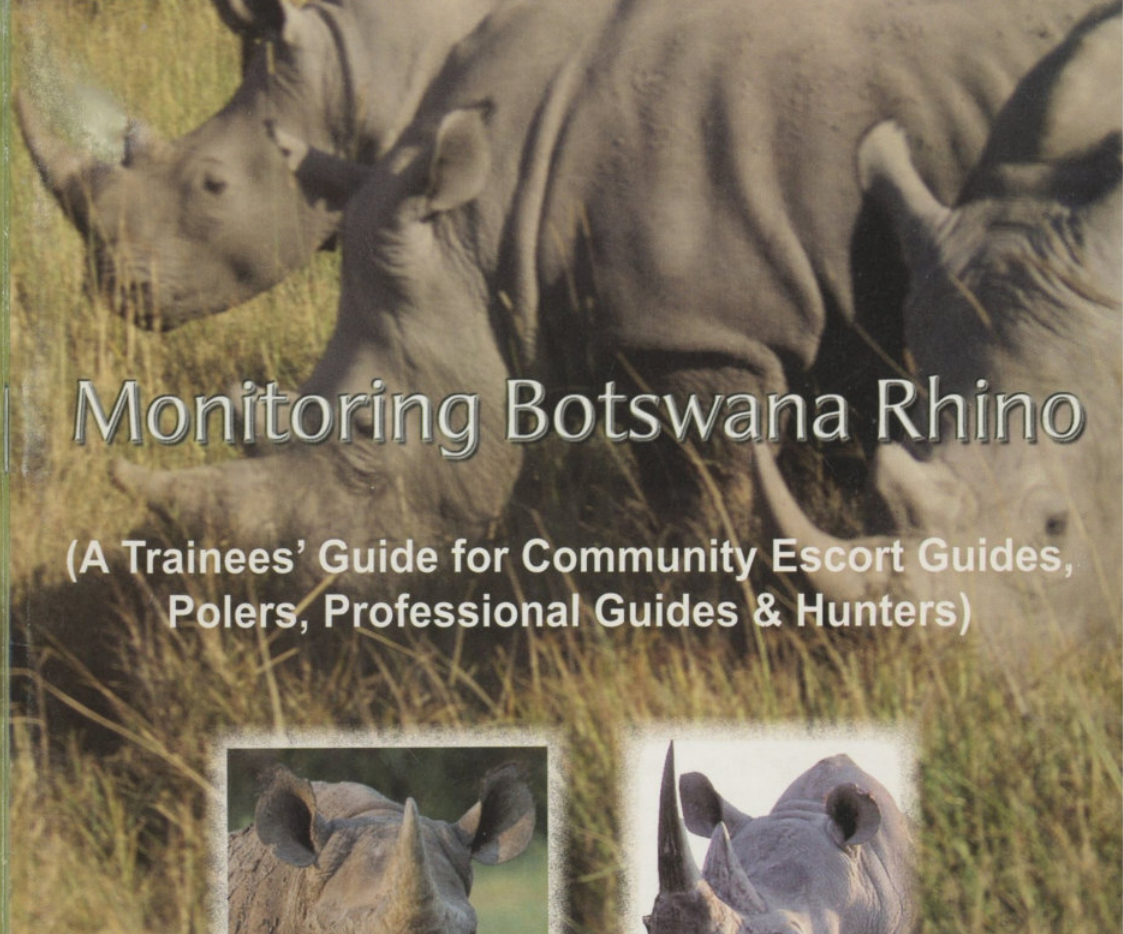




Monitoring Botswana Rhino

(A Trainees' Guide for Community Escort Guides,
Polers, Professional Guides & Hunters)



ISBN: 978 99912-0-683-7

Published by BWF in association with:



Sponsored by:



Quote:

"Human Judges can show mercy
But against the Laws of nature there is no appeal."

Arthur C. Clarke

Acknowledgements

The production of this manual was made possible through the collaboration and consorted efforts of various stakeholders that include Botswana Rhino Management Committee (BRMC), DWNP, Okavango Wilderness Safari (OWS), Every River has its People Project and KCS staff as well as the BWF as the pioneers of the concept note.

Special regards goes to the BRMC for having embraced the concept note from the on set and for having tailored the product to the end. Your scrutiny and analysis is worth than words could speak.

Map Ives, Chairperson of BRMC and employee of Okavango Wilderness Safari availed rare information and photos on rhino on behalf of the committees. It is worth mentioning his colleague Angela Morgan who designed the rhino posters.

Under DWNP, it is worth mentioning without names, the 2006 -2007 Maun Wildlife District Office, Botswana Wildlife Training Institute, Gaborone PAC Office, Rhino Secretariat and APU Coordinating Office personnel for having been instrumental in ensuring that the Roaming Rhino Advisory Committee meet its mandate of guiding publications of Community involvement in Operation Roaming Rhino Project, and this manual being part of those publications.

As for the KCS and ERP Office, KCS Chief Executive Officer, Felix Monggae and Every River Regional Project Manager, Montshiwa Montshiwa had significant input to the publication. They read through every line of the manual from the first draft to the final product. Every River Botswana National Project Coordinator, Bonatla Tsholofelo is applauded for having been spearheading the project with the BWF. Of course the idea was ultimately realized through consorted efforts of Every River and KCS staff members, particularly Thatayaone Mmapatsi for the secretary services rendered even at odd hours and Modiri Ontitile for the layout of the manual.

Lastly but not least an acknowledgement goes to BWF members across the Okavango Delta who represented the reality on the ground by ascertaining perceptions.

We would also like to acknowledge GEF-SGP for funds that made it possible to produce the manual and the subsequent training session that provided the platform for refining the manual and hands on for the intended users.

A very big thank you to all, we were indeed a team worth mentioning.

Monitoring Botswana Rhino

(A Trainees' Guide for Community Escort Guides, Polers,
Professional Guides & Hunters)

Publisher Address

Kalahari Conservation Society
112 Independence Avenue
P.O. Box 859, Gaborone

31 August 2007

ISBN: 978 99912-0-683-7

	Foreword.....	ii
	Preface.....	iii
	Acronyms.....	iv
1	Background information.....	1
2	Rhino Species situation in Africa	2
2.1	Black rhino subspecies	2
2.2	White rhino subspecies	2
3	Threats to rhino populations	3
4	Legal framework for Rhino Management.....	4
4.1	International framework.....	4
4.2	Regional framework.....	4
4.3	National framework	5
5	Rhino Management in Botswana	5
5.1	Rhino Management Structures.....	6
5.1.1	Department of Wildlife and National Parks	6
5.1.2	Botswana Rhino Management Committee	6
5.1.3	Community	7
5.2	Rhino Management Status.....	7
5.2.1	Available species.....	7
5.2.2	Current Rhino status in Botswana	9
5.3	Rhino Observation Field Guide	11
5.4	Rhino Ear notching.....	11
5.4.1	Ear Notching System (ENS)	12
5.4.2	Ear notching sample	13
5.5	Recoding rhino sighting information	13
6	Standardized Rhino Aging Classes	14 - 15
7	Quiz	16
8	Answers.....	18
9	Glossary.....	20
10	Bibliography	22
	Appendices.....	23

Foreword

It is with great pleasure that the Basin-wide Forum (BWF) and the Every River Has its People Project (Every River) in association with the Kalahari Conservation Society (KCS), the Department of Wildlife and National Parks (DWNP), the Botswana Rhino Management Committee (BRMC) and the Global Environmental Facility – Small Grants Programme (GEF-SGP) has made another stride in supporting initiatives aimed at ensuring that this country's resources are managed in a sustainable manner and in this context being the sustainable management of the rhino population in Botswana.

This time the tread is made by developing a Trainees' Guide, which is one of the several products developed as a way of building awareness, appreciation and accountability in the management of the rhino population. The Guide is designed for the professional guides, hunters, community escort guides and mokoro polers. Other products produced under the same project are targeting the general public. These include posters, brochures, bumper and license stickers echoing the need for everybody's participation in conserving the rhino species.

The Trainees' Guide is developed under the project "Role of the communities in the conservation of rhinos in the Operation Roaming Rhino project". The project comes as a realization for the need to contribute to the efforts of the government of Botswana in managing one of the world's most important species, the rhinocerotidae species. The species is listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) hence the assertion on its importance. The BWF through the Every River initiated the project with funding provided by GEF-SGP and it was well accepted by the DWNP.

This project cascades well within the general Every River principles. The Every River is aimed at building capacity of the Okavango basin residents to effectively participate in the planning, management and utilization of their natural resources. The long-term vision is to "Enhance Okavango River Basin ecosystems and livelihoods" and it is may be worth mentioning that Operation Roaming Rhino Project is based in the Okavango Delta, a part of the area covered by the Every River.

In order to achieve its intent, the Every River established the BWF, which is a community institution made up of representatives of the Tribal Authority, Village Development Committees (VDC) and Village Technical Committees (VTC); and other user groups such as community conservation societies, farmer associations, fishermen associations and craft associations. BWF therefore, facilitates the community's effective participation in the management of resources within their respective areas.

The success of natural resources management is by no doubt employed by the Every River Project. Co-management and collective action is the way forward by different institutions.

Preface

Maintaining natural resource stock and variability is by all respects the ultimate goal in this era where sustainability is the dictum. This has seen the international, regional and national including local communities committing to a change of approach in the management of the resources. At international and regional levels, convention and protocols exist while at national level laws and policies have been put in place. At local level, Community Based Natural Resources Management (CBNRM) concept has been widely accepted and currently practiced. All these interventions at different levels demonstrate the co-management approach which entails a situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, or a set of natural resources.

The rhinocerotidae species (spp) is one of such species that inexorably requires concerted efforts in its management. Its numbers have significantly declined mainly due to over hunting and poaching. It is through approaches such as co-management that the security zone of the species can be broadened. The rhinocerotidae spp is in Appendix I of the CITES. Botswana has taken heed of the situation and is involved in restocking initiatives. Some of the re-introduced rhinos are in sanctuaries while some are being piloted through a process called Operation Roaming Rhino led by the Department of Wildlife and National Parks (DWNP). The process is piloted in northern Botswana.

The Basin-wide Forum (BWF) with the Every River Has its People has also taken heed of the rhino status but more especially the value addition in tourism operations in the community areas and Botswana as a tourism country. It is in light of this that the BWF and the Every River have set to assist the DWNP in improving the security base and conservation status of the species thus broadening the roaming zone.

This trainee's guide is a product of a concerted effort by the BWF, Every River, KCS, DWNP, GEF-SGP and the Botswana Rhino Committee. The guide is envisaged to provide a pivotal role in the management of Botswana's two Rhinocerotidae spp namely the south-central black rhinoceros (*Diceros bicornis minor*) and the southern white rhinoceros (*ceratotherium simum simum*). It essentially highlights key factors that influence the management of the two rhinos. The key factors include the species habitation; its management and monitoring initiatives, threats faced by the species, hence the pivotal role of guides in the management of rhinos.

The Training Guide also highlights key points to note when encountering/sighting a rhino, such as the location where the rhino is sighted, its age and any body markings such as ear notching.

Acronyms

AfRSG	African Rhino Specialist Group
APU	Anti Poaching Unit
BRMC	Botswana Rhino Management Committee
BRMS	Botswana Rhino Management Strategy
BWF	Basin wide Forum
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CBO	Community Based Organisation
CE&O	Community Extension and Outreach
CITES	Convention on International Trade in Endangered Species of Wild flora and fauna
CNP	Chobe National Park
DWNP	Department of Wildlife and National Parks
ENS	Ear Notching System
Every River	Every River Has its People Project
• GEF (SGP)	Global Environment Facility / Small Grants Programme
IUCN	World Conservation Union
KCS	Kalahari Conservation Society
M&U	Management and Utilisation
MEWT	Ministry of Environment Wildlife and Tourism
MGR	Moremi Game Reserve
NGO	Non Governmental Organisation
NP&GR	National Parks and Game Reserves
OWS	Okavango Wilderness Safaris
SADC	Southern Africa Development Community
SSC	Species Survival Commission
UNDP	United Nation Development Programme
VDC	Village Development Committee
VTC	Village Technical Committee

1 Background information

Rhinoceroses are odd-toed ungulates (hoofed mammals) found under the family rhinocerotidae and are scientifically called rhinocerotidae spp. The word "rhinoceros" is borrowed from Greek which translates to "*rhino*" for nose and "*ceros*" for horn, hence horn-nosed. Rhino as shortened from rhinoceros like other species found in the animal kingdom first appeared in the Eocene era as slender animals and by the late Miocene (millions of years ago) there were many different species.

There are five (5) surviving rhino species in the world and are native to Africa, Middle East and Asia from one family with four genera. The Dicerorhini is the most primitive group that emerged in the Miocene (which is about 20 millions years ago) comprised of the extinct Woolly Rhinoceros of Northern Europe and Asia. The only surviving member of the tribe is the critically endangered Sumatran Rhinos.

The endangered Indian Rhinoceros and the critically endangered Javan Rhinoceros diverged from one another about 10 million years ago and are found under the Rhinocerotini species.

The two African rhino species belong to the Dicerotini species that evolved in the middle of Miocene, about 14 million years ago. They are said to have diverged from each other in the early Pliocene, about 5 million years ago.

Of the five species, four subspecies (*Diceros bicornis bicornis*/south-western or desert species, *Diceros bicornis minor*/south-central sub-species, *Diceros bicornis longipes*/west African and the *Diceros bicornis michaeli*/eastern species) are found under black rhinos. The remaining two (*ceratotherium simum simum* or the southern subspecies and *ceratotherium simum cottoni* or the northern subspecies) are found under white rhinos. Of the aforementioned species, only two are found in Botswana being the south-central black rhino and the southern white rhino. In this instance one need not consider black and white as the differentiation colour between the species because they all have a grayish colour. The only major difference is the shape of their lips. Black rhinos have long pointed lips (hook-like) for browsing while the white rhino has square broad lips for grazing. In fact the word "white" is Dutch word "weit" meaning wide that describes the shape of the lips.

The rhino population has declined drastically world wide over the years due to demand and over hunting for their valuable horns. In some former rhino ranges particularly in Africa, the rhino population has become extinct and this can be attributed to inadequate protection. Botswana is no exception in this case because it reintroduced rhinos to the wild specifically the white rhino twice in the 20th Century. Besides natural attributes to rhino mortalities, there has been threat to the existence of the species by man. It was only in the mid-1990 that raising rhinos in sanctuaries was considered and the rhino populations has since steadily increased.

The association in this project finds it imperative to expand the knowledge on the rhinos from DWNP officials to all involved including professional guides and hunters, community escort guides, mokoro polers and the general public. This particular product is targeting professional guides and hunters, community escort guides and mokoro polers, with other materials targeting the general public.

2 Rhino Species situation in Africa

Africa has been home and still is home to different rhino species even though there has been drastic change in the range, populations, distribution patterns and the rhino ecology. There are however, two rhino species found in Africa today originating from one ancestor about 3 million years ago and they all have two horns. The two species are the black rhino which has four subspecies and the white rhino with two sub-species. The white rhino is the biggest in the family, while the black rhino has a reputation of aggressiveness. Both species have recognized subspecies, as outlined below:

2.1 Black rhino subspecies

- Western (*Diceros bicornis longipes*) - is the rarest and the most endangered subspecies. Historically it occurred across most of the West Africa Savanna. The known very few surviving individuals were reported in Northern Cameroon, but the most disturbing fact is that in 2006, the World Conservation Union (IUCN) declared the subspecies to be tentatively extinct.
- Eastern (*Diceros bicornis michaeli*) – The subspecies today can be found in Kenya despite the fact that its historical range covered South Sudan, Ethiopia, Somalia, Kenya and North- Central Tanzania.
- South-western (*Diceros bicornis bicornis*) – This species is best adaptable to arid and semi-arid environment and was found in Namibia, Southern Angola, western Botswana and western South Africa
- South-central (*Diceros bicornis minor*) – It is numerous in comparison with other subspecies and once ranged from central Tanzania, Zambia, Zimbabwe, Mozambique and eastern South Africa

2.1 White rhino subspecies

There are two living subspecies of white rhino which are genetically distinct according to DNA analysis, the Northern (*Ceratotherium simum cottoni*) and the Southern (*Ceratotherium simum simum*).

- Northern (*Ceratotherium simum cottoni*) – Their historical range included parts of Uganda, Democratic Republic of Congo (DRC), Sudan, Chad and Central African Republic. However, today the subspecies can only be found in Garamba National Park in DRC. Their continental populations are said to

have been over 2 000 in 1960 and by September 2004 the number has dropped to 15 animals of which eleven were in captivity.

- Southern (*Ceratotherium simum simum*) – The Southern white rhino even though the most numerous at 11 600 animals have a discontinuous range that has been reduced to national parks, private conservancies and other protected areas. In comparison with the black rhino, historically they had a much more restricted distribution. Presently South Africa has the largest population at 94 % of the wild population, followed by 4% of reintroduced rhinos in Botswana, Namibia, Swaziland, Zambia and Zimbabwe, while the remaining 2% is of introduced rhinos in Kenya.

3 Threats to rhino populations

Rhinos are a part and parcel of the ecosystem which impact on their regeneration capacity. Threats to rhino populations are divided here into two categories, namely man and natural threats.

By and large, man is the major threat to the existence of rhinos. Due to rapid population increase human settlements have encroached into rhino habitat. This was compounded by an increase of poaching incidents due to the high value put on the rhino horn. The sad part of the story is that it is only the horn they are after, the rest of the body is left to rot.

From time immemorial, the rhino horn has been highly sought in the Middle and Far East mainly for ornamental and medicinal usages. In Yemen society for instance, the rhino horn is used to make the handle of a man's traditional dagger, for it speaks not only of a man's wealth and status, but also of his fighting ability. Asian men believe that the powdered horn greatly enhances a man's sexual powers.

The other threat faced by rhinos is due to natural causes such as natural mortalities, predation and infightings mainly between males. Unlike other animals, black and white rhinos do not have breeding seasons and respectively have a gestation period of fifteen (15) and sixteen (16) months. They nurture one calf for over two and half years before re-entering oestrous. Even though rhino calves can walk and suckle within three hours of being born, they are susceptible to predation especially to lions and hyenas.

Black rhino calves are more vulnerable to predation than their white counter parts, primarily because they usually trail behind their mothers. More over, black rhinos being smaller, their calves at 50 kg tend to be smaller, feeble and unstable at birth, hence being prone to predation.

The other threat to rhino population is deaths of juvenile males ageing between 2 -3 years caused by territorial males while attempting to court the female. At this stage the juvenile males still has bondage with their mothers and the dominant male at the sage of mating will aggressively fend off all other males regardless of age. Having strong bond with their mothers, young males tend to ignore the bull's

advances and resist being driven off. The infuriated bull attacks and wounds the young males resulting in possible deaths. It is however uncommon for death to occur between adult males, but still fatal wounds emanate from the encounters mainly due to deep thrusts to the neck, chest region and the groin.

4 Legal framework for Rhino Management

4.1 International framework

Botswana is a signatory to international and regional multilateral including bilateral agreements in a bid to conserve its flora and fauna. At international level, Botswana is a party to several conventions and treaties among the Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered Species of Wild flora and fauna (CITES). This guide focuses on the CITES. It is a 1975 international agreement aimed at ensuring that international trade in specimen of wild animals and plants does not threaten their survival. The treaty further provides for the monitoring and regulation of trade of species listed in its appendices.

CITES provides taxonomy, conservation status and distribution information on the taxa that have been globally evaluated. It is aimed at determining the relative risk of extinction, document and highlight those taxa that are facing global extinction. This is achieved through the classification of the flora and fauna into the critically endangered, endangered and vulnerable groups that simply translates to Appendix I, II and III respectively. The rhino species is listed under Appendix I. All species listed in this Appendix are threatened with extinction. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.

Furthermore, the country is party to the World Conservation Union (IUCN) - Specialist Groups in the Species Survival Commission (SSC) through the African Rhino Specialist Group (AfRSG). The AfRSG is among the 100+ of the IUCN SSC that have developed Action Plans for conservation of their rhino species. These action plans provide very specific recommendations and propose detailed projects aiming at ensuring survival and recovery of all rhino species and subspecies. The AfRSG is currently based at the KwaZulu-Natal Nature Conservation Service in South Africa.

4.2 Regional framework

The Southern African Development Committee (SADC) further provides the SADC Protocol on Wildlife Conservation and Law enforcement and the implementation plan for this protocol. The protocol calls for the conservation and sustainable use of wildlife, excluding forestry and fisheries resources. It envisages establishing within the region and within the framework of the respective national laws of each state party, common approaches to the conservation and sustainable use of wildlife resources and to assist with the effective enforcement of laws governing those resources, and in this case rhinos. Within this protocol, there is the SADC Regional Programme for Rhino Conservation.

SADC further has the SADC Regional Programme for Rhino Conservation which is aimed at maintaining Southern African rhino taxa in viable and well distributed metapopulations as flagship species for biodiversity conservation within the SADC region. The programme envisages a pragmatic regional rhino strategy implemented within the SADC region following the acquisition of sound information on the constraints and opportunities for rhino conservation within each range state and at regional level.

SADC has instituted the Wildlife Sector Technical Unit of SADC to create a link between the Non Governmental Organizations (NGO) consortium and the SADC intergovernmental structure. The Unit works with respective governments and foreign donors to promote conservation efforts at protecting rhino populations through the provision of action plans that provide specific recommendations for rhino management.

4.3 National framework

The Botswana government through the Department of Wildlife and National Parks has put in place a law that deals with the management of rhinos in Botswana. The 1992 Wildlife Conservation and National Parks Act is the primary legislation that protects the countries fragile rhino population (together with other species). The law recognizes the pivotal role of communities and the private sector in this endeavor. Legible¹ members of the public, inclusive of guides can legitimize their input in conservation issues by applying to be Honorary Wildlife Officers. The provision for appointment is in Section 4 (1) while Section 4 (2) is about the powers of the Honorary Wildlife Officers thereof saying "In carrying out their duties under this Act, honorary officers shall have powers as are conferred by the Act on wildlife officers, unless otherwise specifically provided." The same Section under subsection 2 provides honorary officers with three years in office unless the Minister provokes the appointment and that shall be eligible for reappointment. The 1992 Act provides legal protection to the rhino. This is explicitly covered under Part XI sections 67 to 70. The fine of contravening the Act is P100 000.00 and an imprisonment term of fifteen years, whilst the maximum sentence for poaching an elephant carries a fine of P50 000.00 and an imprisonment term of ten years. This in itself is a clear indication of the level of rhino protection in the country.

5 Rhino Management in Botswana

Conservation of wild flora and fauna in Botswana dates back to the pre-colonial, colonial and post-colonial era of the history of the country. Under the pre-colonial era Chiefs had the mandate to dispatch hunting expeditions and there were certain animals that were said to be reserved for chiefs, which in itself was a conservation strategy. The colonial era saw the establishment of the Elephant Control Unit in the 1950's which evolved to the Game Department and today is known as the Department of Wildlife and National Parks. The era also established Game Reserves such as the Central Kalahari Game Reserve, Moremi Game Reserve and Chobe National Park.

¹ Legibility is defined in terms of "no criminal records and being a known conservationist"

In light of the above conservation of rhinos can only be traced from the post colonial era when Botswana signed the Convention on International Trade in Endangered Species of Wild flora and fauna (CITES). This guide focuses on the CITES signed in 1975 as alluded to above since there are no records on traditional conservation efforts on the species.

5.1 Rhino Management Structures

5.1.1 Department of Wildlife and National Parks

In Botswana the management of the wildlife lies with the Ministry of Environment Wildlife and Tourism (MEWT). Within the MEWT, the DWNP is tasked with the conservation of all wild animals both in and out of national parks and game reserves. To achieve this, the Department has six Divisions namely National Parks and Game Reserves (NP&GR), Management and Utilization (M&U), Community Extension and Outreach (CE&O), Research, Fisheries and Administration.

The Management and Utilization Division is mandated with management of wildlife outside National Parks and Game Reserves though at times its mandate overflows into protected areas more especially in terms of law enforcement. In this context, M&U is actively involved in the management, security and monitoring of rhinos both in and outside protected areas. The Division established the Rhino Coordinator's office in 2001 to coordinate all rhino activities in the country and serves as secretary to the Rhino Management Committee.

Still under the umbrella of M&U, is the Anti Poaching Unit which was instituted in 1987 in reaction to increased commercial poaching incidents particularly in the northern protected areas of the country. Noticeably, poaching incursions were noted along Botswana/Zimbabwe and Botswana/Namibia borderlines. The specialized Unit sole role is to combat poaching as in this instance provides security and monitoring of rhinos. The highly disciplined and para-military trained Unit is supported by the Investigations Unit which provides covert and overt operations for effective law enforcement operations.

The Botswana Defence Force (BDF) has always complemented DWNP efforts in protecting wildlife. The BDF contributed much in the establishment of APU through training and patrolling international boundaries, at times conducting joint patrols.

5.1.2 Botswana Rhino Management Committee

There also exists the Botswana Rhino Management Committee (BRMC) that was formerly established in 2005 with the adoption of the Botswana Rhino Management Strategy. Under the strategy, BRMC is tasked as an advisory body to DWNP, with the planning, coordination and implementation of Botswana's rhino conservation programme, including approval of areas where rhinos can be conserved. The Committee comprises of the private sector and government through the Management and Utilization, Research Division and the Rhino Coordinator of DWNP.

Community Escort Guides, Mokoro Polers, Professional Guides and Hunters have a pivotal role in the management of rhinos in the country. Guides are highly likely to come across rhinos whilst on duty. It is therefore imperative that they be conversant with the ecology and behavior of rhinos given that it has been a while since rhinos were seen roaming in the wild in Botswana.

Guides therefore are expected to report any rhino sightings to the nearest wildlife office in as much as they usually report illegal activities and mortalities of other animal species. Their mandate lies on the premise that they are partners in conservation and that their work largely depend on the integrity of the flora and fauna. In treating them as partners in conservation this implies that they have a valuable role to play in ensuring that Botswana's rhino population is preserved together with that of other species. To this end the contribution of the guides has invaluablely assisted the APU which is tasked with combating the illegal off take of Botswana's wildlife, particularly high trophy species. The APU works closely with the Investigation Unit which covers covert operations of DWNP. It is quite obvious that the two Units with the support of the Botswana Defence Force can not manage alone without the support of the nation and the international community.

5.1.3 Community

The involvement of communities in natural resources management is very important. The approach is still developing with some of the pioneers of the approach being DWNP, KCS, Conservation International, IUCN and recently the Every River Project. Basically the approach contends for co-management approaches, collective action and most importantly CBNRM which also serves as an incentive based approach to engaging communities in natural resources management. Today communities through the CBNRM programme has established community based organizations (CBOs) in the form of Community Trusts where communities view natural resources with its value to socio economic and national development. This particular project of the Community Involvement in the Operation Roaming Rhino is a conception of a community structure, being the BWF.

5.2 Rhino Management Status

5.2.1 Available species

In Botswana there are two species available. These are:

- a) South-central Black Rhinoceros (*Diceros bicornis minor*)
It is believed that this South-central Black Rhinoceros (*Diceros bicornis minor*) species was found in the northern areas of Botswana, inclusive of some areas in the northeastern and the northwestern areas of the country, though there are no records of any quality to support this assumption, and most of all of these individuals would have disappeared in the early part of the 20th century. With the general lack of perennial freestanding water in the Kalahari ecosystem,



Picture (courtesy of DWNP)

water dependent black rhinos would probably have had a very patchy distribution at low density. However, records from the Department of Wildlife and National Parks indicate that there were about thirty (30) individuals in 1980 and ten (10) in 1984. There are however isolated occasional migrations of the species from Hwange National Park in Zimbabwe into the northeastern part of Botswana, particularly into Chobe District.

b) Southern white rhino (*Ceratotherium simum simum*)

By the end of the 19th century, *Ceratotherium simum simum* or southern white rhino was widespread and common in the western and northern Botswana. As was the case with the black rhino, it was also threatened by poaching. In 1967, a reintroduction exercise was started with four (4) rhinos from South Africa's Natal Parks Board. Subsequent reintroduction efforts were undertaken between 1974 and 1980 to Chobe National Park and Moremi Game Reserve amounting to ninety-one (91), but still the population was faced with immense poaching incidents.



Picture (courtesy of DWNP)

5.2.1 Rhino species status in Botswana

Botswana like any other range states is in the process of building up her rhino population which was in the past decimated by poaching to the extent that it was on the brink of extinction in the 20th century. The 1980's and 1990's in particular as was the continental crisis, saw an upsurge of cross border poaching incursions in Botswana largely targeting the few rhinos that freely roamed Moremi Game Reserve (MRG) and Chobe National Park (CNP).

5.2.2 Current Rhino status in Botswana



Picture (courtesy of Mokolodi Nature Reserve)

In realizing the alarming decline in rhino numbers, the Botswana government in conjunction with the private sector embarked on a mission to raise rhinos in confinement for easier monitoring and ensuring successful breeding. The reintroduction programme fact started in 1967 when four animals were introduced from the Natal Parks Board in South Africa into Moremi Game Reserve. A further ninety-one were introduced in subsequent years between 1974 and 1980 to the Chobe National Park (NP) and Moremi Game Reserve. However, the reintroduction programme coincided with a drastic increase in rhino poaching and inadequate protection, and by the end of the 1980's the re-introduction populations had been almost wiped out once more as aforementioned.

An extensive aerial census for rhinos in the northern Botswana conducted during September and October of 1992 located seven white rhinos. Based upon the results it was estimated that about 17 white rhinos remained in the Chobe area and further 10 animals in the Moremi area. During the period from August to November of 1992, six white rhinos were known to have been poached in the Chobe area.

As for the black rhino, aerial surveys estimated population at ten individuals in 1984 and the 1992 survey conducted did not locate any black rhino. Even ground surveillance did not confirm their presence including their tracks or dung, with the notable exception of occasional migrants from Hwange National Park in Zimbabwe into north-eastern Botswana.

Against the background of increased cross border poaching, Khama Rhino Sanctuary was established in 1991 as a mitigation measure on poaching besides law enforcement. DWNP translocated the remaining rhino population to the Sanctuary. Between 1994 and 1996 seven rhinos were captured at Chobe National Park and Moremi Game Reserve and translocated to the area. Three white rhinos were located, and remained in Moremi Game Reserve, even though their survival can not be said in certainty. In June 1995, Khama Rhino Sanctuary received five white rhinos from North West Parks and Tourism Board of South Africa, and this was followed in 1999 by a further three young adult females to boost the population. Additional rhinos were introduced to Khama Rhino Sanctuary from South Africa in order to enhance captive breeding capabilities.

Adding to the efforts, the DWNP through the Botswana Rhino Management Strategy encourages private rhino game ranching. Today successful rhino breeding have been noted at Mokolodi Game Reserve which was established in 1994 together with Tholo Safaris. More projects have emerged recently in the likes of Kwalata Ranch, Kanana Ranch and Limpopo-Lipadi Game Reserve. Jwana Park in Jwaneng is also in the process of acquiring some rhinos.

The rhino population in Botswana is about hundred individuals found in the wild and in private game reserves as outlined in the table below.

Area	Size (km ²)	Number	Population Status
Khama Rhino Sanctuary – Serowe	43	32	Recent Census
Mokolodi Nature Reserve – Mokolodi	30	9	Recent Census
Tholo Farm		7	Recent Census
Moremi Game Reserve	4853	39	Recent Census
Kanana – Gantsi		5	Recent Census
Limpopo-Lipadi – Tuli Bock	32	6	Recent Census
Kwalata	8	4	Recent Census
Nare	8	3	Recent Census

Source: DWNP Rhino Secretariat Office 2007

5.3 Rhino Observation Field Guide

Management of the rhinos has been extended to community escort guides, mokoro polers and professional tour operation guides. The guides' input in the management of rhinos is through reporting any sightings or mishaps to any wildlife officers where they spot the rhinos during their normal operations as guides. However, rhinos may sometimes be dangerous. For example, Rhinos particularly black species have a reputation for bad temper aggression given their acute sense of smell and hearing. However they have a poor sight. Rhinos are agile and can reach an alarming speed of 55km/h at full tilt. They are therefore quick to perceive a threat but slow to identify it.

They sometimes opt for a blind charge as the best form of defense. The following are some of the guides' important notes to observe when observing rhinos:

- Do not move across the rhino's field of vision while it is looking your way, it can easily pick your movements. Where you cross its field of vision it is advisable to stand still (freeze). It is therefore advised that one breaks silhouette by approaching the rhino behind a tree
- Learn to approach a rhino without it knowing you are there and always aim to leave the rhino without disturbing it.
- Be aware of the wind direction and be alert of any animal or birds nearby that may alert the rhino.
- Observations and recording should be done as quietly and quickly as possible without compromising the quality of the information and endangering one's life.

5.1 Rhino Ear notching

For identification, ear notching is one of the methods used in rhino management. Ear notching is a widely-used technique to permanently mark rhinos for field identification purposes. It is done when the rhino has been immobilized by drugs. Ideally, one or more triangular notches are cut on the outside edges of a rhino ear. Ear notches are considered excellent means of identifying rhinos because of the position of the ears which are on top of the head.

Besides cutting rhino ear, brightly coloured plastic tags which are similar to those used in livestock can be used to identify during translocation operations, but they are normally removed before final release for aesthetic reasons. Moreover, the tags could get caught in vegetation and ears might be ripped off resulting in possible infections.

The ear notches cut into a rhino's ear are typically 30mm triangles and are marked on the ear before hand to ensure accurate cutting. Ear wounds, even minor ones such as these, bleed profusely and should be sprayed with Termacyn to prevent infections. Before cutting, the blood to the area is isolated with clamps. It is of paramount importance to note that each rhino should have a unique pattern of ear notches and must be a consistent approach to a national ear notching system.

It should be noted that calves born in the wild are not notched until they become independent i.e. at 36 months plus. Rhino calves can be identified in association with their mothers. However, due to inherent risks of immobilizing large animals (as this is expensive), ear notching is done concurrently with other activities such as translocation. Ear notches may be damaged in the bush, and such injuries are noted as they may affect a rhino's appearance. Also important to note is that rhinos may already have acquired other tears and holes in the ears including any congenital defects affecting the shape of the ears and these are recorded as "natural notches". Damage to the ears is more likely in the case of black rhinos as they are commonly in dense thorny bushes than white rhinos.

5.1.1 Ear Notching System (ENS)

Ideally, rhino ear notching is country specific and is part of a national register of rhinos which is an important management tool. A national register or blood book will allow decisions on future introductions and translocations to be made in the way most likely to contribute to Botswana's National Rhino Management Strategy (NRMS).

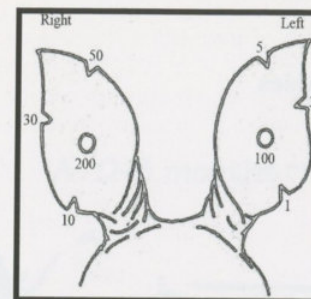
In using the rhino ear notching system, it is important to decide beforehand which ear will be considered left or right respectively. This can either be the rhino's true right and left, or left and right as you look at the rhino (reversed of course). The first method is probably the most logical. It is imperative to note here that the left ear is marked in units while the right ear is marked in tens.

A numerical system must also be devised so that each notch has a value, and then a total (unique) value for each rhino can be arrived at by adding together all the notches. For each rhino the minimum number of notches should be cut. The first few rhinos may need only one or two notches, but the lower numbers will be exhausted with population increase.

The main factors in choosing systems are that it is logical, straightforward, can be applied consistently. The precise details are not crucial, but once the rhino has been notched, then a decision has been made that should be irrevocable, and whichever system is decided on for the first rhinos should be applied to all other rhinos that are brought into the area.

Before the commencement of Operation Roaming Rhino, none of the rhinos then in Botswana had been ear notched according to any coherent system. The Mombo herd was likely to become the most numerically significant within a few years, OWS and DWNP were at liberty to start from the scratch with a new notching system and the system will be adopted country wide. Rhinos in unfenced areas need to be notched urgently as they roam over wider areas and in a larger population there is less likelihood of monitoring personnel being able to recognize individual rhinos.

5.1.2 Ear notching sample



In explaining the picture on the left the rhino ear notching number is 399. (i.e. $1+3+5+100+10+30+50+200=399$)

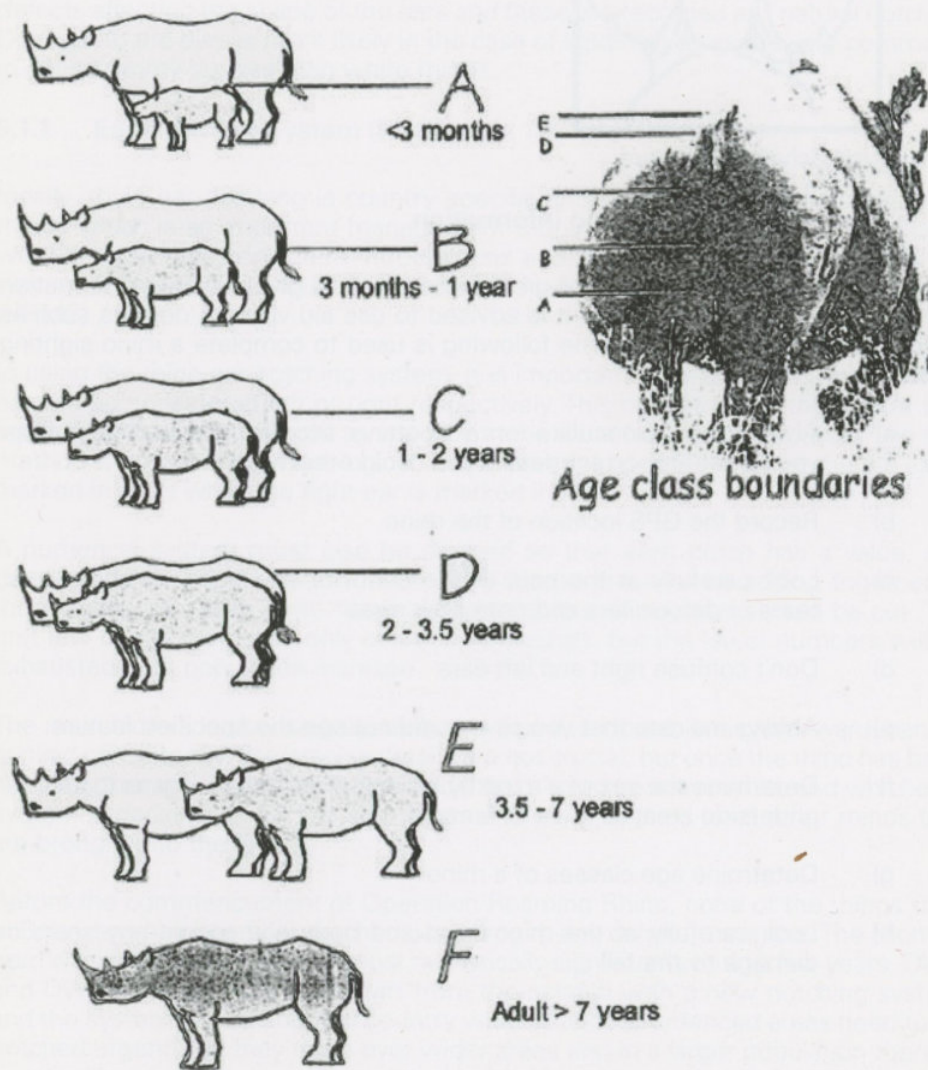
Source: Van Schaik Publishers

5.5 Recoding rhino sighting information

In recording rhino sightings it is of great importance to give accurate information and no guesses or assumptions. It is advised to use aid viewing devices such as binoculars and spotting-scope. The following is used to complete a rhino sighting report:

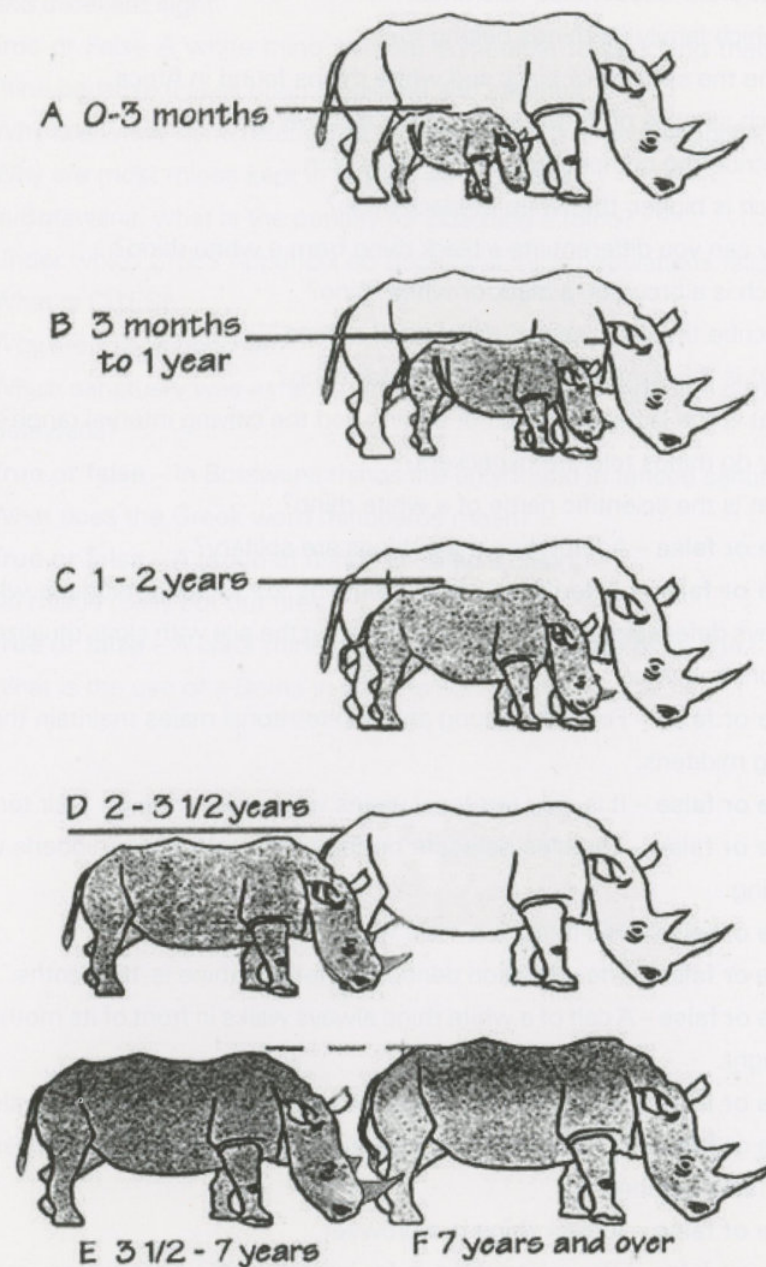
- Always use binoculars or a spotting scope because they allow you to see important details you could otherwise miss.
- Record the GPS location of the rhino
- Look carefully at the ears of the rhino for any nicks, notches, cuts, tears or deformities and note their sizes
- Don't confuse right and left ears
- Always indicate that you saw or did not see the specified feature.
- Determine the sex of a rhino by looking at its sexual organs (backside/underside area) as male or female
- Determine age classes of a rhino
- Look carefully at the rhino head and body and record any scars or damage to the tail

Black Rhino Ages Classes



Source: Monitoring African Rhino – Trainee's Guide

White Rhino Ages Classes



Source: Monitoring African Rhino – Trainee's Guide

7 Quiz

1. What order does rhinos falls under?
2. In which family do rhinos belong to?
3. Name the species of black and white rhinos found in Africa.
4. Which species of rhinos are found in Botswana?
5. Describe the composition of the rhino horn.
6. Which is bigger, the white or black rhino?
7. How can you differentiate a black rhino from a white rhino?
8. Which is a browser, a black or white rhino?
9. Describe the vocal communication of a rhino.
10. What is the gestation period of a black rhino?
11. What is the lactation period of a rhino and the calving interval range?
12. Why do rhinos tolerate oxpeckers?
13. What is the scientific name of a white rhino?
14. **True or false** – Adult white male rhinos are solitary?
15. **True or false** – A territorial male maintains 20-30 dung middens where he always defecates, scattering and excavating the pile with slow, ritualized kicks before and after.
16. **True or false** – Females, young and non-territorial males maintain their own dung middens.
17. **True or false** – It is only territorial males who spray urine on their territory.
18. **True or false** – Females defecate on territorial male dung middens without kicking.
19. **True or false** – Hic-throb is a male white rhino love song.
20. **True or false** – The gestation period of a female rhino is 16 months.
21. **True or false** – A calf of a white rhino always walks in front of its mother even in flight.
22. **True or false** – A white rhino estrus cycles occur at monthly intervals.
23. **True or false** – In white rhinos, conception peak early and calving peak late in the rainy season.
24. **True or false** – A black rhino is a browser.
25. **True or false** – The white rhino is far less excitable and dangerous to man than the black rhino.

26. **True or false** – A rhino spoor has four toes in each leg.
27. **True or false** – Rhinos have a very poor sense of smell and hearing but have and excellent sight.
28. **True or False** A white rhino is more vulnerable to poaching than the black rhino because it likes open grassland and savanna.
29. Why is a white rhino referred to as white even though it is grayish in color?
30. Why are most rhinos kept in fenced sanctuaries?
31. In Botswana, what is the penalty for poaching a rhino?
32. Under which CITES Appendix do Botswana rhino populations falls under/
33. What is CITES?
34. Why are rhinos poached?
35. Which sanctuary was established to save the remaining rhino populations in Botswana?
36. **True or false** – In Botswana rhinos are only found in fenced sanctuaries.
37. What does the Greek word rhinoceros mean?
38. **True or false** – A group of rhinos is called a crash.
39. Do rhinos really put out fires?
40. **True or false** – A black rhino is heavier than the white of its age.
41. What is the use of a Boma in a Rhino Sanctuary?

8 Answers to Quiz

1. Rhinos falls under the order Perissodactyla
 2. Rhinos belong to the family Rhinocerotidae
 3. Black rhino species found in Africa are:
 - i. *Diceros bicornis minor* (South-central rhino)
 - ii. *Diceros bicornis bicornis* (South-western)
 - iii. *Diceros bicornis michaeli* (East Africa)
 - iv. *Diceros bicornis longipes* (West Africa)
- And White rhino species found in Africa are *Ceratotherium simum simum* and *Ceratotherium simum cottoni*.
4. Rhino species found in Botswana are the *Ceratotherium simum simum* and *Diceros bicornis bicornis*
 5. The rhino horn is made up of keratin fibers, the same material of fingernails and hair. The horn has no bone core and does not develop from the skull, but instead grows from the skin.
 6. The white rhino is bigger than the black rhino.
 7. A black rhino has a hook like upper lip, always carries its head up, does not have a hump on the neck, a distinct saddle on the back and is smaller than the white rhino.
 8. A black rhino is a browser.
 9. A rhino is capable of about ten vocalizations that include:
 - i. Panting – a contact call common in groups, e.g. by a calf that has lost visual contact with the mother
 - ii. Whining – juvenile begging call
 - iii. Squeaking – calf in distress
 - iv. Gruff squealing – chasing
 - v. Snarling – defensive/submissive, grades into a shriek at highest intensity
 - vi. Chirping – a peculiar sound made by a rhino fleeing from an aggressor
 - vii. Hic-throb – male love song
 - viii. Loud wailing – by a courting male trying to prevent a female's departure
 - ix. Gasp-puffing – fright (alarm)
 10. The gestation period of a black rhino is 15-16 months.
 11. The lactation period of a rhino is two years and the calving interval is two to four years.
 12. Oxpeckers feed on parasites found in rhinos and help in alerting the rhino of any intruder.
 13. The scientific name of a white rhino is *ceratotherium simum*.

14. True
15. True
16. False
17. True
18. True
19. True
20. True
21. True
22. True
23. True
24. True
25. True
26. False
27. False
28. False
29. The name 'white' was derived from the Dutch word 'weit' meaning wide in reference to its wide, square muzzle.
30. Most rhinos are kept in sanctuaries because there are safer from poachers.
31. The penalty is P50 000.00 or 10 years in prison or maximum of P100 000.00 or 15 years in prison
32. Appendix I, threatened with extinction
33. CITES is Convention on International Trade in Endangered Species of wild Fauna and Flora
34. Rhinos are poached for their horns
35. Khama Rhino Sanctuary
36. False
37. The Greek word 'rhinoceros' mean 'rhino' for nose and ceros for horn.
38. True
39. These are popular legends in Malaysia and Burma but there are no actual records of this happening. In fact in Malaysia these type of rhino was called badak api which translate to badak meaning rhino and api for fire.
40. False
41. A Boma in a Rhino Sanctuary is used to orientate and observe rhinos before they can be released into the sanctuary.

10 Glossary

- Adult rhino** – an individual which is both physically and sexually mature
- Agonistic behavior** – behavior associated with aggression, including offensive, defensive, submissive and fearful behavior
- Animal order** – classification of animal species based on certain communalities
- Boma** – a kraal where animals are kept
- Bovid** – hollow-horned ruminants (eg member of Bovidae family)
- Browser** – an ungulate that feeds on foliage other than grass
- Diurnal** – species that are primarily active during the day
- Dung middens** – pile of droppings that accumulate through regular deposits
- Ecology** – scientific study of the interaction of organisms with their environment, including the physical environment and other organisms that share it.
- Eocene** – geological epoch at 58 million years ago when the dominance of large archaic were replaced by mostly small ancestors of modern mammals.
- Gestation period** – time taken for the development of the fetus or offspring before giving birth
- Grazer** – herbivore that eats mainly grass.
- Gregarious** – sociable species that live in groups.
- Juvenile** – stage between infancy and adolescence.
- Lactation** – period during which milk is produced by the mammary glands
- Miocene** – geological epoch at 24 million years ago when ruminant became dominant as grassland habitats spread and early rhinos picked in this era.
- Nocturnal** – species that are primarily active at night.
Perrisodactyla – odd-toed ungulates that include horses and rhinos.

- Pliocene** – a geological epoch of 5million years ago when homo erectus and existing genera of bovids and carnivores appeared.
- Poaching** – illegal off-take of wild flora and fauna.
- Sanctuary** – a place or area of land deliberately set to protect wildlife from predators and from being destroyed or hunted by human beings.
- Savanna** – flat grassland, sometimes with scattered trees, in a tropical or subtropical region
- Sedentary** – a species that is non-migratory or that remains in one area thought the year.
- Social Organization** – relates to information on group size, composition, size of home range / territory, intra and extra social relations between groups and amongst different sex/age classes, social roles of males and females.
- Species** – population(s) of closely related and similar organisms which are capable of interbreeding freely with one another, and cannot or normally do not interbreed with members of other species.
- Subspecies** – population(s) that has been isolated from other populations of the same species long enough to develop genetic differences sufficiently distinctive to be considered a separate race.
- Taxonomy** – classification of plants, animals, and microorganisms into increasingly broader categories based on shared features.
- Territorial** – animal species that defend a particular area against rivals of their own species usually of the same sex.
- Traits** – a brief description of the species including height, weight, coloration and other general descriptions.
- Ungulate** – A mammal with hooves.

Adcock K and Emslie R (Undated). Monitoring African Rhino:- Trainee's Guide. Sandwith's Training Course for Field Rangers

Botswana Rhino Management Strategy (2005). DWNP. Botswana Government

Estes R.D (1991). The behavior guide to African mammals. Russel Friedman Books CC

Every River (2004). Progress Report 1 – Phase 2.

http://en.wikipedia.org/wiki/Black_Rhinoceros
(accessed October 2006)

http://encarta.msn.com/encyclopedia_761552776_2/Rhinoceros.html
(accessed in October 2006)

http://library.thinquest.org/16645/wildlife/black_rhinoceros.shtml
(accessed December 2006)

<http://tourkenya.5u.com/RHINOCEROS.html>
(accessed in November 2006)

<http://www.cites.org/eng/disc/what.shtml>
(accessed August 2006)

http://www.honolulu zoo.org/white_rhinoceros.htm
(accessed October 2006)

<http://www.ifaw.org/ifaw/general/default.aspx?od=13048>
(accessed August 2006)

<http://www.iucnredlist.org/info/introduction>
(accessed December 2006)

<http://www.rhinorally.com/english/static/subsections/animals/rhino.htm>
(accessed August 2006)

Appendix 1: Fact file on rhinos (Black and white)

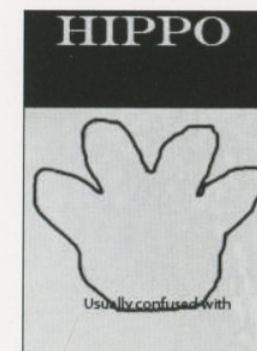
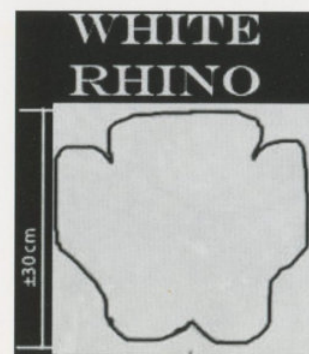
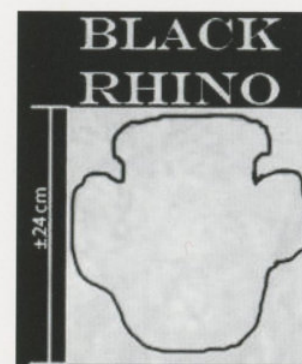
Description	Black rhino/ <i>Diceros bicornis</i> (Tshukudu)	White Rhino/ <i>Ceratotherium simum simum</i> (Tshukudu)
Classification	Kingdom; Animalia Class; Mammalia Phylum; Chordata Subphylum; Vertebrata Order; Perissodactyla Genus; <i>Diceros</i> Species; <i>D. bicornis</i>	Kingdom; Animalia Class; Mammalia Phylum; Chordata Subphylum; Vertebrata Order; Perissodactyla Genus; <i>Ceratotherium</i> Species; <i>Simum</i>
Traits	Height - Male 1.4 -1.6m and females 1.35-1.55m Weight - male 1000-1300kg and female 900-1200kg Coloration – Grayish, but natural color normally hidden beneath the layer of mud they wallow in. Shape of mouth – curved upper lip, triangular or hook like shape Horn – Extremely variable in shape and length, but rear horn shorter than front horn General description – Slighter built, smaller head generally held up and a distinct saddle on the back	(The biggest land mammal after the elephant) Height - Male 1.7-1.85m and female 1.65-1.8m Weight - Male 2000kg-2300kg and female 1600kg Coloration – Slate gray to yellowish brown but as well depend on local soils Shape of mouth – Wide square lips Horn – Extremely variable in shape and length, but rear horn shorter than front horn General description – Twice the bulk of the black rhino with proportionally longer, larger head which is usually carried low to the ground, larger ears and a pronounced hump on the neck. It has a fin-like ridge on the spine.
Reproduction	- Females calve at 4-5 years with a gestation period of 15-16 months and give birth to one calf at a time. - Males reach sexual maturity at 6 years - There is no restricted breeding season - Courtship last for about 20 days and culminates in a strenuous half-hour mating - Lactation period is 1-2 years and calving intervals range between 2.5-4 years	- Females calve for the 1 st time at 6.5-7 years after 15-16 months gestation and birth to one calf at a time. - Males reach sexual maturity at about 10 years. - Courtship last for about 20 days and culminates in a strenuous half-hour mating.
Sexual behavior	Male – cautious approach, urine testing, retreat and circling, dominance and threat displays (rushing, jabbing, horn-clubbing, puffing, dunging ceremony) nudging with horn and head Estrous female – threat and feigned or real attack, frequent spray-urination, mouthing and squealing	Male - Hic-throbbing call, urine-testing, chin-on-rump resting, preliminary mounting Estrous female - urinate frequently, mock charge and threat snarls, curling tail and standing still for copulation
Hearing	Very Good	Excellent

Sight	Poor	Poor
Smell	Very Good	Excellent
Vocal Communication	1. Puffing Snorts - during tense encounters 2. Shrieking & groaning-When fighting 3. Mewing – produced by a cow separated from her calf 4. Squeals – produced by a calf in distress and females while mating	1. Panting – a contact call common in groups, e.g. by a calf that has lost visual contact with the mother 2. Whining – juvenile begging call 3. Squeaking – calf in distress 4. Gruff squealing – chasing 5. Snarling – defensive/submissive, grades into a shriek at highest intensity 6. Chirping – a peculiar sound made by a rhino fleeing from an aggressor 7. Hic-throb – male love song 8. Loud wailing – by a courting male trying to prevent a female's departure 9. Gasp-puffing – fright (alarm)
Olfactory communication	Scent marking by dug-scattering, urine spraying	Scent marking by dug-scattering, urine spraying, scrapping A territorial male maintains 20-30 dung middens
Social Organisation	1. Sedentary, overlapping home ranges, females rarely alone, adult males usually solitary and possible territorial. 2. Bulls may tolerate male acquaintances as long as they remain submissive. 3. Sometimes cows allow an unrelated immature male or female following its rejection from its mother until maturity 4. Male encounters may be aggressive or peaceful	1. Sedentary, semi-social, territorial and satellite males. 2. Adult females live in overlapping home ranges 3. Females and sub-adults are rarely solitary, usually in pairs or more 4. Adult bulls are basically solitary
Agonistic Behavior	1. Dominance/threat display: stiff-legged walk with lateral presentation, dunging ceremony with horn sweeping, approach with head held lower, tail raised and giving puffing shrieks, feinted attack with puffing shrieks and empty horn thrusts. 2. Defensive/Submissive displays: Combat display (confront aggressor silently with head low to the ground, backing away, slow or rapid retreat) 3. Fighting: jousting (horn-clubbing) or stabbing with vocalization of a screaming groan with the upper lip curled.	1. Dominance/threat display: Silent approach with head raised and ears cocked, wiping horn on the ground 2. Defensive/Submissive displays: Head down and forward with ears back, snarling-threat/shrieking, feinted attack, backing away, flight 3. Fighting: Horn-fencing, shouldering, horn-thrusting

Ecology	Prefer a range of habitats from thickets and bush country to semi-arid deserts, forests, wetland or open grassland. They also prefer staying closer to water and drink daily, hence their vulnerability to poaching	Prefer grassland or open savanna where there is bush cover and mud to wallow in. They can go for 2-3 days without water, though they will drink regularly when water is available.
Diet	Strictly browsers and feeds on leaves, twigs, and wild fruits of over 200 plants, preferable leguminous herbs and shrubs and succulents	The largest pure grazer and feeds on short grasses especially those found underneath trees and around water points
Predation	- Lions and hyenas come second after man - During flight the calf gallops behind its mother up to about 55km/h	- Lions and hyenas come second after man - During flight the calf gallops in front of its mother and the two can reach 40km/h.

Source: Monitoring African Rhino – Trainee's Guide

Appendix 2: Differentiating the Spoors



Source: Okavango Wilderness Safari