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

Hippopotamus

Hippopotamus amphibius

Introduction

This booklet provides an overview of the hippopotamus 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, southern savanna buffalo, 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. 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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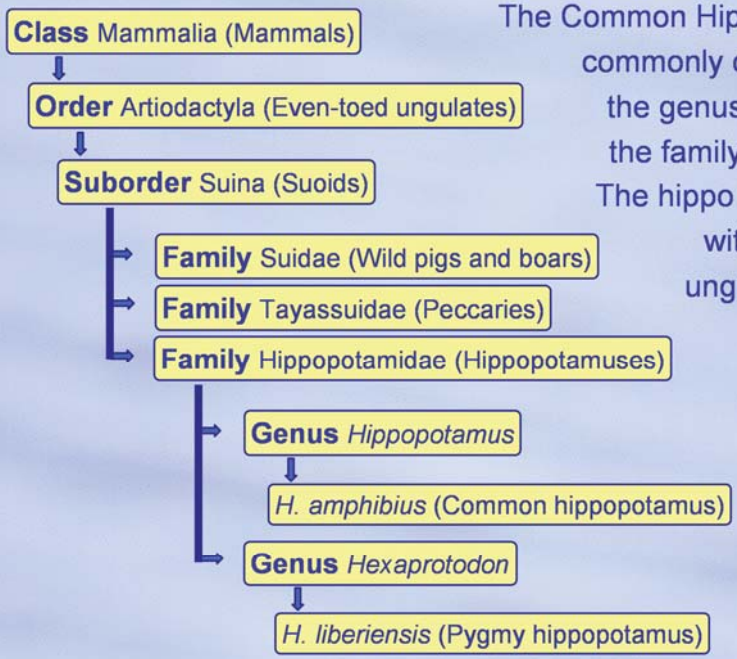
Taxonomy



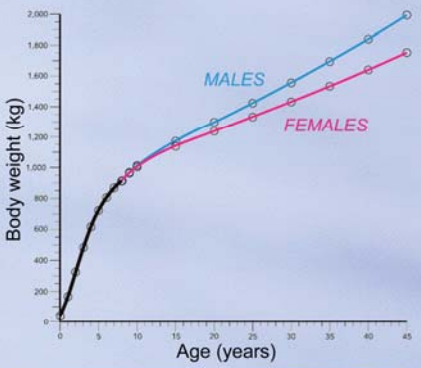
The Common Hippopotamus (more commonly called 'hippo') is in the genus *Hippopotamus* in the family Hippopotamidae. The hippo is classified along with other even-toed ungulates in the order Artiodactyla.

No sub-species of common hippo are recognised and the only other hippo species that exists, Pygmy Hippo, is in a separate genus; it occurs in West Africa.

It is understood that the hippos evolved 225-195 million years ago. The earliest recognisable hippo forebears date back to the Miocene. Until 1985, naturalists grouped hippos with pigs based on molar patterns. But recent studies indicate that hippos have more in common with whales than with other Artiodactyls; it seems that hippos and whales shared a common aquatic ancestor that branched off from the Artiodactyls around 60 million years ago.

Physical Description

The common hippopotamus is amongst the largest land mammals. Male hippos can achieve body weights greater than 2,500 kg; females are smaller with average weights of 1,300 to 1,500 kg. The male hippo is known as a bull, a female as a cow and a baby as a calf.



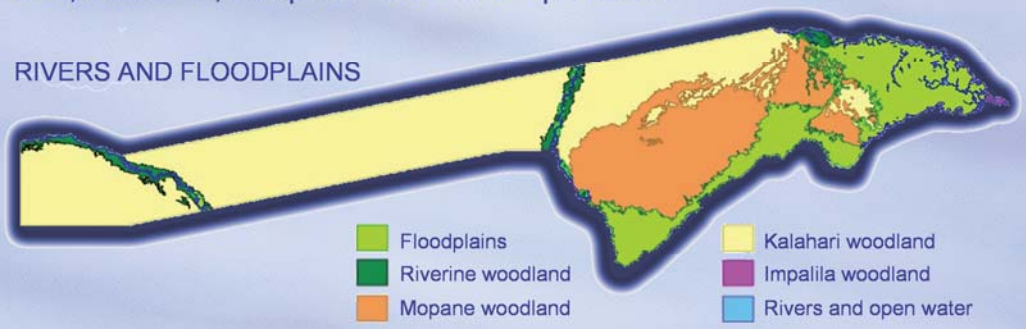
The hippo has a barrel-shaped body, smooth hairless skin and short stout legs. The tail is abbreviated and flattened with a sparse fringe of bristles at the tip. The head is broad and massive with eyes, ears and nostrils on top of the skull, probably an adaptation to spending most of the time semi-submerged in water. The skin has a unique structure which causes a high rate of water loss when exposed to the air – further reason for remaining in water during the day. The body skin is greyish-black with a pink tinge; the skin around the eyes and ears is pinkish-yellow and the gape of the mouth is flesh-coloured.

Hippos have an enormous mouth and teeth. The canines and incisors are extremely enlarged with the former being used exclusively for fighting and the latter for digging. The lower canines are long and are kept very sharp by continuous vertical wear against the short upper canines. There is considerable difference in the canine and incisor growth between males and females. The large protuberances on the front of the upper jaws of male hippos can be used to help in identifying the sex of an adult hippo in water.

Habitats

The hippo is semi-aquatic, inhabiting rivers and lakes in groups. Their habitat must satisfy, firstly, their need for a 'daily living' space - aquatic conditions - and for suitable grazing areas. The hippo grazes almost entirely on short grass and sedges.

Where available, hippos select open stretches of permanent water with submerged sandbanks where they can rest during the day with their back and heads just out of the water and their young can suckle without swimming. They prefer slack and relatively shallow water but like to have sufficient deep water nearby in which to totally submerge. The daily movements between water and the grazing range result in trampling and erosion to river banks. When an exit point from a river becomes unusable due to erosion, hippos will begin another nearby and, over time, this process can reshape rivers.



If sufficient grazing is available hippos tend to remain close to rivers but they will travel long distances to graze if necessitated by drought, arid conditions or competition with humans. In Caprivi, the influence of human activities on the daily living space of hippo is a highly significant factor: hippos are competing for the same resources along river margins as humans and their livestock.

Behaviour

Hippos tend to stay in large groups (called pods) in their territories in water. Group size can reach 45 animals and is influenced by the availability of resources. Hippos stay submerged in water during the day and come out at night to feed. They are able to stay hidden in channels and reedbeds during the day where they are safe from human predation. They can remain under water for over five minutes and surface to breathe with only their nostrils appearing above the water.

It is commonly stated that hippos feed mostly at night because of the need to avoid exposing their sensitive skin to direct sunlight. In some areas, however, they are frequently seen grazing during the day and basking exposed to the full heat of the sun.

Hippos defecate in the water. Males spread their dung by paddling vigorously with their tails. This is thought to be a signalling behaviour rather than a territorial display and this signalling may, in many cases, be a prelude to aggression either to humans or to other hippos. Mating and giving birth also take place under water.

Hippo are capable of moving long distances in search of food. In Caprivi, hippos move up to 90 km from the Kwando river into the Omurambas of the Western Caprivi during good rains.

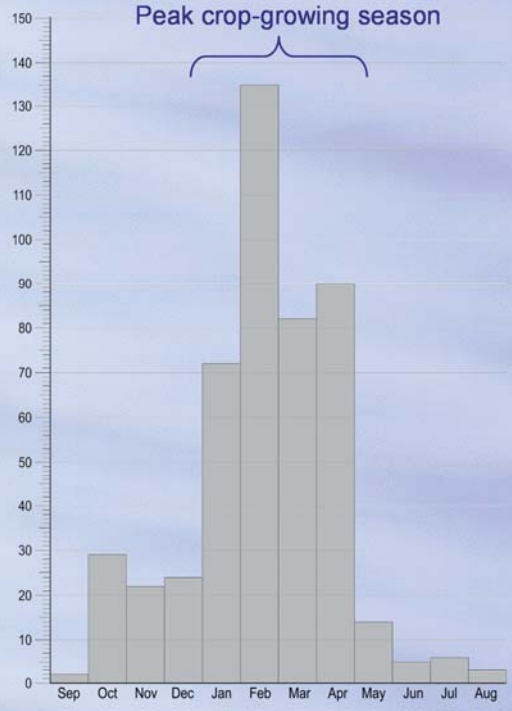
An average hippo requires about 150 kg of food daily. Although hippos graze predominantly on wild grasses and sedges, they will consume maize, sugar cane, pumpkins, beans, cabbages, melons and other vegetables if the opportunity arises. They can devastate crops planted close to river margins. Hippos do not chew the cud and are known as pseudoruminants. Grazing is a solitary activity.

Hippos can be a physical threat to humans; they are among the most dangerous and aggressive of all animals and the hippo is said to be Africa's most dangerous animal. Although they are stocky and heavy, they can run at about 30 km/hour for short distances. In Namibia the greatest conflict with humans occurs on the Kwando river frontage.

Human-hippo conflict incidences in the Caprivi conservancies

Conservancy	2001	2002	2003	2004
Balyerwa	-	-	-	8
Impalila	0	6	12	27
Kasika	15	2	4	25
Kwandu	33	77	82	31
Lianshulu	-	-	12	-
Lusese	-	-	0	2
Malengalenga	-	-	2	9
Mashi	20	16	3	18
Mayuni	-	16	124	17
Nakobolelwa	-	-	0	0
Salambala	0	3	2	1
Wuparo	0	12	36	4

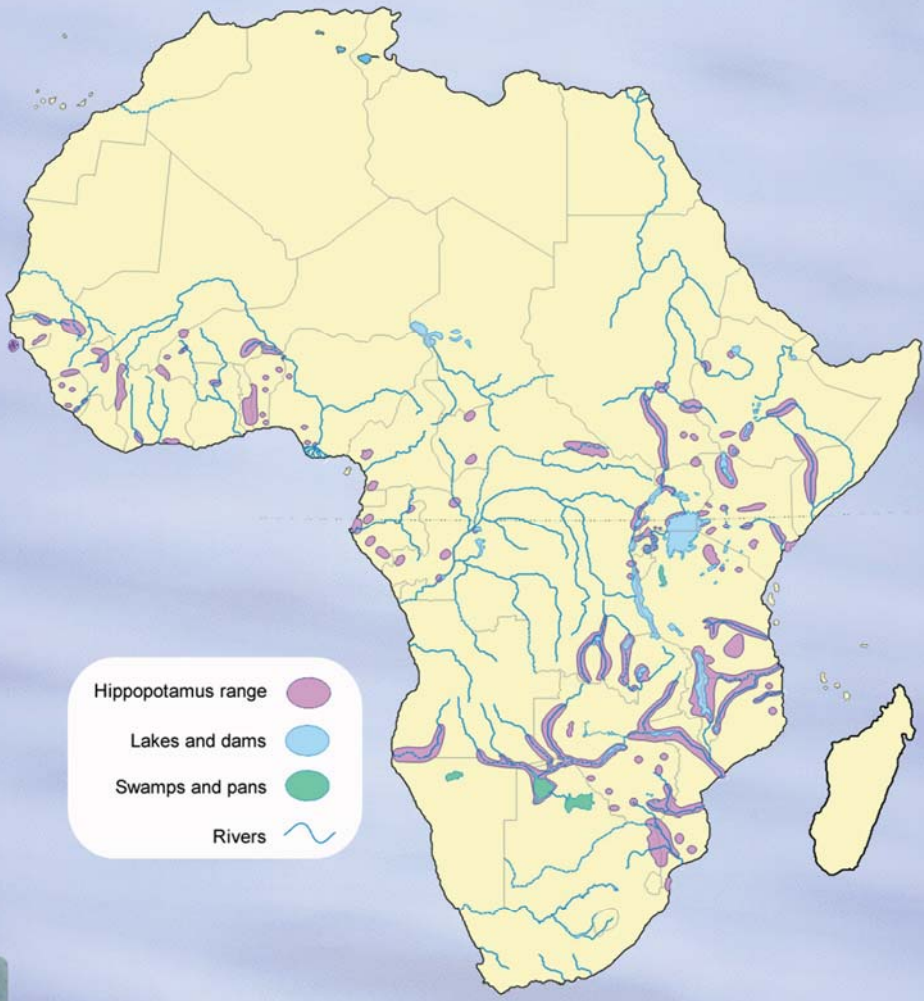
- represents a year with no monitoring



Numbers and Distribution

Africa

The common hippo is distributed throughout Africa and the population in the whole of Africa is estimated to be between 130,000 and 155,000. More than half of this (some 80,000 animals) occurs in southern Africa with about 1,500 in Namibia. Except for the Zambian population which appears to be increasing, hippo populations are stable or declining in most of the other countries.

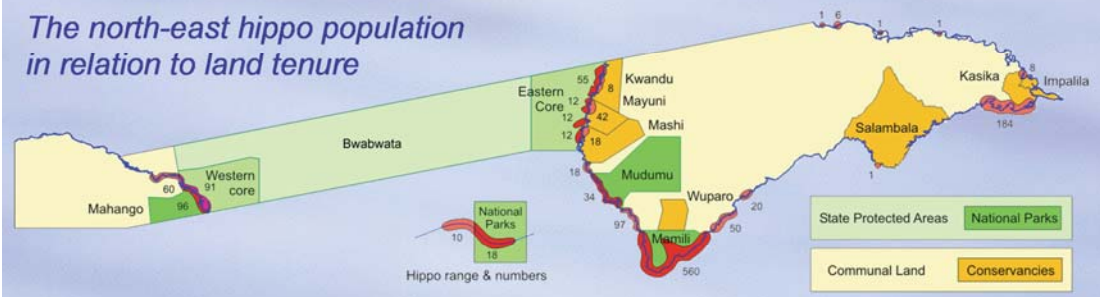


Namibia

The aridity of Namibia limits the potential distribution of hippos to the large perennial rivers, all of which are located on the boundaries of the country. Only in the Caprivi is the rainfall sufficiently high to support significant numbers of hippos. However, it appears that Namibia enjoyed wetter conditions than it does today until about two centuries ago as hippo tusks have been found in the Kuiseb and Swakop rivers. Hippos may even have been in the Windhoek area when there were large areas of permanent open water in the 19th century.

Of the 1,500 hippos in Namibia, most are in the Caprivi region in the wetlands and floodplains of the Kwando, Linyanti, Chobe and Zambezi rivers; these are along international borders and thus shared with neighbouring countries (Botswana and Zambia). A 2004 survey showed the following distribution:

The north-east hippo population in relation to land tenure



Kavango	Kwando	Mamili NP	Chobe / Linyanti	Zambezi	TOTAL
247	308	560	255	17	**1,387**

In addition to those in Caprivi, a few hippos also occur on the 'upper' Okavango in the area around Nkurenkuru; at the Cuito/Okavango confluence; and on the Kunene River. These total fewer than 100 animals.

Population Dynamics

Hippos live for up to about 45 - 50 years. They reach sexual maturity at 8 years and remain fertile throughout their life although fecundity reduces. Young hippos can bear a calf every 2 years. Most hippo populations breed throughout the year, but some breed seasonally.

Longevity	50 years
Gestation period	7.5 – 8 months
Age at first conception	Extremely variable depending on nutritional stress
Age at sexual maturity	8 years
Age at full reproductive capacity	10 years
Fecundity	0.5 calves / female / year
Central mortality	3%
Juvenile mortality (first year)	12%
Mortality (second year)	6%

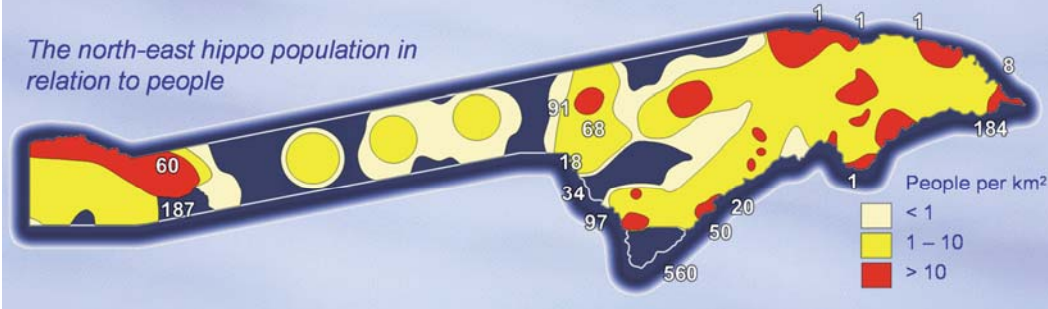
Taking into consideration the reproductive parameters of the Namibian population, it appears the species is capable of maintaining a high growth rate and productivity.

The reproductive strategy of the hippo is well adapted to the semi-arid environments of Africa. When resources are limited, populations are able to maintain stability by delaying sexual maturity and fecundity to adjust to the environmental carrying capacity. Equally, a population can increase rapidly when resources become abundant.

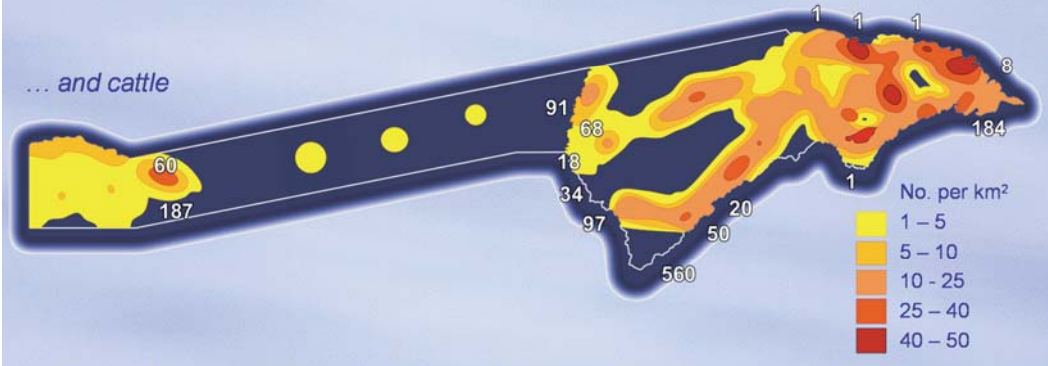
Limiting Factors

Most of Namibia is unsuitable for hippos. Only the Caprivi and Kavango have suitable large wetland systems and high enough rainfall to carry a significant hippo population. The main factors limiting hippos here are human settlement and competition with cattle. Illegal hunting, as a result of high human densities and the nature of the hippo as a problem animal and a potential source of meat, is also another factor. Conservancy development in the Caprivi has reduced illegal hunting by Namibians, but with the animal's major habitat (rivers) being shared international boundaries, poaching from neighbouring countries has the capability of reducing Namibia's 'share' of hippos in the Zambezi and Okavango rivers.

The north-east hippo population in relation to people



… and cattle



The ultimate factor limiting hippo numbers is the fact that wildlife management is not the primary form of land use in the Caprivi. There is a deep cultural commitment to raising cattle and growing crops. The hippo is seen as a threat and is not tolerated by humans.

Significance

Conservation Significance

The species is classified as of 'Least Concern' in the IUCN Red Data book. It was listed on Appendix II of CITES* in 1995 and is classified as Specially Protected Game under Namibian law.

** CITES = Convention on International Trade in Endangered Species of Wild Flora and Fauna*

Namibia holds about 1% of the African hippo population. The species is not considered to be under any threat here.

Whilst hippo currently provide moderate benefits to the people of Caprivi they do, at the same time, cause significant crop losses. The management measures required to enhance the status of hippos may include a greater devolution of rights and responsibilities for hippo management combined with a co-ordinated small live capture and sell and sustainable harvesting programme. However, this will not be possible while the species is classified as Specially Protected Game – a classification which may, in fact, be acting against the conservation of the species. In situations where hippos are unable to increase in number, natural regulating mechanisms tend to reduce population growth; cropping from the population may in fact stimulate productivity.

Economic Significance

Hippos could make a significant financial and economic contribution to the wildlife industry in the Caprivi through –

- Enhanced tourism
- Live capture and sale
- Harvesting for skin and meat
- International sport hunting for trophies
- Control of problem animals

The highest valued use for an adult male hippo lies in the sport hunting industry. The net value of a single trophy bull is about US$8,000 including skin and meat values. There is also a small market for live hippos, with prices reaching about N$7,000 per hippo at recent wildlife auctions.

The value of hippo to non-hunting tourism in the Caprivi is difficult to assess and has not been adequately studied. It is unlikely that tourism returns gained as a result of increasing hippo numbers will be as great as the income derived from consumptive uses, but all forms of use should be optimised to get the best economic value from hippos.

Stakeholders

Landholders – the State through parks, conservancies (on private and communal land) and others – are the primary stakeholders affected by the presence of hippos.

The secondary stakeholders are those with investments in land and the wildlife tourism industry and those who buy products which the primary stakeholders' produce. Other stakeholders include those who are interested in the conservation of hippos.

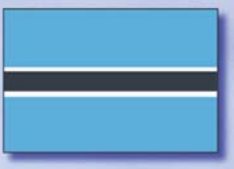
Under Namibia's evolving wildlife legislation, management plans are required for species that are rare and valuable and which share boundaries with neighbouring countries. Although the hippo is not rare it is potentially very valuable and through a mixture of consumptive uses it has the potential to make a significant financial contribution to the people of the Caprivi and to provide employment. A management plan which treats hippos as a valuable resource could become an engine for development in the Caprivi.

With Namibia's commitment to sustainable and highest valued forms of land use, it seems the hippo will continue to be subjected to consumptive use. There are, therefore, good reasons for trying to maximise benefits through scientific management of the population.

Transboundary Co-operation

There is a strong need for transboundary co-operation for hippo management. Hippos live in perennial rivers on international boundaries and in Namibia 35% of hippo populations can be regarded as shared animals.

The Ministry of Environment and Tourism of Namibia has taken the initiative to establish cross-boundary links with Botswana on species management. Namibia must seek collaboration with Angola, Zambia and Zimbabwe as well, which will produce benefits for local peoples in all these countries. Illegal hunting in these countries affects the Namibian hippo population.



Namibia needs to be cautious and sensitive in exploiting hippos along the Chobe, Linyati and Kwando rivers and, in general, should seek full participation from Botswana. Botswana must be informed about the rationale behind all management programmes, quotas and associated assumptions. At the same time Namibia should not be too hesitant in going ahead with a harvesting scheme.

Management

Typically, most wildlife management plans begin with ecological and biodiversity considerations. However, in the case of hippo, economic consideration gets priority followed by social issues and ecological factors; in order to achieve the ecological objective of creating the conditions for the hippo population to increase, it may be necessary to achieve the social and economic objectives first.

The three main actions in the management guidelines are:

- Manage the Caprivi hippo population for maximum sustainable benefit
- Protect remnant populations of the Kunene and upper Okavango rivers *in situ*
- Re-introduce hippo to the Orange River

	No.	PROPOSED QUOTAS			
		Trophy hunting	Problem animals	Sustainable harvesting	Capture and sell
TOTALS	**893***	**5**	**10**	**39**	**5**
State Protected Areas					
Mahango NP & Bwabwata West	187	1		9	
Bwabwata Eastern Core	91	1		4	
Mudumu NP	17			1	
Mamili NP	280	1	1	14	
Conservancies					
Kwandu	8	1 *Shared quota*	1	1	5 *Shared quota*
Mayuni	42		1	1	
Mashi	18		1	1	
Salambala	1	1 *Shared quota*	1	1	
Kasika & Impalila	31		2	2	
Communal Land					
Kavango	60		1	3	
Kwando	58		1	3	
Chobe/Linyanti	100		1	4	

** Total number adjusted to take into account populations shared with neighbouring countries*

The ability of hippo to maintain stable populations according to resource availability has important implications for management. The highest valued use for an adult male hippo lies in the sport hunting industry. Therefore the management guidelines allocate maximum sustainable quotas to sport hunting, minimise numbers of problem animals, allow for a small annual live capture and sell and implement a harvesting programme which will allow numbers to increase gradually towards carrying capacity.

Economic Objective

It is estimated that under a management programme which includes sustainable quotas for trophy hunting, live capture and sell, problem animal control and harvesting, the combined net income from the existing hippo population could be US$100,000 per year.

Social and Ecological Objectives

Local management of hippos is to be promoted in areas where they interact with people and are viewed as problem animals due to their damaging crops and being a physical threat to humans.

A harvesting programme would increase benefits for all stakeholders, however, harvesting should be done without any bias towards particular age classes to avoid negatively altering the population's age structure.

For effective management, key parameters must be monitored: population numbers, ages of hippos killed, reproductive data, habitat use and conflict with humans. Population numbers should be assessed through regular aerial surveys supplemented by local level counts on the ground. The ecological objective is to create the conditions for the hippo population to increase and such surveys will help establish this.

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

Southern Savanna Buffalo *Syncerus caffer caffer*

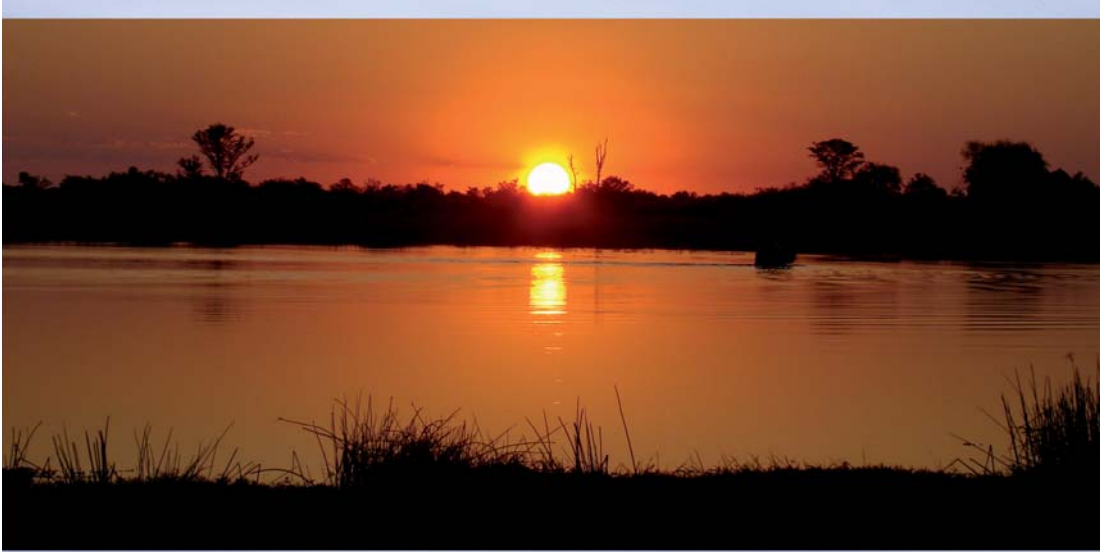
Savanna Elephant *Loxodonta africana africana*

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: Cover & p8 www.treknature.com; p2 bottom, p12, p13 & p14 P. & M. Jarvis; p3 bottom A. Jarvis; p4 top V. Guillemin; p4 bottom & inside back cover S. Linder; p10. K Landen; p11 left A. Jarvis; p11 right http://bigfivehq.com



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FROM THE AMERICAN PEOPLE

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