ? | C/U | ? |
| Equ. Guinea | C | S | U/R | D | U | D |
| Gabon | C/U | S | U | S | U | S |
| Congo-Brazz. | C/U | S/D | X | D | X | D |
| Congo-Kinshasa | C/U | S | X | D | X | D |
| Sudan | - | - | U | S/D | U | S/D |
| Uganda | R | I | - | - | R | I |
| Kenya | X | D | X | D | X | D |
| Rwanda | - | - | - | - | Ex? | - |
| Burundi | - | - | ? | ? | ? | ? |
| Angola | - | - | X | D | X | D |
| Zambia | U/R | S/D | U/R | D | U/R | S/D |

OVERVIEW OF CONSERVATION STATUS

Senegal: Confined to forest-savanna mosaic in the southwest. It was formerly common within Basse-Casamance National Park. It has been reduced to low numbers or eliminated by overhunting in this park and throughout the rest of its range.

Gambia: Formerly occurred locally in forest-savanna mosaic but now extinct.

Guinea-Bissau: Occurs widely in forested valleys within the interior savannas and in forest patches in the coastal zone, but it is absent from the northwest. Forest destruction and uncontrolled hunting are threats to its long-term survival, but it remains common in some localities.

Guinea: Recorded from the southwest and southeast, including Ziama and Diecke Forest Reserves.

Sierra Leone: Formerly occurred widely in primary and secondary forest, farm bush and forest-savanna mosaic. It is vulnerable to excessive hunting pressure and by the 1980s it was generally uncommon or rare where it survived, although it was still relatively common in areas such as Outamba-Kilimi National Park and Tiwai Island Game Sanctuary. There is no recent information on its status.

Liberia: In the early 1980s, the yellow-backed duiker was considered to be the least numerous duiker species in Liberia, although it apparently occurred quite widely at low densities within a variety of habitats. The 1989/90 WWF/FDA survey recorded it from a range of habitats (high forest, logged forest, secondary forest and farm bush) in and around Sapo National Park and Krahn-Bassa and Grebo National Forests in the southeast. It was recorded less frequently than the country's other large duiker species (Jentink's) and appeared to be generally rare, e.g., it was not recorded in bushmeat sales. Its occurrence elsewhere in Liberia is uncertain. There is no more recent information on its status.

Ivory Coast: Recorded sporadically throughout the country. It still occurs widely but sparsely within its historical range, but it is now restricted to national parks and forest reserves. It reaches its highest densities in forest-savanna mosaic, e.g., in Mont Sangbe National Park, and it is much less abundant in extensive areas of closed-canopy forest. In Tai National Park, for example, it is very rare and seems to be confined largely to secondary forest and plantations.

Burkina Faso: Recorded from protected forests in the southwest. No recent information on its status.

Ghana: Recorded from scattered localities throughout the country, ranging from moist lowland forest in the southwest to gallery forest and thickets in the northern savanna woodlands. It generally occurs at low to moderate densities and may now be restricted to protected areas. It still occurs in at least six parks and reserves but it is uncommon or rare in all of these areas.

Togo: Recorded from forested areas in the west and southwest. In the 1980s it occurred in small numbers within Fazao National Park and probably further to the south along the Ghana border. Its entire range in Togo has subsequently been affected by uncontrolled deforestation and hunting for bushmeat.

Benin: Recorded from forest patches in southern and central Benin, including Monts Kouffe and Lama Classified Forests. Little is known about its current status, but most of southern Benin is densely populated and it has undoubtedly suffered from intensive hunting for bushmeat and widespread destruction of natural habitats. This includes areas such as the Lama reserve.

Nigeria: Occurs locally in the southern forest zone and in montane forest on the Cameroon border in the east. It was reported to be locally common in Gashaka-Gumpti National Park in the 1980s, but it is generally uncommon or rare. In the Niger Delta, for example, it has disappeared from most of the

*Yellow-backed Duiker (continued)*
areas where it formerly occurred but survives in small numbers in Upper Orashi Forest Reserve.

Chad: Recorded in the past from near the Central African Republic border in the south, but there is no recent confirmation of its continued occurrence in Chad.

Cameroon: Recorded sporadically in the southern equatorial forests and north of the continuous forest in forest patches within the southern part of the savanna woodland zone. It also occurs in montane forest in the west. It still occurs locally within this range. Two skins of this species were observed in early 1997 in a poachers' camp in montane forest on the northern ridge of Tchabal Mbabo in the Adamaoua Mountains, to the north of its previously known range in Cameroon. It is seen rarely in the southwest, where it has probably been reduced to small remnant populations by excessive hunting. It still occurs widely at low densities in the south and southeast. In the Lobeke region in the southeast, for example, it is relatively common in primary forest but much less abundant in depleted forest, secondary forest and swamp forest. This suggests that in this region it may be affected negatively by timber extraction.

Central African Republic: Occurs widely in the savanna woodland and moist forest zones, but there is no recent confirmation of its presence in the western and south-central regions where human population densities are higher than in other parts of the country. It is uncommon or rare in the dense forests of the southwest. It occurs locally in gallery forests and thickets in the eastern and northern savanna woodlands, including moderate populations in Sangba Pilot Zone and the southern sector of Manovo-Gounda-St. Floris National Park. This duiker appears to reach its highest densities in forest-savanna mosaic, e.g., to the north of the closed-canopy forests in the southwest and in Bangassou Forest in the southeast.

Equatorial Guinea: Probably occurred throughout Mbini in the past. It is well represented in Monte Alen National Park, but elsewhere it appears to occur generally in low, declining numbers as a result of uncontrolled hunting and forest destruction.

Gabon: It probably retains a high proportion of its historical distribution and remains widespread, generally at low population densities. It is not a preferred bushmeat and is the subject of many clan prohibitions throughout Gabon. In addition, its mostly nocturnal habits enable it to persist near settlements to some degree. It may reach higher densities in forest-savanna mosaic than in continuous forest. It is common in savanna areas such as the Moukalaba reserve and the northern section of Lope Reserve. It is uncommon/rare in extensive areas of closed-canopy forest, e.g., Minkebe.

Congo-Brazzaville: Formerly occurred very widely in forests and forest-savanna mosaic, and it remains widespread. It is locally common in the north, e.g., in Odzala and Nouabale-Ndoki National Parks and Kabo Forest where its numbers are stable or increasing. Its populations in the south of the country have suffered from overhunting for meat and are generally in decline, both within and outside protected areas. It is on the verge of extinction in the Kouilou Basin to the north of Pointe-Noire, but its spoor is still observed in areas such as the Conkouati and Lefini reserves.

Congo-Kinshasa: Recorded from equatorial lowland and montane forest and forest-savanna mosaic at localities scattered widely throughout the country. It remains widespread and is locally common in areas such as Maiko National Park and Okapi Faunal Reserve. It also occurs in Kahuzi-Biega, Salonga and Virunga National Parks and in the extreme north of Garamba National Park. Collectively, its remaining distribution within the Democratic Republic of Congo probably comprises a substantial part of its current global range.

Sudan: Known only from forest-savanna mosaic in the southwestern border region, where it was fairly common in the 1980s. No recent information on its status.

Uganda: Formerly known from several localities of montane and lowland forest in southwestern

Uganda. It survives with certainty only in Bwindi-Impenetrable Forest National Park, where its numbers are recovering with the implementation of effective protection.

Kenya: Known with certainty only from the Mau Forest, where it is under threat from meat hunting, habitat destruction and encroachment of settlement.

Rwanda: Formerly occurred widely in the montane forests of western Rwanda. It appears to have been exterminated by uncontrolled hunting and habitat destruction.

Burundi: Recorded from montane forest in the northwest but no recent information on its status.

Angola: Formerly occurred locally in forested areas of northern Angola, including Cabinda. No recent information on its status.

Zambia: Formerly occurred widely in forests and thickets in the northerly, higher rainfall areas of the plateaux. No recent information is available on its status outside protected areas, but it still occurs in all of the national parks from which it has been recorded in the past, viz., West Lunga, Kafue, Kasanka, Lusenga Plain, Mweru Wantipa and Nsumbu. Its conservation status may be reasonable in Kafue National Park, where it occurs mainly in the northern sector, and Kasanka National Park, which is the first privately run national park in Zambia and has been rehabilitated by the Kasanka Trust. Elsewhere, the yellow-backed duiker has probably declined because of poaching.

SUMMARY
The yellow-backed duiker occurs over a vast area of Africa from Senegal to Zambia. Within this range it is generally uncommon and localised, particularly in West Africa. It occurs in lowland and montane forests, forest-savanna mosaics, and riverine forests and isolated forest patches within moist savanna woodlands. It is known to be common in some parts of its range, mainly in Central Africa, e.g., parts of Guinea-Bissau and Ivory Coast, Campo and Lobeke (Cameroon), Bangassou (Central African Republic), Monte Alen (Equatorial Guinea), Lope and Moukalaba (Gabon), Odzala and Kabo (Congo-Brazzaville) and Ituri and Maiko (Congo-Kinshasa).

Estimated Total Numbers: Estimates of this species' population density obtained by ground surveys within closed-canopy forest where it is reasonably common have ranged from 0.5 to 1.6 per sq km, viz., in Lope (White 1994) and Ituri (Hart 1985; Koster & Hart 1988; Hart et al. 1996). Tutin et al. (1996) estimated a density of 2.1 per sq km in forest-savanna mosaic in northern Lope. Lauginie (1975) estimated a population density of 0.09 per sq km within Comoe National Park (Ivory Coast), which comprises mainly savanna woodlands with some forest patches.

Assuming average population densities of 1.0 per sq km where it is known to be common and 0.1 per sq km elsewhere (see p. 92), and a total area of occupancy of approximately 1,150,000 sq km from the information in Appendix 4, gives an estimated total population of about 160,000. About one-third of this estimated population occurs within protected areas. Population trend is generally decreasing, except for some areas where hunting pressures are low because of low human populations and/or effective protection against poaching, e.g., Bia and Nini-Suhien (Ghana), Manovo-Gounda-St. Floris, Sangba and Bangassou (Central African Republic), Monte Alen (Equatorial Guinea), most of Gabon, Odzala and Nouabale-Ndoki-Kabo (Congo-Brazzaville), the forest parks of Congo-Kinshasa, Bwindi (Uganda) and Kafue and Kasanka (Zambia).

The Future: If present trends continue, the yellow-backed duiker's distribution will become increasingly fragmented and contract to about one-third of its current range. Under this scenario, its status will eventually become threatened and its long-term survival will depend on effective protection of key areas in the equatorial forest and savanna woodland zones of West and Central Africa, as national parks and equivalent reserves and effectively managed hunting zones.


**Jentink's Duiker**
*Cephalophus jentinki* Thomas 1892

RED LIST STATUS
Vulnerable

ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Poon/Abund. | Trend | Popn/Abund. | Trend |
| Sierra Leone | R | D | - | - | R | D |
| Liberia | U/R | ? | U/R | ? | U/R | ? |
| Ivory Coast | U/R | S/D | - | - | U/R | S/D |

OVERVIEW OF CONSERVATION STATUS

Sierra Leone: The presence of this species in Sierra Leone was confirmed in 1989 with the discovery of a population in the Western Area Forest Reserve in the southern part of the Freetown Peninsula. It appears to spend most of the year in the forest-covered interior hills of the peninsula, but it utilises secondary vegetation and coastal farm bush on the forest fringes during the wet season. There are also reliable reports from hunters and forest rangers of the presence of Jentink's duiker in the Gola Forest Reserve complex in the southeast. There is no recent information on its status.

Liberia: In the 1980s, Jentink's duiker was reported to occur quite widely in and around the southeastern (Sapo National Park, Krahn-Bassa and Gbi National Forests) and northwestern (Gola National Forest) high forest blocks, entering the edges of farm bush and plantations where it was frequently hunted. The 1989/90 WWF/FDA survey confirmed that this species is relatively widely distributed in the southeastern forests (Sapo National Park, Krahn-Bassa and Grebo National Forests and adjoining areas). The records obtained suggest that it is forest-dependent but is not restricted to primary forest. It was recorded from high forest, logged forest, secondary forest and farm bush, and it was stated to be a significant crop pest by rural communities in some areas of the southeast. Its presence in secondary forest and farm bush appeared to depend on the existence of a mosaic of secondary habitats and large blocks of high forest. Its likely presence in the northwestern forest blocks was also confirmed, with observations of tracks which were probably made by this species (but possibly by the yellow-backed duiker) in Gola and North Lorma National Forests. Jentink's duiker was recorded at a low frequency in bushmeat sales in the

southeast. Observations of tracks indicated that large duikers (this species and/or yellow-backed) survived in appreciable numbers in some areas of high hunting pressure, such as southern Gola. The continued presence of Jentink's duiker in Sapo National Park was confirmed in March 1997.

Ivory Coast: Confined to primary forest areas in the southwest, to the west of the Niouniourou River. Widespread forest destruction and expansion of agriculture in this region during the last 25 years has reduced its distribution to the remaining areas of primary forest, viz., Tai National Park, the adjoining Haut Dodo-Rapide Grah-Hana Forest Reserves, and Cavally-Gouin and Scio Forest Reserves. It is generally uncommon or rare in these areas. Its main stronghold is Tai National Park, where it is found principally in primary forest and rarely in old secondary forest. It is observed relatively frequently in the well protected western part of Tai National Park, including the region of Mount Nienokoue, an isolated inselberg in the southwest of the park. It is seen less often in the central part of the park and appears to be absent from the heavily poached eastern part of the park.

SUMMARY
Jentink's duiker formerly occurred widely in primary forest within its restricted range from Sierra Leone to southwestern Ivory Coast. It also enters secondary growth and farm bush adjacent to high forest. Its distribution has contracted markedly and its populations have decreased and become fragmented as a result of widespread forest destruction and hunting for meat. Its last major strongholds include areas such as the substantial blocks of high forest which remain in southeastern Liberia and the western part of Tai National Park in Ivory Coast.

Estimated Total Numbers: This large duiker appears to be uncommon/rare throughout its range (Appendix 4). Assuming an average population density of 0.1 per sq km (see p. 92), and an area of occupancy of 35,960 sq km from the information in Appendix 4, gives a total population estimate of about 3,500. This is probably a minimal figure, e.g., it may occur at densities of approximately 1.0 per sq km in some areas (Peal & Kranz 1990) and Boitani et al. (1998) estimated that its area of occupancy is 120,000 sq km. Population trend is downwards except for a few remote areas where forest destruction and hunting pressures are low, e.g., Sapo National Park, and areas where there is effective protection such as the western section of Tai National Park.

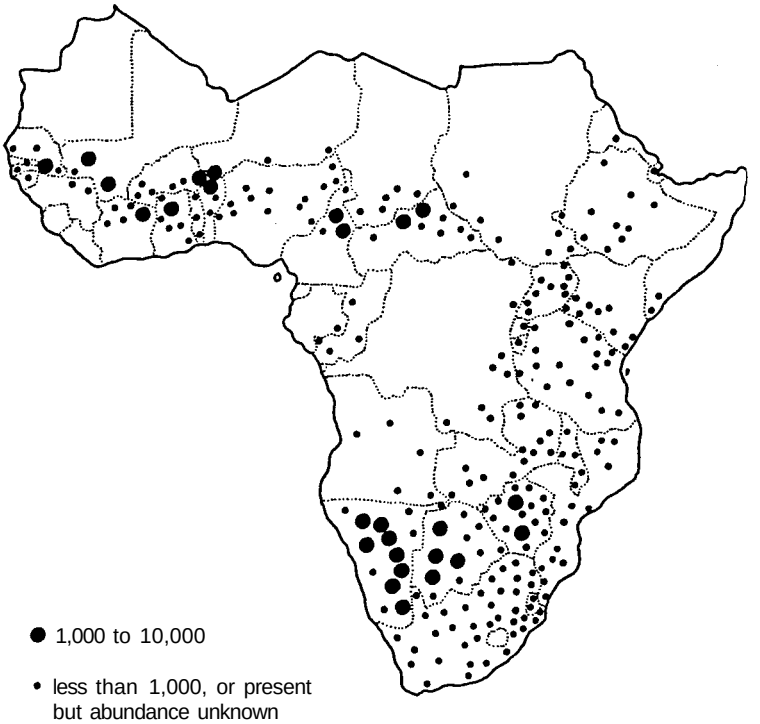
Captive Population: There is a small captive population in North American zoos, which comprised 6 individuals in 1996.

The Future: The long-term survival of Jentink's duiker is closely linked to the future of the remaining blocks of primary forest in Liberia, southwestern Ivory Coast and Sierra Leone. At present, only Tai National Park receives effective protection. Rehabilitation of Sapo National Park and development and implementation of protection and management programmes for the forests and wildlife of key areas such as Krahn-Bassa and Grebo National Forests in Liberia, Cavally-Gouin Forest Reserve in Ivory Coast and Western Area Forest Reserve in Sierra Leone could result in an improvement of this species' conservation status to Lower Risk (conservation dependent). Alternatively, if the current lack of protection and management over most of its range continues, its status will decline to Endangered and it will become restricted to a few protected areas such as Tai National Park.

## Grey Duiker

*Sylvicapra grimmia* (Linnaeus 1758)

RED LIST STATUS
Lower Risk (least concern)




ESTIMATED POPULATIONS/RELATIVE ABUNDANCE AND POPULATION TRENDS

| | Protected Areas | | Other Areas | | Total | |
|---|---|---|---|---|---|---|
| Country | Popn/Abund. | Trend | Popn/Abund. | Trend | Popn/Abund. | Trend |
| Mali | >1,650 | S | >5,000 | S/D | >6,650 | S/D |
| Niger | >1,000 | S | U | D | >1,000 | S/D |
| Senegal | >2,000 | S/I | U | D | >2,000 | S |
| Gambia | X | ? | U | ? | U | ? |
| Guinea-Bissau | - | - | U | S/D | U | S/D |
| Guinea | ? | ? | C | S/D | C | S/D |
| Sierra Leone | - | - | - | - | Ex? | - |
| Ivory Coast | >1,200 | S/D | X | S/D | C/U | S/D |
| Burkina Faso | >2,380 | S/D | X | D | C/U | D |
| Ghana | C | S | C/U | S/D | C/U | S/D |
| Togo | U | D | C/U | S/D | C/U | D |
| Benin | >1,000 | S | C | S/D | C | S/D |
| Nigeria | C/U | S/D | C/U | S/D | C/U | S/D |
| Chad | >800 | S/D | C | S/D | C | S/D |
| Cameroon | >10,170 | D | X | S/D | C/U | S/D |
| CAR | >6,000 | S/I | C/U | S/D | C/U | S |
| Gabon | - | - | R | D | R | D |
| Congo-Brazz. | U/R | S | R | D | U/R | S/D |
| Congo-Kinshasa | C | S/D | X | S/D | X | S/D |
| Sudan | R | S | X | S/D | X | S/D |
| Eritrea | - | - | R | ? | R | ? |
| Ethiopia | C | S/D | X | S/D | X | S/D |
| Djibouti | U/R | ? | - | - | U/R | ? |
| Somalia | X | ? | X | ? | X | ? |
| Uganda | C | S/D | C/U | S/D | C/U | S/D |
| Kenya | C/U | S | X | S/D | X | S/D |
| Tanzania | C | S | X | S/D | X | S/D |

| Country | Protected Areas Popn/Abund. | Trend | Private Land Popn/Abund. | Trend | Other Areas Popn/Abund. | Trend | Total Popn/Abund. | Trend |
|---|---|---|---|---|---|---|---|---|
| Rwanda | X | S/D | - | - | X | S/D | X | S/D |
| Burundi | C | S | - | - | X | S/D | X | S/D |
| Angola | - | - | - | - | X | S/D | X | S/D |
| Zambia | C | S/D | 140 | S/I | X | S/D | C | S/D |
| Malawi | C | S | - | - | X | S/D | C | S/D |
| Mozambique | C/U | S/D | - | - | X | S/D | C/U | S/D |
| Namibia | U/R | S | 75,520 | S/D | U | S/D | >75,520 | S/D |
| Botswana | 7,760 | S | 400 | S | 25,020 | S | 33,180 | S |
| Zimbabwe | C | S | >250,000 | S | C/U | S/D | >250,000 | S/D |
| South Africa | C | S | C | S | C/U | S/D | C | S/D |
| Swaziland | C/U | S | X | S/D | X | S/D | X | S/D |
| Lesotho | - | - | - | - | ? | ? | ? | ? |

OVERVIEW OF CONSERVATION STATUS

Mali: Formerly occurred throughout the savanna woodland zone in the southwest. Its ability to withstand heavy hunting pressure and survive close to settlement has enabled it to remain widespread within its historical range. It is among the most numerous antelopes in the Boucle du Baoule and Bafing protected areas.

Niger: Formerly occurred in the savanna woodland zone in the southwest, at scattered locations along the Nigeria border in the south and in the Lake Chad region in the southeast. In the late 1980s its still occurred widely within its historical range, with a relatively large, stable population in W National Park-Tamou Faunal Reserve. Its numbers were decreasing elsewhere as a result of widespread destruction of wooded habitats. No recent information is available on its status.

Senegal: Formerly widespread in the savanna woodlands of central and southern Senegal. It still occurs widely at low to moderate densities within its historical range. Its overall abundance is probably declining because of severe hunting pressures. It is well represented in Niokolo-Koba National Park and occurs in smaller numbers in several other protected areas.

Gambia: Formerly widespread. It persists locally where there is sufficient cover to provide shelter.

Guinea-Bissau: Formerly occurred very widely. It still occupies almost all of its historical range, generally occurring at low densities. It persists in some areas with high human populations. Deforestation followed by settlement may extend the habitat available to this species.

Guinea: Formerly occurred widely in the northern savanna woodlands. Its status was regarded as satisfactory in the mid-late 1980s, and it probably remains widespread and locally common within its historical range.

Sierra Leone: There is a single old record of this species' occurrence on the northeastern border but no recent confirmation of its presence in Sierra Leone.

Ivory Coast: Formerly occurred throughout the northern savannas. It remains widespread at low to moderate densities within its historical range. It occurs in Comoe National Park and all of the other protected areas within this range.

Burkina Faso: Formerly occurred throughout the savanna woodlands of central and southern Burkina Faso. It still occurs widely within its former range, at least in the south. It is common in protected areas such as Arly-Singou and Nazinga Game Ranch.

Ghana: Remains common thoughout most of its historical range in the savanna woodlands of

*Grey Duiker (continued)*
northern, central and southeastern Ghana. It persists in most areas of suitable habitat, even under intensive hunting pressure. It occurs in all of the protected areas within its range.

Togo: Formerly occurred in savanna woodlands throughout most of the country. In the 1980s it remained widespread, often persisting in settled areas, and was common in Keran and Fazao National Parks. Its current status is probably similar, despite the political and civil upheavals which have affected Togo during the 1990s, although its numbers may have decreased in the former protected areas.

Benin: It still occurs widely within and outside protected areas in its historical range in the savanna woodlands of northern and central Benin. It remains common in stable populations in both relatively well protected areas such as Pendjari National Park and heavily poached areas such as W National **Park.**

Nigeria: Remains widespread within its historical range in the savanna woodlands of northern and central Nigeria despite being heavily hunted. It adapts well to degraded habitats which retain adequate cover.

Chad: Formerly occurred throughout the savanna woodland zone in the south of the country and in the Lake Chad region in the west. It still occurs widely at low to moderate densities within this range, in parks and reserves such as Zakouma and Siniaka Minia and more widely outside protected areas.

Cameroon: Occurs widely within its historical range from Lake Chad to the Adamaoua Plateau. It often persists in settled areas and is common in regions such as the savanna woodland national parks and hunting zones of North Province.

Central African Republic: Remains very widespread and locally common within its historical range, which includes virtually all of the country apart from the sahel zone in the far north and moist lowland forests in the southwest and southeast. It withstands hunting pressures better than most other antelopes and its overall numbers may be more or less stable. It is common in areas such as Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks and the adjoining hunting concessions in the north.

Gabon: Formerly occurred in the savannas which extend from the Congo Republic into southern and

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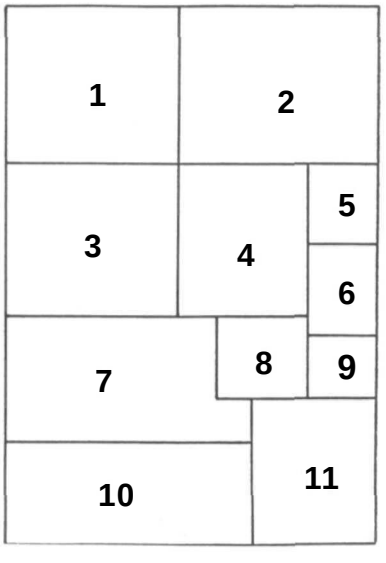



Opposite: Duikers and neotragine antelopes

1: Blue duiker, Chipangali, Zimbabwe.
2: Cape grysbok, Western Cape Province, South Africa.
3: Yellow-backed duiker, San Diego Zoo.
4: Zebra duiker, Los Angeles Zoo.
5: Black duiker, Los Angeles Zoo.
6: Jentink's duiker, Los Angeles Zoo.
7: Salt's dikdik**,** Djibouti.
8: Oribi, Benoue National Park, Cameroon.
9: Guenther's dikdik, San Diego Zoo.
10: Beira, Djibouti.
11: Klipspringcr, San Diego Zoo.

photos - Salt's dikdik and beira: Thomas Kunzel
others: Rod East

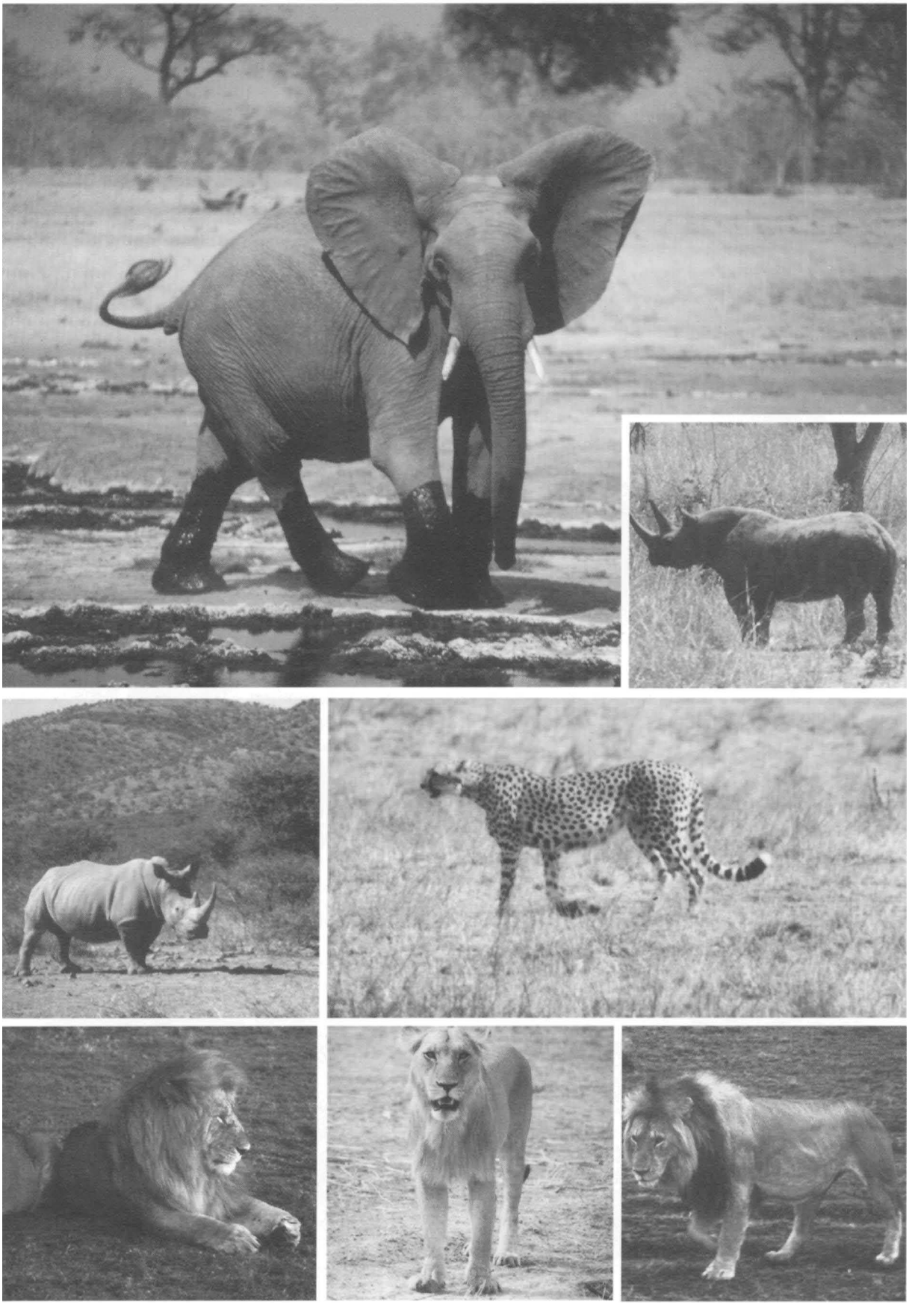
Plate 5

*Photo © Thomas Kunzel*

*Photo © Thomas Kunzel*

*Photos © Rod East*

Plate 6



*Photos © Rod East*

southeastern Gabon, where it has been eliminated from substantial areas by overrenting. It survives in small, rapidly decreasing numbers on the Bateke Plateau. It was recently designated as a totally protected species, but the wildlife legislation is not enforced.

Congo-Brazzaville: The grey duiker formerly occurred widely in the savannas of the central and southeastern Congo Republic, as far north as the Odzala area. Its relatively open habitat provides easy access to meat hunters and it has been eliminated from much of its former range and reduced to small populations where it survives. It is uncommon in the Lekoli-Pandaka and M'Boko reserves which adjoin Odzala National Park, but its numbers are increasing in these relatively well protected reserves which are likely to be vitally important to this species' long-term survival in the country. It has also been recorded, generally in declining numbers, in the Lefini, Mount Fouari and Tsoulou reserves in the south. These areas receive minimal or no protection.

Congo-Kinshasa: Recorded widely in the north, east and south, outside the equatorial forests. It probably still occurs widely within its historical range, e.g., it is common in Garamba National Park and the adjoining reserves in the northeast and Upemba and Kundelungu National Parks in the southeast, and it often persists in heavily hunted areas.

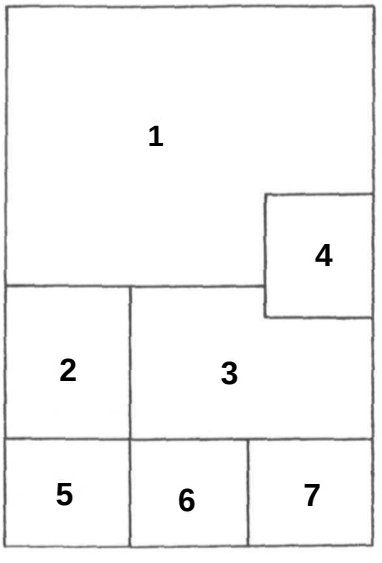
Sudan: Formerly widespread at low densities in southern Sudan and occurred in isolated populations on forested hills in the west. The estimated total population from aerial surveys in the 1970s was >45,000. It survives widely within its historical range, including some settled and/or heavily hunted areas, e.g., Radom National Park and Jebel Marra in the west.

Eritrea: Recorded in the past from hilly areas in south-central Eritrea. It still occurs locally in unknown numbers. References to a *"Cephalophus* duiker" from Semanawi Bahri probably refer to this species.

Ethiopia: Occurs widely within its historical range in western and central regions, including settled areas where there is adequate cover. It is present in most protected areas in the highlands, the Rift Valley and the southern and southwestern lowlands. It is locally common, e.g., in Bale Mountains, Omo and Mago National Parks.

Djibouti: Recorded from the Foret du Day. No recent information on its status.

Somalia: Recorded from wooded habitats in the south, along the Shebelle and Juba Rivers and in the Lake Badana (Bush Bush National Park) region. In the early to mid-1980s it persisted in unknown




Opposite: African megaherbivores and large carnivores (see Appendix 1)

1: Elephant, Luambe National Park, Zambia.
2: White rhino, Loskop Dam Nature Reserve, South Africa.
3: Cheetah, Nairobi National Park, Kenya.
4: Black rhino, South Luangwa National Park, Zambia.
5: Lion, Masai Mara National Reserve, Kenya.
6: Lion, Waza National Park, Cameroon.
7: Lion, Masai Mara National Reserve, Kenya.

photos: Rod East

*Grey Duiker (continued)*
but apparently stable numbers throughout most of this range. No recent information on its status.

Uganda: Formerly occurred throughout except in dense forest and it has maintained most of its distribution. It withstands heavy hunting pressure and survives even in cultivated and overgrazed areas with a small amount of cover. This enables it to persist in areas where most other wildlife species have been eliminated by overhunting and the encroachment of cultivation and large numbers of domestic livestock.

Kenya: Still occurs very widely throughout most of Kenya, apart from dense forest and most of the semi-arid and arid northern rangelands from which it is naturally absent. Its current range includes settled areas with minimal cover. It occurs in most of the protected areas of central and southern Kenya and is common on the moorlands of Mount Elgon and Mount Kenya National Parks.

Tanzania: Formerly occurred almost throughout. It remains very widespread wherever there is sufficient cover, from coastal scrub to subalpine moorland, including many settled areas. It occurs in almost all protected areas and is locally common within suitable habitat in many parks and reserves, e.g., Serengeti, Kilimanjaro (above the treeline) and Udzungwa Mountains (lower altitude woodlands) National Parks and Selous Game Reserve.

Rwanda: Occurs in Akagera National Park, where its estimated population was about 500 in the early 1970s. It also persists close to settlements in some unprotected areas where there is sufficient cover.

Burundi: Despite widespread hunting and very high human population densities, in the 1980s this species still occurred over considerable parts of its historical range in the savannas of the east and south. It survived locally within densely settled areas where there was sufficient cover to provide shelter during the day, and it was common in protected areas such as Ruvubu National Park. No recent information is available on its status, but this is probably largely unchanged.

Angola: Formerly occurred throughout. It probably remains very widespread.

Zambia: Remains very widespread and probably still occurs throughout almost all of Zambia. It is locally common both inside and outside protected areas. It often survives at low to medium densities in areas where poaching has severely depleted or eliminated most other antelope species, e.g., Lukusuzi and Lusenga Plain National Parks, Kaputa, Tondwa, Kafue Flats and Musalangu Game Management Areas.

Malawi: Formerly occurred throughout and remains widespread and common in all but very densely populated areas. It occurs in all of the national parks and game reserves and many forest reserves. It is common in areas such as the *Brachystegia* woodlands of Kasungu National Park and Nkhotakota Game Reserve and the forest margins of Nyika National Park.

Mozambique: Probably still occupies almost all of its former range, which extended over most of the country. It remains very widespread and locally common from Maputaland in the south to the Niassa Game Reserve area in the north.

Namibia: Still occurs very widely, but naturally absent from the most arid coastal deserts. It occurs in low to moderate numbers in most protected areas and communal lands and in good numbers on private farmland.

Botswana: Formerly occurred throughout, wherever there was sufficient cover of bush or tall grass. It remains very widespread, including settled regions. Its estimated numbers in the Botswana section of the Kalahari increased significantly between 1979 and 1994. It is more numerous in the northern Kalahari than the south, and it is common in Central Kgalagadi Game

Reserve.

Zimbabwe: The grey duiker still occurs more or less throughout, including settled areas. It occurs in all of the country's protected areas, Communal Lands and commercial farming areas, generally in good numbers. Its abundance varies locally, e.g., within Hwange National Park it is common in Kalahari woodland in the east of the park but rare in dry, open mopane woodland in the north.

South Africa: Formerly occurred throughout, wherever there was sufficient woody vegetation for cover and food. This resilient species remains widespread and common, persisting in the face of agricultural development and even surviving in some urban areas. It occurs in most of the national parks and provincial reserves and is also widespread on private land.

Swaziland: Despite extensive habitat modification and widespread hunting for meat, it persists locally within and outside protected areas over substantial parts of its former range. This included almost all of Swaziland. It probably occurs in all of the country's protected areas.

Lesotho: Probably occurred widely in the past but no recent confirmation of its occurrence.

SUMMARY
The grey duiker formerly occurred throughout the savanna woodland zones of sub-Saharan Africa. It shows a high level of adaptability to habitat modifications caused by the spread of agricultural settlement, and it frequently survives in good numbers wherever there is low secondary growth. It is also highly resilient to hunting. These attributes have enabled it to persist widely in human-dominated landscapes, often in close proximity to settlement. It also occurs throughout the remaining unmodified savannas and is well represented in a large number of protected areas from Senegal to South Africa. It is a significant source of protein for human populations in many parts of the savanna zones of sub-Saharan Africa.

Estimated Total Numbers: Aerial surveys generally produce estimates of grey duiker population density in the range 0.01-0.15 per sq km, e.g., W National Park (Burkina Faso) (Belemsobgo & Chardonnet 1996), Pendjari (Benin) (Chardonnet 1995), Zakouma and Siniaka Minia (Chad) (D. Moksia, in litt. July 1995), Kaiso-Tonya, Lake Mburo, Toro-Semliki, Kidepo Valley, North and South Karamoja, Matheniko and Pian-Upe (Uganda) (Lamprey & Michelmore 1996), Mkomazi and Katavi-Rukwa (Tanzania) (TWCM 1993a; M. Maige & C. Seeberg-Elverfeldt, in litt. August 1998), Sioma Ngwezi and Kaputa (Zambia) (Kapungwe 1994b; Tembo 1995) and Vwaza Marsh, Nyika, Lengwe, Majete, Mwabvi and Matandwe (Malawi) (Mkanda 1998; D. Gibson, in litt. April 1998). Aerial surveys underestimate the numbers of this small, secretive species by a large but unknown factor. Ground surveys in areas where the grey duiker is common often produce density estimates of the order 0.3-1.7 per sq km, e.g., Bafing (Mali) (Pavy 1993), W (Niger) (Koster 1981), Arly and Nazinga (Burkina Faso) (Belemsobgo & Chardonnet 1996), Lupande (Zambia) (Jachmann & Kalyocha 1994), Nkhotakota (Malawi) (Mkanda 1998) and Bontebok and Mountain Zebra National Parks (South Africa) (Anderson et al. 1996).

Assuming an average correction factor of 10.0 for undercounting bias in aerial surveys, and that areas for which population estimates are unavailable support an average density of 1.0 per sq km where the species is known to be common or abundant and 0.1 per sq km elsewhere, the information in Appendix 4 gives an estimated total population of 1,660,000. This is probably a conservative figure. About 30% of the estimated population occurs in and around protected areas and about 20% on private land. Population trend is probably stable over extensive parts of the species' range, but decreasing in areas where hunting pressures are extremely high and in marginal parts of its range such as Gabon and Niger.

The Future: Despite localised declines, the grey duiker should continue to exist in large numbers over much of its current range for the foreseeable future. Its overall conservation status is unlikely to change.

# 5. Summary and Conclusions

## CURRENT STATUS OF ANTELOPES

Table 5-1 summarises the information on the estimated order of magnitude of each species' total population, overall population trend and current Red List status. Most species of antelopes still exist in large numbers in sub-Saharan Africa, e.g., 50% of the 78 species listed in Table 5-1 (including giraffe, okapi, water chevrotain and buffalo) are estimated to number in the hundreds of thousands or more and 85% in the tens of thousands or more. These populations are nevertheless probably well below historical levels. It is likely that many species numbered in the millions 100 years ago, before the explosion of human and livestock populations across much of Africa. Overall population trends are assessed as decreasing for 45 species (58% of the total) and stable/ decreasing, i.e., showing a tendency to decline, for an additional 15 species (19%). Hence about three-quarters of the species are either in decline or showing a tendency for their distribution and abundance to decrease. The rate of decline of many species is accelerating.

## FUTURE PROSPECTS

If current trends continue, Africa will lose a substantial proportion of its remaining populations of antelopes and other wildlife during the 21st century. Continued expansion of agriculture and settlement, degradation of rangelands by large numbers of livestock and excessive offtake by meat hunters will result in further contractions of the distributions of most antelope species and reduction or elimination of local populations. These trends will only be countered by more widespread action to protect and manage areas of natural habitat and their wildlife populations. Continuation of present trends may result in healthy antelope populations becoming increasingly confined to Southern Africa with its strong private wildlife sector, as wildlife populations decline over much of the rest of the continent. Most species which do not occur in Southern Africa are likely to eventually become restricted to a few effectively protected areas of suitable habitat. Projections of the conservation status of antelopes based on the continuation of current trends (Table 5-1) suggest that the proportion of sub-Saharan Africa's antelope species which is threatened or extinct will double from about one-quarter at present (see Table 2-5, p. 30) to about half by 2025.

The opportunity still exists to prevent the conservation status of most African antelopes from eventually declining to threatened. However, projection of current human population growth rates suggests that by 2100 almost all African countries will have human population densities sufficiently high to place the survival of most antelope species at risk, in the absence of effective conservation measures (East 1995a). This projection does not allow for factors which may impact negatively on human population growth during the 21st century, e.g., increased living standards through economic development, AIDS. It is nevertheless likely that extensive loss of biodiversity

will continue in some parts of Africa because of continued human population growth and associated over-exploitation of natural resources to meet the immediate survival needs of people. In some cases, economic decline and political turbulence may facilitate the loss of biodiversity.

The development of effective, sustainable wildlife conservation in many parts of Africa may depend on pragmatic implementation of approaches such as strict protection within national parks, sustainable utilisation through carefully regulated trophy and/or meat hunting, community-based wildife management and/or involvement of the private sector. The most appropriate combinations of these approaches will vary from country to country and between localities within a country. Strong support for conservation at national government level and/or by local communities and recognition of wildlife protection and management as an integral element of national and regional development and landuse plans will be universal features of successful long-term conservation measures. Significant levels of external donor assistance will also be very important in most cases.

In Africa's current and foreseeable socioeconomic climate, realisation of the potential economic value of wildlife will be essential if conservation is to be widely successful in the long term. This will include both consumptive uses such as trophy hunting and non-consumptive uses such as game-viewing tourism. The private sector may play an increasingly important role in the conservation of many antelopes, as in several Southern African countries at present. Africa's environmental assets are potentially among the most valuable marketable products in an increasingly industrialised world (de Villiers 1995). Those countries which by luck or design manage to retain substantial antelope populations and other wildlife resources in 50-100 years time will probably reap substantial economic benefits.

TABLE 5-1. Summary of Current Status of Antelopes in sub-Saharan Africa and Projected Status if Current Trends Continue.

| Species & Subspecies | Estimated Order of Magnitude of Total Popn. | Overall Popn. Trend | Current Red List Status* | Projected Red List Status in 2025* |
|---|---|---|---|---|
| Family Giraffidae | | | | |
| Giraffe | low hundreds of thousands | S | LR/cd | LR/cd |
| Okapi | low tens of thousands | S/D | LR/nt | LR/nt |
| Family Tragulidae | | | | |
| Water Chevrotain | hundreds of thousands | D | LR/nt | VU |
| Family Bovidae | | | | |
| Subfamily Bovinae | | | | |
| Tribe Bovini | | | | |
| African Buffalo | hundreds of thousands | D | LR/cd | LR/cd |
| W. African Savanna Buffalo | tens of thousands | D | LR/cd | VU |
| Cen. African Savanna Buffalo | hundreds of thousands | D | LR/cd | LR/nt |
| Southern Savanna Buffalo | hundreds of thousands | D | LR/cd | LR/cd |
| Forest Buffalo | tens of thousands | D | LR/nt | VU |

*EX = Extinct; EW = Extinct in the Wild; CR = Critically Endangered; EN = Endangered; VU = Vulnerable; LR = Lower Risk; lc = least concern; cd = conservation dependent; nt = near threatened.

Table 5-1 (continued)

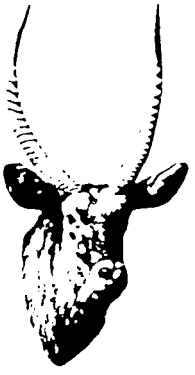
| Species & Subspecies | Estimated Order of Magnitude of Total Popn. | Overall Popn. Trend | Current Red List Status* | Projected Re List Status in 2025* |
|---|---|---|---|---|
| Tribe Tragelaphini | | | | |
| Bushbuck | millions | S/D | LR/lc | LR/lc |
| Sitatunga | hundreds of thousands | D | LR/nt | VU |
| Nyala | tens of thousands | S/I | LR/cd | LR/cd |
| Mountain Nyala | low thousands | S/I | EN | EN |
| Lesser Kudu | low hundreds of thousands | D | LR/cd | LR/nt |
| Greater Kudu | hundreds of thousands | S | LR/cd | LR/cd |
| Common Eland | low hundreds of thousands | S | LR/cd | LR/cd |
| Giant Eland | low tens of thousands | S/D | LR/nt | VU |
| Western Giant Eland | low hundreds | D | EN | EN |
| Eastern Giant Eland | low tens of thousands | S/D | LR/nt | VU |
| Bongo | tens of thousands | D | LR/nt | VU |
| Lowland Bongo | tens of thousands | D | LR/nt | VU |
| Mountain Bongo | hundreds | D | EN | EW |
| Subfamily Reduncinae | | | | |
| Bohor Reedbuck | low hundreds of thousands | D | LR/cd | LR/nt |
| Southern Reedbuck | tens of thousands | S | LR/cd | LR/cd |
| Mountain Reedbuck | tens of thousands | D | LR/cd | LR/cd |
| Western Mt. Reedbuck | hundreds | D | EN | EX |
| Chanler's Mt. Reedbuck | thousands? | D | LR/nt | VU |
| Southern Mt. Reedbuck | tens of thousands | S | LR/cd | LR/cd |
| Kob | hundreds of thousands | D | LR/cd | VU |
| Buffon's Kob | high tens of thousands | D | LR/cd | VU |
| Uganda Kob | low hundreds of thousands | S/I | LR/cd | LR/cd |
| White-eared Kob | hundreds of thousands? | D | LR/nt | VU |
| Puku | low hundreds of thousands | D | LR/cd | LR/cd |
| Waterbuck | hundreds of thousands | D | LR/cd | LR/cd |
| Ellipsen Waterbuck | low hundreds of thousands | D | LR/cd | LR/cd |
| Defassa Waterbuck | high tens of thousands | D | LR/cd | LR/nt |
| Lechwe | hundreds of thousands | S | LR/cd | LR/cd |
| Red Lechwe | high tens of thousands | S/D | LR/cd | LR/cd |
| Kafue Lechwe | tens of thousands | S/I | VU | LR/nt |
| Black Lechwe | tens of thousands | S/I | VU | LR/nt |
| Nile Lechwe | tens of thousands? | S/D | LR/nt | VU |
| Subfamily Peleinae | | | | |
| Grey Rhebok | low tens of thousands | S/D | LR/cd | LR/cd |
| Subfamily Alcelaphinae | | | | |
| Common Hartebeest | hundreds of thousands | D | LR/cd | LR/cd |
| Western Hartebeest | tens of thousands | D | LR/cd | VU |
| Lelwel Hartebeest | tens of thousands | D | LR/cd | VU |
| Tora Hartebeest | hundreds? | D | EN | EX |
| Swayne's Hartebeest | hundreds | D | EN | EX |
| Kenya Hartebeest | thousands | S | LR/cd | LR/cd |
| Coke's Hartebeest | tens of thousands | D | LR/cd | LR/nt |
| Red Hartebeest | low hundreds of thousands | S/I | LR/cd | LR/cd |
| Lichtenstein's Hartebeest | tens of thousands | S/D | LR/cd | LR/cd |
| Bontebok & Blesbok | hundreds of thousands | S/I | LR/cd | LR/cd |
| Bontebok | low thousands | I | VU | VU |
| Blesbok | hundreds of thousands | S/I | LR/cd | LR/cd |

Table 5-1 (continued)

| Species & Subspecies | Estimated Order of Magnitude of Total Popn. | Overall Popn. Trend | Current Red List Status* | Projected Red List Status in 2025* |
|---|---|---|---|---|
| Tsessebe, Topi & Tiang | hundreds of thousands | D | LR/cd | VU |
| Tsessebe | tens of thousands | I | LR/cd | LR/cd |
| Topi | high tens of thousands | S/D | LR/cd | VU |
| Coastal Topi | low hundreds of thousands | S/D | LR/cd | LR/nt |
| Tiang | tens of thousands | D | LR/nt | VU |
| Korrigum | thousands | D | VU | EN |
| Hirola | hundreds/low thousands | D | CR | CR |
| Blue/White-bearded Wildebeest | low millions | D | LR/cd | VU |
| Blue Wildebeest | hundreds of thousands | S/I | LR/cd | LR/cd |
| Western White-b. Wildebeest | high hundreds of thousands | D | LR/cd | VU |
| Eastern White-b. Wildebeest | high tens of thousands | S | LR/cd | LR/cd |
| Nyassa Wildebeest | high tens of thousands | S | LR/cd | LR/cd |
| Cookson's Wildebeest | low tens of thousands | S | LR/cd | LR/cd |
| Black Wildebeest | low tens of thousands | I | LR/cd | LR/cd |
| | | | | |
| Subfamily Hippotraginae | | | | |
| Roan Antelope | tens of thousands | D | LR/cd | VU |
| Bluebuck | - | - | EX | EX |
| Sable Antelope | tens of thousands | S | LR/cd | LR/cd |
| Common Sable | tens of thousands | S | LR/cd | LR/cd |
| Giant Sable | low thousands? | S/D | CR | EN |
| Gemsbok | hundreds of thousands | I | LR/cd | LR/cd |
| Beisa & Fringe-eared Oryx | tens of thousands | D | LR/cd | VU |
| Beisa Oryx | tens of thousands | D | LR/cd | VU |
| Fringe-eared Oryx | low tens of thousands | D | LR/cd | VU |
| Scimitar-horned Oryx | - | - | EW | EW |
| Addax | hundreds? | D | CR | EW |
| | | | | |
| Subfamily Aepycerotinae | | | | |
| Impala | low millions | S/I | LR/cd | LR/cd |
| Common Impala | low millions | S/I | LR/cd | LR/cd |
| Black-faced Impala | low thousands | I | VU | VU |
| | | | | |
| Subfamily Antilopinae | | | | |
| Tribe Antilopini | | | | |
| Dorcas Gazelle | tens of thousands | D | VU | EN |
| Slender-horned Gazelle | low thousands? | D | EN | EW |
| Red-fronted Gazelle | tens of thousands | D | VU | EN |
| Nominate Subspecies | tens of thousands | D | VU | EN |
| Heuglin's Gazelle | thousands | D | VU | EN |
| Thomson's Gazelle | hundreds of thousands | D | LR/cd | LR/cd |
| Nominate Subspecies | hundreds of thousands | D | LR/cd | LR/cd |
| Mongalla Gazelle | hundreds of thousands? | D | LR/nt | VU |
| Speke's Gazelle | tens of thousands? | D | VU | EN |
| Grant's Gazelle | hundreds of thousands | D | LR/cd | LR/nt |
| Soemmerring's Gazelle | low tens of thousands | D | VU | VU |
| Dama Gazelle | low thousands? | D | EN | EW |
| Springbok | hundreds of thousands | S/I | LR/cd | LR/cd |
| Gerenuk | high tens of thousands | D | LR/cd | LR/nt |
| | | | | |
| Tribe Ammodorcadini | | | | |
| Dibatag | low thousands? | D | VU | EN |

Table 5-1 (continued)

| Species & Subspecies | Estimated Order of Magnitude of Total Popn. | Overall Popn. Trend | Current Red List Status* | Projected Red List Status in 2025* |
|---|---|---|---|---|
| Tribe Neotragini | | | | |
| Royal Antelope | tens of thousands | D | LR/nt | VU |
| Bates' Pigmy Antelope | hundreds of thousands | S/D | LR/nt | VU |
| Suni | hundreds of thousands | S/D | LR/cd | LR/cd |
| Cape Grysbok | tens of thousands | S/D | LR/cd | LR/cd |
| Sharpe's Grysbok | high tens of thousands | S/D | LR/cd | LR/cd |
| Steenbok | hundreds of thousands | S | LR/lc | LR/lc |
| Salt's Dikdik | hundreds of thousands | S | LR/lc | LR/lc |
| Silver Dikdik | tens of thousands? | D | VU | EN |
| Guenther's Dikdik | hundreds of thousands | S | LR/lc | LR/lc |
| Kirk's Dikdik | high hundreds of thousands | S/D | LR/lc | LR/lc |
| Oribi | hundreds of thousands | D | LR/cd | LR/cd |
| Haggard's Oribi | thousands? | D | VU | EN |
| Other Subspecies | hundreds of thousands | D | LR/cd | LR/cd |
| Beira | thousands? | S/D | VU | EN |
| Klipspringer | tens of thousands | S/D | LR/cd | LR/cd |
| Western Klipspringer | low thousands? | D | EN | CR |
| Other Subspecies | tens of thousands | S/D | LR/cd | LR/cd |
| | | | | |
| Subfamily Cephalophinae | | | | |
| Maxwell's Duiker | millions | D | LR/nt | VU |
| Blue Duiker | millions | S/D | LR/lc | LR/cd |
| Aders' Duiker | low thousands | D | EN | EX |
| Bay Duiker | hundreds of thousands | D | LR/nt | VU |
| Peters' Duiker | hundreds of thousands | D | LR/nt | VU |
| Nominate Subspecies | hundreds of thousands | D | LR/nt | VU |
| Weyns' Duiker | hundreds of thousands | D | LR/nt | VU |
| White-bellied Duiker | hundreds of thousands | D | LR/nt | VU |
| Ogilby's Duiker | tens of thousands | D | LR/nt | VU |
| Nominate Subspecies | low tens of thousands | D | LR/nt | VU |
| Brooke's Duiker | thousands? | D | VU | EN |
| White-legged Duiker | tens of thousands | S/D | LR/nt | LR/nt |
| Black-fronted Duiker | hundreds of thousands | D | LR/nt | VU |
| Rwenzori Black-fr. Duiker | thousands? | D | EN | ? |
| Other Subspecies | hundreds of thousands | D | LR/nt | VU |
| Harvey's Red Duiker | tens of thousands | D | LR/cd | LR/nt |
| Natal Red Duiker | tens of thousands | D | LR/cd | LR/cd |
| Black Duiker | low hundreds of thousands | D | LR/nt | VU |
| Red-flanked Duiker | hundreds of thousands | D | LR/cd | LR/cd |
| Zebra Duiker | tens of thousands | D | VU | EN |
| Abbott's Duiker | thousands? | D | VU | CR |
| Yellow-backed Duiker | hundreds of thousands | D | LR/nt | VU |
| Jentink's Duiker | thousands? | D | VU | EN |
| Grey Duiker | millions | S/D | LR/lc | LR/lc |



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Appendix 1: Comparison of Key Conservation Areas for Antelope Communities with Those for other Large Mammals

CONSERVATION STATUS OF OTHER LARGE MAMMALS

Information on the Red List status of larger African mammals other than antelopes, giraffe, okapi, water chevrotain and buffalo in the following accounts is from the 1996 IUCN Red List (Baillie & Groombridge 1996), with the exception of hyaenas (see Mills & Hofer 1998).

## Elephant

The African elephant (*Loxodonta africana*) currently numbers in the hundreds of thousands (Said et al. 1995). It has suffered a marked decrease in its total population and a substantial contraction of its range over the last 300 years because of unsustainable hunting for ivory, desertification and displacement by growing human populations (Cumming et al. 1990). Poaching for ivory on a massive scale caused a precipitous decline in its populations in many parts of Africa during the 1970s and 1980s. It still occurs in many protected areas within its former distribution and is an important flagship species for the conservation of Africa's wildlife. The largest estimated populations in and around protected areas occur in northern Botswana (70,750), Selous (52,150) and Ruaha (18,900) (Tanzania), Hwange-Matetsi (37,400), Middle Zambezi Valley (15,700) and Sebungwe (10,500) (Zimbabwe), Luangwa Valley (14,000) and Kafue National Park and adjoining game management areas (10,260) (Zambia) and Garamba (11,200) (Congo-Kinshasa) (Said et al. 1995). The largest forest elephant populations occur in Gabon, Congo-Kinshasa and Congo-Brazzaville.

Although the elephant meets the Red List criteria for Endangered, it is not in any short or medium-term danger of extinction as a species because of the existence of healthy, stable or increasing populations in some parts of its range, especially in Southern Africa.

## Rhinos

Both species of African rhinos have been reduced to remnant populations. The white rhino (*Ceratotherium simum*) was formerly common in savanna grasslands in two separate regions, Southern Africa south of the Zambezi River and Central Africa from Lake Chad to the Nile. By 1900, uncontrolled hunting had reduced the southern subspecies (C. *s. simum*) to a tiny remnant population within a small fragment of its former range. Careful protection of the survivors in Htuhluwe-Umfolozi in South Africa and subsequent reintroductions to other parks and reserves within its former range have enabled the population of the southern white rhino to gradually recover to its current level of >7,000 (Martin & Vigne 1997). Having been the rarest of the world's five rhinoceros species for most of the 20th century, the white rhino is now the most numerous with a Red List status of Lower Risk (conservation dependent). Major populations of the southern white rhino occur in Kruger National Park, Hluhluwe-Umfolozi Park and other protected areas in South Africa (M. Brooks, in litt. May 1995).

The Critically Endangered northern white rhino (C. s. *cottoni*) was eliminated by poachers from most of its remaining range during the 1970s and 1980s. The last known population, in Garamba National Park (Congo-Kinshasa), had decreased to 15 animals in the mid-1980s. Effective protection enabled this population to double its numbers over the next decade, but since the outbreak of civil war in Congo-Kinshasa in late 1996 Garamba National Park has been affected by the country's insecurity. A few northern white rhino may survive elsewhere, e.g., in Southern National Park (Sudan) (Spinney 1996).

The black rhino (*Diceros bicornis*) remained much more abundant than all other rhino species until intensive poaching for horns severely reduced or eliminated most of its populations during the 1970s and 1980s. Its estimated total population plummeted by 96% between 1970 and 1992, from 65,000 animals spread through about 18 countries to 2,475 confined mainly to four countries (Kenya, Namibia, Zimbabwe and South Africa) (Martin & Vigne 1997). The black rhino's Red List

status is therefore Critically Endangered. The last remaining substantial free-ranging populations, each numbering in the hundreds, occur in Etosha National Park and Kaokoland (Namibia) and Kruger National Park and Hluhluwe-Umfolozi Park (South Africa) (M. Brooks, in litt. May 1995). Most of the other surviving black rhinos occur in relatively small, intensively protected, fenced rhino sanctuaries within national parks and on private land. Here they are relatively safe from poaching and the species' total numbers are beginning to recover (Martin & Vigne 1997).

## Equids

Burchell's zebra (*Equus burchelli*) formerly occurred in large numbers in the savanna grasslands of East and Southern Africa. It has been exterminated over substantial parts of its former range as a result of overhunting for meat and skins and the spread of settlement, agriculture and livestock, but it is still common in and around many protected areas and on private land. It shows marked ability to recover from population declines when afforded suitable habitat and adequate protection. Burchell's zebra remains one of the most abundant ungulates in Africa, with an estimated total population of about 650,000 (East 1997a; Hack et al. 1998). This estimate makes no allowance for undercounting bias in aerial surveys and true numbers may be closer to 1,000,000 (East 1997a). The largest population, estimated to number approximately 150,000, occurs in the Serengeti ecosystem of Tanzania. Populations numbering in the tens of thousands occur in many of the other major savanna wildlife areas of East and Southern Africa, e.g., Kajiado and Tsavo (Kenya), Tarangire, Katavi-Rukwa, Ruaha and Selous (Tanzania), Luangwa Valley (Zambia), Kruger (South Africa) and northern Botswana. This species' Red List status is Lower Risk (conservation dependent).

The other three African equids are threatened (Baillie & Groombridge 1996), viz., the Endangered Grevy's zebra (*Equus grevyi*) and mountain zebra (*E. zebra*) and the Critically Endangered African wild ass (*E. africanus*). Grevy's zebra has disappeared from most of its former range in the semi-arid grasslands and bushland of Northeast Africa during the last 50 years, mainly because of loss of habitat and exclusion from water sources by increasing numbers of livestock. Its total population has been reduced to about 5,000-6,000 animals and it is now confined to the northern rangelands of Kenya and a few localities in Ethiopia (Duncan 1992; East 1997a).

There are two distinct subspecies of the mountain zebra in the arid mountains and escarpments of Southwestern and extreme Southern Africa, viz., the Cape mountain zebra *(E. zebra zebra)* of the southern Cape and Karoo regions of South Africa and Hartmann's mountain zebra (*E. z. hartmannae*) of southwestern Angola, Namibia and the northwestern Cape. The Cape mountain zebra was on the verge of extinction 50 years ago. It has made a gradual recovery from not more than 100 individuals in the late 1940s to about 1,000 at present (Duncan 1992; East 1997a) as a result of strict protection in Mountain Zebra National Park and other areas. Populations of Hartmann's mountain zebra number in the thousands in protected areas in Namibia with the largest populations in the Namib-Naukluft and Etosha parks (Duncan 1992). This subspecies occurs in much greater numbers on private farmland in Namibia, where there were an estimated 34,400 in 1992 compared to 22,500 20 years earlier (Barnes & de Jager 1996). This suggests that the status of Hartmann's mountain zebra is secure.

The African wild ass has disappeared from almost all of its former range in the semi-desert grasslands of North and Northeast Africa. Rangeland degradation caused by overgrazing by livestock is probably the major cause of this decline. It is now one of the most threatened species of African wildlife and survives only in a few remnant populations in areas such as the Danakil Desert in Ethiopia, adjoining areas in southern Eritrea and the Nugal Valley in northern Somalia (Moehlman, in Duncan 1992).

## Hippos and Pigs

The common hippopotamus (*Hippopotamus amphibius*) formerly occurred throughout sub-Saharan Africa in lakes and rivers with adjoining grasslands. It has been eliminated from substantial parts of its former range by overhunting for meat and loss of grazing lands to cultivation, but it remains

widespread and locally abundant. Its total population is of the order 157,000, with the largest numbers in eastern Congo-Kinshasa, Sudan, Ethiopia, Tanzania, Zambia and Malawi (Oliver 1993). Its numbers are generally in decline except where it is protected in parks and reserves. Its status is Lower Risk (conservation dependent).

The pigmy hippopotamus (*Hexaprotodon liberiensis*) occurs in water-courses within the West African rainforests in Liberia, Sierra Leone, Ivory Coast and Nigeria. Hunting for meat and habitat destruction caused by forest clearance have greatly reduced its distribution and abundance. No more than a few thousand individuals are likely to survive (Oliver 1993) and its Red List status is Vulnerable. It occurs in only a few protected areas, such as Tai National Park (Ivory Coast) and Sapo National Park (Liberia).

Five Afrotropical species of pigs are now recognised (Oliver 1993), viz., the red river hog (*Potamochoerus porcus*) of the equatorial forests of West and Central Africa and adjoining galleries and forest-savanna mosaic, the bushpig (*P. larvatus*) of the savannas of East and Southern Africa, the forest hog (*Hylochoerus meinertzhageni*) which occurs in the equatorial forests of West and Central Africa and some upland forests of East Africa, the common warthog (*Phacochoerus africanus*) which occurs throughout most of the savannas of sub-Saharan Africa, and the desert warthog (*P. aethiopicus*) which replaces the common warthog in the Somali arid zone and (formerly) the southwestern Cape. The desert warthog is listed as Vulnerable in Baillie & Groombridge (1996) but the other four African suids are regarded as not threatened overall (Oliver 1993).

The red river hog and bushpig remain widespread and locally abundant and may be favoured by secondary vegetation which accompanies the spread of agriculture. Both of these species are notorious crop pests and attempts to control or eradicate them have usually proved unsuccessful.

The forest hog is well represented in protected areas such as Sapo (Liberia), Tai (Ivory Coast), Bia (Ghana), Dja and Campo (Cameroon), Dzanga-Sangha (Central African Republic), Odzala (Congo-Brazzaville), Maiko, Kahuzi-Biega, Okapi and Virunga (Congo-Kinshasa) and Queen Elizabeth-Kibale (Uganda). Outside protected areas its numbers are decreasing because of hunting for bushmeat and destruction of forest.

The common warthog is present in most of the protected areas throughout its extensive range, often in good numbers, although its populations are decreasing elsewhere because of loss of habitat to the spread of settlement and agriculture and hunting for meat. The distributional limits of the desert warthog in Somalia, Ethiopia and northern Kenya and the extent to which it intergrades with the common warthog are unclear. There are few protected areas in this region of Africa, but warthogs benefit from religious taboos relating to the consumption of pork by Muslims and remain very common, e.g., in the Ogaden region of Ethiopia (Wilhelmi 1997).

## Hyaenas

Two of the three African hyaena species, viz., the striped hyaena *{Hyaena hyaena)* and the brown hyaena (*H. brunnea*)*,* are classed as Lower Risk (near threatened) and the third species, the spotted hyaena (*Crocuta crocuta*)*,* as Lower Risk (conservation dependent) (Mills & Hofer 1998).

The striped hyaena occurs in arid thornbush and open habitats in North and Northeast Africa, the Middle East, the Caucasus, central Asia and the Indian subcontinent. It is a solitary, nocturnal forager and occurs at very low densities. The global population is estimated to number between 5,000 and 14,000 individuals and is in decline because of persecution by expanding human populations (Mills & Hofer 1998). In sub-Saharan Africa, viable populations survive in the northern sahel zone and southern protected areas of Burkina Faso, the sahelian rangelands of Niger, the far north of Cameroon, the northern rangelands and Tsavo area of Kenya, and probably some other regions (Mills & Hofer 1998).

The brown hyaena is confined to arid and semi-arid areas of Southwestern and Southern Africa. Like the striped hyaena, it is a solitary, nocturnal forager and occurs at very low population densities. The brown hyaena is prone to deliberate and incidental persecution by people. Poisoning, trapping, hunting and deterioration of habitat quality are threats to its long-term survival (Mills & Hofer 1998). Estimated total numbers are between 5,000 and 8,000 individuals, with major populations in areas such as Gemsbok National Park, Central Kgalagadi Game Reserve, the rest of the Kalahari and the northern rangelands (Botswana), Etosha National Park-Kaokoland, Skeleton Coast, the northeast and the southwest (Namibia) and Kalahari Gemsbok National Park and private land (South Africa) (Mills & Hofer 1998).

The spotted hyaena formerly occurred throughout the savanna zones of sub-Saharan Africa. It has disappeared from large parts of its former range because of persecution by livestock herders and ranchers and is now generally restricted to protected areas and other areas with low human population densities. Its long-term survival will be increasingly dependent on protection within parks and reserves. Spotted hyaena populations are probably decreasing in many protected areas in West, Central and East Africa because of incidental snaring and poisoning, but are generally stable in protected areas in Southern Africa. Estimated total numbers are 27,000-47,000 (Mills & Hofer 1998). It survives in most of the larger protected areas of savanna in sub-Saharan Africa, with major populations in areas such as Serengeti-Mara, Selous Game Reserve and other wildlife areas of Tanzania, the larger wildlife areas of Zimbabwe and Kruger National Park. It is the numerically dominant large carnivore in areas such as Serengeti, Ngorongoro and Kruger.

## Large Felids

Two of the three large species of African cats, the cheetah (*Acinonyx jubatus*) and lion (*Panthera led*), are classed as Vulnerable. The third species, the leopard (*P. pardus*), is not threatened. The cheetah formerly occurred throughout the drier savannas and subdesert zones of sub-Saharan Africa. Its populations have been eliminated or greatly reduced over large parts of its former distribution as livestock has replaced wild herbivores. Its total numbers are estimated to be of the order 9,000-25,000 with two main surviving regional concentrations, in East Africa (Kenya and Tanzania) and Southern Africa (Namibia, Botswana, Zimbabwe and Zambia) (Nowell & Jackson 1996). Its populations in many protected areas appear to be limited by predation of cubs by lions and other large carnivores. The cheetah occurs at higher densities in areas where most or all other large predators have been eliminated, e.g., private farmland in Namibia and pastoral rangeland in Kenya (Nowell & Jackson 1996). These areas may be especially important for this species' long-term survival, but it is also persecuted in ranching areas because it preys on livestock. Namibia, South Africa and Zimbabwe are pursuing a strategy of permitting trophy hunting of cheetahs on private land, with the goal of encouraging landowners to accept and profit from cheetahs on their land.

The lion formerly occurred throughout sub-Saharan Africa, except for dense forests and the most arid deserts. It has been widely eliminated as the distribution and numbers of livestock have expanded. This process is continuing outside protected areas. Estimates of its total numbers are in the range 30,000-100,000 (Nowell & Jackson 1996). The largest surviving populations occur in East and Southern Africa, with major protected populations in areas such as Masai Mara and Tsavo (Kenya), Serengeti, Ruaha and Selous (Tanzania), Luangwa Valley (Zambia), Etosha (Namibia), northern region (Botswana), Hwange, Sebungwe and Middle Zambezi Valley (Zimbabwe) and Kruger (South Africa). Kingdon (1997) pointed out that the lion is an indicator of a self-sustaining community of large grazers and an appropriate symbol for conservation in Africa. Its long-term survival will be confined to national parks, equivalent reserves and hunting zones, where its value to game-viewing tourists and trophy hunters justifies setting aside the large tracts of land required to support viable lion populations.

Despite widespread persecution by people, the leopard still occupies a large part of its historical range. This included most of sub-Saharan Africa from subdeserts to lowland and montane forests. Its total numbers are unknown but could be as high as 700,000 (Nowell & Jackson 1996). Only a

small proportion of its population occurs within protected areas. The countries with the largest estimated populations include Congo-Kinshasa, Cameroon, Central African Republic, Gabon, Congo-Brazzaville, Tanzania, Angola, Zambia and Mozambique. The leopard tolerates habitat modification and often occurs in the vicinity of settlements, although at reduced densities.

### Large Canids

The two large canids of sub-Saharan Africa, the African wild dog (*Lycaon pictus*) and the Ethiopian wolf (*Canis simensis*) are among the continent's most threatened wildlife species. The wild dog is Endangered and the Ethiopian wolf is Critically Endangered.

Formerly widespread throughout the savanna zones of sub-Saharan Africa, the wild dog has declined dramatically over the last 30 years as human populations have expanded. It has disappeared from more than half of the countries in which it formerly occurred. Total numbers are estimated to be between 3,000 and 5,500 with most of the surviving animals in East and Southern Africa (Woodroffe et al. 1997). The wild dog occurs naturally at very low population densities and packs often range over vast areas. Consequently, it has very large area requirements for the conservation of viable populations (East 1981a, 1981b; Fanshawe et al. 1991). Perhaps more than any other species, the wild dog is the most appropriate flagship species for the conservation of intact large mammal communities in the savanna ecosystems of Africa. The presence of a healthy, resident breeding population of the wild dog provides a "gold standard" for the conservation status of wildlife (Woodroffe et al. 1997). At present only a few areas are known to support populations of >1 00 wild dogs, viz., the Selous and Ruaha ecosystems (Tanzania), Kafue and the Luangwa Valley (Zambia), Kruger (South Africa), and the contiguous wildlife areas of northeastern Namibia, northern Botswana and northwestern Zimbabwe (Woodroffe 1998). Management of metapopulations in networks of smaller, fenced protected areas may be a feasible option for wild dog conservation where sufficient resources are available, e.g., in South Africa, but this species' long-term survival will depend on the continued existence of very large areas of contiguous land managed for wildlife.

The conservation status of the Ethiopian wolf is even more precarious. It is endemic to the Ethiopian highlands, where invasion of its habitat by people and livestock, hunting by livestock herders, and interbreeding with and possible disease transmission from domestic dogs are major threats to its survival. It is now restricted to a few fragments of its former range and its total numbers are <1,000, including about 400 adult dogs (Ginsberg & Macdonald 1990; Sillero-Zubiri & Macdonald 1997). The only sizeable population left is in Bale Mountains National Park, where its numbers decreased significantly between 1989 and 1992 but have subsequently shown some recovery (Stephens 1997).

## Primates

Oates (1996a) reviewed the priorities for surveys and protected area management programmes required to ensure the survival of threatened African primates and to provide effective protection for areas of high primate diversity and/or abundance. Twelve of the 48 species of monkeys and apes in sub-Saharan Africa were identified as threatened. This includes all three African great apes, the chimpanzee *(Pan troglodytes),* pigmy chimpanzee (*P. paniscus*) and gorilla *{Gorilla gorilla),* all of which are Endangered (Baillie & Groombridge 1996).

The chimpanzee has been affected adversely by poaching and habitat loss over large parts of its range, which includes the equatorial forests of West and Central Africa and some adjoining forest galleries and savanna woodlands. This species' total population is of the order 100,000, with the largest numbers in Gabon and Congo-Brazzaville (Oates 1996a). Its numbers are now decreasing rapidly in some regions, especially in West Africa. It occurs in most of the major forest national parks of West and Central Africa.

The pigmy chimpanzee, which is endemic to the equatorial forests of Congo-Kinshasa to the south of the Congo (Zaire) River, is also in decline because of habitat destruction from commercial logging

and agriculture, subsistence farming and encroachment by growing human populations, as well as hunting for meat. It is now reduced to small, isolated populations, and its total numbers may not exceed 10,000-20,000 (Oates 1996a). There are few protected areas within its range. Those which exist are protected in name only, but hunting pressures are low in parts of the pigmy chimpanzee's range where there are few people, e.g., the northeastern sector of Salonga National Park (Oates 1996a).

The gorilla occurs in two separate regions of equatorial Africa. Three subspecies are usually recognised, the western lowland gorilla *(Gorilla gorilla gorilla)* in southern Cameroon, southwestern Central African Republic, Equatorial Guinea, Gabon and Congo-Brazzaville, with an outlying population in southeastern Nigeria; the eastern lowland gorilla (*G. g. graueri*) in eastern Congo-Kinshasa; and the mountain gorilla (*G. g. beringei*) in the Virunga Volcanoes of Congo-Kinshasa, Rwanda and Uganda and the Bwindi-Impenetrable Forest of southwestern Uganda. Estimated populations of the subspecies (Oates 1996a) include a stable population of 600 mountain gorillas, all of which occur in national parks; a stable population of at least 10,000 eastern lowland gorillas, about half in Kahuzi-Biega, Maiko and Virunga National Parks [a more recent estimate by Hall et al. (1998) indicates a total of about 17,000 *G. g. graueri,* with two-thirds of these in the three national parks which lie within the subspecies' range]; and more than 110,000 western lowland gorillas, of which less than 10% are in national parks. Hunting and forest clearance for timber and agriculture, which are the main threats to gorillas, are increasing in intensity and extent. The numbers of the most abundant subspecies, the western lowland gorilla, are likely to crash within a century until it occurs only in conservation areas (Oates 1996a).

## Summary of Conservation Status of Other Large Mammals

The status of the other large mammal species considered above is summarised in Table A-1. Thirteen (52%) of the 25 species listed in Table A-1 are classed as threatened. In comparison, 23% of the antelope species in sub-Saharan Africa are considered threatened or extinct (see Table 2-5, p. 30, and Table 5-1, p. 351).

### SIGNIFICANCE FOR OTHER LARGE MAMMALS OF KEY AREAS FOR ANTELOPES

Table A-2 lists the significance for other large mammals of the key areas for the conservation of antelope communities identified in Fig. 2-1 and Table 2-3 (p. 18). The areas in Fig. 2-1 include a high proportion of the key areas for the conservation of the African elephant, rhinos, equids, hyaenas, large felids, and large canids, and 50% or more of those for primates, hippos and pigs. For the latter groups, this figure is much higher if only threatened species are considered, e.g., Fig. 2-1 includes 70% of the areas where the pigmy hippo is known to still occur (Oliver 1993) and 64% of the priority areas identified by Oates (1996a) which support populations of chimpanzee or pigmy chimpanzee and/or gorilla. It is therefore concluded that the key areas for the conservation of antelope communities (Fig. 2-1) include a high proportion of those for other taxa of large mammals and hence a high proportion of Africa's key wildlife areas.

All of these areas are of outstandingly high international importance for the conservation of African wildlife. The information in Table A-2 highlights the exceptional significance for large mammal diversity of areas such as:

Benoue, Bouba Ndjida and Faro National Parks and adjoining hunting zones of North Province (Cameroon);

Garamba National Park (Congo-Kinshasa);

Virunga National Park (Congo-Kinshasa)-Queen Elizabeth and Kibale Forest National Parks (Uganda);

northern rangelands, Aberdare and Mount Kenya National Parks and Forest Reserves and

TABLE A-1. Summary of Conservation Status of Other Large African Mammals.

| Species & Subspecies | Estimated Order of Magnitude of Total Popn. | Current Popn. Trend | Red List Status* |
|---|---|---|---|
| Elephant | hundreds of thousands | D | EN |
| White Rhino | thousands | I | LR/cd |
| Southern White Rhino | thousands | I | LR/cd |
| Northern White Rhino | tens | ? | CR |
| Black Rhino | low thousands | S/I | CR |
| Burchell's Zebra | hundreds of thousands | S/D | LR/cd |
| Mountain Zebra | tens of thousands | I | LR/cd** |
| Cape Mt. Zebra | high hundreds/low thousands | I | EN |
| Hartmann's Mt. Zebra | tens of thousands | I | LR/cd** |
| Grevy's Zebra | thousands | S/D | EN |
| African Wild Ass | hundreds/low thousands | D | CR |
| Common Hippopotamus | low hundreds of thousands | D | LR/cd |
| Pigmy Hippopotamus | low thousands? | D | VU |
| Red River Hog | ? | S/D | not threatened |
| Bushpig | ? | S/D | not threatened |
| Forest Hog | ? | D | LR/cd |
| Common Warthog | hundreds of thousands | D | LR/cd |
| Desert Warthog | ? | ? | VU |
| Striped Hyaena | thousands | D | LR/nt |
| Brown Hyaena | thousands | D | LR/nt |
| Spotted Hyaena | tens of thousands | D | LR/cd |
| Cheetah | low tens of thousands | D | VU |
| Lion | tens of thousands | D | VU |
| Leopard | hundreds of thousands | S/D | not threatened |
| African Wild Dog | thousands | D | EN |
| Ethiopian Wolf | hundreds | D | CR |
| Chimpanzee | high tens/low hundreds of thousands | D | EN |
| Pigmy Chimpanzee | low tens of thousands | D | EN |
| Gorilla | low hundreds of thousands | D | EN |
| Western Lowland Gorilla | low hundreds of thousands | D | EN |
| Eastern Lowland Gorilla | low tens of thousands | S/D | EN |
| Mountain Gorilla | hundreds | S/D | CR |

* CR = Critically Endangered; EN = Endangered; VU = Vulnerable; LR = Lower Risk; cd = conservation dependent; nt = near threatened.

** Although the Mountain Zebra is classed as Endangered in Baillie & Groombridge (1996), it is more appropriate to classify Hartmann's Mountain Zebra (and hence the species as a whole) as Lower Risk/conservation dependent (see text).

Kajiado-eastern Narok (Kenya);

Serengeti-Mara and Tsavo-Mkomazi (Kenya and Tanzania);

Tarangire, Moyowosi-Kigosi-Ugalla River-Katavi-Rukwa, Ruaha and Selous-Kilombero-Udzungwa (Tanzania);

Etosha-Kaokoland-lona (Namibia and Angola);

the contiguous wildlife areas of northeastern Namibia, northern Botswana and northwestern Zimbabwe;

Kafue, Lochinvar and Blue Lagoon National Parks and adjoining game management areas, and the Luangwa Valley (Zambia);

the Sebungwe and Middle Zambezi Valley regions (Zimbabwe);

Kruger National Park (South Africa)-Gaza Province (Mozambique)-Gonarezhou National Park (Zimbabwe);

Hluhluwe-Umfolozi Park (South Africa);

private farms and conservancies (Namibia, Zimbabwe and South Africa).

In the equatorial forests where species such as rhinos, equids and large canids are absent, areas of exceptionally great significance for large mammal conservation include:

Sapo-Krahn-Bassa (Liberia);

Tai and Cavally-Gouin-Grebo (Ivory Coast and Liberia);

Campo and Dja (Cameroon);

Dzanga-Sangha-Dzanga-Ndoki (Central African Republic)-Lobeke-Mongokele (Cameroon)-Nouabale-Ndoki-Kabo (Congo-Brazzaville);

Wonga-Wongue and Gamba (Gabon);

Lope and Minkebe-Mingouli-Djoua (Gabon), Odzala (Congo-Brazzaville);

Salonga, Okapi, Maiko and Kahuzi-Biega (Congo-Kinshasa).

Other areas in Fig. 2-1 are critically important for the conservation of regional large mammal communities such as those of the West African savanna woodlands, e.g., Niokolo-Koba (Senegal), Arly-W-Pendjari National Parks and adjoining reserves and hunting zones (Benin, Burkina Faso and Niger), the Central African savannas, e.g., Manovo-Gounda-St. Floris, Sangba and adjoining hunting zones (Central African Republic), and the southwestern arid region, e.g., Kalahari Gemsbok National Park (South Africa)-Gemsbok National Park (Botswana) and Central Kgalagadi-Khutse Game Reserves (Botswana).

Some of the key locations for the conservation of threatened antelopes shown in Fig. 2-2 are also important for other threatened large mammals, e.g., the Awash Valley and northern Danakil Desert (Ethiopia), southern coastal plain (Eritrea) and Nugal Valley (Ethiopia) for the African wild ass.

TABLE A-2. Significance for Other Large Mammals of Key Locations for the Conservation of Antelope Communities. Locations numbered as in Fig. 2-1 and Table 2-3. See footnote on p. 394 for sources of information.

Symbols:
+: key area
-: not a key area
(+): formerly a key area, habitat remains suitable but populations greatly reduced or eliminated by poaching
?: may be a key area, but insufficient information available

| Location | Elephant | Rhinos | Equids | Hippos & Pigs | Hyaenas | Large Felids | Large Canids | Primates |
|---|---|---|---|---|---|---|---|---|
| 1. Air & Tenere | - | - | - | - | - | ? | - | - |
| 2. Ouadi Rime-Ouadi Achim | - | - | - | - | - | ? | ? | - |
| 3. Corubal River | - | - | - | + | + | ? | - | - |
| 4. Niokolo-Koba | - | - | - | + | + | + | + | - |
| 5. Bouale/Bafing | - | - | - | + | ? | ? | - | - |
| 6. Outamba-Kilimi | - | - | - | + | ? | ? | - | - |
| 7. Gola-Kpelle-Lorma | - | - | - | + | - | + | - | + |
| 8. Sapo-Krahn-Bassa | + | - | - | + | - | + | - | + |
| 9. Tai/Cavally-Grebo | + | - | - | + | - | + | - | + |
| 10. Songan-Tamin | - | - | - | - | - | ? | - | + |
| 11. Marahoue/Sangbe | - | - | - | - | ? | ? | - | - |
| 12. Comoe/Diefoula | (+) | - | - | + | + | + | - | - |
| 13. Nazinga | - | - | - | - | + | - | - | - |
| 14. Arly-W-Pendjari | + | - | - | + | + | + | - | - |
| 15. Mole/Bui | - | - | - | + | ? | ? | - | - |
| 16. Bia/Nini-Suhien/Kakum | - | - | - | + | - | + | - | + |
| 17. Digya | - | - | - | + | ? | ? | - | - |
| 18. Kainji Lake | - | - | - | + | ? | ? | - | - |
| 19. Cross River-Korup | - | - | - | + | - | + | - | + |
| 20. Gashaka-Gumpti | - | - | - | + | ? | ? | - | - |
| 21.Waza | + | - | - | - | + | + | - | - |
| 22. Benoue/Bouba Ndjida/Faro | + | + | - | + | + | + | + | - |
| 23. Zakouma/Salamat | + | - | - | - | + | + | ? | - |
| 24. Manovo/Sangba | + | (+) | - | + | + | + | ? | - |
| 25. Chinko/Bangassou | + | - | - | + | + | + | ? | - |
| 26. Campo/Dja | + | - | - | + | - | + | - | + |
| 27. Dzanga-Lobeke-Ndoki | + | - | - | + | ? | + | - | + |
| 28. Monte Alen | - | - | - | + | - | + | - | - |
| 29. Wongue/Gamba | + | - | - | + | - | + | - | + |
| 30. Lope/Minkebe/Odzala | + | - | - | + | ? | + | - | + |
| 31. Lake Tele-Likouala | + | - | - | + | - | + | - | - |
| 32. Salonga | + | - | - | + | - | + | - | + |
| 33. Garamba | + | + | - | + | + | + | - | - |
| 34. Ituri (Okapi) | + | - | - | + | - | + | - | + |
| 35. Virunga-Queen Elizabeth | + | - | - | + | + | + | - | + |
| 36. Maiko | + | - | - | + | - | + | - | + |
| 37. Kahuzi-Biega | + | - | - | + | - | + | - | + |
| 38. Upemba/Kundelungu | ? | - | ? | + | + | ? | - | - |
| 39. Southern | ? | ? | - | - | ? | ? | ? | - |
| 40. Boma/Badingilo | ? | - | + | + | + | + | ? | - |
| 41. Gash-Setit | - | - | ? | - | ? | ? | - | - |
| 42. Awash Valley | - | - | + | + | + | + | ? | - |
| 43. Bale Mountains | - | - | - | + | + | ? | + | + |

Table A-2 (continued)

| Location | Elephant | Rhinos | Equids | Hippos & Pigs | Hyaenas | Large Felids | Large Canids | Primates |
|---|---|---|---|---|---|---|---|---|
| 44. Omo-Mago | - | - | + | ? | + | + | + | - |
| 45. Southern Ogaden | - | - | ? | ? | + | + | + | - |
| 46. Murchison Falls | (+) | (+) | - | + | + | + | - | - |
| 47. Kidepo Valley | (+) | - | - | - | ? | ? | - | - |
| 48. Mount Elgon | - | - | - | - | - | ? | - | - |
| 49. Northern Kenya | + | (+) | + | + | + | + | + | - |
| 50. Laikipia | + | + | + | - | + | ? | - | - |
| 51. Southwest Mau | - | - | - | + | - | + | - | - |
| 52. Aberdare/Mount Kenya | + | + | - | + | + | + | - | - |
| 53. Kajiado-eastern Narok | + | + | + | + | + | + | + | - |
| 54. Tsavo-Mkomazi | + | + | + | + | + | + | + | - |
| 55. E. Afr. coastal hinterland | - | - | + | + | ? | ? | ? | + |
| 56. Serengeti-Mara | + | + | + | + | + | + | - | - |
| 57. Kilimanjaro | - | - | - | - | - | + | - | - |
| 58. Tarangire | + | (+) | + | + | + | + | + | - |
| 59. Biharamulo-Burigi | - | - | + | + | + | ? | - | - |
| 60. Moyowosi/Katavi | + | - | + | + | + | + | + | - |
| 61. Ruaha-Rungwa-Kisigo | + | (+) | + | + | + | + | + | - |
| 62. Selous/Udzungwa | + | + | + | + | + | + | + | + |
| 63. Akagera | - | - | - | + | + | ? | - | - |
| 64. Luando | - | - | - | + | ? | ? | - | - |
| 65. Etosha-Kaokoland | + | + | + | - | + | + | - | - |
| 66. Chobe/Hwange/Caprivi | + | + | + | + | + | + | + | - |
| 67. Liuwa Plain | - | - | + | - | ? | ? | ? | - |
| 68. Kafue/Lochinvar | + | (+) | + | + | + | + | + | - |
| 69. Bangweulu-Kafinda | - | - | - | - | ? | - | - | - |
| 70. Luangwa Valley | + | (+) | + | + | + | + | + | - |
| 71. Mweru Wantipa/Nsumbu | - | - | - | + | + | + | - | - |
| 72. Nyika | - | - | - | - | ? | - | - | - |
| 73. Lengwe | - | - | - | + | - | - | - | - |
| 74. Niassa | + | - | (+) | + | + | + | - | - |
| 75. Gorongosa/Marromeu | (+) | - | (+) | + | + | ? | - | - |
| 76. Namib-Naukluft | - | - | + | - | + | ? | - | - |
| 77. Kalahari Gemsbok | - | - | - | - | + | + | + | - |
| 78. Central Kgalagadi | - | - | - | - | + | + | + | - |
| 79. Ngamiland | - | - | - | - | + | ? | - | - |
| 80. Tuli block | - | - | - | + | + | ? | - | - |
| 81. Sebungwe | + | + | + | + | + | + | + | - |
| 82. Zambezi Valley | + | + | + | + | + | + | + | - |
| 83. Kruger-Gaza-Gonarezhou | + | + | + | + | + | + | + | - |
| 84. Hluhluwe-Umfolozi | - | + | + | + | + | + | + | - |
| 85. Drakensberg | - | - | - | - | - | - | - | - |
| 86. Hlane/Malolotja | - | - | - | - | ? | - | - | - |
| 87. Private Land | - | + | + | + | + | + | - | - |
| 88. Other prot areas (S. Africa) | - | + | + | + | + | ? | ? | - |
| No. of key areas not included in Fig. 2-1 | 9 | 5 | 5 | 47 | 15 | 16 | 0 | 18 |
| % of identified key areas in common with antelopes | 80 | 76 | 84 | 57 | 76 | 77 | 100 | 50 |

Table A-2 (continued)

Sources of information:

Elephant: Key areas are assumed to be those with estimated populations of 1,000 or more (data from Said et al. 1995).

Rhinos: Key and important rhino populations in Africa as assessed by the lUCN/SSC African Rhino Specialist Group (M. Brooks, in litt. May 1995).

Equids: Key areas are those known to support a major population (>1,000 individuals) of Burchell's zebra and/or viable populations of mountain zebra, Grevy's zebra or African wild ass (data from Duncan 1992, East 1997a and Hack et al. 1998).

Hippos and Pigs (Suiformes): Key areas are those known to support viable populations of at least one of the two hippo species and/or at least two of the five African pig species and/or the desert warthog only [data from Oliver (1993), with additional information from sources given in Appendix 3].

Hyaenas: Key areas are those known to support viable populations of at least one of the three hyaena species [data from Mills & Hofer (1998), with additional information from sources in Appendix 3].

Large Felids: Key areas are those known to support viable populations of at least two of Africa's three large cat species (savanna areas) or the leopard only (forest areas) [information from Nowell & Jackson (1996) and sources in Appendix 3].

Large Canids: Areas known to support viable or potentially viable populations of the African wild dog (Woodroffe et al. 1997) or the Ethiopian wolf (Ginsberg & Macdonald 1990; Sillero-Zubiri & Macdonald 1997).

Primates: Areas identified as priorities for action by the lUCN/SSC Primate Specialist Group (Oates 1996a).

## Appendix 2: Acronyms

| | |
|---|---|
| AWF | African Wildlife Foundation |
| ASG | Antelope Specialist Group |
| BMZ | Bundesministerium fur Wirtschaftliche Zusammenarbeit (German Ministry of Economic Cooperation) |
| CECI | Centre Canadien d'Etudes et de Cooperation Internationale |
| CEPA | Conservation des Especes et des Populations Animale |
| CI | Conservation International |
| CIDA | Canadian International Development Agency |
| CMS | Convention on the Conservation of Migratory Species |
| DANIDA | Danish International Development Agency |
| DSCF | David Shepherd Conservation Foundation |
| ECOFAC | Ecosystemes Forestiers en Afrique Centrale |
| EU | European Union |
| EWCO | Ethiopian Wildlife Conservation Organisation |
| FAC | Fonds d'Aide a la Cooperation (France) |
| FFEM | Fonds Francais pour l'Environnement Mondial |
| FFI | Fauna and Flora International |
| FINNIDA | Finnish International Development Agency |
| FoC | Friends of Conservation |
| FZS | Frankfurt Zoological Society |
| GEF | Global Environment Facility |
| GTZ | Gesellschaft fur Technische Zusammenarbeit (implementing agency of BMZ) |
| IFAW | International Fund for Animal Welfare |
| IUCN | The World Conservation Union |
| JICA | Japan International Cooperation Agency |
| KfW | Kreditanstalt fur Wiederaufbau (German Development Bank) |
| KWS | Kenya Wildlife Service |
| NORAD | Norwegian Agency for International Development |
| ODA | Overseas Development Administration (UK) (now the Department for International Development) |
| SADC | Southern African Development Community |
| SDC | Swiss Development Cooperation |
| SIDA | Swedish International Development Authority |
| SSC | Species Survival Commission |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Scientific, Educational and Cultural Organisation |
| USAID | United States Agency for International Development |
| USFWS | United States Fish and Wildlife Service |
| USPC | United States Peace Corps |
| WCS | Wildlife Conservation Society (New York Zoological Society) |
| WWF | World Wide Fund for Nature |
| ZSCSP | Zoological Society for the Conservation of Species and Populations |

## Appendix 3: Sources of Information

The information on each country in section 4 and Appendix 4 was obtained from the following sources (countries listed in alphabetical order):

*Angola:* J. L. Anderson (in litt. September 1998), Dagg & Foster (1976), B. Dooley (in litt. February 1996), R. D. Estes (in litt. September 1998), Estes (1989, 1997), Green & Rothstein (1996), Horsten (1982), IUCN/ROSA (1992).

*Benin:* B. Chardonnet (in litt. May 1995), Chardonnet (1995), Green & Chardonnet (1990).

*Botswana:* Crowe (1995), B. Dooley (in litt. July 1995), DWNP (1995), D. Gibson (in litt. May 1997), K. Ross (in litt. July 1996), Ross (1992), Ross et al. (1998), Spinage (1993, 1998), Spinage et al. (1989), Thouless (in press).

*Burkina Faso:* Barry & Chardonnet (1998), U. Belemsobgo (in litt. October 1995, February 1998), Belemsobgo & Chardonnet (1996), Bousquet (1992), B. Chardonnet (in litt. May 1995, March & June 1998), A. Green (in litt. January 1998), Heringa et al. (1990), Newby (1998), World Bank (1995).

*Burundi:* Verschuren (1988).

*Cameroon:* Bro-Jorgensen (1997), J. Culverwell (in litt. July 1994, June 1995), East (1996b, 1997b), East & Elkan (1995), P. Elkan (in litt. May 1995), Elkan (1995), Gadsby & Jenkins (1992), A. Green (in litt. August 1994, May 1995), Lamarque et al. (1990), G. Nicolet (in litt. April 1997), H. Planton & I. Michaux (in litt. August 1994, April 1998), Planton et al. (1995), P. Scholte (in litt. January 1997), Scholte et al. (1995).

*Central African Republic: A.* Blom (in litt. May 1995, August 1997), Blom et al. (1995), B. Chilvers Lubin & R. Lubin (pers. comm. July 1997, October 1998), F. Duckworth (in litt. January & March 1998), East (1997b), Fay et al. (1990), Ottow et al. (1997), J. L Tello (in litt. August 1994, September 1995).

*Chad:* Chai (1996), P. Chardonnet (in litt. December 1997), Dejace (1996), D. Moksia (in litt. July 1995), Moksia & Reouyo (1996), Newby (1998), Pfeffer (1995), M. T. Reouyo (in litt. February 1996), Scholte (1997), Smith (1998), Thomassey & Newby (1990), Tubiana (1995, 1996).

*Congo-Brazzaville:* C. Aveling (in litt. July 1994), Blake et al. (1994), C. Chatelain (in litt. May 1995), M. Colyn (in litt. February 1996, May 1997), Congo Safaris (1997a, 1997b), Doumenge (1992), Dowsett & Dowsett-Lemaire (1989b, 1991), Dowsett-Lemaire & Dowsett (1991), P. Elkan (in litt. May 1997, June 1998), Elkan (1996, 1998), J. M. Fay (in litt. May 1994), Feer (1990), Hecketsweiler & Mokoko Ikonga (1991), Nganga et al. (1990), R. Ruggiero (in litt. October 1994, July 1997), E. Stockenstroom (in litt. June & October 1995, May 1997), Stockenstroom et al. (1997), Wilson & Wilson (1991), World Bank (1993).

*Congo-Kinshasa:* Alers et al. (1989), Alers & Sikubwabo Kiyengo (1989), Anon. (1990), C. Aveling (in litt. December 1995), A. Blom (in litt. February 1990), Blom & Tshobo Masunda (1989), T. Butynski (in litt. August 1995), Colyn et al. (1987), J. Hall (in litt. September 1995, September 1996), J. Hart (in litt., December 1995), Hart & Hart (1992), Hart & Sikubwabo (1994), K. Hillman Smith (in litt. October 1995, January 1996), Hillman Smith et al. (1995, 1996), Muhindo Mesi Habuyewe (through K. Hillman Smith, in litt. January 1996), Nicholas (1995), Ilambu Omari (through Bihini Won Wa Musiti, in litt. February 1996), von Richter et al. (1990), Sarmiento & Butynski (1997a, 1997b), H. Smith (in litt. January 1997), J. Watkin (in litt. June 1996).

*Djibouti:* East (1988), T. Kunzel (in litt. March 1998), Kunzel & Kunzel (1998), Laurent (1990).

*Equatorial Guinea:* L. Arranz & N. Mangue (in litt. April 1998), Butynski et al. (1995), Castroviejo et al. (1990), J. E. Garcia (in litt. May 1998), Juste et al. (1995).

*Eritrea:* Butynski (1995), Hagos Yohannes (in litt. January 1997), Hillman (1988, 1993), Litoroh (1997), P. Moehlman (in litt. November 1997), Yalden et al. (1984).

*Ethiopia:* Bolton (1973), Ato Fikadu (through Asferachew Abate & S. Millington, in litt. February 1997), A. Graham (in litt. November 1996), Graham et al. (1996, 1997), J. Henshaw (in litt. April 1996), Hillman (1988, 1991), Lamprey (1994), Malcolm & Sillero-Zubiri (1997), G. H. Mattravers Messana (in litt. November 1998), P. Moehlman (in litt. August 1997), Moehlman & Kebede (1998), C. Schloeder & M. Jacobs (in litt. June 1995, August 1996), Schloeder & Jacobs (1996), Schloeder et al. (1997), Shibru Tedla (1995), Fekadu Shiferaw (in litt. November 1995), Stephens (1997), P. 0. Syvertsen (in litt. October 1996, October 1998), C. Thouless (in litt. August 1996), Thouless (1995a, 1995b), Wilhelmi (1997, 1998), Yalden et al. (1984).

*Gabon:* Blom et al. (1990), A. Greth (in litt. January 1996), S. Lahm (in litt. September 1995, January, May & August 1996), Lahm (1995a, 1995b), Lahm et al. (1996), Tutin et al. (1996), White (1994).

*Gambia:* Camara (1990), Grubb et al. (1998).

*Ghana:* A. K. Agyare (in litt. April 1996), Ankudey & Ofori-Frimpong (1990), Ghana Wildlife Department (1996), Wilson (1994a, 1994b).

*Guinea:* Barnett & Prangley (1997), Barnett et al. (1993, 1994), Bourque & Wilson (1990), Bousquet (1992), I. Hall (in litt. July 1998), Sillero-Zubiri et al. (1997), Sournia et al. (1990).

*Guinea-Bissau:* Chardonnet & Limoges (1990), Gippoliti & Dell'Omo (1996), IUCN (1991), Jean-Marc Leger (in litt. September 1992), Paris (1991).

*Ivory Coast:* F. Fischer (in litt. January, June & August 1996), Fischer (1996), B. Hoppe-Dominik (in litt. March 1997), Hoppe-Dominik (1997), Hoppe-Dominik et al. (1998), Roth & Hoppe-Dominik (1990), World Bank (1995).

*Kenya:* Andanje (1997), Broten & Said (1995), T. Butynski (in litt. August 1995, April 1998), Butynski et al. (1997), Cook (1996), Davey (1996), Davies (1993, 1994), H. Dublin (pers. comm. March 1996; in litt. January 1997), Dublin (1996), Fitzgibbon et al. (1995), Grunblatt et al. (1995a, 1995b, 1996), Hillman et al. (1988), Kanga (1995a, 1995b), R. Kock (in litt. June 1995, November 1996; pers. comm. March 1996), Kock (1996), Kock et al. (1996), Lockwood (1996), Mondolfi & Mondolfi (1993), Wargute & Aligula (1996), Watkin (1997), Wilson (1988), Wilson (1995).

*Lesotho:* Anderson (1989b).

*Liberia:* S. Anstey (in litt. March 1992), Anstey (1991a, 1991b), Appleton & Morris (1997), Dunn (1991), A. Peal (in litt. October 1997), Peal & Kranz (1990).

*Malawi:* Bell (1989), D. Gibson (in litt. April 1998), Medland (1992, 1993), F. X. Mkanda (in litt. March 1997), Mkanda (1998), Munthali & Banda (1992).

*Mali:* B. Chardonnet (in litt. June 1998), Chardonnet (1997b), C. Duvall (in litt. July, September & October 1996), Duvall et al. (1997), Heringa (1990, 1992), B. Lamarche (1997, in litt. to Smith 1998), Mulley (1998), Niagate (1996), J. M. Pavy (1996, in litt. to Smith 1998), Pavy (1993), Smith (1998).

*Mauritania:* Bousquet (1992), Dagg & Foster (1976), B. Lamarche (1997, in litt. to Smith 1998),

B. Lamarche & 0. Hamerlynck (1997, in litt. to Smith 1998), Sournia & Verschuren (1990).

*Mozambique:* J. L. Anderson (in litt. December 1997, June 1998), Anderson (1997), B. Chardonnet (in litt. October 1998), Dagg & Foster (1976), P. Dutton (in litt. February 1995), Dutton (1994), Tello (1989).

*Namibia:* Barnes & de Jager (1996), Burling (1996b), P. Erb (in litt. November 1997), K. & B. Gasaway (in litt. October 1997), Green & Rothstein (1996), Owen-Smith (1996), van der Walt (1989).

*Niger:* B. Chardonnet (in litt. July 1998), Dixon et al. (1991), Dragesco-Joffe (1993), C. Duvall (in litt. July 1996), Grettenberger (1991), Grettenberger & Newby (1990), J. Newby (in litt. September 1988), Newby (1990, 1998), Poilecot (1996).

*Nigeria:* Anadu & Green (1990), S. Birch (in litt. November 1994), Dowsett & Dowsett-Lemaire (1989a), A. Green (in litt. January 1998), Happold (1987), Osemeobo (1988), C. Powell (in litt. November 1994), Powell (1997), Smith (1998).

*Rwanda:* Chardonnet & East (1995), Fourniret (1994), Monfort (1988), Plumptre (1997), Plumptre & Bizumuremyi (1996), Plumptre & Harris (1995), Vande weghe (1990).

*Senegal:* 0. Burnham (in litt. March 1995, June & July 1996), Burnham (1998), Chardonnet (1997a, 1997b), B. Clark (1996, in litt. to Smith 1998), Dagg & Foster (1976), I. Diop (in litt. May 1995), Diop et al. (1996), Galat et al. (1996), Schulman (1997), Sillero-Zubiri et al. (1997), Smith (1998), Sournia & Dupuy (1990), G. Wartraux (in litt. July 1996).

*Sierra Leone:* Grubb et al. (1998), G. Teleki (in litt. February 1987), Teleki et al. (1990).

*Somalia:* Osman Gedow Amir (in litt. June 1996), J. Bauer (pers. comm. to T. Butynski, in litt. April 1997), Estes (1995a), P. Moehlman (in litt. November 1997), Mohamud Ahmed Ayan (1994), Simonetta (1988), Thurow (1996).

*South Africa:* Anderson et al. (1989, 1996), Fabricius et al. (1989), M. Knight (in litt. November 1995, September 1996), P. H. Lloyd (in litt. October 1995, November 1996), Norton & Lloyd (1994), Novellie et al. (1991), B. K. Reilly (in litt. May 1995), Rowe-Rowe (1994), P. T. van der Walt (in litt. September 1995), P. Viljoen (in litt. February & October 1995, July 1996), S. Vrahimis (in litt. May 1995, July 1996), I. Whyte (in litt. February 1998).

*Sudan:* Cloudsley-Thompson (1992), Dagg & Foster (1976), Dulling (1992), Ernst (1991), Ernst & Elwasila (1991), J. Fryxell (in litt. September 1995), Fryxell (1985), Habibi (1994), I. Hashim (in litt. March 1995), I. Hashim (1996, in litt. to Smith 1998), Hashim (1995, 1996a, 1996b, 1998, in preparation), Hashim et al. (1992, 1998), Hillman & Fryxell (1988), Mefit-Babtie (1983), N. Rottcher (in litt. April 1997), Smith (1998), Spinney (1996), UNDP (1994), Watson et al. (1977), P. Winter (in litt. April 1997), Winter (1996, 1997a).

*Swaziland:* Anderson (1989a), Culverwell (1995).

*Tanzania:* Baldus (1993, 1994), Campbell & Borner (1995), Campbell & Hofer (1995), E. Carter (in litt. March 1998), H. Dublin (pers. comm. March 1996), Estes (1995b), C. Foley (in litt. October 1996), Grimshaw et al. (in press), J. Kingdon (in litt. June 1997), Kingdon (1994), M. Maige & C. Seeberg-Elverfeldt (in litt. August 1998), S. Mduma (in litt. April 1996), Mduma (1995), D. Moyer (in litt. November 1996), W. Newmark (in litt. May 1995), Prins & Douglas-Hamilton (1990), S. Riedmiller (in litt. March 1998), Rodgers & Swai (1988), Runyoro et al. (1995), L. Siege (in litt. October 1995), TWCM (1991, 1992a, 1992b, 1993a, 1993b, 1993c, 1994a, 1994b, 1994c, 1995a, 1995b, 1995c, 1997), TWCM et al. (1997), Williams et al. (1996).

*Togo:* B. Chardonnet (in litt. May 1995), Chardonnet et al. (1990), J. F. Walsh (in litt. March 1995), Walsh & Chardonnet (1995).

*Uganda:* C. Bakuneeta (in litt. July 1995), H. Busulwa (in litt. to W. von Richter, July 1996), T. Butynski (in litt. August 1995), Butynski (1996), C. Chapman (in litt. November 1995), S. E. Cook (in litt. July 1997), Eltringham & Malpas (1993), Kalema (1998), Kingdon (1979, 1982, 1988), Lamprey & Michelmore (1996), Monck-Mason (1996), Plumptre (1994), Reynolds (1993), W. von Richter (in litt. April 1996), von Richter et al. (1997), J. Serugo (in litt. to W. von Richter, April 1996), Sommerlatte & Williamson (1995).

*Zambia:* B. Dooley (in litt. February 1996), Dooley (1995), Goldspink et al. (1998), Jachmann & Kalyocha (1994), Jeffery (1994), Jeffery et al. (1989a, 1989b, 1989c, 1996), Kapungwe (1994a, 1994b), I. Lungwe (in litt. September 1994), Mwima & Yoneda (1995), NPWS (in litt. June 1995), D. Owens (in litt. October 1995), Plewman & Dooley (1995), Tembo (1995), Thirgood et al. (1994), Yoneda & Mwima (1995).

*Zimbabwe:* J. L. Anderson (in litt. October 1996, October 1997), Anderson & Wilson (1998), Anon. (1996d), Bowler (1995), Davies et al. (1996), Taylor (1993), Wilson (1997), Wilson & Cumming (1989).

## Antelope Survey Update & Gnusletter

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*No. 3* (December 1996): Senegal, South Africa, Sudan, Zaire.

*No. 4* (February 1997): Mali, Tanzania.

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*No. 6* (September 1997): Republic of Congo, Ethiopia, Senegal: Status of the western giant eland, Status of the eastern giant eland.

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## Appendix 4: Data on Antelope Species' Abundance and Population Trend

This database lists the information on each species' abundance and population trend by country and location. Species are listed in the same order as in section 4. Sources of information for each country are given in Appendix 3.

Each entry for a species x range state combination is in the form:

Location/Area/Year/Estimated Population or Relative Abundance/Population Trend/Data Category

Symbols for relative abundance and population trend are as given on p. 89, viz.:

Relative Abundance
Ab: abundant
C: common
U: uncommon
R: rare
V: occurs only as a vagrant
x: definitely present but abundance unknown

Population Trend
I: increasing
S: stable
D: decreasing
?: unknown

The following symbols are used for data category (see p. 89):
TC: total count
AS: aerial survey (sample count of more extensive area)
GS: ground survey (sample count of more extensive area)
QS: questionnaire survey of private landowners
IG: informed guess by knowledgeable observer(s) with experience of the area concerned
FO: information on occurrence and estimates of relative abundance and population trend based on direct field observations by informant
LP: information on occurrence and estimates of relative abundance and population trend based on reports by local hunters, pastoralists and other rural people

Example Entries:

Lesser Kudu/Ethiopia
Awash Valley/17,000 sq km/1995/1,600/S/AS
0gaden/>30,000 sq km/1997/C-U/S-D/FQ

The first entry indicates that the Awash Valley (17,000 sq km) in 1995 had an estimated lesser kudu population of 1,600, with estimated population trend stable, as assessed by aerial survey.

The second entry indicates that in the Ogaden region (more than 30,000 sq km) in 1997 the lesser kudu's abundance varied locally from common to uncommon with population trend stable or decreasing as assessed by field observations.

Family Giraffidae

Giraffe/Mali
Ansongo-Menaka/17,500 sq km/1996/<10/D/TC

Giraffe/Niger
southwestern rangelands/>2,000 sq km/1998/<70/I/TC

Giraffe/Burkina Faso
eastern woodlands/-/1991/V/D/FO

Giraffe/Nigeria
northeast/-/1990/V/7/FO

Giraffe/Chad
Zakouma NP/3,000 sq km/1995/800/I/AS
Bahr Salamat FR/20,600 sq km/1989/x/D/F0
Siniaka Minia FR/4,260 sq km/1995/20/I/AS
eastern Salamat/40,000 sq km/1989/x/D/FO
southeastern Chart Baguirmi/3,000 sq km/1996/R/D/FO
Binder Lere FR/1,350 sq km/1996/5/D/AS
unprot. areas of Mayo Kebi/2,000 sq km/1996/R/D/AS

Giraffe/Cameroon
Waza NP/1,700 sq km/1994/>1,000/S/IG
N. Province/>29,700 sq km/1998/360/S/IG

Giraffe/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<500/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<50/D/AS
Sangba Pilot Zone/1,000 sq km/1995/<50/I/AS
northern region HZs/60,000 sq km/1996/R/D/FO

Giraffe/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/280/S/AS

Giraffe/Sudan
Bahr el Ghazal/?/1992/?/?/IG
southeast/>10,000 sq km/1996/x/D/FO

Giraffe/Ethiopia
Gambella NP/5,061 sq km/1990/x/D/FO
Omo NP-Tama WR/6,780 sq km/1997/160/D/AS
Borana CHA/40,000 sq km/1995/140/S-D/AS
southwestern Ogaden/?/1997/x/?/LP

Giraffe/Somalia
Bush-Bush NP/4,267 sq km/1997/x/?/FO
other areas in south/>5,000 sq km/1988/U/D/FO

Giraffe/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/130/S-I/AS
Kidepo Valley NP/1,575 sq km/1995/5/D/TC
Plan Upe GR/3,250 sq km/1995/10/D/AS

Giraffe/Kenya
Marsabit NP & NR/2,090 sq km/1995/>300/S/GS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/75/S-D/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/200/D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/26,970/S/AS
Tsavo NP & surrounds/40,572 sq km/1997/2,020/D/AS
Laikipia ranches/10,000 sq km/1991-94/1,510/S/AS
Masai Mara NR/1,670 sq km/1994/340/S/AS
Mara ranches/3,890 sq km/1994/1,370/S/AS
Amboseli NP/392 sq km/1994-96/50/S-D/AS
Nairobi NP/117 sq km/1990-94/100/S/GS
Kajiado & eastern Narok rangelands/28,000 sq km/1991-94/9,990/S-I/AS
Tana River NR & surrounds/200 sq km/1995/15/S/AS
Shimba Hills NR/217 sq km/1995/x/?/FO
coastal rangelands/15,000 sq km/1991-94/1,930/S/AS
Lake Nakuru NP/139 sq km/1993/>100/S-I/GS
Ruma NP/120 sq km/1994/40/S/GS

Giraffe/Tanzania
Serengeti ecosystem/27,000 sq km/1996/6,170/D/AS
Kilimanjaro NP & FR/1,835 sq km/1995/x/S/FO
Arusha NP/137 sq km/1987/x/S-D/F0
Tarangire NP/2,600 sq km/1994/750/S/AS
Tarangire GCAs/10,000 sq km/1994/3,500/?/AS
Mkomazi GR/3,615 sq km/1996/790/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/280/7/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/135/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/1,380/S-I/AS

Giraffe/Tanzania (continued)
Moyowosi-Kigosi GCAs/2,191 sq km/1994/90/S/AS
Ugalla River GR/4,760 sq km/1991/370/S/AS
Ugalla River GCAs/2,140 sq km/1991/15/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/4,100/S/AS
Ruaha NP & GRs/29,280 sq km/1993/7,210/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/840/S/AS
Selous GR (northern sector) & surrounds/9,000 sq km/1994/2,740/I/AS
Mikumi NP/3,215 sq km/1994/130/S-D/AS
Eyasi region/2,500 sq km/1992/310/S/AS
other areas in northeast/>5,000 sq km/1996/x/?/IG

Giraffe/Rwanda
Akagera NP/1,500 sq km/1994/20/S/GS

Giraffe/Zambia
Sioma Ngwezi NP/5,240 sq km/1994/R/S-D/FO
N. Luangwa NP/4,636 sq km/1995/V/I/FO
S. Luangwa NP/9,050 sq km/1994/275/S/AS
Lupande GMA/4,500 sq km/1994/780/S-I/GS
other Luangwa Valley GMAs/22,840 sq km/1994/90/S-D/AS
private game ranches/-/1994/16/S-I/QS

Giraffe/Namibia
Etosha NP/22,270 sq km/1995/1,840/S/AS
Kaudom NP/3,841 sq km/1988/U-R/S/FO
Kaokoland/70,000 sq km/1990/300/I/AS
other communal lands/-/! 988/U-R/S-D/FO
private farmland/-/1992/4,550/I/QS

Giraffe/Botswana
northern prot. areas & rangelands/80,000 sq km/1994/10,270/S-I/AS
southwestern Ngamiland/10,000 sq km/1994/200/S-D/AS
Central Kgalagadi-Khutse GRs/55,300 sq km/1994/1,200/S-D/AS
Tuli block farms/250 sq km/1994/30/S-D/AS

Giraffe/Zimbabwe
Hwange NP/14,651 sq km/1996/3,000/S/GS
Matetsi SA complex/3,295 sq km/1995/50/S/AS
Kazuma Pan/561 sq km/1995/20/S/AS
Zambezi NP/543 sq km/1995/90/S/AS
Gonarezhou NP/4,972 sq km/1995/200/S/AS
forestry areas/2,344 sq km/1995/20/S/AS
private farmland/-/1996/2,050/S-I/QS

Giraffe/South Africa
Kruger NP/21,682 sq km/1993/5,000/S/AS
other NPs/-/1995/30/I/TC
Hluhluwe-Umfolozi P/965 sq km/1994/300/S/AS
Mkuzi GR/251 sq km/1994/180/S/TC
Itala GR/259 sq km/1994/200/S-I/TC
other provincial reserves/-/1994-96/540/S-I/TC
private land/-/l994-96/1,630/S-I/QS

Giraffe/Swaziland
Hlane GR/163 sq km/1994/R/S-D/FO
Mlilwane WS/45 sq km/1994/U-R/I/FO
private land/-/1994/x/S-I/F0

Okapi/Congo-Kinshasa
Virunga NP/>1,000 sq km/1996/R/D/FO
Okapi FR/13,726 sq km/1992/5,500/S/GS
Maiko NP/10,800 sq km/1992/C/S/FO
other areas/>25,000 sq km/1 992/x/S-D/IG

Family Tragulidae

Water Chevrotain/Guinea
Mt. Nimba BR/170 sq km/1990/x/?/FO
other areas in southeast/>500 sq km/1990/x/?/IG

Water Chevrotain/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/x/D/FO
other areas/>2,000 sq km/1986/x/D/IG

Water Chevrotain/Liberia
N. Lorma NF/712 sq km/1990/x/?/FO
Krahn-Bassa NF/5,140 sq km/1990/x/?/FO
Sapo NP/1,308 sq km/1990/C/?/FO
Grebo NF/2,673 sq km/1990/C/?/FO
other areas/>10,000 sq km/1990/x/?/IG

Water Chevrotain/Ivory Coast
Tai NP/4,540 sq km/1996/C/S-D/GS
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/x/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/x/S-D/FO
Mont Peko NP/340 sq km/1990/?/?/FO
Azagny NP/200 sq km/1985/x/?/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/x/S-D/FO
other FRs/3,940 sq km/1990/x/D/FO

Water Chevrotain/Ghana
Bia NP & GPR/306 sq km/199S/x/S-D/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/x/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/x/D/FO

Water Chevrotain/Nigeria
Cross River NP/3,750 sq km/1990/R/D/FO

Water Chevrotain/Cameroon
Korup NP/1,260 sq km/1994/U/S-D/FO
Campo R/3,000 sq km/1994/Ab/D/FO
Dja R/6,194 sq km/1994/U/?/F0
Lobeke R/2,500 sq km/1994/C/S/FO
other areas in south/>50,000 sq km/1994/x/S-D/IG

Water Chevrotain/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/R/?/FO
Bangassou Forest/16,600 sq km/1996/Ab/?/FO
other areas/>10,000 sq km/1995/x/D/IG

Water Chevrotain/Equ. Guinea
Monte Alen NP/1,500 sq km/1998/C/D/FO
other areas of Mbini/>5,000 sq km/1998/C/D/FO

Water Chevrotain/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Wonga-Wongue R/4,800 sq km/1988/x/S-D/FO
Gamba complex/11,000 sq km/1994-96/U/S/FO
Minkebe Forest/15,000 sq km/1995/C/S/FO
other areas/>100,000 sq km/1996/C/D/FO

Water Chevrotain/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/U/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/x/S/FO
Lake Tele-Likouala/10,500 sq km/1994/x/?/FO
Conkouati FR/1,450 sq km/1995/U/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
other areas/>50,000 sq km/1995/x/D/IG

Water Chevrotain/Congo-Kinshasa
Virunga NP/7,800 sq km/1996/x/D/FO
Okapi FR/13,726 sq km/1995/C/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
other areas/>300,000 sq km/1996/C-U/D/IG

Water Chevrotain/Angola
Cabinda/?/1992/x/?/IG

Family Bovidae
Subfamily Bovinae
Tribe Bovini

Buffalo/Mali
Bafing FR/1,690 sq km/1996/120/D/GS
Faleme River Valley/>500 sq km/1996/V/D/IG

Buffalo/Niger
W NP-Tamou FR/2,980 sq km/1988/500/D/GS

Buffalo/Senegal
Niokolo-Koba NP/9,130 sq km/1996/4,000/S-D/GS
Faleme HZ/10,000 sq km/1997/x/?/F0
Casamance region/-/1996/?/?/IG

Buffalo/Guinea-Bissau
Corubal River/1,500 sq km/1991/x/S-D/FO
Cantanhez Forest/650 sq km/1994/C-U/D/FO
Lake Cufada/700 sq km/1991/x/D/FO
Cacheu River/300 sq km/1991/x/D/FO
other areas/500 sq km/1991/x/D/FO

Buffalo/Guinea
Badiar NP/380 sq km/1991/V/7/FO
Mt Nimba BR/170 sq km/1990/x/?/FO
other areas/>500 sq km/1990/U-R/D/IG

Buffalo/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/R/D/FO

Buffalo/Liberia
N. Lorma NF/712 sq km/1990/U/D/FO
Gola-Kpelle-Lorma NF/4,253 sq km/1990/U/D/FO
Krahn-Bassa NF/5,140 sq km/1990/U/D/FO
Sapo NP/1,308 sq km/1990/U/?/FO
Grebo NF/2,673 sq km/1990/U/D/FO
other areas/>5,000 sq km/1990/U-R/D/FO

Buffalo/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/8,330/D/GS
Haut Bandama GR/1,230 sq km/1990/x/D/FO
forest reserves in northern & central savannas/4,070 sq km/1990/x/D/FO
Mont Sangbe NP/950 sq km/1990/R/D/FO
Marahoue NP/1,010 sq km/1997/C/S-D/FO
Tai NP/4,540 sq km/1996/2,000/D/GS
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/C/S-D/F0
Mont Peko NP/340 sq km/1990/C/S-D/FO
Azagny NP/200 sq km/1985/Ab/S/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1986/C/S-D/FO
other forest reserves in south/3,880 sq km/1990/x/D/FO

Buffalo/Burkina Faso
Arly NP/930 sq km/1998/450/I/AS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/>400/S-D/IG
W NP-Kourtiago FR/2,860 sq km/1991/420/D/AS
Nazinga GR/940 sq km/1995/250/I/GS
Diefoula FR/720 sq km/1997/100/I/GS
other areas/>5,000 sq km/1990/x/D/IG

Buffalo/Ghana
Bia NP & GPR/306 sq km/1995/V/D/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/x/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/x/?/FO
Digya NP/3,126 sq km/1995/x/D/FO
Kogyae SNR/324 sq km/1995/x/D/FO
Kalakpa GPR/324 sq km/1995/C/I/FO
Mole NP/4,921 sq km/1995/Ab/S/FO
Bui NP/3,074 sq km/1995/C/I/FO
Gbele GPR/324 sq km/1995/U/S/FO

Buffalo/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U-R/D/FO
Fazao NP/1,920 sq km/1995/x/D/FO
Togodo NR/350 sq km/1990/x/D/FO

Buffalo/Benin
Pendjari NP & HZs/6,505 sq km/1994/>2,000/I/AS
W NP-Djona HZ/7,930 sq km/1994/x/D/FO
forest reserves/6,500 sq km/1990/x/D/FO

Buffalo/Nigeria
Kainji Lake NP/5,340 sq km/1990/R/D/FO
Yankari GR/2,240 sq km/1990/200/D/IG
Gashaka Gumpti NP/5,950 sq km/1990/R/D/FO
Okomu FR/1,082 sq km/1988/R/D/FO
Cross River NP/3,750 sq km/1990/R/D/FO
other prot. areas/>1,000 sq km/1990/R/D/FO

Buffalo/Chad
Zakouma NP/3,000 sq km/1995/1,000/1/AS
Siniaka Minia FR/4,260 sq km/1995/20/I/AS
eastern Salamat/40,000 sq km/1989/x/D/FO
Manda NP/1,140 sq km/1996/x/?/FO

Buffalo/Cameroon
N. Province/29,700 sq km/1998/3,210/I/IG
Korup NP/1,260 sq km/1994/U/S/FO
Campo R/3,000 sq km/1994/Ab/D/FO
Dja R/6,194 sq km/1994/U/S/FO
Lobeke R/2,500 sq km/1994/C/S/FO
other areas in south/>50,000 sq km/1994/x/D/IG

Buffalo/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<10,000/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<500/D/AS
Sangba Pilot Zone/11,000 sq km/1995/9,000/I/AS
northern region HZs/60,000 sq km/1998/C/S-D/FO
east-central region HZs/70,000 sq km/1997/U-R/D/FO
Chinko Basin/95,000 sq km/1997/U-R/D/FO
Bangassou Forest/16,600 sq km/1996/C/S/FO
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C/S/FO
other areas/>5,000 sq km/1995/x/D/IG

Buffalo/Equ. Guinea
Monte Alen NP/1,500 sq km/1998/x/?/F0
other areas of Mbini/>5,000 sq km/1998/x/D/F0

Buffalo/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Wonga-Wongue R/4,800 sq km/1988/>20,000/S/IG
Gamba complex/11,000 sq km/1994-96/Ab-C/S/FO
Minkebe Forest/15,000 sq km/1995/U/S/FO
other areas/>100,000 sq km/1996/U/S-D/FO

Buffalo/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/Ab/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/C/S-I/FO
Lake Tele-Likouala/10,500 sq km/1994/x/?/FO
Conkouati FR/1,450 sq km/1995/C/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
Lefini FR/6,300 sq km/1997/R/D/FO
other areas/>50,000 sq km/1995/x/D/IG

Buffalo/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/26,180/D/AS
Virunga NP/7,800 sq km/1990/13,000/D/AS
Okapi FR/13,726 sq km/1995/U/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C/S-D/FO
Salonga NP/36,560 sq km/1989/R/S/FO
Upemba NP/11,730 sq km/1996/R/D/FO
other areas/>100,000 sq km/1996/U-R/D/IG

Buffalo/Sudan
Radom NP/7,500 sq km/1994/R/D/FO
other areas in southwest/>50,000 sq km/1992/x/D/IG
Dinder NP/8,960 sq km/1997/100/D/GS
southeastern savannas/>50,000 sq km/1992/x/D/IG

Buffalo/Ethiopia
Gambella NP/5,061 sq km/1990/U/D/FO
Omo NP-Omo West CHA/4,815 sq km/1995-96/1,190/D/AS
Mago NP-Murule CHA/6,020 sq km/1995-96/1,140/D/AS

Buffalo/Somalia
Bush-Bush NP/4,267 sq km/1997/C/?/FO

Buffalo/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/1,780/S-I/AS
Queen Elizabeth NP & GRs/2,419 sq km/1995/16,600/I/AS
Lake Mburo NP/260 sq km/1995/750/S/AS
Toro GR-Semliki Flats CHA/1,144 sq km/1995/40/?/AS
Kidepo Valley NP/1,575 sq km/1995/550/D/AS
Pian-Upe GR/3,250 sq km/1995/500/?/AS
Mgahinga Gorilla NP/34 sq km/1995/U/S/FO
Semliki Forest NP/220 sq km/1988/x/?/FO
Kibale Forest NP/766 sq km/1995/U/S-I/FO
Mt. Elgon NP/1,145 sq km/1988/x/?/F0
Budongo FR/435 sq km/1995/R/?/FO
other forest reserves/>500 sq km/1995/U-R/?/IG

Buffalo/Kenya
Marsabit NP & NR/2,090 sq km/1995/300/S-D/GS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/75/D/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/1,090/D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/1,330/S/AS
Tsavo NP & surrounds/40,572 sq km/1997/5,490/D/AS
Laikipia ranches/10,000 sq km/1991-94/2,400/S/AS
Masai Mara NR/1,670 sq km/1996/1,890/D/AS
Mara ranches/3,890 sq km/1996/760/D/AS
Amboseli NP/392 sq km/1994-96/510/S/AS
Nairobi NP/117 sq km/1997/100/D/GS
Tana River NR & surrounds/200 sq km/1995/250/S/AS
Shimba Hills NR/217 sq km/1996/390/I/GS
Boni-Dodori NRs/2,117 sq km/1995/C-U/?/FO
coastal rangelands/15,000 sq km/1991-94/3,440/S/AS
Lake Nakuru NP/139 sq km/1993/670/I/GS
Ruma NP/120 sq km/1994/15/7/GS
Aberdare NP & FR/1,966 sq km/1995/850/D/GS
Mt. Elgon NP & FR/469 sq km/1995/x/S/FO
Mt. Kenya NP & FR/1,367 sq km/1995/C/S-D/FO
Kakamega Forest NP/97 sq km/1995/x/?/F0
Arabuko-Sokoke FR/372 sq km/1995/R/D/FO

Buffalo/Tanzania
Serengeti ecosystem/27,000 sq km/1994/21,290/D/TC
Ngorongoro Crater/250 sq km/1992/2,690/1/TC
Lake Manyara NP/110 sq km/1990/1,750/S/GS
Kilimanjaro NP & FR/1,835 sq km/1995/U-R/S/FO

Buffalo/Tanzania (continued)
Arusha NP/137 sq km/1986/C/D/FO
Tarangire NP/2,600 sq km/1994/12,760/S/AS
Tarangire GCAs/10,000 sq km/1994/1,720/?/AS
Mkomazi GR/3,615 sq km/1996/1,210/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/<10/?/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/2,670/S/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/6,690/S/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/80/S/AS
Gombe Stream NP/52 sq km/1988/x/?/FO
Ugalla River GR/4,760 sq km/1991/1,290/S/AS
Ugalla River GCAs/2,140 sq km/1991/1,290/S/AS
Mahale Mts NP/1,200 sq km/1988/x/?/F0
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/43,850/S-D/AS
Ruaha NP & GRs/29,280 sq km/1993/27,180/D/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/1,580/D/AS
Udzungwa Mts NP/1,000 sq km/1996/C-U/D/FO
Selous GR/43,626 sq km/1994/138,100/1/AS
Selous GR surrounds/38,212 sq km/1994/28,360/?/AS
Mikumi NP/3,215 sq km/1994/3,260/S/AS
Kilombero GCA/6,928 sq km/1994/46,610/S/AS
Eyasi region/2,500 sq km/1992/55/?/AS
other areas/>20,000 sq km/1996/x/S-D/IG

Buffalo/Rwanda
Akagera NP/1,500 sq km/1996/<1,000/D/IG
Volcanoes NP/150 sq km/1996/>200/S/GS

Buffalo/Burundi
Ruvubu NP/436 sq km/1988/500/S/IG

Buffalo/Angola
Kissama NP/9,960 sq km/1992/<500/D/IG
Luando R-Kangandala NP/8,900 sq km/1992/R/D/IG
southeast/>10,000 sq km/1992/x/D/IG

Buffalo/Zambia
Kafue NP/22,357 sq km/1994/3,100/S-I/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/D/FO
Lower Zambezi NP/4,092 sq km/1995/1,500/S-D/AS
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/150/D/AS
Bangweulu-Kafinda GMAs/7,500 sq km/1993/180/S/AS
Sioma Ngwezi NP/5,240 sq km/1994/x/S-D/FO
Liuwa Plain NP/3,660 sq km/1994/250/D/IG
West Lunga NP/1,684 sq km/1994/<100/D/IG
Mweru Wantipa NP/3,134 sq km/1994/x/D/FO
Nsumbu NP/2,020 sq km/1994/C/S/FO
Lusenga Plain NP/880 sq km/1994/x/D/FO
N. Luangwa NP/4,636 sq km/1995/10,000/1/AS
S. Luangwa NP/9,050 sq km/1994/11,670/S/AS
Lupande GMA/4,500 sq km/1994/U/S/FO
Luambe NP/320 sq km/1994/6,900/S/AS
Lukusuzi NP/1,920 sq km/1994/430/D/AS
other Luangwa Valley GMAs/22,840 sq km/1994/5,800/S-D/AS
private game ranches/-/1994/8/S-I/QS

Buffalo/Malawi
Nyika NP/3,134 sq km/1996/R/?/FO
Vwaza Marsh GR/986 sq km/1996/180/S/AS
Kasungu NP/2,316 sq km/1996/330/D/AS
Nkhotakota GR/1,802 sq km/1996/600/I/GS
Majete GR/682 sq km/1996/x/?/FO
Lengwe NP/887 sq km/1996/2,040/S/GS
Mwabvi GR/340 sq km/1996/x/?/FO

Buffalo/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/7,200/S/IG
Marromeu GR/1,500 sq km/1994/2,350/D/AS
Mahimba area/?/1 998/Ab/S-I/FO
Maputo GR/800 sq km/1997/R/I/FO
Manica Province/7/1998/x/S-I/FO
Gaza HZ/40,000 sq km/1997/20/D/IG

Buffalo/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1996/660/S-D/AS
Waterberg Plateau P/405 sq km/1986/30/1/TC
communal lands/-/1988/310/D/AS

Buffalo/Botswana
Okavango Delta & surrounds/20,000 sq km/1994/24,380/D/AS
Chobe NP & surrounds/14,000 sq km/1994 /2,200/S/AS
Zimbabwe border/10,000 sq km/1994/310/S/AS

Buffalo/Zimbabwe
Hwange NP/14,651 sq km/1996/4,500/D/IG
Matetsi SA complex/3,295 sq km/1995/1,670/S-D/AS
Zambezi NP/543 sq km/1995/2,010/S/AS
Chizarira NP/1,910 sq km/1995/11,010/S/AS
Matusadona NP/1,537 sq km/1995/3,450/S/AS
Chete & Chirisa SAs/2,794 sq km/1995/1,140/S/AS
Sebungwe communal lands/9,232 sq km/1995/5,150/S/AS
Mana Pools NP/2,162 sq km/1995/2,480/S/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/10,690/S/AS
Dande communal lands/3,161 sq km/1995/6,150/S/AS
Gonarezhou NP/4,972 sq km/1995/40/D/AS
forestry land/2,344 sq km/1995/310/S/AS
other communal lands/1,283 sq km/1995/230/?/AS
private farmland/-/l996/1,500/I/IG

Buffalo/South Africa
Kruger NP/21,682 sq km/1997/19,500/I/TC
Addo-Zuurberg NP/515 sq km/1995/91/I/TC
other NPs/-/1995/77/I/TC
Hluhluwe-Umfolozi P/965 sq km/1994/7,300/S/AS
Itala GR/259 sq km/1994/20/S-I/TC
Ndumu GR/101 sq km/1994/70/S/TC
other provincial Rs/-/1994-96/1,410/S-I/TC
private land/-/1994-96/>2,500/I/QS

Buffalo/Swaziland
Mlilwane WS/45 sq km/1994/U/S-I/F0

Tribe Tragelaphini

Bushbuck/Mauritania
lower Senegal River Valley/> 1,000 sq km/1986/R/D/FO

Bushbuck/Mali
Boucle du Baoule complex/7,710 sq km/1996/R/D/FO
Bafing FR/1,690 sq km/1996/<2,000/S-D/IG
other areas in southwest/>30,000 sq km/1996/U-R/S-D/IG

Bushbuck/Niger
W NP-Tamou FR/2,980 sq km/1988/<750/D/GS
other areas in southwest/>5,000 sq km/1988/<500/D/IG
Lake Chad region/>500 sq km/1988/R/D/FO

Bushbuck/Senegal
Niokolo-Koba NP/9,130 sq km/1995/50,000/1/IG
Faleme HZ/10,000 sq km/1997/x/S-D/IG
Basse Casamance NP/50 sq km/1996/U/D/FO
Casamance region/>10,000 sq km/1996/C/S-D/IG
Senegal River Valley/>1,000 sq km/1988/R/?/FO

Bushbuck/Gambia
Kiang West NP/100 sq km/1988/x/?/FO
other areas/>1,000 sq km/1988/U/D/FO

Bushbuck/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S/FO
Cantanhez Forest/650 sq km/1994/x/S-D/F0
Lake Cufada/700 sq km/1991/x/S-D/FO
other areas of mainland/>10,000 sq km/1991/C/S-D/FO
Bijagos Archipelago/300 sq km/1991/C/S-D/FO

Bushbuck/Guinea
Badiar NP/380 sq km/1990/U/S-D/FO
Mt Nimba BR/170 sq km/1990/x/?/FO
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/F0
other areas/>50,000 sq km/1990/U/S-D/IG

Bushbuck/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/C/S/FO
Gola FRs/738 sq km/1987/C/S-D/FO
Western Area FR/179 sq km/1988/C/S-D/FO
other areas/>10,000 sq km/1987/U/S-D/IG

Bushbuck/Liberia
Krahn-Bassa NF/5,140 sq km/1990/C/?/F0
Grebo NF/2,673 sq km/1990/x/?/FO
farmbush & secondary forests/>40,000 sq km/1990/C/7/FO

Bushbuck/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/3,630/D/GS

Bushbuck/Ivory Coast (continued)
Haut Bandama GR/1,230 sq km/1990/C/S-D/FO
Mont Sangbe NP/950 sq km/1990/C/S-D/FO
Marahoue NP/1,010 sq km/1997/C/S-D/FO
Tai NP/4,540 sq km/1996/R/S-D/GS
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/x/S-D/FO
Mont Peko NP/340 sq km/1990/C/S-D/FO
Azagny NP/200 sq km/1990/C/S-D/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/x/S-D/FO
other forest reserves/7,950 sq km/1990/x/S-D/FO
unprotected areas/>75,000 sq km/1990/U/S-D/IG

Bushbuck/Burkina Faso
Arly NP/760 sq km/1991/x/S/GS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/>500/S/IG
W NP-Kourtiago FR/2,860 sq km/1991/30/D/AS
Nazinga GR/940 sq km/1995/920/S/GS
Diefoula FR/720 sq km/1997/155/S/GS
other areas/>30,000 sq km/1990/C-U/S-D/IG

Bushbuck/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/C/S/FO
Gbele GPR/324 sq km/1995/C/S/FO
Digya NP/3,126 sq km/1995/Ab/S/FO
Kogyae SNR/324 sq km/1995/x/S/FO
Bomfobiri WS/73 sq km/1995/C/D/FO
Kalakpa GPR/324 sq km/1995/C/I/FO
Shai Hills GPR/54 sq km/1995/R/S/FO
Bia NP & GPR/306 sq km/1995/x/I/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/C/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/C/S/FO
Owabi WS/52 sq km/1995/x/D/FO
unprotected areas/>30,000 sq km/1995/x/S-D/IG

Bushbuck/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U-R/D/FO
Fazao NP/1,920 sq km/1995/x/S-D/FO
Togodo NR/350 sq km/1990/U/S-D/FO
other areas/>4,000 sq km/1990/U/S-D/IG

Bushbuck/Benin
Pendjari NP & HZs/6,505 sq km/1994/C/S/AS
W NP-Djona HZ/7,930 sq km/1994/C/D/FO
forest reserves/7,900 sq km/1990/C-U/S-D/FO
other areas/>20,000 sq km/1990/C-U/S-D/IG

Bushbuck/Nigeria
Kainji Lake NP/5,340 sq km/1990/U/S-D/FO
Yankari GR/2,240 sq km/1990/U-R/S-D/FO
Gashaka Gumpti NP/5,950 sq km/1990/x/S-D/FO
Okomu FR/1,082 sq km/1988/R/D/FO
Cross River NP/3,750 sq km/1990/x/S-D/FO
other protected areas/19,500 sq km/1990/U-R/D/FO
Niger Delta/5,000 sq km/1994/x/S-D/FO
other areas/>50,000 sq km/1990/U-R/D/IG

Bushbuck/Chad
Zakouma NP/3,000 sq km/1995/150/S/AS
Bahr Salamat FR/20,600 sq km/1989/x/S-D/FO
Siniaka Minia FR/4,260 sq km/1989/x/S/FO
eastern Salamat/40,000 sq km/1989/x/S-D/FO
Manda NP/1,140 sq km/1996/80/S-I/GS
eastern Chart Baguirmi/10,000 sq km/1989/x/S-D/FO
Binder Lere FR/1,350 sq km/1989/x/S-D/FO
other areas in south/>3,000 sq km/1989/x/S-D/IG

Bushbuck/Cameroon
N. Province/29,700 sq km/1998/5,230/I/IG
Kalamaloue NP/45 sq km/1994/70/S-D/IG
Campo R/3,000 sq km/1994/x/?/F0
Dja R/6,194 sq km/1994/U/?/F0
other areas/>250,000 sq km/1994/x/S-D/IG

Bushbuck/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/>2,500/?/IG
Bamingui-Bangoran NP/11,560 sq km/1995/>I,000/D/IG
Sangba Pilot Zone/11,000 sq km/1995/>2,000/I/IG
northern region HZs/60,000 sq km/1998/C/S-D/FO
east-central region HZs/70,000 sq km/1997/x/S-D/FO
Chinko Basin/95,000 sq km/1997/x/S-D/FO
Bangassou Forest/16,600 sq km/1996/C/?/F0
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/U/S/FO
other areas/>5,000 sq km/1995/x/S-D/IG

Bushbuck/Equ. Guinea
Monte Alen NP/1,500 sq km/1998/C/D/FO
other areas of Mbini/>2,500 sq km/1989/U-R/S-D/IG

Bushbuck/Gabon
Lope R/5,000 sq km/1994-96/C-U/S-D/F0
Gamba complex (Moukalaba)/I,000 sq km/1994-96/x/S-D/FO
other areas/>1,000 sq km/1996/U/S-D/FO

Bushbuck/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/C/S/FO
Conkouati FR/1,450 sq km/1995/R/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
Lefini FR/6,300 sq km/1997/R/D/FO
other areas/>5,000 sq km/1995/U-R/D/IG

Bushbuck/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/C/S/FO
Virunga NP/7,800 sq km/1996/C/S/FO
Kahuzi-Biega NP (montane section)/750 sq km/1989/C/S/FO
Upemba NP/11,730 sq km/1996/U/S-D/F0
Kundelungu NP/7,600 sq km/1996/U/S-D/FO
other areas/>100,000 sq km/1996/x/S-D/IG

Bushbuck/Sudan
Radom NP/7,500 sq km/1994/U/S/FO
other areas in southwest/>150,000 sq km/1992/x/S-D/IG
DinderNP/8,960 sq km/1995/R/S/FO
southeastern savannas/>120,000 sq km/1992/x/S-D/IG

Bush buck/ Eritrea
southwestern savannas/>5,000 sq km/1995-97/U/7/FO

Bushbuck/Ethiopia
Gambella NP/5,061 sq km/1998/x/?/F0
Simien Mts NP/179 sq km/1995/x/?/FO
Bale Mts NP/2,471 sq km/1995/<500/S/IG
Awash Valley/17,000 sq km/1995/>140/S/AS
southern Ogaden/?/1997/U-R/D/FO
Senkelle WS/54 sq km/1995/30/D/IG
Nechisar NP/514 sq km/1995/C/S/FO
Borana CHA-Yabelo WS/41,000 sq km/1993/x/S-D/FO
Omo-Mago NPs-Murule CHA/8,715 sq km/1995/C/S/FO
other areas/>150,000 sq km/1995/x/S-D/IG

Bushbuck/Somalia
lower Juba & Shebelle Rivers/?/1983/R/D/FO
Bush-Bush NP/4,267 sq km/1995/x/?/FO

Bushbuck/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/290/S/AS
Aswa Lolim/3,725 sq km/1995/140/7/AS
Ajai's GR/125 sq km/1995/20/?/AS
Kaiso-Tonya CHA/194 sq km/1995/50/?/AS
Queen Elizabeth NP & GRs/2,419 sq km/ 1995/U/7/FO
Lake Mburo NP & surrounds/1,563 sq km/1995/150/S/AS
Katonga GR/208 sq km/1995/x/?/FO
N. Karamoja CHA/10,800 sq km/1995/20/?/AS
Matheniko GR/1,825 sq km/1995/20/S/AS
Bokora Corridor GR/3,200 sq km/1995/20/?/AS
Pian-Upe GR/3,250 sq km/1995/200/?/AS
S. Karamoja CHA/5,900 sq km/1995/30/?/AS
Mgahinga Gorilla NP/34 sq km/1995/U/S/F0
Bwindi-Impenetrable Forest NP/321 sq km/1995/R/I/FO
Kibale Forest NP/766 sq km/1995/C/S/FO
Rwenzori Mts NP/996 sq km/1988/R/D/FO
Semliki Forest NP/220 sq km/1988/x/?/F0
Mt Elgon NP/1,145 sq km/1988/x/?/FO
Budongo FR/435 sq km/1995/C/S/FO
other areas/>7,500 sq km/1995/x/S-D/IG

**Bushbuck/Kenya**
Marsabit NP & NR/2,090 sq km/1995/100/S-D/GS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1995/R-V/7/FO
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/x/?/FO
Tsavo NP & surrounds/40,572 sq km/1995/U-R/D/FO
Masai Mara NR/1,670 sq km/1994/U/S/FO
Mara ranches/3,890 sq km/1994/U/S/FO
Amboseli NP/392 sq km/1996/U/S/FO
Nairobi NP/117 sq km/1993/x/S/FO
Tana River NR & surrounds/200 sq km/1995/C/S/FO
Shimba Hills NR/217 sq km/1995/C/S/FO
Boni-Dodori NRs/2,117 sq km/1995/C/?/FO
Lake Nakuru NP/139 sq km/1993/C/S/FO
Ruma NP/120 sq km/1994/x/?/F0
Aberdare NP & FR/1,966 sq km/1995/420/S/GS
Mt Kenya NP & FR/1,367 sq km/1995/C/S/FO
Mt Elgon NP & FR/469 sq km/1995/x/S/FO
Kakamega Forest NP/97 sq km/1995/C/S/FO

Bushbuck/Kenya (continued)
Arabuko-Sokoke FR/372 sq km/1995/R/D/FO
other areas/>30,000 sq km/1995/x/S-D/IG

Bushbuck/Tanzania
Serengeti ecosystem/27,000 sq km/1989-91/5,790/S/AS
Lake Manyara NP/110 sq km/1990/30/S/GS
Kilimanjaro NP & FR/1,835 sq km/1995/C/S/FO
Arusha NP/137 sq km/1986/C/S-D/FO
Tarangire NP/2,600 sq km/1996/U/D/FO
Tarangire GCAs/10,000 sq km/1996/U/?/FO
Mkomazi GR/3,100 sq km/1991/<20/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/<10/?/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/175/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/180/S-D/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/20/S-D/AS
Gombe Stream NP/52 sq km/1988/x/S/FO
Mahale Mts NP/1,200 sq km/1988/x/?/F0
Ugalla River GR/4,760 sq km/1991/20/S/AS
Ugalla River GCAs/2,140 sq km/1991/10/S/AS
Katavi NP/1,989 sq km/1991 /120/S/AS
Katavi-Rukwa GCAs/10,652 sq km/1991/60/S/AS
Ruaha NP & GRs/29,280 sq km/1993/x/?/FO
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/x/?/FO
Udzungwa Mts NP/1,000 sq km/1996/C/D/F0
Selous GR/43,626 sq km/1994/90/S/AS
Selous GR surrounds/38,212 sq km/1994/120/S/AS
Mikumi NP/3,215 sq km/1994/x/?/FO
Eyasi region/2,500 sq km/1992/x/?/F0
other areas/>350,000 sq km/1996/x/S-D/IG

Bushbuck/Rwanda
Akagera NP/1,500 sq km/1996/C-U/S-D/IG
Volcanoes NP/150 sq km/1996/>2,000/S/GS
other areas/>2,000 sq km/1996/x/S-D/IG

Bushbuck/Burundi
Ruvubu NP/436 sq km/1988/C/S/FO
Kibira NP/377 sq km/1988/x/S-D/FO
other areas/>2,500 sq km/1988/x/S-D/IG

Bushbuck/Angola
north, west, east & southeast/>350,000 sq km/1992/x/D/IG

Bushbuck/Zambia
Kafue NP/22,357 sq km/1994/C/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lower Zambezi NP/4,092 sq km/1995/x/S/FO
Lavushi Manda NP/1,500 sq km/1994/C/S-D/FO
Kasanka NP/420 sq km/1994/C/S-l/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/C/S/FO
Sioma Ngwezi NP/5,240 sq km/1991/40/S-D/AS
West Lunga NP/1,684 sq km/1994/x/S-D/FO
Mweru Wantipa NP/3,134 sq km/1994/C/S/FO
Nsumbu NP/2,020 sq km/1994/C/S/FO
Lusenga Plain NP/880 sq km/1994/x/D/F0
N. Luangwa NP/4,636 sq km/1995/C/S/F0
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/870/D/GS
other Luangwa Valley GMAs/22,840 sq km/1994/x/S-D/FO
private game ranches/-/! 994/160/S-l/QS
other areas/>100,000 sq km/1994/x/S-D/IG

Bushbuck/Malawi
Nyika NP/3,134 sq km/1996/x/?/FO
Vwaza Marsh GR/986 sq km/1996/x/D/FO
Kasungu NP/2,316 sq km/1996/x/?/FO
Nkhotakota GR/1,802 sq km/1996/290/?/GS
Liwonde NP/548 sq km/1996/x/D/FO
Majete GR/682 sq km/1996/U/D/FO
Lengwe NP/887 sq km/1996/240/S/GS
Mwabvi GR/340 sq km/1996/U/l/FO
Lake Malawi NP/94 sq km/1996/x/S/FO
forest reserves/>5,000 sq km/1996/x/S-D/IG
other areas/>5,000 sq km/1996/x/S-D/IG

Bushbuck/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/C/S-D/FO
Gorongosa NP/3,775 sq km/1997/U-R/S-D/F0
Zinave NP/5,000 sq km/1997/x/S-D/FO
Maputo GR/800 sq km/1997/C-U/S/FO
Gaza HZ/40,000 sq km/1997/C/S/FO
other areas/>400,000 sq km/1997/x/S-D/IG

Bushbuck/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/R-V/?/F0
communal lands/-/1988/R/S-D/FO

Bushbuck/Botswana
Okavango Delta-Linyanti-Chobe NP/30,000 sq km/1994/U/S/FO
Tuli block farms/15,000 sq km/1994/C-U/S/FO

Bushbuck/Zirnbabwe
Hwange NP/14,651 sq km/1996/U-R/S-D/FO
other protected areas/26,780 sq km/1995/C-U/S/FO
forestry land/>3,000 sq km/1995/C-U/S/FO
communal land/>50,000 sq km/1995/x/S-D/FO
private farmland/-/1996/5,720/S/QS

Bushbuck/South Africa
Kruger NP/21,682 sq km/1993/1,000/S/IG
Tsitsikamma NP (forest section)/25 sq km/1995/75/S/TC
other NPs/-/1995/>100/S-I/IG
provincial Rs/3,500 sq km/1995/C/S/FO
other areas/>40,000 sq km/1995/C-U/S-D/IG

Bushbuck/Swaziland
Malolotja NR/180 sq km/1994/R/S/FO
Hlane GR/163 sq km/1994/C/S/FO
Mlawula NR/120 sq km/1994/C/S/FO
Mliliwane WS/45 sq km/1994/C/S/FO
private land/-/1994/x/S-D/FO
other areas/>2,000 sq km/1994/x/S-D/IG

Sitatunga/Senegal
Casamance region/>500 sq km/1996/R/D/FO
Basse Casamance NP/50 sq km/1996/?/?/FO

Sitatunga/Gambia
Abuko NR/1 sq km/1988/x/S-l/FO
Kiang West NP/100 sq km/1988/x/?/FO

Sitatunga/Guinea-Bissau
Cacheu River area/500 sq km/1991/R/D/FO

Sltatunga/Guinea
northern coastal zone/?/1986/R/D/LP

Sltatunga/Benin
southeastern coastal swamps/<250 sq km/1990/R/D/FO

Sitatunga/Nigeria
Gilli Gilli GR/363 sq km/1990/R/D/FO
Orle River GR/352 sq km/1990/R/D/FO
Niger Delta/5,000 sq km/1990/x/D/FO
Lake Chad/<500 sq km/1990/R/D/FO

Sitatunga/Chad
Lake Chad/<1,000 sq km/1989/R/D/FO

Sitatunga/Cameroon
Korup NP/1,260 sq km/1994/R/D/FO
Campo R/3,000 sq km/1994/U/D/FO
Dja R/6,194 sq km/1994/C/S/FO
Lobeke R/2,500 sq km/1994/C/S/FO
other areas/> 100,000 sq km/1994/x/S-D/IG

Sitatunga/CAR
Sangba Pilot Zone/11,000 sq km/1995/>50/S-I/IG
east-central HZs/70,000 sq km/1997/U-R/?/FO
Bangassou Forest/16,600 sq km/1996/Ab/S/FO
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C/S/FO
other areas/>l,000 sq km/1995/x/S-D/IG

Sitatunga/Equ. Guinea
Monte Alen NP/1,500 sq km/1998/Ab/S/FO
other areas of Mbini/>5,000 sq km/1998/C-U/D/IG

Sitatunga/Gabon
Lope R/5,000 sq km/1994-96/U-R/S/FO
Wonga-Wongue R/4,800 sq km/1988/C/S/FO
Gamba complex/11,000 sq km/1994-96/C/S/FO
Minkebe Forest/15,000 sq km/1995/C-U/S/FO
other areas/> 100,000 sq km/1996/C/S-D/FO

Sitatunga/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/C/l/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/C/S-l/FO
Lake Tele-Likouala/10,500 sq km/1994/C/?/FO
Conkouati FR/1,450 sq km/1995/R/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
Lefini FR/6,300 sq km/1997/R/D/FO
other areas/> 100,000 sq km/1995/x/S-D/IG

Sitatunga/Congo-Kinshasa
Garamba NP & HZs/12,477 sq km/1995/R/?/FO
Virunga NP/7,800 sq km/1996/U-R/S/FO
Okapi FR/13,726 sq km/1995/U/S/FO
Maiko NP/10,800 sq km/1992/x/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/x/S/FO

Sitatunga/Congo-Kinshasa (continued)
Salonga NP/36,560 sq km/1989/C/S/FO
Upemba NP/11,730 sq km/1996/U/D/FO
Kundelungu NP/7,600 sq km/1996/C/D/FO
other areas/>500,000 sq km/1996/x/S-D/IG

Sitatunga/Sudan
Sudd swamps/>10,000 sq km/1997/x/S-D/FO
southwestern Western Equatoria/>1,000 sq km/1996/x/?/LP

Sitatunga/Uganda
Murchison Falls NP & GRs/5,500 sq km/1997/x/?/FO
Ajai's GR/125 sq km/1995/x/?/FO
Queen Elizabeth NP & GRs/2,419 sq km/1995/x/?/FO
Lake Mburo NP/260 sq km/1995/x/?/FO
Bwindi-Impenetrable Forest NP/321 sq km/1995/R/S-I/FO
Kibale Forest NP/766 sq km/1995/U/S/FO
other areas/>10,000 sq km/1988/U/S-D/IG

Sitatunga/Kenya
Saiwa Swamp NP/2 sq km/1996/<50/D/IG
Lake Victoria swamps/?/1988/R/?/F0
Lewa Downs WC/158 sq km/1996/15/S-I/TC

Sitatunga/Tanzania
Biharamulo-Burigi GRs & surrounds/3,680 sq km/1990/660/D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/410/S-I/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/110/S/AS
other areas in northwest/>1,000 sq km/1996/x/?/IG

Sitatunga/Rwanda
Akagera NP/1,500 sq km/1996/500/S-D/IG

Sitatunga/Burundi
Ruvubu NP/436 sq km/1988/U-R/S-D/FO

Sitatunga/Angola
Luando R-Kangandala NP/8,900 sq km/1992/U-R/S-D/IG
eastern border/>10,000 sq km/1992/x/S-D/IG

Sitatunga/Zambia
Kafue NP (Busanga Plain)/960 sq km/1994/C/S/FO
Kasanka NP/420 sq km/1994/C/S-I/FO
Lavushi Manda NP/1,500 sq km/1994/U/S-D/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/R/S-D/FO
Bangweulu-Kafinda GMAs/7,500 sq km/1993/C/S/FO
West Lunga NP/1,684 sq km/1994/x/S-D/FO
Mweru Wantipa NP/3,134 sq km/1994/x/?/F0
Nsumbu NP/2,020 sq km/1994/x/S/FO
other areas/>30,000 sq km/1994/x/S-D/IG

Sitatunga/Mozambique
western Tete Province/?/1987/R/?/FO

Sitatunga/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/20/S-I/GS

Sitatunga/Botswana
Okavango Delta/8,000 sq km/1992/4,000/S/GS
Linyanti swamps/1,000 sq km/1994/760/S-I/AS

Sitatunga/Zimbabwe
extreme northwest/?/1988/R-V/7/F0

Nyala/Malawi
Lengwe NP (eastern section)/130 sq km/1996/2,880/I/GS
Mwabvi GR/340 sq km/1998/?/?/AS
private land/-/1989/100/I/TC

Nyala/Mozambique
Gorongosa NP/3,775 sq km/1997/U-R/D/FO
Zinave NP/5,000 sq km/1997/200/D/IG
Banhine NP/7,000 sq km/1997/R/D/FO
Gaza HZ/40,000 sq km/1997/C-U/S-D/FO
Maputo GR/800 sq km/1997/U/S-D/FO
other areas/>10,000 sq km/1997/x/D/IG

Nyala/Namibia
private farmland/-/1992/96/S-I/QS

Nyala/Botswana
Tuli block farms/?/1994/U-R/I/F0

Nyala/Zimbabwe
Mana Pools NP-Sapi & Chewore SAs/6,700 sq km/1995/U/S/FO
Gonarezhou NP/4,972 sq km/1993/40/?/AS
communal land/>1,000 sq km/1995/x/?/IG
private farmland/-/1996/420/I/QS

Nyala/South Africa
Kruger NP/21,682 sq km/1993/>l ,000/S/IG
Hluhluwe-Umfolozi P/965 sq km/1994/7,000/S/GS
Mkuzi GR/251 sq km/1994/7,000/S/GS
Ndumu GR/101 sq km/1994/4,000/S/GS
other provincial Rs/-/1994-96/4,360/I/GS
private land/-/1994-96/>3,500/I/QS

Nyala/Swaziland
Hlane GR/163 sq km/1994/C/S/FO
Mlawula NR/120 sq km/1994/x/I/FO
private land/-/1994/x/S-I/FO

Mountain Nyala/Ethiopia
Bale Mts NP (northern sector)/250 sq km/1997/1,150/I/GS
other areas of Bale & Arsi Mts/?/1996/1,500/S-D/IG

Lesser Kudu/Sudan
southeastern bushland/>2,500 sq km/1989/x/?/LP

Lesser Kudu/Ethiopia
Awash Valley/17,000 sq km/1995/1,600/S/AS
Aysha-Jigjiga/?/I 995/x/?/FO
0gaden/>30,000 sq km/1997/C-U/S-D/FO
Omo & Mago NPs-Omo W. & Murule CHAs-Tama & Chew Bahir WRs/15,600 sq km/1995-97/4,870/S/AS
Borana CHA-Yabelo WS/41,000 sq km/1995/7,270/S/AS

Lesser Kudu/Somalia
Bele-dougle/?/1996/x/S-D/FO
Bush-Bush NP/4,267 sq km/1995/C/S-D/FO
other areas in south/>20,000 sq km/1983/C-U/S-D/FO

Lesser Kudu/Uganda
S. Karamoja CHA/5,900 sq km/1995/880/S/AS

Lesser Kudu/Kenya
Sibiloi NP & surrounds/2,000 sq km/1994/20/S/AS
Marsabit NP & NR/2,090 sq km/1995/50/0/GS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/75/D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/4,330/S-D/AS
Tsavo NP & surrounds/40,572 sq km/1997/1,010/D/AS
Amboseli NP/392 sq km/1996/R/S-D/FO
Tana River NR & surrounds/200 sq km/1995/15/7/AS
Kajiado & eastern Narok rangelands/28,000 sq km/1991-94/110/S/AS
Baringo district/6,000 sq km/1991-94/120/S-I/AS
coastal rangelands/15,000 sq km/1991-94/340/S-D/AS

Lesser Kudu/Tanzania
Tarangire NP/2,600 sq km/1994/<10/S-D/AS
Tarangire GCAs/10,000 sq km/1994/165/?/AS
Mkomazi GR/3,615 sq km/1996/550/S-I/AS
Ruaha NP & GRs/29,280 sq km/1993/415/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/65/S/AS
other areas in northeast/>20,000 sq km/1996/x/S-D/IG

Greater Kudu/Chad
Aboutelfan FR/1,100 sq km/1988/U-R/D/FO
Bahr Salamat FR/20,600 sq km/1989/U-R/S-D/F0
Zakouma NP/3,000 sq km/1995/100/I/AS

Greater Kudu/Chad (continued)
Siniaka Minia FR/4,260 sq km/1995/50/I/AS

Greater Kudu/CAR
north of Ouandjia & Koumbal Rivers/<1,000 sq km?/1989/x/S-D/FO

Greater Kudu/Congo-Kinshasa
Kundelungu NP/7,600 sq km/1996/R/D/FO

Greater Kudu/Sudan
Jebel Marra/>250 sq km/1991/x/S-D/FO
Dinder NP/8,960 sq km/1997/1 5/S/GS
Red Sea Hills/>500 sq km/1988/x/?/FO
southeastern bushland/>2,S00 sq km/1989/x/?/LP

Greater Kudu/Eritrea
northwestern hills/>5,000 sq km/1995/x/?/IG
southwestern savannas/>5,000 sq km/1995-97/U/?/FO
Semanawi Bahri/200 sq km/1995/x/?/LP

Greater Kudu/Ethiopia
Dinder River Valley/7/1996/x/?/FO
Awash NP/804 sq km/1995/85/D/GS
Awash Valley/17,000 sq km/1995/450/S-D/AS
southern Ogaden/>15,000 sq km/1997/U-R/D/FO
Senkelle WS/54 sq km/1995/x/S-D/FO
Nechisar NP/514 sq km/1995/<200/S/IG
Borana CHA-Yabelo WS/41,000 sq km/1995/400/?/AS
Omo-Mago NPs/6,135 sq km/1992-95/R/S/FO
Murule CHA/3,900 sq km/1995/220/S-D/AS
other areas in west & south/>15,000 sq km/1995/x/S-D/IG

Greater Kudu/Uganda
eastern Karamoja/?/1988/R/S-D/FO

Greater Kudu/Kenya
Lake Bogoria NR/107 sq km/1995/U/?/FO
Baringo district/6,000 sq km/1991-94/45/S-D/AS
Laikipia north escarpment/?/1997/250/S/IG
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1994/x/D/FO
Tsavo NP & surrounds/40,572 sq km/1997/90/D/AS

Greater Kudu/Tanzania
Maswa GR surrounds/?/1996/x/?/FO
Tarangire NP/2,600 sq km/1996/U/S/FO
Tarangire GCAs/10,000 sq km/1996/U/?/FO
Mahale Mts NP/1,200 sq km/1988/R/?/FO
Ugalla River GR/4,760 sq km/1991/60/S/AS
Ugalla River GCAs/2,140 sq km/1991/40/S/AS
Katavi-Rukwa GCAs/10,652 sq km/1991/100/S/AS
Ruaha NP & GRs/29,280 sq km/1993/285/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/90/S/AS
Udzungwa Mts NP/1,000 sq km/1996/U/D/FO
Selous GR/43,626 sq km/1994/930/S-I/AS
Selous GR surrounds/38,212 sq km/1994/490/S-I/AS
Mikumi NP/3,215 sq km/1988/R/?/FO
other areas/>15,000 sq km/1996/x/S-D/IG

Greater Kudu/Angola
south/>20,000 sq km/1992/U-R/D/IG

Greater Kudu/Zambia
Kafue NP/22,357 sq km/1994/>600/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lower Zambezi NP/4,092 sq km/1995/80/S/AS
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/>25/S/AS
Sioma Ngwezi NP/5,240 sq km/1991/195/S-D/AS
N. Luangwa NP/4,636 sq km/1995/>l,000/S/AS
S. Luangwa NP/9,050 sq km/1994/C/S/F0
Lupande GMA/4,500 sq km/1994/1,380/S/GS
other Luangwa Valley GMAs/22,840 sq km/1994/>500/S-D/AS
Lukusuzi NP/1,920 sq km/1994/U/D/FO
private game ranches/-/1994/280/S-l/QS
other areas/>10,000 sq km/1994/x/S-D/IG

Greater Kudu/Malawi
Nyika NP/3,134 sq km/1996/U-R/?/FO
Vwaza Marsh GR/986 sq km/1996/60/D/AS
Kasungu NP/2,316 sq km/1996/50/D/AS
Nkhotakota GR/1,802 sq km/1996/90/l/GS
Liwonde NP/548 sq km/1996/x/S/FO
Majete GR/682 sq km/1996/Ab/l/FO
Lengwe NP/887 sq km/1996/90/l/GS
Mwabvi GR/340 sq km/1996/C/l/FO
forest reserves/>1,000 sq km/1996/x/S-D/IG

Greater Kudu/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/x/S-D/FO
Gorongosa NP/3,775 sq km/1997/R/D/FO
Manica Province/?/1998/C/S-l/FO
Zinave NP/5,000 sq km/1997/<200/D/IG
Banhine NP/7,000 sq km/1997/300/D/IG
Gaza HZ/40,000 sq km/1997/C/S/FO
Maputo GR/880 sq km/1997/30/l/TC
other areas/>75,000 sq km/1997/U-R/D/IG

Greater Kudu/Namibia
Etosha NP/22,270 sq km/1995/820/S/AS
Skeleton Coast P/16,390 sq km/1988/R-V/?/FO
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/90/l/AS
Von Bach R/43 sq km/1988/40/S/TC
Daan Viljoen GP/40 sq km/1988/32/S/TC
Kaudom GP/3,841 sq km/1988/220/S/AS
Waterberg Plateau P/405 sq km/1986/150/1/TC
Namib-Naukluft P/49,768 sq km/1987/160/1/IG
Hardap GP/250 sq km/1988/80/S/GS
Ai-Ais Hot Springs P/461 sq km/1988/10/S/GS
Kaokoland/70,000 sq km/1990/x/S-l/FO
other communal lands/-/1988/1,350/D/AS
private farmland/-/1992/203,090/l/QS

Greater Kudu/Botswana
northern protected areas & rangelands & adjoining areas of Ngamiland, Chobe & Central districts/1 50,000 sq km/1994/11,980/S-l/AS
Central Kgalagadi-Khutse GRs/55,300 sq km/1994/5,000/1/AS
western Ghanzi & Kgalagadi districts/160,000 sq km/1994/4,600/S/AS
Tuli block farms/10,000 sq km/1994/1,000/S/AS
other areas/150,000 sq km/1994/3,500/S-D/AS

Greater Kudu/Zimbabwe
Hwange NP/14,651 sq km/1996/4,000/S/IG
Matetsi SA complex/3,295 sq km/1995/840/S/AS
Zambezi NP/543 sq km/1995/120/S/AS
Chizarira NP/1,910 sq km/1995/720/S/AS
Matusadona NP/1,537 sq km/1995/80/S/AS
Chete & Chirisa SAs/2,794 sq km/1995/580/S/AS
Mana Pools NP/2,162 sq km/1995/250/S/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/1,060/S/AS
Gonarezhou NP/4,972 sq km/1995/360/S/AS
other protected areas/1,600 sq km/1995/C/S/FO
forestry land/2,950 sq km/1995/1 50/S/AS
Sebungwe communal lands/9,232 sq km/1995/630/S/AS
northwestern Matabeleland communal lands/3,110 sq km/1995/1 50/S/AS
Dande communal lands/3,161 sq km/1995/360/S/AS
Zambezi Valley escarpment/1,283 sq km/1995/15/S/AS
other communal lands/>15,000 sq km/1995/x/S-D/IG
private farmland/-/1996/39,910/S/QS

Greater Kudu/South Africa
Kruger NP/21,682 sq km/1993/3,150/D/AS
Karoo NP/433 sq km/1994/82/I/TC
Mt Zebra NP/67 sq km/1995/34/S/TC
Addo-Zuurberg NP/515 sq km/1995/460/S/AS
other NPs/-/1995/>180/S-I/TC
Hluhiuwe-Umfolozi P/965 sq km/1994/2,000/S/GS
Mkuzi GR/251 sq km/1994/500/S/GS
Itala GR/259 sq km/1994/300/S/GS
Karoo NR/145 sq km/1995/600/S/TC
other provincial Rs/-/1994-96/5,820/S-I/TC
private land/-/1994-96/>50,000/l/QS
other areas/>30,000 sq km/1995/C-U/S-l/IG

Greater Kudu/Swaziland
Hlane GR/163 sq km/1994/C/S/FO
Mlawula-Ndzindza NRs/175 sq km/1994/C/S/FO
Mliliwane WS/45 sq km/1994/C/S/FO
private land/-/1994/x/S/FO
other areas/>1,000 sq km/1994/x/S-D/IG

Common Eland/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/U/S-D/FO
Kundelungu NP/7,600 sq km/1996/R/D/FO

Common Eland/Sudan
southeastern savannas/>5,000 sq km/1992/x/D/IG

Common Eland/Ethiopia
Omo NP/4,015 sq km/1995/2,630/D/AS

Common Eland/Uganda
Lake Mburo NP/260 sq km/1995/270/S/AS
Pian-Upe GR/3,250 sq km/1995/10/D/AS

Common Eland/Kenya
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1994/R/S-D/FO
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/250/S/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/700/S-D/AS
Tsavo NP & surrounds/40,572 sq km/1997/760/D/AS
Laikipia ranches/10,000 sq km/1991-94/3,560/S/AS
Baringo district/6,000 sq km/1991-94/130/S/AS
Masai Mara NR/1,670 sq km/1994/170/D/AS
Mara ranches/3,890 sq km/1994/725/S/AS
Amboseli NP/392 sq km/1994-96/150/D/AS
Nairobi NP/117 sq km/1990-94/110/S/GS
Kajiado & eastern Narok rangelands/28,000 sq km/1991-94/5,650/S/AS
coastal rangelands/15,000 sq km/1991-94/260/S/AS
Lake Nakuru NP/139 sq km/1993/80/S/GS
Aberdare NP & FR/1,966 sq km/1995/440/D/GS

Common Eland/Tanzania
Serengeti ecosystem/27,000 sq km/1996/11,740/S/AS
Ngorongoro Crater/250 sq km/1992/30/D/TC
Kilimanjaro NP & FR/1,835 sq km/1995/C/S-D/FO
Arusha NP/137 sq km/1986/U-R/?/FO
Tarangire NP/2,600 sq km/1994/240/S-D/AS
Tarangire GCAs/10,000 sq km/1994/1,140/?/AS
Mkomazi GR/3,615 sq km/1996/230/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/x/?/FO
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/990/S/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/720/S/AS
Ugalla River GR & GCAs/6,900 sq km/1991/x/?/F0
Katavi NP- Katavi-Rukwa GCAs/13,341 sq km/1995/1,150/S-D/AS
Ruaha NP & GRs/29,280 sq km/1993/3,420/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/700/S/AS
Selous GR/43,626 sq km/1994/2,240/S/AS
Selous GR sun-ounds/38,212 sq km/1994/670/S/AS
Mikumi NP/3,215 sq km/1994/60/S/AS
Kilombero GCA/6,928 sq km/1994/1,060/S/AS
other areas/>25,000 sq km/1996/x/S-D/IG

Common Eland/Rwanda
Akagera NP/1,500 sq km/1996/<50/D/IG

Common Eland/Angola
west & south/>10,000 sq km/1992/R/D/IG

Common Eland/Zambia
Kafue NP/22,357 sq km/1994/1,250/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lower Zambezi NP/4,092 sq km/1995/<50/S/AS
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
Sioma Ngwezi NP/5,240 sq km/1991/140/S-D/AS
Liuwa Plain NP/3,660 sq km/1994/V/?/FO
Mweru Wantipa NP/3,134 sq km/1994/x/D/FO
Nsumbu NP/2,020 sq km/1994/x/S-D/FO
Lusenga Plain NP/880 sq km/1994/U-R/D/FO
N. Luangwa NP/4,636 sq km/1995/l,500/S/AS
S. Luangwa NP/9,050 sq km/1994/140/D/AS
Lupande GMA/4,500 sq km/1994/R/D/FO
other Luangwa Valley GMAs/22,840 sq km/1994/410/D/AS
Luambe NP/320 sq km/1994/30/S/AS
private game ranches/-/1994/130/S-l/QS
other areas/>10,000 sq km/1994/R/D/IG

Common Eland/Malawi
Nyika NP/3,134 sq km/1996/2,030/l/AS
Vwaza Marsh GR/986 sq km/1996/20/D/AS
Kasungu NP/2,316 sq km/1996/320/S/AS
Nkhotakota GR/1,802 sq km/1996/20/?/GS

Common Eland/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/R/?/FO
Manica Province/7/1 998/C-U/S-l/FO
Gorongosa NP/3,775 sq km/1997/R/D/FO
Banhine NP/7,000 sq km/1998/<10/D/IG

Common Eland/Namibia
Etosha NP/22,270 sq km/1995/1,090/S/AS
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/R/?/FO
Kaudom GP/3,841 sq km/1988/14/l/AS
Waterberg Plateau P/405 sq km/1986/280/1/TC
Von Bach R/43 sq km/1988/11/S-l/TC
Daan Viljoen GP/40 sq km/1988/49/S/TC
Hardap GP/250 sq km/1988/R/S/FO
communal lands/-/1988/1,000/D/AS
private farmland/-/1992/29,150/l/QS

Common Eland/Botswana
northern Ngamiland-Chobe district/60,000 sq km/1994/930/S/AS
southwestern Ngamiland/10,000 sq km/1994/1,010/S-D/AS
Central Kgalagadi-Khutse GRs/5S,300 sq km/1994/7,110/l/AS
Gemsbok NP & surrounds/40,000 sq km/1994/4,290/S/AS
Tuli block farms/2,000 sq km/1994/330/S-l/AS

Common Eland/Zimbabwe
Hwange NP/14,651 sq km/1996/500/D/IG
Matetsi SA complex/3,295 sq km/1995/310/S-D/AS
Zambezi NP/543 sq km/1995/10/S-D/AS
Chizarira NP/1,910 sq km/1995/80/S/AS
Chirisa SA/1,713 sq km/1995/80/S/AS
Mana Pools NP/2,162 sq km/1995/130/S-l/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/510/S-l/AS
Gonarezhou NP/4,972 sq km/1995/240/S/AS
other protected areas/1,310 sq km/1995/C-U/S/FO
forestry land/2,344 sq km/1995/40/S/AS
Dande communal lands/3,161 sq km/1995/30/S/AS
private farmland/-/1996/11,840/S-l/QS

Common Eland/South Africa
Kruger NP/21,682 sq km/1993/500/D/AS
Kalahari Gemsbok NP/9,591 sq km/1994/585/S/AS
Augrabies Falls NP/137 sq km/1995/21/S/TC
Vaalbos NP/227 sq km/1995/149/l/TC
Karoo NP/433 sq km/1994/35/l/TC
Mt Zebra NP/67 sq km/1995/129/S/TC
Addo-Zuurberg NP/515 sq km/1995/67/l/TC
Golden Gate Highlands NP/116 sq km/1995/84/S/TC
other NPsA/1995/140/l/TC
Natal Drakensberg P/2,428 sq km/1994/1,800/S/TC
Itala GR/259 sq km/1994/150/S/TC
Suikerbosrand NR/133 sq km/1995/500/S/TC
Sandveld NR/377 sq km/1996/166/S/TC
De Hoop NR/178 sq km/1996/>200/S/TC
other provincial Rs/-/1994-96/2,180/l/TC
private land/-/1994-96/>3,280/l/QS

Common Eland/Swaziland
Mlilwane WS/45 sq km/1994/U-R/D/FO

Common Eland/Lesotho
Sehlabathebe NP/65 sq km/1988/V/?/F0

Western Giant Eland/Mali
Bating FR & surrounds/6,000 sq km/1997/30/D/IG
Guinea border area south of Kita/1,400 sq km/1997/10/?/FO
Mandingues Mts/1,600 sq km/1997/?/?/FO

Western Giant Eland/Senegal
Niokolo-Koba NP/3,500 sq km/1997/100/7/IG
Faleme HZ/10,000 sq km/1997/U-R/?/FO

Western Giant Eland/Guinea-Bissau
Corubal River/1,500 sq km/1992/V/D/LP

Eastern Giant Eland/Chad
eastern Salamat/?/1996/V/J/FO

Eastern Giant Eland/Cameroon
N. Province/>29,700 sq km/1998/2,090/S/IG

Eastern Giant Eland/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<1,500/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/500/?/AS
Sangba Pilot Zone/11,000 sq km/1995/>1,000/S-l/AS
northern region HZs/60,000 sq km/1996/>2,500/S-D/IG
east-central region HZs/70,000 sq km/1997/>3,000/S-D/IG
Chinko Basin/95,000 sq km/1997/>4,000/S-D/IG

Eastern Giant Eland/Congo-Kinshasa
northern savannas/>5,000 sq km/1989/U-R/D/LP

Eastern Giant Eland/Sudan
southwestern savanna woodlands/>50,000 sq km/1995/x/D/LP

Bongo/Guinea
Kounounkan Forest/50 sq km/1992/x/?/FO
Ziama & Diecke FRs/1,679 sq km/1990/x/?/FO

Bongo/Sierra Leone
Outamba-Kilimi IIP/980 sq km/1986/R/D/FO
Gola N. FR/448 sq km/1987/R/D/FO

Bongo/Liberia
Gola NF/2,070 sq km/1990/x/?/LP
N. Lorma NF/712 sq km/1990/R/?/LP
Krahn-Bassa NF/5,140 sq km/1990/R/?/LP
Sapo NP/1,308 sq km/1990/C/?/FO
Grebo NF/2,673 sq km/1990/C-U/?/FO
other areas/>2,000 sq km/1990/R/?/FO

Bongo/Ivory Coast
Monts Tingui Forest/1,160 sq km/1996/x/?/FO
Haut Bandama GR/1,230 sq km/1990/R/?/FO
Mont Sangbe NP/950 sq km/1990/R/D/FO
Marahoue NP/1,010 sq km/1997/R/S-D/FO
Tai NP/4,540 sq km/1996/1,100/S-D/GS
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/x/S-D/FO
Mont Peko NP/340 sq km/1990/R/S-D/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1986/x/S-D/FO
other FRs/2,000 sq km/1990/R/S-D/FO

Bongo/Ghana
Digya NP/3,126 sq km/1995/R/D/FO
Bia NP & GPR/306 sq km/1995/x/I/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/x/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/C/I/FO

Bongo/Togo
Fazao NP/1,920 sq km/1986/R/D/FO

Bongo/Benin
Mounts Kouffe FR/1,080 sq km/1990/?/?/IG

Bongo/Cameroon
Campo R/3,000 sq km/1994/U/D/FO
Dja R/6,194 sq km/1994/U/S/F0
Lobeke R/2,500 sq km/1994/C/D/FO
other areas in southeast/>30,000 sq km/1994/U-R/D/IG

Bongo/CAR
Sangba Pilot Zone/11,000 sq km/1995/200/S-I/IG
Bangassou Forest/16,600 sq km/1996/Ab/S/FO
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C/S/FO
other areas/>10,000 sq km/1995/x/D/IG

Bongo/Gabon
Minkebe Forest/15,000 sq km/1995/U-R/S/FO
other areas in northeast/>5,000 sq km/1995/R/S/IG

Bongo/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/U/S/F0
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/Ab-C/S-I/FO
other areas in north/>30,000 sq km/1995/x/S-D/IG

Bongo/Congo-Kinshasa
Azande HR/2,892 sq km/1995/R/?/F0
Isiro region/>5,000 sq km/1995/C/S-D/FO
Virunga NP/>1,000 sq km/1996/R/D/FO
Okapi FR/13,726 sq km/1995/R/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
Lomami Forest/>10,000 sq km/1989/C/S-D/FO
other areas/>70,000 sq km/1996/x/D/IG

Bongo/Sudan
southwestern Western Equatoria/>2,000 sq km/1995/x/S-D/LP

Mountain Bongo/Kenya
Aberdare NP & FR/1,966 sq km/1995/45/D/GS
Mt Kenya NP & FR/1,367 sq km/1995/R/D/FO
Mau escarpment forests/2,400 sq km/1992/x/D/FO

Subfamily Reduncinae

Bohor Reedbuck/Mauritania
Senegal River Valley/>1,000 sq km/1986/R/D/F0

Bohor Reedbuck/Mali
Boucle du Baoule complex/7,710 sq km/1996/<500/D/IG
Bafing FR/1,690 sq km/1996/<100/?/GS
other areas in southwest/>10,000 sq km/1996/<400/D/IG

Bohor Reedbuck/Niger
W NP-Tamou FR/2,980 sq km/1988/<350/D/GS
other areas in southwest/>5,000 sq km/1988/<500/D/IG
Lake Chad/1,000 sq km/1988/R/D/FO

Bohor Reedbuck/Senegal
Niokolo-Koba NP/9,130 sq km/1995/U/D/FO
Faleme HZ/10,000 sq km/1988/x/?/F0
Delta du Saloum BR/1,000 sq km/1988/x/?/FO

Bohor Reedbuck/Gambia
Kiang West NP/100 sq km/1988/x/?/FO
other areas/>250 sq km/1988/R/D/FO

Bohor Reedbuck/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S-D/FO
other areas of mainland/500 sq km/1991/R/D/FO

Bohor Reedbuck/Guinea
northern savannas/>5,000 sq km/1990/x/D/F0

Bohor Reedbuck/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/R/D/FO

Bohor Reedbuck/Ivory Coast
Comoe NP & surrounds/12,550 sq km/1996/?/?/FO
Nougbo-Leraba FR/443 sq km/1990/x/S-D/FO
Boundiale-Pale FR/386 sq km/1990/R/S-D/FO

Bohor Reedbuck/Burkina Faso
Arly NP/760 sq km/1991/270/S/GS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/U-R/S-D/FO
W NP-Kourtiago FR/2,860 sq km/1991/x/?/FO
Nazinga GR/940 sq km/1990/100/S/GS
Diefoula FR/900 sq km/1990/R/D/FO
other areas/>15,000 sq km/1990/U-R/S-D/IG

Bohor Reedbuck/Ghana
Mole NP/4,921 sq km/1995/R/?/FO
Digya NP/3,126 sq km/1995/x/D/FO

Bohor Reedbuck/Togo
Keran NP-Oti Valley FR/1,700 sq km/1990/R/D/FO

Bohor Reedbuck/Benin
Pendjari NP & HZs/6,505 sq km/1994/x/S/FO
W NP-Djona HZ/7,930 sq km/1994/R/D/F0
forest reserves/7,900 sq km/1990/U-R/S-D/FO
other areas/>5,000 sq km/1990/U-R/D/IG

Bohor Reedbuck/Nigeria
Kainji Lake NP/5,340 sq km/1990/R/D/FO
other protected areas/6,800 sq km/1990/R/D/FO
other areas/>10,000 sq km/1990/R/D/IG

Bohor Reedbuck/Chad
Zakouma NP/3,000 sq km/1995/150/S/AS
Bahr Salamat FR/20,600 sq km/1989/C-U/S/FO
Siniaka Minia FR/4,260 sq km/1995/20/S/AS
eastern Salamat/40,000 sq km/1989/x/S-D/FO
Manda NP/1,140 sq km/1996/50/S-I/GS
Lake Chad/1,000 sq km/1989/x/S-D/FO
eastern Chari Baguirmi/10,000 sq km/1989/x/S-D/FO
Binder Lere FR/1,350 sq km/1996/3/D/AS
other areas in south/>10,000 sq km/1989/x/S-D/IG

Bohor Reedbuck/Cameroon
Waza NP/1,700 sq km/1994/70/S-D/GS
Kalamaloue NP/45 sq km/1994/20/S-D/IG
N. Province/>29,700 sq km/1998/3,8OO/D/IG
other areas/>20,000 sq km/1994/U-R/D/IG

Bohor Reedbuck/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<3,000/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<150/D/AS
Sangba Pilot Zone/11,000 sq km/1995/>300/I/AS
northern region HZs/60,000 sq km/1996/U/S-D/FO
east-central region HZs/70,000 sq km/1997/x/D/FO
Chinko Basin/95,000 sq km/1997/U/S-D/FO
other areas/>20,000 sq km/1 995/x/S-D/IG

Bohor Reedbuck/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/270/S/AS
Virunga NP/7,800 sq km/1996/U/S-D/FO
other areas in north/>25,000 sq km/1996/x/D/IG

Bohor Reedbuck/Sudan
Radom NP/7,500 sq km/1994/U/S/FO
other areas in southwest/>75,000 sq km/1992/x/D/IG
Dinder NP/8,960 sq km/1997/280/D/GS
southeastern savannas/>60,000 sq km/1995/x/D/FO

Bohor Reedbuck/Eritrea
southwestern savannas/?/1997/?/?/IG

Bohor Reedbuck/Ethiopia
Bale Mts NP/2,471 sq km/1995/<1,000/I/IG
Senkelle WS/54 sq km/1995/x/S-D/FO
Omo-Mago NPs/6,135 sq km/1995/U-R/S/FO
other areas in west/>20,000 sq km/1995/x/S-D/IG

Bohor Reedbuck/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/840/S/AS
Aswa-Lolim/3,725 sq km/1995/250/S-D/AS
Kaiso-Tonya CHA/194 sq km/1995/90/?/AS
Queen Elizabeth NP & GRs/2,419 sq km/1995/150/S/AS
Lake Mburo NP & surrounds/1,563 sq km/1995/140/S/AS
Toro GR-Semliki Flats CHA/1,144 sq km/1995/310/?/AS
Kidepo Valley NP/1,575 sq km/1995/25/?/AS
N. Karamoja CHA/10,800 sq km/1995/100/D/AS
Pian-Upe GR/3,250 sq km/1995/1,000/S-I/AS
S. Karamoja CHA/5,900 sq km/1995/430/?/AS
Kibale Forest NP/766 sq km/1995/x/S-D/FO

Bohor Reedbuck/Kenya
Tsavo NP & surrounds/40,572 sq km/1995/U/S-D/FO
Masai Mara NR/1,670 sq km/1994/C/S/FO
Mara ranches/3,890 sq km/1994/C/S/FO
Ruma NP/120 sq km/1994/670/S/GS
Nairobi NP/117 sq km/1993/x/S/FO
Lake Nakuru NP/139 sq km/1993/40/D/GS
Shimba Hills NR/217 sq km/1995/U/?/FO
Aberdare NP/766 sq km/1995/1OO/S/GS
other areas/>5,000 sq km/1995/x/?/IG

Bohor Reedbuck/Tanzania
Serengeti ecosystem/27,000 sq km/1989-91/28,320/S/AS
Ngorongoro Crater/250 sq km/1986/60/S/TC
Lake Manyara NP/110 sq km/1986/<20/D/GS
Tarangire NP/2,600 sq km/1994/50/S-D/AS
Tarangire GCAs/10,000 sq km/1994/140/?/AS
Mkomazi GR/3,100 sq km/1991/30/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/>15/?/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/175/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/4,790/S-I/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/440/S/AS
Ugalla River GR/4,760 sq km/1991/85/S/AS
Ugalla River GCAs/2,140 sq km/1991/35/S/AS
Katavi NP/1,989 sq km/1991/240/S/AS
Katavi-Rukwa GCAs/10,652 sq km/1991/290/S/AS
Ruaha NP & GRs/29,280 sq km/1993/160/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/170/S/AS
Selous GR/43,626 sq km/1994/420/S/AS
Selous GR surrounds/38,212 sq km/1994/1,700/S/AS
Mikumi NP/3,215 sq km/1988/x/S/FO
Kilombero GCA/6,928 sq km/1994/30/S-D/AS
Eyasi region/2,500 sq km/1992/x/?/FO
other areas/>25,000 sq km/1996/x/S-D/IG

Bohor Reedbuck/Rwanda
Akagera NP/1,500 sq km/1994/150/D/GS

Bohor Reedbuck/Burundi
unprotected areas/?/1988/R/D/FO

Southern Reedbuck/Gabon
southwestern savannas/>500 sq km/1996/U-R/D/FO

Southern Reedbuck/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/C/S-D/FO
Kundelungu NP/7,600 sq km/1996/C/S-D/F0
other areas in south/>50,000 sq km/1996/x/D/IG

Southern Reedbuck/Tanzania
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/175/S-D/AS
Moyowosi-Kigosi GRs & surrounds/21,870 sq km/1988/x/?/FO
Ugalla River GR/4,760 sq km/1991/85/S/AS
Ugalla River/GCAs/2,140 sq km/1991/35/S/AS
Ruaha NP & GRs & surrounds/42,340 sq km/1988/x/?/FO
Selous GR/43,626 sq km/1994/110/S/AS
Selous GR surrounds/38,212 sq km/1994/400/S/AS
other areas/>20,000 sq km/1996/x/S-D/IG

Southern Reedbuck/Angola
north, west, east & southeast/>150,000 sq km/1992/U-R/D/IG

Southern Reedbuck/Zambia
Kafue NP/22,357 sq km/1994/1,300/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lower Zambezi NP/4,092 sq km/1995/<50/S-D/AS
Kasanka NP/420 sq km/1994/C/S-I/FO
Lavushi Manda NP/1,500 sq km/1994/C/S-D/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/C/S-D/FO
Bangweulu-Kafinda GMAs/7,500 sq km/1993/C/S/FO
Sioma Ngwezi NP/5,240 sq km/1991/450/S-D/AS
Mweru Wantipa NP/3,134 sq km/1994/C/S/FO
Nsumbu NP/2,020 sq km/1994/C/S-D/FO
Kaputa GMA/900 sq km/1994/60/D/AS
Tondwa GMA/420 sq km/1994/25/S-D/AS
Lusenga Plain NP/880 sq km/1994/U-R/D/FO
N. Luangwa NP/4,636 sq km/1995/R/S/FO
S. Luangwa NP/9,050 sq km/1994/100/S/AS
Lupande GMA/4,500 sq km/1994/U/S/F0
other Luangwa Valley GMAs/22,840 sq km/1994/770/S-D/AS
Lukusuzi NP/1,920 sq km/1994/345/S-D/AS
private game ranches/-/1994/220/S-I/QS
other areas/>25,000 sq km/1994/x/S-D/IG

Southern Reedbuck/Malawi
Nyika NP/3,134 sq km/1996/6,120/S/AS
Vwaza Marsh GR/986 sq km/1996/50/D/AS
Kasungu NP/2,316 sq km/1996/50/D/AS
Nkhotakota GR/1,802 sq km/1996/350/S/GS
Liwonde NP/548 sq km/1996/x/S/FO
Majete GR/682 sq km/1996/C/D/FO
Lengwe NP/887 sq km/1996/110/S/GS
Mwabvi GR/340 sq km/1996/x/?/FO
forest reserves/>2,000 sq km/1996/x/S-D/IG
other areas/>5,000 sq km/1996/x/D/IG

Southern Reedbuck/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/x/?/F0
Gorongosa NP/3,775 sq km/1994/950/S-D/AS
Marromeu GR/1,500 sq km/1994/10/D/AS
Banhine NP/7,000 sq km/1998/>100/S-D/IG
Gaza HZ/40,000 sq km/1997/R/?/F0
Maputo GR/800 sq km/1997/C-U/S-D/FO
other areas/>40,000 sq km/1997/U-R/D/IG

Southern Reedbuck/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/30/I/AS
Kaudom GP/3,841 sq km/1988/10/I/AS
communal lands/-/1988/R/D/FO
private farmland/-/1992/2,300/I/QS

Southern Reedbuck/Botswana
Okavango Delta/16,000 sq km/1994/2,090/S-I/AS
Linyanti swamps/3,000 sq km/1994/100/S-I/AS

Southern Reedbuck/Zimbabwe
Hwange NP/14,651 sq km/1996/200/S/IG
Matetsi SA complex/3,295 sq km/1989/U/S/FO
Zambezi NP/543 sq km/1989/U/S/FO
Chirisa SA/1,713 sq km/1989/U/S/FO
other protected areas/1,070 sq km/1989/C-U/S/FO
communal lands/?/1995/R/D/IG
private farmland/-/! 996/3,860/S/QS

Southern Reedbuck/South Africa
Kruger NP/21,682 sq km/1993/900/D/IG
Eastern Shores SF/200 sq km/1994/7,000/S-I/GS
other provincial Rs/-/1994-96/>2,370/I/GS
private land/-/1994-96/>3,000/I/QS
other areas/>15,000 sq km/1995/U/D/IG

Southern Reedbuck/Swaziland
Malolotja NR/180 sq km/1994/C-U/I/F0
Mlawula NR/120 sq km/1994/U-R/S/FO
Mlilwane WS/45 sq km/1994/U-R/S/FO

Western Mountain Reedbuck/Nigeria
Gashaka Gumpti NP & surrounds/>6,000 sq km/1988/U-R/S-D/FO

Western Mountain Reedbuck/Cameroon
Adamaoua Mts/>1,000 sq km/1997/U-R/D/FO
N. Province/>22,200 sq km/1998/240/?/IG

Chanler's Mountain Reedbuck/Sudan
Eastern Equatoria/>1,000 sq km/1982/U-R/?/FO

Chanler's Mountain Reedbuck/Ethiopia
Awash NP/804 sq km/1995/R/S/FO
Nechisar NP/514 sq km/1995/<300/I/IG
Omo-Mago NPs/6,135 sq km/1995/U-R/S/FO
southern Rift Valley/>5,000 sq km/1995/x/D/IG

Chanler's Mountain Reedbuck/Uganda
eastern Karamoja/?/1988/R/D/FO

Chanler's Mountain Reedbuck/Kenya
Tsavo NP & surrounds/40,572 sq km/1995/R/?/F0
Lake Nakuru NP/139 sq km/1993/x/?/F0
Nairobi NP/117 sq km/1993/R/S/FO
Aberdare NP/766 sq km/1995/1OO/S/GS
other areas/>10,000 sq km/1988/U/D/IG

Chanler's Mountain Reedbuck/Tanzania
Ngorongoro CA (highlands)/4,200 sq km/1988/U/S-D/FO
Serengeti NP/14,763 sq km/1988/R/?/F0
Arusha NP/137 sq km/1988/x/?/FO
Tarangire NP/2,600 sq km/1996/R/?/F0

Southern Mountain Reedbuck/Botswana
Mannyelanong Hill GR & surrounds/<500 sq km/1988/x/?/F0

Southern Mountain Reedbuck/S. Africa
Kruger NP/21,682 sq km/1993/200/S-D/IG
Karoo NP/433 sq km/1994/50/S/TC
Mt Zebra NP/67 sq km/1995/500/S/TC
Addo-Zuurberg NP/515 sq km/1995/23/S/TC
Marakele NP/399 sq km/1996/40/S-I/GS
Golden Gate Highlands NP/116 sq km/1995/362/S/TC
Natal Drakensberg P/2,428 sq km/1994/1,850/S/GS
Royal Natal NP/89 sq km/1994/300/S/TC
Sterkfontein Dam NR/180 sq km/1996/200/S/TC
other provincial Rs/-/1994-96/3,350/S/TC
private land/-/1994-96/>25,000/S-D/QS
other areas/>10,000 sq km/1995/U/D/IG

Southern Mountain Reedbuck/Swaziland
Malolotja NR/180 sq km/1994/C-U/S/FO
Mlawula-Ndzindza NRs/175 sq km/1994/C/S/FO

Southern Mountain Reedbuck/Lesotho
unprotected areas/?/1988/R/D/FO

Buffon's Kob/Mauritania
Senegal River Valley/2,500 sq km/1986/V/D/FO

Buffon's Kob/Mali
Bafing FR/1,690 sq km/1996/<100/D/GS
other areas in southwest/>1,000 sq km/1996/<100/D/IG

Buffon's Kob/Niger
W NP-Tamou FR/2,980 sq km/1988/<400/D/GS
Lake Chad/>500 sq km/1988/R/D/FO

Buffon's Kob/Senegal
Niokolo-Koba NP/9,130 sq km/1995/26,000/S-I/IG
Faleme HZ/10,000 sq km/1988/x/?/F0

Buffon's Kob/Guinea-Bissau
Corubal River/1,500 sq km/1991/R/D/FO
Lake Cufada/700 sq km/1991/R/D/FO
other areas of mainland/500 sq km/1991/R/D/F0
Bijagos Archipelago/24 sq km/1991/R/D/FO

Buffon's Kob/Guinea
northern savannas/>1,000 sq km/1990/R/D/LP

Buffon's Kob/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/9,430/D/GS
Haut Bandama GR/1,230 sq km/1990/x/D/FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/x/D/FO
forest reserves/4,070 sq km/1990/x/D/FO

Buffon's Kob/Burkina Faso
Arty NP-Konkombouri HZ/930 sq km/1998/980/D/AS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/x/D/FO
W NP-Kourtiago FR/2,860 sq km/1991/70/D/AS
Nazinga GR/940 sq km/1990/40/S-I/GS
Diefoula FR/720 sq km/1997/100/I/GS
other forest reserves/>1,000 sq km/1990/R/D/IG

Buffon's Kob/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/C/I/FO
Digya NP/3,126 sq km/1995/x/D/FO
Kalakpa GPR/324 sq km/1995/C/I/FO
Shai Hills GPR/54 sq km/1995/x/D/FO

Buffon's Kob/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U/D/FO
Fazao NP/1,920 sq km/1995/U/D/FO

Buffon's Kob/Benin
Pendjari NP & HZs/6,505 sq km/1994/C/S/FO
W NP-Djona HZ/7,930 sq km/1994/U-R/D/F0
forest reserves/6,500 sq km/1990/x/D/FO

Buffon's Kob/Nigeria
Kainji Lake NP/5,340 sq km/1990/U-R/D/FO
Gashaka Gumpti NP/5,950 sq km/1990/R/D/FO
other protected areas/12,600 sq km/1990/R/D/FO

Buffon's Kob/Chad
Zakouma NP/3,000 sq km/1995/300/S/AS
eastern Salamat/40,000 sq km/1989/U-R/D/F0
Manda NP/1,140 sq km/1996/90/S-I/GS

Buffon's Kob/Cameroon
Waza NP/1,700 sq km/1994/2,060/I/GS
Kalamaloue NP/45 sq km/1994/>I,000/S-D/IG
N. Province/>29,700 sq km/1998/10,740/D/IG
other areas/>5,000 sq km/1994/U-R/D/IG

Buffon's Kob/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<4,000/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<350/D/AS
Sangba Pilot Zone/11,000 sq km/1995/<1,000/S-D/AS
northern region HZs/60,000 sq km/1998/U-R/D/FO
east-central region HZs/70,000 sq km/1997/R/D/FO
Chinko Basin/95,000 sq km/1997/R/D/F0

Buffon's Kob/Congo-Kinshasa
northwestern savannas/>1,000 sq km/1996/R/D/IG

Uganda Kob/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/7,650/I/AS
Virunga NP/7,800 sq km/1996/Ab/S-D/F0

Uganda Kob/Sudan
southwestern savanna woodlands/>5,000 sq km/1992/x/D/IG

Uganda Kob/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/5,360/S-I/AS
Aswa-Lolim/3,725 sq km/1995/1,660/?/AS
Ajai's GR/125 sq km/1995/20/D/AS
Kaiso-Tonya CHA/194 sq km/1995/20/D/AS
Queen Elizabeth NP & GRs/2,419 sq km/1995/31,200/I/AS
Toro GR-Semliki Flats CHA/1,144 sq km/1995/1,200/D/AS
Bokora Corridor GR/3,200 sq km/1995/80/D/AS
Pian-Upe GR/3,250 sq km/1995/140/S/AS
S. Karamoja CHA/5,900 sq km/1995/30/?/AS
Kibale Forest NP/766 sq km/1995/U/I/FO

White-eared Kob/Sudan
southeastern savannas & floodplains/>100,000 sq km/1994/C/D/FO

White-eared Kob/Ethiopia
Gambella NP/5,061 sq km/1990/U/D/FO

White-eared Kob/Uganda
Kidepo Valley NP/1,575 sq km/1995/10/?/AS

Puku/Congo-Kinshasa
Kundelungu NP/7,600 sq km/1996/x/D/FO
Luama HR/7/1989/C-U/D/FO

Puku/Tanzania
Katavi-Rukwa GCAs/10,652 sq km/1988/1,450/D/AS
Kilombero GCA/6,928 sq km/1994/53,020/S/AS
Selous GR (northwest)/<100 sq km/1986-94/120/S/AS

Puku/Angola
northeast/>5,000 sq km/1992/x/D/IG

Puku/Zambia
Kafue NP/22,357 sq km/1994/>8,500/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/D/FO
Kasanka NP/420 sq km/1994/610/I/GS
West Lunga NP/1,684 sq km/1994/500/S-D/IG
Mweru Wantipa NP/3,134 sq km/1994/C/S-D/FO
Nsumbu NP/2,020 sq km/1994/Ab/S-D/FO
Kaputa GMA/900 sq km/1994/40/D/AS
Tondwa GMA/420 sq km/1994/1,470/S-D/AS
N. Luangwa NP/4,636 sq km/1995/7,000/S/AS
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/1,230/S/GS
other Luangwa Valley GMAs/22,840 sq km/1994/>1,500/D/AS
Luambe NP/320 sq km/1994/C/S/FO
private game ranches/-/! 994/190/S-I/QS
other areas/>5,000 sq km/1994/U-R/D/IG

Puku/Malawi
Nyika NP/3,134 sq km/1996/V/?/F0
Vwaza Marsh GR/986 sq km/1996/40/S/AS
Kasungu NP/2,316 sq km/1996/100/1/AS

Puku/Namibia
communal lands/7/1988/V/7/FO

Puku/Botswana
Chobe NP/11,100 sq km/1993/<100/S-D/IG

Puku/Zimbabwe
Mana Pools NP-Chewore SA/5,586 sq km/1987/V/?/FO

Defassa Waterbuck/Mali
Boucle du Baoule complex/7,710 sq km/1996/x/D/IG
Bating FR/1,690 sq km/1996/<100/D/GS
other areas in southwest/?/1996/U-R/D/IG

Defassa Waterbuck/Niger
W NP-Tamou FR/2,980 sq km/1988/<300/D/GS

Defassa Waterbuck/Senegal
Niokolo-Koba NP/9,130 sq km/1995/3,300/D/IG
Faleme HZ/10,000 sq km/1988/x/?/FO

Defassa Waterbuck/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S-D/FO
Cantanhez Forest/650 sq km/1994/x/D/LP
Lake Cufada/700 sq km/1991/x/D/FO
other areas of mainland/>500 sq km/1991/x/D/FO

Defassa Waterbuck/Guinea
northern savannas/>2,500 sq km/1990/U/D/LP

Defassa Waterbuck/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/U/D/FO

Defassa Waterbuck/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/780/D/GS
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/R/D/FO
Haut Bandama GR/1,230 sq km/1990/R/S-D/FO
forest reserves/4,070 sq km/1990/x/D/FO

Defassa Waterbuck/Burkina Faso
Arly NP/930 sq km/1998/120/S-D/AS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/U/S-D/FO
W NP-Kourtiago FR/2,860 sq km/1991/10/D/AS
Nazinga GR/940 sq km/1995/370/I/GS
Diefoula FR/720 sq km/1997/50/I/GS
other forest reserves/>1,000 sq km/1990/U-R/D/IG

Defassa Waterbuck/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/C/I/FO
Gbele GPR/324 sq km/1995/C/S/FO
Digya NP/3,126 sq km/1995/x/D/FO
Kogyae SNR/324 sq km/1995/x/D/FO
Bomfobiri WS/73 sq km/1995/x/D/FO
Kalakpa GPR/324 sq km/1995/U/D/FO

Defassa Waterbuck/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/R/D/FO
Fazao NP/1,920 sq km/1995/U-R/D/FO

Defassa Waterbuck/Benin
Pendjari NP & HZs/6,505 sq km/1994/>1,000/S/AS
W NP-Djona HZ/7,930 sq km/1994/U-R/D/FO
forest reserves/6,500 sq km/1990/x/D/FO

Defassa Waterbuck/Nigeria
Kainji Lake NP/5,340 sq km/1990/R/D/FO
Yankari GR/2,240 sq km/1990/<200/D/IG
Gashaka Gumpti NP/5,950 sq km/1990/R/D/FO
Cross River NP/950 sq km/1990/R/D/FO
other protected areas/7,300 sq km/1990/R/D/FO

Defassa Waterbuck/Chad
Zakouma NP/3,000 sq km/1995/300/S/AS
Siniaka Minia FR/4,260 sq km/1995/20/S-D/AS
Manda NP/1,140 sq km/1996/40/S-I/GS
eastern Salamat/40,000 sq km/1989/U-R/D/F0

Defassa Waterbuck/Cameroon
N. Province/>29,700 sq km/1998/2,760/D/IG
other areas/>5,000 sq km/1994/R/D/IG

Defassa Waterbuck/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<1,000/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<250/D/AS
Sangba Pilot Zone/11,000 sq km/1995/90/S-D/AS
northern region HZs/60,000 sq km/1996/R/D/F0
east-central region HZs/70,000 sq km/1997/R/D/FO
Chinko Basin/95,000 sq km/1997/U/D/FO
Bangassou Forest/16,600 sq km/1996/R/D/FO

Defassa Waterbuck/Gabon
Gamba complex (Moukalaba)/1,000 sq km/1994-96/C-U/S-D/FO
other savanna areas in southwest/>500 sq km/1996/x/D/IG

Defassa Waterbuck/Congo-Brazzaville
Mt Fouari FR/156 sq km/1988/x/D/FO
Tsoulou FR/300 sq km/1988/x/D/FO
Conkouati FR/1,450 sq km/1995/?/?/LP

Oefassa Waterbuck/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/2,500/I/AS
Virunga NP/7,800 sq km/1996/C/S-D/F0
Upemba NP/11,730 sq km/1996/U/D/FO
Kundelungu NP/7,600 sq km/1996/U/D/FO

Defassa Waterbuck/Sudan
southwestern savanna woodlands/>100,000 sq km/1992/x/D/IG
Dinder NP/8,960 sq km/1995/100/D/GS
southeastern savannas/>100,000 sq km/1992/x/D/IG

Defassa Waterbuck/Eritrea
southwestern savanna woodlands/>5,000 sq km/1996/U/7/FO

Defassa Waterbuck/Ethiopia
Awash NP/804 sq km/1995/C/S/FO
Awash Valley/17,000 sq km/1995/1,800/S/AS
Nechisar NP/514 sq km/1995/<400/I/IG
Yabelo WS/2,496 sq km/1993/x/S-D/FO
Omo & Mago NPs-Murule CHA-Chew Bahir WR/12,035 sq km/1995-97/740/S-D/AS
Gambella NP/5,061 sq km/1990/x/D/FO
other areas in west/>10,000 sq km/1995/x/D/IG

Defassa Waterbuck/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/550/S/AS
Aswa Lolim/3,725 sq km/1995/30/D/AS
Ajai's GR/125 sq km/1995/x/D/FO
Kaiso-Tonya CHA/194 sq km/1995/20/D/AS
Queen Elizabeth NP & GRs/2,419 sq km/1995/1,820/S/AS
Lake Mburo NP & surrounds/1,563 sq km/1995/240/S/AS
Toro GR-Semliki Flats CHA/1,144 sq km/1995/10/D/AS
Kidepo Valley NP/1,575 sq km/1995/100/D/AS
Kibale Forest NP/766 sq km/1995/x/S/FO

Defassa Waterbuck/Kenya
Masai Mara NR/1,670 sq km/1994/340/S/AS
Mara ranches/3,890 sq km/1994/140/D/AS
Ruma NP/120 sq km/1994/170/S/GS
Mt Elgon NP & FR/469 sq km/1995/x/?/FO

Defassa Waterbuck/Tanzania
Serengeti ecosystem/27,000 sq km/1996/1,560/S/AS
Ngorongoro Crater/250 sq km/1992/25/D/TC
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/470/S-I/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/850/S/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/70/S/AS
Gombe Stream NP/52 sq km/1988/x/?/FO
Mahale Mts NP/1,200 sq km/1988/x/?/FO
Ugalla River GR/4,760 sq km/1991/450/S-D/AS
Ugalla River GCAs/2,140 sq km/1991/50/S-D/AS
Katavi NP-Katavi-Rukwa GCAs/13,141 sq km/1995/1,390/S-D/AS
Eyasi region/2,500 sq km/1992/70/?/AS
other areas/>10,000 sq km/1996/x/D/IG

Defassa Waterbuck/Rwanda
Akagera NP/1,500 sq km/1994/300/D/GS

Defassa Waterbuck/Burundi
Ruvubu NP/436 sq km/1988/500/S/IG

Defassa Waterbuck/Angola
west, central & southeast/>5,000 sq km/1992/R/D/IG

Defassa Waterbuck/Zambia
Kafue NP/22,357 sq km/1994/1,400/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/D/FO
Kasanka NP/420 sq km/1994/C/S-I/FO
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
West Lunga NP/1,684 sq km/1994/x/D/FO
Mweru Wantipa NP/3,134 sq km/1994/U/S-D/FO
Nsumbu NP/2,020 sq km/1994/C/S-D/FO
Tondwa GMA/420 sq km/1994/40/S-D/AS
Lusenga Plain NP/880 sq km/1994/R/D/FO
private game ranches/-/I994/155/S-I/QS
other areas/>5,000 sq km/1994/U-R/D/IG

Ellipsen Waterbuck/Somalia
lower Shebelle River/?/1983/C-U/D/FO
Bush-Bush NP/4,267 sq km/1995/x/?/IG

Ellipsen Waterbuck/Kenya
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/<100/S/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/170/S-D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/610/S/AS
Tsavo NP & surrounds/40,572 sq km/1997/890/S-D/AS
Laikipia ranches/10,000 sq km/1991-94/470/I/AS
Baringo district/6,000 sq km/1991-94/100/D/AS
Amboseli NP/392 sq km/1996/R/D/FO
Nairobi NP/117 sq km/1993/x/S/FO
Kajiado rangelands/18,000 sq km/1991-94/570/S/AS
Tana River NR & surrounds/200 sq km/1995/C/S/FO
Boni-Dodori NRs/2,117 sq km/1991-94/>200/?/AS
coastal rangelands/17,500 sq km/1991-94/2,500/S-D/AS
Lake Nakuru NP/139 sq km/1993/1,570/D/GS
Aberdare NP & FR/1,966 sq km/1995/180/S-D/GS
Mt Kenya NP & FR/1,367 sq km/1995/C/S-D/FO
Arabuko-Sokoke FR/372 sq km/1995/R/D/FO

Ellipsen Waterbuck/Tanzania
Lake Manyara NP/110 sq km/1990/20/S/GS
Arusha NP/137 sq km/1986/U/S-D/F0
Tarangire NP/2,600 sq km/1996/C/S/FO
Tarangire GCAs/10,000 sq km/1996/C/?/FO
Mkomazi GR/3,615 sq km/1996/70/S/AS
Sadani GR & surrounds/1,537 sq km/1991-92/110/7/AS
Ruaha NP & GRs/29,280 sq km/1993/80/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/120/S/AS
Udzungwa Mts NP/1,000 sq km/1996/U/D/FO
Selous GR/43,626 sq km/1994/10,050/I/AS
Selous GR surrounds/38,212 sq km/1994/1,280/S-I/AS
Mikumi NP/3,215 sq km/1994/1,590/1/AS
Kilombero GCA/6,928 sq km/1994/60/S/AS
other areas/>10,000 sq km/1996/x/D/IG

Ellipsen Waterbuck/Zambia
Lower Zambezi NP/4,092 sq km/1995/100/D/AS
N. Luangwa NP/4,636 sq km/1995/4,000/S/AS
S. Luangwa NP/9,050 sq km/1994/950/D/AS
Lupande GMA/4,500 sq km/1994/510/S/GS
other Luangwa Valley GMAs/22,840 sq km/1994/2,180/D/AS
Luambe NP/320 sq km/1994/40/S/AS
Lukusuzi NP/1,920 sq km/1994/40/D/AS
private game ranches/-/1994/150/S-I/QS
other areas/>1,500 sq km/1994/x/D/IG

Ellipsen Waterbuck/Malawi
Kasungu NP/2,316 sq km/1996/x/?/FO
Nkhotakota GR/1,802 sq km/1996/240/?/GS
Liwonde NP/548 sq km/1996/540/D/AS
Majete GR/682 sq km/1996/U/D/FO

Ellipsen Waterbuck/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/x/?/F0
Manica Province/?/1998/x/I/F0
Gorongosa NP/3,775 sq km/1994/130/D/AS
Marromeu GR/1,500 sq km/1994/140/D/AS
Gaza HZ/40,000 sq km/1997/400/S-D/IG
Maputo GR/800 sq km/1997/14/I/TC

Ellipsen Waterbuck/Namibia
communal lands/-/1988/R/D/FO
private farmland/-/1992/>160/S-I/QS

Ellipsen Waterbuck/Botswana
Okavango Delta/16,000 sq km/1994/670/S-I/AS
Linyanti-Chobe River frontage/3,500 sq km/1994/1OO/S-I/AS
Tuli block farms/2,500 sq km/1994/230/S-D/AS

Ellipsen Waterbuck/Zimbabwe
Hwange NP/14,651 sq km/1996/400/S-D/IG
Matetsi SA complex/3,295 sq km/1995/350/S-D/AS
Kazuma Pan/561 sq km/1995/260/S-D/AS
Zambezi NP/543 sq km/1995/110/S-D/AS
Chizarira NP/1,910 sq km/1995/460/S/AS
Matusadona NP/1,537 sq km/1995/30/S/AS
Chirisa SA/1,713 sq km/1995/20/S/AS
Mana Pools NP/2,162 sq km/1995/180/S-I/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/710/S-I/AS
Gonarezhou NP/4,972 sq km/1995/30/S/AS
other protected areas/1,010 sq km/1989/C-U/S/FO
forestry land/2,344 sq km/1995/490/S/AS
Sebungwe communal lands/9,232 sq km/1995/1,180/S/AS
private farmland/-/1996/3,960/S-I/QS

Ellipsen Waterbuck/South Africa
Kruger NP/21,682 sq km/1993/1,500/D/AS
other NPs/-/1996/80/I/TC
Hluhluwe-Umfolozi P/965 sq km/1994/580/S-I/GS
Eastern Shores SF/200 sq km/1994/300/S-I/GS
Itala GR/259 sq km/1994/300/S-I/GS
other provincial Rs/-/1994-96/1,420/I/TC
private land/-/1994-96/8,700/I/QS

Ellipsen Waterbuck/Swaziland
Hlane GR/163 sq km/1994/R/S/FO
Mlawula NR/120 sq km/1994/50/S/TC
private land/-/1994/x/I/F0

Red Lechwe/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/V/D/FO
Lualaba River floodplain/>1,000 sq km/1989/R/D/FO

Red Lechwe/Angola
southeast/>1,000 sq km/1992/U-R/D/IG

Red Lechwe/Zambia
Kafue NP (Busanga Plain)/960 sq km/1994/4,500/I/AS
Kasonso-Busanga GMA/>250 sq km/1994/x/S-I/FO
Lukanga swamps/>500 sq km/1994/x/?/F0
Sioma Ngwezi NP/5,240 sq km/1994/V/?/IG
Liuwa Plain NP/3,660 sq km/1994/U-V/?/FO
upper Zambezi floodplain/>500 sq km/1994/x/?/FO

Red Lechwe/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/170/I/AS
communal lands/-/1988/4,300/D/AS

Red Lechwe/Botswana
Okavango Delta/16,000 sq km/1994/69,520/S-D/AS
Linyanti swamps/3,000 sq km/1994/2,160/S-D/AS
Chobe River floodplains/2,500 sq km/1994/150/S-D/AS

Kafue Lechwe/Zambia
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/65,000/I/AS

Black Lechwe/Zambia
Bangweulu-Kafinda GMAs/7,500 sq km/1993/30,000/S/AS

Nile Lechwe/Sudan
Sudd swamps/>10,000 sq km/1995/x/?/LP
Machar marshes/>500 sq km/1989/x/D/LP

Nile Lechwe/Ethiopia
Gambella NP/5,061 sq km/1990/>100/?/AS

Subfamily Peleinae

Grey Rhebok/South Africa
Karoo NP/433 sq km/1994/1 50/S/TC
Mt Zebra NP/67 sq km/1995/42/S/TC
Addo-Zuurberg NP/515 sq km/1995/100/S/AS
Golden Gate Highlands NP/116 sq km/1995/194/S/TC
Bontebok NP/28 sq km/1993/120/S/TC
Natal Drakensberg NP/2,428 sq km/1994/2,500/S/AS
Royal Natal NP/89 sq km/1994/130/S/TC
Sterkfontein Dam NR/180 sq km/1996/200/S/TC
other provincial Rs/-/1994-96/>I ,200/S/TC
private land/-/1994-96/>5,000/S-D/QS
other areas/>80,000 sq km/1995/U/D/IG

Grey Rhebok/Swaziland
Malolotja NR/180 sq km/1994/C-U/S/FO
other areas/>500 sq km/1994/x/S-D/IG

Grey Rhebok/Lesotho
Sehlabathebe NP/65 sq km/1988/200/I/TC
other areas/>100 sq km/1988/x/D/IG

Subfamily Alcelaphinae

Western Hartebeest/Mali
Boucle du Baoule complex/7,710 sq km/1996/?/D/IG
Bating FR/1,690 sq km/1996/190/D/GS
other areas in southwest/>2,000 sq km/1996/<100/D/IG

Western Hartebeest/Niger
W NP-Tamou FR/2,980 sq km/1988/320/D/GS
other areas in southwest/>l ,000 sq km/1988/100/D/IG

Western Hartebeest/Senegal
Niokolo-Koba NP/9,130 sq km/1995/2,650/S/GS
Faleme HZ/10,000 sq km/1997/x/?/FO
Casamance region/?/1996/?/?/IG

Western Hartebeest/Guinea-Bissau
Corubal River/1,000 sq km/1 991/R/D/FO

Western Hartebeest/Guinea
northern savannas/>1,000 sq km/1990/R/D/LP

Western Hartebeest/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/6,580/D/GS
Haut Bandama GR/1,230 sq km/1990/C/S-D/FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/C/S-D/FO
forest reserves/4,070 sq km/1990/x/S-D/FO

Western Hartebeest/Burkina Faso
Arly NP/930 sq km/1998/210/D/AS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/C/S-D/FO
W NP-Kourtiago FR/2,860 sq km/1991/x/D/AS
Nazinga GR/940 sq km/1995/1,85O/I/GS
Diefoula FR/720 sq km/1997/2,440/I/GS
other forest reserves/>2,000 sq km/1990/x/D/IG

Western Hartebeest/Ghana
Mole NP/4,921 sq km/1995/Ab/S/FO
Bui NP/3,074 sq km/1995/U/D/FO
Gbele GPR/324 sq km/1995/R/S/FO
Digya NP/3,126 sq km/1995/U/S/FO

Western Hartebeest/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U-R/D/FO
Fazao NP/1,920 sq km/1995/U-R/D/FO

Western Hartebeest/Benin
Pendjari NP & HZs/6,505 sq km/1994/>2,000/I/AS
W NP-Djona HZ/7,930 sq km/1994/x/S-D/FO
forest reserves/6,500 sq km/1990/U-R/S-D/F0

Western Hartebeest/Nigeria
Kainji Lake NP/5,340 sq km/1990/U-R/D/FO
Yankari GR/2,240 sq km/1990/200/D/IG
Gashaka Gumpti NP/5,950 sq km/1990/U/D/FO
other protected areas/13,700 sq km/1990/R/D/FO

Western Hartebeest/Cameroon
N. Province/>29,700 sq km/1998/7,970/D/IG
other areas/>5,000 sq km/1994/U-R/D/IG

Lelwel Hartebeest/Chad
Zakouma NP/3,000 sq km/1995/1,800/1/AS
Bahr Salamat FR/20,600 sq km/1989/U/D/FO
Siniaka Minia FR/4,260 sq km/1995/100/?/AS
eastern Salamat/40,000 sq km/1989/C/S-D/FO
Manda NP/1,140 sq km/1996/20/S-I/GS

Lelwel Hartebeest/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<5,000/D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<700/D/AS
Sangba Pilot Zone/11,000 sq km/1995/<2,300/S-I/AS
northern region HZs/60,000 sq km/1998/U/D/FO
east-central region HZs/70,000 sq km/1997/R/D/FO
Chinko Basin/95,000 sq km/1997/R/D/FO

Lelwel Hartebeest/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/2,950/I/AS

Lelwel Hartebeest/Sudan
Radom NP/7,500 sq km/1994/R/D/FO
other areas in southwest/>100,000 sq km/1992/x/D/IG
southeastern savannas/>100,000 sq km/1992/x/D/IG

Lelwel Hartebeest/Ethiopia
Gambella NP/5,061 sq km/1996/x/D/LP
Omo & Mago NPs-Tama WR-Murule CHA/12,800 sq km/1995-97/1,380/D/AS

Lelwel Hartebeest/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/2,750/S/AS
Aswa Lolim/3,725 sq km/1995/140/D/AS
Ajai's GR/125 sq km/1995/20/D/AS
Kidepo Valley NP/1,575 sq km/1995/60/D/AS
Pian-Upe GR/3,250 sq km/1995/400/S-D/AS

Lelwel Hartebeest/Tanzania
Rumanyika Orugundu-Ibanda Arena GRs/1,000 sq km/1988/U/D/FO

Tora Hartebeest/Eritrea
western savannas/7/1995/U-R/D/LP

Tora Hartebeest/Ethiopia
Dinder River Valley/?/1996/x/?/FO

Swayne's Hartebeest/Ethiopia
Awash NP/804 sq km/1995/5/D/GS
Senkelle WS/36 sq km/1998/200/S-D/IG
Nechisar NP/514 sq km/1995/40/S/IG
Maze CHA/7/1995/15/D/IG

Kenya Hartebeest/Kenya
Laikipia ranches/10,000 sq km/1991-94/2,200/S/AS
Ruma NP/120 sq km/1994/190/S/GS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/25/D/AS

Coke's Hartebeest/Kenya
Tsavo NP & surrounds/40,572 sq km/1997/4,120/D/AS
Masai Mara NR/1,670 sq km/1994/1,150/S/AS
Mara ranches/3,890 sq km/1994/1,260/S-D/AS
Amboseli NP/392 sq km/1994-96/<50/D/AS
Nairobi NP/117 sq km/1990-94/200/S-D/GS
Kajiado rangelands/18,000 sq km/1991-94/4,270/I/AS
coastal rangelands/15,000 sq km/1991-94/1,210/S/AS

Coke's Hartebeest/Tanzania
Serengeti ecosystem/27,000 sq km/1996/11,120/D/AS
Ngorongoro Crater/250 sq km/1992/120/S/TC
Tarangire NP/2,600 sq km/1994/1,390/S/AS
Tarangire GCAs/10,000 sq km/1994/1,950/?/AS
Mkomazi GR/3,615 sq km/1996/420/S/AS

Coke's Hartebeest/Tanzania (continued)
Sadani GR & surrounds/1,537 sq km/1991-92/l,160/?/AS
other areas/>5,000 sq km/1996/x/S-D/IG

Red Hartebeest/Namibia
Etosha NP/22,270 sq km/1995/860/l/AS
Kaudom GP/3,841 sq km/1988/20/l/AS
Waterberg Plateau P/405 sq km/1986/50/S/TC
Daan Viljoen GP/40 sq km/1988/53/S/TC
Hardap GP/250 sq km/1988/20/S/GS
communal lands/-/1988/1 50/D/AS
private farmland/-/1992/50,800/l/QS

Red Hartebeest/Botswana
Makgadikgadi-Nxai Pan NP & surrounds/10,000 sq km/1994/400/S-D/AS
southwestern Ngamiland/10,000 sq km/1994/50/S-D/AS
Central Kgalagadi-Khutse GRs-Gemsbok NP & adjoining areas/210,000 sq km/1994/42,700/S-I/AS
other areas/50,000 sq km/1994/1,200/D/AS

Red Hartebeest/Zimbabwe
private farmland/-/1996/50/l/QS

Red Hartebeest/South Africa
Kalahari Gemsbok NP/9,591 sq km/1994/410/S/AS
Vaalbos NP/227 sq km/1995/820/l/TC
Karoo NP/433 sq km/1994/70/l/TC
Mt Zebra NP/67 sq km/1995/61/S/TC
Addo-Zuurberg NP/515 sq km/1995/84/l/TC
other NPS/-/1995/95/I/TC
Tussen-die-Riviere GF/175 sq km/1995/426/S/TC
Sandveld NR/377 sq km/1995/389/S/TC
Soetdoring NR/62 sq km/1995/105/S/TC
Willem Pretorius GR/120 sq km/1995/90/S/TC
Weenen NR/43 sq km/1994/80/S/TC
Itala GR/259 sq km/1994/130/S/TC
other provincial Rs/-/1994-96/2,580/l/TC
private land/-/1994-96/>6,000/l/QS

Red Hartebeest/Swaziland
Malolotja NR/180 sq km/1994/C/S/FO

Lichtenstein's Hartebeest/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/U/S-D/FO
Kundelungu NP/7,600 sq km/1996/U/D/FO

Lichtenstein's Hartebeest/Tanzania
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/320/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/1,080/S/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/50/S/AS
Ugalla River GR/4,760 sq km/1991/720/S/AS
Ugalla River GCAs/2,140 sq km/1991/210/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/2,060/S-D/AS
Ruaha NP & GRs/29,280 sq km/1993/990/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/500/S/AS
Selous GR/43,626 sq km/1994/11,790/S/AS
Selous GR surrounds/38,212 sq km/1994/7,940/S/AS
Mikumi NP/3,215 sq km/1988/U/S-D/FO
Kilombero GCA/6,928 sq km/1994/280/S/AS
other areas/>20,000 sq km/1996/x/D/IG

Lichtenstein's Hartebeest/Zambia
Kafue NP/22,357 sq km/1994/3,700/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/D/FO
Kasanka NP/420 sq km/1994/x/S-I/FO
Lavushi Manda NP/1,500 sq km/1994/U/D/FO
Mweru Wantipa NP/3,134 sq km/1994/x/D/FO
Nsumbu NP/2,020 sq km/1994/C-U/S-D/F0
Lusenga Plain NP/880 sq km/1994/U-R/D/FO
N. Luangwa NP/4,636 sq km/1995/2,000/S/AS
S. Luangwa NP/9,050 sq km/1994/870/D/AS
Lupande GMA/4,500 sq km/1994/U/D/FO
other Luangwa Valley GMAs/22,840 sq km/1994/2,630/S-D/AS
Lukusuzi NP/1,920 sq km/1994/240/D/AS
private game ranches/-/1994/270/S-I/QS
other areas/>5,000 sq km/1994/U-R/D/IG

Lichtenstein's Hartebeest/Malawi
Nyika NP/3,134 sq km/1996/V/?/FO
Vwaza Marsh GR/986 sq km/1996/170/D/AS
Kasungu NP/2,316 sq km/1996/140/l/AS

Lichtenstein's Hartebeest/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/U/S-D/FO
Manica Province/?/1998/x/S-I/FO
Gorongosa NP/3,775 sq km/1994/160/D/AS

Lichtenstein's Hartebeest/Zimbabwe
protected areas/?/1997/15/D/TC
private farmland/-/1997/50/I/TC

Lichtenstein's Hartebeest/South Africa
Kruger NP/21,682 sq km/1996/40/?/TC
private land/-/1995/1 5/S/TC

Bontebok/South Africa
Bontebok NP/28 sq km/1993/220/S/TC
West Coast NP/248 sq km/1995/65/l/TC
De Hoop NR/178 sq km/1995/270/S/TC
Overberg Test Range/7/1995/>400/S-I/TC
Cape of Good Hope NR/77 sq km/1995/>100/S/TC
Salmonsdam, Goukamma & Thomas Baines NRs/41 sq km/1995/<50/S-I/TC
private land/-/1994-96/>l,200/l/QS

Blesbok/Namibia
private farmland/-/1992/>6,000/l/QS

Blesbok/Botswana
Tuli block farms/?/1994/>1 50/S-I/IG

Blesbok/Zimbabwe
private farmland/-/1995/50/S-I/QS

Blesbok/South Africa
Mt Zebra NP/67 sq km/1995/68/S/TC
Golden Gate Highlands NP/116 sq km/1995/340/S/TC
Vaalbos NP/227 sq km/1995/60/l/TC
Tussen-die-Riviere GF/175 sq km/1995/340/S/TC
Willem Pretorius GR/120 sq km/1995/330/S/TC
Sterkfontein Dam NR/180 sq km/1995/490/S/TC
other provincial Rs/-/1994-96/4,930/S-I/TC
private land/-/1994-96/>225,000/S-I/QS

Blesbok/Swaziland
Malolotja NR/180 sq km/1994/C/S/FO
Mlilwane WS/45 sq km/1994/C/S/FO

Blesbok/Lesotho
Sehlabathebe NP/65 sq km/1988/x/S-I/FO

Tsessebe/Angola
southeast/>2,000 sq km/1992/U-R/D/IG

Tsessebe/Zambia
Bangweulu-Kafinda GMAs/7,500 sq km/1993/3,500/l/AS
Sioma Ngwezi NP/5,240 sq km/1994/x/S-D/FO
Liuwa Plain NP/3,660 sq km/1994/6,500/S-D/IG
private game ranches/-/1994/30/S-I/QS

Tsessebe/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/40/I/AS
Kaudom GP/3,841 sq km/1988/40/I/AS
communal lands/-/1988/80/D/AS
private farmland/-/1992/1,560/l/QS

Tsessebe/Botswana
Okavango Delta/16,000 sq km/1994/8,520/S-I/AS
Linyanti swamps/2,000 sq km/1994/180/D/AS
Chobe NP (Savuti Marsh)/2,500 sq km/1994/1,080/D/AS
Zimbabwe border/3,500 sq km/1994/240/S-I/AS
Tuli block farms/?/1994/U-R/7/IG

Tsessebe/Zimbabwe
Hwange NP/14,651 sq km/1996/<20/D/IG
Kazuma Pan NP-Matetsi SA complex/3,800 sq km/1996/x/?/FO
Chizarira NP/1,910 sq km/1989/300/S/GS
Chirisa SA/1,713 sq km/1989/R/?/FO
other protected areas/720 sq km/1989/C/S/FO
private farmland/-/1996/3,940/l/QS

Tsessebe/South Africa
Kruger NP/21,682 sq km/1993/400/D/AS
other NPS/-/1995/110/I/TC
Itala GR/259 sq km/1994/75/l/TC
other provincial Rs/-/1994-96/450/l/TC

Tsessebe/South Africa (continued)
private land/-/1994-96/500/l/QS

Topi/Congo-Kinshasa
Virunga NP/7,800 sq km/1996/C/D/FO

Topi/Uganda
Queen Elizabeth NP (southern sector)-Kigezi GR/80 sq km/1995/510/S-D/AS
Lake Mburo NP & surrounds/1,563 sq km/1995/60/D/AS
Pian-Upe GR/3,250 sq km/1995/10/D/AS

Topi/Kenya
Masai Mara NR/1,670 sq km/1994/5,180/D/AS
Mara ranches/3,890 sq km/1994/5,680/D/AS
Ruma NP/120 sq km/1994/260/S/GS

Topi/Tanzania
Serengeti ecosystem/27,000 sq km/1996/41,890/?/AS
Biharamulc-Burigi GRs & surrounds/6,530 sq km/1990/4,350/l/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/9,350/l/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/60/S-I/AS
Ugalla River GR/4,760 sq km/1991/470/S/AS
Ugalla River GCAs/2,140 sq km/1991/150/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/2,510/S/AS
Ruaha ecosystem/42,000 sq km/1993/x/?/FO

Topi/Rwanda
Akagera NP/1,500 sq km/1996/<500/D/IG

Coastal Topi/Somalia
lower Shebelle River/7/1983/C/D/FO
Bush-Bush NP/4,267 sq km/1983/x/?/FO

Coastal Topi/Kenya
Boni-Dodori NRs/2,117 sq km/1995/Ab-C/?/F0
Lamu-southern Garissa-southeastern Tana River districts/12,000 sq km/1991-94/76,600/S/AS

Tiang/Chad
Zakouma NP/3,000 sq km/1995/1,100/l/AS
Bahr Salamat FR/20,600 sq km/1989/U/D/FO
eastern Salamat/40,000 sq km/1989/U/D/FO
Manda NP/1,140 sq km/1996/<10/S-l/GS
eastern Chari Baguirmi/10,000 sq km/1996/U/S-D/FO

Tiang/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/<700/D/AS
northern region HZs/60,000 sq km/1996/R/D/FO

Tiang/Sudan
southeastern savannas & floodplains/>100,000 sq km/1996/C/D/FO
Dinder NP/8,960 sq km/1997/1OO/l/GS

Tiang/Ethiopia
Omo & Mago NPs-Tama WR/8,910 sq km/1997/9,300/?/AS
Murule CHA-Chew Bahir WR/5,900 sq km/1995/790/7/AS

Tiang/Kenya
Sibiloi NP & surrounds/2,000 sq km/1991-94/2,600/S/AS

Korrigum/Niger
W NP-Tamou FR/2,980 sq km/1988/50/D/GS

Korrigum/Burkina Faso
Arly-Singou complex/6,000 sq km/1998/500/l/AS
W NP-Kourtiago FR/2,860 sq km/1991/U-R/D/FO

Korrigum/Benin
Pendjari NP & HZs/6,505 sq km/1994/>100/S/AS
W NP-Djona HZ/7,930 sq km/1994/R/D/FO

Korrigum/Nigeria
Sambisa GR/517 sq km/1990/V/D/FO
unprotected areas/<1,000 sq km/1990/R/D/F0

Korrigum/Cameroon
Waza NP/1,700 sq km/1994/1,680/S/GS
N. Province/>29,700 sq km/1998/150/S/IG

Hirola/Somalia
Badhadhe District/?/1997/C/?/FO

Hirola/Kenya
southern Garissa/32,000 sq km/1996/>400/S-D/AS
southern Tsavo East NP/7/1997/93/l/TC

Blue Wildebeest/Angola
south & southeast/>5,000 sq km/1992/U-R/D/IG

Blue Wildebeest/Zambia
Kafue NP/22,357 sq km/1994/2,750/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/D/FO
Lochinvar NP/410 sq km/1993/210/S-D/AS
Sioma Ngwezi NP/5,240 sq km/1994/x/S-D/FO
Liuwa Plain NP & surrounds/7,000 sq km/1994/27,500/D/IG
private game ranches/-/1994/50/S-l/QS

Blue Wildebeest/Mozambique
Gorongosa NP/3,775 sq km/1997/R/D/FO

Blue Wildebeest/Namibia
Etosha NP/22,270 sq km/1995/3,080/S/AS
Kaudom GP/3,841 sq km/1988/200/S/AS
Waterberg Plateau P/405 sq km/1986/7/?/TC
Daan Viljoen GP/40 sq km/1988/38/S-l/TC
communal lands/-/1988/790/D/AS
private farmland/-/1992/4,940/l/QS

Blue Wildebeest/Botswana
Okavango Delta & adjoining areas of Ngamiland/30,000 sq km/1994/11,980/l/AS
Makgadikgadi-Nxai Pan NP & surrounds/9,000 sq km/1994/3,490/S-l/AS
western & southwestern Ngamiland/12,500 sq km/1994/3,330/S-D/AS
Central Kgalagadi-Khutse GRs-Gemsbok NP & adjoining areas/160,000 sq km/1994/12,790/S-D/AS
Tuli block farms/8,000 sq km/1994/10,050/S-l/AS

Blue Wildebeest/Zimbabwe
Hwange NP/14,651 sq km/1996/1,750/S/IG
Matabeleland communal lands/3,110 sq km/1995/40/S/AS
other protected areas/1,350 sq km/1989/C/S/FO
private farmland/-/l 996/8,850/S-l/QS

Blue Wildebeest/South Africa
Kruger NP/21,682 sq km/1993/12,800/S/AS
Kalahari Gemsbok NP/9,591 sq km/1994/730/S/AS
other NPS/-/1995/227/l/TC
Pongola NR/69 sq km/1995/1,000/S/TC
Hluhluwe-Umfolozi P/965 sq km/1994/1,900/S/GS
Mkuzi GR/251 sq km/1994/1,800/S/GS
Itala GR/259 sq km/1994/1,200/S/GS
other provincial Rs/-/1994-96/4,400/S-l/TC
private land/-/1994-96/11,600/l/QS

Blue Wildebeest/Swaziland
Hlane GR/163 sq km/1994/Ab-C/?/F0
Mlawula NR/120 sq km/1994/x/?/FO
Mlilwane WS/45 sq km/1994/x/S/FO

Cookson's Wildebeest/Zambia
N. Luangwa NP/4,636 sq km/1995/6,000/S/AS
S. Luangwa NP/9,050 sq km/1994/550/S/AS
Lupande GMA/4,500 sq km/1994/U/D/FO
other Luangwa Valley GMAs/22,840 sq km/1994/4,950/S-D/AS
Luambe NP/320 sq km/1994/175/S/AS
Lukusuzi NP/1,920 sq km/1994/170/D/AS

Nyassa Wildebeest/Tanzania
Sadani GR & surrounds/1,537 sq km/1991-92/310/7/AS
Selous GR/43,626 sq km/1994/46,350/S/AS
Selous GR surrounds/38,212 sq km/1994/25,210/S/AS
Mikumi NP/3,215 sq km/1994/1,180/S-D/AS
other areas in southeast/>10,000 sq km/1996/x/D/IG

Nyassa Wildebeest/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/400/S-D/IG

Western White-bearded Wildebeest/Kenya (resident popns only)
Masai Mara NR/1,670 sq km/1994/680/S/AS
Mara ranches/3,890 sq km/1994/11,640/D/AS

Western White-bearded Wildebeest/Tanzania
Serengeti ecosystem/27,000 sq km/1994/917,200/D/TC

Western White-bearded Wildebeest/Tanzania (continued)
Ngorongoro Crater/250 sq km/1992/8,670/D/TC
Eyasi region/2,500 sq km/1992/90/S/AS

Eastern White-bearded Wildebeest/Kenya
Amboseli NP/392 sq km/1994-96/3,000/S/AS
Nairobi NP/117 sq km/1990-94/2,170/S/GS
Kajiado rangelands/18,000 sq km/1991-94/22,010/S/AS

Eastern White-bearded Wildebeest/Tanzania
Tarangire NP & GCAs/12,600 sq km/1994/44,910/S/AS
Lake Manyara NP/110 sq km/1990/330/?/GS
other areas in northeast/>5,000 sq km/1996/x/?/IG

Black Wildebeest/Namibia
private farmland/-/1992/7,180/l/QS

Black Wildebeest/South Africa
Mt Zebra NP/67 sq km/1995/109/S/TC
Vaalbos NP/227 sq km/1995/30/l/TC
Golden Gate Highlands NP/116 sq km/1995/106/S/TC
Suikerbosrand NR/133 sq km/1995/320/S/TC
Bloemhof Dam NR/72 sq km/1995/229/S/TC
S. A. Lombard NR/37 sq km/1995/120/S/TC
Boskop Dam NR/27 sq km/1995/108/S/TC
Willem Pretorius GR/120 sq km/1995/350/S/TC
Koppies Dam NR/43 sq km/1995/245/S/TC
Verwoerd Dam NR/275 sq km/1995/140/S/TC
Sterkfontein Dam NR/180 sq km/1995/110/S/TC
Sandveld NR/377 sq km/1995/100/S/TC
other provincial Rs/-/1994-96/>l,700/S-l/TC
private land/-/1994-96/7,400/S-l/QS

Black Wildebeest/Swaziland
Malolotja NR/180 sq km/1994/C/S/FO

Black Wildebeest/Lesotho
Sehlabathebe NP/65 sq km/1988/R/S-l/FO

Subfamily Hippotraginae

Roan/Mauritania
Senegal River Valley/2,500 sq km/1986/V/D/FO

Roan/Mali
Boucle du Baoule compiex/7,710 sq km/1996/<500/D/IG
Bating FR/1,690 sq km/1996/790/S-D/GS
other areas in southwest/>20,000 sq km/1996/250/D/IG

Roan/Niger
W NP-Tamou FR/2,980 sq km/1988/<350/D/GS
other areas in southwest/>2,000 sq km/1988/<350/D/IG

Roan/Senegal
Niokolo-Koba NP/9,130 sq km/1995/2,400/S/GS
Faleme HZ/10,000 sq km/1997/x/?/F0

Roan/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S/FO
Lake Cufada/700 sq km/1991/x/S-D/FO
other areas of mainland/2,000 sq km/1991/U/D/FO

Roan/Guinea
Badiar NP/380 sq km/1996/x/?/FO
N'Dama FR/>300 sq km/1997/x/?/FO
other areas of northern savannas/>5,000 sq km/1990/R/D/LP

Roan/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/1,330/D/GS
Haut Bandama GR/1,230 sq km/1990/R/S D/FO
Mont Sangbe NP/950 sq km/1990/R/S-D/FO
Marahoue NP/1,010 sq km/1997/R/D/FO
forest reserves/4,070 sq km/1990/x/S-D/FO

Roan/Burkina Faso
Arly-Singou complex/6,000 sq km/1998/3,500/D/AS
W NP-Kourtiago FR/2,860 sq km/1991/160/S-D/AS
Nazinga GR/940 sq km/1995/2,900/l/GS
Diefoula FR/720 sq km/1997/810/I/GS
other areas/>20,000 sq km/1990/x/S-D/IG

Roan/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/U/D/FO
Gbele GPR/324 sq km/1995/C/S/FO
Digya NP/3,126 sq km/1995/x/D/FO

Roan/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U-R/D/FO
Fazao NP/1,920 sq km/1995/U-R/D/FO

Roan/Benin
Pendjari NP & HZs/6,505 sq km/1994/>1,500/S-I/AS
W NP-Djona HZ/7,930 sq km/1994/x/S-D/FO
forest reserves/6,500 sq km/1990/x/S-D/FO

Roan/Nigeria
Kainji Lake NP/5,340 sq km/1990/U-R/D/FO
Yankari GR/2,240 sq km/1990/<150/D/IG
Gashaka Gumpti NP/5,950 sq km/1990/R/D/FO
other protected areas/11,800 sq km/1990/R/D/FO

Roan/Chad
Zakouma NP/3,000 sq km/1995/700/1/AS
Bahr Salamat FR/20,600 sq km/1989/U/S-D/FO
Siniaka Minia FR/4,260 sq km/1995/700/l/AS
Manda NP/1,140 sq km/1996/40/S-I/GS
eastern Salamat/40,000 sq km/1989/U/S-D/FO
Binder Lere FR/1,350 sq km/1996/60/D/AS
unprotected areas of Mayo Kebi/2,000 sq km/1996/U-R/D/FO

Roan/Cameroon
Waza NP/1,700 sq km/1994/1,170/S-I/GS
N. Province/>29,700 sq km/1998/4,900/D/IG
other areas/>10,000 sq km/1994/U-R/D/IG

Roan/CAR
Manovo-Gounda-St. Floris NP/1 7,400 sq km/1995/<1,500/S-D/AS
Bamingui-Bangoran NP/11,560 sq km/1995/<400/D/AS
Sangba Pilot Zone/11,000 sq km/1995/>600/I/AS
northern region HZs/60,000 sq km/1998/C-U/S-D/FO
east-central region HZs/70,000 sq km/1997/R/D/FO
Chinko Basin/95,000 sq km/1997/U/D/FO
Bangassou Forest/16,600 sq km/1996/U/?/FO

Roan/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/80/S/AS
Upemba NP/11,730 sq km/1996/U/S-D/FO
Kundelungu NP/7,600 sq km/1996/U/D/FO

Roan/Sudan
southwestern savanna woodlands/>100,000 sq km/1996/x/D/F0
Dinder NP/8,960 sq km/1997/300/S-D/GS
southeastern savannas/>100,000 sq km/1992/x/D/IG

Roan/Ethiopia
Gambella NP/5,061 sq km/1990/x/D/FO

Roan/Uganda
Pian-Upe GR/3,250 sq km/1995/15/D/AS

Roan/Kenya
Ruma NP/120 sq km/1995/22/D/TC

Roan/Tanzania
Maswa GR/2,200 sq km/1991/40/D/AS
Tarangire NP & GCAs/12,600 sq km/1994/R/?/F0
Biharamuto-Burigi GRs & surrounds/6,530 sq km/1990/260/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/1,680/I/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/50/S-I/AS
Mahale Mts NP/1,200 sq km/1988/x/?/FO
Ugalla River GR/4,760 sq km/1991/250/S/AS
Ugalla River GCAs/2,140 sq km/199V260/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/1,190/S/AS
Ruaha NP & GRs/29,280 sq km/1993/350/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/230/S/AS
other areas in west/>10,000 sq km/1996/x/D/IG

Roan/Rwanda
Akagera NP/1,500 sq km/1994/<20/D/GS

Roan/Angola
northwest, northeast & southeast/>5,000 sq km/1992/R/D/IG

Roan/Zambia
Kafue NP/22,357 sq km/1994/600/S-D/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lower Zambezi NP/4,092 sq km/1995/60/S-D/AS
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
Bangweulu-Kafinda GMAs/7,500 sq km/1993/>20/S/AS
Sioma Ngwezi NP/5,240 sq km/1991/40/S-D/AS
Liuwa Plain NP/3,660 sq km/1994/U/S-D/FO
West Lunga NP/1,684 sq km/1994/<100/D/IG
Mweru Wantipa NP/3,134 sq km/1994/U-R/D/FO
Nsumbu NP/2,020 sq km/1994/C-U/?/F0
Tondwa GMA/420 sq km/1994/25/S-D/AS
Lusenga Plain NP/880 sq km/1994/U-R/D/FO
N. Luangwa NP/4,636 sq km/1995/530/S/AS
S. Luangwa NP/9,050 sq km/1994/1,810/S-I/AS
Lupande GMA/4,500 sq km/1994/U/S-D/FO
other Luangwa Valley GMAs/22,840 sq km/1994/1,750/D/AS
Lukusuzi NP/1,920 sq km/1994/80/D/AS
private game ranches/-/1994/3O/S-I/QS
other areas/>5,000 sq km/1994/U-R/D/IG

Roan/Malawi
Nyika NP/3,134 sq km/1996/1,180/S/AS
Vwaza Marsh GR/986 sq km/1996/90/D/AS
Kasungu NP/2,316 sq km/1996/100/S/AS
Nkhotakota GR/1,802 sq km/1996/420/I/GS

Roan/Mozambique
Gaza HZ/40,000 sq km/1996/R-V/?/FO

Roan/Namibia
W.Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/5/I/TC
Kaudom GP/3,841 sq km/1988/160/I/AS
Waterberg Plateau P/405 sq km/1986/220/1/TC
communal lands/-/1988/120/D/AS
private farmland/-/1992/630/I/QS

Roan/Botswana
Okavango Delta-Linyanti-Chobe NP & surrounds/60,000 sq km/1994/1,360/S-D/AS

Roan/Zimbabwe
Hwange NP/14,651 sq km/1996/300/S-D/IG
Matetsi SA complex/3,295 sq km/1995/10/S-D/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/100/S/AS
other protected areas/430 sq km/1995/U-R/S/FO
private farmland/-/1996/80/S-I/QS

Roan/South Africa
Kruger NP/21,682 sq km/1996/50/D/TC
Marakele NP/399 sq km/1995/10/7/TC
provincial Rs/-/1994-96/1 30/S-I/TC
private land/-/1994-96/16O/S-I/QS

Roan/Swaziland
private land/-/1994/R/?/F0

Common Sable/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/U/S-D/FO
Kundelungu NP/7,600 sq km/1996/U/D/FO

Common Sable/Kenya
Shimba Hills NR/217 sq km/1995/150/S/GS
Lunga Lunga/?/1992/15/D/IG

Common Sable/Tanzania
Sadani GR & surrounds/1,537 sq km/1991-92/85/?/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/150/S-D/AS
Moyowosi-Kigosi GRs/19,679 sq km/1994/640/S-I/AS
Moyowosi-Kigosi GCAs/2,191 sq km/1994/350/S-I/AS
Mahale Mts NP/1,200 sq km/1988/x/?/FO
Ugalla River GR/4,760 sq km/1991/460/S/AS
Ugalla River GCAs/2,140 sq km/1991/160/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/930/S/AS
Ruaha NP & GRs/29,280 sq km/1993/2,460/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/230/S/AS
Selous GR/43,626 sq km/1994/1,600/S/AS
Selous GR surrounds/38,212 sq km/1994/3,140/S/AS
Mikumi NP/3,215 sq km/1994/50/S/AS
Kilombero GCA/6,928 sq km/1994/420/S/AS
Udzungwa Mts NP/1,000 sq km/1996/U/D/FO
other areas/>25,000 sq km/1996/x/D/IG

Common Sable/Angola
southeast/>2,000 sq km/1992/R/D/IG

Common Sable/Zambia
Kafue NP/22,357 sq km/1994/2,400/S-D/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/IG
Lower Zambezi NP/4,092 sq km/1995/<50/S-D/AS
Kasanka NP/420 sq km/1994/x/S-I/FO
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
Sioma Ngwezi NP/5,240 sq km/1991/390/S-D/AS
West Lunga NP/1,684 sq km/1994/<100/D/IG
Mweru Wantipa NP/3,134 sq km/1994/U-R/D/FO
Lusenga Plain NP/880 sq km/1994/U-R/D/FO
N. Luangwa NP/4,636 sq km/1995/545/D/AS
S. Luangwa NP/9,050 sq km/1994/160/7/AS
Lupande GMA/4,500 sq km/1994/R/?/F0
other Luangwa Valley GMAs/22,840 sq km/1994/180/D/AS
private game ranches/-/1994/260/S-I/QS
other areas/>5,000 sq km/1994/U-R/D/IG

Common Sable/Malawi
Vwaza Marsh GR/986 sq km/1996/10/D/AS
Kasungu NP/2,316 sq km/1996/140/D/AS
Nkhotakota GR/1,802 sq km/1996/180/I/GS
Liwonde NP/548 sq km/1996/690/I/AS
Majete GR/682 sq km/1996/110/D/AS
Lengwe NP/887 sq km/1996/10/D/GS

Common Sable/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/4,200/S/IG
Manica Province/?/1998/C-U/I/FO
Gorongosa NP/3,775 sq km/1994/12/D/AS
Gaza HZ/40,000 sq km/1997/60/?/IG

Common Sable/Namibia
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/200/I/AS
Waterberg Plateau P/405 sq km/1986/60/1/TC
communal lands/-/1988/40/D/AS
private farmland/-/199 2/6,800/I/QS

Common Sable/Botswana
Okavango Delta-northwestern Chobe NP & surrounds/18,000 sq km/1994/2,130/S/AS
eastern Chobe NP-Zimbabwe border/12,500 sq km/1994/1,150/S-D/AS

Common Sable/Zimbabwe
Hwange NP/14,651 sq km/1996/2,600/S-I/IG
Matetsi SA complex/3,295 sq km/1995/1,330/S/AS
Kazuma Pan/561 sq km/1995/40/S/AS
Zambezi NP/543 sq km/1995/270/S/AS
Chizarira NP/1,910 sq km/1995/200/S/AS
Matusadona NP/1,537 sq km/1995/310/S/AS
Chete SA/1,081 sq km/1995/110/S/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/1,450/S/AS
Gonarezhou NP/4,972 sq km/1995/70/S/AS
other protected areas/1,240 sq km/1989/C-U/S/FO
Ngamo-Sikumi Forest/2,344 sq km/1995/2,880/S/AS
Sebungwe communal lands/9,232 sq km/1995/290/S/AS
Dande communal lands/3,161 sq km/1995/210/S/AS
Zambezi Valley escarpment/1,283 sq km/1995/100/7/AS
private farmland/-/1996/9,830/I/QS

Common Sable/South Africa
Kruger NP/21,682 sq km/1993/900/D/AS
provincial Rs/-/1994-96/>550/I/TC
private land/-/I994-96/>1,500/I/QS

Common Sable/Swaziland
Mlilwane WS/45 sq km/1994/R/?/FO

Giant Sable/Angola
Luando R-Kangandala NP/9,000 sq km/1997/>250/?/GS

Gemsbok/Namibia
Etosha NP/22,270 sq km/1995/7,640/1/AS
Skeleton Coast P/16,390 sq km/1988/1,400/1/AS
Kaudom GP/3,841 sq km/1988/140/S/AS
Waterberg Plateau P/405 sq km/1986/90/S/TC
Von Bach R/43 sq km/1988/36/S/TC
Daan Viljoen GP/40 sq km/1988/51/S/TC

Gemsbolc/Namibia (continued)
Namib-Naukluft P/49,768 sq km/1987/10,300/I/AS
Hardap GP/250 sq km/1988/450/I/GS
Ai-Ais Hot Springs P/461 sq km/1988/R/S/FO
Kaokoland/70,000 sq km/1990/1,800/I/AS
other communal lands/-/1988/1,000/D/AS
private farmland/-/1992/164,310/I/QS

Gemsbok/Botswana
Makgadikgadi-Nxai Pan NP & adjoining areas/30,000 sq km/1994/2,440/S-I/AS
western & southwestern Ngamiland/15,000 sq km/1994/8,830/S-I/AS
Central Kgalagadi-Khutse GRs/55,300 sq km/1994/39,370/I/AS
Gemsbok NP & surrounds/45,000 sq km/1994/64,140/S/AS
other areas of Ghanzi & Kgalagadi districts/25,000 sq km/1994/10,970/S-D/AS

Gemsbok/Zimbabwe
Hwange NP/14,651 sq km/1996/100/S/IG
private farmland/-/1996/I 50/S-I/QS

Gemsbok/South Africa
Kalahari Gemsbok NP/9,591 sq km/1994/5,420/S/AS
other NPs/-/1995/207/I/TC
Sandveld NR/377 sq km/1995/350/S/TC
Soetdoring NR/62 sq km/1995/140/S/TC
Tussen-die-Riviere GF/175 sq km/1995/130/S/TC
Willem Pretorius GR/120 sq km/1995/80/S/TC
other provincial Rs/-/1994-96/>1,100/I/TC
private land/-/1994-96/>6,000/I/QS

Beisa Oryx/Sudan
southeastern bushland/>2,500 sq km/1989/x/D/LP

Beisa Oryx/Eritrea
northern coastal plain/?/1997/?/?/IG

Beisa Oryx/Djibouti
Gammari plateau/7/1987/U-R/D/FO

Beisa Oryx/Ethiopia
Awash NP/804 sq km/1995/920/S-D/GS
Awash Valley/17,000 sq km/1995/I,400/S-D/AS
Mille-Serdo WR/?/1996/x/?/FO
northwestern Ogaden/?/1997/R/D/LP
southern Ogaden/>15,000 sq km/1997/U/D/FO
Borana CHA/40,000 sq km/1995/250/D/AS
Yabelo WS/2,496 sq km/1993/x/S-D/FO
Omo West CHA-Omo & Mago NPs-Murule CHA-Chew Bahir WR/12,840 sq km/1995-96/2,300/D/AS

Beisa Oryx/Somalia
Kenya border/7/1988/x/D/IG

Beisa Oryx/Kenya
Sibiloi NP & surrounds/2,000 sq km/1994/1,400/S/AS
Marsabit NP & NR/2,090 sq km/1995/125/S/GS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/>100/S-D/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/40/D/AS
unprotected areas of northern rangelands/230,000 sq km/I99I-94/18,160/S-D/AS
Laikipia ranches/10,000 sq km/1991-94/770/S/AS
Baringo district/6,000 sq km/1991-94/45/S/AS

Fringe-eared Oryx/Kenya
Tsavo NP & surrounds/40,572 sq km/1997/2,350/D/AS
Amboseli NP/392 sq km/1994-96/<20/?/AS
Kajiado rangelands/18,000 sq km/1991-94/1,440/S/AS
Tana River NR & surrounds/200 sq km/1995/<10/?/AS
coastal rangelands/15,000 sq km/1991-94/1,370/S/AS

Fringe-eared Oryx/Tanzania
Loliondo GCA-Ngorongoro CA/7,000 sq km/1991/100/7/AS
Tarangire NP & GCAs/12,600 sq km/1994/2,190/S-I/AS
Mkomazi GR/3,615 sq km/1996/570/S-I/AS
other areas in northeast/>15,000 sq km/1996/x/S-D/IG

Addax/Mauritania
eastern deserts (Majabat al Koubra)/>40,000 sq km/1997/<150/S-D/IG

Addax/Mali
northwestern deserts/>20,000 sq km/1997/<150/S-D/IG

Addax/Niger
Air & Tenere National NR/77,360 sq km/1995/<20/D/IG
other areas of central & northern deserts/>50,000 sq km/1991-98/R/?/FO

Addax/Chad
Ouadi Rime-Ouadi Achim FR (northern section)/20,000 sq km/1995/R/D/LP
eastern & southern Ennedi/>10,000 sq km/1995/R/D/LP
northern Kanem/?/1995/R/D/LP

Addax/Sudan
Chad border (Northern Darfur)/?/1992/R/D/FO

Subfamily Aepycerotinae

Impala/Uganda
Lake Mburo NP & surrounds/1,563 sq km/1995/6,700/D/AS

Impala/Kenya
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/>100/S/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/40/S-D/AS
unprotected areas of northern rangelands/>10,000 sq km/1991-94/I,450/S/AS
Tsavo NP & surrounds/40,572 sq km/1997/1,130/D/AS
Laikipia ranches/10,000 sq km/1991-94/8,120/S/AS
Baringo district/6,000 sq km/1991-94/290/S-D/AS
Masai Mara NR/1,670 sq km/1994/11,280/S/AS
Mara ranches/3,890 sq km/1994/31,090/S/AS
Amboseli NP/392 sq km/1994-96/<300/D/AS
Nairobi NP/117 sq km/1990-94/660/S/GS
Kajiado rangelands/18,000 sq km/1991-94/13,720/S/AS
coastal rangelands/15,000 sq km/1991-94/1,480/D/AS
Lake Nakuru NP/139 sq km/1993/3,660/S/GS
Ruma NP/120 sq km/1994/560/S/GS

Impala/Tanzania
Serengeti ecosystem/27,000 sq km/1996/70,650/S/AS
Lake Manyara NP/110 sq km/1990/75O/?/GS
Tarangire NP/2,600 sq km/1994/3,880/S/AS
Tarangire GCAs/10,000 sq km/1994/5,190/?/AS
Mkomazi GR/3,615 sq km/1996/1,180/S/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/9,800/I/AS
Moyowosi-Kigosi GRs & GCAs/21,870 sq km/1994/R/S/FO
Ugalla River GR/4,760 sq km/1991/I,680/S/AS
Ugalla River GCAs/2,140 sq km/1991/120/S/AS
Katavi NP-Katavi-Rukwa GCAs/13,341 sq km/1995/3,210/S/AS
Ruaha NP & GRs/29,280 sq km/1993/13,230/S/AS
Ruaha-Rungwa surrounds to NP & GRs/13,060 sq km/1993/2,120/S/AS
Selous GR/43,626 sq km/1994/29,510/S/AS
Selous GR surrounds/38,212 sq km/1994/4,670/S-I/AS
Mikumi NP/3,215 sq km/1994/810/S/AS
Eyasi region/2,500 sq km/1992/920/S/AS
other areas/>25,000 sq km/1996/x/D/IG

Impala/Rwanda
Akagera NP/1,500 sq km/1996/5,0OO/D/IG

Common Impala/Angola
southeast/>2,000 sq km/1992/R/D/IG

Impala/Zambia
Kafue NP/22,357 sq km/1994/5,400/S/AS
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/IG
Lower Zambezi NP/4,092 sq km/1995/1,450/S/AS
Lochinvar NP/410 sq km/1993/R/S-D/FO
Sioma Ngwezi NP/5,240 sq km/1991/40/S-D/AS
Tondwa GMA/420 sq km/1994/40/S-D/AS
N. Luangwa NP/4,636 sq km/1995/18,000/S/AS

Impala/Zambia (continued)
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/7,680/S/GS
other Luangwa Valley GMAs/22,840 sq km/1994/>7,000/S-D/AS
Luambe NP/320 sq km/1994/C/S/FO
Lukusuzi NP/1,920 sq km/1994/R/D/FO
private game ranches/-/! 994/940/S-l/QS

Impala/Malawi
Vwaza Marsh GR/986 sq km/1996/20/D/AS
Kasungu NP/2,316 sq km/1996/60/S/AS
Liwonde NP/548 sq km/1996/450/D/AS
Majete GR/682 sq km/1996/U/?/FO
Lengwe NP/887 sq km/1996/1,980/l/GS
Mwabvi GR/340 sq km/1998/?/?/FO

Impala/Mozambique
Gorongosa NP/3,775 sq km/1997/U-R/D/FO
Manica Province/7/1998/x/S-l/FO
Zinave NP/5,000 sq km/1997/>100/D/IG
Gaza HZ/40,000 sq km/1997/C/S/FO

Common Impala/Namibia
Waterberg Plateau P/405 sq km/1986/20/1/TC
communal lands/-/1988/100/D/AS
private farmland/-/1936/7,000/l/GS

Impala/Botswana
Okavango Delta & surrounds/20,000 sq km/1994/39,960/S-D/AS
Chobe & Central districts/80,000 sq km/1994/5,300/S-l/AS
Tuli block farms/10,000 sq km/1994/16,250/S-l/AS

Impala/Zimbabwe
Hwange NP/14,651 sq km/1996/17,500/l/IG
Matetsi SA complex/3,295 sq km/1995/1,770/S/AS
Zambezi NP/543 sq km/1995/10/?/AS
Chizarira NP/1,910 sq km/1995/1,110/S/AS
Matusadona NP/1,537 sq km/1995/3,700/S/AS
Chete & Chirisa SAs/2,794 sq km/1995/2,380/S/AS
Mana Pools NP/2,162 sq km/1995/3,220/S/AS
Middle Zambezi Valley SAs/8,858 sq km/1995/4,690/S/AS
Gonarezhou NP/4,972 sq km/1995/4,150/S-D/AS
other protected areas/1,120 sq km/1989/C/S/FO
forestry land/2,950 sq km/1995/420/S/AS
northwestern Matabeleland communal lands/3,110 sq km/1995/20/?/AS
Sebungwe communal lands/9,232 sq km/1993/48,000/S/GS
Dande communal lands/3,161 sq km/1995/130/S/AS
private farmland/-/1996/>250,000/S/QS

Impala/South Africa
Kruger NP/21,682 sq km/1993/98,000/S-D/AS
Marakele NP/399 sq km/1995/196/l/TC
Mkuzi GR/251 sq km/1994/7,000/S/GS
Hluhluwe-Umfolozi P/965 sq km/1994/8,700/S/GS
Itala GR/259 sq km/1994/400/S-l/TC
other provincial Rs/-/1994-96/27,260/S-l/TC
private land/-/1994-96/>760,000/S-l/QS

Impala/Swaziland
Malolotja NR/180 sq km/1994/U-R/S-l/FO
Hlane GR/163 sq km/1994/>1,000/S/IG
Mlawula NR/120 sq km/1994/Ab/S/FO
Mlilwane WS/45 sq km/1994/x/S-l/FO
private land/-/1994/x/S-l/FO

Black-faced Irnpala/Angola
Iona NP/15,1 50 sq km/1992/R/D/IG

Black-faced Impala/Namibia
Etosha NP/22,270 sq km/1995/1,000/1/IG
Kaokoland/70,000 sq km/1990/R/?/FO
private farmland/-/! 996/1,200/l/GS

Subfamily Antilopinae
Tribe Antilopini

Dorcas Gazelle/Mauritania
Bane d'Arguin NP/5,000 sq km/1997/<200/S/IG
other areas/>50,000 sq km/1997/R/D/IG

Dorcas Gazelle/Mali
northern sahel zone/>50,000 sq km/1996/2,250/S-l/IG
northeastern deserts/7/199 6/R/D/IG

Dorcas Gazelle/Niger
Air & Tenere National NR/77,360 sq km/1995/5,000/S-D/GS
Gadabedji FR/760 sq km/1988/100/D/IG
other areas of northwestern & central deserts/>100,000 sq km/1995/15,000/S-D/IG

Dorcas Gazelle/Senegal
Djoudj NP & surrounds/>160 sq km/1996/<50/D/IG

Dorcas Gazelle/Burkina Faso
Seno-Mango region/1,020 sq km/1995/R/D/FO

Dorcas Gazelle/Chad
Ouadi Rime-Ouadi Achim FR (northern section)/20,000 sq km/1995/C/D/FO
eastern Kanem-western Batha/>5,000 sq km/1991/C/D/FO
southern Ennedi/>10,000 sq km/1995/C/D/FO
central Ennedi/>10,000 sq km/1995/U-R/D/FO
northern Kanem/>10,000 sq km/1995/R/D/FO

Dorcas Gazelle/Sudan
northwestern deserts/>20,000 sq km/1996/U/D/FO
Northern Kordofan/>10,000 sq km/1989/x/D/FO
Red Sea Hills & surrounds/>30,000 sq km/1997/C-U/S-D/FO

Dorcas Gazelle/Eritrea
northwestern hills/>5,000 sq km/1995/C/?/IG
Cheru-Agordat area/>2,000 sq km/1995/C/?/FO
coastal plain/>1,000 sq km/1997/C/S/FO

Dorcas Gazelle/Djibouti
southwest, central & north/>7,500 sq km/1987/C/S-l/FO
southeast/>2,500 sq km/1997/C/S/FO

Dcrcas Gazelle/Ethiopia
Serdo/900 sq km/1994-98/1,000/S/GS
Afrera/?/1998/C/?/FO
other areas of Danakil/>20,000 sq km/1995/x

Dorcas Gazelle/Somalia
northern coastal strip/>1,000 sq km/1994/C/S/FO

Slender-horned Gazelle/Mali
northern deserts (Adrar des Iforhas)/?/1996/R/D/IG

Slender-horned Gazelle/Niger
Air & Tenere National NR & possibly other areas of northern deserts/?/1988/<1,000/D/IG

Slender-horned Gazelle/Chad
northern Tibesti-Borkou/?/1990/?/?/IG

Slender-horned Gazelle/Sudan
northwestern deserts/7/1996/U-R/D/LP

Red-fronted Gazelle/Mauritania
southern rangelands/100,000 sq km/1989/R/D/FO

Red-fronted Gazelle/Mali
Elephant FR/12,000 sq km/1996/<200/D/IG
Ansongc-Menaka R/17,500 sq km/1996/<200/D/IG
other areas of central region/>75,000 sq km/1996/3,000/D/IG

Red-fronted Gazelle/Niger
W NP-Tamou FR/2,980 sq km/1998/C/S-D/FO
Gadabedji FR/760 sq km/1988/R/D/FO
other areas in southwest & central regions/>50,000 sq km/1988/4,000/D/IG

Red-fronted Gazelle/Senegal
Djoudj NP/160 sq km/1988/R/S-D/FO
Ferlo N.-Ferio S. FRs/11,207 sq km/1988/R/D/F0
other areas of north/>10,000 sq km/1988/R/D/FO

Red-fronted Gazelle/Burkina Faso
Seno-Mango region/1,020 sq km/1986/720/S-D/AS
Sirba region/1,200 sq km/1986/500/S-D/AS
W NP/2,350 sq km/1998/U-R/?/IG
other areas in north & east/>25,000 sq km/1990/x/S-D/IG

Red-fronted Gazelle/Togo
Oti Valley FR/750 sq km/1987/V/?/F0

Red-fronted Gazelle/Nigeria
Niger border/>1,000 sq km/1990/R/D/IG

Red-fronted Gazelle/Chad
central sahelian rangelands (eastern Kanem-Batha-southern Ouadi Rime-Ouadi Achim FR)/>20,000 sq km/1991-95/>2,000/S-D/AS,IG
Lake Fitri/5,000 sq km/1991/C/D/FO
eastern Chari Baguirmi/10,000 sq km/1996/U/S-D/FO
Mayo Kebi/>2,000 sq km/1996/U-R/D/FO
Zakouma NP/3,000 sq km/1995/600/I/AS
Bahr Salamat FR/20,600 sq km/1989/U/D/FO
Siniaka Minia FR/4,260 sq km/1995/150/S/AS
northern Salamat-southern Ouaddai/>10,000 sq km/1989/x/S-D/FO

Red-fronted Gazelle/Cameroon
Waza NP/1,700 sq km/1994/620/I/GS
Kalamaloue NP/45 sq km/1994/>500/S-I/IG
other areas/>5,000 sq km/1994/U-R/S-D/IG

Red-fronted Gazelle/CAR
Manovo-Gounda-St. Floris NP (northern section)/9.000 sq km/1995/<20/D/AS
other areas in north/>500 sq km/1995/R/D/IG

Red-fronted Gazelle/Sudan
Jebel Marra/>250 sq km/1991/R/D/F0
other areas in Southern Darfur & Southern Kordofan/>10,000 sq km/1986/U-R/S-D/FO
between White Nile & Blue Nile/?/1992/U-R/?/F0
Dinder NP/8,960 sq km/1995/R/D/FO
Abu Kabo FR/>50 sq km/1996/U/S-D/FO
southeastern Haya/>50 sq km/1996/U-R/?/FO
other areas in northeast/>10,000 sq km/1997/x/D/FO

Red-fronted Gazelle/Eritrea
western savannas/>10,000 sq km/1995/C/S-D/FO

Red-fronted Gazelle/Ethiopia
northwestern lowlands/>5,000 sq km/1984/U-R/7/F0

Thomson's Gazelle/Sudan
southeastern savannas & floodplains/>100,000 sq km/1994/C/D/F0

Thomson's Gazelle/Kenya
Laikipia ranches/10,000 sq km/1991-94/7,160/S/AS
Kitui district/>20,000 sq km/1991-94/160/S/AS
Masai Mara NR/1,670 sq km/1994/14,620/S/AS
Mara ranches/3,890 sq km/1994/21,390/D/AS
Amboseli NP/392 sq km/1994-96/1 60/S/AS
Nairobi NP/117 sq km/1990-94/120/S-D/GS
Kajiado rangelands/18,000 sq km/1991-94/4,140/D/AS
Lake Nakuru NP/139 sq km/1993/475/S/GS

Thomson's Gazelle/Tanzania
Serengeti ecosystem/27,000 sq km/1996/340,200/S/AS
Ngorongoro Crater/250 sq km/1992/1,790/D/TC
Tarangire NP/2,600 sq km/1996/V/?/FO
Tarangire GCAs/10,000 sq km/1994/x/?/FO
Eyasi region/2,500 sq km/1992/2OO/?/AS
other areas in north/>10,000 sq km/1996/x/D/IG

Speke's Gazelle/Somalia
Ogo Plateau/>15,000 sq km/1994/C/S-D/FO
eastern & central Nugal Valley/?/1997/C/?/FO
Ceel Dhere/>1,000 sq km/1985-88/C/S-D/F0
other areas of northeast & central coastal regions/>10,000 sq km/1986/C/S-D/FO

Grant's Gazelle/Sudan
southeastern bushland/>2,500 sq km/1989/x/?/LP

Grant's Gazelle/Ethiopia
Nechisar NP/514 sq km/1995/<1,000/I/IG
Omo & Mago NPs-Omo W. & Murule CHAs-Chew Bahir WR/12,840 sq km/1995-96/4,210/S-D/AS
Yabelo WS/2,496 sq km/1993/x/S-D/FO
Borana CHA/40,000 sq km/1995/1,1 30/S-D/AS

Grant's Gazelle/Somalia
Kenya border/>3,000 sq km/1983/C-U/D/FO

Grant's Gazelle/Uganda
Bokora Corridor GR/3,200 sq km/1995/80/D/AS
Pian-Upe GR/3,250 sq km/1995/40/D/AS
S. Karamoja CHA/5,900 sq km/1995/30/?/AS

Grant's Gazelle/Kenya
Marsabit NP & NR/2,090 sq km/1995/>400/S/GS
Sibiloi NP & surrounds/2,000 sq km/1994/1,000/S/AS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/150/S-I/AS
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/70/D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/51,640/D/AS
Tsavo NP & surrounds/40,572 sq km/1997/5,350/D/AS
Laikipia ranches/10,000 sq km/1991-94/2,450/S/AS
Baringo district/6,000 sq km/1991-94/180/S-D/AS
Masai Mara NR/1,670 sq km/1994/1,240/S/AS
Mara ranches/3,890 sq km/1994/4,500/D/AS
Amboseli NP/392 sq km/1994-96/1,500/S/AS
Nairobi NP/117 sq km/1990-94/125/S-D/GS
Kajiado & eastern Narok rangelands/28,000 sq km/1991-94/31,050/S-D/AS
Tana River NR & surrounds/200 sq km/1995/20/S-D/AS
coastal rangelands/15,000 sq km/1991-94/260/S-D/AS
Lake Nakuru NP/139 sq km/1993/1 50/S/GS

Grant's Gazelle/Tanzania
Serengeti ecosystem/27,000 sq km/1996/24,900/S/AS
Ngorongoro Crater/250 sq km/1992/920/D/TC
Tarangire NP/2,600 sq km/1994/1,190/S/AS
Tarangire GCAs/10,000 sq km/1994/6,870/?/AS
Mkomazi GR/3,615 sq km/1996/680/S-I/AS
Ruaha NP & GRs/29,280 sq km/1988/R/?/FO
Eyasi region/2,500 sq km/1992/220/S/AS
other areas/>10,000 sq km/1996/x/D/IG

Soemmerring's Gazelle/Sudan
northeast (Eritrea border)/?/1996/R/D/LP
Red Sea Hills/7/1992/R/7/LP

Soemmerring's Gazelle/Eritrea
northwestern hills/>5,000 sq km/1995/x/?/IG
southwestern savannas/>2,500 sq km/1995/x/7/FO
coastal plain/>1,000 sq km/1997/C/S/FO

Soemmerring's Gazelle/Ethiopia
Awash NP/804 sq km/1995/21 5/S-D/GS
Awash Valley/17,000 sq km/1995/6,230/S/AS
Serdo region/1,000 sq km/1994-96/C-U/S/F0
Aysha-Jigjiga region/7/1995/x/?/FO
northern Ogaden/?/1997/x/?/LP
southern Ogaden/>15,000 sq km/1997/U/D/FO

Soemmerring's Gazelle/Djibouti
coastal plains in north/>3,000 sq km/1987/U/S/FO
southeast/>2,000 sq km/1997/U/S/FO

Soemmerring's Gazelle/Somalia
central coastal strip & hinterland/>1,000 sq km/1986/U-R/D/FO

Dama Gazelle/Mauritania
southeast & Tidjika area/?/1997/R/D/LP

Dama Gazelle/Mali
central sahel rangelands/50,000 sq km/1996/400/S-l/IG

Dama Gazelle/Niger
Air & Tenere National NR/77,360 sq km/1991/175/S/GS
Termit region/>25,000 sq km/1991/350/D/IG
south of Tenere Desert/?/ 1998/R/7/FO

Dama Gazelle/Senegal
Gueumbeul FR & Bandia NR/8 sq km/1997/25/S-l/TC

Dama Gazelle/Burkina Faso
Seno-Mango region/1,020 sq km/1986/R/D/FO

Dama Gazelle/Chad
Ouadi Rime-Ouadi Achim FR (western section)/5,000 sq km/1992-93/U-R/D/FO
eastern Kanem-westem Batha/>5,000 sq km/1993/U/D/LP

Dama Gazelle/Sudan
Northern Kordofan & Northern Darfur/?/1998/R/D/LP

Springbok/Angola
southwest/>5,000 sq km/1992/U-R/D/IG

Springbok/Namibia
Etosha NP/22,270 sq km/1995/13,410/S/AS
Skeleton Coast P/16,390 sq km/1988/490/1/AS
Daan Viljoen GP/40 sq km/1988/23/S-l/TC
Namib-Naukluft P/49,768 sq km/1987/2,600/l/AS
Hardap GP/250 sq km/1988/200/l/GS
Kaokoland/70,000 sq km/1990/7,500/l/AS
other communal lands/-/1988/6,000/D/AS
private farmland/-/1992/286,l1O/l/QS

Springbok/ Botswana
Makgadikgadi-Nxai Pan NP & surrounds/20,000 sq km/1994/11,500/S/AS
southern Ngamiland/1 2,000 sq km/1994/4,740/S-l/AS
Central Kgalagadi-Khutse GRs, Gemsbok NP & adjoining areas of Ghanzi, Kgalagadi, Kweneng, Southern & Central districts/300,000 sq km/1994/104,310/S/AS

Springbok/South Africa
Kalahari Gemsbok NP/9,591 sq km/1994/740/S/AS
Augrabies Falls NP/137 sq km/1995/107/l/TC
Vaalbos NP/227 sq km/1995/540/l/TC
Karoo NP/433 sq km/1994/824/S-l/TC
Mt Zebra NP/67 sq km/1995/292/S/TC
Golden Gate Highlands NP/116 sq km/1995/72/S/TC
West Coast NP/248 sq km/1995/27/l/TC
Verwoerd Dam NR/275 sq km/1995/1,260/S/TC
Tussen-die-Riviere GF/175 sq km/1995/1,100/S/TC
Sandveld NR/377 sq km/1995/750/S/TC
Willem Pretonus GR/120 sq km/1995/580/S/TC
other provincial Rs/-/1 994-96/7,810/S-l/TC
private land/-/! 994-96/>220,000/S-l/QS

Gere nuk/Ethiopia
Awash Valley/17,000 sq km/1995/550/S/AS
Aysha region/?/1995/x/?/FO
northern 0gaden/>15,000 sq km/1997/C-U/S-D/FO
southern Ogaden/>15,000 sq km/1997/C/S/FO
Borana CHA/40,000 sq km/1995/2,400/S-D/AS
Yabelo WS/2,496 sq km/1993/x/S-D/F0
Maoo NP-Murule CHA-Chew Bahir WR/8,020 sq km/1995/>l,340/S/AS

Gerenuk/Djibouti
southern border/<2,000 sq km/1997/U/S/FO

Gere nuk/ Somalia
Ogo Plateau/?/1994/R/D/LP
Bush-Bush NP/4,267 sq km/1995/C-U/?/FO
other areas/>20,000 sq km/1983/R/D/FO

Gerenuk/Kenya
Sibiloi NP & surrounds/2,000 sq km/1994/320/S/AS
Marsabit NP 4 NR/2,090 sq km/1995/30/S/GS
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/1 50/S/AS
Mem NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/40/D/AS
unprotected areas of northern rangelands/230,000 sq km/1991-94/17,970/D/AS
Tsavo NP & surrounds/40,572 sq km/1997/790/D/AS
Baringo district/6,000 sq km/1991-94/60/S/AS
Amboseli NP/392 sq km/1996/R/S/FO
Kajiado rangelands/18,000 sq km/1991-94/290/1/AS
Tana River NR & surrounds/200 sq km/1995/U/S/FO
coastal rangelands/15,000 sq km/1991-94/160/S/AS

Gerenuk/Tanzania
Tarangire NP/2,600 sq km/1996/>50/S-l/IG
Tarangire GCAs/10,000 sq km/1994/U/?/FO
Mkomazi GR/3,615 sq km/1996/30/S/AS
other areas in northeast/>10,000 sq km/1996/x/S-D/IG

Tribe Ammodorcadini

Dibatag/Ethiopia
northern Ogaden/?/1997/R/D/LP
southern 0gaden/>3,000 sq km/1997/U-R/D/FO

Dibatag/Somalia
central coastal hinter)and/>5,000 sq km/1989/C-U/D/LP

Tribe Neotragini

Royal Antelope/Guinea
Ziama & Diecke FRs/1,679 sq km/1990/x/?/FO
other areas in southeast/?/1990/x/D/IG

Royal Antelope/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/x/?/F0
Gola FRs/738 sq km/1987/C/S-D/LP
other areas/>5,000 sq km/1987/C/S-D/IG

Royal Antelope/Liberia
Grebo NF/2,673 sq km/1990/x/?/FO
farmbush & secondary forest/>10,000 sq km/1990/C/S-D/LP

Royal Antelope/Ivory Coast
Mont Sangbe NP/950 sq km/1990/R/S-D/FO
Marahoue NP/1,010 sq km/1997/R/S-O/FO
Tai NP/4,540 sq km/1996/C/S/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/R/S-D/FO
Mont Peko NP/340 sq km/1990/R/S-D/FO
Azagny NP/200 sq km/1990/R/S/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/C/S-D/FO
other forest reserves/3,880 sq km/1990/x/S-D/FO
other areas/>10,000 sq km/1990/x/S-D/IG

Royal Antelope/Ghana
Kogyae SNR/324 sq km/1995/x/S/FO
Bomfobiri WS/73 sq km/1995/R/D/FO
Bia NP & GPR/306 sq km/1995/x/S/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/x/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/C/S/FO
Owabi WS/52 sq km/1995/R/D/FO
other areas/>10,000 sq km/1995/x/S-D/IG

Bates' Pigmy Antelope/Nigeria
Ogoniland/>2,500 sq km/1994/C-U/D/F0

Bates' Pigmy Antelope/Cameroon
Campo R/3,000 sq km/1994/x/D/FO
Dja R/6,194 sq km/1994/C/S/FO
Lobeke R/2,500 sq km/1994/C/S/FO
other areas in south/>50,000 sq km/1994/C-U/S-D/IG

Bates' Pigmy Antelope/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/R/?/FO
other areas in southwest/>10,000 sq km/1990/C/7/F0

Bates' Pigmy Antelope/Equ. Guinea
Monte Alen NP/1,500 sq km/1998/C/S/F0
other areas of Mbini/>5,000 sq km/1998/U-R/S-D/IG

Bates' Pigmy Antelope/Gabon
Lope R/5,000 sq km/1994-96/R/S/FO
Gamba complex/11,000 sq km/1994-96/U-R/S/FO
other areas/>25,000 sq km/1996/C/S/FO

Bates' Pigmy Antelope/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/C/S/F0
other areas in northwest/>10,000 sq km/1995/C/S-D/IG
Conkouati FR/1,450 sq km/1995/x/?/LP

Bates' Pigmy Antelope/Congo-Kinshasa
Okapi FR/13,726 sq km/1995/C/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C/S/FO
other areas/>75,000 sq km/1996/x/S-D/IG

Bates' Pigmy Antelope/Uganda
Kibale Forest NP/766 sq km/1995/R/S-D/FO
Semliki Forest NP/220 sq km/1988/R/?/FO

Suni/Kenya
Nairobi NP/117 sq km/1993/x/?/FO
Shimba Hills NR/217 sq km/1995/x/?/FO
Aberdare NP & FR/1,966 sq km/1995/C/S/FO
Mt Kenya NP & FR/1,367 sq km/1995/C/S/FO
Arabuko-Sokoke FR/372 sq km/1995/U/D/FO
other areas/>5,000 sq km/1995/x/S-D/IG

Suni/Tanzania
Kilimanjaro NP & FR/1,835 sq km/1995/C/S/FO
Lake Manyara NP/110 sq km/1988/x/?/FO
Arusha NP/137 sq km/1988/x/S-D/FO
Mkomazi GR/3,580 sq km/1997/x/?/FO
Selous ecosystem/92,000 sq km/1995/U/S/FO
Udzungwa Mts NP/1,000 sq km/1996/C/S-D/FO
other areas of mainland/>50,000 sq km/1996/x/S-D/IG
Zanzibar Island/1,200 sq km/1996/20,000/S/GS

Suni/Malawi
Lengwe NP (eastern section)/130 sq km/1996/1,790/D/GS
Mwabvi GR/340 sq km/1996/R/D/FO

Suni/Mozambique
Gorongosa NP/3,775 sq km/1997/R/D/FO
Manica Province/7/1998/x/S/FO
Marromeu GR/1,500 sq km/1997/U-R/D/FO
Zinave NP/5,000 sq km/1997/x/S-D/FO
Banhine NP/7,000 sq km/1997/R/S-D/F0
Maputo GR/800 sq km/1997/x/?/F0
other areas/>100,000 sq km/1997/x/S-D/IG

Suni/Zimbabwe
Mana Pools NP-Urungwe SA/5,076 sq km/1989

Gonarezhou NP/4,972 sq km/1989/U/?/F0
northeast (Mozambique border)/?/1989/x/?/FO

Suni/South Africa
Tembe Elephant R/290 sq km/1994/>500/S-D/IG
Mkuzi GR/251 sq km/1994/230/S-D/GS
Ndumu GR/101 sq km/1994/100/S-D/IG
Greater St. Lucia Wetland P/2,587 sq km/1994/30/S-D/IG
Pongola NR/69 sq km/1995/>10/S/GS
private land/-/1994/<250/D/IG

Cape Grysbok/South Africa
Addo Elephant NP/86 sq km/1995/15/S/GS
Bontebok NP/28 sq km/1995/30/S/GS
Tsitsikamma NP (forest section)/25 sq km/1995/15/S/GS
provincial Rs/>700 sq km/1995/C/S/FO
private land/>30,000 sq km/1995/C-U/S/IG
other areas/>30,000 sq km/1995/C-U/S-D/IG

Sharpe's Grysbok/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/x/?/FO

Sharpe's Grysbok/Tanzania
Ugalla River GR & GCAs/6,900 sq km/1988/x/?/F0
Selous GR/43,626 sq km/1995/U/S/FO
other areas/>10,000 sq km/1996/x/?/IG

Sharpe's Grysbok/Zambia
Kafue NP/22,357 sq km/1994/C/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/IG
Kasanka NP/420 sq km/1994/x/S-I/F0
Lavushi Manda NP/1,500 sq km/1994/C/S-D/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/R/S-D/FO
Mweru Wantipa NP/3,134 sq km/1994/C/S/FO
Nsumbu NP/2,020 sq km/1994/C/S-D/F0
Lusenga Plain NP/880 sq km/1994/C/S-D/FO
N. Luangwa NP/4,636 sq km/1995/C/S/FO
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/3,210/S-I/GS
other Luangwa Valley GMAs/22,840 sq km/1994/C-U/S-D/FO
other areas/>40,000 sq km/1994/x/S-D/IG

Sharpe's Grysbok/Malawi
Vwaza Marsh GR/986 sq km/1996/20/S/IG
Kasungu NP/2,316 sq km/1996/x/?/FO
Nkhotakota GR/1,802 sq km/1996/30/?/GS
Majete GR/682 sq km/1996/U/S/FO
Lengwe NP/887 sq km/1996/310/I/GS
Mwabvi GR/340 sq km/1996/x/?/FO
forest reserves/>5,000 sq km/1996/x/S-D/IG
other areas/>5,000 sq km/1996/x/S-D/IG

Sharpe's Grysbok/Mozambique
Gorongosa NP/3,775 sq km/1997/R/D/FO
Manica Province/7/1998/x/S/FO
Zinave NP/5,000 sq km/1997/x/D/FO
Banhine NP/7,000 sq km/1997/>100/S-D/IG
Gaza HZ/40,000 sq km/1997/C/S/FO
other areas/>75,000 sq km/1997/x/S-D/IG

Sharpe's Grysbok/Botswana
Chobe NP/11,100 sq km/1988/R/?/FO

Sharpe's Grysbok/Zimbabwe
Hwange NP/14,651 sq km/1996/U-R/S-D/FO
other protected areas/24,480 sq km/1989/C-U/S/FO
communal lands/>25,000 sq km/1995/U-R/D/IG
private farmland/-/1996/>30,000/S/QS

Sharpe's Grysbok/South Africa
Kruger NP/21,682 sq km/1998/R/S/FO
provincial Rs/-/1995/5O/S/GS
private land/>10,000 sq km/1995/U/S/IG
other areas/>5,000 sq km/1995/U-R/D/IG

Sharpe's Grysbok/Swaziland
Mlawula NR/120 sq km/1995/U-R/S/FO

Steenbok/Kenya
Tsavo NP & surrounds/40,572 sq km/1995/C/S/FO
Nairobi NP/117 sq km/1993/U/S/FO
Masai Mara NR/1,670 sq km/1994/C/S/FO
Mara ranches/3,890 sq km/1994/C/S/FO
Lake Nakuru NP/139 sq km/1993/U/S/FO
Ruma NP/120 sq km/1994/x/7/F0
Mt Kenya NP/588 sq km/1995/x/S/FO
other areas/>10,000 sq km/1995/x/S-D/IG

Steenbok/Tanzania
Serengeti ecosystem/27,000 sq km/1991/C/S/FO
Tarangire NP/2,600 sq km/1996/C/S/FO
Tarangire GCAs/10,000 sq km/1996/C/?/FO
Lake Manyara NP/110 sq km/1988/U-R/S-D/FO
Mkomazi GR/3,100 sq km/1988/C-U/S/FO
other areas/>20,000 sq km/1996/x/S-D/IG

Steenbok/Angola
south & southeast/>50,000 sq km/1992/x/D/IG

Steenbok/Zambia
Kafue NP/22,357 sq km/1994/U/S/FO
Sioma Ngwezi NP/5,240 sq km/1994/x/S-D/FO
Liuwa Plain NP/3,660 sq km/1994/x/?/F0
other areas/>10,000 sq km/1994/x/S-D/IG

Steenbok/Mozambique
Zinave NP/5,000 sq km/1997/>250/D/IG
Banhine NP/7,000 sq km/1997/500/S-D/IG
Gaza HZ/40,000 sq km/1997/C-U/S-D/FO
Maputo GR/800 sq km/1997/C-U/S-D/FO
other areas/>20,000 sq km/1997/x/S-D/IG

Steenbok/Namibia
Etosha NP/22,270 sq km/1995/C/S/FO
Skeleton Coast P/16,390 sq km/1988/R/S/FO
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/x/S/FO
Kaudom GP/3,841 sq km/1988/30/S/AS
Waterberg Plateau P/405 sq km/1986/U/S/FO
Von Bach R/43 sq km/1988/6/S/TC
Namib-Naukluft P/49,768 sq km/1987/U-R/S/FO
Hardap GP/250 sq km/1988/10/S/GS
Kaokoland/70,000 sq km/1990/R/S/FO
other communal lands/-/1988/U/S-D/FO
private farmland/-/1992/138,940/I/QS

Steenbok/Botswana
Ngamiland, Chobe & Central districts/300,000 sq km/1994/19,650/S/AS
Ghanzi, Kgalagadi, Kweneng & Southern districts/250,000 sq km/1994/52,750/I/AS

Steenbok/Zimbabwe
Hwange NP/14,651 sq km/1996/C/S/FO
other protected areas/10,890 sq km/1989/C/S/FO
communal lands/>25,000 sq km/1995/U-R/S-D/IG
private farmland/-/1996/>50,000/S/QS

Steenbok/South Africa
Kruger NP/21,682 sq km/1998/C/S/FO
Kalahari Gemsbok NP/9,591 sq km/1994/1,250/S/AS
Augrabies Falls NP/137 sq km/1995/<10/S/GS
Vaalbos NP/227 sq km/1995/12/S/AS
Karoo NP/433 sq km/1994/x/S/FO
Mt Zebra NP/67 sq km/1995/20/S/GS
Marakele NP/399 sq km/1995/10/S-I/GS
Bontebok NP/28 sq km/1993/10/S/GS
West Coast NP/248 sq km/1995/20/S/GS
Hluhluwe-Umfolozi P/965 sq km/1994/300/S/GS
Mkuzi GR/251 sq km/1994/250/S/GS
other provincial Rs/>15,000 sq km/1994-96/C/S/FO
other areas/>300,000 sq km/1995/C-U/S-D/IG

Steenbok/Swaziland
Hlane GR/163 sq km/1994/C/S/FO
Mlawula NR/120 sq km/1994/U-R/S/FO
Mlilwane WS/45 sq km/1994/C/S/FO
private land/-/1994/x/S/FO

Salt's Dikdik/Sudan
Eritrea border/7/1986/x/?/FO

Salt's Dikdik/Eritrea
northwestern hills/>5,000 sq km/1995/x/?/IG
coastal plain/>1,000 sq km/1997/C-U/?/FO

Salt's Dikdik/Ethiopia
Awash NP/804 sq km/1995/C/S/FO
Awash Valley/17,000 sq km/1995/C/S/FO
Danakil Desert/>10,000 sq km/1995/x/?/IG
Babille Elephant S/>1,000 sq km/1992/C/S/FO
Ogaden/>100,000 sq km/1997/C/S/FO

Salt's Dikdik/Djibouti
north, central & southwest/>6,000 sq km/1987/C/S/FO
southeast/>2,000 sq km/1997/C/S/FO

Salt's Dikdik/Somalia
Sanag region/>30,000 sq km/1994/C/S/FO
Haud Plateau/>20,000 sq km/1997/Ab-C/?/F0
other areas/>50,000 sq km/1986/C/S-D/FO

Silver Dikdik/Somalia
central coastal strip/15,000 sq km/1996/x/D/FO

Guenther's Dikdik/Sudan
southeastern bushland/>2,500 sq km/1989/x/?/LP

Guenther's Dikdik/Ethiopia
0gaden/>100,000 sq km/1997/C/S/FO
Yabelo WS/2,496 sq km/1993/>8,700/I/IG
Borana CHA/40,000 sq km/1993/C/?/FO
Omo NP/4,015 sq km/1995/Ab-C/S/FO
Mago NP/2,120 sq km/1992/>1,000/S/IG
Nechisar NP/514 sq km/1995/C/S/FO
other areas in south/>10,000 sq km/1995/C/S/IG

Guenther's Dikdik/Somalia
Haud Plateau/>20,000 sq km/1997/C/?/FO
Sanag region/>10,000 sq km/1994/x/S-D/FO
other areas/>50,000 sq km/1983/C/S-D/F0

Guenther's Dikdik/Uganda
Karamoja/>30,000 sq km/1988/C/S-D/IG

Guenther's Dikdik/Kenya
Sibiloi NP & surrounds/2,000 sq km/1995/C/S/FO
Marsabit NP & NR/2,090 sq km/1995/C/S/FO
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/C/S/FO
Meru NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/C/S/FO
unprotected areas of northern rangelands/230,000 sq km/1995/C/S/IG

Kirk's Dikdik/Somalia
Bush-Bush NP/4,267 sq km/1983/C/S/FO
other areas in south/>10,000 sq km/1996/C/?/FO

Kirk's Dikdik/Kenya
Samburu-Buffalo Springs-Shaba NRs/743 sq km/1993-94/C/S/FO
Mem NP-Rahole-Kora-Bisanadi NRs/4,528 sq km/1995/C/S/FO
Tsavo NP & sutrounds/40,572 sq km/1995/C/S/FO
Masai Mara NR/1,670 sq km/1994/C/S/FO
Mara ranches/3,890 sq km/1994/C/S/FO
Amboseli NP/392 sq km/1996/C/S/FO
Nairobi NP/117 sq km/1993/x/S/FO
Kajiado & eastern Narok rangelands/28,000 sq km/1995/C/S/IG
Tana River NR & surrounds/200 sq km/1995/C/S/FO
Shimba Hills NR/217 sq km/1995/x/?/FO
coastal rangelands/15,000 sq km/1995/C/S/IG
Lake Nakuru NP/139 sq km/1993/C/S/FO
Ruma NP/120 sq km/1994/x/?/F0
Arabuko-Sokoke FR/372 sq km/1995/R/D/FO
other areas/>20,000 sq km/1995/x/S-D/IG

Kirk's Dikdik/Tanzania
Serengeti ecosystem/27,000 sq km/1991/C/S/FO
Lake Manyara NP/110 sq km/1988/x/?/F0
Arusha NP/137 sq km/1988/C/S/FO
Tarangire NP & GCAs/12,260 sq km/1996/Ab/S/FO
Mkomazi GR/3,615 sq km/1996/C/S/FO
Ugalla River GR & GCAs/6,900 sq km/1988/x/?/F0
Katavi NP/1,989 sq km/1988/x/?/F0
Ruaha NP & GRs/29,280 sq km/1993/x/?/FO
other areas/>25,000 sq km/1996/x/S-D/IG

Kirk's Dikdik/Angola
southwest/>10,000 sq km/1992/x/S-D/IG

Kirk's Dikdik/Namibia
Etosha NP/22,270 sq km/1995/C/S/FO
Waterberg Plateau P/405 sq km/1986/40/S/TC
Kaokoland/70,000 sq km/1990/x/S/FO
other communal lands/-/1988/U/S-D/FO
private farmland/-/1992/1 5,780/S-I/QS

Oribi/Mali
Boucle du Baoule complex/7,710 sq km/1996/<1,000/D/IG
Bafing FR/1,690 sq km/1996/510/S-D/GS
other areas in southwest/>20,000 sq km/1996/>2,500/D/IG

Oribi/Niger
W NP-Tamou FR/2,980 sq km/1988/500/S-D/GS
other areas in southwest/>5,000 sq km/1988/U/D/FO

Oribi/Senegal
Niokolo-Koba NP/9,130 sq km/1995/12,000/1/IG
Faleme HZ/10,000 sq km/1997/x/?/FO
Casamance region/>10,000 sq km/1996/U/D/F0

Onbi/Gambia
Kiang West NP/100 sq km/1988/x/?/F0
other areas/500 sq km/1988/x/D/FO

Oribi/Guinea-Bissau
Corubal River/1,500 sq km/1991/U-R/S/FO
eastern savannas/>2,500 sq km/1991/U-R/S/FO

Oribi/Guinea
northern savannas/>10,000 sq km/1990/U/S-D/IG

Oribi/Sierra Leone
Outamba-Kilimi NP/938 sq km/1986/R/D/FO

Oribi/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/5,600/D/GS
Haut Bandama GR/1,230 sq km/1990/x/S-D/FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
forest reserves/4,070 sq km/1990/x/S-D/FO
other areas/>10,000 sq km/1990/x/D/IG

Oribi/Burkina Faso
Arly NP/760 sq km/1991/1,310/S/GS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/C/S/FO
W NP-Kourtiago FR/2,860 sq km/1991/150/S/AS
Nazinga GR/940 sq km/1995/1,600/S-I/GS
Diefoula FR/720 sq km/1997/100/D/GS
other areas/>25,000 sq km/1990/x/D/IG

Oribi/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/C/S/FO
Gbele GPR/324 sq km/1995/C/S/FO
Kalakpa GPR/324 sq km/1995/C/S/FO
Shai Hills GPR/54 sq km/1995/x/S-D/FO
other areas/>10,000 sq km/1995/C-U/S-D/FO

Oribi/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U/D/FO
Fazao NP/1,920 sq km/1995/U/D/FO
Togodo NR/350 sq km/1990/U/D/FO
other areas/>4,000 sq km/1990/C-U/S-D/!G

Oribi/Benin
Pendjari NP & HZs/6,505 sq km/1994/>2,000/S/AS
W NP-Djona HZ/7,930 sq km/1994/C/S/FO
forest reserves/7,700 sq km/1990/x/S-D/FO
other areas/>10,000 sq km/1990/x/S-D/IG

Oribi/Nigeria
Kainji Lake NP/5,340 sq km/1990/U/S-D/F0
Yankari GR/2,240 sq km/1990/U/S-D/FO
Gashaka Gumpti NP/5,950 sq km/1990/x/S-D/FO
other protected areas/17,000 sq km/1990/U/S-D/FO
other areas/>10,000 sq km/1990/U-R/D/IG

Oribi/Chad
Zakouma NP/3,000 sq km/1995/150/D/AS
Bahr Salamat FR/20,600 sq km/1989/C/S-D/FO
Siniaka Minia FR/4,260 sq km/1995/250/D/AS
eastern Salamat/40,000 sq km/1989/C/S/FO
other areas in south/>25,000 sq km/1989/x/S-D/IG

Oribi/Cameroon
N. Province/>29,700 sq km/1998/11,620/D/IG
other areas/>50,000 sa Km/1994/x/S-D/IG

Oribi/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/>2,000/S/IG
Bamingui-Bangoran NP/11,560 sq km/1995/>300/S/IG
Sangba Pilot Zone/11,000 sq km/1995/>1,500/S-D/IG
northern region HZs/60,000 sq km/1996/C/S-D/FO
east-central region HZs/70,000 sq km/1997/U/D/FO
Chinko Basin/95,000 sq km/1997/U/S-D/FO
other areas/>1 5,000 sq km/1995/C-U/S-D/IG

Oribi/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/C/S/FO
Upemba NP/11,730 sq km/1996/C/S-D/F0
Kundelungu NP/7,600 sq km/1996/C/S-D/FO
other areas/>30,000 sq km/1996/x/S-D/IG

Onbi/Sudan
Radom NP/7,500 sq km/1994/U/S/FO
other areas in southwest/>100,000 sq km/1992/x/S-D/IG
Dinder NP/8,960 sq km/1997/160/D/GS
southeastern savannas/>100,000 sq km/1992/x/S-D/IG

Oribi/Eritrea
southwestern savannas/>5,000 sq km/1995-97/U/S-D/FO

Oribi/Ethiopia
Gambella NP/5,061 sq km/1990/x/S-D/FO
Senkelle WS/54 sq km/1995/<100/S-D/IG
Omo NP/4,015 sq km/1995/C/S/FO
Mago NP/2,120 sq km/1995/R/S-D/FO
Omo W., Maze & Akobo CHAs/?/1995/x/?/FO
other areas in Rift Valley, western highlands, southwestern & western lowlands/>50,000 sq km/1995/x/S-D/IG

Oribi/Somalia
Lower Shebelle & Juba Rivers/>500 sq km/1983/U-R/D/FO
Bush-Bush NP/4,267 sq km/1983/x/?/FO

Oribi/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/990/S/AS
Lake Mburo NP & surrounds/1,563 sq km/1995/C/S/FO
Kidepo Valley NP/1,575 sq km/1995/C/?/FO
other areas/>10,000 sq km/1995/x/?/IG

Oribi/Kenya
Masai Mara NR/1,670 sq km/1994/C-U/S/FO
Mara ranches/3,890 sq km/1994/C-U/S/FO
Ruma NP/120 sq km/1994/660/S/GS
Boni-Dodori NRs/2,117 sq km/1995/x/?/F0
other areas/>5,000 sq km/1995/x/S-D/IG

Oribi/Tanzania
northwestern Serengeti NP/700 sq km/1991/6,635/S/GS
Lake Manyara NP/110 sq km/1990/R/?/FO
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/>50/S-D/AS
Moyowosi-Kigosi GRs & GCAs/21,870 sq km/1994/x/?/F0
Ugalla River GR & GCAs/6,900 sq km/1991/x/7/FO
Katavi NP & Katavi-Rukwa GCAs/12,641 sq km/1991/x/?/FO
Ruaha ecosystem/42,000 sq km/1993/x/?/FO
Selous ecosystem/92,000 sq km/1995/R/S/FO
other areas/>10,000 sq km/1996/x/S-D/IG

Oribi/Rwanda
Akagera NP/1,500 sq km/1994/200/D/GS

Oribi/Angola
central, east & southeast/>50,000 sq km/1992/U-R/D/IG

Oribi/Zambia
Kafue NP/22,357 sq km/1994/C/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/FO
Lavushi Manda NP/1,500 sq km/1994/R/D/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/C/S-D/FO
Bangweulu-Kafinda GMAs/7,500 sq km/1993/C/S/FO
Sioma Ngwezi NP/5,240 sq km/1991/140/S-D/AS
Liuwa Plain NP/3,660 sq km/1994/Ab/S-D/FO
N. Luangwa NP/4,636 sq km/1995/U/S/FO
S. Luangwa NP/9,050 sq km/1994/R/?/F0
Lupande GMA/4,500 sq km/1994/R/S/FO
private game ranches/-/1994/70/S-I/QS
other areas/>7,500 sq km/1994/x/S-D/IG

Oribi/Malawi
Kasungu NP/2,316 sq km/1996/R/?/F0
Liwonde NP/548 sq km/1996/R/?/FO

Oribi/ Mozambique
Gorongosa NP/3,775 sq km/1997/U-R/D/FO
Manica Province/?/1998/C-U/S-I/FO
Marromeu GR/1,500 sq km/1997/U-R/D/F0
Zinave NP/5,000 sq km/1997/x/D/FO
Banhine NP/7,000 sq km/1998/x/D/FO
other areas/>10,000 sq km/1997/x/D/IG

Oribi/Botswana
Chobe NP-Zimbabwe border/3,500 sq km/1994/R/7/F0

Oribi/Zimbabwe
Hwange NP/14,651 sq km/1996/R/l/FO
other protected areas/8,200 sq km/1989/U-R /?/FO
private farmland/-/l996/1,45O/S/QS

Oribi/South Africa
Golden Gate Highlands NP/116 sq km/1995/17/ S/TC
Sterkfontein Dam NR/180 sq km/1995/20/S/ TC
Giant's Castle GR/346 sq km/1995/120/S/TC
other provincial Rs/>500 sq km/1995/U-R/S- D/FO
private land/>10,000 sq km/1995/U-R/S-D/IG

Oribi/Swaziland
Malolotja NR/180 sq km/1994/U/l/FO
Mlawula NR/120 sq km/1994/U-R/D/FO

Oribi/Lesotho
Sehlabathebe NP/65 sq km/1988/V/?/FO

Beira/Ethiopia
Marmar Mts/?/1972/x/?/FO

Beira/Djibouti
southeastern hills/250 sq km/1994/R/?/FO

Beira/Somalia
northern mountains/>30,000 sq km/1994/U-R /S-D/FO, LP
eastern Nugal/>5,000 sq km/1997/x/?/LP

Klipsp ringer/ Nigeria
Jos Plateau & surrounds/2,000 sq km/1990/x /S-D/FO

Klipspringer/CAR
northwestern mountains/7/1990/x/?/FO
mountains east of Ouanda Djalle/?/1990/x/S-D /FO

Klipspringer/Congo-Kinshasa
Upemba NP/11,730 sq km/1996/V/S-D/FO
Kundelungu NP/7,600 sq km/1996/U/S-D/FO

Klipspringer/Sudan
Red Sea Hills/>500 sq km/1988/x/?/FO
southeastern Eastern Equatoria/>500 sq km/ 1989/x/?/LP

Klipsp ringer/Eritrea
northwestern hills/>2,000 sq km/1995/x/?/ IG
Semanawi Bahri/200 sq km/1995/U/?/FO

Klipsp ringer/ Ethiopia
Simien Mts NP/179 sq km/1995/C/?/FO
Bale Mts NP/2,471 sq km/1995/C/S/FO
Awash NP/804 sq km/1995/R/S/FO
Babille Elephant S/>1,000 sq km/1992/x/?/F0
Nechisar NP/514 sq km/1996/U/S/FO
Yabelo WS/2,496 sq km/1993/x/S/FO
Omo NP/4,015 sq km/1995/U/S/FO
Mago NP/2,120 sq km/1992/R/S/FO
other areas in highlands & Rift Valley/>50,000 sq km/1986/C/S-D/FO

Klipspringer/Djibouti
Foret du Day/>100 sq km/1987/250/S/IG
other areas of Goda & Mabla massifs/>500 sq km/1987/U-R/S/FO

Klipspringer/Somalia
northern mountains/>1,000 sq km/1986/U/?/ FO

Klipspringer/ Uganda
Lake Mburo NP/260 sq km/1995/x/S-D/F0
Karamoja/>1,000 sq km/1988/R/S-D/FO

Klipspringer/Kenya
Samburu-Buffalo Springs-Shaba NRs/743 sq km /1994/C/l/FO
Tsavo NP & surrounds/40,572 sq km/1995/C- U/S/FO
Masai Mara NR/1,670 sq km/1994/U/S/FO
Mara ranches/3,890 sq km/1994/U/S/FO
Nairobi NP/117 sq km/1993/x/?/FO
Aberdare NP/766 sq km/1995/x/S/FO
other areas/>15,000 sq km/1995/x/S-D/IG

Klipspringer/Tanzania
Serengeti ecosystem/27,000 sq km/1991/U/S /FO
Tarangire NP & GCAs/12,600 sq km/1996/C/ S/FO
Lake Manyara NP/110 sq km/1988/U/S/FO
Arusha NP/137 sq km/1988/U/S/FO
Mkomazi GR/3,100 sq km/1988/x/?/FO
Ruaha ecosystem/42,000 sq km/1993/x/?/FO
Selous ecosystem/92,000 sq km/1994/C-U/S /F0
other areas/>50,000 sq km/1996/x/S-D/IG

Klipspringer/Rwanda
Akagera NP/1,500 sq km/1996/U-R/S-D/IG

Klipspringer/ Angola
southwest/>3,000 sq km/1992/x/S-D/IG

Klipspringer/Zambia
Lower Zambezi NP/4,092 sq km/1995/x/S/F0
Lavushi Manda NP/1,500 sq km/1994/U/S-D/ FO
Nsumbu NP/2,020 sq km/1994/x/S/FO
N. Luangwa NP/4,636 sq km/1995/C/S/FO
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/220/S-D/GS
Lukusuzi NP/1,920 sq km/1994/R/S-D/FO
other Luangwa Valley GMAs/22,840 sq km/ 1994/C-U/S-D/FO
other areas/>10,000 sq km/1994/x/S-D/IG

Klipsp ringer/ Malawi
Nyika NP/3,134 sq km/1996/Ab/?/F0
Nkhotakota GR/1,802 sq km/1996/x/?/FO
Majete GR/682 sq km/1996/C/S/FO
Lengwe NP/887 sq km/1996/220/S/GS
Mwabvi GR/340 sq km/1998/?/?/FO
Lake Malawi NP/94 sq km/1996/x/S/FO
forest reserves/>2,000 sq km/1996/x/S-D/ IG
other areas/>1,000 sq km/1996/x/S-D/IG

Klipspringer/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/x /S-D/FO
Gorongosa NP/3,775 sq km/1997/R/D/FO
Gaza HZ/40,000 sq km/1997/C-U/S/FO
other areas/>1 5,000 sq km/1997/x/S-D/IG

Klipspringer/ Namibia
Etosha NP/22,270 sq km/1995/U/S/FO
Waterberg Plateau P/405 sq km/1986/x/S/FO
Namib-Naukluft P/49,768 sq km/1987/>1,000 /S/IG
Ai-Ais Hot Springs P/461 sq km/1988/U/S/FO
Kaokoland/70,000 sq km/1990/x/S/FO
other communal lands/-/1988/U-R/S-D/FO
private farmland/-/1992/22,880/S-D/QS

Klipspringer/Botswana
Tuli block farms/10,000 sq km/1996/C-U/S/ FO
other areas in east & southeast/>2,500 sq km/ 1996/x/S-D/IG

Klipspringer/Zimbabwe
Hwange NP/14,651 sq km/1996/U/S/FO
Matobo NP/432 sq km/1996/>1,000/S/IG
other protected areas/16,490 sq km/1989/C/ S/FO
communal lands/>10,000 sq km/1995/U-R/S- D/IG
private farmland/-/1996/830/S/QS

Klipspringer/South Africa
Kruger NP/21,682 sq km/1998/C-U/S/FO
Augrabies Falls NP/137 sq km/1995/C/S/FO
Karoo NP/433 sq km/1994/75/S/GS
Mt Zebra NP/67 sq km/1995/20/S/GS
Addo-Zuurberg NP/515 sq km/1995/35/S/GS
Marakele NP/399 sq km/1995/30/S/GS
Giant's Castle GR & surrounds/400 sq km/ 1994/60/S/GS
Royal Natal NP/89 sq km/1994/65/S/GS
Itala GR/259 sq km/1994/25/S/GS
Mkuzi GR/251 sq km/1994/10/S/GS
Umfolozi GR/478 sq km/1994/35/S/GS
other provincial Rs/>900 sq km/1994-96/C-U /S/FO
other areas/>50,000 sq km/1995/C-U/S-D/IG

Klipspringer/Swaziland
Malolotja NR/180 sq km/1994/U/S/FO
Mlawula NR/120 sq km/1994/U/S/FO

Subfamily Cephalophinae

Maxwell's Duiker/Senegal
Basse Casamance NP/50 sq km/1996/U/D/FO
Casamance region/>7,500 sq km/1996/C/D/FO

Maxwell's Duiker/Gambia
Kiang W. NP/100 sq km/1988/x/?/FO
other areas/500 sq km/1988/U/D/FO

Maxwell's Duiker/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S/FO

Maxwell's Duiker/Guinea-Bissau (continued)
Cantanhez Forest/650 sq km/1994/x/S-D/FO
Lake Cufada/700 sq km/1991/C/S/FO
other areas of mainland/>10,000 sq km/1991/C/S-D/FO
Bijagos Archipelago/250 sq km/1991/C/S-D/F0

Maxwell's Duiker/Guinea
Mt Nimba BR/170 sq km/1990/x/?/FO
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/FO
other areas/>25,000 sq km/1990/C/S-D/IG

Maxwell's Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/U/S-D/FO
Gola FRs/738 sq km/1987/C/S-D/FO
Western Area FR/179 sq km/1988/C/S-D/FO
other areas/>20,000 sq km/1987/C/S-D/IG

Maxwell's Duiker/Liberia
N. Lorma NF/712 sq km/1990/C/?/FO
Gola-Kpelle-Lorma NFs/4,253 sq km/1990/C/?/F0
Krahn-Bassa NF/5,140 sq km/1990/C/?/FO
Sapo NP/1,308 sq km/1990/Ab/?/FO
Grebo NF/2,673 sq km/1990/C/?/F0
farmbush & secondary forests/>40,000 sq km/1990/Ab-C/?/FO

Maxwell's Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/2,800/D/GS
Haut Bandama GR/1,230 sq km/1990/x/S-D/FO
Mont Sangbe NP/950 sq km/1990/C/S/FO
Marahoue NP/1,010 sq km/1997/C/S-D/FO
Tai NP/4,540 sq km/1996/Ab/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/D/FO
Cavally-Gouin FR/1,890 sq km/1990/C/S/FO
Mont Peko NP/340 sq km/1990/C/S/FO
Azagny NP/200 sq km/1990/C/S/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/C/S/FO
other forest reserves/7,950 sq km/1990/C/S-D/FO
other areas/>50,000 sq km/1990/C/D/IG

Maxwell's Duiker/Burkina Faso
Diefoula-Logoniegue FRs/1,140 sq km/1990/U/S-D/FO

Maxwell's Duiker/Ghana
Digya NP/3,126 sq km/1995/C/S/FO
Kogyae SNR/324 sq km/1995/R/S/FO
Bomfobiri WS/73 sq km/1995/C/D/FO
Bia NP & GPR/306 sq km/1995/C/S/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/C/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/Ab/I/FO
Owabi WS/52 sq km/1995/R/D/FO
other areas/>10,000 sq km/1995/C/S-D/FO

Maxwell's Duiker/Togo
Fazao NP/1,920 sq km/1990/R/D/FO
other areas/>500 sq km/1990/U-R/D/IG

Maxwell's Duiker/Benin
Monts Kouffe FR/1,080 sq km/1990/x/D/FO
Lama FR/162 sq km/1990/x/D/FO
other areas/>500 sq km/1990/U-R/D/IG

Maxwell's Duiker/Nigeria
Okomu FR/1,082 sq km/1990/x/S-D/FO
Gilli-Gilli GR/363 sq km/1990/x/S-D/F0
Orle River GR/352 sq km/1990/x/S-D/FO
other forest reserves/540 sq km/1990/x/S-D/FO
Niger Delta/5,000 sq km/1994/x/S-D/F0
other areas in southwest/>10,000 sq km/1990/U/D/IG

Blue Duiker/Nigeria
Gashaka Gumpti NP/5,950 sq km/1988/x/S-D/FO
Cross River NP/3,750 sq km/1990/C/S-D/FO
forest reserves/806 sq km/1990/x/S-D/FO
other areas in southeast/>5,000 sq km/1990/U/S-D/IG

Blue Duiker/Cameroon
Korup NP/1,260 sq km/1994/C/S/FO
Campo R/3,000 sq km/1994/Ab/D/FO
Dja R/6,194 sq km/1994/Ab/S/FO
Lobeke R/2,500 sq km/1994/Ab/S/FO
other areas in south/>1 50,000 sq km/1994/C-U/S-D/IG

Blue Duiker/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/>2,000/S-I/IG
Bamingui-Bangoran NP/11,560 sq km/1995/<20/?/IG
Sangba Pilot Zone/11,000 sq km/1995/>2,000/S-I/IG
northern region HZs/60,000 sq km/1996/U-R/S-D/FO
east-central region HZs/70,000 sq km/1997/U-R/S-D/FO
Chinko Basin/95,000 sq km/1997/U/S-D/F0
Bangassou Forest/16,600 sq km/1996/Ab/I/FO
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/Ab/S/FO
other areas/>10,000 sq km/1995/C-U/S-D/IG

Blue Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/C/I/FO
other areas of Mbini/>20,000 sq km/1998/C/S-D/IG
Bioko Island/1,600 sq km/1990/C/S-D/FO

Blue Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Wonga-Wongue R/4,800 sq km/1988/x/S/FO
Gamba complex/11,000 sq km/1994-96/Ab-C/S/FO
Minkebe Forest/15,000 sq km/1995/Ab/S/FO
other areas/>200,000 sq km/1996/Ab-C/S/FO

Blue Duiker/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/Ab/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/Ab-C/S/FO
Lake Tele-Likouala/10,500 sq km/1994/C/?/FO
Conkouati FR/1,450 sq km/1995/Ab/S/FO
Dimonika BR/1,360 sq km/1991/C/S-D/FO
Lefini FR/6,300 sq km/1997/x/S-D/FO
other areas/>200,000 sq km/1995/C-U/S-D/IG

Blue Duiker/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/U/?/FO
Virunga NP/7,800 sq km/1996/x/S-D/FO
Okapi FR/13,726 sq km/1995/Ab/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
Upemba NP/11,730 sq km/1996/V/D/FO
Kundelungu NP/7,600 sq km/1996/x/?/FO
other areas/>850,000 sq km/1996/x/S-D/IG

Blue Duiker/Sudan
southwestern Western Equatoria/>4,000 sq km/1986/C/S-D/FO
southwestern Eastern Equatoria/>500 sq km/1986/x/?/FO

Blue Duiker/Uganda
Kibale Forest NP/766 sq km/1995/C/S/FO
Semliki Forest NP/220 sq km/1988/x/?/FO
Mt Elgon NP/1,145 sq km/1988/x/?/F0
Budongo FR/435 sq km/1995/C/S/FO
other forest reserves/>4,000 sq km/1995/x/S-D/IG
Murchison Falls NP & GRs/5,500 sq km/1995/x/?/F0
Queen Elizabeth NP & GRs/2,419 sq km/1995/x/?/FO

Blue Duiker/Kenya
Shimba Hills NR/217 sq km/1995/x/?/FO
Kakamega Forest NP/97 sq km/1995/x/?/FO
Arabuko-Sokoke FR/372 sq km/1995/U/D/F0

Blue Duiker/Tanzania
Udzungwa Mts NP/1,000 sq km/1996/U/S-D/FO
Selous GR/43,626 sq km/1995/R/S/FO
other areas on mainland/>10,000 sq km/1996/x/D/IG
Zanzibar Island/1,200 sq km/1996/8,000/D/GS

Blue Duiker/Angola
Kissama NP/9,960 sq km/1992/C/S-D/IG
Cabinda/?/1992/x/D/IG
other areas in northwest, north & northeast/>20,000 sq km/1992/x/D/IG

Blue Duiker/Zambia
Kafue NP/22,357 sq km/1994/x/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/x/S-D/IG
West Lunga NP/1,684 sq km/1994/x/S-D/F0
Mweru Wantipa NP/3,134 sq km/1994/x/?/FO
Nsumbu NP/2,020 sq km/1994/x/?/F0
Lusenga Plain NP/880 sq km/1994/x/S-D/FO
Nyika NP/80 sq km/1994/x/S-D/FO
other areas/>1,000 sq km/1988/x/S-D/IG

Blue Duiker/Malawi
Nyika NP/3,134 sq km/1996/U-R/S/FO
forest reserves/>5,000 sq km/1996/C-U/S-D/IG

Blue Duiker/Mozambique
Gorongosa NP/3,775 sq km/1997/R/D/FO

Blue Duiker/Mozambique (continued)
Chimanimani Mts/>2,000 sq km/1989/x/S-D/FO

Blue Duiker/Zimbabwe
Chimanimani NP/171 sq km/1989/U/S-D/FO
Mtarazi Falls NP/25 sq km/1989/C/D/FO
Nyanga NP/289 sq km/1989/U/S-D/FO
Melsetter S/12 sq km/1989/R/?/FO
other areas in eastern highlands/7/1989/R/D/FO

Blue Duiker/South Africa
Tsitsikamma NP (forest section)/25 sq km/1995/400/S/GS
KwaZulu-Natal Province/-/1994/2,200/D/I6
southeastern Cape/>5,000 sq km/1995/U/D/IG

Aders[1] Duiker/Kenya
Arabuko-Sokoke FR/372 sq km/1995/R/D/FO

Aders' Duiker/Tanzania
Zanzibar Island/800 sq km/1996/1,400/D/GS

Bay Duiker/Guinea-Bissau
Dulombi area/200 sq km/1991/R/S-D/FO
Lake Cufada/300 sq km/1991/R/D/FO
Cacheu River/500 sq km/1991/R/D/FO
other areas of mainland/750 sq km/1991/R/D/FO

Bay Duiker/Guinea
Mt Nimba BR/170 sq km/1990/x/?/F0
Ziama & Diecke FRs/1,679 sq km/1990/x/D/FO
other areas/?/1990/R/D/IG

Bay Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/R/D/FO
Gola FRs/738 sq km/1987/U/D/FO
Western Area FR/179 sq km/1988/x/D/FO
other areas/500 sq km/1987/R/D/IG

Bay Duiker/Liberia
N. Lorma NF/712 sq km/1990/x/?/F0
Gola-Kpelle-Lorma NFs/4,253 sq km/1990/x/?/F0
Krahn-Bassa NF/5,140 sq km/1990/C/?/FO
Sapo NP/1,308 sq km/1990/C/?/FO
Grebo NF/2,673 sq km/1990/x/?/FO
farmbush & secondary forests/>5,000 sq km/1990/x/?/FO

Bay Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/R/D/GS
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/x/S-D/FO
Tai NP/4,540 sq km/1996/C-U/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/x/D/FO
Cavally-Gouin FRs/1,890 sq km/1990/x/S-D/FO
Mont Peko NP/340 sq km/1990/x/S-D/FO
Azagny NP/200 sq km/1990/x/S/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/x/S-D/FO
other forest reserves/5,830 sq km/1990/x/D/FO

Bay Duiker/Ghana
Kalakpa GPR/324 sq km/1995/R/D/FO
Bia NP & GPR/306 sq km/1995/C/S/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/C/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/Ab/I/FO

Bay Duiker/Togo
Fazao NP/1,920 sq km/1995/R/D/FO

Bay Duiker/Nigeria
Cross River NP/3,750 sq km/1990/U-R/S-D/FO
other areas in southeast/>500 sq km/1990/x/D/IG

Bay Duiker/Cameroon
Korup NP/1,260 sq km/1994/C/S/FO
Campo R/3,000 sq km/1994/Ab/D/FO
Dja R/6,194 sq km/1994/C/S/FO
Lobeke R/2,500 sq km/1994/C/S/FO
other areas in south/>100,000 sq km/1994/x/D/IG

Bay Duiker/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C/S/FO
Bangassou Forest/16,600 sq km/1996/Ab/S/F0
other areas/>5,000 sq km/1995/C-U/D/IG

Bay Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/C/I/FO
other areas of Mbini/>10,000 sq km/1998/C/D/IG

Bay Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Gamba complex/11,000 sq km/1994-96/x/S/F0
Minkebe Forest/15,000 sq km/1995/C/S/F0
other areas/>150,000 sq km/1996/C/S/FO

Bay Duiker/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/C/S/F0
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/C/S/FO
Lake Tele-Likouala/10,500 sq km/1994/x/?/FO
Conkouati FR/1,450 sq km/1995/x/D/FO
Dimonika BR/1,360 sq km/1991/U-R/D/FO
Lefini FR/6,300 sq km/1997/x/D/FO
other areas/>75,000 sq km/1995/x/S-D/IG

Bay Duiker/Congo-Kinshasa
Virunga NP/7,800 sq km/1996/R/?/FO
Okapi FR/13,726 sq km/1995/Ab/S/FO
Maiko NP/10,800 sq km/1992/C/S/F0
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/Ab/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
other areas/>300,000 sq km/1996/x/S-D/IG

Bay Duiker/Angola
Cabinda/?/1992/x/D/IG
northwest & northeast/>5,000 sq km/1992/x/D/IG

Peters' Duiker/Cameroon
Campo R/3,000 sq km/1994/U/?/F0
Dja R/6,194 sq km/1994/C/S-D/FO
Lobeke R/2,500 sq km/1994/Ab/S/FO
other areas in south/>100,000 sq km/1994/x/D/IG

Peters' Duiker/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C/S/FO
Bangassou Forest/16,600 sq km/1996/Ab/S/FO
other areas/>5,000 sq km/1995/U/D/IG

Peters' Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/Ab/S/FO
other areas of Mbini/>5,000 sq km/1998/U/D/IG

Peters' Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/F0
Gamba complex/11,000 sq km/1994-96/x/S/FO
Minkebe Forest/15,000 sq km/1995/C/S/FO
other areas/>100,000 sq km/1996/C/S/FO

Peters' Duiker/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/Ab/S/F0
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/Ab-C/S-I/FO
Lake Tele-Likouala/10,500 sq km/1994/C/?/FO
Conkouati FR/1,450 sq km/1995/R/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
other areas/>75,000 sq km/1995/x/D/IG

Peters' Duiker/Congo-Kinshasa
Virunga NP/7,800 sq km/1996/x/S-D/FO
Okapi FR/13,726 sq km/1995/Ab/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
other areas/>300,000 sq km/1996/x/D/IG

Peters' Duiker/Sudan
southwestern Eastern Equatoria/>500 sq km/1986/x/?/IG

Peters' Duiker/Uganda
Kibale Forest NP/766 sq km/1995/C/S/FO
Mt Elgon NP/1,145 sq km/1988/x/?/FO
Budongo FR/435 sq km/1995/C/S/FO
other forest reserves/>3,000 sq km/1995/x/?/IG
Queen Elizabeth NP & GRs/2,419 sq km/1995/x/?/FO

Peters' Duiker/Kenya
Mt Elgon NP & FR/469 sq km/1995/x/S/FO
Kakamega Forest NP/97 sq km/1995/x/?/FO

Peters' Duiker/Kenya (continued)
Mau escarpment forests/2,400 sq km/1995/x/7/IG

Peters' Duiker/Tanzania
Gombe Stream NP/52 sq km/1988/R/?/FO
Mahale Mts NP/1,200 sq km/1988/R/?/F0

Peters' Duiker/Rwanda
Nyungwe FR/970 sq km/1988/R/D/FO

White-bellied Duiker/Cameroon
Campo R/3,000 sq km/1994/x/D/FO
Lobeke R/2,500 sq km/1994/U/S/FO
other areas in south/>50,000 sq km/1994/x/D/IG

White-bellied Duiker/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/U/S/FO
Bangassou Forest/16,600 sq km/1996/R/D/FO
other areas/>1,000 sq km/1995/x/D/IG

White-bellied Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/R/?/F0
other areas of Mbini/>2,500 sq km/1998/U-R/D/IG

White-bellied Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/F0
Gamba complex/11,000 sq km/1994-96/x/S/FO
Minkebe Forest/15,000 sq km/1995/x/S/FO
other areas/>75,000 sq km/1996/C/S/FO

White-bellied Duiker/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/R/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/R/S/FO
Lake Tele-Likouala/10,500 sq km/1994/x/?/FO
Conkouati FR/1,450 sq km/1995/R/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
other areas/>50,000 sq km/1995/x/D/IG

White-bellied Duiker/Congo-Kinshasa
Okapi FR/13,726 sq km/1995/Ab/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C/S/FO
other areas/>100,000 sq km/1996/x/D/IG

Ogilby's Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/R/D/FO

Ogilby's Duiker/Guinea
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/FO

Ogilby's Duiker/Liberia
Sapo NP/1,308 sq km/1990/U-R/?/FO
Grebo NF/2,673 sq km/1990/x/?/FO
Krahn-Bassa NF/5,140 sq km/1990/x/?/FO

Ogilby's Duiker/Ivory Coast
Tai NP/4,540 sq km/1996/U-R/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/x/D/FO
Cavally-Gouin FR/1,890 sq km/1990/x/S-D/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/x/S-D/FO
other forest reserves/1,440 sq km/1990/x/S-D/FO

Ogilby's Duiker/Ghana
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/?/?/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/7/7/FO

Ogilby's Duiker/Nigeria
Cross River NP/3,750 sq km/1990/R/S-D/FO
Niger Delta/<1,000 sq km/1994/x/S-D/FO

Ogilby's Duiker/Cameroon
Korup NP/1,260 sq km/1994/C-U/S-D/FO
Takamanda FR/676 sq km/1990/x/S-D/FO
Etinde Forest/250 sq km/1992/C/D/FO

Ogilby's Duiker/Equatorial Guinea
Bioko Island/> 1,000 sq km/1990/C/D/FO

Ogilby's Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Gamba complex/11,000 sq km/1994-96/x/S/FO
other areas/>25,000 sq km/1996/C-U/S/IG

Ogilby's Duiker/Congo-Brazzaville
northwestern forests/>5,000 sq km/1996/x/?/FO
Chaillu Forest/?/1990-96/?/?/IG

Black-fronted Duiker/Nigeria
Niger Delta/5,000 sq km/1994/C-U/S-D/FO

Black-fronted Duiker/Cameroon
Mt Cameroon/?/1986/x/7/FO
Campo R/3,000 sq km/1994/U/D/FO
Dja R/6,194 sq km/1994/U/S/FO
Lobeke R/2,500 sq km/1994/C/S/FO
other areas/>25,000 sq km/1994/x/D/IG

Black-fronted Duiker/CAR
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/C-U/S/FO
Bangassou Forest/16,600 sq km/1996/Ab/S/FO
other areas/>5,000 sq km/1995/x/D/IG

Black-fronted Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/U-R/S/FO

Black-fronted Duiker/Gabon
Lope R/5,000 sq km/1994-96/x/?/LP
Gamba complex/11,000 sq km/1994-96/x/S/FO
Minkebe Forest/15,000 sq km/1995/U/S/FO
other areas/>10,000 sq km/1996/U/D/IG

Black-fronted Duiker/Congo-Brazzaville
Odzala NP 4 Rs/2,848 sq km/1995/U/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/C/S/FO
Lake Tele-Likouala/10,500 sq km/1994/C/?/FO
Conkouati FR/1,450 sq km/1995/C/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
other areas/>50,000 sq km/1995/x/S-D/IG

Black-fronted Duiker/Congo-Kinshasa
Virunga NP/7,800 sq km/1996/C/S-D/FO
Okapi FR/13,726 sq km/1995/C/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP (montane section)/750 sq km/1989/C/S/FO
Salonga NP/36,560 sq km/1989/C/S/FO
other areas/>250,000 sq km/1996/x/D/IG

Black-fronted Duiker/Uganda
Mgahinga Gorilla NP/34 sq km/1995/U/S/FO
Bwindi-Impenetrable Forest NP/321 sq km/1995/C/I/FO
Rwenzori Mts NP/996 sq km/1988/U/D/FO
Mt Elgon NP/1,145 sq km/1988/x/S-D/FO

Black-fronted Duiker/Kenya
Mt Elgon NP & FR/469 sq km/1995/x/S/FO
Mt Kenya NP & FR/1,367 sq km/1995/C/S/FO

Black-fronted Duiker/Rwanda
Volcanoes NP/150 sq km/1996/>1,000/S-I/GS
Gishwati & Nyungwe FRs/1,070 sq km/1988/U-R/D/FO

Black-fronted Duiker/Burundi
Kibira NP/377 sq km/1988/U-R/?/F0

Black-fronted Duiker/Angola
Cabinda/?/1992/x/D/IG
northwest & northeast/>5,000 sq km/1992/x/D/IG

Harvey's Red Duiker/Ethiopia
Bale Mts NP/2,471 sq km/1995/x/?/FO
Omo NP/4,015 sq km/1996/x/7/FO

Harvey's Red Duiker/Somalia
Bush-Bush NP/4,267 sq km/1983/x/?/FO

Harvey's Red Duiker/Kenya
Nairobi NP/117 sq km/1993/x/?/FO
Tana River NR & surrounds/200 sq km/1995/U/S/FO
Boni-Dodori NRs/2,117 sq km/1995/C-U/?/FO
Aberdare NP & FR/1,966 sq km/1995/C/S/FO
Mt Kenya NP & FR/1,367 sq km/1995/C/S/FO
Arabuko-Sokoke FR/372 sq km/1995/U/D/FO
other areas/>10,000 sq km/1995/x/D/IG

Harvey's Red Duiker/Tanzania
Kilimanjaro NP & FR/1,835 sq km/1995/C/S/FO
Arusha NP/137 sq km/1988/C-U/S-D/FO
Lake Manyara NP/110 sq km/1988/x/?/F0
Udzungwa Mts NP/1,000 sq km/1996/C/S-D/FO
Mikumi NP/3,215 sq km/1988/x/?/FO
other areas/>10,000 sq km/1996/x/D/IG

Natal Red Duiker/Tanzania
Selous GR/43,626 sq km/1995/C-U/S/FO
other areas in southeast/>5,000 sq km/1996/x/D/IG

Natal Red Duiker/Zambia
Nyika NP/80 sq km/1994/x/S-D/FO

Natal Red Duiker/Malawi
Nyika NP/3,134 sq km/1996/U-R/S/FO
forest reserves/>3,000 sq km/1996/x/S-D/IG

Natal Red Duiker/Mozambique
Gorongosa NP/3,775 sq km/1997/U-R/D/FO
Zinave NP/5,000 sq km/1997/x/D/FO
Maputo GR/800 sq km/1997/3,000/S/IG
Bazaruto NP/150 sq km/1995/x/?/FO
other areas/>100,000 sq km/1997/x/D/IG

Natal Red Duiker/South Africa
Greater St. Lucia Wetland P/2,587 sq km/1994/1,000/S/IG
Hluhluwe-Umfolozi P/965 sq km/1994/300/S/GS
other provincial Rs/-/1994-95/200/S-D/IG
private land/-/1994-95/l ,000/S-D/IG
other areas/-/1995/4,000/D/IG

Natal Red Duiker/Swaziland
Malolotja NR/180 sq km/1994/R/?/F0
Mlawula NR/120 sq km/1994/U/S/F0
other areas/>1,000 sq km/1994/U-R/D/IG

Black Duiker/Guinea
Mt Nimba BR/170 sq km/1990/x/?/F0
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/FO
other areas in south & southeast/>3,000 sq km/1990/U/D/IG

Black Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/R/D/F0
Western Area FR/179 sq km/1988/x/S-D/FO
Loma Mts FR/560 sq km/1989/C-U/?/FO
other areas/>5,000 sq km/1986/x/D/IG

Black Duiker/Liberia
N. Lorma NF/712 sq km/1990/x/?/FO
Gola-Kpelle-Lorma NFs/4,2S3 sq km/1990/x/?/FO
Krahn-Bassa NF/5,140 sq km/1990/C/?/FO
Sapo NP/1,308 sq km/1997/C/S-l/FO
Grebo NF/2,673 sq km/199O/C/?/FO
farmbush & secondary forests/>75,000 sq km/1990/C/7/FO

Black Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/900/D/GS
Haut Bandama GR/1,230 sq km/1990/x/S-D/FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/x/S-D/FO
Tai NP/4,540 sq km/1996/C-U/S-D/F0
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/x/S-D/FO
Cavally-Gouin FRs/1,890 sq km/1990/x/S-D/FO
Mont Peko NP/340 sq km/1990/x/S-D/FO
Azagny NP/200 sq km/1990/x/S/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/x/S-D/FO
other forest reserves/7,950 sq km/1990/x/D/FO
other areas/>40,000 sq km/1990/x/D/IG

Black Duiker/Ghana
Digya NP/3,126 sq km/1995/C/S/FO
Kogyae SNR/324 sq km/1995/R/S-D/FO
Bomfobiri WS/73 sq km/1995/R/D/FO
Bia NP & GPR/306 sq km/1995/C/S/F0
Nini-Suhien NP & Ankasa GPR/311 sq km/1995/C/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/Ab/l/FO
Owabi WS/52 sq km/1995/R/D/FO
other areas/>20,000 sqkm/1995/C-U/S-D/IG

Black Duiker/Togo
Togo Mts/<1,000 sq km/1990/R/D/LP

Black Duiker/Nigeria
southwestern forests/<1,000 sq km/1990/R/D/IG

Red-flanked Duiker/Mali
Boucle du Baoule complex/7,710 sq km/1996/<600/S-D/IG
Bafing FR/1,690 sq km/1996/110/S-D/GS
other areas in southwest/>25,000 sq km/1996/10,000/D/IG

Red-flanked Duiker/Niger
W NP-Tamou FR/2,980 sq km/1988/<100/D/GS

Red-flanked Duiker/Senegal
Niokolo-Koba NP/9,130 sq km/1995/40,000/1/IG
Faleme HZ/10,000 sq km/1988/x/D/FO
Casamance region/>5,000 sq km/1996/R/D/FO

Red-flanked Duiker/Gambia
Kiang W. NP/100 sq km/1988/R/7/FO
other areas/>250 sq km/1988/R/D/FO

Red-flanked Duiker/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S/FO
Cantanhez Forest/650 sq km/1994/x/S-D/FO
Lake Cufada/700 sq km/1991/C/S-D/FO
other areas of mainland/>10,000 sq km/1991/C/S-D/FO

Red-flanked Duiker/Guinea
Badiar NP/380 sq km/1990/U/S/FO
other areas/>25,000 sq km/1990/C/S-D/LP

Red-flanked Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/U/S-D/FO
other areas/>5,000 sq km/1987/U-R/D/IG

Red-flanked Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/6,300/D/GS
Haut Bandama GR/1,230 sq km/1990/C/S-D/FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
Marahoue NP/1,010 sq km/1997/C/D/FO
forest reserves/4,070 sq km/1990/C/D/FO
other areas/>50,000 sq km/1990/x/D/IG

Red-flanked Duiker/Burkina Faso
Arly NP/760 sq km/1991/x/S/GS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/1991/x/S-D/FO
W NP-Kourtiago FR/2,860 sq km/1991/x/?/F0
Nazinga GR/940 sq km/1989/40/S/GS
Diefoula FR/900 sq km/1990/U/D/FO
other areas/>10,000 sq km/1990/x/D/IG

Red-flanked Duiker/Ghana
Mole NP/4,921 sq km/1995/C/S/FO
Bui NP/3,074 sq km/1995/C/S/FO
Gbele GPR/324 sq km/1995/C/S/FO
Digya NP/3,126 sq km/1995/Ab/S/FO
Kogyae SNR/324 sq km/1995/C/S/FO
Bomfobiri WS/73 sq km/1995/C/D/FO
Kalakpa GPR/324 sq km/1995/C/S/FO
other areas/>10,000 sq km/1995/C-U/S-D/FO

Red-flanked Duiker/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U/D/FO
Fazao NP/1,920 sq km/1995/U/D/FO
other areas/>3,000 sq km/1990/U/D/IG

Red-flanked Duiker/Benin
Pendjari NP & HZs/6,505 sq km/1994/C/S/FO
W NP- Djona HZ/7,930 sq km/1994/C/S-D/FO
forest reserves/3,500 sq km/1990/C-U/S-D/FO
other areas/>1,000 sq km/1990/C-U/S-D/IG

Red-flanked Duiker/Nigeria
Kainji Lake NP/5,340 sq km/1990/U/D/FO
Yankari GR/2,240 sq km/1990/U/D/FO
Gashaka Gumpti NP/5,950 sq km/1988/U/D/FO
other protected areas/14,000 sq km/1990/U-R/D/FO
other areas/>10,000 sq km/1990/U-R/D/IG

Red-flanked Duiker/Chad
Logone Oriental-Moyen Chari/<5,000 sq km/1989/R/D/FO

Red-flanked Duiker/Cameroon
N. Province/>29,700 sq km/1998/7,830/D/IG
other areas/>100,000 sq km/1994/x/S-D/IG

Red-flanked Duiker/CAR
Chinko Basin/95,000 sq km/1997/C-U/S-D/FO

Red-flanked Duiker/CAR (continued)
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/>2,000/?/IG
Bamingui-Bangoran NP/11,560 sq km/1995/>1,500/?/IG
Sangba Pilot Zone/11,000 sq km/1995/>2,000/S-I/IG
northwestern region HZs/60,000 sq km/1998/C/S-O/FO
east-central region HZs/70,000 sq km/1997/C-U/S-D/FO
other areas/>10,000 sq km/1995/x/D/IG

Red-flanked Duiker/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/C/?/FO
other areas in northeast/>5,000 sq km/1996/x/D/IG

Red-flanked Duiker/Sudan
Radom NP/7,500 sq km/1994/R/S-D/FO
other areas in southwest/>100,000 sq km/1992/x/S-D/IG

Red-flanked Duiker/Uganda
West Nile district/?/1988/?/?/IG

Zebra Duiker/Guinea
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/F0

Zebra Duiker/Sierra Leone
Gola FRs/980 sq km/1987/R/D/FO

Zebra Duiker/Liberia
N. Lorma NF/712 sq km/1990/R/?/FO
Gola NF/2,070 sq km/1990/x/?/F0
Krahn-Bassa NF/5,140 sq km/1990/x/?/F0
Sapo NP/1,308 sq km/1997/C/?/LP
Grebo NF/2,673 sq km/1990/x/?/FO
other areas/>2,500 sq km/1990/x/?/FO

Zebra Duiker/Ivory Coast
Tai NP/4,540 sq km/1996/C/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/C/D/FO
Cavally-Gouin FR/1,890 sq km/1990/C/S-D/FO
other forest reserves/2,400 sq km/1990/x/S-D/FO

Abbott's Duiker/Tanzania
Kilimanjaro NP & FR/1,835 sq km/1995/U-R/S-D/FO
Udzungwa Mts NP-W. Kilombero FR/1,500 sq km/1996/C/S-D/FO
other areas/>7,500 sq km/1996/U-R/D/IG

Yellow-backed Duiker/Senegal
Basse Casamance NP/50 sq km/1997/U-R/D/FO
Casamance region/>2,500 sq km/1996/R/D/FO

Yellow-backed Duiker/Guinea-Bissau
Corubal River/1,500 sq km/1991/C/S-D/FO
Cantanhez Forest/650 sq km/1994/x/D/FO
Lake Cufada/700 sq km/1991/x/D/FO
other areas of mainland/>1,000 sq km/1991/C/D/FO

Yellow-backed Duiker/Guinea
southwestern forests/>500 sq km/1990/R/D/FO
Ziama & Diecke FRs/1,679 sq km/1990/x/S-D/FO

Yellow-backed Duiker/Sierra Leone
Outamba-Kilimi NP/980 sq km/1986/U/D/F0
Western Area FR/179 sq km/1988/x/?/FO
other areas/>500 sq km/1987/R/D/IG

Yellow-backed Duiker/Liberia
Krahn-Bassa NF/5,140 sq km/1990/R/?/F0
Sapo NP/1,308 sq km/1990/R/?/F0
Grebo NF/2,673 sq km/1990/R/?/FO
other areas/>5,000 sq km/1990/R/?/FO

Yellow-backed Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/R/D/FO
Haut Bandama GR/1,230 sq km/1990/x/S-D/FO
Mont Sangbe NP/950 sq km/1990/C/S-D/FO
Marahoue NP/1,010 sq km/1997/x/S-D/FO
Tai NP/4,540 sq km/1996/R/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/1997/U/S-D/FO
Cavally-Gouin FR/1,890 sq km/1990/R/S-D/F0
Mont Peko NP/340 sq km/1990/x/S-D/FO
Azagny NP/200 sq km/1990/x/S-D/FO
Songan-Tamin-Mabi-Yaya FRs/2,307 sq km/1990/R/S-D/FO
other forest reserves/7,950 sq km/1990/x/S-D/FO

Yellow-backed Duiker/Burkina Faso
Diefoula-Logoniegue FRs/1,140 sq km/1990/R/S-D/FO

Yellow-backed Duiker/Ghana
Mole NP/4,921 sq km/1995/R/?/FO
Gbele GPR/324 sq km/1995/R/S/FO
Digya NP/3,126 sq km/1995/U/D/FO
Bia NP & GPR/306 sq km/1995/R/S/FO
Nini-Suhien NP-Ankasa GPR/311 sq km/1995/R/S/FO
Kakum NP-Assin Attandanso GPR/347 sq km/1995/U/D/FO

Yellow-backed Duiker/Togo
Fazao NP/1,920 sq km/1990/R/D/FO

Yellow-backed Duiker/Benin
Monts Kouffe FR/1,080 sq km/1990/U-R/S-D/FO
Lama FR/162 sq km/1990/U-R/D/FO

Yellow-backed Duiker/Nigeria
Okomu FR/1,082 sq km/1990/x/S-D/FO
Gashaka Gumpti NP/5,950 sq km/1988/U/S-D/FO
Cross River NP/3,750 sq km/1990/U/S-D/FO
Niger Delta/<1,000 sq km/1994/R/D/FO
other areas in southwest & southeast/>3,000 sq km/1990/R/D/IG

Yellow-backed Duiker/Chad
Moyen Chari/?/1989/?/?/IG

Yellow-backed Duiker/Cameroon
Korup NP/1,260 sq km/1994/U-R/S-D/FO
Campo R/3,000 sq km/1994/C/S-D/FO
Dja R/6,194 sq km/1994/U/S-D/FO
Lobeke R/2,500 sq km/1994/C-U/S-D/FO
Adamaoua Mts/?/1997/x/?/F0
other areas in south/>100,000 sq km/1994/x/D/IG

Yellow-backed Duiker/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/1995/>5OO/S-I/IG
Bamingui-Bangoran NP/11,560 sq km/1995/

Sangba Pilot Zone/11,000 sq km/1995/>750/S-I/IG
northern region HZs/60,000 sq km/1996/R/S-D/FO
east-central region HZs/70,000 sq km/1997/R/S-D/FO
Chinko Basin/95,000 sq km/1997/R/S-D/FO
Bangassou Forest/16,600 sq km/1996/Ab/I/F0
Dzanga-Sangha-Ndoki R & NP/4,579 sq km/1995/U-R/S/FO
other areas/>10,000 sq km/1995/x/D/IG

Yellow-backed Duiker/Equatorial Guinea
Monte Alen NP/1,500 sq km/1998/C/S/F0
other areas of Mbini/>5,000 sq km/1998/U-R/D/IG

Yellow-backed Duiker/Gabon
Lope R/5,000 sq km/1994-96/C/S/FO
Gamba complex/11,000 sq km/1994-96/C-U/S/FO
Minkebe Forest/15,000 sq km/1995/U-R/S/FO
other areas/>75,000 sq km/1996/U/S/FO

Yellow-backed Duiker/Congo-Brazzaville
Odzala NP & Rs/2,848 sq km/1995/C/S/FO
Nouabale-Ndoki NP-Kabo UFA/6,266 sq km/1997/C-U/S-I/FO
Lake Tele-Likouala/10,500 sq km/1994/U/?/FO
Conkouati FR/1,450 sq km/1995/x/D/FO
Dimonika BR/1,360 sq km/1991/R/D/FO
Lefini FR/6,300 sq km/1997/R/D/F0
other areas/>80,000 sq km/1995/x/D/IG

Yellow-backed Duiker/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/x/?/FO
Virunga NP/7,800 sq km/1996/R/D/FO
Okapi FR/13,726 sq km/1995/C/S/FO
Maiko NP/10,800 sq km/1992/C/S/FO
Kahuzi-Biega NP & surrounds/11,000 sq km/1995/C-U/S/FO

Yellow-backed Duiker/Congo-Kinshasa (continued)
Salonga NP/36,560 sq km/1989/U/S/FO
other areas/>300,000 sq km/1996/x/D/IG

Yellow-backed Duiker/Sudan
southwestern Western Equatoria/>2,000 sq km /1986/C-U/S-D/FO

Yellow-backed Duiker/Uganda
Bwindi-Impenetrable Forest NP/321 sq km/ 1995/R/I/FO

Yellow-backed Duiker/Kenya
Mau escarpment forests/2,400 sq km/1992/x /D/FO

Yellow-backed Duiker/Angola
Cabinda/?/1992/x/D/IG
northwest & northeast/>5,000 sq km/1992/x/ D/IG

Yellow-backed Duiker/Zambia
Kafue NP/22,357 sq km/1994/U-R/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/ U-R/S-D/IG
Kasanka NP/420 sq km/1994/U/S-I/FO
Mweru Wantipa NP/3,134 sq km/1994/x/?/F0
Nsumbu NP/2,020 sq km/1994/x/?/FO
Lusenga Plain NP/880 sq km/1994/x/S-D/FO
other areas/>5,000 sq km/1994/U-R/D/IG

Jentink's Duiker/Sierra Leone
Western Area FR/179 sq km/1990/R/D/FO
Gola FRs/738 sq km/1987/x/?/LP

Jentink's Duiker/Liberia
Gola NF/2.070 sq km/1990/x/?/FO
N. Lorma NF/712 sq km/1990/x/?/FO
Krahn-Bassa NF/5,140 sq km/1990/U-R/?/FO
Sapo NP/1,308 sq km/1997/U-R/S/LP
Grebo NF/2,673 sq km/1990/U-R/?/FO
Gbi NF/610 sq km/1989/x/?/FO
farmbush & secondary forest/>10,000 sq km/ 1990/U-R/7/IG

Jentink's Duiker/Ivory Coast
Tai NP/4,540 sq km/1996/U-R/S-D/FO
Haut Dodo-Rapide Grah-Hana FRs/4,762 sq km/ 1997/R/D/FO
Cavally-Gouin FR/1,890 sq km/1990/x/S-D/ FO
Scio FR/1,338 sq km/1990/x/S-D/FO

Grey Duiker/Mali
Boucle du Baoule complex/7,710 sq km/1996/ >1,000/S/IG
Bafing FR/1,690 sq km/1996/650/S/GS
other areas in southwest/>30,000 sq km/1996 />5,000/S-D/IG

Grey Duiker/Niger
W NP-Tamou FR/2,980 sq km/1988/>1,000/S /GS
other areas in southwest & south/>10,000 sq km/1988/U/D/IG

Grey Duiker/Senegal
Niokolo-Koba NP/9,130 sq km/1995/2,000/S-I/IG
Faleme HZ/10,000 sq km/1997/x/?/FO
Casamance region/>10,000 sq km/1996/U/D/ FO
Delta du Saloum NP/1,000 sq km/1988/x/?/ FO
Ferio S. FR/6,337 sq km/1988/R/?/FO

Grey Duiker/Gambia
Kiang W. NP/100 sq km/1988/x/?/FO
other areas/>500 sq km/1988/U/?/IG

Grey Duiker/Guinea-Bissau
Corubal River/1,500 sq km/1991AJ/S/FO
Lake Cufada/700 sq km/1991/U/S-D/FO
other areas of mainland/>20,000 sq km/1991/ U/S-D/FO

Grey Duiker/Guinea
northern savannas/>25,000 sq km/1990/C/S-D/IG

Grey Duiker/Ivory Coast
Comoe NP & surrounds/13,710 sq km/1996/ 1,200/D/GS
Haut Bandama GR/1,230 sq km/1990/x/S-D/ FO
Mont Sangbe NP/950 sq km/1990/x/S-D/FO
forest reserves/4,070 sq km/1990/x/S-D/FO
other areas/>30,000 sq km/1990/x/S-D/IG

Grey Duiker/Burkina Faso
Arly NP/760 sq km/1991/1,270/S/GS
Singou-Pama-Madjoari-Arly FRs/5,280 sq km/ 1991/C/S/FO
W NP-Kourtiago FR/2,860 sq km/1991/160/D /AS
Nazinga GR/940 sq km/1995/850/D/GS
Diefoula FR/720 sq km/1997/100/D/GS
other areas/>50,000 sq km/1990/x/D/IG

Grey Duiker/Ghana
Mole NP/4,921 sq km/1995/Ab/S/FO
Bui NP/3,074 sq km/1995/C/S/FO
Gbele GPR/324 sq km/1995/C/S/FO
Digya NP/3,126 sq km/1995/C/S/FO
Kogyae SNR/324 sq km/1995/C/S-D/FO
Bomfobiri WS/73 sq km/1995/x/D/FO
Kalakpa GPR/324 sq km/1995/C/S/FO
Shai Hills GPR/54 sq km/1995/R/S-D/FO
other areas/>20,000 sq km/1995/C-U/S-D/FO

Grey Duiker/Togo
Keran NP-Oti Valley FR/1,700 sq km/1995/U/ D/FO
Fazao NP/1,920 sq km/1995/U/D/FO
Togodo NR/350 sq km/1990/U/S-D/FO
other areas/>4,000 sq km/1990/C-U/S-D/IG

Grey Duiker/Benin
Pendjari NP & HZs/6,505 sq km/1994/>1,000 /S/AS
W NP-Djona HZ/7,930 sq km/1994/C/S/FO
forest reserves/7,900 sq km/1990/C/S-D/F0
other areas/>20,000 sq km/1990/x/S-D/IG

Grey Duiker/Nigeria
Kainji Lake NP/5,340 sq km/1990/C-U/S-D/ FO
Yankari GR/2,240 sq km/1990/C-U/S-D/FO
Gashaka Gumpti NP/5,950 sq km/1990/x/S-D/ FO
other protected areas/17,350 sq km/1990/C-U/S-D/FO
other areas/>100,000 sq km/1990/C-U/S-D/ IG

Grey Duiker/Chad
Zakouma NP/3,000 sq km/1995/400/S-D/AS
Bahr Salamat FR/20,600 sq km/1989/C/S/FO
Siniaka Minia FR/4,260 sq km/1995/400/S/ AS
eastern Salamat/40,000 sq km/1989/C/S/FO
Manda NP/1,140 sq km/1989/x/S-D/FO
other areas in south/>10,000 sq km/1989/x/S -D/IG

Grey Duiker/Cameroon
Waza NP/1,700 sq km/1994/R/S/FO
N. Province/>29,700 sq km/1998/10,170/D/ IG
other areas/>100,000 sq km/1994/x/S-D/IG

Grey Duiker/CAR
Manovo-Gounda-St. Floris NP/17,400 sq km/ 1995/>3,000/S-I/IG
Bamingui-Bangoran NP/11,560 sq km/1995/ >1,500/?/IG
Sangba Pilot Zone/11,000 sq km/1995/>1,500 /S-I/IG
northern region HZs/60,000 sq km/1998/C/S/ FO
east-central region HZs/70,000 sq km/1997/C -U/S-D/FO
Chinko Basin/95,000 sq km/1997/C-U/S-D/FO
other areas/>20,000 sq km/1995/x/S-D/IG

Grey Duiker/Gabon
Bateke Plateau/>1,000 sq km/1996/R/D/F0

Grey Duiker/Congo-Brazzaville
Lekoli-Pandaka FR-M'Boko HR/1,570 sq km/ 1995/U/I/FO
Lefini FR/6,300 sq km/1997/R/D/FO
Mt Fouari FR/156 sq km/1988/x/S-D/FO
Tsoulou FR/300 sq km/1988/x/S-D/FO
other areas/>3,000 sq km/1995/R/D/IG

Grey Duiker/Congo-Kinshasa
Garamba NP & HZs/12,447 sq km/1995/C/S/ FO
Virunga NP/7,800 sq km/1996/R/D/FO
Upemba NP/11,730 sq km/1996/C/S-D/F0
Kundelungu NP/7,600 sq km/1996/C/D/FO
other areas/>150,000 sq km/1996/x/S-D/IG

Grey Duiker/Sudan
Radom NP/7,500 sq km/1994/R/S/FO
other areas in southwest/>100,000 sq km/ 1992/x/S-D/IG
Jebel Marra/>250 sq km/1991/x/S-D/FO
southeastern savannas/>100,000 sq km/1992/ x/S-D/IG

Grey Duiker/Eritrea
Semanawi Bahri/200 sq km/1995/?/?/LP

Grey Duiker/Ethiopia
Simien Mts NP/179 sq km/1995/x/?/FO

Grey Duiker/Ethiopia (continued)
Bale Mts NP/2,471 sq km/1995/C/S/FO
Gambella NP/5,061 sq km/1990/x/?/F0
Awash Valley/17,000 sq km/1995/x/S/FO
Babille Elephant S/>1,000 sq km/1992/x/?/FO
Senkelle WS/54 sq km/1995/x/S-D/FO
Nechisar NP/514 sq km/1995/R/S/FO
Borana CHA-Yabelo WS/41,000 sq km/1995/x/S/FO
Omo-Mago NPs/6,135 sq km/1995/C/S/FO
other areas in highlands, Rift Valley & western lowlands/>100,000 sq km/1995/x/S-D/IG

Grey Duiker/Djibouti
Foret du Day/?/1987/x/?/FO

Grey Duiker/Somalia
Shebelle & Juba Rivers/>500 sq km/1983/x/?/FO
Bush-Bush NP/4,267 sq km/1983/x/?/FO

Grey Duiker/Uganda
Murchison Falls NP & GRs/5,500 sq km/1995/C/S/FO
Aswa Lolim/3,725 sq km/1995/2O/?/AS
Kaiso-Tonya CHA/194 sq km/1995/40/?/AS
Queen Elizabeth NP & GRs/2,419 sq km/1995/x/?/FO
Lake Mburo NP & surrounds/1,563 sq km/1995/40/D/AS
Toro GR-Semliki Flats CHA/1,144 sq km/1995/15/7/AS
Kidepo Valley NP/1,575 sq km/1995/30/?/AS
N. Karamoja CHA/10,800 sq km/1995/130/S/AS
Matheniko GR/1,825 sq km/1995/30/S/AS
Bokora Corridor GR/3,200 sq km/1995/20/0/AS
Pian-Upe GR/3,250 sq km/1995/160/7/AS
S. Karamoja CHA/5,900 sq km/1995/400/S/AS
Mt Elgon NP/1,145 sq km/1988/x/?/FO
other areas/>I 0,000 sq km/1995/x/S-D/IG

Grey Duiker/Kenya
Tsavo NP & surrounds/40,572 sq km/1995/U-R/S/FO
Masai Mara NR/1,670 sq km/1994/U/S/FO
Mara ranches/3,890 sq km/1994/U/S/FO
Nairobi NP/117 sq km/1993/x/S/FO
Shimba Hills NR/217 sq km/1995/x/?/FO
Lake Nakuru NP/139 sq km/1993/x/S/FO
Ruma NP/120 sq km/1994/x/?/FO
Aberdare NP/766 sq km/1995/C/S/FO
Mt Kenya NP/588 sq km/1995/x/S/FO
Mt Elgon NP/169 sq km/1995/C/S/FO
Arabuko-Sokoke FR/372 sq km/1995/U/D/FO
other areas/>50,000 sq km/1995/x/S-D/IG

Grey Duiker/Tanzania
Serengeti ecosystem/27,000 sq km/1991/C/S/FO
Lake Manyara NP/110 sq km/1988/x/?/FO
Kilimanjaro NP & FR/1,835 sq km/1995/C/S/FO
Arusha NP/137 sq km/1988/x/S-D/FO
Tarangire NP & GCAs/12,600 sq km/1996/R/?/F0
Mkomazi GR/3,615 sq km/1996/50/S/AS
Biharamulo-Burigi GRs & surrounds/6,530 sq km/1990/x/?/FO
Moyowosi-Kigosi GRs & GCAs/21,870 sq km/1994/X/7/FO
Mahale Mts NP/1,200 sq km/1988/x/S-D/FO
Ugalla River GR & GCAs/6,900 sq km/1991/x/?/FO
Katavi-Rukwa GCAs/10,652 sq km/1991/130/S/AS
Ruaha ecosystem/42,344 sq km/1993/x/?/FO
Udzungwa Mts NP/1,000 sq km/1996/C/S/FO
Selous ecosystem/92,000 sq km/1994/C/S/FO
other areas/>150,000 sq km/1996/x/S-D/IG

Grey Duiker/Rwanda
Akagera NP/1,500 sq km/1996/x/S-D/IG
other areas/>3,000 sq km/1996/x/S-D/IG

Grey Duiker/Burundi
Ruvubu NP/436 sq km/1988/C/S/FO
other areas/>2,500 sq km/1988/x/S-D/IG

Grey Duiker/Angola
north, west, east & south/>500,000 sq km/1992/x/S-D/IG

Grey Duiker/Zambia
Kafue NP/22,357 sq km/1994/C/S/FO
GMAs adjoining Kafue NP/42,720 sq km/1994/C/S-D/IG
Lower Zambezi NP/4,092 sq km/1995/x/S/FO
Kasanka NP/420 sq km/1994/C/S-I/FO
Lochinvar-Blue Lagoon NPs-Kafue Flats GMA/6,000 sq km/1993/x/S/FO
Sioma Ngwezi NP/5,240 sq km/1991/580/S-D/AS
Liuwa Plain NP/3,660 sq km/1994/C/S/FO
West Lunga NP/1,684 sq km/1994/x/S-D/FO
Mweru Wantipa NP/3,134 sq km/1994/C/S/FO
Nsumbu NP/2,020 sq km/1994/x/S/FO
Lusenga Plain NP/880 sq km/1994/x/S-D/FO
Kaputa GMA/900 sq km/1994/20/S-O/AS
Tondwa GMA/420 sq km/1994/110/S/AS
N. Luangwa NP/4,636 sq km/1995/C/S/FO
S. Luangwa NP/9,050 sq km/1994/C/S/FO
Lupande GMA/4,500 sq km/1994/3,710/S/GS
other Luangwa Valley GMAs/22,840 sq km/1994/C/S/FO
Lukusuzi NP/1,920 sq km/1994/C/S-D/FO
private game ranches/-/1994/140/S-I/QS
other areas/>120,000 sq km/1994/x/S-D/IG

Grey Duiker/Malawi
Nyika NP/3,134 sq km/1996/C/S/FO
Vwaza Marsh GR/986 sq km/1996/60/D/AS
Kasungu NP/2,316 sq km/1996/C/D/FO
Nkhotakota GR/1,802 sq km/1996/1,770/I/GS
Liwonde NP/548 sq km/1996/x/I/FO
Lengwe NP/887 sq km/1996/140/S/GS
Mwabvi GR/340 sq km/1996/x/?/FO
Lake Malawi NP/94 sq km/1996/x/S/FO
forest reserves/>7,500 sq km/1996/x/S-D/IG
other areas/>10,000 sq km/1996/x/S-D/IG

Grey Duiker/Mozambique
Niassa GR & surrounds/15,000 sq km/1997/C/S/FO
Manica Province/?/1998/C/S/FO
Gorongosa NP/3,775 sq km/1997/U-R/S-D/FO
Marromeu GR/1,500 sq km/1997/U-R/D/FO
Zinave NP/5,000 sq km/1997/>1,000/S/IG
Banhine NP/7,000 sq km/1997/>1,000/S/IG
Gaza HZ/40,000 sq km/1997/C/S/FO
Maputo GR/800 sq km/1997/C/S/FO
other areas/>400,000 sq km/1997/x/S-D/IG

Grey Duiker/Namibia
Etosha NP/22,270 sq km/1995/U/S/FO
W. Caprivi GR-Mahango GP-Mamili & Mudumu NPs/2,100 sq km/1988/x/S/FO
Kaudom GP/3,841 sq km/1988/40/S/AS
Waterberg Plateau P/405 sq km/1986/>10/S/GS
Von Bach R/43 sq km/1988/8/S/TC
Daan Viljoen GP/40 sq km/1988/10/S/TC
Namib-Naukluft P/49,768 sq km/1987/R/S/FO
Hardap GP/250 sq km/1988/R/S/FO
Ai-Ais Hot Springs P/461 sq km/1988/R/S/FO
Kaokoland/70,000 sq km/1990/x/S/FO
other communal lands/-/1988/U/S-D/FO
private farmland/-/1992/75,520/S-D/QS

Grey Duiker/Botswana
Ngamiland, Chobe & Central districts/300,000 sq km/1994/12,330/S/AS
Ghanzi, Kgalagadi, Kweneng & Southern districts/250,000 sq km/1994/20,850/1/AS

Grey Duiker/Zimbabwe
Hwange NP/14,651 sq km/1996/C/S/FO
other protected areas/30,690 sq km/1995/C/S/FO
communal lands/>100,000 sq km/1995/C-U/S-D/IG
private farmland/-/1996/>250,000/S/IG

Grey Duiker/South Africa
Kruger NP/21,682 sq km/1998/C/S/FO
Kalahari Gemsbok NP/9,591 sq km/1995/200/S/GS
Vaalbos NP/227 sq km/1995/26/S/GS
Karoo NP/433 sq km/1994/x/S/FO
Mt Zebra NP/67 sq km/1995/20/S/GS
Addo-Zuurberg NP/515 sq km/1995/74/S/GS
Marakele NP/399 sq km/1996/10/S-I/GS
Bontebok NP/28 sq km/1993/25/S/GS
provincial Rs/>20,000 sq km/1994-96/C/S/FO
other areas/>400,000 sq km/1995/C-U/S-D/IG

Grey Duiker/Swaziland
Malolotja NR/180 sq km/1994/C-U/S/FO
Hlane GR/163 sq km/1994/x/S/FO
Mlawula-Ndzindza NRs/175 sq km/1994/x/S/FO
Mlilwane WS/45 sq km/1994/x/S/FO
other areas/>4,000 sq km/1994/x/S-D/IG

# Occasional Papers of the IUCN Species Survival Commission

1. *Species Conservation Priorities in the Tropical Forests of Southeast Asia.* Edited by R.A. Mittermeier and W.R. Constant, 1985, 58pp. (Out of print)

2. *Priorités en matière de conservation des espèces a Madagascar.* Edited by R.A. Mittermeier, L.H. Rakotovao, V. Randrianasolo, E.J. Sterling and D. Devitre, 1987, 167pp. (Out of print)

3. *Biology and Conservation of River Dolphins.* Edited by W.F. Perrin, R.K. Brownell, Zhou Kaiyaand Liu Jiankang, 1989, 173pp. (Out of print)

4. *Rodents. A World Survey of Species of Conservation Concern.* Edited by W.Z. Lidicker, Jr., 1989, 60pp.

5. *The Conservation Biology of Tortoises.* Edited by I.R. Swingland and M.W. Klemens, 1989,202pp. (Out of print)

6. *Biodiversity in Sub-Saharan Africa and its Islands: Conservation, Management, and Sustainable Use.* Compiled by Simon N. Stuart and Richard J. Adams, with a contribution from Martin D. Jenkins, 1991, 242pp.

7. *Polar Bears: Proceedings of the Tenth Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 1991,*107pp.

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The SSC's mission is to conserve biological diversity by developing and executing programs to save, restore and wisely manage species and their habitats. A volunteer network comprised of nearly 7,000 scientists, field researchers, government officials and conservation leaders from 188 countries, the SSC membership is an unmatched source of information about biological diversity and its conservation. As such, SSC members provide technical and scientific counsel for conservation projects throughout the world and serve as resources to governments, international conventions and conservation organizations.

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