



**Background Information and
Species Management Guidelines
for
Namibia's Rare and Valuable Wildlife**



Southern Savanna Buffalo
Syncerus caffer caffer

Introduction

This booklet provides an overview of the southern savanna buffalo in Namibia. It is part of a series of five booklets reviewing the conservation status and management guidelines of three large mammals and two groups of antelopes in Namibia. The other booklets are on savanna elephant, hippopotamus, three large antelopes – roan antelope, sable antelope and tsessebe; and four water-associated grazing antelope – southern reedbuck, common waterbuck, red lechwe and puku.

These booklets summarise two technical reports (*Background Study* and *Management Plan*) prepared by Rowan Martin as part of the Transboundary Mammal Project of the Ministry of Environment and Tourism. The project was facilitated by The Namibia Nature Foundation (NNF) and funded via WWF by the USAID Living in a Finite Environment (LIFE) Programme. Further information can be obtained from the technical reports which can be downloaded from www.nnf.org.na/RARESPECIES. A series of five posters is also available for a quick overview of these issues and the reports, posters and booklets are available on CD from NNF.

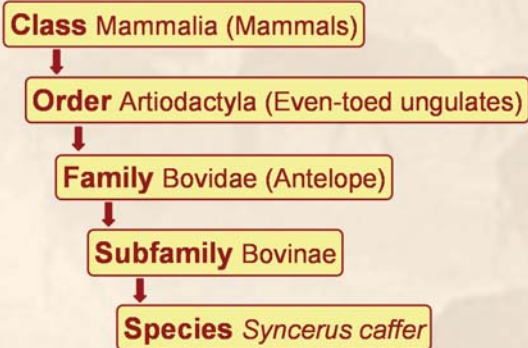
The conservation and management issues and ideas presented here are from a Namibian perspective; however, to fully achieve their aims, many of them require considerable co-operation and collaboration with neighbouring countries. Many of the management actions recommended for one species/group of species would have similar benefits to other rare or high value species.

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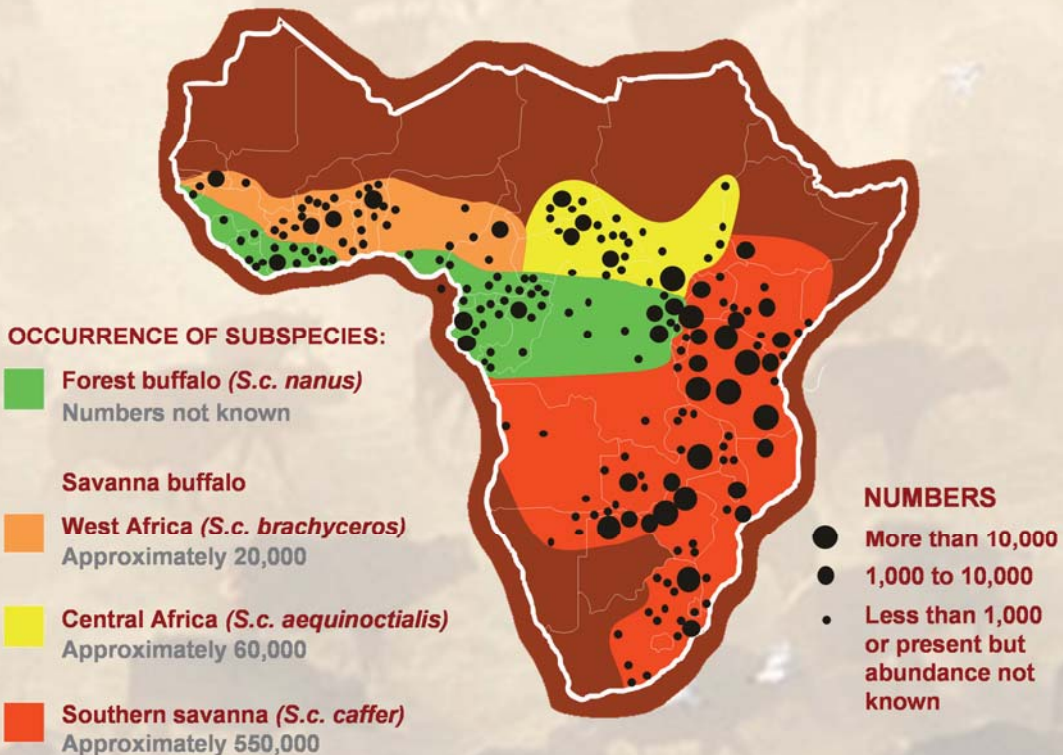
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Biology

Taxonomy



There are 4 distinct subspecies of *Syncerus caffer*. Of these, the Southern Savanna Buffalo (*S.c. caffer*) is by far the most numerous and widely distributed across Africa.



Physical Description and Behaviour

Buffalo are the heaviest species of antelope and, apart from the shape of their horns, they resemble cattle. The front hooves are significantly larger than the hind hooves, presumably because of the massive forequarters, head and neck. Adult male buffalo are black; females, subadults and juveniles all show a tinge of reddish-brown colouring.

Bulls develop large horns and massive horn bosses and, consequently, are highly sought after by safari hunters. They are a key species in the international sport hunting industry. The world record for a buffalo trophy - from the centre of the boss to the tip of the horn - is 125 cm.



Typical measurements	Males	Females
Maximum body weight (kg)	800	750
Average adult body weight (kg)	700	500
Age to reach full adult weight (years)	7	5
Shoulder height for adults (cm)	155	145
Weight of a buffalo calf at birth (kg)	40	

Buffalo form large herds in the wet season when food is abundant and separate into small herds when food is scarce. Daily activity cycles are more pronounced in the dry season when food quality is poorer, with animals spending little time grazing in the heat of the day and devoting longer periods to ruminating.

Buffalo bulls can be extremely dangerous, particularly when wounded. Aggression amongst buffalo males often results in animals being expelled from herds. However, male mortality is no worse than female mortality and social stress does not cause mortality directly. Buffalo waste little energy in competing for territory; their best strategy is to use resources as fast as possible when they are abundant.

Habitats

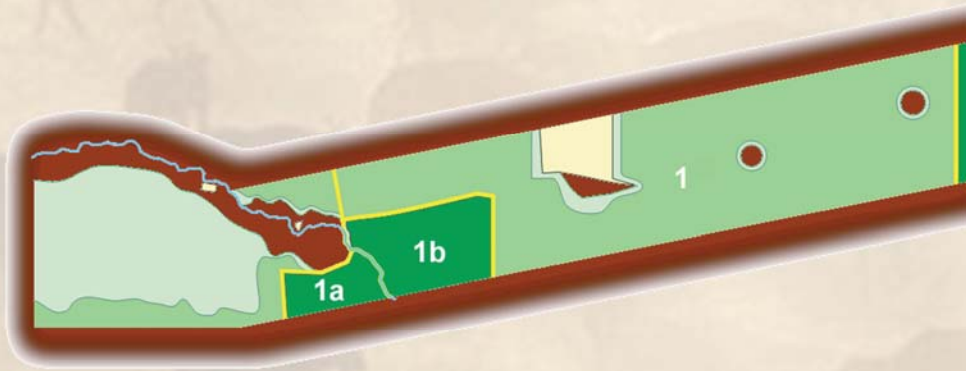
Buffalo require a year-round supply of grass, adequate water and shade. Suitable habitat includes Mopane, Miombo, Acacia and Teak woodlands, riparian fringes and 'omurambas'. Buffalo normally drink twice a day, drinking an average of about 30 litres per day.

In Namibia, most of the Caprivi region is good habitat for buffalo except where distance to water is a constraint. In the rest of the country, any area which can support cattle could also support buffalo. Carrying capacities in the arid south and west would be lower, and buffalo are unlikely to be able to survive at all in any area where annual rainfall is lower than about 200 mm. Large parts of the north have held buffalo in the past and could probably carry modest densities today; however, current veterinary policies and practices preclude this.



Numbers and

The distribution of buffalo in the Caprivi and Kavango is shown below. The present buffalo population is some 5,000 animals which could rise to perhaps 10,000 animals in the core areas of the range and as many as 20,000 animals in the Caprivi and Kavango as a whole if conditions were favourable in the 'medium' and 'maximum' ranges.

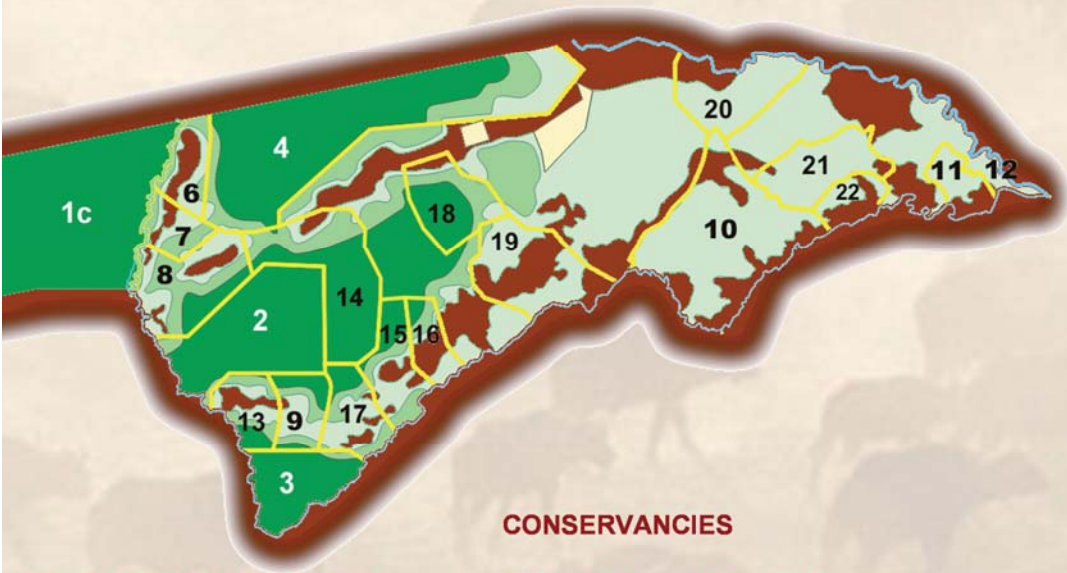


Two small disease-free buffalo herds exist in the main body of the country: one south of the veterinary control fence in the Waterberg Plateau Park (300 animals) and one at Tsumkwe in the Nyae Nyae Conservancy (100 animals).

Distribution in Namibia

BUFFALO RANGE

Area (km ²)	Potential population	Color	Description
5,000	10,000	Dark Green	Core range: Areas where buffalo should reach full potential if water supplies are developed, conservancies fulfil expectations and illegal hunting is minimised.
4,000	5,000	Medium Green	Medium range: Additional range which buffalo could colonise.
8,000	5,000	Light Green	Maximum possible range: Further range which buffalo might occupy under favourable policies with active promotion and major incentives for local communities.



CONSERVANCIES

STATE PROTECTED AREAS

- 1. Bwabwata National Park
 - 1a. Mahango Core Area
 - 1b. Western Core Area
 - 1c. Eastern Core Area
- 2. Mudumu National Park
- 3. Mamili National Park
- 4. State Forest Reserve

Registered

- 6. Kwandu
- 7. Mayuni
- 8. Mashi
- 9. Wuparo
- 10. Salambala
- 11. Kasika
- 12. Impalila
- 13. Balyerwa
- 14. Sobbe

Emerging

- 15. Batubaja
- 16. Kapani
- 17. Malengalenga
- 18. Sibinda
- 19. Bamunu
- 20. Sikunga
- 21. Lusese
- 22. Nakobolelwa

STATE AGRICULTURAL PROJECTS



Population Dynamics

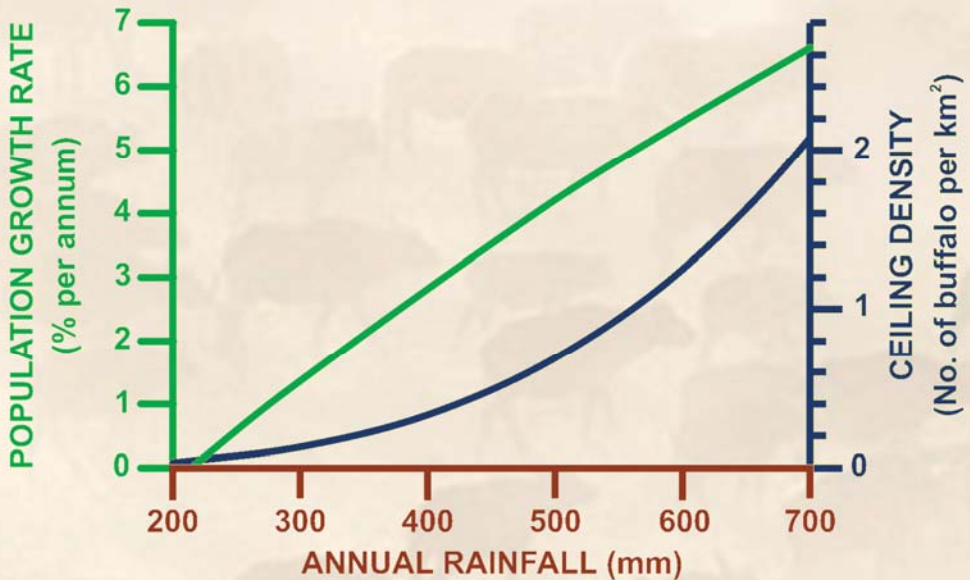


Buffalo breed seasonally in southern Africa with the majority of births occurring in January and February. In the Caprivi and Kavango regions, the key reproductive parameters are as follows:

Longevity	18 years (in the wild)
Gestation period	330 - 346 days
Age at first conception	3 - 6 years
Breeding lifetime	Cows breed until about 14 years old with peak fecundity at about 10 years
Age-specific fecundity	Females produce a calf about every two years
Age-specific mortality	Mortality is about 20% for juveniles, decreasing to some 3% at 3 years old. Mortality increases progressively above 11 years as animals approach old age.
Sex ratio	Very close to 1:1

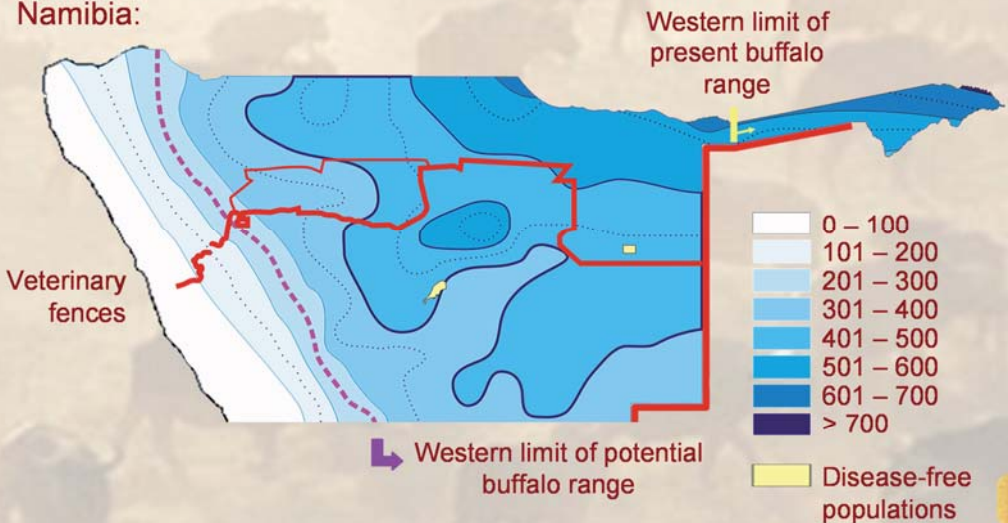
The rinderpest epidemic of 1890 - 1900 drastically reduced buffalo numbers throughout southern Africa. Except in Caprivi, the Namibian population was brought to extinction. After the epidemic, buffalo increased their range southwards and westwards up until the 1960s. However, this expansion was terminated by the advent of veterinary control fencing and the elimination of buffalo in the farming districts.

Ecological carrying capacity for buffalo is strongly linked to rainfall:



Buffalo do not occur where annual rainfall is less than about 200 mm and their maximum densities are almost linearly related to rainfall above this. In higher rainfall areas (500 mm+), density might reach 2 buffalo per km².

Influence of rainfall and veterinary fences on buffalo distribution in Namibia:



Limiting Factors

Ecological factors

Most savanna habitats are suitable for buffalo providing **rainfall** is adequate. Rainfall is the primary factor which affects population growth rate and the overall carrying capacity through food production. Even habitats with good food may be unavailable to buffalo if there is insufficient surface water.

With the exception of rinderpest, the effects of the various **diseases** to which buffalo are susceptible are also relatively minor. Together, predation and disease tend to be secondary factors which act on undernourished animals.

Buffalo populations are regulated by adult mortality caused by under-nutrition as a result of **food shortage**: in particular, the decline in quality and quantity of food below the maintenance level required during the dry season. Food shortage, in turn, is caused by **competition**. In the Caprivi, competition for food with elephants may also be affecting buffalo numbers. Competition for food, between buffalo or with other species, is a critical factor regulating buffalo populations.

Human factors

The ecological factors with a potential effect on buffalo abundance are secondary to the human-induced factors –

Illegal hunting in and around the Caprivi may be reducing buffalo numbers but this may be less important than the factors which follow.

Veterinary control measures are probably the single most important determinant of buffalo distribution and numbers within Namibia and across the entire subregion. Large parts of the potential range are not available to buffalo and, within the allowed range, many populations are becoming isolated as a result of the placement of fences.



Within the Caprivi and northern Botswana, the location of **human communities** and their **cattle** dictates the application of veterinary measures and also results in direct competition with buffalo for land and grazing; a competition which buffalo cannot win. The available range for buffalo is determined by patterns of human settlement, the amount of land cleared for agriculture and the grazing requirements of cattle.

Parks, people and cattle in Caprivi

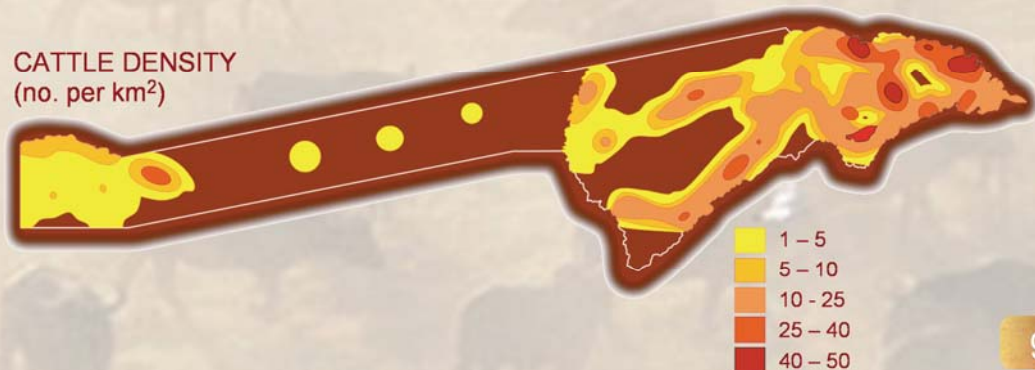
PARKS AND CONSERVANCIES



POPULATION DENSITY (people per km²)



CATTLE DENSITY (no. per km²)



Significance

Conservation Significance

The Southern Savanna buffalo is not under any conservation threat in a global or regional context and is classified as “Lower Risk (Conservation Dependent)” in the IUCN Red Data Book. It is regarded as a valuable species in Namibia. The greatest danger to the Namibian buffalo population is probably the fragmentation which could arise if links with the Botswana population were severed due to veterinary control fencing or the spread of settlement and subsistence agriculture within the Caprivi and Kavango, resulting in the isolation of subpopulations.

It is difficult to argue on conservation grounds that more buffalo are needed in Namibia. Whilst there are no longer buffalo in the main body of the country where they were once common, their functional role as bulk grazers in ecosystems has been taken over by cattle and this is seen by many landholders and veterinarians as a good thing. Their presence in these areas would be unlikely to result in a significant increase in non-hunting tourism income. However, their ecological role in protected areas such as Etosha and Khaudum National Parks would be very beneficial to the ecosystem.

The area in which the abundance of buffalo is most significant is the safari hunting industry.



Economic Significance

The primary importance of buffalo in land under wildlife management is their pivotal role in the international sport hunting industry. A single trophy bull is worth more than US\$10,000. If buffalo densities were raised from their present level of 0.25/km² to 1.5/km² in the core areas of the Caprivi (4,000 km²), the net earnings from the land would increase from about US\$4.7/ha to US\$8.8/ha. The addition of some 5,000 buffalo would allow 150 trophies to be taken annually and the net income would increase by US\$1.6 million. In effect, every buffalo in the population would be providing an income of some US\$327 per year.

If the buffalo population was at carrying capacity, the potential net income from wildlife in the Caprivi could be raised from its present level of US\$2.5 million to US\$7.5 million. This would result in the maximum possible income from land in the Caprivi and provide the incentive for additional land to be managed under wildlife. The income would benefit the State and conservancies.



Similarly, if buffalo were reintroduced to commercial farms or conservancies in northern Namibia, the present negative land use value of some US\$0.35/ha in these areas would change to a net positive return of about US\$1.27/ha.

The economic value which can be generated around buffalo would be about double the financial value of the buffalo trophy.

Stakeholders



The primary stakeholders affected by the abundance or absence of buffalo in Namibia are landholders – the State through parks, conservancies (on private and communal land) and other private and communal landholders.

Secondary stakeholders are those who have investments in land and the wildlife industry, and who buy the products the primary stakeholders produce. Tertiary stakeholders include those with an interest in the conservation of buffalo.

Namibia has been at the forefront of African nations in developing policies, legislation and institutions which empower landholders to manage wildlife on their land. These enlightened policies have resulted in tourism contributing US\$60 million annually to the national economy. International safari hunting on private and communal land generates some 14% of this amount. The income to conservancies was about US\$5.6 million in 2007.



Transboundary Co-operation

A major trans-frontier conservation area centered on the Caprivi is an admirable long-term goal – but it should be preceded by initiatives which build collaboration between Namibia and its neighbours (Angola, Botswana, Zambia and Zimbabwe).

The management of buffalo is an appropriate vehicle for beginning to develop such linkages. The primary objective should be to avoid or minimise the fragmentation of buffalo populations through veterinary control measures or the spread of unplanned settlements. To achieve this will require collaborative management at a scale which transcends national boundaries. A start has been made by engaging in dialogue on buffalo management with Botswana.



Management

Goal:

To realise the full potential of buffalo as a component of wildlife-based land use both in the areas where the species presently occurs and in appropriate areas where it used to occur.

Namibia has a population of some 5,000 buffalo in the Caprivi and Kavango and two other small disease-free populations in the main body of the country. The potential range of 10,000km² in the Caprivi and Kavango could carry some 15,000 buffalo. The adjacent northern Botswana population is about 90,000 buffalo. The social and institutional requirements to achieve this increase are inextricably linked to the ecological and economic objectives and must be integrated into each management issue.

Ecological Objectives

Range:

The range available to buffalo in the Caprivi and Kavango will not fall below 10,000 km²;

The range will be maintained as an intact area without fragmentation resulting in isolated subpopulations;

To the maximum extent possible, key riparian habitats along the Kavango, Kwando, Linyanti, Chobe, and Zambezi River frontages will be secured;

Linkages with the Botswana buffalo population will be maintained and enhanced.

To achieve the full potential for buffalo in the Caprivi and Kavango **the buffalo range needs to be secured**: currently, veterinary control fencing and *ad hoc* patterns of settlement are fragmenting the population and reducing the available range. Linkages with the Botswana buffalo population are crucial in this respect. Many of the threats of fragmentation can be addressed by internal land use planning in existing and emerging conservancies. The new co-management initiatives between the State and conservancies hold great promise for managing at an appropriate scale.

Habitat:

The impact of fire will be reduced from its present level so that no more than 25% of the buffalo range is burnt each year;

Those parts of the range which are at present inaccessible to buffalo due to lack of surface water will be made available through development of water supplies;

Research will be undertaken to assess the degree of inter-specific competition between buffalo and other species, particularly the large population of elephants.

Having secured the range, **habitats need to be improved**. More than half of the grazing is destroyed by fire each year; parts of the range are inaccessible due to lack of surface water and competition with the elephant population may be further limiting buffalo. Habitats could be improved through a network of firebreaks and adequate manpower and equipment to control fires, permanent game watering points in Bwabwata National Park and the Forest Reserve and a significant reduction in elephant numbers under an adaptive management experiment.

Abundance:

The buffalo population in Caprivi and Kavango will increase to 15,000 animals within 30 years;

Numbers of buffalo illegally killed will not exceed 1% of the population per year;

All practical measures will be taken to minimise the likelihood of buffalo contracting diseases from domestic livestock which threaten their well-being.

To achieve the growth rate of which the buffalo are capable, **illegal hunting must be contained**. Buffalo populations can withstand illegal offtakes of over 5% but, at such a level, their growth rate is zero. This requires a major effort from conservancies and a level of field staff and operating budgets in the parks which must be above the minimum threshold.

The buffalo need **protection against domestic livestock diseases** such as Rinderpest and Contagious Bovine Pleuropneumonia (CBPP). The primary measure needed is the avoidance of contact with domestic livestock. This poses problems in the Caprivi because land use allocations are in a state of flux.

Economic Objective

With the Caprivi and Kavango buffalo population at carrying capacity, the net annual income from international safari hunting will be increased from its present potential level of some US\$2.5 million by an additional US\$5 million, making wildlife-based land use the highest valued production system for the Caprivi and Kavango. This income should equitably benefit both the State and conservancies as the primary stakeholders, and safari operators as secondary stakeholders.



To maximise income for the primary stakeholders -

Sustainable sport hunting quotas should be set:

This should be done through adaptive management using the criterion that there should be a significant number of trophies from bulls which are older than 10 years. Harvesting buffalo for meat should be avoided because it reduces the overall sport hunting potential.

Quotas need to be set for the entire range in the Caprivi because of the mobility of buffalo. On a larger scale the same principle applies. Some buffalo trophies would be derived from populations shared between Botswana and Namibia. This is a test case for developing workable trans-boundary institutions for quota setting which ultimately lead to income sharing.

Safari hunting concessions should be sold to maximum advantage:

The best prices are usually obtained through open tender or on public auction and it is difficult for corrupt practices to affect the outcome. Tenders offer opportunities to conservancies to negotiate a suite of benefits (e.g. jobs, training, meat distribution) and to find partners with whom they can establish good, long-term relationships.

This series of booklets provides an overview of 5 groups of species:

Southern Savanna Buffalo *Syncerus caffer caffer*

Savanna Elephant *Loxodonta africana africana*

Hippopotamus *Hippopotamus amphibius*

Roan Antelope *Hippotragus equinus*

Sable Antelope *Hippotragus niger niger*

Tsessebe *Damaliscus lunatus lunatus*

Southern Reedbuck *Redunca arundinum arundinum*

Common Waterbuck *Kobus ellipsiprymnus ellipsiprymnus*

Red Lechwe *Kobus leche leche*

Puku *Kobus vardoni*

Photos: inside front cover S. Mayes; p2 S. Linder; p3 top & bottom K. Landen; p6 S. Mayes; p9 DED-CFN Project; p10 S. Linder; p13 A. Symonds; p15 <http://photography.nationalgeographic.com>; p16 K. Landen; inside back cover S. Mayes.





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