PREFACE

The Chobe National Park, located in the northern part of Botswana and within the Chobe District covering an area of about 10 590km2 is arguably one of the country's premier conservation areas. The park was created with the aim of protecting wildlife from over hunting and to cater for the visitors. Uncontrolled hunting by settler communities from Northern and Southern Rhodesia threatened the viability of a large number of mammals and unique species such as the Chobe bushbuck and puku thereby leading to the establishment of the park.

From humble beginnings of complete preservation and game viewing through to the period of assertive management and research and growing tourism numbers, the park has remained relatively a hands-off affair with little adaptive management being practiced. The park, which is divided into four main focal zones comprising of the Chobe Riverfront, the Savuti Marsh; the Linyanti swamps and the dry lands of Nogatshaa, has remained a national and international focal point. There is little infrastructure in the park in terms of development for tourism adventures. The park is managed through a series of camps dotted throughout the park which provide guidance to tourists, wildlife management as well as law enforcement in the park.

In an effort to effectively manage wildlife resources in the park, government has, since 1988 developed a series of management plans which unfortunately have never been put to good use, thus leaving park development without a policy guiding document for management and development. It is against this background that the plan is being reviewed to bring it in line with current national and international best practices.

The review of the plan is currently being carried out within the framework of the Wildlife Conservation and National Parks Act of 1992 and the subsiding regulations, the Game Reserves regulations of 2000. The management objectives are guided by the visions of the Ministry of Environment, Wildlife and Tourism and that of the Department of Wildlife and National Parks as well as the national Vision 2016. Other legal and policy documents guide the development of the plan.

The Chobe National Park is entirely on state land and is surrounded by other conservation areas life Forest Reserves, Wildlife Management areas and settlements thereby placing a lot of pressure on the operations of the park as well as increased human-wildlife conflicts. Forest Reserves are also secondarily used for tourism activities by the tourism operators that fail to get access to the Chobe National Park.

MANAGEMENT PLANNING

The plan being developed seeks to bring into focus thoroughly thought of and planner development of the Chobe National Park in line with the latest conservation norms both nationally and internationally. The plan provides the basis and direction for future management of the park to ensure that natural resources therein are conserved for future generations and are managed on a sustainable basis. The plan addresses the regional and district perspectives of tourism development as it affect the overall wellbeing of the Chobe National Park as it falls with the Kavango- Zambezi Tourism initiatives.

In terms of tourism development, the different zones of the park are described as well as their tourism potential. Permissible activities within the zones are described within the limits of acceptable change and carrying capacity. The plan describes in detail the potential for each zone as well as monitoring strategy for the same. The various tourism development zones have differing potentials and as such proposals are presented for the expansion of the tourism development of the area. It follows that in order for the Chobe National Park to approach its full tourism potential, infrastructural developments have to be in place including among others a good road network and provision of water for wildlife.

Other aspects that offer potential for the diversification of the tourism product includes the promotion of cultural tourism amongst the communities living around the park as well as focusing on the abundant archaeological resources in the park. Archaeological resources can be a great potential tourist attraction as evidenced by the Tsodilo and Gchwihaba hills in the Ngamiland District. Numerous sites occur in the park and these have been mapped.

In terms of the management of other biological resources, fire management strategies are proposed as the area is fire prone. A review of historical fire data shows that extensive areas of the district are frequently burnt each year. However, only about a quarter of the park gets burnt. Even though fire have been used to manage natural habitats for biodiversity conservation, it is prudent that wild fires should be managed.

The plan covers other critical areas that include management of disease outbreaks like anthrax, rabies etc; conservation of biodiversity which is a primary objective of the park; provision of artificial watering points to improve spread of wildlife; research and monitoring of biological resources within the park. Other areas covered include park interpretation and educational services; law enforcement and anti-poaching and finally enhancement and facilitation of community benefits for communities adjacent to the park.

MISSION, VISION AND OBJECTIVES OF THE PLAN

The Chobe National Park is managed by the Department of Wildlife and National Parks that falls under the Ministry of Environment Wildlife and Tourism (MEWT). This therefore shows that the overall vision of the Chobe National Park is derived from the mission, vision and strategic objectives of the Ministry of Environment, Wildlife and Tourism. The Ministry of Wildlife Environment and Tourism's mandate is to protect the environment, conserve the country's natural resources and derive value out of the environment for the benefit of Botswana.

MINISTRY OF ENVIRONMENT, WILDLIFE AND TOURISM (MEWT) MANDATE AND STRATEGIC OBJECTIVES

The mandate of the Ministry of Environment, Wildlife and Tourism (MWET) is to *"protect the environment, conserve the country's natural resources and derive value out of the environment for the future benefit of Batswana"*.

To fully deliver on this mandate the MWET has identified three key objectives. These objectives are:

1. Environmental sustainability;

2. Organisational effectiveness;

3. Delivering prosperity to the majority of Batswana from the environment and natural resources.

A number of tools, key stakeholders and initiatives have been identified that when implemented could enable the MEWT to achieve its objectives. In terms of managing the Chobe National Park, all the objectives of the MEWT are relevant to the relevant to the effective management of the park. The attainment of environmental sustainability and deliverance of prosperity from the environment and natural resources are the key objectives. These are the issues that need to be harnessed as they address issues central to the survival of many of Botswana's protected areas. These two objectives deal with issues of benefit sharing that have to be sustained in order for communities to embrace the idea of a protected area in their midst.

The MEWT is cognizant of the contribution of the environment and natural resources to the Gross Domestic Product (GDP) and asserts that the same should be increased. In order to achieve this, there is need to sustain and promote nature based tourism. This is based on the realization that environment and nature are key tourism products for Botswana. The Ministry of

Environment, Wildlife and Tourism considers effective management of protected areas as the key to achieving and enhancing benefits from tourism.

The Ministry of Environment and Wildlife and Tourism acknowledges that there are a number of challenges that impeded the effective management, protection and conservation of Botswana's natural resources. Amongst these challenges are uncontrolled fires, human-wildlife conflicts, illegal and unsustainable off take of wildlife resources; increased wildlife numbers beyond the veld's carrying capacity, how to mitigate the effects of drought amongst many others.

THE CHOBE NATIONAL PARKS'VISION

The vision of the Chobe National Park remains *the conservation of the ecological integrity through adoption of adaptive management*. The adoption of this vision offers the greatest potential of unleashing the tourism potential within acceptable limits in the Chobe National Park.

PRIMARY OBJECTIVES OF THE PLAN

The Ministry of Environment Wildlife and Tourism's mandate is to *"protect the environment, conserve the country's natural resources and derive value out of the environment for the future benefit of Batswana"*. Implied in this mandate are issues of environmental sustainability and prosperity from the environment and natural resources. On the basis of this, the vision of the Chobe National Park is to conserve the ecological integrity of the park through careful management of the flora and fauna within the park in line with the tenets of the Wildlife and national parks act and any other policy documents.

The Botswana government considers tourism as a potential future engine of economic growth. Wildlife based tourism accounts for almost 90% of the tourist revenue in Botswana. The Okavango delta in Ngamiland, the Kwando–Linyanti system and the Chobe National Park are the main tourist destinations accounting for almost 93% of the tourist traffic to the northern protected areas. At the moment tourism contributes 5% to Botswana's Gross Domestic (GDP). In terms of employment, approximately 15,000 people are employed in the many tourist establishments in the northern part of the country. This figure has a potential of increasing significantly with improved infrastructure, allocation of additional concessions and increased bed nights.

The Chobe National Park has resources that attract a considerable portion of the tourist traffic. It is therefore important that Chobe National Park is effectively managed to sustain the tourism industry and resources upon which the industry depends.

The Chobe National Park is managed to achieve the following key objectives:

i. To preserve the diversity of flora and fauna indigenous to the Chobe as functional elements of the ecological landscape;

ii. Preserve ecological processes, biodiversity and landscapes with minimal human intervention as it relates to:
    a. Rainfall induced fluctuations in vegetation and wildlife resources;
    b. Sustain movement patterns of the different herbivores;
    c. Predator –prey interactions;
    d. Natural fires within the park;

iii. To provide facilities opportunities for research and monitoring focusing on understanding the physical and biological processes of the those aspects that further enhance the attainment of conservation objectives;

iv. To provide opportunities for the development of wildlife based tourism initiatives within acceptable limits so as not to interfere with conservation objectives;

v. Human-Wildlife conflicts are inherent risks of insitu conservation. Therefore mitigation and management of such conflicts is one of the objectives of the plan;

vi. Provision of effective education and interpretation services for visitors and the general public to foster a better understanding and appreciation and appreciation of conservation ethos is another important objective of the plan.

In order for Department of Wildlife and National Parks to effectively manage the Chobe National Parks, the government needs to adopt two key strategies:

1. The initial strategy is based on the premise that understanding of the various ecological processes within the Chobe National Park are not adequately understood, therefore adoption of adaptive management approach is essential.. It is therefore important that effective implementation of such a management paradigm, there is need for a comprehensive database.

2. In addition to adopting the adaptive management approach, it is vital that a motivated work force provided with the requisite skills, commitment, and competences is engaged to enable attainment of the primary objective of conserving flora and fauna. This workforce should be provided with the requisite equipment, tools, training and funding.

I.0 INTRODUCTION

Chobe National Park is found in the northern part of Botswana (Fig. 1.1) within Chobe District covering an area of around 10 589 km^2. The Chobe National Park (CNP) was gazetted on 8th March 1968 (GN No 4 of 1968). The Mababe triangle was added in 1980 (SI No 126 of 1980) and the Kakulwane triangle was added in 1987 (SI No 9 of 1987). The park is divided into four main focal points comprising the Chobe River Front with flood plain and teak forest, the Savute Marsh in the west about 50 km north of Mababe gate, the Linyanti swamps in the north west and the hot dry land in between (Nogatshaa).

At the peak of the ivory trade, the Chobe National Park was the favourite hunting ground for settler communities from Northern and Southern Rhodesia. This uncontrolled hunting threatened the viability of a large number of mammals and unique species such as the Chobe bushbuck, puku. To safeguard and sustain these and other species and create a place for relaxation and leisure, the Chobe National Park was established in 1931. To effectively manage wildlife resources in the Chobe National Park, Department of Wildlife and National Parks (DWNP) with the assistance of Dr C Spinage working for FGU in 1988 drafted the first management plan for the Park. In this case a management plan is defined as *'' a policy document designed to guide the activities of the mother institution',* which in this case is the Department of Wildlife and National Parks.

The 1988, plan was followed by a second plan drafted in 1993 by Deloitte and Touché in 1993. In 1997, through the European Union funded Wildlife Conservation and Development Project for National Parks, a third management plan was produced.

In 2000, the **"Chobe Riverfront Management Plan"** was produced by Ecosurv Consultants, for and on behalf of the Chobe Wildlife Trust (CWT). That plan was accepted (with a few minor modifications) and is included as Chapter 7 of the latest version of the Chobe National Park Management plan. The catalyst for the River front management plans was to reduce the perceived congestion along the Chobe River front. This is an area designated as a High Density Tourism Zone (HDTZ), where all the tourist establishments in Kasane and surrounding settlements take their clients for game viewing, boat cruisers, bird watching and many other activities.

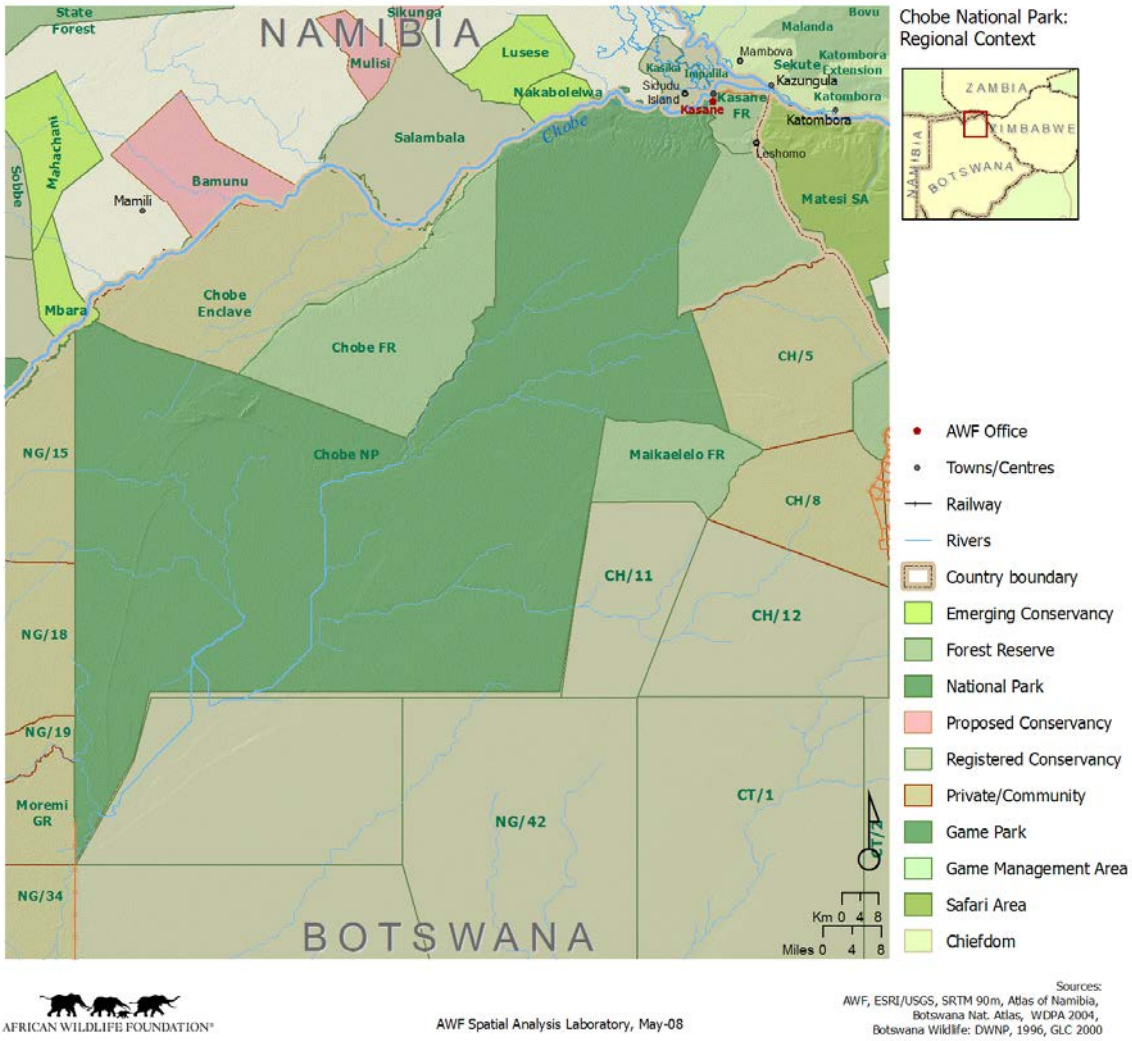

Fig. 1.1: Location of Chobe National Park; Regional Context

2.0 LEGAL AND POLICY FRAMEWORK

Botswana's National Parks, like everywhere else in the world are managed primarily for ecosystem conservation and recreational use in line with the International Union for the Conservation of Nature (IUCN) category II. It must however, be realised that Botswana's management objectives are for the most part guided by the vision of the Ministry of Environment, Wildlife and Tourism (MWET) and that of the Department of Wildlife and National Parks. These two visions are in turn influenced by existing legal and policy framework provided principally by the Wildlife and National Parks Act 28 of 1992. The Act provides for conservation of natural resources in their environment. The act makes allowance for natural processes to continue with minimum disturbance and maintenance of biodiversity, whilst also promoting recreational activities.

In addition to the Wildlife and National Parks Act 28 of 1992, management of resources within the Chobe National Parks and environs is guided by other legal instruments in the form of Acts, policy documents and management plans. In light of the above, it is imperative to highlight some of these legal instruments. The following are some of the key legal and policy document provide the legal basis for activities taking place in the Chobe National Park:

2.1 Wildlife Conservation and National Parks Act 28 of 1992

This act is intended to make further and better provision for the conservation and management of the wildlife resource of Botswana, giving effect to CITES and any other international conventions for the protection of fauna and flora to which Botswana is, from time to time, a party; to provide for the establishment, control and management of national parks and game reserves; and for matters incidental thereto or connected therewith.

Furthermore, the Act states that in his or her duties relating to the development of Wildlife Management Areas (WMA's) and their administration, the Director of the Department of Wildlife and National Parks (DWNP) shall consult with the Land Boards and District Councils responsible for the area concerned. The Minister of Environment, Wildlife and Tourism (MEWT) is responsible for making regulations for the Wildlife Management Areas (WMA). Section 94 of this act provides for the continued enforcement of some of the subsidiary regulations of the repealed Fauna Conservation Act. Therefore any recommendations regarding developmental activities for the study area will have to be in line with the provisions of this Act

2.2 Wildlife Conservation Policy, 1986

The overall aim of the policy is that a better return be gained on land allocated to wildlife while at the same time ensuring the continuity of this resource. Rational and effective conservation and

management programmes are therefore considered to be the essence of the policy. Specific objectives include the need to realise the full potential of the wildlife resource; the need to develop a commercial wildlife industry in order to create economic opportunities, jobs and incomes for the rural population; and to increase the supply of game meat as a consequence of the further development of commercial wildlife utilisation. The need for rural development, citizen participation and government control of development are general guidelines that are to be applied. It is imperative that the review of the Chobe National Park Management Plan and its integration with the Chobe River front Development Management Plans should aim at attaining the objective of sustaining the wildlife resources while at the same time ensuring the fully participation of Batswana people in the exploitation of economic opportunities provided by the wildlife resource in the area.

2.3 Tourism Policy, 1990

The main objective of the tourism policy is to obtain from the tourism resources of the country, on a sustainable basis, the greatest possible net social and economic benefits for Batswana. The policy advocates that *'tourism should be carried out on a sustainable basis and that local communities are provided with direct and indirect benefits from it in order to engender their support for conservation and the wildlife industry*. Therefore any recommendations regarding tourism development should take cognisance of the fact the tourism in Botswana is dependent mainly on the wildlife resource, which should be sustained.

2.4 The Environmental Impact Assessment Act, 2005

The newly enacted EIA Act provides for EIA to be used to 'assess the potential effects of planned development activities, to determine and to provide mitigation measures for effects of such activities that may have a significant adverse impact on the environment'. In line with section 6, the Act demands that any management plan should be subjected to strategic assessment.

2.5 Rural Development Policy, 1972

The primary aims of this policy are; to increase sustained production from land and from wildlife through research, coordinated extension work, and conservation planning leading to the introduction of correct land management practices; to improve marketing and credit facilities in the rural areas and to create new employment opportunities wherever feasible and thereby reduce the numbers without any means of support; and, to promote industries, services and crafts in the rural areas. The expansions of the Power generation capacity and consequent increase in water demands will most likely enhance the intended objectives of this policy.

2.6 Community Based Natural Resource Management (CBNRM) Policy of 2007

The policy is primarily designed to provide for broad stakeholder participation in natural resource management at District and National level. It based on the premise that if communities derive utilitarian and financial benefits from the wildlife resources they will be inclined to engage in the conservation of the resources thereby sustaining the development agenda. The policy acknowledges that sustained utilisation of the resource can only be achieved by empowerment through programs directed towards community self-reliance and the promotion of responsible, accountable and transparent decision making process.

The overall objective of the policy is to enhance the conservation of Botswana's natural resources and economic and social development in rural areas by providing eligible communities with opportunities and incentives to earn direct benefits from natural resource conservation. It is founded on the premise that all members of the community share an interest in conserving their local environment. The policy is needed to facilitate the stimulation and growth of community interest and attract investment.

2.7 The National Conservation Strategy

The National Conservation Strategy provides for the conservation of natural resources including soils, vegetation, water and wildlife. The strategy is inclusive of guidelines for the sustainable use of natural resources in Botswana.

2.8 Public Health Act

The Public Health Act provides for a wide range of public health measures, including the regulation of sanitation and camping. The tenets of this Act shall have to be strictly adhered to when setting up workers camps in the project area.

2.9 Monuments and Relics Act (2001)

This Act enables the government to identify and declare sites of national, historical and archaeological importance and to protect them. The Act also stipulates that Archaeological Impact Assessments (AIA) and Environmental Impact Assessments (EIA) are both required for any major development, which will physically disturb the earth's surface. Therefore in the carrying out of the ground water assessment and development project, the provisions and legal framework outlined in this Act shall have to de to be adhered to.

2.10 Water Act CAP 34.0 of 1968;

This Act amongst other things defines ownership of any rights to water use. The Water Act seeks to regulate the use of surface water that is water from rivers, streams, springs, lakes, swamps, underground water, etc. The Act is very relevant to water conservation as it demands stringent water management measures.

2.11 Waste Management Act 1998

The Act provides for a wide range of public health measures, including the regulation of sanitation and camping.

2.12 The Tribal land Act CAP 32.02 (Revised 1993).

This Act regulates the use of tribal land and is administered by the Land Boards. It is important to fully understand their rights and obligation in the administration of their affairs in the study area.

3.0. NATURAL RESOURCE CONSERVATION AND MANAGEMENT

The Wildlife and National Parks Act 28 of 1992 advocates the preservation of the diversity of flora and fauna and maintenance of ecological processes without interference. However, there might be instances where intervention is necessary to mitigate unnatural influences. There might also be cases where management might feel compelled to intervene to preserve the aesthetic value of the landscape and make it attractive to tourists. In the case of the Chobe National Park, there a number key ecological drivers of the ecological landscape. Amongst these drivers are rainfall and water availability; Elephant numbers have a tremendous influence on woodland dynamics and spatial abundance and distribution of herbivores within the Chobe National Park. In addition to the above facets, fire also plays an important role in habitat dynamics and species aggregation in space and time. In acknowledgement of the important role that each of these factors play in the ecological landscape, for each aspect, background information in provided to justify the management strategies and actions proffered to ensure conservation objectives are attained.

3.1. WILDLIFE BIOMASS

The Chobe National Park and surrounding areas are renowned for a large diversity of both flora and fauna. The largest concentration of wildlife biomass is concentrated along and around drainage channels. Based on the 2006 DWNP aerial survey, the population elephants in the Chobe National Park and the surrounding areas ranges between 46,000 and 56,000 individuals (Table 3.1)

Table 3.1: Numbers of Selected Wildlife Species 2003-2007

No.	SPECIES	YEAR				
		2001	**2002**	**2003**	**2004**	**2006**
1	Elephant	33060	32170	31584	30992	36764
2	Zebra	1851	811	2776	1240	2550
3	Warthog	86	192	59	187	217
4	Rhino	-	-	-	-	16
5	Waterbuck	70	55	27	197	200
6	Hippo	93	52	49	50	271
7	Giraffe	732	564	937	1108	713
8	Eland	148	164	186	485	584
9	Kudu	165	156	237	480	366
10	Gemsbok	236	-	55	258	79

11	Roan	237	248	98	21	428
12	Sable	1374	1636	1368	400	606
13	Wildebeest	192	147	-	152	237
14	Impala	1830	1425	854	2093	2537
15	Steenbok	29	73	14	30	62
16	Buffalo	2838	2713	4512	833	6950
17	Ostrich	90	257	414	82	373
18	Lion	73	-	-	-	-
19	Klipspringer	30	-	-	-	-
20	Crocodile	-	182	4	8	26
21	Hyena	15	-	28	-	-
22	Baboon	222	185	-	282	158
23	Lechwe			355	197	-
24	Tsessebe	118	44	77	15	

Apart from the 24 species outlined in table 4. 1 above, the Chobe National Park is home to species such as puku, leopard, cheetah, bat eared fox, black backed jackal, caracal.

3.1.1 Elephant Numbers and Their Impact on the Landscape

Table 3.1 shows that almost 90% of the wildlife biomass in the Chobe National Park is dominated by elephants. It is estimated that during the peak of the dry season when almost all the ephemeral water bodies in the Park have dried up over 40,000 elephants (DWNP 2006 aerial surveys) converge in and around the perennial drainage system of the Chobe River and the Kwando-Linyanti to access water (Fig 3.1.1). In the wet season elephants are widely distributed throughout northern Botswana (Fig. 3.1.2). This confirms the assertion that the movement and distribution of elephants and other wildlife species in the study area is mainly influenced by availability of water.

The large elephant population is perceived to be a threat to the woodland vegetation especially along the main drainage systems where closed canopy woodland has been gradually but systematically destroyed by elephants and produced a lot of dead wood which is susceptible to fires. The closed canopy has been replaced by shrub vegetation, there radically transforming the physiognomic characteristics of the woodland especially along the Chobe river front and the Kwando-Linyanti system. The change in woodland structure according to studies conducted during the BONIC project has created favorable habitat to enable species such as impala, Kudu and other browsers to prosper. In addition to these species, game birds have also benefitted greatly from changed physiognomic structure of the woodland vegetation community.

Therefore contrary to popular belief, increased in elephants numbers have only resulted in the changes in woodland characteristic and not in species composition. It is only in areas where the woodland vegetation has been exposed to a combined assault of uncontrolled late fires and elephants that discernible changes in composition could be observed. This situation would in

the event of extended droughts lead to marked changes not only in woodland characteristics but in composition as well.
It is therefore imperative that concerted measures are taken to mitigate the combined impacts of drought, fires and increasing elephant numbers. The 2004 draft Elephant Management Plan outlines in detail a number of strategies and actions that need to be undertaken in the Chobe National Park and surrounding areas to protect woodland vegetation to sustain the integrity of the whole ecosystem.

The 2004 Elephant Management Plan suggests a number of strategies that are required to mitigate the impacts of elephants on the woodland vegetation community. Amongst the strategies recommended is the provision of artificial watering points in the interior of the Chobe National Park. The provision of water ion these area would also enhance the promotion of photographic tourism. It is however, important to undertake a detailed baseline inventory prior to commissioning any water points. The baseline data will form the basis of any future monitoring strategy (Mughogho 1995, Vanderwalle 1989).

There are eleven artificial watering points in the Chobe National Park. The impact of these boreholes in changing the seasonal distribution patterns of wildlife, especially elephants is not fully understood. Concerted observation, however, seem to suggest that the strategy has not fully succeeded in mitigating the numbers of elephants that congregate in and around the major perennial systems in the dry season. Although no detailed studies have yet been conducted, it appears, the water points have been useful in attracting other species of wildlife to areas where these water points have been established.

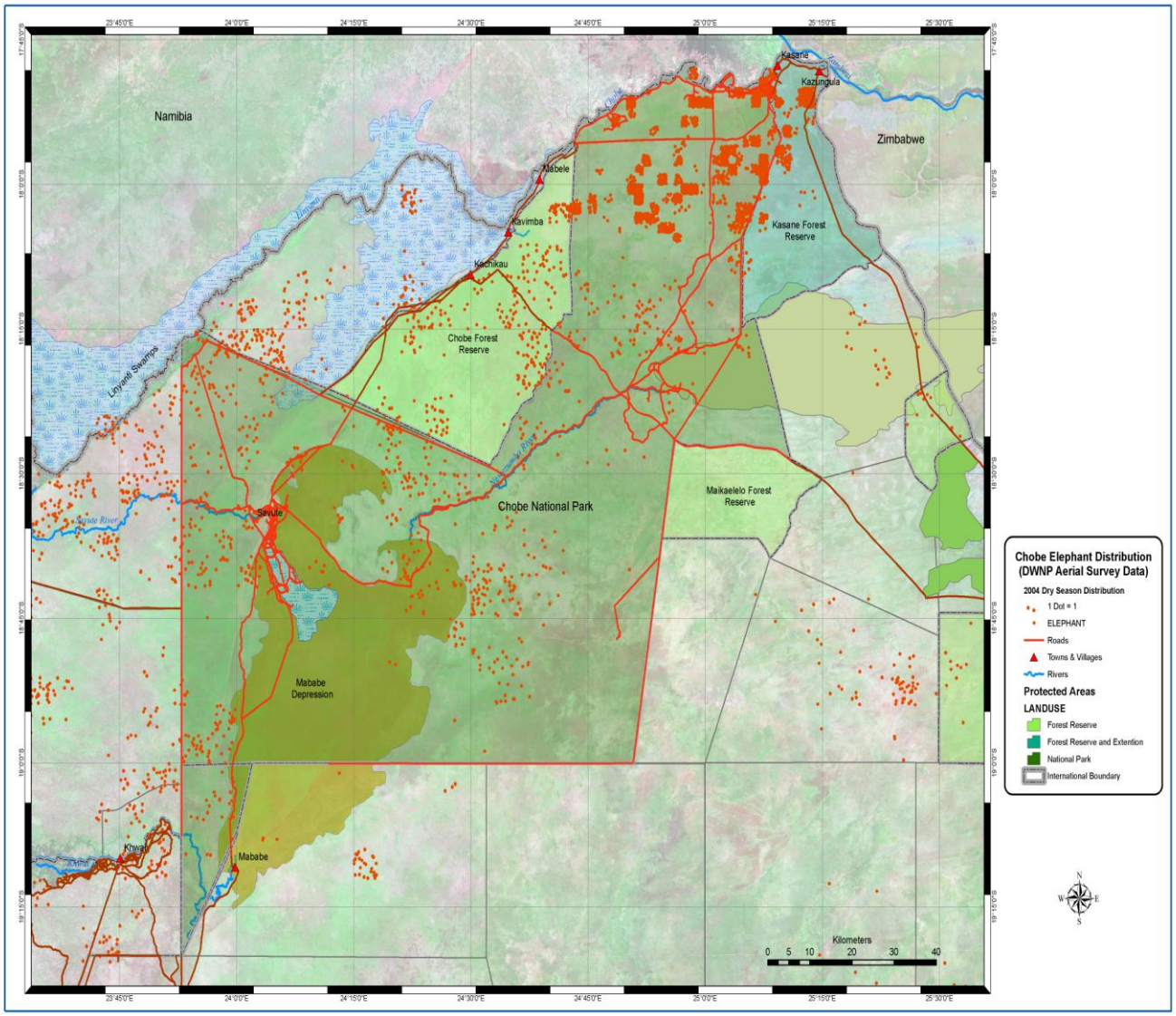

Fig. 3.1.1: Dry Season Elephant Distribution In and Around Chobe National Park

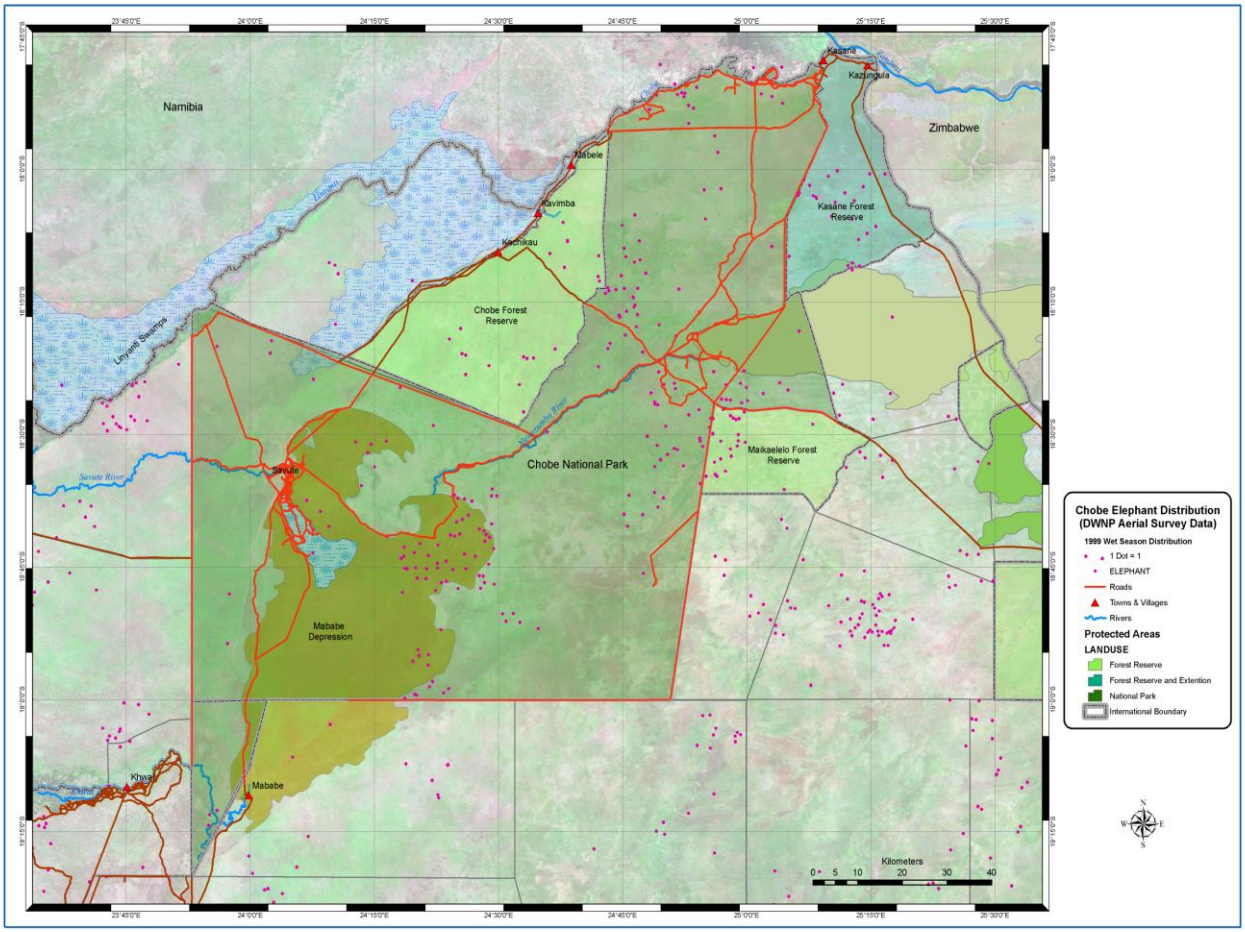

Fig. 3.1.2: Wet Season Elephant Distribution In and Around Chobe National Park.

3.2. ALIEN ANIMAL SPECIES

Alien animal species according to McDonald et.al (1986) are species introduced intentionally or unintentionally by man to areas outside their natural range of distribution. Included in this category are animals considered alien to southern Africa including domesticated animals such as cattle , sheep, goats, horses, dogs, cats) and those indigenous to southern Africa but alien to the northern savanna woodland vegetation communities.

Domestic cats *Felis catus* are known to be aggressive invaders (Brown and Gubb 1986). This species is particularly known to breed with wild cats.

STRATEGY

1. Only species that historically occurred in the Chobe National Park and environs should be considered for reintroduction;
2. Domestic animals or hybrids should not be allowed in the Chobe National Park;

3.3. STRATEGY FOR MANAGING DISEASE OUTBREAKS

Botswana's tourism is for the most part dependent on wildlife and as a result wildlife is increasingly becoming an important economic, cultural and aesthetic asset that cannot be ignored by all stakeholders. Even veterinary professionals have an interest in the wildlife resource mainly because of the two-way disease transmission between wildlife and domestic animals. In addition, there are zonotic implications of diseases and also wildlife diseases have a potential of impacting on trade.

To deal with inherent risks that wildlife poses to management of disease, the predominant strategy has been to undertake campaigns and schemes designed to eradicate certain infectious diseases. This is especially prevalent amongst domestic animals. It is difficult to manage wildlife diseases in free ranging populations due to technical problems and also because it is ecologically contentious when dealing with indigenous diseases in natural species.

Disease surveillance in wildlife populations is an important undertaking in order to detect presence of infectious and zootic diseases. The adoption of such a strategy is necessary as it allows for the adoption of counter measures. Disease surveillance is particularly relevant today due to increasing human population, which has resulted in increased the probability of contacts between humans and wildlife. This is manifested in increased sporadic epizootic outbreaks characterised by high morbidity and mortality (Morner, et. al. 2002). There are fears that increasing and persistent outbreaks of a host of wildlife diseases has a potential of considerably affecting the viability of the Chobe as a tourist destination. The past ten years have witnessed a

number of diseases outbreaks in the Chobe National Park and surrounding Wildlife Management Areas (WMA). These diseases include:

i. *Anthrax,*

   Anthrax is a highly contagious disease for domestic wild animals including human beings. This disease is caused by the bacterium *Bacillus anthraces.* The disease in wild animal population is spread by bloody discharge from nostrils, mouth and anus as well as skin, bones and other tissues.

   Observations in the Kruger National Parks and other protected areas in the region also suggest that vultures, scavengers and flies play a role in spreading diseases. Runoff water can also disperse spores to pans or dams and create sources of infection in other areas.

   Infection is acquired by drinking contaminated water, grazing on contaminated pasture or by licking contaminated skins bones, blood and carcasses.

   The latest outbreak occurred in 2004 resulted in the death more than 265 animals with elephants and buffalo being the species that were heavily affected. It is estimated that 12 elephants and 248 buffalo died from anthrax (Anon. 2004).

ii. *Tuberculosis*

   Department of Wildlife and National Parks' veterinary officers in 2002 discovered outbreaks of tuberculosis in two families of banded mongoose in the Chobe National Park and also received reports of one outbreak that wiped out a group of meerkats in the Kalahari Desert (Anon 2002).

iii. *Rabies*

   There have been unconfirmed reports also of rabies out breaks amongst wild dogs that is believed to have wiped bands of wild dogs

In response to these disease outbreaks, the Department of Wildlife and National Park's veterinary unit undertook an extensive surveillance program to identify the origin of this outbreak and to initiate measures to contain these disease outbreaks.
During the initial outbreak in the early 1990's, the Department of Wildlife and National Parks drafted a strategy for disease management with specific recommendations on how to manage disease out breaks in Botswana's protected areas.

However, in developing the disease strategy, cognisance will be made of the fact diseases are a natural phenomenon that act as a mechanisms for populations control. The strategy outlined protocols and procedures of dealing with diseased animals including the disposal and handling of carcasses. These protocols were crafted on the basis and inconformity with Botswana's legislation that governs management of diseases in the country.

STRATEGY:

1. One of the strategies proposed is passive monitoring. This has proved effective in discovering dieses amongst free ranging wildlife. This approach would entail the DWNP officials collecting and submitting wildlife material to diagnostic laboratories in Botswana and outside the country;

2. Undertake a concerted wildlife disease monitoring program by building capability to investigate events of mass mortality and morbidity. In the case the Chobe National Park, the disease that has proved to be more virulent is anthrax;

3. Undertake a sustained passive monitoring program. This should involve routine collection of tissues and sending them for analysis. This approach is effective in discovering various pathogens in association with diseases causing agents;

4. Make an effort to understand the ecological patterns of the wildlife disease under investigation;

5. Introduction of foreign animal diseases or parasites into an ecosystem should be prevented at all costs. However, where translocation are inevitable, this should be done after carefully identifying diseases hazards, risk assessment and risk management.

ACTIONS

1. Collection of blood samples, frozen and preserved tissues and appropriately prepared microbiological samples from randomly selected free ranging wildlife will assist in the ongoing investigations to confirm the presence or absence of disease causing agents;

2. Animals suspected of dying from anthrax should not be cut open;

3. Carcasses of animals suspected to have died from Anthrax should be buried to a depth of at least 3 meters and soils around it should be treated with chloride or lime; Always wear protective clothing when carcasses are buried

4. These carcasses may also be burned in situ without cutting them open;

5. Any carcasses observed in the field should be immediately reported to the DWNP Veterinary Unit or the Department of Animal Health and Production (DAHP) veterinarian;

6. The personnel engaged in the surveillance and disposal of carcasses should avoid direct contact with carcasses suspected of having died of anthrax;

7. The DWNP veterinary Unit to prescribe methods of disinfecting transport and any other equipment used in the control exercise.

3.4. PROVISION OF ARTFICIAL WATERRING POINTS

The provision of artificial water as a management tool is controversial. In Botswana, discussions of on the efficacy of providing artificial watering points to wildlife can be traced to a series of catastrophic events of the 1960's (Child 1972, Bachman 1965). A review of historical records shows that due to shortage of water compounded by inadequate forage due to drought, large numbers of wildlife, especially wildebeest and zebra perished during prolonged droughts of the 1960's.

In Chobe National Park, information from Anon (1991) and Matlhare (1994) suggests that the idea to provide artificial watering points was prompted by concerns that large concentrations of elephant along most of the perennial water systems, especially along the kwando-linyati, and the Chobe Riverfront were having deleterious impact on the woodland vegetation community. It was feared that if this situation is not arrested, massive habitat degradation would occur leading to decline in a number of wildlife species. A decision was therefore made to provide water sources in strategic locations to spread the distribution of elephants over a wider range.

There have and there continues to be other view points, which argue that the provision of water exacerbates habitat degradation on a wider scale. The practice tends to concentrate wildlife in confined environment resulting in marked change in vegetation in terms of floristic composition and structure. This school of thought advocates that provision of watering points should be discouraged.

It is clear from the above that the establishment of artificial watering points was motivated by the following;

1. To discourage the dry season migration of elephants towards the overgrazed perennial drainage systems of the Chobe, Kwando and Linyanti;
2. To minimise wildlife mortality due to debilitating impacts of droughts;
3. To encourage congregation of a large diversity of wildlife in order to enhance the tourism potential of some areas within the Park;
4. To mitigate human-wildlife conflicts by attracting wildlife especially elephants away from the periphery of the Chobe National Park.

The use of watering points was extensively examined during the development of the latest (2004) elephant management plan. This plan clearly states that provision as a tool of managing elephant distribution cannot succeed as more artificial would be needed to ensure adequate water is provided.

There are thirteen artificial watering points in the Chobe National Park confined to the Savute and the Nogatshaa areas. These watering points were established initially to stem the dry season flow of elephants to perennial drainage systems in the park. It is not clear whether the existing

water points have succeeded in mitigating the concentration of elephants in and around the Chobe River and the Kwando-Linyanti complex.

However, observations suggest that existing water points have demonstrated that the same is a management strategy concentrates a wide diversity of species around such points. This therefore demonstrates that artificial watering points offer an opportunity for enhancing photographic tourism away from the Chobe River front.

STRATEGY

Chobe National Park has thirteen twelve artificial watering points. This is a manifestation of the Department of Wildlife and National Parks acknowledgement that provision of artificial watering points is a prudent management strategy in an environment where water is the main limiting factor.

1. The provision of artificial watering points should continue;
2. Watering points have proved to be a viable tool for enhancing viability of tourism in localized areas, therefore provision of additional artificial watering points should be encouraged to assist in spreading tourism traffic within the Chobe National Park;
3. There is need to initiate a monitoring program to provide requisite information to enable management effectively manage artificial watering points in the park;

ACTIONS

Taking cognisance of the arguments against provision of water, it is recommended that the vegetation around artificial waster points be closely monitored.

1. *Establishment of a Monitoring Program.*
   - For all new watering points, a comprehensive inventory of trees and grass resources around the watering points should be done; This data will form the basis for determining any changes in species composition and structure resulting from provision of artificial watering points;
   - This baseline inventory should be collected in a series of sampling quadrants strategically located around each water point. In these quadrants, all trees encountered should be recorded by species, height and canopy size.

2. *An Inventory of the Herbaceous Layer;*
   This should be conducted in 1x1 m quadrants randomly established within the larger quadrants used for tree baseline data.

3. *Establishment of Monitoring Photo Stations*;
   In addition to monitoring quadrants, it is recommended that a series of photo stations be established, where overlapping photographs around water points should be taken annually, preferably on the same month and date these photographs must be preserved and reviewed to detect any changes in the woodland structure;

4. *Investigate Possibility of Using Remote Sensing Such As Aerial Photographs and Satellite Images to Assess Impact of Water Provision On The Habitat.*

In all monitoring strategies, the limits of acceptable changes based on the recommendations of the DWNP for monitoring boreholes in artificial watering points in different parts of the country are outlined in Table 3.4.1 below.

Table 3.4.1: Limits of Acceptable Threshold for Vegetation In and Around Artificial Watering Points.

Indicators	Tree Height	Percent Reduction	Remedial Action	
A	2 m to ≤ 5m	≥40%	Switch off Bore Hole for two dry seasons except in severe drought years	
B	≥5metres	≥40%	Switch off Bore Hole for two dry seasons except in severe drought years	
C	2 m to ≤ 5m	≥20%	Switch off Bore Hole for two dry seasons except in severe drought years	
D	≥5metres	≥20%	Initiate monthly rotation of watering points for the rest of the dry season	
	Distance From Waterhole		**Biomass Levels**	**Action**
E	100 to 500 meters		≥ Baseline biomass exceeds baseline by 200%	Initiate monthly rotation of watering points for the rest of the dry season

3.5. PREDATOR MANAGEMENT

In addition to elephants, predators are a keystone species in the Chobe National Park ecosystem. Their removal or introduction in the system can have major impacts on prey population. In the Chobe landscape, the Chobe National Park is at the moment the only place where predators are accorded maximum protection.

However, cases of livestock predation suggest that increasing predator population can be a source of conflicts where predators venture into surrounding livestock farming areas. In such cases management intervention are necessary. These interventions may involve translocation or destruction of the offending individuals.

Studies elsewhere by for example Kruuk (1980) have shown that the impact of predators on stock can be reduced through vigilance and herding practices by herdsmen.

STRATEGY

In the Chobe National Park, the strategies for dealing with predators are recommended in line with strategies outlined in the Department of Wildlife and national parks draft *Predator Management Strategy*. The following are the recommended strategies:

1. Destruction of diseased or injured animals is prohibited;
2. All problem predators should be captured and released deeper into the park. There shall be no branding of such animals even for research purposes. However, collaring of such animals shall be permitted to allow for monitoring of their movements;
3. All stakeholders including community members should be encouraged to work closely with the Department of Wildlife and national Parks' (DWNP) Problem Animal Control (PAC) unit to manage and mitigate impacts of predation-livestock conflicts;
4. Public awareness campaigns need to be initiated to sensitize communities on the importance of good livestock husbandry in mitigation of human-wildlife conflicts. In addition, these campaigns should be aimed at encouraging community members to use alternative measures of minimising predation of their livestock;
5. Endangered species such as wild dogs must be chased back into the park. Where such action is not feasible, these animals should be captured and translocated away from problem areas;
6. Records of all problem animals including stock losses, number of predator's killed or captured and translocated must be recorded and maintained in a database. This database should be used to identify "hotspots" to aid in the implementation of mitigation measures;
7. Understanding movement patterns, abundance and distribution of predators is important for implementation of effective mitigation measures. It is therefore recommended that research on key predator species be initiated;
8. Predator species in communal areas must be utilised through controlled hunting. This approach would serve to encourage communities to protect and tolerate problem animals in their areas.

3.6. LAWENFORCEMENT AND ANTIPOACHING

Lawenforcement is critical to sustenance of natural resources (flora and fauna) in protected areas. In Botswana there are a variety of strategies that are used to combat illegal harvesting and trafficking of wildlife resources. These strategies include, foot patrols, intelligence gathering, setting up search and seizure operations through road blocks. Lawneforcement is one of the strategies used to conserve and preserving wildlife resources in Botswana's protected areas.

The Department of Wildlife and National Parks has a dedicated antipoaching unit for the Chobe district based at Kasane, in the Chobe National Park. This Antipoaching Unit (APU) comprises of twenty two (22) men including the detachment Commander and his assistant. This unit has a fleet of vehicles, boats and guns. This team is supported by a team of intelligence operatives based in Francistown, whose operational base extends to Kasane including the Chobe National Park.

The Botswana Defence Force (BDF) also has an antipoaching unit that assists the Department of Wildlife and National Parks in curbing cross boarder poaching activities. In order to effectively deploy and conduct antipoaching activities the BDF has a number of satellite operational bases in various places within the Chobe National Park. The number of BDF personnel and other resources directed at antipoaching operations are not known as the same is not in the public domain.

In addition to the APU and BDF personnel, there is permanent road barrier at Ngwatshaa, on the Kasane –Francistown road. This barrier plays a deterrent role on poaching and trafficking of wildlife products from the Chobe National Park. In addition to this barrier, the DWNP does from time to time, especially during long holidays set up check points at strategic locations and along main roads in the district, where passersby are randomly checked for contraband.

Chobe National Park is the pilot site for Monitoring Illegal Killing of Elephants (MIKE) program in Botswana. Therefore in line with the tenets of the MIKE program, a dedicated and fully equipped antipoaching unit is stationed in Kasane which does from time to time receive aerials support from the Department of Wildlife and National Parks Aviation Unit and the Botswana Defence Force air wing. In line with the MIKE expectations, the Antipoaching Unit is obliged to collect requisite standard data sets to enable assessment of its effectiveness in curbing poaching in the park. The data that is readily available are records of dead elephants recorded in Chobe National Park and the surrounding areas (Fig. 3.6.1).

Examination of its operational procedures revealed that the Anti poaching Unit does not collect requisite data to enable evaluation of its effectiveness. The standard index for measuring effectiveness is the catch per effort analysis (Bell 1981, Munthali and Mkanda, 1998). The catch per unit effort analysis gives an index of encounter rates of illegal activity per unit of law enforcement effort per effort by area and time as expressed in man days.

STRATEGY

1. *Improve Data Collection and Reporting Procedures.*

   This is important to enable effective evaluation and assessment of antipoaching operations. The detachment commander should always compile detailed monthly antipoaching reports detailing the following:

   a. *Personnel;*
      Number of people involved in each of the patrol conducted

   b. *Coverage;*
      It is important to provide information on the geographical distribution of antipoaching patrols including antipoaching infrastructure (camps, check points etc) and location of intelligence sources;

   c. *Time*;
      This variable is defined by the number of days that patrol teams are active in the field, manning check points or period over which intelligence is actively sought. This is usually measured in patrol days/man days.

   d. Resources
      Another variable that the consultants will attempt to factor in to measure effectiveness is the amount of resources allocated to antipoaching effort. The information required in order to effectively assess antipoaching activities include:

   e. Financial expenditure
      This comprises patrols costs: included in this component are vehicle running costs, salaries, uniforms, camp equipment, food, allowances)

   f. Patrol effort
      This is calculated from number of patrol days/hour and number of scouts. This suggests that antipoaching unit on average spends a total of 300 man days in the field conducting patrols. The Chobe National Parks is 10, number of individuals actually deployed in antipoaching operations in the field; number of individuals manning barriers and personnel providing intelligence;

   g. Record of Illegal Activities Observed
      All illegal activities encountered in the field such as poachers camps, meat drying racks, snares, poachers' foot prints, wildlife mortalities should be recorded by geographical location. This information is required for identifying and mapping "Hotspots"; that is areas where poaching activities are intense.

2. *Increase Number of Personnel Involved In Antipoaching Activities*
   The Chobe National Park is 10,569 square kilometers and the number of antipoaching personnel for this huge park is only 20. This translates to 1 game scout per 528 square kilometers. This figure is far much below what is ideal, which is 1 game scout per 50

square kilometer (Bell 1981). It is therefore important that additional personnel be provided to assist in conduct of antipoaching activities.

3. *Open temporary launching bases in strategic locations within the Park*
   It is acknowledged that a number of government agencies such as the intelligence services, the Botswana defence Forces, and DWNP personnel from other divisions are involved in antipoaching activities. The Chobe National Park is huge; there are a lot of gaps that needs to be plugged and this can only be done by recruiting, where such teams can easily be accessed and provided with aerial support and other services required to carry out effective antipoaching operations.

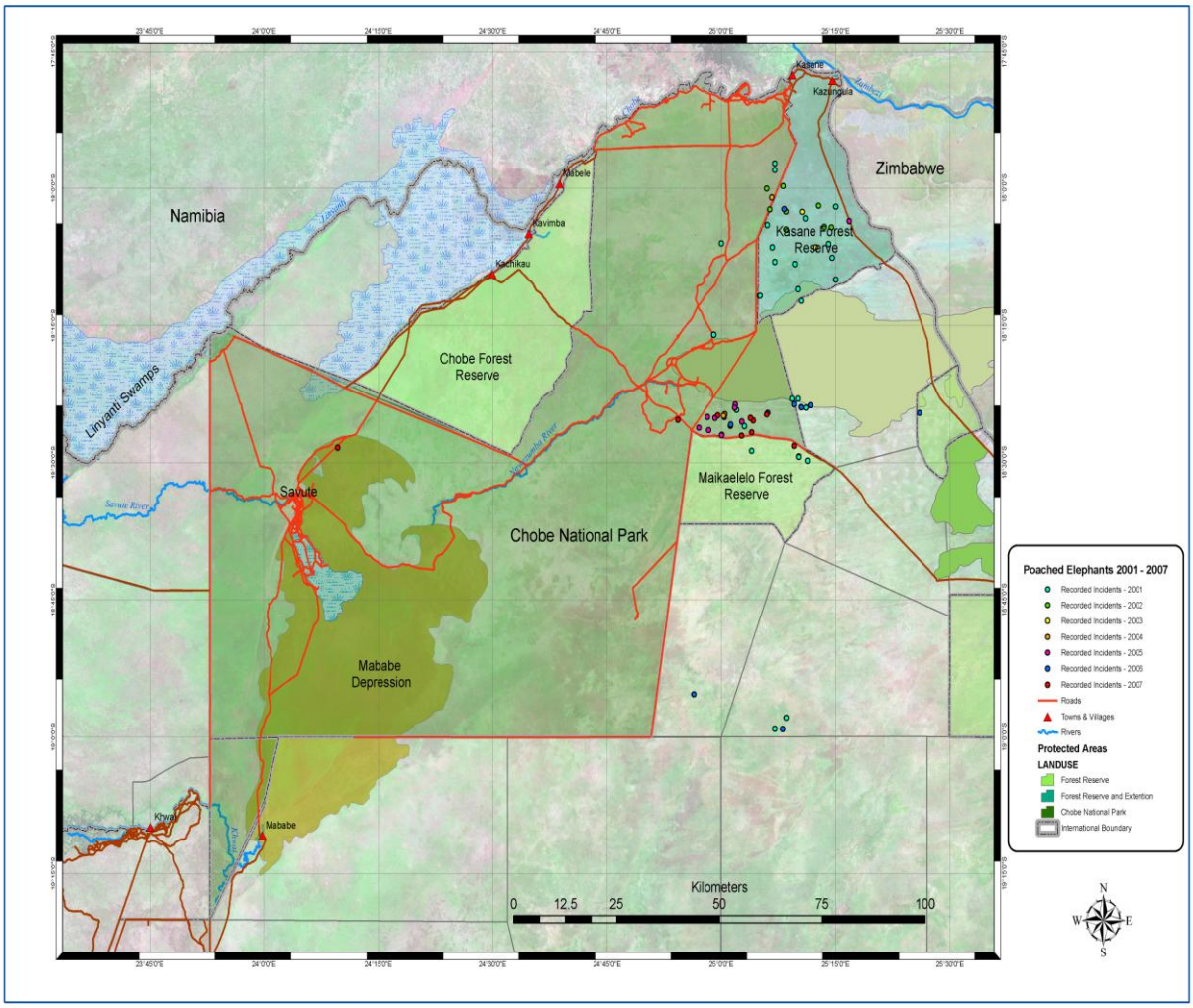

Fig.3.6.1: Recorded Elephant Mortalities in Chobe National Park and Surrounding Areas.

3.7. WOODLAND VEGETATION

The woodland vegetation is also diverse (Fig.3.7.1) ranging from closed canopy woodland typical of the Okavango fringing forest dominated by Acacia spp; aspirations of the dry deciduous miombo woodland dominated by *Burkea* and *Pterocarpuis* spp to open savannah grasslands. The type of vegetation, species composition and woodland structure appears to be mainly influenced by soil characteristics, climate, fire and some extent elephant numbers. The assertion that elephants have played a critical role in determining woodland structure and species composition is confirmed by studies conducted during the BONIC project by Makhabu and Mosugelo between 1999 and 2004. The studies by Makhabu and Mosugelo confirmed that increasing elephant numbers have led to a gradual but steady decline in closed canopy mature woodland that dominated most parts of the Chobe district in the 1960's. Increasing human population and changes in settlement patterns have also contributed to changes in woodland vegetation characteristics.

It is apparent from the foregoing that there a number of factors that influencing vegetation species composition and structure. The main factors responsible for the current state of vegetation are fire and increasing elephant numbers.

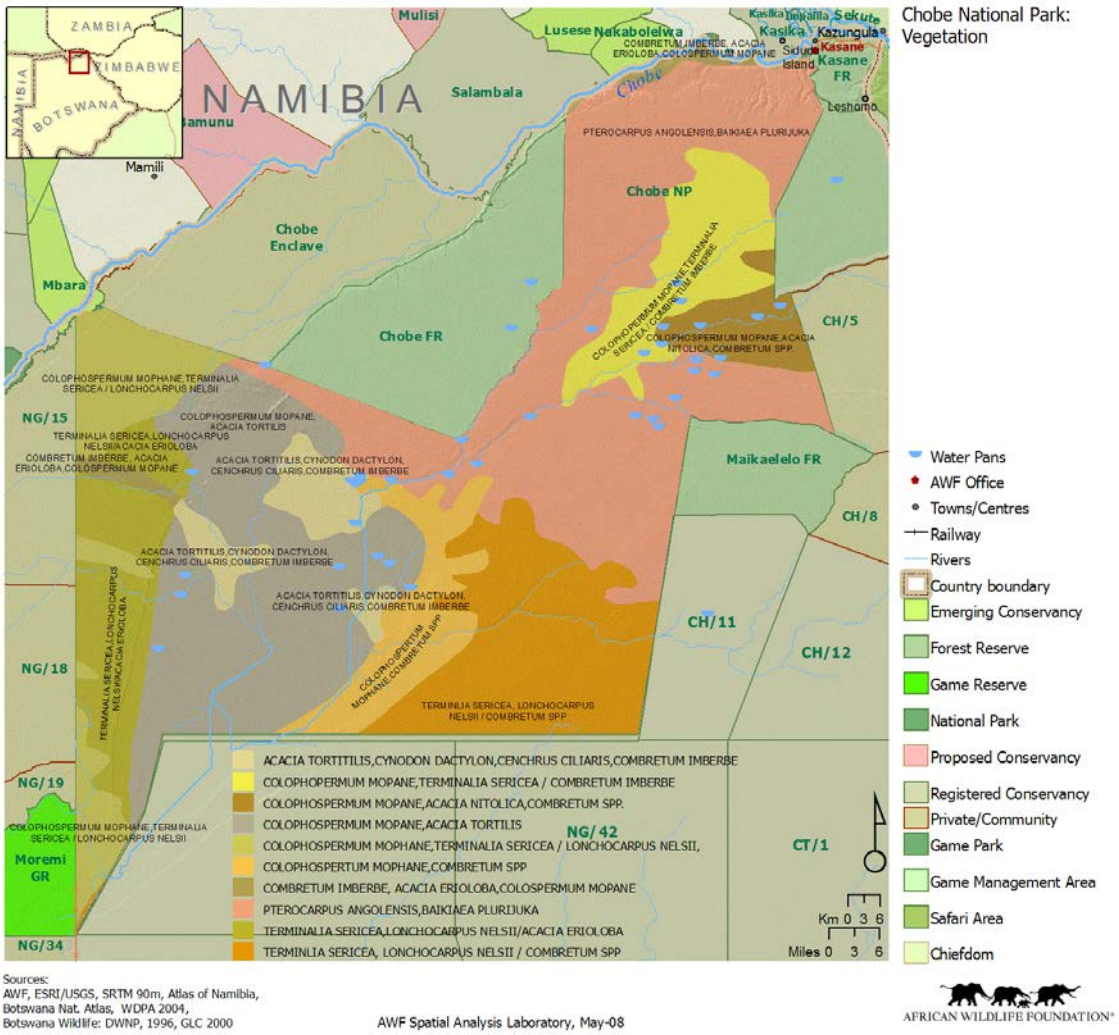

Fig 3.7.1 Vegetation Map of Chobe National Park

STRATEGY

1. *The Strategy Should Be To Minimise The Impacts Of Both Fire And Elephants.*
   The strategies and actions needed to mitigate the impact of elephant on the woodland vegetation have been adequately addressed in the draft *Elephant Management Plan of 200;*

2. *Remove and do not permit introduction of alien plants in the Park*;

3. *Strategies for mitigating fire impacts are discussed below*.

3.8. ALIEN PLANT SPECIES

The invasion of alien plant species into the Chobe National Park is not a problem at the moment. There is however, need for vigilance and active monitoring to ensure that there are no alien plant species allowed in the Chobe National Park.

STRATEGY AND ACTIONS

1. All alien plant species found growing in the Chobe National Park should be destroyed using appropriate methods;

3.9. FIRE MANAGEMENT

Fire has and continues to be regarded as a negative force in ecosystems, as a result considerable efforts have always been channeled towards suppression of fires whenever they occur. However, observations and research carried out in different savannah ecosystems suggest that fire play an important role. Fires have been used to manage natural habitat for biodiversity conservation. They have been used to control invasive plants. This is especially true in the savannah ecosystems where indigenous communities have and continue to use fire to sustain their livelihoods (Andersen 1996). Mc Keon et.al (1990) suggests that fires tend to maintain a balance between grass, trees and shrubs. In addition fires are credited with enhancing mineralization of the organic matter thus aiding in the nutrient cycle.

However, on some cases, fires have been credited with aiding the decline in birds and small mammal populations. Observations have shown that even areas exposed to extreme devastating fires tend to recover in record time following periods of very good rains.

It therefore appears that adoption of fire suppression strategy is based on a Eurocentric perception of fires. Generally data seems to show that areas where fire suppression strategies are religiously pursued, there is always a massive build up of underground litter and understory biomass. The resultant impact is that such landscapes experience extremely hot fires due to accumulated fuel load.

There is therefore a realization amongst range managers that fire impacts can be effectively managed through prescribed burning. However, there are a number of uncertainties as to what the ideal prescribed burning regime for a particular area should be. This is especially true in African protected areas, where to due to limited financial and material resources, it has been extremely difficult to build a fire history taking into account fire frequency and intensity. This has made it difficult in many places to build a fire history and as a result the long term of fire for most savannah ecosystem is lacking.

3.9.1 Fires in the Chobe National Park

Every year 20% of the Chobe National Park gets burnt every year. The most frequently burnt areas are the north-eastern portion of the park including part of Nogatshaa especially areas adjacent to Forest reserves and the western edge of the Park in the Kwando-Linyanti complex (Fig. 3.9.1). Almost 98% of the fires that have been recorded Chobe National Park emanates from outside the Park especially on forest reserves and settlements adjacent to the international boundary in the Kwando-Linyanti complex. This suggests that the majority of these fires are set deliberately by people. In very exceptional circumstances have these fires been caused by lightning bolts. There are no records on the timing of these fires, and frequency of these fires. It however, suffices to note that most fires in the study area occur between June and October of each year.

The rest of the Chobe National Park seems to be well protected by a network of fire breaks. These fire breaks are maintained by the Agriculture Resources Board (ARB), which has now been incorporated in the Department of Forestry and Range Resources (DFRR). In the Chobe district, there are a number of east-west aligned fire breaks one of which traverses the Chobe National Park, north of Savute parallel to the ancient Ngwezumba channel.

In addition to this fire break, tourist and service roads connecting for example Savute to other management camps in the park serve as fire breaks. In addition to these roads, the DWNP maintains a series of north-south aligned fire breaks from the Ngoma Road to the Chobe River between Kasane and the Ngoma to protect vegetation in the Chobe River front.

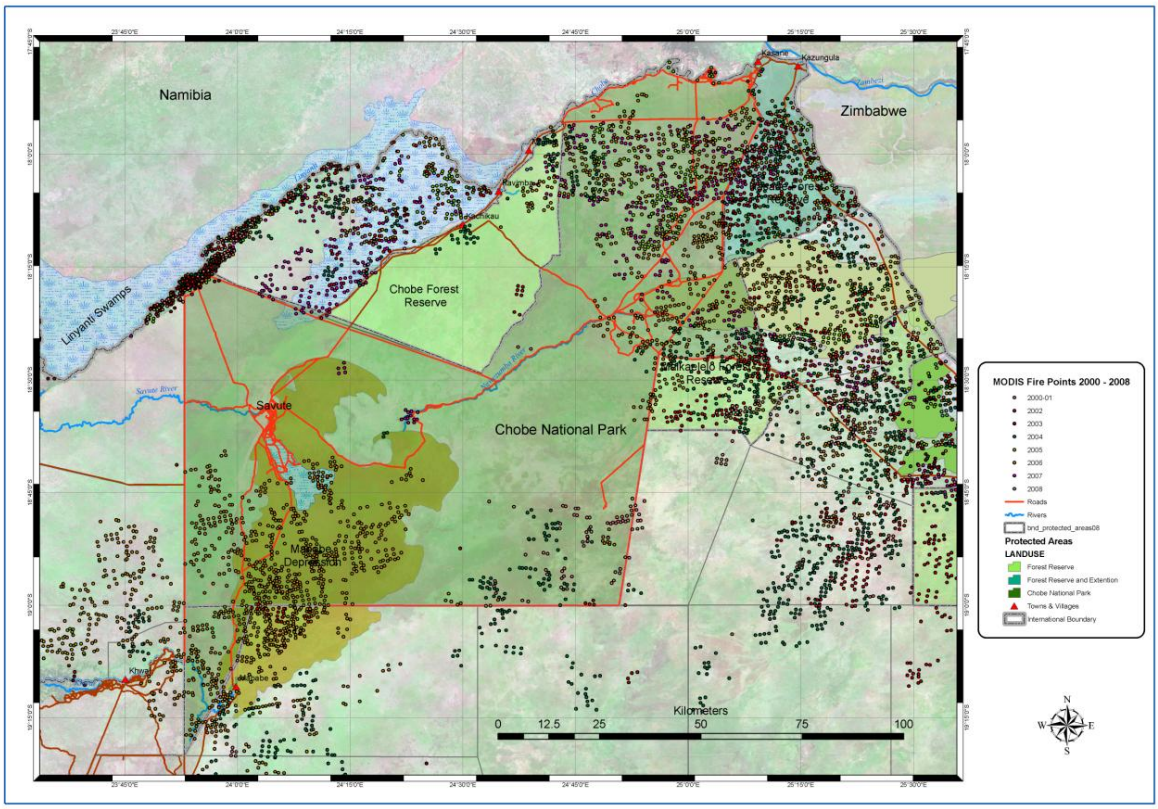

Fig. 3.9.1: Map Showing Areas Frequently Burnt in Chobe National Park and surrounding Areas (2004-2008).

3.8.1. Fire Management Strategy

It apparent from the foregoing that fire management should be aimed at *"Providing direction to the management of Chobe National Park on how to use fire as a means of protecting the various vegetation communities in the park, whilst supporting ecologically sound resource management"*.

The adoption of this strategy would premise that:

1. Fire is regarded as a natural phenomenon on the ecological landscape and should therefore not be interfered with. This would be in line with the tenets of the Wildlife and National Parks Act 26, which advocates for minimal interference of natural processes.
2. Fires are an important tool for ecosystem renewal and as such in the event of naturally induced fires, the strategy should be to let nature take its course, whilst ensuring lives, tourist and administrative infrastructure are protected;
3. Prescribed burning can yield positive benefits on the ecological landscape;
4. Adequate resources should be availed towards educating the public on the role and benefits associated with fires on the ecosystem;
5. Riparian vegetation is at greater potential risk and need to be protected;
6. Encourage research into understanding the impact different fire burning regime on the woodland vegetation in the Chobe National Park.

3.9.2.1 Objectives of the Fire Management Strategy

The following should be the objectives of the fire management strategy:

i. Protect park visitors and ensure there is minimal socio-economic disruptions;
ii. Accept the ecological role of fire in the maintenance of ecosystems and critical habitats;
iii. Minimise fire damage to Park properties, infrastructure and structures;
iv. Minimise impacts of fire by adopting prescribed burning program in areas adjacent to the Chobe National Park. This could be achieved by working closely with institutions such as the Department of Forestry and Range Resources and also with communities living on the periphery of the park. For fires within the Chobe National Park, management will undertake appropriate fire response strategy;
v. For fire that threaten park visitor safety, or park infrastructure will receive full and sustained action until extinguished;
vi. The management of the park will have to develop a fire management plan taking cognizance of the role of fire on the ecological landscape. This will provide for rational use and control of fires;
vii. Prescribed burning is an important tool for managing ecosystems and as a means of minimising hazards associated with uncontrolled fires. This action will need to be adopted.

ACTIONS

1. In order to effectively implement this strategy all fires breaks within the park should be adequately maintained, to ensure fire damage is confined to a limited area;
2. In addition to fire breaks, adequate fire suppression equipment including vehicles, water supplies and personnel will have to be provided to enable their deployment whenever the need arises;
3. The Management of the Park should invest in firefighting equipment and personnel to initiate an effective fire suppression strategy;
4. The fire suppression strategy negates the fact that fire has and continues to be used as a management tool throughout Africa. This would therefore suggest that in addition to fire suppression strategy, an attempt should be made to initiate controlled burning strategy. This strategy could, for example, be used in areas where management feels uncontrolled fires could result in the damage of some unique and special woodland vegetation communities. Another scenario where controlled burning could be used is where management feels that if fires are not controlled, the same would compromise the aesthetic appeal of some landscapes;
5. Maintain service and game viewing roads to ensure that they serve their additional purpose of acting as internal fire breaks within the Chobe National Park;
6. Incorporate results of ecological monitoring and research into the fire management plan as these become available;
7. Publicise and enforce fire regulations to minimise the risk of accidental fires especially from campers;
8. Include detailed explanation of the role of fire on the ecological landscape, for prevention and fire safety issues in interpretative programs and displays;
9. Protect camping and day visitor areas by:
    a. Slashing the areas
    b. Providing water within or close to such facilities to facilitate fire suppression in cases of accidental fires;
    c. Creating strategic fire breaks around such facilities;
    d. Undertake prescribed early burning to reduce fuel loads around such facilities;
10. Minimise the effect and impact of intense late fires on specific mammal species and woodland communities by reducing fuel loads through appropriately timed low intensity mosaic burning. The vegetation that should be considered for protection include:
        i. The teak forest between Kasane-Ngoma Road and the Ngwezumba river;
        ii. The eastern side of the High Density Tourism Zone;
        iii. The Linyanti riverine forest.
11. Early mosaic burning should be done to reduce fuel loads in the following areas:
        i. Molapowadiphofu;
        ii. The whole of the savute area
        iii. Nogatshaa.

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4.0. TOURISM MANAGEMENT

Tourism has been touted by the Botswana government as the future engine of economic growth and potential area for economic diversification away from mining. The government's commitment toward unleashing natures economic potential is reflected in the Ministry of Environment Wildlife and Tourism's mandate, which is to *"protect the environment, conserve the country's natural resources and derive value out of the environment for the future benefit of Batswana"*. Implied in this mandate are issues of environmental sustainability and prosperity from the environment and natural resources. The basis of this statement is the realization that abundance and diversity of natural resources including wildlife and landscapes are the main drivers of the tourism economy.

The Okavango delta in Ngamiland, the Kwando–Linyanti system and the Chobe National Park are the main tourist destinations accounting for almost 93% of the tourist traffic to the northern protected areas. At the moment tourism contributes 5% to Botswana's Gross Domestic (GDP). In terms of employment, approximately 15,000 people are employed in the many tourist establishments in the northern part of the country. This figure has a potential of increasing significantly with improved infrastructure, allocation of additional concessions and increased bed nights.

The Okavango delta and the Chobe National Park have resources that attract a considerable portion of the tourist traffic. These two areas are important tourist destinations that should be effectively managed to sustain the tourism industry and resources upon which the industry depends. To effectively manage resources in the Chobe National Park, the Department of Wildlife and National Parks has had a number of documents that guide management activities undertaken in the Chobe National Park. The latest of these documents is the 2002 Chobe National Park Management Plan

4.1. REGIONAL PERSPECTIVES IN TOURISM DEVELOPMENT AND CONSERVATION OF BIODIVERSITY

4.1.1. The Kavango Zambezi (KAZA) Initiative and Its Implications

The Chobe National Parks is not an island. It is an entity that lies within an ecological landscape with close links to other ecosystems. The sustainability and viability of tourism in the Chobe National Park is influenced by factors within the parks itself and also by what goes on outside it. It is therefore important in the planning process that consideration is made of what goes on inside and outside to enable an adoption of a holistic approach tourism planning. At the moment, it is estimated that almost eighty (80%) percent of the Chobe district has been set aside for conservation purposes. The Chobe National Park constitutes forty nine percent of this area.

Forest Reserves and Wildlife Management Areas (WMA) constitute 21%. The remainder is the area that is currently used for communal agriculture and livestock production. This setup bolds well for conservation of wildlife and development of wildlife and nature based tourism related activities.

On the regional front, it is noted that countries bordering the Kavango-Zambezi basin that includes Angola, Botswana, Namibia, Zambia and Zimbabwe recognize the role that tourism can play in stimulating regional economic growth and sustaining livelihoods. In order to fully exploit this potential the five countries acknowledge that ecosystems and what goes on in them are not constrained by political boundaries. Representatives of these countries met and agreed to set up one of the most far reaching ecological landscape in the region. This initiative is the Transfrontier Conservation Area (TFCA) encompassing a large proportion of the Upper Zambezi basin, the Okavango basin and the Okavango delta. This area encompasses the largest continuous wilderness, wetland and wildlife area in southern Africa (Fig. 4.1.). This initiative is now commonly referred to as the Kavango–Zambezi Transfrontier Conservation Area (KAZA TFCA). The objectives of this initiative are to:

i. Put in place mechanisms and strategies to promote collaborative management planning to ensure resources within the basin are properly inventoried, monitored and that research and land use planning are harmonized;
ii. Undertake measures to ensure that policies and legal framework are harmonized;
iii. Promoting ecologically and socio–economic sustainable tourism development;
iv. Establishing mechanisms that would ensure proper coordination and facilitation of the implementation of the initiative by the five countries;
v. Adopting appropriate strategies to identify and mobilise resources to attain the overall objective of the initiative.

The implementation of the above objectives would lead to improved cooperative management of shared resources, increase the area available to wildlife and plants and consequently would unleash economic benefits to the local communities living within and on the periphery of the KAZATFCA.

The architects of the KAZA initiative view tourism as the main driver of economic growth and sustainable growth in the KAZA TFCA. In addition, Botswana, which at the moment has well over 170,000 elephants that are perceived to be negatively impacting on the woodland vegetation, it is envisaged that establishment of the KAZA TFCA, would provide an environment that would encourage elephants to range free within this huge conservation area. This would ultimately result in reduced impact on the woodland vegetation communities. It is therefore hoped elephants, wilderness area and abundant and diverse wildlife will be the basis of tourism marketing for the KAZA.

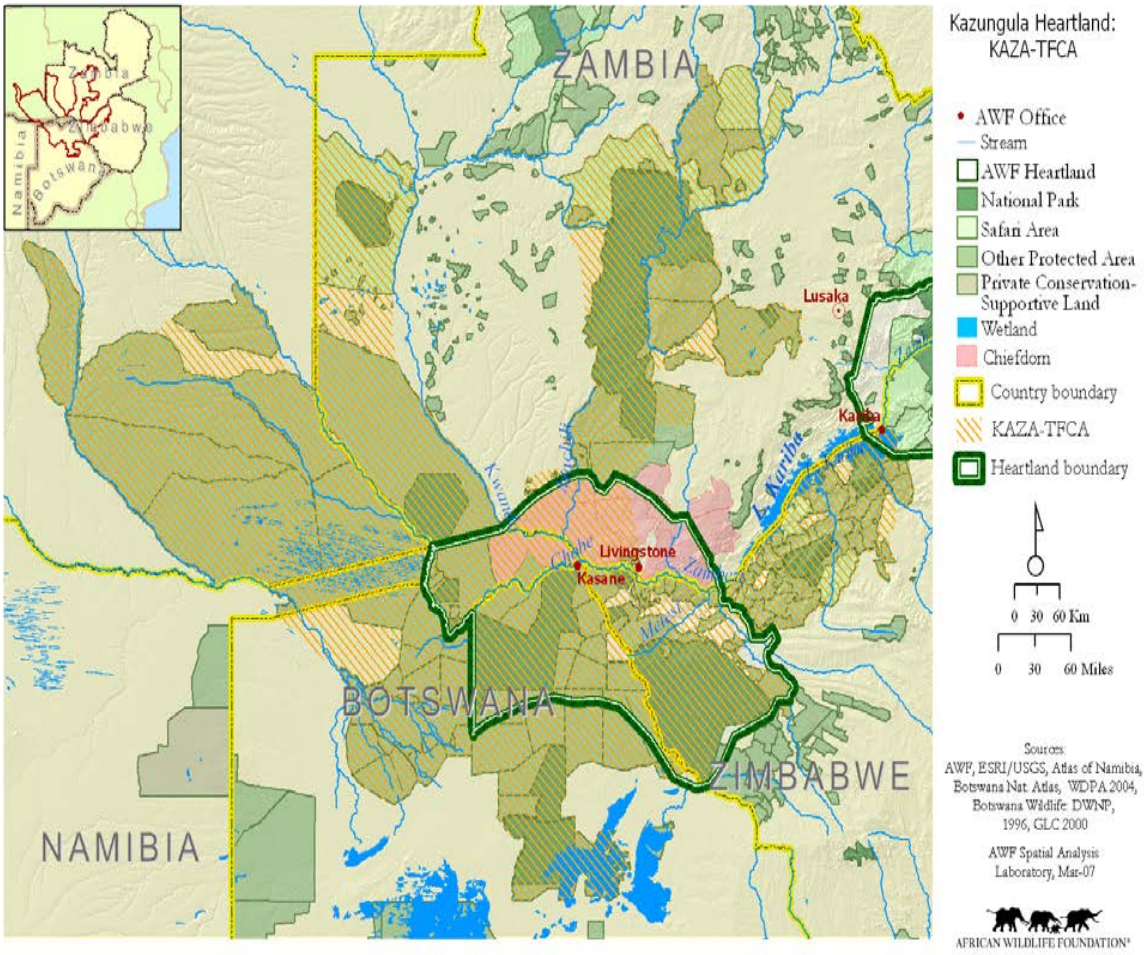

Fig.4.1: Map of Proposed Kavango–Zambezi Transfrontier Conservation Area

4.2. CHOBE DISTRICT TOURISM PLAN

The KAZA TFCA initiative will greatly enhance the potential of the Chobe District in general and the Chobe National Park in particular as a tourist destination. The growth in the tourism sector is a welcome phenomenon, it is however vital that such an expansion is effectively managed and controlled. If this is not done, the consequences on the environment will be such that the industry will not be sustained. The KAZATFCA initiative has huge potential benefits for the Chobe district as a whole, it is therefore imperative that concerted efforts are channeled towards developing a district tourism plan. The development of such a plan would ensure the ecology and ecosystems to which the Chobe National Park is linked are sustained. The development of such a plan will ensure measures are put in place to protect conservation areas around the Chobe National Park to mitigate the impacts on the environment. This will ensure the Chobe National Park continues to function as a centre for economic development, whilst retaining its most important function; that of conserving and preserving biodiversity and linkages to surrounding conservation areas.

STRATEGY

1. Ensure integrity of the Chobe National Park is sustained.
    a. This to be sustained through development of Management Plans for the Controlled Hunting Area (CHA) allocated to the Chobe Enclave villages. This is necessary for the inhabitants of the enclave to continue managing and derive both utilitarian and financial benefits from wildlife and tourism potential of the area.
    b. Ensure tourism activities in forestry reserves take cognisance of ecosystem linkages between the forests and the Chobe National Park. This will ensure Forestry Reserves play a very important role in conservation of biodiversity;
    c. Carrying out discussions with relevant authorities and other stakeholders to ensure the Kakulwane and Pandamatenga plains continue to act as corridors for wildlife movements between the Matesi conservation area in Zimbabwe and the Chobe National Park.
    d. Facilitate the development of tourist infrastructure on the fringes of the Kakulwane and Pandamatenga plains;

4.3. TOURISM IN THE CHOBE NATIONAL PARK

In Botswana, the tourism industry is dependent on the wildlife resource, as a result protected areas such as Game Reserves and National Parks play an important role in offering a range of visitor experiences. The Chobe National Park at the moment is renowned for guided game

drives, boat cruises; fishing; self drive game drive viewing, bird watching. These activities have mainly been concentrated in Chobe Riverfront and the Chobe River. This area is the prime tourist destinations for clients accommodated at 22 tourist establishments that include hotels, lodges and guests houses in and around Kasane and at two other establishments inside the Chobe National Park.

In addition to these lodges, Kasane also hosts a number of camping sites, budget accommodation facilities and DWNP run camping facilities inside the park. In addition to the above, there are day trippers from Zimbabwe and to a lesser extent Zambia's who come in groups for either game viewing or boat cruises or both.

Therefore one of the functions and objectives of establishing National Parks is to accord discerning visitors a chance to enjoy nature. A review of the tourism statistics for 2007 suggests that almost 70% of the tourists that come to Botswana come to enjoy the diverse wildlife.

4.3.1. ZONATION

As alluded elsewhere in this plan, tourism is considered the future engine of economic growth for Botswana (Tourism Policy of 1990). Wildlife based tourism accounts for almost 83% of the tourist arrivals in northern Botswana. The Chobe National Park is one of the favourite tourist destinations. It is therefore imperative that the Park is zoned to:

- Provide a geographical frame work in which to effectively manage the park;
- Indicate the type and levels of use appropriate throughout the park;
- Assist in minimising existing and potential conflicts between uses and activities of the different stakeholders;
- So that zones would be used as a basis of assisting suitability of future activities and development proposals.

The Chobe National Park is divided into six land use and tourism development zones (Fig.4.3.1). These zones are; the High Density Tourism Zone, Medium Density Tourism Zone, Low Density Tourism Zone, Communal Use Zone, Protected Zone, and Development Zone. For each zone, different land use and management approaches including visitor carrying capacities and infrastructure development strategies are recommended.

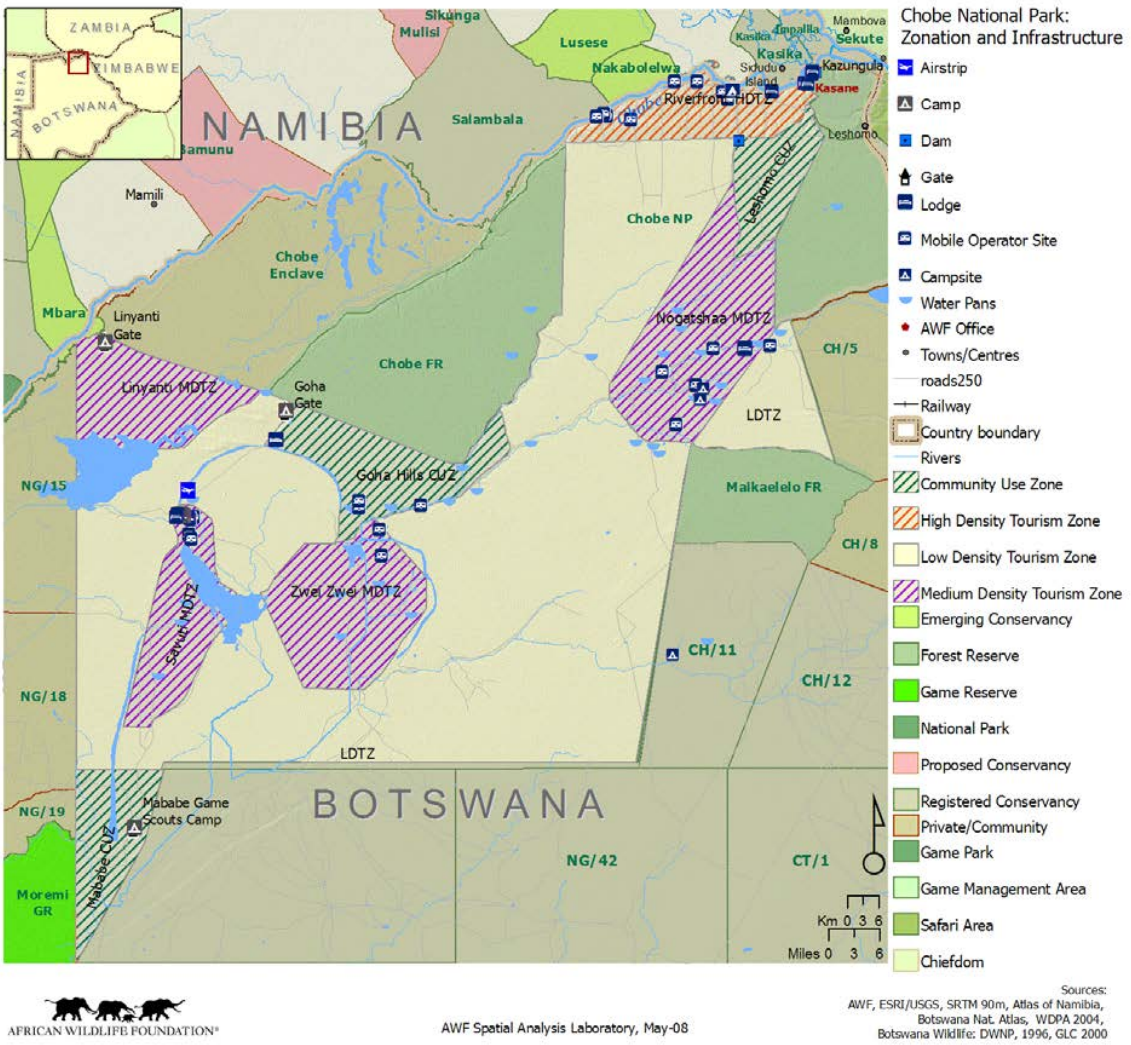

Fig. 4.3.1: Map of Land Use and Development Zone for Chobe National Park

4.3.1.1. Description and Outline of Activities for Each Zone

a. High Density Tourism Zone

This zone refers to the area lying to the north between of the Kasane–Ngoma along the Chobe river front. This area is the prime tourist zone of the whole Chobe National Park because of the diversity and abundance of wildlife. Almost 90% of the tourist establishments in the district are located in close proximity to this zone. In addition, to game viewing roads the other popular mode of viewing game is the use of boats. There have been concerns that boat traffic had been increasing at such a pace such that there were fears that if the same is not controlled the tourist product could be affected. There were also concerns that oil leakages, and noise pollution were posing a danger to the many wildlife species that come to the drink and utilize the water resources of the Chobe River. There were therefore calls that measures should be taken to address most of these concerns to mitigate potential impacts.

A number of measures to militate these concerns were outlined in the 2002 Chobe Management Plan. Some of the measures suggested have been implemented such as the boat station and closure of some of the entry gates, while others have yet to be implemented such as construction of roads and introduction of booking system, limiting the number of vehicles entering the park, construction of additional game viewing routes in the Chobe river front area. In this a detailed discussion of measures that need to be implemented to spread tourism are discussed and also measures that should be implemented in order to reduce congestion in the Chobe river front are discussed.

b. Medium Density Tourism Zone (MDTZ)

The type of tourist activities permitted in this zone is an assortment of activities that do not require construction of permanent tourist infrastructure. Activities that are permitted in this zone according to recommendations in the 2002 Management Plan include mobile operator's sites; wilderness camp sites; public camping sites; stretch points and game viewing facilities such as hides and game viewing roads. The latter would suggest that developed of game viewing roads is permitted. There are four MDTZ sites in Chobe National Park; these are:

i. **Linyanti MDTZ.**

   This zone is approximately 372 square kilometers in size lying on the north western tip of the park. This zone is considerably under developed with a small camping site capable of holding 18 campers. The facilities are generally rustic and archaic. The ablution is old with limited toilet and shower ring facilities.

ii. **Savute MDTZ**

   This zone is about 802 square kilometers in size. This is by far the most developed of all the MDTZ in terms tourist infrastructure. There are 170 kilometers of game viewing roads. There are two lodges, five mobile sites and one public camping site making a total of 158 bed nights.

In addition to tourist facilities, there is a DWNP staff camp, an airs strip and three artificial watering points near the camping site, Marabou Pan and at Rhino Vlei.

The above developments are concentrated on the northern portion of the zone.

iii. Zwei Zwei MDTZ

The Zwei Zwei is approximately 785 square kilometers in size. This zone is grossly underdeveloped; it has only 14 kilometers of official game viewing roads. There are however several unofficial game viewing roads in this zone opened by photographic safari operators. The lengths of these roads are difficult to quantify.

iv. Nogatshaa MDTZ

This is the largest of the four MDTZ, it is approximately 1186 square kilometers in size. According to studies by various scientists who have worked in the area and information from various stakeholders, the Nogatshaa area is renowned for good forage and an abundance of ephemeral pans that in times of good rainfall hold water for extended periods of time. The area has potential of being developed into prime photographic tourism zone. The crude road network is capable of supporting 158 bed nights. Unfortunately the area has no facilities to allow for overnight stay such as ablution blocks as a result the area is heavily underutilized.

The potential of the area is stifled by poor game viewing infrastructure and limited surface water especially during periods of drought. In an effort to mitigate the ravages of drought and rejuvenate photographic tourism in the area, the Department of Wildlife and National Parks has drilled several boreholes and constructed eight artificial watering sites in the area.

The tourist infrastructures in the area are five mobile sites and game observation hides at Kabunga, Nogatshaa, Poha and Saurigho.

A new semi permanent lodge site at Mapororo (S18º 16'52 E025 01'48) has been issued out to tender for development by the private sector.

c. Low Density Tourism Zone

This by far the largest of the three tourism development zones in the Chobe National Park. There are no game viewing roads in this zone except for a few routes that pass through the area. It is one of the areas in the Chobe National Park that has wilderness

qualities. In acknowledgement of these qualities, a number of sites have been identified for development of wilderness camping. Although this area is designated a wilderness zone, there is a lodge site located between Kakulwane plains and the Chinamba Hills. This lodge site was allocated in 1999 and up to now it has not been developed.

d. Community Use Zone

This a zone that is allocated for community use, where target communities are allowed to undertake tourism related activities and also harvest veld products for subsistence purposes. In the Chobe National Park, management has allocated the south-western edge of the park for use by the Mababe community. In addition to this zone, the communities of Chobe enclave and Lesoma are advocating for their own use zones. These zones are on Fig. 4.3.1.

e. The Development zone

In the 2002 management plan zone map, there were provision for three lodge sites. These sites are the Chobe Game Lodge, Savuti Safari Lodge and Savuti Elephant Lodge. An additional four sites have been added and these are at Shinamba, Nogatshaa and two Goha hills.

4.4. TOURIST ACTIVITIES AND ASSESSMENT OF VISITOR FACILITIES

An assessment of tourist facilities in each of the tourist zones was undertaken to determine the quality and number of available facilities. This assessment assisted determining which facilities need to be provided in order to meet the existing tourist demands. A summary of the state of facilities and a list of proposed infrastructure is provided in table 5.1 below.

It is apparent from the table that the Chobe National Park offers a range of visitor experiences. These visitor activities in the Park include;

- Angling;
- Camping;
- Boating
- 4x4 game viewing drives;
- Canoeing;
- Motor boating;
- Picnicking;
- Game viewing using observation hides;
- Boat cruises;

New activities being proposed include:

- Night drives;
- Accompanied walks;
- Animal back safaris;
- Mokoro boat trips.

4.4.1. Provision for the Tourist

The plan advocates for the provision of visitor facilities and services to meet the needs a range of tourist taking cognisance of Botswana's tourism policy of *High Cost: Low Volume*.

STRATEGY

1. The Park should provide opportunities and quality services and facilities for visitor use and enjoyment;
2. The park management should undertake appropriate monitoring to ensure visitor use are not to the detriment of conservation objectives;

ACTIONS

In order to achieve aforementioned strategies, the following actions are recommended:

1. Provide facilities that will ensure and enhance visitor experience of the Chobe National Park;
2. Conduct visitor surveys to assess visitor profiles, expectations, preferences and patterns of behaviour;
3. Continue assessment of tourist infrastructure requirements to satisfy current and future visitor needs;
4. Encourage visitors to the Chobe National Park to adopt minimum impact techniques and adhere to the code of conduct appropriate to their activity;
5. Monitor visitor use to ensure adequate provision of facilities consistent with appropriate types and levels of use; This monitoring should focus particularly on:
    i. Ablution facilities
    ii. Waste receptacles
    iii. Parking space
    iv. Game viewing roads
6. Maintain annual visitor statistics of :
    i. Day visitors;
    ii. Campers;
    iii. Guided tours;
    iv. Day trippers from Zimbabwe and Zambia;
    v. Boat cruises;
    vi. Number of boats plying the Chobe river;

ACTIVITY	TOURISM DEVELOPMENT ZONE				
	HIGH TOURISM DEVELOPMENT ZONE	MEDIUM TOURISM DEVELOPMENT ZONE	LOW TOURISM DEVELOPMENT ZONE	WILDERNESS ZONE	COMMUNITY USE ZONE
Rock climbing	-	***	***	***	***
Angling	Yes	-	-	-	-
Bush walking	No	Yes	Yes	Yes	Yes
Camping	Yes	Yes	Yes	Yes	Yes
Canoeing	Yes	-	-	-	-
Caving		-	-	-	-
Cycling		-	***	***	***
Four Wheel Driving	Yes	Yes	Yes	Yes	Yes
Motor Boating	Yes	-	-		
Picnicking	Yes	Yes	Yes	Yes	Yes
Rest stop	Yes	Yes	Yes	Yes	Yes
Government operated Camping sites	3	3	No	No	No
Picnic tables	Yes	Yes	No	No	No
Toilets	Yes	Yes	No	No	No
Showers	Yes	Yes	No	No	No
Water	Yes	Yes	No	No	No
Car parking facilities	Yes	Yes	No	No	No
Fire places	Yes	Yes	No	No	No
Waste Bins	Yes**	Yes	No	No	No
Game Viewing Hides	Yes	Yes	No	No	***
Stretch sites	Yes	Yes	Yes	Yes	Yes
Private operator camping sites	Yes	Yes	Yes	Yes	Yes
Wilderness sites	No	Yes	Yes	Yes	Yes

NB: *** -Recommended Activity; Yes-Activity currently taking place; No-Not recommended

4.5. MANAGEMENT OF TOURISM ACTIVITIES AND VISITOR DENSITIES

4.5.1. High Density Tourism Zone

In Chobe National Park, the Chobe Riverfront (Fig. 4.5.1), the area designated the High Density Tourist Zone (HDTZ) is the favourite tourist destination. The Chobe Riverfront serves mainly tourists that reside in the 22 lodges, guest houses, camping sites in Kasane Township and public camping sites in the Chobe National Park. In addition to these tourists, the area serves day trippers from places such as Livingstone in Zambia and the Victoria falls in Zimbabwe. These tourists come to view game by vehicles and by boats. This has led many people including members of the Local Advisory Committee on Management (LACOM) to conclude that increasing tourist traffic was having undesirable impact the Chobe National Park especially in the HDTZ. It was therefore proposed that something needed to be done to mitigate potential negative tourism impacts. In this case *"tourism Impacts"* is defined according to Cole and Cadres (1996), Goodwin et.al (1979a), (1979b) as being "*primarily the alteration and disturbance of the physical sites and vegetation, disturbance to animals, pollution of the water, littering and fires"*.

In 2002 a study to assess the impact of tourism in the Chobe Riverfront and come up with measures to stem the deleterious impacts of tourism on the environment was commissioned. The study was intended to;

i. Ensure conservation of the ecological integrity in order to ensure "all" stakeholders continue to enjoy benefits from natural resources;
ii. Put in place reciprocal measures that would ensure sustainable use of resources within the district and within the upper Zambezi integrated land use planning zone in line with the tenets of the KAZA;
iii. Ensure that the Chobe continues to offer a holistic experience and diverse tourism product;
iv. Put in place a framework that would commit all stakeholders to play a meaningful role in the adaptive management of the resources within the Chobe National Park

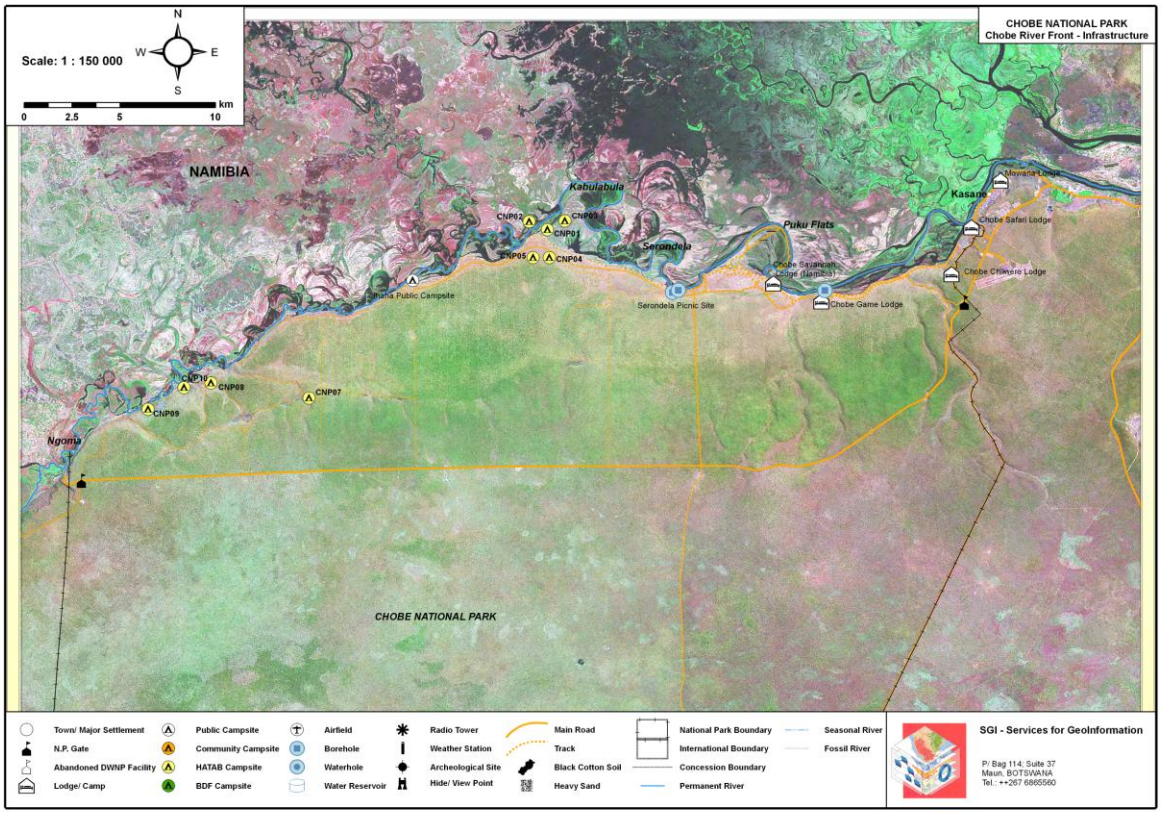

Fig. 4.5.1: Tourist Infrastructure in the Chobe River Front High Density Tourism Zone.

4.5.1.1 Limits of Acceptable Change and Carrying Capacity

The foregoing shows that the tourism capacity in the Chobe Riverfront has been exceeded and is having a deleterious effect on the product. Measures should be adopted mitigate the deleterious impacts in the Chobe river front. A study commissioned by LACOM and DWNP undertook a strategic assessment of the tourism impact in the study area. The study considered a number of models with respect to sustainability of the resources and the tourism industry in general. The study opted for the use of both the Carrying Capacity (CC) and Limits of Acceptable Change (LAC) models to mitigate tourism impacts in the Chobe river front.

The use of LAC in evaluating tourism impact is rapidly gaining ground throughout the world. This system was devised as a planning tool in response to the realization that the use of the other approach; carrying capacity for mitigating tourism impact was failing. The other rational for adopting the LAC approach is that the carrying capacity module is based on the wrong question and totally dependent on quantities. The carrying capacity approach negates the fact that many of the problems associated with tourism/recreational use is a result of human behavior. Studies elsewhere including the Okavango delta, which is closely linked to the Chobe National Park and environs, have demonstrated that the Limits of Acceptable Change are ideal.

The use of LAC concept was also explored in the drafting of the 2001 Integrated Chobe National Park Management Plan. The analysis conducted in 2001 identified areas that would help to improve tourism management thereby reducing impact of tourism in the Chobe River front, whilst broadening the experience of the tourist. This analysis focused on:

i. Type of facilities and infrastructure required to reduce traffic congestions and provide facilities to ensure tourists are accorded an opportunity to enjoy a wide range of experience and enhancing their relative comfort on game viewing experience;
ii. Adoption of an adaptive management approach with a view of determining appropriate visitor entry, vehicles and boats permits into the park with a view of;
    a. Reducing to acceptable levels soil erosion resulting from vehicle roads and tracks
    b. Reducing to acceptable levels the disturbance and direct physical harm to animal and plant life in the HDTZ';
    c. Maintain the number, speed, size, appearance, noise and general behaviors of drivers and passengers and standards that are generally acceptable to the majority of paying visitors to the Park;
    d. Ensuring that emerging local business is provided with opportunities to become tour operators;
iii. Identifying alternative activities to widen visitor experience and diversify the product.

On the basis of studies conducted in 2002, where a number of measures to limit the impacts on the river front were suggested. These measures are still applicable today and management of the park is urged to fully implement them. These measures include:

4.5.1.1. Limits of Acceptable Change for Boats

In order to mitigate boat impacts, the following management activities are recommended:

i. Limit the number of boats entering the park per any given time;
ii. Encourage operators to use boats with larger passenger capacity and phase out small boats entering the park;
iii. Ban all boat tourist transfers
iv. Set quotas for each tourist operator.

The limit on boat traffic and set boat quota for different operators in the area are outlined in tables below:

Table 4.5.1: Acceptable Thresholds for Boats traffic on the Chobe River per Operator

OPERATOR	BOAT TYPE				Total
	Speed Boat	Cruise Boat	Pontoon/skimmer boats	Unspecified Boat	
Tour Operators	19	3	15	0	37
Private Boat Owners	0	0	0	7	7
Botswana Government	0	0	0	1	1
Namibian	0	0	0	5	5
TOTAL	**19**	**3**	**15**	**13**	**50**

Table 4.5.2: Quota of Boats per Operator

OPERATOR	BOAT TYPE				TOTAL
	Speed Boat	Cruise Boat	Pontoon/Skimmer Boats	Unspecified Boat	
Into Africa safaris	4	1	1	0	6
Chobe Chilwero	2	0	0	0	2
African Odyssey	1	0	4	0	5
Thebe River safari	2	0	1	0	3
Chobe Safari Lodge	1	1	4	0	6
Chobe Game Lodge	5	1	2	0	8
Kalahari Tours	2	0	0	0	2
Janala	1	0	0	0	1
Safari excellence	0	0	3	0	3
Gabbie Lodge	1	0	0	0	1
TOTAL	**19**	**3**	**15**	**0**	**37**

4.5.1.2. Limits of Acceptable Change for vehicles

Table 4.5.3: Vehicle Carrying capacity (Adopted from the 2000 Chobe River front plan)

Vehicle Carrying Capacity Peak Times	Units	Sedudu Area	Ngoma Area	Proposed Changes	
				Sedudu	Ngoma
No of vehicles present	Vehicles	45	5	0	0
Maximum number of vehicles per day	Vehicles	68	70		
Percent of vehicles at peak periods of total per day	Percent (%)	45%	45%		
Present Acceptable capacity	**Vehicles**	**31**	**31**		
Hides (Increase capacity by 1 vehicle per hide)	Vehicles	2	1	2 new hides	1 new hide
Stretch and viewing points; increase capacity by 0.5 vehicles per point	Vehicles	3	1.5	6 new points	3 new points
On prime tourist tracks; increase capacity by 0.59 vehicles per km	Vehicles	4	1	Additional 6.5 km	Additional 1.84 km
On secondary tourism tracks: Increase capacity by 0.2 vehicles per km	Vehicles	7	3	Additional 37.05km	Additional 13.51km
Service roads at Sedudu increases capacity by 3 vehicles	Vehicles	3	0		
Campers at Ihaha decreases capacity by 5 vehicles	Vehicles	0	-5		10 campsites
Increased capacity due to proposed changes	Vehicles	19	1		
New proposed capacity after changes (excluding extra gate)	Vehicles	50	33		
Factor for extra gate; improvement of new capacity	Percent (%)	15%	15%	Increase distribution and capacity	
Increase in capacity due to extra gate	Vehicles	7	5	1 extra gate	1 extra gate
New proposed capacity after changes including extra gate	Vehicles	57	38		
Percent (%) increase in capacity	**Percent (%)**	**87**	**20**		
Calculation of Acceptable Vehicle Density for Primary and Secondary Tracks					
Present kilometers of primary tourist tracks	Kilometers	42	32		
Present kilometers of secondary tourist tracks	Kilometers	31	64		
Acceptable density on primary tourists roads (80% of vehicles)	Vehicles per kilometer	0.59	0.59		

STRATEGY

In addition to setting the limits, a number of actions were proposed that would enable management to monitoring and ensure that the limits of acceptable change and carrying capacity are not exceeded. Other strategies and actions are proposed that should be tried in order to mitigate impacts. These strategies are:

1. *Limiting The Number Of Boats And Vehicles Entering The Chobe River Front;*
   On the basis of these limits of acceptable change and maximum carrying capacity indices were set.
2. *Set Limits to Number of Visitors Entering a Particular Management Zone;*
   There should be separate permits for accommodation and that of providing game viewing services. This approach has been tried in elsewhere such as Zimbabwe's Hwange National Park and apparently it works very well. The best way of implementing such an option is to consider a change in the tourism licensing;
3. *Spreading Available Capacity Depending On Available Beds;*
   The number of vehicles allocated to a particular establishment would depend on number of bed nights for that establishment;
4. *Allocating Time Slots;*
   Each establishment should be allocated time slots to reduce congestion;
   In some cases, entry by booking only can mitigate congestion. The adoption of such an approach would guarantee entry for each establishment on the booked slots.
5. *Crowd Limits;*
   This mechanism uses a thumb up rule whereby management decides that after reaching a certain number tourist in the protected area, no other tourists are allowed access.
6. *Pricing;*
   Pricing has been used as tool for controlling the number of visitors to a particular area. Prices should be increased until the numbers of tourist arrivals start falling.
7. *Lottery;*
   This approach should be used to allocate access to prime visitor sites such as the Chobe river front;
8. *Routes planning;*
   Compel tours to travel using certain routes or trails in a linear management determined direction;
9. *Entry Permit system;*
   Each operator to be given an annual permit issued by the in line with the National Parks and gamer Reserves regulations of 2000. These permits will be used to enforce the set quota and ensure compliance. In the event of non compliance, permits will be withdrawn and auctioned to other emerging local entrepreneurs;
10. *Zoning*;
    Zones where boating activities can take place have been identified based on game viewing opportunities, bird viewing and the need to protect ecologically sensitive areas;
11. *Policing.*
    This an important aspect of the whole process of setting limits. Policing is aimed at ensuring compliance to the set boat quota and size specifications. To ensure effective policing, the DWNP has constructed a floating jetty

4.6. ALTERNATIVE TOURIST ATTRACTION ZONES

Review of previous plans (Anon 1997, Anon 2002) and the Chobe River front management Plan of 2002 suggest that the High Density Tourism Zone has or is close to exceeding its limits of acceptable change. It is therefore imperative that tourism be extended to other areas.

STRATEGY:

1. Develop additional infrastructure and also expand the same to other areas within the Chobe National Park to sustain the tourism industry in and protect the environment and various ecological interactions and functions in the Chobe river front.

2. Divert tourist traffic away from High Density Tourism Zone to other areas in the park. There is always an opportunity to diversify visitor experience based on landscape diversity.

A number of zones within the Chobe National Park have been identified where tourism infrastructure can be developed and attract tourists away from the Chobe River front area. Recreational activities that could potentially be introduced in these zones include; rock climbing, angling, bush walking, biking, camping, four wheel driving, motor biking, mountain biking, picnicking, wilderness camping.

Areas that should be considered for diversifying and diverting tourist traffic away from the Chobe River front area are:

1. The Medium Density Tourism Zones (MDTZ);
2. Low Density Tourism Zone;
3. Community Use Zone.

The zones targeted for expanded tourist infrastructure are:

4.6.1. Linyanti Medium Density Tourism Zone;

The Linyanti Medium Density Tourism Zone is located on the north-western corner of the Chobe National Park. This zone is in an area that has a substantial diversity of game with elephants contributing 90% of the biomass. The remaining 10% comprises of impala, buffalo, waterbuck, lechwe amongst many others. The Linyati zone is under developed and the only tourist infrastructure is a small archaic public campsite that can cater up to a maximum of 18 people. The number of bed nights though is far much in excess of the recommended carrying capacity for the area, which is 11 bed nights. In addition to camping slots and public water points, the site has an ablution block. The factor that limits tourism in the area is the limited game viewing road network that is confined to the flood plain.

Table 4.6.1: Tourist Infrastructure at Linyanti MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	0
Mobile Operators Sites	5	0
Public Camping Sites	1	18
TOTAL		
OTHER TOURIST FACILITIES		
Game Viewing Roads	14	11
Air Strips	0	-
DWNP Staff Camp	1	-
Artificial watering points	0	-

An additional 97 kilometer of game viewing roads should be built in this zone. This will increase the number of available beds to 84. These beds should be allocated as follows:

i. Forty (40) of these beds should be reserved for public camping;
ii. Twenty (20) bed nights to mobile operators and wilderness camp sites;
iii. The remaining bed nights could either be allocated to a lodge, mobile safari operators and wilderness camping.

4.6.2. Savute Medium Density Tourism Zone;

The Savute zone is by far the most developed, with all the developments concentrated in the northern part of what was once the savute marsh (Fig.5.6.1). There two lodges private lodges at Savute. In addition, there are five mobile operator sites, one public camping site.

The game viewing road network at Savute is extensive, covering a total of 170 kilometers. In addition savute has an airstrip, DWNP staff camp, three (3) artificial watering points. A factor that makes Savute a potential zone for tourism expansion is its rich game and birdlife.

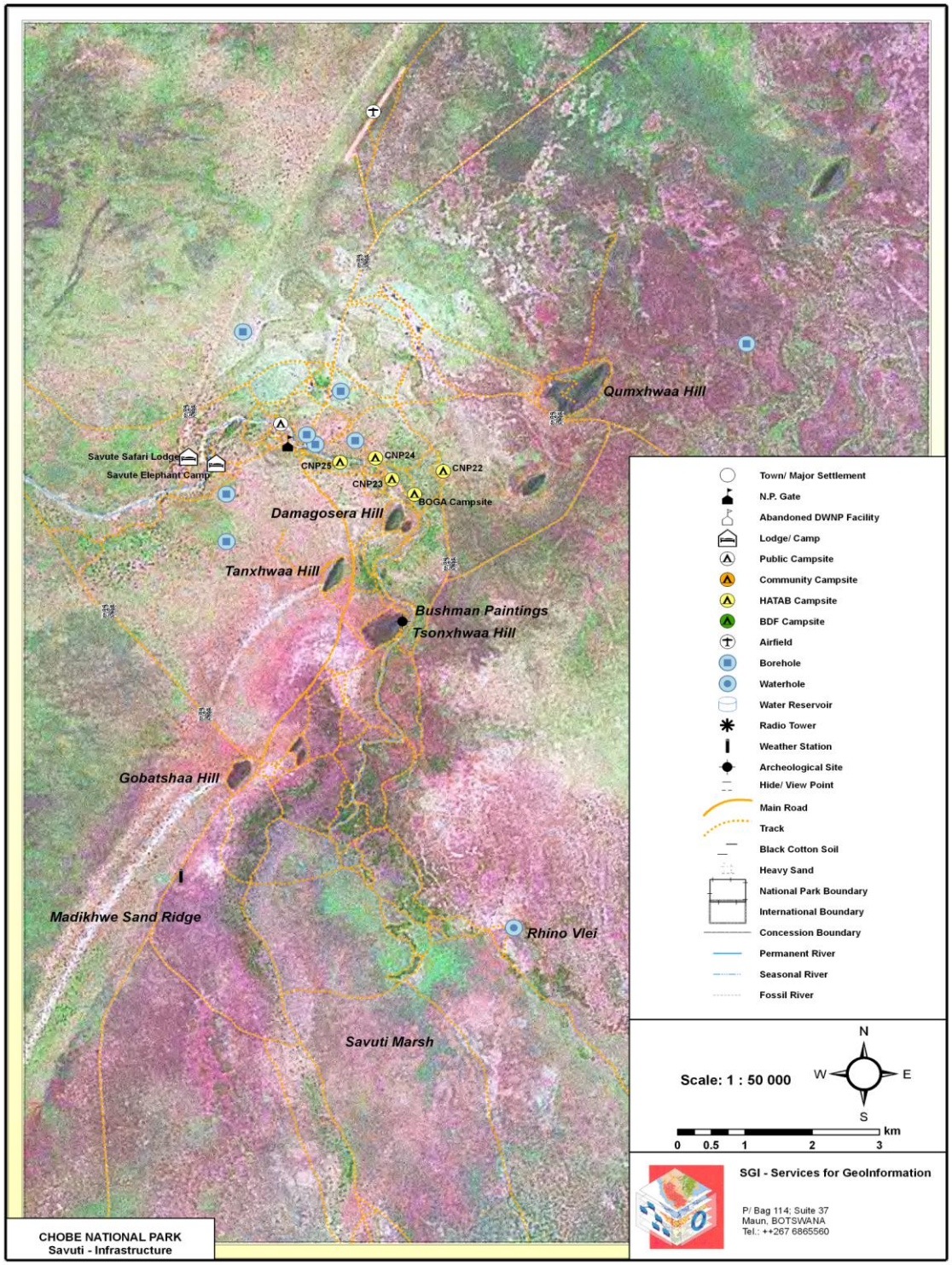

Fig. 4.6.1: Tourist Infrastructure in the Savute Medium Density Tourism Zone.

Table 4.6.2: List of Tourist Infrastructure at Savute MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	2	48
Mobile Operators Sites	5	50
Public Camping Sites	1	60
TOTAL		**158**
OTHER TOURIST FACILITIES		
Game Viewing Roads	170	158
Air Strips	1	-
DWNP Staff Camp	1	-
Artificial watering points	3	-

In addition to good game viewing, Savute is a stopover point for tourists travelling through the park between Maun and Kasane. This massive tourist traffic presses considerable pressure on the facilities that are currently in place at savute. It is imperative that with increased tourist arrivals, that tourist infrastructure at Savute be increased to meet this demand. At the moment, the carrying capacity for Savute is 158 bed nights shared as follows:

STRATEGY

1. Increase visitor capacity for the Savute zone developing additional game viewing roads;

2. Construct 70 kilometers of game viewing roads. The construction of these roads could increase the carrying capacity by 64;

3. Expansion of visitor facilities to concentrate in the central and southern portion of the savute marsh;

4. In the 2002 Management Plan, it was proposed that of the additional 64 beds, 25 should be reserved for the establishment of wilderness campsites. However, in view of current levels of development and other constraints such as staff transport, it is recommended that wilderness campsites should not be developed. Therefore any additional bed nights should be reserved for development of a third lodge and additional mobile sites.

4.6.3. Zwei Zwei Medium Density Tourism Zone

This zone is approximately 785 square kilometers. Its potential for tourism development is constrained by the fact that a large part of it lies within the Mababe depression, which is susceptible to seasonal flooding and soils dominated by kaolinite. These soils make it difficult for the area to be accessed for most part of the year.

Table 4.6.3: Tourist Infrastructure at Zweizwei MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	-
Mobile Operators Sites		-
Public Camping Sites	0	-
TOTAL		
OTHER TOURIST FACILITIES		
Game Viewing Roads	14	11
Air Strips	0	-
DWNP Staff Camp	0	-
Artificial watering points	0	-

STRATEGY

1. Develop appropriate roads and provide artificial water points:
   The provision of these infrastructures will enhance the zones tourism potential.

2. Construct 236 kilometers of game viewing roads. At the moment the area has only 14 kilometers of game viewing roads. An increase in network of game viewing roads would increase carrying capacity from 11 to 177 bed nights;

3. Do not develop wilderness camping sites in this zone;

4. The carrying capacity makes the area suitable for development of a permanent lodge. This development would entail construction of an air strip, artificial watering points, and all weather roads to allow for yearlong access.

4.6.4. Nogatshaa Medium Density Tourism Zone

The area around Nogatshaa and the open woodland vegetation community south of the Kasane-Ngoma Road offer good forage and are the favourite grazing grounds for most wildlife in Chobe National Park (BONIC 1990). The only factors that limits wildlife abundance and diversity in this area is water. This constrains tourism development in the area.

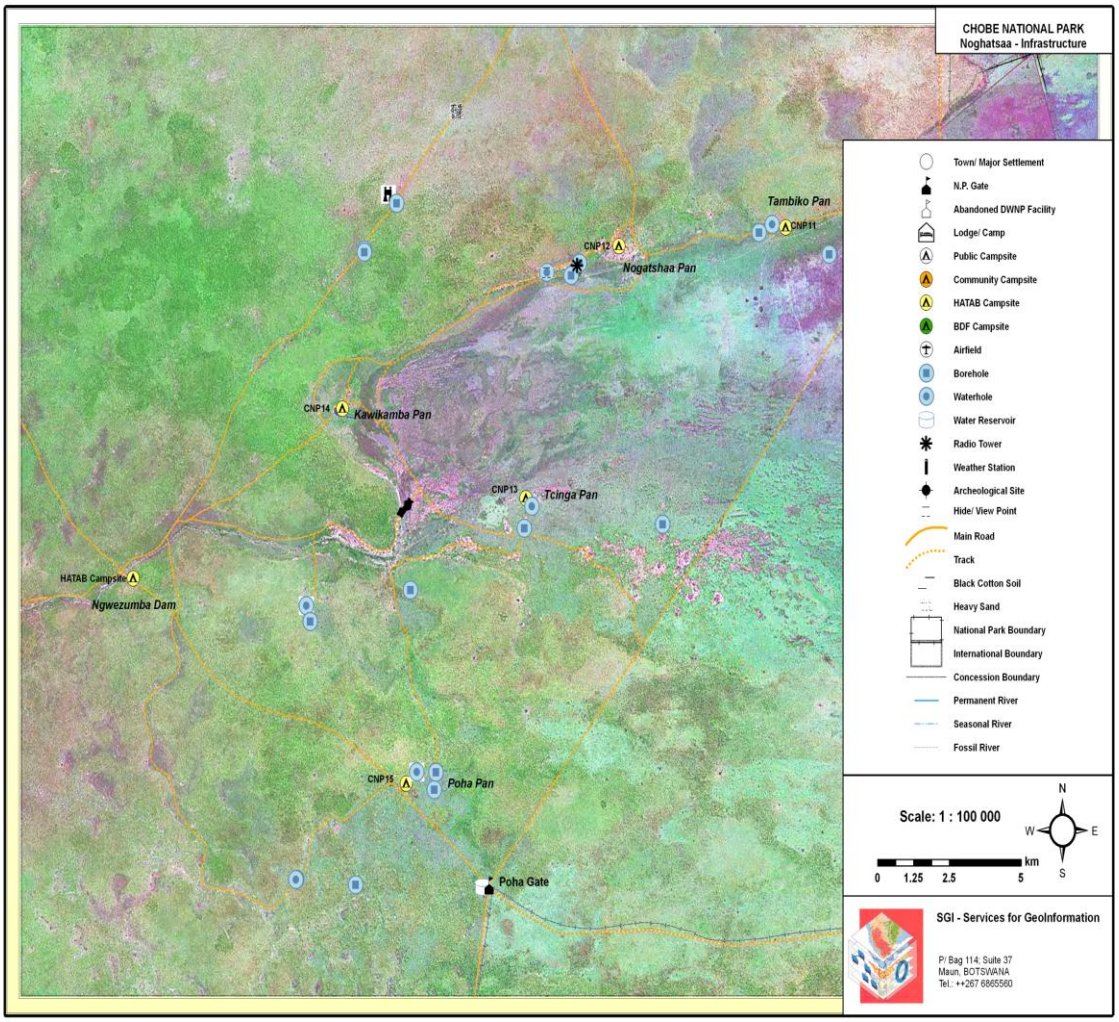

Fig. 4.6.2: Tourist Infrastructure in the Nogatshaa Medium Density Tourism Zone

Table 4.6.4: List of Tourist Infrastructure at Nogatshaa MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	0
Mobile Operators Sites	5	50
Public Camping Sites	0	60
TOTAL		**158**
OTHER TOURIST FACILITIES		
Game Viewing Roads	152	158
Air Strips	0	-
DWNP Staff Camp	1	-
Artificial watering points	8	-
Game viewing hides	4	-

STRATEGY AND ACTIONS

To unleash the tourist potential for Nogatshaa, the following strategies and actions are recommended:

1. Provide artificial watering sites and tourist infrastructure such as game viewing roads, game viewing hides, public camping sites, lodges and other facilities to unleash tourism potential of the area. Provision of these infrastructures could ensure Nogatshaa rival the Savute and the Chobe River front as a tourist destination.

2. Increase the road network from 152 kilometers to 297 kilometers. The additional road network will increase capacity to 308 bed nights.

3. Increased road work and bed nights should allow for development of facilities such as public camping and wilderness camping sites and a 24 bed lodge.

4. To develop appropriate tourism infrastructure that would attract and sustain tourists to the Nogatshaa area would require substantial investments in the form of capital and equipment. To ensure that the proposed and requisite infrastructure is built, a number of options are recommended. Amongst these recommendations are:
    - Raising of vehicle entry fees;
      This would be accommodated in the review process of the National Parks and Game Reserves regulations.
    - Adopt Build Operate Transfer (BOT) strategy.
      Adopt of this approach would allow the private investor to develop, build and operate any tourism infrastructure in the zone for a number of years

before transferring ownership to the government or any management authority in the conservation area.

- The Department of Wildlife and National Parks should seek financial support from a number of Non Governmental Organisations (NGO's) such as the African Wildlife Foundation (AWF), Wildlife Society (WS), Conservation International (CI) to mention just a few. In order to access such funding, the management authority will need to develop and submit funding proposal to these funding organisations.

5. In the previous management plans, there were proposals that some of the beds in the Nogatshaa zone should be set aside for development of an education facility. This facility should not be developed at Nogatshaa.

4.6.5. Low Density Tourism Zone

There is a 6066 square kilometer zone where currently there is no development except for a lodge site located between Kakulwane plains and the Chinamba hills. This area can be classified as a wilderness zone. Therefore consistent with its designation, no development should be allowed in this zone.

STRATEGY

1. In order for this zone to maintain its wilderness classification, it is proposed that the Nogatshaa medium Density Tourism Zone be extended to include the lodge site that is between the Kakulwane plains and Chinamba hills.

4.6.6. Community Use Zone

On the basis of the National Parks and Game Reserves regulations, the management authority is empowered to declare a portion of a park or game reserve as a community use zone. These zones are for use by *designated communities living in or immediately adjacent to the national Park or Game Reserve.* These zones may only be used to conduct commercial tourism activities and for sustainable use of veld products.

STRATEGY

1. Establish Additional Community Use Zone;
   There is one only one recognised community use zone in the Chobe National Park. This zone is located on the south western boundary of the Chobe National Park bordering Ngamiland. This zone is for the use by the members from Mababe settlement. Two additional community use zones should be established for use by the enclave villages and Lesoma; the establishment of additional community use zones should pursued cautiously.

Table 5.6.5 below outlines existing and proposed tourist infrastructure and facilities in areas away from the High Density Tourism Zone.

Zone		Game Viewing Roads		Number of Bed- Nights		Mobile sites		Public Campsites		Lodge Sites		Game Viewing Hides		Ablution facilities		Education/Public Interpretation		Artificial Water points		Air strip	
High Density Tourism Zone		**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**
		-	-			8	8	0	0	2	2	5	0	0	0	0	1	0	0	0	0
Medium Density Tourism Zone	**Linyanti**	14	97	11	84	5	8	1	1	0	1	0	1	1	1	0	0	0	0	0	0
	Savute	170	210	158	223	5	7	1	1	2	3	0	0	1	1	0	0	3	3	1	1
	Zweizwei	14	236	11	177			0	0	0	2	0		0	0	0		0	2		
	Nogatshaa	152	145	158	150	5	8	0	1	0	2	4	6	0	1	1	0	8	8	0	1
Low Density Tourism Zone		14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0
Community Use Zone		0	75			2	2	0	0	0	2	0	2	0	0	0	0	0	2	0	1

4.6.7. Forest Reserves and Surrounding Wildlife Management Areas

Forestry Reserves comprise a significant portion of the Chobe District (Fig. 4.6.3), several of which are immediately adjacent to the Chobe National Park. These forest reserves are Kasane, Sibuyu and Maikalelo Forest Reserves. These areas are heavily used by wildlife and provide critical resources and migratory corridors for wildlife moving between Botswana and Zimbabwe's conservation areas.

STRATEGY

1. Liaises with the Department of Forestry and Range Resources (DFRR) to identify potential sites where tourism infrastructure can be developed. At the moment tourism activities are not developed in these forest reserves.

2. Develop tourist infrastructure in the Forest reserves.

3. Declare all forest areas in the Chobe District as Wildlife Management Areas and gazette them as such. This recommendation is made on the realization forest reserves are not fully utilised.

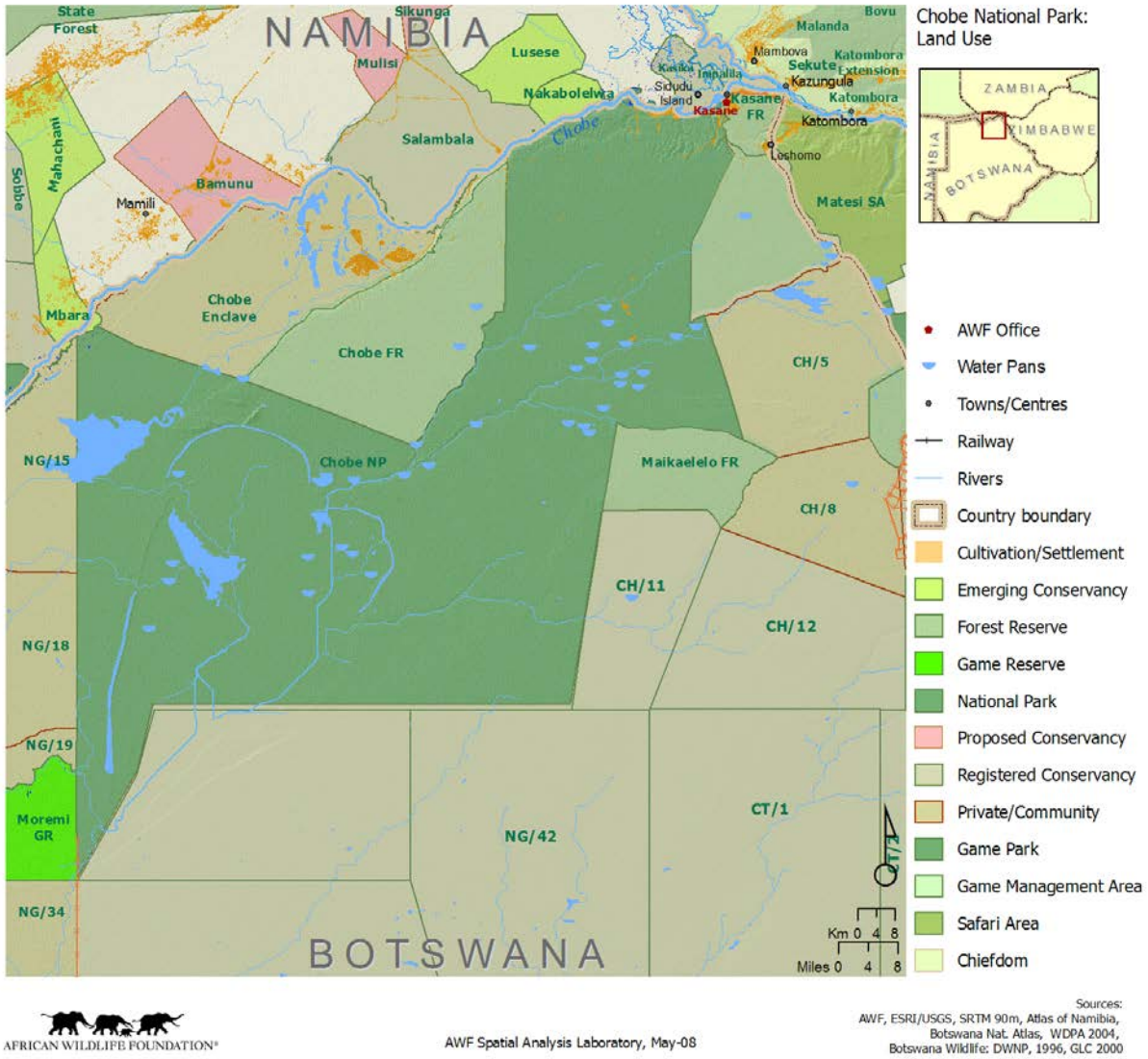

Fig. 4.6.3: Land Use around the Chobe National Park

4.7. SOLID WASTE MANAGEMENT

One of the negative impacts associated with tourism development is the generation solid and hazardous waste. It is therefore important to develop an effective solid and liquid waste management system in order to sustain resources upon which tourism is dependent upon. Inappropriate disposal of rubbish and waste may impact on natural values of a park and the ability of park users to use and enjoy the Park and to do so safely. It has been demonstrated elsewhere that if visitors do not, for example take their rubbish out, the same has impacted and reflected negatively on amenity and conservation values of the park. In the Chobe National Park, human waste is not correctly disposed off especially in wilderness and mobile sites where there are no ablution facilities, water ways might be polluted and the surrounding area contaminated. The ends result of such actions is complete degradation of park environment and may also endanger the safety of other park users, through the spread of parasites and infections.

In cases where ablution facilities at public camping sites and lodges concession are do not have a properly sealed French drains, there is a possibility of toilet waste seepage into the underground water system. It is therefore important that periodic monitoring of water quality is undertaken to determine that there is no pollution of the water system.

It is apparent from the foregoing that management of human waste and other refuse in the Chobe National park should be carefully handled to avoid or minimise the adverse effects of disposal. The public must be informed of the appropriate means of disposing of rubbish and waste. It is important to note that public support, understanding for and cooperation with rubbish and other waste disposal initiatives in vital for effective waste management.

It is therefore important the Department of Wildlife and National Parks should assist with management of rubbish and other waste by raising awareness of the need for public to take responsibility for refuse disposal. In addition to public awareness the DWNP will have to provide the necessary waste containment facilities for disposal of waste including toilet waste in public camping sites. The mobile operators and private individuals will be responsible for waste refuse at mobile sand wilderness sites.

THE STRATEGY:

Prevent rubbish and human waste from causing adverse effects in the park.

Actions

1. The "pack in-pack out" policy should be encouraged especially in relation to management of visitor rubbish by raising awareness amongst park users of the need for visitors and mobile operators to take responsibility for rubbish and other waste in the park and ensure its appropriate disposal.

It should be noted, that where rubbish removal is the prerogative of a management institution, visitor responsibility for disposal of rubbish tends to be diminished and also tends to reduce visitor self sufficiency in waste management. It should be noted that waste management is expensive for any management authority to sustain. Visitors will be required to take all rubbish items brought into the park with them on their departure. In this case rubbish refers and includes all unused or unwanted items including uneaten food;

2. The Department of Wildlife and National Parks will continue provide waste receptacles at all its public camping sites and provide refuse collection services;

3. Initiate a process of incorporating in the national Parks and game reserves regulations during the review process to ensure rubbish is removed and appropriately disposed. This will clarify the responsibility for rubbish in the park and encourage visitor compliance with the "pack in-pack out" policy;

4. Ensure all ablution facilities at public camping's sites and lodges within the area upgraded to minimise and where possible prevent adverse impacts on natural values of the Chobe National Park including water quality and aesthetics;

5. In cases, where pit latrines are provided, these should only be used for a very short time and continual review of such facilities should be undertaken and where feasible the facilities should be upgraded wherever necessary;

6. Provision, location and type of toilet facilities will only be done after a through Environmental Impact Assessment (EIA) in line with the EIA Act of 2005;

7. All lodges and public camping facilities built prior to the enactment of the 2005 EIA Act to undergo a detailed environmental Audit and come up with Environmental Management Plans (EMP) within the Chobe National Park;

4.8. VISITOR SAFETY AND PUBLIC HEALTH

Parks are there to provide recreation of to visitors in the natural environment and this therefore entails a degree of risk that is often difficult and impractical to mitigate. It is therefore almost impossible within a national park environment to guarantee complete visitor safety. Almost all activities undertaken in life, there is an element of risk, this is more so in an isolated natural environment such as a National Park. In most cases the inherent risk, freedom and independence of recreating in a National Park adds to the recreational value of a place. It is therefore important that visitors are and should ultimately be responsible for their own safety and that of others within their care.

The responsibility of management is to provide and accord necessary precautions for safety and protection of visitors, those within their care and their property.

There are a number of factors that add to the inherent risk in the Chobe National Park, these may range from dangerous animals such as lions, elephants, buffalo, snakes and other natural factors such as fires and man induced such as theft at public camping sites. In addition, visitors may be exposed to risk by incorrectly using structures and facilities within the Park. Unprepared and inexperienced visitors may expose themselves to increased risk as they lack the knowledge, skills and equipment necessary to safely enjoy what national parks offer.

It should be noted that most of the inherent risks outlined above are beyond the direct control of the management authority or visitors themselves. However, such risks may be mitigated by advising visitors of risks and how to avoid and minimise the same.

In private concessions, it is the duty of concessionaires to inform their clients of the risks and measures that need to be undertaken to mitigate the risks. Game guides have the responsibility of safeguarding and protecting their clients. It is their responsibility to enlighten their clients of the inherent risks of recreating in a national park.

STRATEGY

1. The park management will ensure that all visitors are made aware of the inherent risks of recreating in the Chobe National park and ways of minimizing such risks.

2. Ensure that all structures and facilities constructed for visitor use are:
    i. Built such that they meet building and engineering requirements, safety standards as prescribed by the Botswana Bureau of Standards;
    ii. Located in a place suitable in terms of location and user groups that they are intended for;

iii. Regularly checked and maintained;

Action

The management of Chobe National Park and operators will try to mitigate risks to visitors by making them aware of the risks associated with the park and ways of mitigating the same or avoiding such risks. This will be done through:

a. provision of verbal advice;
b. displays and signs;
c. publications and leaflets displayed at all entry gates and availed to tourists;
d. Prevention of access to areas deemed risky to tourists.

4.9. PARK INTERPRETATION AND EDUCATION SERVICES

National Parks throughout the world, in addition to conserving biological diversity, are places where individuals come for recreational purposes. Park interpretation services offer visitors an opportunity to fully appreciate the conservation values of a park without actually going on a game drive. In this case park interpretation services refer a "*process of providing each visitor find an opportunity to personally with the place"*. It is the management's responsibility to provide such a service and put in place the requisite infrastructure to ensure messages on issues such as heritage and cultural history of the area are easily conveyed. The messages in such facilities should be drawn focusing specifically on features of interest such as:

i. The role that parks play in conservation and maintenance of biodiversity of indigenous flora and fauna;
ii. Exalt the core conservation values of the parks and the role that local communities have and continue to play in the conservation cause;
iii. Presentation of the heritage and cultural history of past and present communities associated with the park as manifested in cultural and archeological artifacts in various parts of the Chobe National Park;

The goal of interpretative services is to increase each visitor's enjoyment and understanding of the Park. Generally, there have been minimal efforts towards developing fully fledged interpretive centers within National Parks and Game Reserves. This is despite the fact that the Environmental Education Unit is well resourced compared to other division within the Department of Wildlife and National Parks. The unit is manned by well trained, enthusiastic and motivated personnel. The unit has the necessary equipment and facilities to enable the development and presentation of first class interpretive materials.

In the past, the Department of Wildlife and National Parks, tried with minimal success to develop natural resources interpretative/education centers with accommodation facilities. These facilities were mainly for use by school groups on education tours. One such facility is the Lechwe centre in the Maun education reserve. This centre was built with financial and material support provided by the Botswana government and Conservation International respectively. The Lechwe centre project was not completed. The structure that was intended to house the interpretive centre is in an advanced state of disrepair and has been vandalized.

In the Chobe National Park, the 2002 management Plan proposed that an education centre with overnight facilities be built at Nogatshaa. This facility has not been built, instead funds that were sourced were used to refurbish and convert the old Ngoma gate staff housing into accommodation units for visiting school groups. In addition, a fire place and a hall that serves as an interpretive centre. The hall has rudimentary static displays comprising of maps, posters and pictures of animals found in Botswana's protected areas. The Ngoma facility does not offer any inspiring interpretative services and therefore does not add to the visitor's enjoyment and

understanding of the Chobe National Parks and its role in promoting the conservation cause in Botswana.

STRATEGIC OBJECTIVE

It is therefore recommended that the DWNP management should try to build a modern interpretive and Education centre at the Ngoma gate. In developing such a facility, it is important at the initial that management clearly defines interpretation and education objectives as guided by legislation, mission and vision of the Ministry of Environment, Wildlife and tourism and those of the Department of Wildlife and National Parks.

The envisaged centre should be aimed at:

i. Increasing visitor awareness and understanding of the values of resources being managed;
ii. Increasing visitor enjoyment;
iii. Informing the visitor/community about purposes and nature of parks;
iv. Increasing community support for the organizations programs;
v. Minimizing visitor impacts.
vi. It is also important to integrate interpretation and education with other communication programs.

In order to achieve the tenets of the above objectives, a modern fully fledged interpretive and education facility with the requisite equipment and presentation material should be built at Ngoma. The centre to be developed will provide educational opportunities for school groups. The centre will have static presentations on various themes particularly relevant to the Chobe National Park.

Actions

In order to achieve the above objectives, the following are the recommended actions;

i. Prepare a comprehensive interpretive and education program for the Chobe National Parks;
ii. Prepare brochures and fact sheets and maps of the Chobe National Park;
iii. Distribute fact sheets and maps to all entry gates and pins some of the information on the bulletin boards provided;
iv. In acknowledgement that funds to develop and print brochures and information sheets are limited, it is recommended that funding proposals be developed and submitted to potential donors; the bulk of these funds should be for construction of a fully fledged interpretative and education centre to replace the aging and archaic facilities at the old Ngoma gate,
v. Design and construct a nature trail near the proposed education centre;

vi. Provide information broadly outlining location data, history of the establishment, including milestones in the development of the Chobe National Park; In addition any other information such physical features, climate vegetation, communities etc will also need to be presented.

vii. Faunal information particularly detailing species found in the park, population trends and distribution patterns of the key species such as lions, leopards, elephants, buffalo, rhinocerous, roan and sable antelopes to mention just a few.

viii. Information on cultural heritage such as location and details of important archeological sites is also interesting to visitors to education and interpretative centre. This information is especially interesting when presented with contemporary human history and culture.

ix. It is also important that such an interpretive centre reserve space for presentation of any scientific, research, conservation and management issues to aid in the clear understanding of the dynamics of the Chobe National Park.

x. The centre will need to have a substantial stock of the Chobe National Park general information sheets showing all the road network and details of facilities available and what to see and where;

xi. The DWNP education Unit will need to organize interpretative walks, talks, slide shows, especially during the school holidays. The objective of interpretive walks is to encourage personal presentations, which is in most cases more fulfilling to the visitor that the use of video or any other automated equipment.

To ensure that the information on display is relevant to prevailing circumstances, management will need to undertake consistent periodic review and evaluation of the message on offer. This is necessary in order for the static information to be updated.

4.10. PRESERVATION OF ARCHAEOLOGICAL RESOURCES

The Chobe National Park and environs are endowed with archaeological resources. The rapidly expanding specialized tourism focusing on the linkages between wildlife, heritage and cultural aspects is another area where tourism in the Chobe National Park should be diversified into. The Chobe National Park has a number of archeological sites, which coupled with diverse and spectacular landscapes ranging from sand ridges, extensive grasslands, plains, hills such as Goha, Chinamba are potential tourist's destinations

In addition, there are a number of ancient riverbeds such as the Ngwezumba and a number of cultural and archeological that has a potential of attracting a wide range of tourists.

STRATEGY

1. *Protect and Manage Sites of Archaeological and Cultural Significance consistent with tenets of the Department of National Museums and Arts Gallery (DNMAG)*
   The Department of National Museums and Arts Gallery maintain a site register, listing all known archaeological resources by location with a detailed description of their extent and significance. The DNMAG have a detailed strategy for managing and preserving the integrity of these sites, this strategy should be adopted. It is therefore imperative that DWNP liaises closely with the DNMAG in the management of archaeological sites in the Chobe National Park.

2. *Archaeological Impact Assessment (AIA)*
   For any infrastructure development in the Chobe National Park, it a requirement by law (the 2005 EIA Act) that prior to development of such project a detailed Archaeological Impact Assessment (AIA) by a qualified Archaeologist registered with the Department of National Museums and Arts Gallery should be conducted.

3. *Improve Access to and interpret selected archeological and cultural sites;*

ACTIONS

1. *Map All Archaeological Sites*
   It is therefore important that attempts are made to properly map these sites
2. *Produce Information Leaflets*
   In order to effectively do this, the DWNP will need to seek the assistance of the Department of Museums and National Arts Gallery (DMNAG).
3. *Advertise such sites to the local and international community.*

5.0. RESEARCH AND MONITORING

The ecology of the Chobe National Park has and continues to undergo extensive changes. On the basis of information from early explorers such as Selous' in Campbell (1987), Moroka 1984, Sommerlatte 1976 suggests that towards the end of the 17th century due to abundance and concentration of large mammals, woodland vegetation around and along the major perennial drainage systems was completely destroyed. Towards the beginning of the 18th century ivory hunters decimated most of the large mammal, especially elephants for their ivory. This was followed at the beginning of the 20th century with an outbreak of rinderpest that killed most of the other large mammals. As a result the woodland vegetation in most parts of northern Botswana recovered markedly. This saw the proliferation of closed woodland vegetation communities especially along the major drainage systems.

However, by the 1940's the population of elephants and other large mammals had sufficiently recovered and slowly started destroying some of the woodland vegetation communities. By the 1990's the population of elephants had risen to almost 50,000. At this time more and more dead trees were being encountered throughout the elephants range. This raised concerns amongst conservationists and other stakeholders in the conservation cause that the growing elephants population if not checked was going to destabilize the Chobe ecosystem. The failure of elephants to range into countries such as Angola forced elephants to range within northern Botswana with limited excursions into Zimbabwe further exacerbated the impact on the woodland vegetation in the Chobe National Park.

In responses to these concerns the Department of Wildlife and National Park, in 1991 organized a workshop to discuss the elephant problem. The outcome of this workshop was the 1991 Elephant Management Plan. The plan highlighted a number of issues and actions that needed to be undertaken to deal with the elephant problem and safeguard biodiversity in the northern Botswana ecosystem. Amongst the many recommendations suggested was population reduction through culling, increased hunting quotas and other means.

In addition, to population management strategies, the plan outlined a number of priority research studies. Amongst these was the study of elephant population dynamics, habitat preference, seasonal distribution, movement patterns and assessment of the effect of interactions between elephant and their habitats. There have been a number of studies in the Chobe National Park, but none of the population control measures proposed have ever been implemented as a result the elephant population continued rising. It is estimated that by 2007, the population of elephants had risen to almost 170,000 (Anon. 2006). This increased elephants population is threatening the sustainability of the environment and other species.

In order to assess the impact of elephants on the Chobe National Park ecosystem, research studies have been going on in the Chobe National Park and surrounding areas since the 1960's (Child 1960, Sommerlatte 1978, Moroka 1984) and others. In 2004 a comprehensive integrated

corroborative research project spearheaded by the governments of Botswana and the Kingdom of Norway was undertaken to fully address and assess the impact of elephants on the woodland vegetation and on other species in the Chobe National Park. This project was known by its acronym, BONIC. The BONIC project was designed to develop competency amongst Batswana to enable them detect, monitor and manage the increasing effects of elephant population on the ecosystem within Chobe National Park. The basis of the study was the understanding that the Chobe ecosystem has undergone profound changes over the past 100 years due to effects of the ivory trade, outbreak of rinderpest and lately unprecedented growth in elephant numbers.

In order to unravel the impacts of elephants on the vegetation and various interactions in the ecosystem, the project adopted holistic approach in recognition of the complex interactions of various facets and issues at play in an ecosystem. Studies undertaken ranged from issues such as soil and nutrient cycling, vegetation dynamics, interaction between large herbivores and vegetation, abundance and distribution of gallinaceous birds, including aspects of ecology of impala, buffalo, lions and other species in the area.

In addition to BONIC, there have been several studies conducted by DWNP personnel and private researchers. A brief review of these studies are outlined in the draft *Strategic Plan for Wildlife Research in Botswana 2004;* This document was prepared by the Research Division, reviewed studies that have been conducted in Botswana's conservation areas including Chobe National Park.
It is clear from the foregoing that increasing elephant numbers are the main driver of the ecosystem in Chobe National Park and the surround areas and that there is a rich research database that can be used to effectively manage the resources in the park.

The DWNP recognizes the important role that research plays in the effective management and conservation of biodiversity, biophysical process and landscapes. Therefore to ensure resources are sustained, an adaptive management strategy is recommended.

The adoption of the adaptive management principle is based on the following:

i. The need to have a comprehensive data base of flora and fauna;
ii. The need to set measurable objectives and goals;
iii. Setting in place effective monitoring systems;

On the basis of these principles, the following are the priority areas of research:

5.1. MONITORING

The goal of monitoring is to "*Undertake baseline inventory of wildlife populations, their habitats and changes therein*. In the case of the Chobe National Park, it is recommended that monitoring efforts should focus on the following aspects:

5.1.1 Baseline Inventory

Compile inventories of ecosystems including plant and animal communities to establish baseline in terms of distribution, abundance and Monitor ecosystems natural processes and wildlife populations

5.1.2 Population Dynamics

It should be recognized that information on sex and age composition together with information on changes in population abundance reflects the overall status of a specific wildlife population in relation to its environment. It is therefore important that a species specific population structure, sex and age composition monitoring program be initiated. This should include movement patterns. These studies should concentrate of the following species; elephants, buffalo, lion, leopard, sable, roan, crocodile.

5.1.3 Human –Wildlife Interactions

Human-wildlife issues are critical to the management and continued support of conservation initiatives by communities living adjacent to conservation areas. It is therefore important to monitor and map incidents of conflicts between wildlife and humans or their activities such as crop and livestock farming in order to identify 'hotspots'. This information is vital for effective deployment of mitigation measures;

Recommended Monitoring Projects:

i. *Conduct Aerial Surveys*
   This needed to monitor trends in abundance and distribution of the various key species;
ii. *Conduct Species–Specific Surveys Including Ground Surveys*
   This necessary to collect detailed population dynamics data;
iii. *Record all Human–Wildlife Conflicts by species and location*
iv. *Radio Telemetry Studies to Monitor Movement Patterns, Home Range and Habitat Preference for Key Species.*
v. *Undertake studies of factors affecting wildlife and their habitats*;
   It is recommended that such studies concentrate on monitoring the effect of fences and fire. In the case of fences, there have been so many studies on the impact of fences on wildlife. It is therefore recommended that fencing studies should focus on identifying areas in the wildlife range that would be sensitive to fencing. This information is required in order to draw a proper district fencing plan. This in recognition of the need to make provision for migration routes where fencing should be avoided.

vi. The effect of fire on the vegetation community has been extensively studied in Botswana and elsewhere. It is therefore recommended that emphasis be placed on monitoring the effect of uncontrolled fires on different vegetation communities in the Chobe National Park.

a. To do this a number of fixed point photo stations should be established in the various vegetation communities in the park to monitor the long-term effects of fires in different habitats within the Chobe National Park;

b. In addition to photo stations, the use of remote sensing is recommended as a viable and effective tool of monitoring and trending impacts of various management strategies and ecological interactions especially between fire and vegetation;

c. Remote sensing could be used to monitor changes in vegetation around artificial watering points.

vii. *Studies Assessing The Impact of Various Management Activities*;
in this category are studies monitoring the effect of the provision of artificial watering points in the various zones within the Chobe National Park. There have been several studies assessing the impact of providing water to wildlife in Botswana. Therefore the effects and impact of providing artificial watering points are well known. In order to mitigate these effects, it is important to undertake a rigorous monitoring program of these areas around artificial

viii. Ornithological studies.
Hermann's (1996), Birdlife Botswana and the DWNP research office in Maun have collected detailed inventory of birds in Botswana. Information that is available include: species composition; numbers; habitat preference, feeding habits, breeding success etc. Adequate baseline data on birds including waterfowls is available in Botswana.

The emphasis' now should be on monitoring studies to assess how various land use activities such as lodges, fire, changes in the flood regime, the impact of elephant and the resultant changes in the physiognomic characteristics of the woodland vegetation affect the diversity, breeding regime and movement patterns of various bird species in the delta.

5.2. APPLIED RESEARCH

5.2.1. Ecosystem function

The Chobe National Park is one of the largest protected areas in Botswana within which many ecosystem processes may be operating relatively independently from direct human intervention. However, very little is known about the factors driving the system, and the relationships between

different components. Studies need to be conducted to fully understand the functions and interactions of the various components in this system. The following are the recommended studies:

i. *Migration, Population Dynamics and Effects on Habitat of Elephants.*

Elephant the internal movement patterns of elephants have been adequately studied in northern Botswana. What are outstanding here are the transboundary movements between Zimbabwe, Namibia and perhaps also Angola and Zambia. More needs to be known in this regard especially regarding the numbers of animals moving and whether these are emigration, immigration or part of seasonal movements within a range. Population trends are well known and monitored through aerial surveys and some demographic data is available.

However, more research into age & sex demography is required to assess birth rates, age specific survival rates, mortalities and so on. If active management of the population should take place, this opportunity should be used to collect data from female carcasses to establish accurate assessment of such demographic data.

ii. *A Study of the Effects Of Translocation On Problem Predators.*

iii. *Investigate The Extent, And Methods Of Non-Lethal Control, Of Problem Animals.*

This is a major management concern in wildlife and communities, extending to parliament level. Wildlife is moving into human settlement areas and visa versa. The DWNP is for the most part restricted to lethal control of problem animals. It is therefore important that research be focused on identifying alternative methods. In addition, studies should be conducted to determine and assess why human-wildlife conflicts are increasing;

iv. *Investigate The Effects of Tourist Activities In High-Density Areas On Animals And The Environment.*

Botswana is progressively becoming a more popular tourist destination. Despite the high income – low volume policy, there are areas where high numbers of tourists appear to have a major influence on wildlife behaviour, movements and on the environment.

There has been a review recently on the number of bed nights from 16 to 24 , it is therefore important that studies are conducted to assess the impact of these lodges on the ecosystems.

v. *Fire Effects on Range Condition.*

Fires should be monitored as has been suggested under the Monitoring section above. However, research into the specific plant communities of concern need to be

undertaken. In Chobe there is need for experimental research on the *Baikiaea plurijuga* and *Ptreocarpus* spp woodlands.

Fires also affect the biodiversity of small animals and research in this area is also needed.

vi. *Specific Ecosystem Studies***.**

As previously mentioned, this is a very broad category and mentions possible examples. We feel that specific subsections need to be included here highlighting the ecosystems of concern. For example, hydromorphic grassland ecosystems (Savute, Nogatshaa) because they are limited in extent, are nutritious and important grazing areas for herbivores.

vii. *Miscellaneous Species-Specific Studies.*

This study need to focus, which aerials survey data seems to suggest have been declining, these include: zebra, wildebeest, wild dog, puku, lechwe, Sharpe's grysbok and then other species that are generally rare such as aardvark, aardwolf, pangolin, and so on. The list should be prioritised.

6.0. ENHANCEMENT OF COMMUNITY BENEFITS

Tourism has been identified by the Botswana government as the engine of economic growth that would sustainably bring financial benefits to the country. It emerged during the consultative process that generally members of the community feel there is need to increase benefits from the resources in Chobe National Park. The members feel that at the moment they are benefiting little from the Chobe National Park except for the three Community Based Organisation initiatives taking place in the Chobe enclave villages, Pandamatenga and around Lesoma. It also came up during discussion that the community would like to see more community Use Zones established in the Chobe National Park with lodge and public camping sites reserved exclusively for indigenous Batswana, who, it appears are currently not really directly benefiting from tourism in the Chobe National Park. The community acknowledges that some of them have benefited through employment in lodges but feel they could benefit more if they run some businesses in the tourism industry

Interactions with various stakeholders and writings in newspapers and other sources seem to suggest that there is a perception that non-citizen companies and individuals or a few citizens dominate the tourism industry in Botswana. The majority of indigenous citizens play a peripheral role, mainly as workers. It is clear from meetings and discussions with the various stakeholders especially politicians and community leaders that if tourism is to be sustained in the Chobe, there are need for the tourism resource base to be conserved with sustained engagement and direct involvement of indigenous communities on the periphery of the protected areas. These are the people who suffer most of the brunt of the human-wildlife conflicts and derive minimal economic benefits

Events elsewhere have shown that such a situation is not sustainable in the long-term. It is therefore imperative that indigenous Batswana are given an opportunity to invest and derive both utilitarian and financial benefits offered by the country's natural resources. Measures should be put in place that would allow and encourage citizens to fully participate and benefit from the industry.

STRATEGY

1. *Enhance Community and Indigenous Batswana benefits from Tourism*

Actions

The following are some of the actions that should adopted in order to enhance community benefits from tourism:

i. *Increasing strategic representation of citizens in the tourism economy*

There is need to change existing tourism licensing procedures. It is suggested that some activities such as provision of guiding and operation for game viewing services should be reserved for citizens and that establishments that offer accommodation should not also be engaged in offering game viewing services. This will enable more citizen companies and individuals to be engaged as service providers.

ii. *Employment equity for citizens in the tourism economy in the Chobe;*

iii. *Skill enhancement.*

Tourism Operators have put in place to ensure management skills are passed on to citizens. Companies that promote skills transfer should be rewarded, whilst those that ignore the concept of skills transfer would be encouraged to implement such a strategy;

iv. *Promote Establishment of Citizen owned Business in the Park*

This should be done by deliberately according preference to communities and citizen entrepreneurs through selection procedures and concerted enterprise development by providing appropriate support to citizen owned businesses;

v. *Existing businesses to spend on corporate social development focussing specifically on tourism and tourism related businesses.*

It is apparent that development of citizen and community based tourism enterprises are stifled by lack of access to capital and skills. Therefore it is important that established companies as part of their corporate social responsibility should be encouraged to develop support mechanisms to infuse capacity amongst the local community to develop entrepreneurial skills and access financial resources that would allow their ventures to succeed;

7.0. INFRASTRUCTURE

The Parks management will be responsible for development, construction and maintenance of all conservation and tourist infrastructure such as roads, ablution blocks at public camping sites. The private sector on the other hand will be responsible for tourism projects within the leased concession areas allocated to them.

STRATEGY:

1. The Department of Wildlife and National Parks will ensure all conservation infrastructure is developed and maintained throughout the entire Chobe National Park. The infrastructure will all be built in line with standards set by the Department of Buildings and Architectural Services (DBAS) and ensure that the same are maintained in good working order;

2. All development in the Chobe National Park will be subjected to Environmental Impact Assessment in line with the EIA Act of 2005 before it can be approved and implemented. The developer is responsible for the full cost of the EIA. Other infrastructure developed prior to the EIA Act of 2005 , will have to subjected to environmental audit and be required to develop Environmental Management Plans;

3. Roads within the Chobe National Park will be responsible for developing game viewing and service road network within the park. The management of the park will ensure that these roads are well maintained. It is recommended that all these roads be graveled all-weather roads and provided with adequate drainage;

4. Park management will be responsible for providing and maintaining accommodation for its own staff in line with existing government policies. The lodges and private developers will be responsible for supplying their own staff accommodation within their own exclusive use area. This accommodation must be in line with standards set by the Department of Wildlife and national Parks;

5. Offices and workshops
   The Chobe national park management will operate offices inside the park. Private Concessionaries will build their own offices and workshops within their exclusive leased sites;

6. Services such as telephones, radios, electricity and water for use by the lodges must be supplied and paid for by the lodges and ensure there is sufficient capacity to meet their needs.
7. Visitor facilities such as water holes, game viewing hides, rest stops, air strips, will be built by the Department of Wildlife and National Parks. However, acknowledging that funds can be limiting, it might be necessary in some circumstances to adopt a Build-Operate and Transfer (BOTA) strategy. Adoption of this stage will allow, private entrepreneurs to develop and operate tourist infrastructure for some period and then handing the same over to the management authority if need be.

8.0. FINANCIAL PLANNING

8.1. Proposed Infrastructure

A substantial amount of funding would be required to develop the recommended infrastructure. The infrastructures proposed are listed in Table 9.1.

Table 8.1: Proposed Infrastructure and Estimated Development Cost.

INFRASTRUCTURE	NO.	ESTIMATED COST (P)	RESPONSIBLE AUTHORITY	SOURCES OF FUNDING
Game Viewing Roads	820 Kilometers	1,640,000.00	DWNP	Government/Private Sector
Mobile Sites	8	320,000.00	HATAB	Private sector
Stretch Sites	7	15,000.00	DWNP	Botswana Government
Lodges	8	32,000,000.00	Private sector	Private Sector
Public Camping Site Ablution Facilities	3	3,600,000.00	DWNP/BOT	Public/Private sector partnership
Game Viewing Hides	5	200,000.00	DWNP/BOT	Public/Private sector partnership
Interpretation And Education Facilities and fittings	1	6,400,000.00	DWNP/BOT	Public/Private sector partnership/NGO's
Nature Trails At Education Centre	1	250,000.00	DWNP	NGO's
Artificial Watering Points	6	7,200,000.00	Private sector	Private Sector
Air Strip	3	4,800,000.00	DWNP	Botswana Government

8.2. Staff Compliment

In order to effectively manage the Chobe National Park, the following staff compliment is recommended:

Table 8.2: Staff compliment

Post	Rank	Mgmt	Parks Division					Utilisation		APU	Research	Total
			1	2	3	4	5	PAC	Liceng.			
Coordinator	**D3**	1	0	0	0	0	0	0	0	0	0	1
Senior Wildlife Officer	**D4**	1	0	0	0	0	0	1	0	1	1	4
Wildlife Officer II	**C1**	1	1	0	0	1	0	1	1	1	2	8
Chief Wildlife Ranger	**C2**	1	1	1	1	1	1	1	1	1	2	11
Assist. Wildlife Officer	**C3**	2	1	1	1	1	1	1	1	1	3	13
Principal Wildlife. Ranger	**C3.4**	2	1	1	1	1	1	1	1	4	3	16
Senior Wildlife Ranger	**C4**	1	2	2	2	2	2	2	2	8	3	26
Senior Wildlife scout	**B2**	3	1	1	1	1	1	7	3	40	4	62
Wildlife Scout	**B2.3**	4	2	3	3	3	3	10	4	60	4	94
Camp Keeper	**B3**	4	2	2	2	2	2	0	0	2	0	16
Gate Attendant	**B3.4**	4	1	1	1	1	1	0	0	2	0	11
Borehole Mechanic	**A2**	2	0	0	0	0	0	0	0	0	0	2
Tractor Driver	**A1**	3	0	0	0	0	0	0	0	0	0	3
Grader driver	**A1**	2	0	0	0	0	0	0	0	0	0	2
Truck Driver	**A1**	2	0	0	0	0	0	0	0	2	0	2
Vehicle driver	**A1**	2	0	0	0	0	0	0	0	4	0	0
TOTAL		**35**	**12**	**12**	**12**	**13**	**12**	**24**	**13**	**126**	**20**	**279**

NB: Parks Division: 1-Linyanti; 2-Savuti; 3-Goha; 4-Poga; 5-Nogatshaa/Nantanga. The staff appearing on the management section includes the Head of the Parks Division and staff whose main assignment include servicing all the camps.

Table 8.3: Equipment and Vehicles Required to Effectively Management the Park

EQUIPMENT	NUMBER	RUNNING COST PER ANNUM IN PULA (P)	TOTAL
Grader	2	40,000.00	480,000.00
Front End Loader	2	40,000.00	480,000.00
JCB	2	35,000.00	420,000.00
Truck	4	50,000.00	1.200,000.00
Tractor	3	30,000.00	1,080,000.00
Water Bowser	5	500.00	300,000.00
Trailer	3	500.00	180,000.00
TOTAL			**4,140,000.00**

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APPENDICES:

APPENDIX I: ISSUES AND OPTIONS REPORT

EXECUTIVE SUMMARY

The Chobe National park, located in the northern part of Botswana and within the Chobe District covering an area of about 10 590km2 is arguably one of the country's premier conservation areas. The park was created with the aim of protecting wildlife from over hunting and to cater for the visitors. Uncontrolled hunting by settler communities from Northern and Southern Rhodesia threatened the viability of a large number of mammals and unique species such as the Chobe bushbuck and puku thereby leading to the establishment of the park.

From humble beginnings of complete preservation and game viewing through to the period of assertive management and research and growing tourism numbers, the park has remained relatively a hands-off affair with little adaptive management being practiced. The park, which is divided into four main focal zones comprising of the Chobe Riverfront, the Savuti Marsh; the Linyanti swamps and the dry lands of Nogatshaa, has remained a national and international focal point. There is little infrastructure in the park in terms of development for tourism adventures. The park is managed through a series of camps dotted throughout the park which provide guidance to tourists, wildlife management as well as law enforcement in the park.

In an effort to effectively manage wildlife resources in the park, government has, since 1988 developed a series of management plans which unfortunately have never been put to good use, thus leaving park development without a policy guiding document for management and development. It is against this background that the plan is being reviewed to bring it in line with current national and international best practices.

The review of the plan is currently being carried out within the framework of the Wildlife Conservation and National Parks Act of 1992 and the subsiding regulations, the Game Reserves regulations of 2000. The management objectives are guided by the visions of the Ministry of Environment, Wildlife and Tourism and that of the Department of Wildlife and National Parks as well as the national Vision 2016. Other legal and policy documents guide the development of the plan.

The Chobe National Park is entirely on state land and is surrounded by other conservation areas life Forest Reserves, Wildlife Management areas and settlements thereby placing a lot of pressure on the operations of the park as well as increased human-wildlife conflicts. Forest Reserves are also secondarily used for tourism activities by the tourism operators that fail to get access to the Chobe National Park.

MANAGEMENT PLANNING

The plan being developed seeks to bring into focus thoroughly thought of and planner development of the Chobe National Park in line with the latest conservation norms both nationally and internationally. The plan provides the basis and direction for future management

of the park to ensure that natural resources therein are conserved for future generations and are managed on a sustainable basis. The plan addresses the regional and district perspectives of tourism development as it affect the overall wellbeing of the Chobe National Park as it falls with the Kavango- Zambezi Tourism initiatives.

In terms of tourism development, the different zonations of the park are described as well as their tourism potentials. Permissible activities within the zones are described within the limits of acceptable change and carrying capacity. The plan describes in detail the potential for each zone as well as monitoring strategy for the same. The various tourism development zones have differing potentials and as such proposals are presented for the expansion of the tourism development of the area. It follows that in order for the Chobe National Park to approach its full tourism potential, infrastructural developments have to be in place including among others a good road network and provision of water for wildlife.

Other aspects that offer potential for the diversification of the tourism product includes the promotion of cultural tourism amongst the communities living around the park as well as focusing on the abundant archaeological resources in the park. Archaeological resources can be a great potential tourist attraction as evidenced by the Tsodilo and Gchwihaba hills in the Ngamiland District. Numerous sites occur in the park and these have been mapped.

In terms of the management of other biological resources, fire management strategies are proposed as the area is fire prone. A review of historical fire data shows that extensive areas of the district are frequently burnt each year. However, only about a quarter of the park gets burnt. Even though fire have been used to manage natural habitats for biodiversity conservation, it is prudent that wild fires should be managed.

The plan covers other critical areas that include management of disease outbreaks like anthrax, rabies etc; conservation of biodiversity which is a primary objective of the park; provision of artificial watering points to improve spread of wildlife; research and monitoring of biological resources within the park. Other areas covered include park interpretation and educational services; law enforcement and anti-poaching and finally enhancement and facilitation of community benefits for communities adjacent to the park.

I.0 INTRODUCTION

Chobe National Park is found in the northern part of Botswana (Fig. 1.1) within Chobe District covering an area of around 10 589 km^2. The Chobe National Park (CNP) was gazetted on 8th March 1968 (GN No 4 of 1968). The Mababe triangle was added in 1980 (SI No 126 of 1980) and the Kakulwane triangle was added in 1987 (SI No 9 of 1987). The park is divided into four main focal points comprising the Chobe River Front with flood plain and teak forest, the Savute Marsh in the west about 50 km north of Mababe gate, the Linyanti swamps in the north west and the hot dry land in between (Nogatshaa).

At the peak of the ivory trade, the Chobe National Park was the favourite hunting ground for settler communities from Northern and Southern Rhodesia. This uncontrolled hunting threatened the viability of a large number of mammals and unique species such as the Chobe bushbuck, puku. To safeguard and sustain these and other species and create a place for relaxation and leisure, the Chobe National Park was established in 1931. To effectively manage wildlife resources in the Chobe National Park, Department of Wildlife and National Parks (DWNP) with the assistance of Dr C Spinage working for FGU in 1988 drafted the first management plan for the Park. In this case a management plan is defined as *'' a policy document designed to guide the activities of the mother institution',* which in this case is the Department of Wildlife and National Parks.

The 1988, plan was followed by a second plan drafted in 1993 by Deloitte and Touché in 1993. In 1997, through the European Union funded Wildlife Conservation and Development Project for National Parks, a third management plan was produced.

In 2000, the **"Chobe Riverfront Management Plan"** was produced by Ecosurv Consultants, for and on behalf of the Chobe Wildlife Trust (CWT). That plan was accepted (with a few minor modifications) and is included as Chapter 7 of the latest version of the Chobe National Park Management plan. This plan used parts of the 1993 and 1997 plans.

The River front management plans' primary objective was to come up with a number of strategies designed to reduce the perceived congestion along the Chobe River front. This is an area designated as a High Density Tourism Zone (HDTZ), where all the tourist establishments in Kasane and surrounding settlements take their clients for game viewing, boat cruisers, bird watching and many other activities. The consultants' assignment is to review the 2002 revised Integrated Management Plan. This will entail reviewing the Chobe National Park Management Plan and the Chobe Riverfront Development Plan with the ultimate aim of integrating the two.

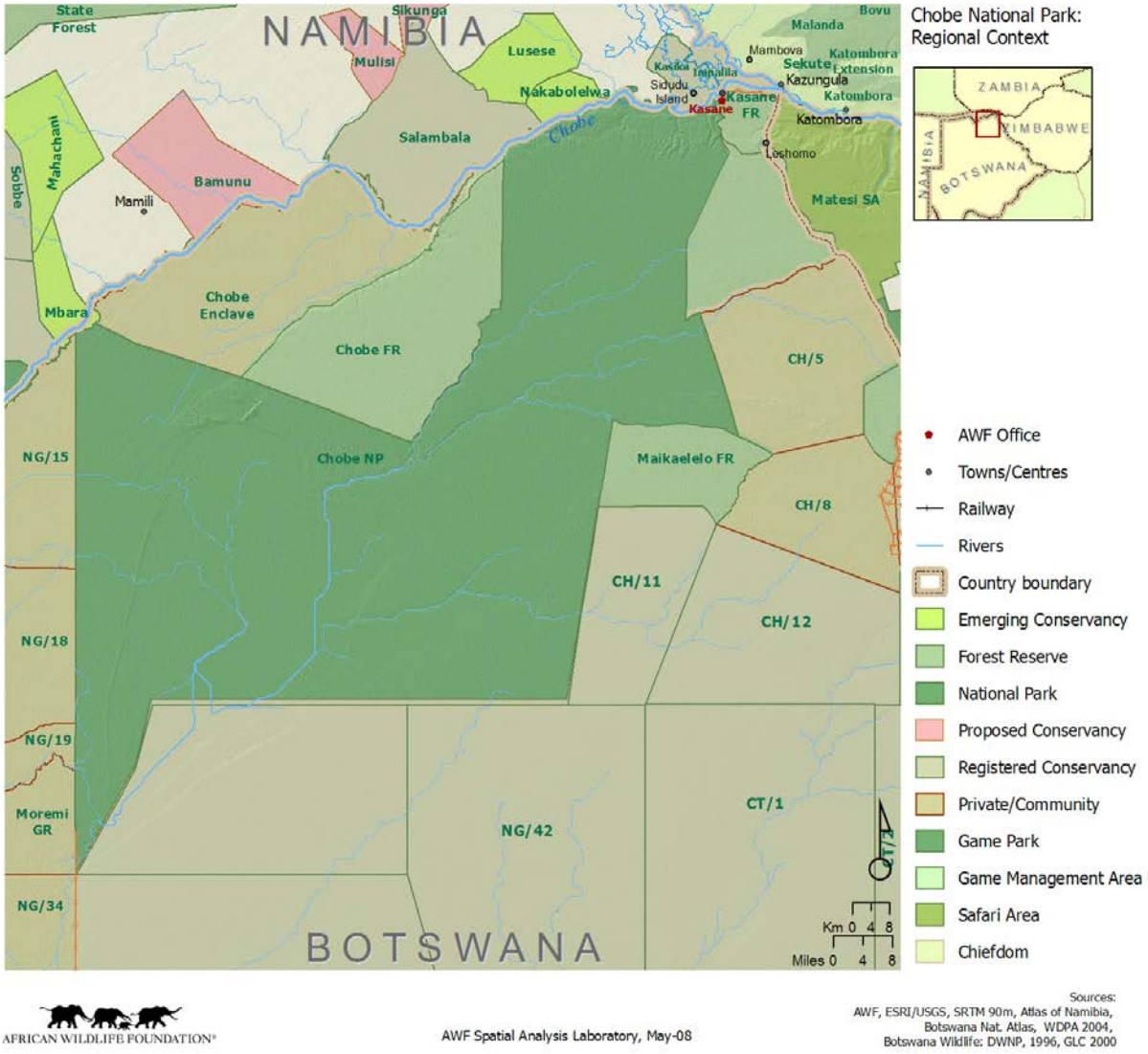

Fig. 1.1: Location of the Chobe National Park in the Regional Context

2.0 LEGAL AND POLICY FRAMEWORK

Botswana's National Parks, like everywhere else in the world are managed primarily for ecosystem conservation and recreational use in line with the IUCN category II. It must however, be realised that Botswana's management objectives are for the most part guided by the vision of the Ministry of Environment, Wildlife and Tourism (MWET) and that of the Department of Wildlife and National Parks. These two visions are in turn influenced by existing legal and policy framework provided principally by the Wildlife and National Parks Act 28 of 1992. The Act provides for conservation of natural resources in their environment. The act makes allowance

for natural processes to continue with minimum disturbance and maintenance of biodiversity, whilst also promoting recreational activities.

It is clear that management of resources within the Chobe National Parks and environs is guided by a number of legal instruments in the form of Acts, policy documents and management plans. In light of the above, it is imperative that a review and integration process, the consultants will focus on identifying the management objectives of the two plans informed by an analysis of the existing legal and policy frame work. The following are some of the key legal and policy document that attention will be focused on:

2.1 Wildlife Conservation and National Parks Act 28 of 1992

This act is intended to make further and better provision for the conservation and management of the wildlife resource of Botswana, giving effect to CITES and any other international conventions for the protection of fauna and flora to which Botswana is, from time to time, a party; to provide for the establishment, control and management of national parks and game reserves; and for matters incidental thereto or connected therewith.

Furthermore, the Act states that in his or her duties relating to the development of Wildlife Management Areas (WMA's) and their administration, the Director of the Department of Wildlife and National Parks (DWNP) shall consult with the Land Boards and District Councils responsible for the area concerned. The Minister of Environment, Wildlife and Tourism (MEWT) is responsible for making regulations for the Wildlife Management Areas (WMA). Section 94 of this act provides for the continued enforcement of some of the subsidiary regulations of the repealed Fauna Conservation Act. Therefore any recommendations regarding developmental activities for the study area will have to be in line with the provisions of this Act

2.2 Wildlife Conservation Policy, 1986

The overall aim of the policy is that a better return be gained on land allocated to wildlife while at the same time ensuring the continuity of this resource. Rational and effective conservation and management programmes are therefore considered to be the essence of the policy. Specific objectives include the need to realise the full potential of the wildlife resource; the need to develop a commercial wildlife industry in order to create economic opportunities, jobs and incomes for the rural population; and to increase the supply of game meat as a consequence of the further development of commercial wildlife utilisation. The need for rural development, citizen participation and government control of development are general guidelines that are to be applied. It is imperative that the review of the Chobe National Park Management Plan and its integration with the Chobe River front Development Management Plans should aim at attaining the objective of sustaining the wildlife resources while at the same time ensuring the fully

participation of Batswana people in the exploitation of economic opportunities provided by the wildlife resource in the area.

2.3 Tourism Policy, 1990

The main objective of the tourism policy is to obtain from the tourism resources of the country, on a sustainable basis, the greatest possible net social and economic benefits for Batswana. The policy advocates that *'tourism should be carried out on a sustainable basis and that local communities are provided with direct and indirect benefits from it in order to engender their support for conservation and the wildlife industry*. Therefore any recommendations regarding tourism development should take cognisance of the fact the tourism in Botswana is dependent mainly on the wildlife resource, which should be sustained.

2.4 The Environmental Impact Assessment Act, 2005

The newly enacted EIA Act provides for EIA to be used to 'assess the potential effects of planned development activities, to determine and to provide mitigation measures for effects of such activities that may have a significant adverse impact on the environment'. In line with section 6, the Act demands that any management plan should be subjected to strategic assessment.

2.5 Rural Development Policy, 1972

The primary aims of this policy are; to increase sustained production from land and from wildlife through research, coordinated extension work, and conservation planning leading to the introduction of correct land management practices; to improve marketing and credit facilities in the rural areas and to create new employment opportunities wherever feasible and thereby reduce the numbers without any means of support; and, to promote industries, services and crafts in the rural areas. The expansions of the Power generation capacity and consequent increase in water demands will most likely enhance the intended objectives of this policy.

2.6 Community Based Natural Resource Management (CBNRM) Policy of 2007

The policy is primarily designed to provide for broad stakeholder participation in natural resource management at District and National level. It based on the premise that if communities derive utilitarian and financial benefits from the wildlife resources they will be inclined to engage in the conservation of the resources thereby sustaining the development agenda. The policy acknowledges that sustained utilisation of the resource can only be achieved by empowerment through programs directed towards community self-reliance and the promotion of responsible, accountable and transparent decision making process.

The overall objective of the policy is to enhance the conservation of Botswana's natural resources and economic and social development in rural areas by providing eligible communities with opportunities and incentives to earn direct benefits from natural resource conservation. It is founded on the premise that all members of the community share an interest in conserving their

local environment. The policy is needed to facilitate the stimulation and growth of community interest and attract investment.

2.7 The National Conservation Strategy

The National Conservation Strategy provides for the conservation of natural resources including soils, vegetation, water and wildlife. The strategy is inclusive of guidelines for the sustainable use of natural resources in Botswana.

2.8 Public Health Act

The Public Health Act provides for a wide range of public health measures, including the regulation of sanitation and camping. The tenets of this Act shall have to be strictly adhered to when setting up workers camps in the project area.

2.9 Monuments and Relics Act (2001)

This Act enables the government to identify and declare sites of national, historical and archaeological importance and to protect them. The Act also stipulates that Archaeological Impact Assessments (AIA) and Environmental Impact Assessments (EIA) are both required for any major development, which will physically disturb the earth's surface. Therefore in the carrying out of the ground water assessment and development project, the provisions and legal framework outlined in this Act shall have to de to be adhered to.

2.10 Water Act CAP 34.0 of 1968;

This Act amongst other things defines ownership of any rights to water use. The Water Act seeks to regulate the use of surface water that is water from rivers, streams, springs, lakes, swamps, underground water, etc. The Act is very relevant to water conservation as it demands stringent water management measures.

2.11 Waste Management Act 1998

The Act provides for a wide range of public health measures, including the regulation of sanitation and camping.

2.12 The Tribal land Act CAP 32.02 (Revised 1993).

This Act regulates the use of tribal land and is administered by the Land Boards. It is important to fully understand their rights and obligation in the administration of their affairs in the study area.

3.0. MINSTRY OF ENVIRONMENT, WILDLIFE AND TOURISM (MEWT) STRATEGIC VISION

The Chobe National Park is managed by the Department of Wildlife and National Parks that falls under the Ministry of Environment Wildlife and Tourism (MEWT). The Ministry of Wildlife Environment and Tourism's mandate is to protect the environment, conserve the country's natural resources and derive value out of the environment for the benefit of Botswana. To fully deliver on its mandate the MWET has identified three key objectives. These objectives are:

4. Environmental sustainability;

5. Organisational effectiveness;

6. Delivering prosperity to the majority of Batswana from the environment and natural resources.

A number of tools, key stakeholders and initiatives have been identified that when implemented could enable the MEWT to achieve its objectives. In terms of managing the Chobe National Park, all the objectives of the MEWT are relevant to the relevant to the effective management of the park. The attainment of environmental sustainability and deliverance of prosperity from the environment and natural resources are the key objectives. These are the issues that need to be harnessed as they address issues that are central to the survival of many of Botswana's protected areas. These two objectives deal with issues of benefit sharing that have been sustained in order for communities to embrace the idea of a protected area in their midst.

The MEWT is cognizant of the contribution of the environment and natural resources to the Gross Domestic Product (GDP) and asserts that the same should be increased. In order to achieve this, there is need to sustain and promote nature based tourism. This is based on the realization that environment and nature are key tourism products for Botswana. Therefore effective management of protected areas is the key to achieving and enhancing benefits from tourism.

The Ministry of Environment and Wildlife and Tourism acknowledges that there are a number of challenges that impeded the effective management, protection and conservation of Botswana's natural resources. Amongst these challenges are uncontrolled fires, human-wildlife conflicts, illegal and unsustainable off take of wildlife resources; increased wildlife numbers beyond the veld's carrying capacity, how to mitigate the effects of drought amongst many others.

3.1 THE CHOBE NATIONAL PARKS'VISION

The vision of the Chobe National Parks remains the conservation of the ecological integrity through adoption of adaptive management. The adoption of this vision offers the greatest potential of unleashing the tourism potential within acceptable limits in the Chobe National Park.

3.1.1 PRIMARY OBJECTIVES OF THE PLAN

Tourism has been touted by the Botswana government as the future engine of economic growth and potential area for economic diversification away from mining. The government's commitment toward unleashing natures economic potential is reflected in the Ministry of Environment Wildlife and Tourism's mandate, which is to *"protect the environment, conserve the country's natural resources and derive value out of the environment for the future benefit of Batswana"*. Implied in this mandate are issues of environmental sustainability and prosperity from the environment and natural resources. The basis of this statement is the realization that abundance and diversity of natural resources including wildlife and landscapes are the main drivers of the tourism economy.

The Okavango delta in Ngamiland, the Kwando–Linyanti system and the Chobe National Park are the main tourist destinations accounting for almost 93% of the tourist traffic to the northern protected areas. At the moment tourism contributes 5% to Botswana's Gross Domestic (GDP). In terms of employment, approximately 15,000 people are employed in the many tourist establishments in the northern part of the country. This figure has a potential of increasing significantly with improved infrastructure, allocation of additional concessions and increased bed nights.

The Okavango delta and the Chobe National Park have resources that attract a considerable portion of the tourist traffic. These two areas are important tourist destinations that should be effectively managed to sustain the tourism industry and resources upon which the industry depends. To effectively manage resources in the Chobe National Park, the Department of Wildlife and National Parks has had a number of documents that guide management activities undertaken in the Chobe National Park. The latest of these documents is the 2002 Chobe National Park Management Plan

4.0. LAND USE CLASSIFICATION AND ZONATION

The Chobe National Park is divided into six land use and tourism development zones based mainly on tourism (Fig.4.1). This is in recognition that tourism is a very important sector that sustains the viability of the Chobe National Park.

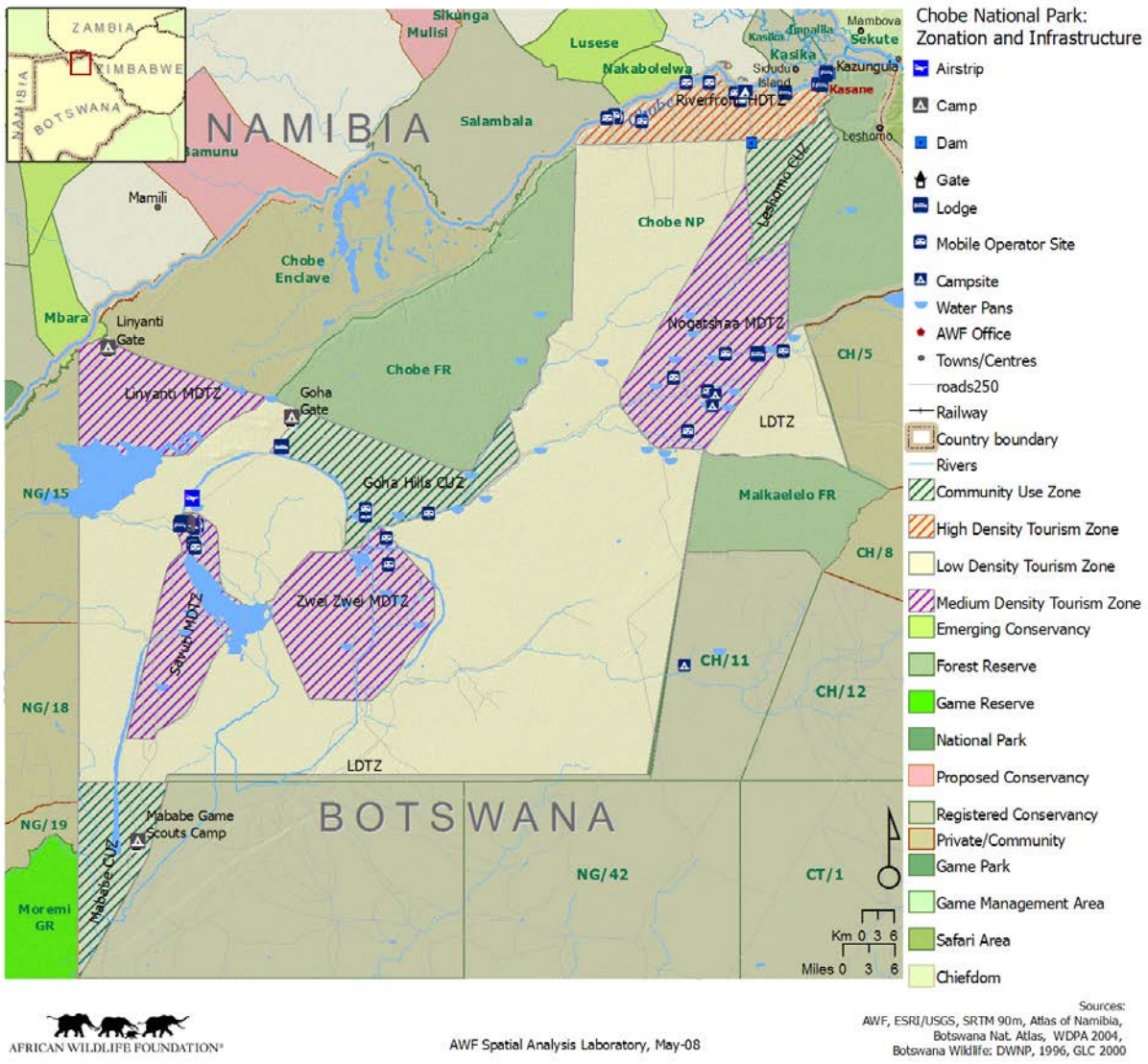

Fig. 4.1: Map of Land Use and Development Zone for Chobe National Park

4.1 Description and Outline of Activities in Each Zone

Different land use and management approaches including visitor carrying capacities and infrastructure development strategies are recommended for each zone. These zones are; the High Density Tourism Zone, Medium Density Tourism Zone, Low Density Tourism Zone, Communal Use Zone, Protected Zone, and Development Zone

4.1.1 High Density Tourism Zone

This zone refers to the area lying to the north between of the Kasane –Ngoma along the Chobe river front. This area is the prime tourist zone of the whole Chobe national park because of the diversity and abundance of wildlife. Almost 90% of the tourist establishments in the district are located in close proximity to this zone. To accommodate the increasing tourist demands, previous plans advocated for an additional tourist game viewing roads and closure of others. In addition, to game viewing roads the other popular mode of viewing game is the use of boats. There have been concerns that boat traffic had been increasing at such a pace such that there were fears that if the same is not controlled the tourist product could be affected. There were also concerns that oil leakages, and noise pollution were posing a danger to the many wildlife species that come to the drink and utilize the water resources of the Chobe River. There were therefore calls that measures should be taken to address most of these concerns to mitigate potential impacts.

A number of measures to militate these concerns were outlined in the 2002 Chobe Management plan. Some of the measures suggested have been implemented such as the boat station and closure of some of the entry gates, while others have yet to be implemented such as construction of roads and introduction of booking system, limiting the number of vehicles entering the park, construction of additional game viewing routes in the Chobe river front area. In this a detailed discussion of measures that need to be implemented to spread tourism are discussed and also measures that should be implemented in order to reduce congestion in the Chobe river front are discussed.

4.1.2. Medium Density Tourism Zone (MDTZ)

The type of tourist activities permitted in this zone is an assortment of activities that do not require construction of permanent tourist infrastructure. Activities that are permitted in this zone according to recommendations in the 2002 management plan include mobile operator's sites; wilderness camp sites; public camping sites; stretch points and game viewing facilities such as hides and game viewing roads. The latter would suggest that developed of game viewing roads is permitted. There are four MDTZ sites in Chobe national Park; these are:

4.1.2.1 Linyanti MDTZ.

This zone is approximately 372 square kilometers in size lying on the north western tip of the park. This zone is considerably under developed with a small camping site capable of holding 18 campers. The facilities are generally rustic and archaic. The ablution is old with limited toilet and shower ring facilities.

4.1.2.2 Savute MDTZ

This zone is about 802 square kilometers in size. This is by far the most developed of all the MDTZ in terms tourist infrastructure. There are 170 kilometers of game viewing roads. There are two lodges, five mobile sites and one public camping site making a total of 158 bed nights.

In addition to tourist facilities, there is a DWNP staff camp, an airs strip and three artificial watering points near the camping site, Marabou pan and at Rhino Vlei.

The above developments are concentrated on the northern portion of the zone.

4.1.2.3 Zwei Zwei MDTZ

The Zwei Zwei is approximately 785 square kilometers in size. This zone is grossly underdeveloped; it has only 14 kilometers of official game viewing roads. There are however several unofficial game viewing roads in this zone opened by photographic safari operators. The lengths of these roads are difficult to quantify.

4.1.2.4 Nogatshaa MDTZ

This is the largest of the four MDTZ, it is approximately 1186 square kilometers in size. According to studies by various scientists who have worked in the area and information from various stakeholders, the Nogatshaa area is renowned for good forage and an abundance of ephemeral pans that in times of good rainfall hold water for extended periods of time. The area has potential of being developed into prime photographic tourism zone. The crude road network is capable of supporting 158 bed nights. Unfortunately the area has no facilities to allow for overnight stay such as ablution blocks as a result the area is heavily underutilized.

The potential of the area is stifled by poor game viewing infrastructure and limited surface water especially during periods of drought. In an effort to mitigate the ravages of drought and rejuvenate photographic tourism in the area, the Department of Wildlife and National Parks has drilled several boreholes and constructed eight artificial watering sites in the area.

The tourist infrastructures in the area are five mobile sites and game observation hides at Kabunga, Nogatshaa, Poha and Saurigho.

A new semi permanent lodge site at Mapororo (S18 16'52 E025 01'48) has been issued out to tender for development by the private sector.

4.1.3 Low Density Tourism Zone

This by far the largest of the three tourism development zones in the Chobe National Park. There are no game viewing roads in this zone except for a few routes that pass through the area. It is one of the areas in the Chobe National Park that has wilderness qualities. In acknowledgement of these qualities, a number of sites have been identified for development of wilderness camping. Although this area is designated a wilderness zone, there is a lodge site located between Kakulwane plains and the Chinamba Hills. This lodge site was allocated in 1999 and up to now it has not been developed.

4.1.4 Community Use Zone

This a zone that is allocated for community use, where target communities are allowed to undertake tourism related activities and also harvest veld products for subsistence purposes. In the Chobe National Park, management has allocated the south-western edge of the park for use by the Mababe community.

4.1.5 The Development zone

In the 2002 management plan zone map, there were provision for three lodge sites. These sites are the Chobe Game Lodge, Savuti Safari Lodge and Savuti Elephant Lodge. An additional four sites have been added and these are at Shinamba, Nogatshaa and two Goha hills.

5.0 REGIONAL PERSPECTIVES IN TOURISM DEVELOPMENT AND CONSERVATION OF BIODIVERSITY

5.1. THE KAVANGO ZAMBEZI (KAZA) INITIATIVE AND ITS IMPLICATIONS

The Chobe National Parks is not an island. It is an entity that lies within an ecological landscape and its sustainability and viability as a conservation area is influenced by factors within the parks itself and also by what goes on outside. It is therefore important in the planning process that consideration is made of what goes on inside and outside to enable an adoption of a holistic approach to planning. At the moment, it is estimated that almost eighty (80%) percent of the Chobe district has been set aside for conservation purposes. The Chobe National Park constitutes forty nine percent of this area. Forest Reserves and Wildlife Management Areas (WMA) constitute 21%. The remainder is the area that is currently used for communal agriculture and livestock production. This setup bolds well for conservation of wildlife and development of wildlife and nature based tourism related activities.

It should be noted that countries bordering the Kavango Zambezi basin that includes Angola, Botswana, Namibia, Zambia and Zimbabwe recognize that tourism can play an important role in stimulating regional economic growth and sustaining livelihoods. In order to fully exploit this potential the five countries acknowledge that ecosystems and what goes in them are not constrained by political boundaries. Representatives of these countries met and agreed to set up one of the most far reaching ecological landscape in the region. These countries proposed to set up a Transfrontier Conservation Area that includes that a large proportion of the Upper Zambezi basin, the Okavango basin and the Okavango delta. This area encompasses the largest continuous wilderness, wetland and wildlife area in southern Africa (**Fig. 5.1 Map of the KAZA TFCA).** This initiative is now commonly referred to as the Kavango–Zambezi Transfrontier Conservation Area (KAZA TFCA).

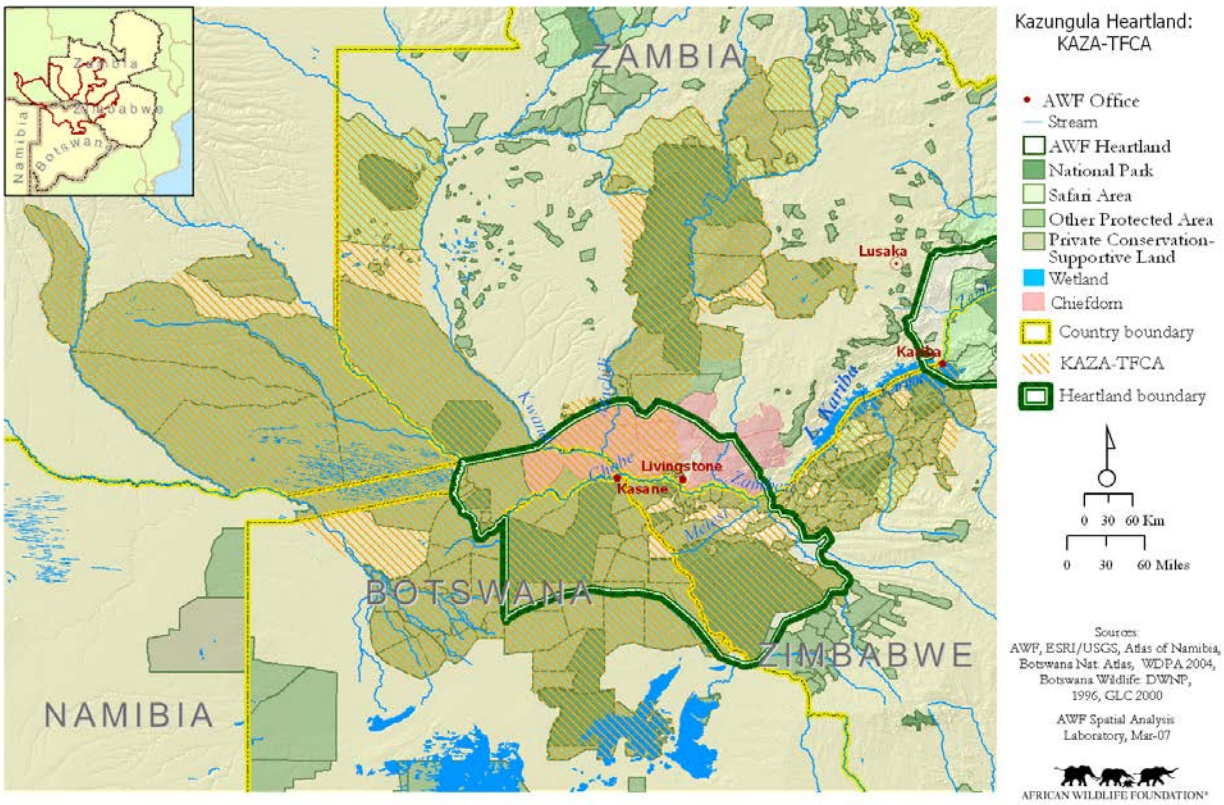

Fig. 5.1: Map of the Proposed Kavango–Zambezi Transfrontier Conservation Area

In 2003, the countries flanking the KAZA TFCA met to define elements of the initiative and agreed that the KAZA should focus on:

vi. Putting in place mechanism and strategies to promote collaborative management planning to ensure resources within the basin are properly inventoried, monitored and that research and land use planning are harmonized;

vii. Undertaking measures to ensure that policies and legal framework are harmonized;

viii. Promoting ecologically and socio –economic sustainable tourism development;

ix. Establishing mechanisms that would ensure proper coordination and facilitation of the implementation of the initiative by the five countries;

x. Adopting appropriate strategies to identify and mobiliser resources to attain the overall objective of the initiative.

The ultimate objective of the KAZA initiative is to improve the cooperative management of shared resources, increase the area available to wildlife and plants and to unleash economic benefits to the local communities living within and on the periphery of the KAZATFCA. The

architects of the KAZA initiative view tourism as the main driver of economic growth and sustainable growth in the KAZA TFCA.

In addition, Botswana, which at the moment has well over 170,000 elephants that are perceived to be negatively impacting on the woodland vegetation anticipates that establishment of the KAZA TFCA, will encourage elephants to range free within this huge conservation area. This will ultimately result in reduced impact on the woodland vegetation communities. It is hoped elephants, wilderness area and abundant and diverse wildlife will be the basis of tourism marketing for the KAZA.

5.2 CHOBE DISTRICT TOURISM PLAN

The KAZA TFCA initiative will greatly enhance potential of the Chobe District in general and the Chobe National Park in particular as a tourist destination. The growth in the tourism sector is a welcome phenomenon, it is however vital that such an expansion is effectively managed and controlled. If this is not done, the consequences on the environment will be such that the industry is not be sustained. There is a general acknowledgement that existing plans and strategies might not be adequate to effectively deal with potential impacts of tourism on the environment. Considering that the KAZATFCA initiative has huge potential benefits for the Chobe district as a whole, it is imperative that concerted efforts are channeled towards developing a district tourism plan. The development of such a plan would ensure the ecology and ecosystems to which the Chobe National Park is linked are sustained. It is therefore necessary that measures are put in place to protect conservation areas around the Chobe National Park to mitigate the impacts on the environment. This is necessary to allow the Chobe National Park to continue functioning as a centre for economic development, whilst retaining its most important function; that of conserving and preserving biodiversity and linkages to surrounding conservation areas.

A review of various documents suggests that concerted efforts and suggestions have been made to ensure integrity of the Chobe National Park is sustained. Communities in the Chobe Enclave have for example developed a Management Plan for their area. A number of government institutions through the Technical Advisory Committee (TAC) provided input in the production of this plan. This plan advocates for pronounced community participation in the management of the wildlife resource, landscapes and cultural aspects. This, the community felt is necessary to ensure the inhabitants of the enclave are involved and derive both utilitarian and financial benefits from wildlife and tourism potential of the area.

Forestry Reserves take up a significant portion of the Chobe district and almost all of them are adjacent to the Chobe National Park. Therefore any tourism activities in forestry reserves must take cognisance of ecosystem linkages that exists between them and the Chobe National Park. Forestry Reserves play a very important role in conservation of biodiversity, they provide necessary resources that are heavily utilised by a number of wildlife species especially elephants.

In addition forest reserves provide corridors for migratory species. Therefore forest reserves have a potential to significantly contributing to the conservation of wildlife and development of wildlife and nature based tourism.

The Kakulwane and Pandamatenga plains, especially the former are important migratory routes for wildlife between conservation areas in Zimbabwe and the Chobe National Park. These two plains are also centers of biodiversity preservation and should therefore be preserved in their current state. The fringes of the plain are ideal for development of tourist infrastructure.
There are plans to develop horticulture, fisheries and vegetable production in the northern plains. If this project goes ahead, it will disrupt migration patterns and this could eventually lead to decline in wildlife numbers negatively impacting on the tourism viability of the area. The realization of the horticultural project has a potential of severely affecting wildlife numbers as the alternative route, through the adjacent Pandamatenga farms are completely electric fenced.

Currently, the majority of tourism activities are focused on resources available in the Chobe National Park. It is however, apparent from the foregoing that viability of wildlife and nature based tourism activities in the Chobe are strongly linked to current and future land use plans of the government. It is therefore important that government acknowledges that the viability of tourism is dependent on the wildlife resource and the same needs to be managed and sustained for it to continue providing benefits to Botswana.

5.3 TOURISM IN THE CHOBE NATIONAL PARK

5.3.1 High Density Tourism Zone

The terms of reference seem to suggest that there is a view amongst members of LACOM that recreational demands on the Chobe National Park to meet tourism development of surrounding areas, notably the Kasane Township and the Chobe Enclave has led to over use of eastern sections of the Chobe National Park especially on the river front. In 2002 a section of stakeholders, mainly members of the Local Advisory Committee (LACOM) were of the view increasing trends in tourist traffic was having undesirable impact the Chobe National park especially in the HDTZ. LACOM members proposed that something needed to be done in order to mitigate potential negative tourism impacts. In this case *"tourism Impacts"* is defined according to Cole and Cadres (1996), Goodwin et.al (1979a), (1979b) as being "*primarily the alteration and disturbance of the physical sites and vegetation, disturbance to animals, pollution of the water, littering and fires".*

The increased number of tourists visiting the Park on daytrips from Victoria falls in Zimbabwe and Livingstone in Zambia has further exacerbated this situation.

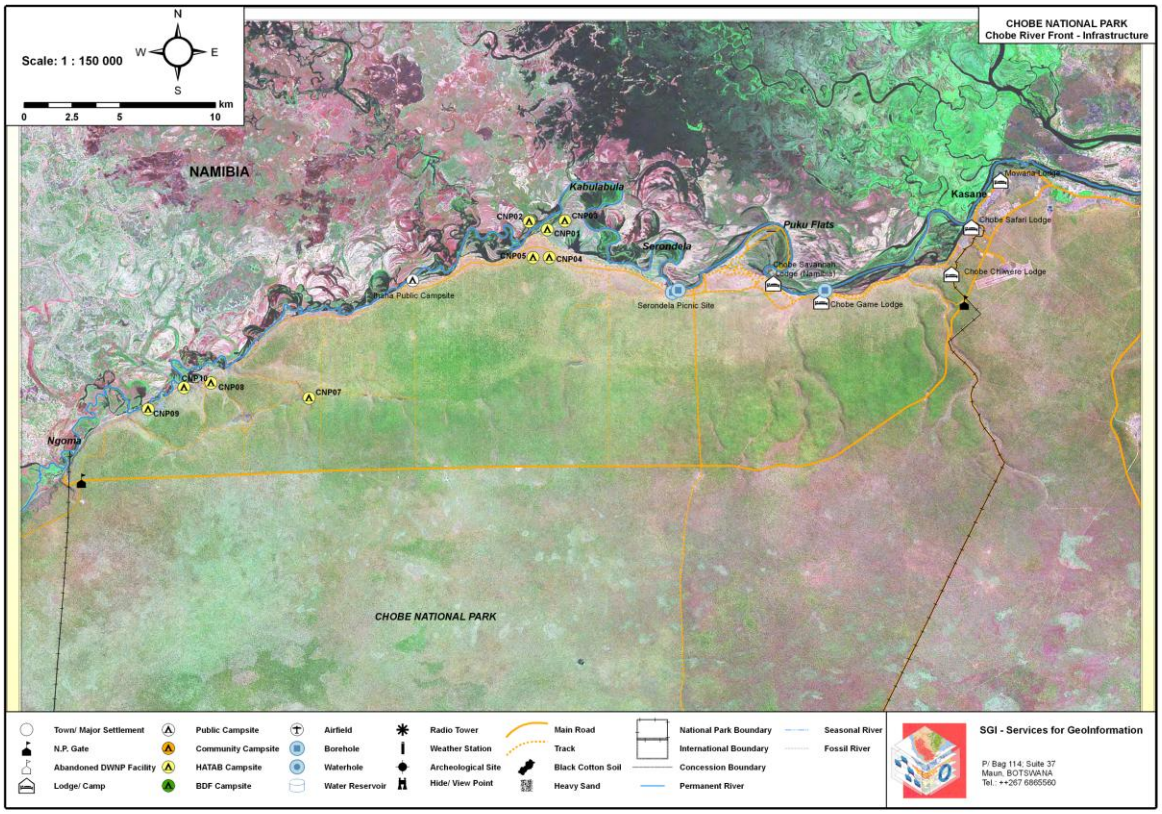

Fig. 5.3.1: Tourist Infrastructure in the Chobe River Front Area.

In 2002 the Chobe Wildlife Trust together with the Department of Wildlife and National Parks and LACOM, with the financial support of the United States Agency for International Development (USAID) commissioned a study to assess the impact of tourism in the Chobe Riverfront and come up with measures to stem the deleterious impacts of tourism on the environment. The study was intended to;

v. Ensure conservation of the ecological integrity in order to ensure "all" stakeholders continue to enjoy benefits from natural resources;
vi. Put in place reciprocal measures that would ensure sustainable use of resources within the district and within the upper Zambezi integrated land use planning zone in line with the tenets of the KAZA;
vii. Ensure that the Chobe continues to offer a holistic experience and diverse tourism product;
viii. Put in place a framework that would commit all stakeholders to play a meaningful role in the adaptive management of the resources within the Chobe National Park

5.3.2 VISITOR MANAGEMENT STRATEGY

It appears from the foregoing that the tourism capacity in the Chobe river front has been exceeded and is having a deleterious effect on the product. Stakeholders have for the past ten years suggested a number of options that would spread tourism to other parts of the Chobe National Park. Amongst these strategies

5.3.2.1. Limiting the number of boats and vehicles entering the Chobe river front

On the basis of these limits of acceptable change and maximum carrying capacity indices were set.

5.3.2.2. Set Limits to Number of Visitors Entering a Particular Management Zone.

As part of this strategy, it was proposed there should be separate permits for accommodation and that of providing game viewing services. This approach has been tried in Zimbabwe's Hwange National Park and apparently it works very well. The best way of implementing such an option is to consider a change in the tourism licensing;

5.3.2.3 Spreading Available Capacity Depending On Available Beds.

The number of vehicles allocated to a particular establishment would depend on number of bed nights for that establishment;

5.3.2.4 Allocating Time Slots

Each establishment should be allocated time slots to reduce congestion;
In some cases, entry by booking only can mitigate congestion. The adoption of such an approach would guarantee entry for each establishment on the booked slots. Other strategies that should be considered include:

5.3.2.5 Crowd Limits

This mechanism uses a thumb up rule whereby management decides that after reaching a certain number tourist in the protected area, no other tourists are allowed access.

5.3.2.6 Pricing

In some case, pricing has been used as tool for controlling the number of visitors to a particular area. This strategy includes raising prices until a number of tourist arrivals start falling. This strategy should be tried.

5.3.2.7 Lottery

In some instances the lottery system has been used to allocate access to prime visitor sites;

5.3.2.8 Routes planning

A strategy is adopted, which compels tours to use and travel using certain routes or trails in a linear management determined direction;

5.3.3 Limits of Acceptable Change and Carrying Capacity

There are two tools that are normally used to ensure the ecological integrity of a protected area and surrounding areas are sustained. These tools are: Carrying capacity (CC) and Limits of Acceptable Change (LAC). In order to ensure integrity and sustain tourism in the Chobe National Park, it is imperative that the optimum numbers of tourists that the study area can handle are prescribed based on carrying capacity and limits of acceptable change. In order to do this, a study commissioned by LACOM and DWNP undertook a strategic assessment of the tourism impact in the study area. The study considered a number of models with respect to sustainability of the resources and the tourism industry in general. The study opted for the use of both the Carrying Capacity (CC) and Limits of Acceptable Change (LAC) models.

The use of LAC in evaluating tourism impact is rapidly gaining ground throughout the world. This system was devised as a planning tool in response to the realization that the use of the other approach; carrying capacity for mitigating tourism impact was failing. The other rational for adopting the LAC approach is that the carrying capacity module is based on the wrong question and totally dependent on quantities. The carrying capacity approach negates the fact that many of the problems associated with tourism/recreational use is a result of human behavior. Studies elsewhere including the Okavango delta, which is closely linked to the Chobe National Park and environs, have demonstrated that the Limits of Acceptable Change are ideal.

The use of LAC concept was also explored in the drafting of the 2001 Integrated Chobe National Park Management Plan. In order for the LAC approach to be effective, the study suggested a number of management objectives and these are based on the fact that:

- There is diversity in resources and social conditions;
- It is inevitable that the conditions that influence human induced change are not natural processes;
- Those impacts on resources are a result of human actions and these can be temporary or long-term and vary in extent too;
- There are many variables that influence impacts and use relationships;
- Management problems are independent of density of the use, other factors such as behaviour might have a major influence on perception;
- There are many options out there that need to be explored to determine whether the LAC has been exceeded;
- There is need for monitoring in order to determine that LAC has been exceeded;
- There is need to separate technical issues from value judgments;
- Need for consensus amongst affected parties is a prerequisite for successful management strategies to be implemented;

- It is important to identify and understand concerns and issues of people who live, use, manage and how they are linked to the area that is being protected. This is necessary in order to minimise conflicts.

The environmental analysis conducted on the basis of the above objectives identified areas that would help to improve management thereby reducing impact of tourism in the Chobe River front, which is classified as the High Density Tourism Zone (HDTZ) whilst broadening the experience of the tourist. The use of the above objectives had a major influence at the tools that could be used to minimize the potential negative impacts of tourism.

There are three components that Manning (1998) considers vital for effective determining either carrying capacity or proscribing limits of acceptable change. These components include:

i. Physical-ecological component

This includes an evaluation of the capacity of a natural system to withstand a certain level of impact from tourist traffic as determined by density. In addition to the natural system, it is recognized that the resilience of a system is dependent on the ability of available infrastructure (roads, water, tourist trails, camping slots etc) to handle a set number of tourists.

ii. Socio-demographic component

It is important to always consider issues such as available trained manpower to provide the necessary and desired tourist experience this category is also the level of tolerance exhibited by the host population towards tourists and the quality of visitor experience.

iii. Political –Economic considerations.

This is another important component worth considering as it relates to the contribution of tourism to the local economic structure (local community benefits) as compared to other sectors.

In order to meet Manning's (1998) recommendations, the study focused on:

iv. What type of facilities and infrastructure are required to reduce traffic congestions and provide facilities to ensure tourists are accorded an opportunity to enjoy a wide range of experience and enhancing their relative comfort on game viewing experience;

v. Adoption of an adaptive management approach with a view of determining appropriate visitor entry, vehicles and boats permits into the park with a view of;
    a. Reducing to acceptable levels soil erosion resulting from vehicle roads and tracks
    b. Reducing to acceptable levels the disturbance and direct physical harm to animal and plant life in the HDTZ';
    c. Maintain the number, speed, size, appearance, noise and general behaviors of drivers and passengers and standards that are generally acceptable to the majority of paying visitors to the Park;
    d. Ensuring that emerging local business is provided with opportunities to become tour operators;

vi. Proposal for alternative activities to widen visitor experience and diversify the product.

On the basis of the above, the objectives for sustaining vegetation resources and visitor experience around artificial watering points, for boat traffic, vehicle and actions that need to be undertaken to remedy the situation were set. These are summarized in the Tables below.

5.3.3.1 Acceptable Limits for Vegetation around Watering Points

Table 5.3.1: Limits of Acceptable Threshold for Vegetation In and Around Artificial Watering Points

Indicators	Tree Height	Percent Reduction	Remedial Action	
A	2 m to ≤ 5m	≥40%	Switch off Bore Hole for two dry seasons except in sever drought years	
B	≥5metres	≥40%	Switch off Bore Hole for two dry seasons except in sever drought years	
C	2 m to ≤ 5m	≥20%	Switch off Bore Hole for two dry seasons except in sever drought years	
D	≥5metres	≥20%	Initiate monthly rotation of watering points for the rest of the dry season	
	Distance From Waterhole		**Biomass Levels**	**Action**
E	100 to 500 meters		≥ Baseline biomass exceeds baseline by 200%	Initiate monthly rotation of watering points for the rest of the dry season

5.3.3.2 Limits of Acceptable Change for Boats

Table 5.3.2: Acceptable Thresholds for Boats traffic on the Chobe Riverfront per Operator

OPERATOR	BOAT TYPE				Total
	Speed Boat	Cruise Boat	Pontoon/skimmer boats	Unspecified Boat	
Tour Operators	19	3	15	0	37
Private Boat Owners	0	0	0	7	7
Botswana Government	0	0	0	1	1
Namibian	0	0	0	5	5
TOTAL	**19**	**3**	**15**	**13**	**50**

At the time of setting these limits in 2002, it had been observed that these limits had already been exceeded. In order to mitigate the impacts, the following management activities were recommended:

v. Limit the number of boats entering the park per any given time;
vi. Encourage operators to use boats with larger passenger capacity and phase out small boats entering the park;
vii. Ban all boat tourist transfers
viii. Set quotas for each tourist operator. The set quota are outlined in table below:

Table 5.3.3: Quota of Boats per Operator

OPERATOR	BOAT TYPE				TOTAL
	Speed Boat	Cruise Boat	Pontoon/Skimmer Boats	Unspecified Boat	
Into Africa safaris	4	1	1	0	6
Chobe Chilwero	2	0	0	0	2
African Odyssey	1	0	4	0	5
Thebe River safari	2	0	1	0	3
Chobe Safari Lodge	1	1	4	0	6
Chobe Game Lodge	5	1	2	0	8
Kalahari Tours	2	0	0	0	2
Janala	1	0	0	0	1
Safari excellence	0	0	3	0	3
Gabbie Lodge	1	0	0	0	1
TOTAL	**19**	**3**	**15**	**0**	**37**

5.3.3.3 Limits of Acceptable Change for vehicles

Table 5.3.4: Vehicle Carrying capacity (Adopted from the 2000 Chobe River front plan)

Vehicle Carrying Capacity Peak Times	Units	Sedudu Area	Ngoma Area	Proposed Changes	
				Sedudu	Ngoma
No of vehicles present	Vehicles	45	5	0	0
Maximum number of vehicles per day	Vehicles	68	70		
Percent of vehicles at peak periods of total per day	Percent (%)	45%	45%		
Present Acceptable capacity	**Vehicles**	**31**	**31**		
Hides (Increase capacity by 1 vehicle per hide)	Vehicles	2	1	2 new hides	1 new hide
Stretch and viewing points; increase capacity by 0.5 vehicles per point	Vehicles	3	1.5	6 new points	3 new points
On prime tourist tracks; increase capacity by 0.59 vehicles per km	Vehicles	4	1	Additional 6.5 km	Additional 1.84 km

On secondary tourism tracks: Increase capacity by 0.2 vehicles per km	Vehicles	7	3	Additional 37.05km	Additional 13.51km
Service roads at Sedudu increases capacity by 3 vehicles	Vehicles	3	0		
Campers at Ihaha decreases capacity by 5 vehicles	Vehicles	0	-5		10 campsites
Increased capacity due to proposed changes	Vehicles	19	1		
New proposed capacity after changes (excluding extra gate)	Vehicles	50	33		
Factor for extra gate; improvement of new capacity	Percent (%)	15%	15%	Increase distribution and capacity	
Increase in capacity due to extra gate	Vehicles	7	5	1 extra gate	1 extra gate
New proposed capacity after changes including extra gate	Vehicles	57	38		
Percent (%) increase in capacity	**Percent (%)**	**87**	**20**		
Calculation of Acceptable Vehicle Density for Primary and Secondary Tracks					
Present kilometers of primary tourist tracks	Kilometers	42	32		
Present kilometers of secondary tourist tracks	Kilometers	31	64		
Acceptable density on primary tourists roads (80% of vehicles)	Vehicles per kilometer	0.59	0.59		

5.4 MONITORING STRATEGY

In addition to setting the limits, a number of actions were proposed that would enable management to monitoring and ensure that the limits of acceptable change and carrying capacity are not exceeded. Two strategies of monitoring adherence to the set boat quota and limits are proposed and these are:

i. Entry Permit system

Each operator to be given an annual permit issued by the in line with the National Parks and Game Reserves regulations of 2000. These permits will be used to enforce the set quota and ensure compliance. In the event of non compliance, permits will be withdrawn and auctioned to other emerging local entrepreneurs.

ii. Zoning;

Zones where boating activities can take place have been identified based on game viewing opportunities, bird viewing and the need to protect ecologically sensitive areas.

iii. Policing.

This an important aspect of the whole process of setting limits. Policing is aimed at ensuring compliance to the set boat quota and size specifications. To ensure effective policing, the DWNP has constructed a floating jetty

5.5. ALTERNATIVE TOURIST ATTRACTION ZONES

One of the functions and objectives of establishing National Parks is to accord discerning visitors a chance to enjoy nature. The Chobe National Park at the moment is renowned for guided game drives, boat cruises; fishing; self drive game viewing, bird watching. These activities have mainly been concentrated in Chobe Riverfront and the Chobe River. This area is the prime tourist destinations for clients accommodated at 22 tourist establishments that include hotels, lodges and guests houses in and around Kasane and at two other establishments inside the Chobe National Park.

In addition to these lodges, Kasane also hosts a number of camping sites, budget accommodation facilities and DWNP run camping facilities inside the park. In addition to the above, there are day trippers from Zimbabwe and to a lesser extent Zambia's who come in groups for either game viewing or boat cruises or both.

At the moment the area along the Chobe River front is designated as a High Density Tourism Zone. Review of the previous plans (Anon 1997, Anon 2002) and the Chobe River front management Plan of 2002 suggest that the High density Tourism zone has or close to exceeding its limits of acceptable change and in some cases has exceeding its carrying capacity indices. It is therefore imperative that tourism be extended to other areas.

On the basis of the limits of acceptable change and carrying capacity indices outlined above, the Chobe river front is over traded and previous plans advocated the development of new infrastructure such as roads in order to increase capacity in the zone.

Tourists that come to the Chobe National Park, come mainly to view wildlife, watch birds through guided game drives or by boat cruises. A review of the tourism statistics for 2007 suggests that almost 70% of the tourists that come to Botswana come to enjoy the diverse wildlife. Information collected during the Botswana Norway Institutional capacity (BONIC) project in the mid 1990's seems to suggest that wildlife congregate around the Chobe River front to access water, which is fairly limited during the dry season. The same data also suggest that the area around Nogatshaa and the open woodland vegetation community south of the Kasane-Ngoma Road offer good forage and are the favourite grazing grounds for most wildlife in Chobe National Park. The only factor that limits wildlife abundance and diversity is water in these areas. In order to unleash the tourism potential of these area, artificial watering sites and tourist infrastructure such as game viewing roads, game viewing hides, public camping sites, lodges and other facilities need to be provided.

The above discussions show that in the High Density Tourism Zone, the limits of acceptable change and carrying capacity indices have been exceeded. It is important to develop additional infrastructure and also expand the same to other areas with the Chobe National Park. The

adoption of such a strategy will help to sustain the tourism industry in and protect the environment and various ecological interactions and functions in the Chobe river front.

However, there is a limit as to the number of new infrastructure that can be developed in the High Density Tourism Zone. The only viable alternative is to divert tourist traffic away from this zone to other areas in the park. There is always an opportunity to diversify visitor experience based on landscape diversity. Existing plans have identified a number of zones within the Chobe National Parks where tourism infrastructure can be developed and attract tourists away from the Chobe River front area. These zones offer varied and diverse tourist potential. Each type of zone permits certain developments and visitor carrying capacities. A list of potential recreational activities that could potentially be introduced in these zones include rock climbing; angling, bush walking, biking, camping, four wheel driving, motor biking, mountain biking, picnicking, wilderness camping. The type of recommended visitor experience/activity will be designed to meet particular needs of the segments identified.

5.5.1 ALTERNATIVE AREAS FOR TOURISM DEVELOPMENT IN CHOBE NATIONAL PARK

The areas being considered for diversifying and diverting tourist traffic away from the Chobe River front area are the Medium Density Tourism Zones (MDTZ), Low Density Tourism Zone and Community Use Zone located in different parts of Chobe National Park. These zones are ideal for development of tourist infrastructure in the form of non-permanent structures (e.g. mobile operator sites, stretch points and day use facilities) and activities (e.g. game drives). These four areas are:

5.5.1.1 Linyanti MDTZ

The Linyanti Medium Density Tourism Zone is located on the north-western corner of the Chobe National Park. This zone is in an area that has a substantial diversity of game with elephants contributing 90% of the biomass. The remaining 10% comprises of impala, buffalo, waterbuck, lechwe amongst many others. The Linyati zone is under developed and the only tourist infrastructure is a small archaic public campsite that can cater up to a maximum of 18 people. The number of bed nights though is far much in excess of the recommended carrying capacity for the area, which is 11 bed nights. In addition to camping slots and public water points, the site has an ablution block. The factor that limits tourism in the area is the limited game viewing road network that is confined to the flood plain.

Table 5.5.1: Tourist Infrastructure at Linyanti MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	0
Mobile Operators Sites	5	0
Public Camping Sites	1	18
TOTAL		

OTHER TOURIST FACILITIES		
Game Viewing Roads	14	11
Air Strips	0	-
DWNP Staff Camp	1	-
Artificial watering points	0	-

However, there is room for this road work to be expanded by an additional 97 kilometer. The Department of Wildlife and National Parks have made submissions to the District Development Plan (DDP) 7 to develop an increased network and construct a bigger more modern ablution facility at Linyanti. Once this is developed the carrying capacity of the zone would increase to 84 beds. Forty (40) of these beds would be reserved for public camping. The remaining bed nights could either be allocated to a lodge, mobile safari operators and wilderness camping. According the DWNP DDP 7 submission, the Linyanti zone is increasingly becoming popular. To meet this increasing demand, it is proposed that the 20 bed nights be allocated to mobile operators and 24 to wilderness camp sites, which could be made available to the general public.

5.5.1.2 Savute Medium Density Tourism Zone

The Savute medium density tourism zone is another area where tourism infrastructure could be expanded to reduce the perceived congestion along the Chobe River front. The Savute zone is by far the most developed, with all the developments concentrated in the northern part of what was once the savute marsh. Savute has two lodges owned by Oriental Express and Desert and Delta, a subsidiary of Chobe Holdings. In addition, there are five mobile operator sites, one public camping site.

The game viewing road network is extensive, covering a total of 170 kilometers. In addition savute has an airstrip, DWNP staff camp, three (3) artificial watering points (Fig. 5.5.1). A factor that makes Savute a potential zone for tourism expansion is its rich game and birdlife. The area is renowned for the big five game viewing dating back to the days when the Savute marsh was in flood. Due to rich game and a comparatively good game viewing network, Savute is a favourite stop over for mobile and private safari operators. As a result mobile operator sites and public camping sites are most of the times fully booked.

In addition to good game viewing, Savute is a stopover point for tourists travelling through the park between Maun and Kasane. This massive tourist traffic presses considerable pressure on the facilities that are currently in place at savute. It is imperative that with increased tourist arrivals, that tourist infrastructure at Savute be increased to meet this demand. At the moment, the carrying capacity for Savute is 158 bed nights shared as follows:

Table 5.5.2: List of Tourist Infrastructure at Savute MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	2	48
Mobile Operators Sites	5	50
Public Camping Sites	1	60
TOTAL		**158**
OTHER TOURIST FACILITIES		
Game Viewing Roads	170	158
Air Strips	1	-
DWNP Staff Camp	1	-
Artificial watering points	3	-

The capacity for the Savute zone could be increased by developing additional game viewing roads. There room for construction of an additional 70 kilometers of game viewing roads. The construction of these roads could increase the carrying capacity by 64.

The northern part of the marsh as alluded to elsewhere in this report, northern part, of the marsh is the most developed and almost all the infrastructure is confined to this zone. There is therefore limited room for further expansion in this area. It is therefore recommended that any additional tourist infrastructure such as accommodation and mobile operator sites should go to the central and southern portion of the marsh.

In the 2002 Management Plan, it was proposed that of the additional 64 beds, 25 should be reserved for the establishment of wilderness campsites. However, in view of current levels of development and other constraints such as staff transport, it is recommended that wilderness campsites should not be developed. Therefore any additional bed nights should be reserved for development of a third lodge and additional mobile sites.

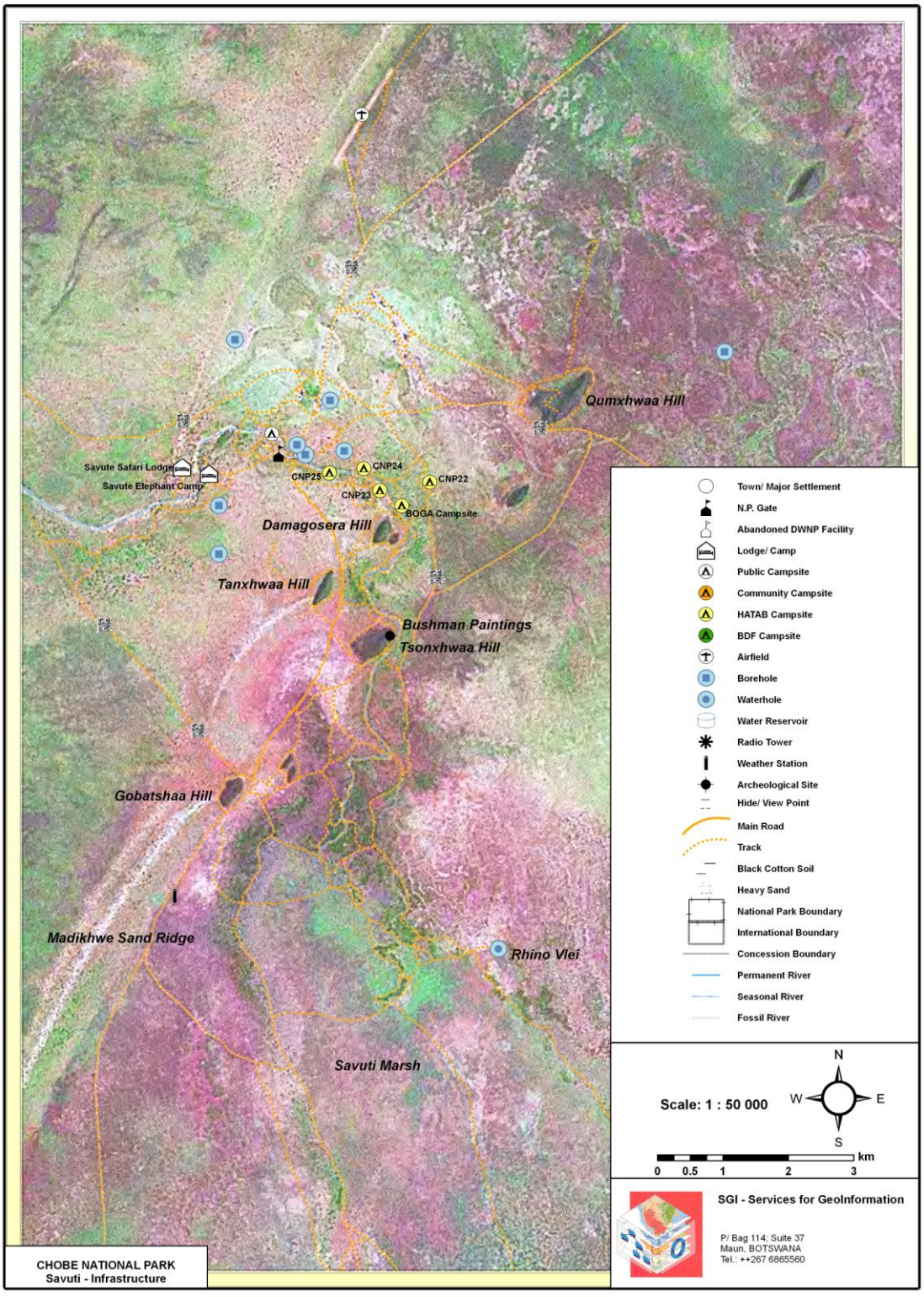

Fig.5.5.2: Tourism Infrastructure in Savute Medium Density Tourism Zone

5.5.1.3 Zwei Zwei Medium Density Tourism Zone

This zone is approximately 785 square kilometers. Its potential for tourism development is constrained by the fact that a large part of it lies within the Mababe depression, which is susceptible to seasonal flooding and soils dominated by kaolinite. These soils make it difficult for the area to be accessed for most part of the year.

However, if appropriate roads are developed and artificial water points are provided, the tourism potential for this area can be greatly enhanced. The area has a potential of accommodating 236 kilometers of game viewing roads. At the moment the area has only 14 kilometers of game viewing roads. An increase in network of game viewing roads would increase carrying capacity from 11 to 177 bed nights. The problem with the area is that there is no DWNP camp, which precludes development of wilderness camping sites. The carrying capacity makes the area suitable for development of a permanent lodge. This development would entail construction of an air strip, artificial watering points, and all weather roads to allow for yearlong access.

Table 5.5.3: Tourist Infrastructure at Zweizwei MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	-
Mobile Operators Sites		-
Public Camping Sites	0	-
TOTAL		
OTHER TOURIST FACILITIES		
Game Viewing Roads	14	11
Air Strips	0	-
DWNP Staff Camp	0	-
Artificial watering points	0	-

5.5.1.4 Nogatshaa Medium Density Tourism Development Zone

This is another area where tourism could easily rival the Savute and the Chobe River front. The potential for game viewing is good. There are eight artificial watering points and four of these; Kabungu, Nogatshaa, Poha and Saurigno have game viewing hides.

In addition to artificial watering points, the Nogatshaa area has the largest concentration of ephemeral water pans including the Seloko plains where wildlife tends to congregate during the rainy season and early part of the dry season.

The current road network is capable of handling 158 bed nights. There is room to develop a further 145 kilometers of game viewing roads and this would markedly increase the number of

bed nights to 150 beds. The extension of the road network would allow for development of facilities such as public camping and wilderness camping sites and a 24 bed lodge.

Table 5.5.4: List of Tourist Infrastructure at Nogatshaa MDTZ

FACILITY	NUMBER	NUMBER OF BED NIGHTS
Lodge	0	0
Mobile Operators Sites	5	50
Public Camping Sites	0	60
TOTAL		**158**
OTHER TOURIST FACILITIES		
Game Viewing Roads	152	158
Air Strips	0	-
DWNP Staff Camp	1	-
Artificial watering points	8	-
Game viewing hides	4	-

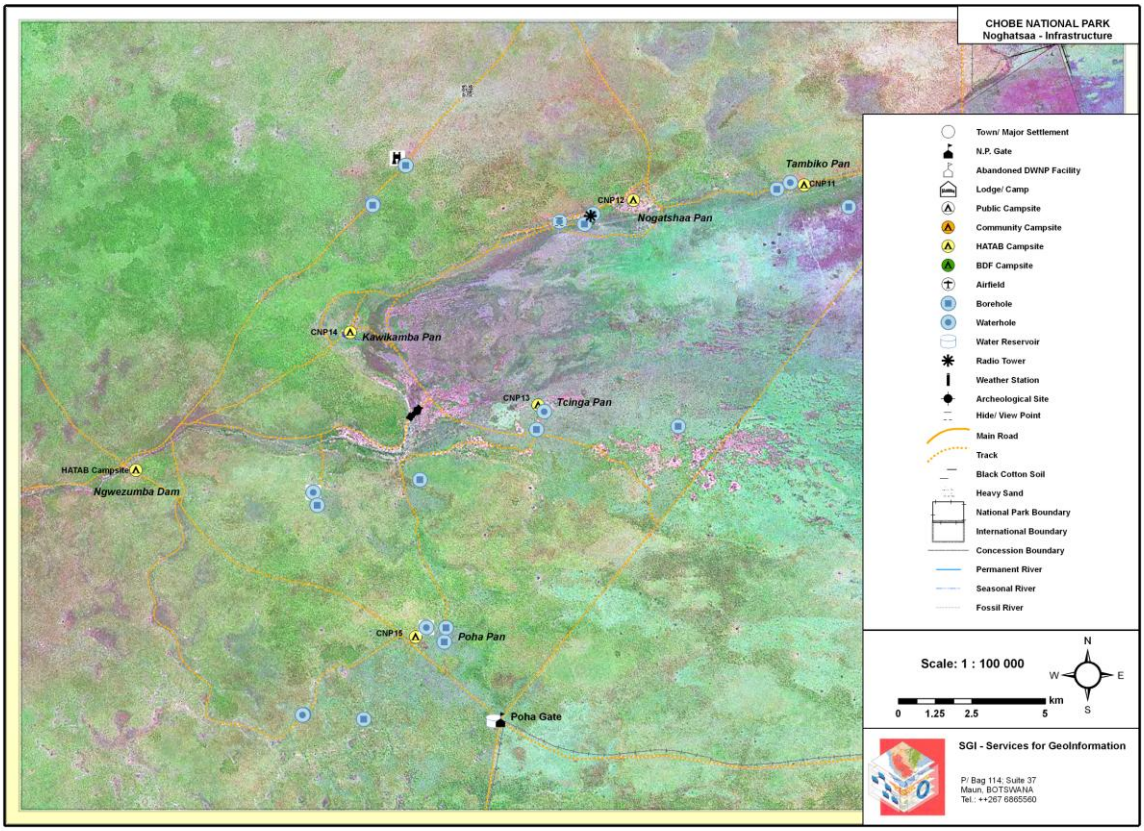

Fig. 5.5.3: Tourist Infrastructure at Nogatshaa MDTZ

In acknowledgement of the tourism potential of the Nogatshaa area, the Department of Wildlife and National Parks in its submission for the DDP 7 has proposed for the development of a public camping site at Nogatshaa and upgrading of the road network. The development and construction of new tourist infrastructure in Nogatshaa would greatly reduce congestion in the Chobe river front. The Department of Wildlife and National Parks is therefore encouraged to seek funding to develop the road infrastructure and construction of a fully equipped public camping site at Nogatshaa.

To develop appropriate tourism infrastructure that would attract and sustain tourists to the Nogatshaa area would require substantial investments in the form of capital and equipment. To ensure that the proposed and requisite infrastructure is built, a number of options are recommended. Amongst these recommendations are:

- Raising of vehicle entry fees;
  This would be accommodated in the review process of the National Parks and Game Reserves regulations.
- Adopt Build Operate Transfer (BOT) strategy.
  Adopt of this approach would allow the private investor to develop, build and operate any tourism infrastructure in the zone for a number of years before transferring ownership to the government or any management authority in the conservation area.
- The Department of Wildlife and National Parks should seek financial support from a number of Non Governmental Organisations (NGO's) such as the African Wildlife Foundation (AWF), Wildlife Society (WS), Conservation International (CI) to mention just a few. In order to access such funding, the management authority will need to develop and submit funding proposal to these funding organisations.

In the previous management plans, there were proposals that some of the beds in the Nogatshaa zone should be set aside fore development of an education facility. This facility has not been developed and at the moment an education center has been established at old Ngoma gate. Therefore the idea to build an education center at Nogatshaa appears to have been abandoned. Therefore, it is recommended that the Department of Wildlife and National Parks should consider upgrading the facilities at Ngoma into a full-fledged Interpretive and Education centre with overnight accommodation facilities.

5.5.1.5 Low Density Tourism Development Zone

There is a 6066 square kilometer zone where currently there is no development except for a lodge site located between Kakulwane plains and the Chinamba hills. This area can be classified as a wilderness zone. Therefore consistent with its designation, no development should be allowed in this zone.

In order for this zone to maintain its wilderness classification, it is proposed that the Nogatshaa medium Density Tourism Zone be extended to include the lodge site that is between the Kakulwane plains and Chinamba hills.

5.5.1.6 Community Use Zone

On the basis of the National Parks and Game Reserves regulations, the management authority is empowered to declare a portion of a park or game reserve as a community use zone. These zones are for use by *designated communities living in or immediately adjacent to the national Park or Game Reserve.* These zones may only be used to conduct commercial tourism activities and for sustainable use of veld products.

At the moment, there only one recognised community use zone in the Chobe National Park. This zone is located on the south western boundary of the Chobe National Park bordering Ngamiland. This zone is for the use by the members from Mababe settlement. During the public consultation, members from the enclave villages and Lesoma requested that they also be allocated community use zones in the park. There was a provision in the 2000 management plan that such a request could be considered in future and two community use zones were identified. The plan made it clear that such a consideration would only be made when the community in the enclave villages and Lesoma had clearly demonstrated their management capability in the running of the current Community Based initiatives. It is abundantly clear that the existing Community based initiatives in the district are plagued with a lot administrative problems. There is therefore there is no need for setting aside additional community use zones in the Chobe National Park.

One of the zones that would be available for use as a community use zone is north of savute, near Goha Hills. This zone would when allocated be for the Chobe enclave communities. There are two lodge sites within this zone located at east of Goha hills S18º 26'14 E024º 13'35 and another located at S18º 24'14 E024º 11'28.

5.5.1.7 Forest Reserves And Surrounding Wildlife Management Areas

Forestry Reserves comprise a significant portion of the Chobe District, several of which are immediately adjacent to the Chobe National Park (Fig 5.5.1). These forest reserves are Kasane, Sibuyu and Maikalelo Forest Reserves. These areas are heavily used by wildlife and provide critical resources and migratory corridors for wildlife moving between Botswana and Zimbabwe's conservation areas.

At the moment tourism activities are not developed in these forest reserves. However, there are plans by the Department for Forestry and Range Resources (DFRR) to develop tourism in forestry reserves. If these plans are realized then forestry reserves would offer an opportunity for diversification of the tourism product in the district. This would contribute to reducing congestion along the Chobe river front. Most of these forest reserves surround the Chobe National Park; therefore developing tourism infrastructure in these areas would relieve the pressure on the Chobe National Park. The Kasane Forest Reserve in particular can make a significant contribution to the resolution of the overcrowding along the Chobe River front.

Forest Reserve at the moment only serves one purpose of woodland preservation. However, lately due to increasing human population and proliferation of settlements forest reserves are increasing providing critical resources and act migration corridors for wildlife. Therefore there is an increasing potential for the future use of the Forest Reserves by the wildlife and development of the tourism sector. It would therefore be logical to turn all of the Forest Reserves in the Chobe District as Wildlife Management Areas and gazette them as such.

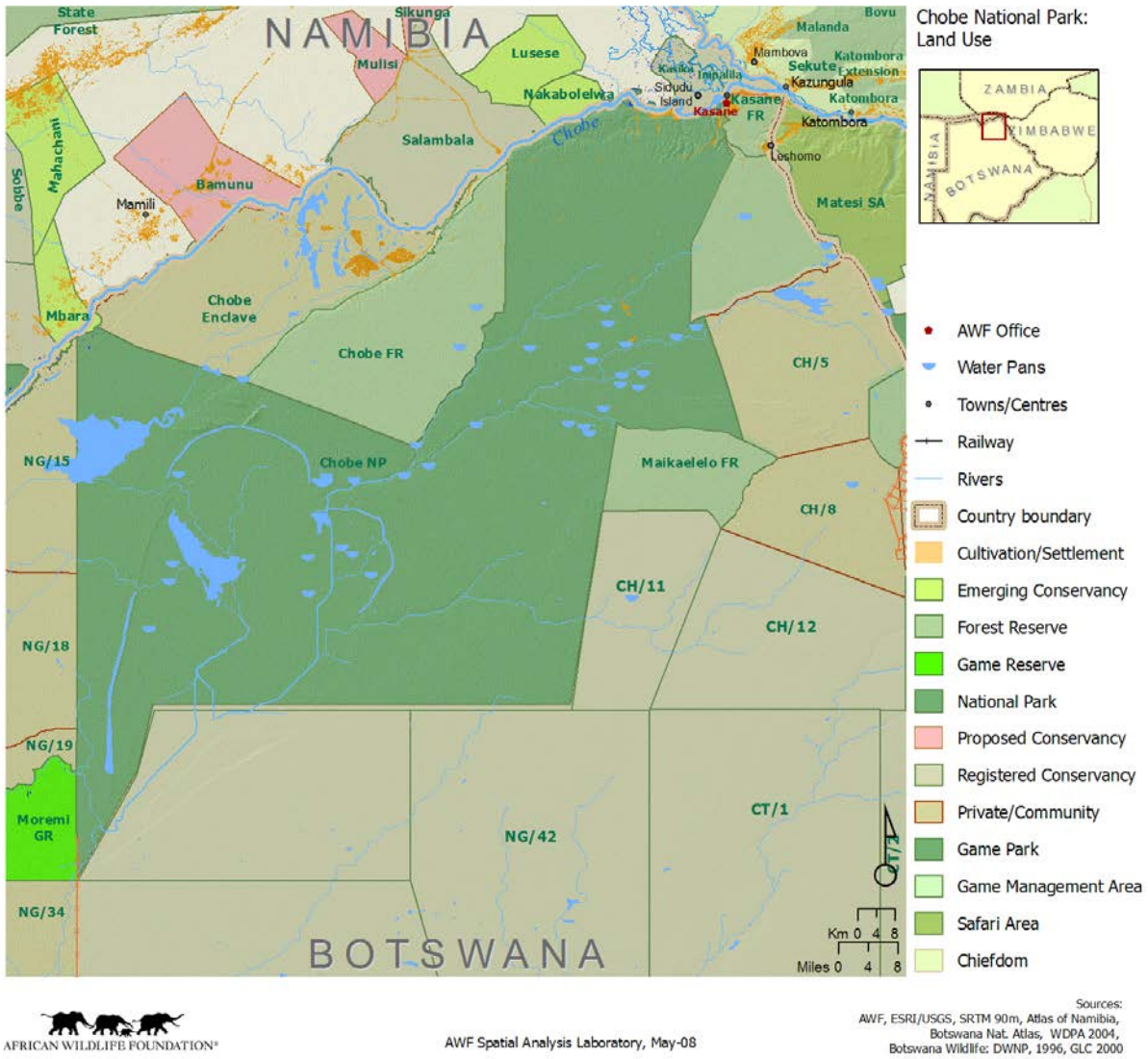

Fig. 5.5.4: Land Use in Chobe National Park

5.6 ASSESSMENT OF VISITOR FACILITIES

An assessment of tourist facilities in each of the tourist zones was undertaken to determine the quality and number of available facilities. This assessment assisted determining which facilities need to be provided in order to meet the existing tourist demands. A summary of the state of facilities and a list of proposed infrastructure is provided in table 5.6.1 below:

ACTIVITY	TOURISM DEVELOPMENT ZONE				
	HIGH TOURISM DEVELOPMENT ZONE	MEDIUM TOURISM DEVELOPMENT ZONE	LOW TOURISM DEVELOPMENT ZONE	WILDERNESS ZONE	COMMUNITY USE ZONE
Rock climbing	-	***	***	***	***
Angling	Yes	-	-	-	-
Bush walking	No	Yes	Yes	Yes	Yes
Camping	Yes	Yes	Yes	Yes	Yes
Canoeing	Yes	-	-	-	-
Caving		-	-	-	-
Cycling		-	***	***	***
Four Wheel Driving	Yes	Yes	Yes	Yes	Yes
Motor Boating	Yes	-	-		
Picnicking	Yes	Yes	Yes	Yes	Yes
Rest stop	Yes	Yes	Yes	Yes	Yes
Government operated Camping sites	3	3	No	No	No
Picnic tables	Yes	Yes	No	No	No
Toilets	Yes	Yes	No	No	No
Showers	Yes	Yes	No	No	No
Water	Yes	Yes	No	No	No
Car parking facilities	Yes	Yes	No	No	No
Fire places	Yes	Yes	No	No	No
Waste Bins	Yes**	Yes	No	No	No
Game Viewing Hides	Yes	Yes	No	No	***
Stretch sites	Yes	Yes	Yes	Yes	Yes
Private operator camping sites	Yes	Yes	Yes	Yes	Yes
Wilderness sites	No	Yes	Yes	Yes	Yes

NB: *** -Recommended Activity; Yes-Activity currently taking place; No-Not recommended

Zone		Game Viewing Roads		Number of Bed- Nights		Mobile sites		Public Campsites		Lodge Sites		Game Viewing Hides		Ablution facilities		Education/Public Interpretation		Artificial Water points		Air strip	
High Density Tourism Zone		**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**	**Avail.**	**Prop.**
		-	-			8	8	0	0	2	2	5	0	0	0	0	1	0	0	0	0
Medium Density Tourism Zone	**Linyanti**	14	97	11	84	5	8	1	1	0	1	0	1	1	1	0	0	0	0	0	0
	Savute	170	210	158	223	5	7	1	1	2	3	0	0	1	1	0	0	3	3	1	1
	Zweizwei	14	236	11	177			0	0	0	2	0		0	0	0		0	2		
	Nogatshaa	152	145	158	150	5	8	0	1	0	2	4	6	0	1	1	0	8	8	0	1
Low Density Tourism Zone		14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0
Community Use Zone		0	75			2	2	0	0	0	2	0	2	0	0	0	0	0	2	0	1

5.7 SOLID WASTE MANAGEMENT

5.7.1 BACKGROUND

One of the negative impacts associated with tourism development is the generation solid and hazardous waste. It is therefore important to develop an effective solid and liquid waste management system in order to sustain resources upon which tourism is dependent upon. Inappropriate disposal of rubbish and waste may impact on natural values of a park and the ability of park users to use and enjoy the Park and to do so safely. It has been demonstrated elsewhere that if visitors do not, for example take their rubbish out, the same has impacted and reflected negatively on amenity and conservation values of the park. In the Chobe National Park, human waste is not correctly disposed off especially in wilderness and mobile sites where there are no ablution facilities, water ways might be polluted and the surrounding area contaminated. The ends result of such actions is complete degradation of park environment and may also endanger the safety of other park users, through the spread of parasites and infections.

In cases where ablution facilities at public camping sites and lodges concession are do not have a properly sealed French drains, there is a possibility of toilet waste seepage into the underground water system. It is therefore important that periodic monitoring of water quality is undertaken to determine that there is no pollution of the water system.

It is apparent from the foregoing that management of human waste and other refuse in the Chobe National Park should be carefully handled to avoid or minimise the adverse effects of disposal. The public must be informed of the appropriate means of disposing of rubbish and waste.. It is important to note that public support, understanding for and cooperation with rubbish and other waste disposal initiatives in vital for effective waste management.

It is therefore important the Department of Wildlife and National Parks should assist with management of rubbish and other waste by raising awareness of the need for public to take responsibility for refuse disposal. In addition to public awareness the DWNP will have to provide the necessary waste containment facilities for disposal of waste including toilet waste in public camping sites. The mobile operators and private individuals will be responsible for waste refuse at mobile sand wilderness sites.

5.7.2 THE STRATEGY:

Prevent rubbish and human waste from causing adverse effects in the park.

5.7.2.1 Actions

8. The "pack in-pack out" policy should be encouraged especially in relation to management of visitor rubbish by raising awareness amongst park users of the need for

visitors and mobile operators to take responsibility for rubbish and other waste in the park and ensure its appropriate disposal.

It should be noted, that where rubbish removal is the prerogative of a management institution, visitor responsibility for disposal of rubbish tends to be diminished and also tends to reduce visitor self sufficiency in waste management. It should be noted that waste management is expensive for any management authority to sustain. Visitors will be required to take all rubbish items brought into the park with them on their departure. In this case rubbish refers and includes all unused or unwanted items including uneaten food;

9. The Department of Wildlife and National Parks will continue provide waste receptacles at all its public camping sites and provide refuse collection services;

10. Initiate a process of incorporating in the national parks and game reserves regulations during the review process to ensure rubbish is removed and appropriately disposed. This will clarify the responsibility for rubbish in the park and encourage visitor compliance with the "pack in-pack out" policy;

11. Ensure all ablution facilities at public camping's sites and lodges within the area upgraded to minimise and where possible prevent adverse impacts on natural values of the Chobe national Park including water quality and aesthetics;

12. In cases, where pit latrines are provided, these should only be used for a very short time and continual review of such facilities should be undertaken and where feasible the facilities should be upgraded wherever necessary;

13. Provision, location and type of toilet facilities will only be done after a through Environmental Impact Assessment (EIA) in line with the EIA Act of 2005;

14. All lodges and public camping facilities built prior to the enactment of the 2005 EIA Act to undergo a detailed environmental Audit and come up with environmental management Plans (EMP) within the Chobe National Park;

5.8. STRATEGIES TO PRESERVE ARCHAEOLOGICAL RESOURCES

5.8.1 BACKGROUND

Specialized tourism focusing on the linkages between wildlife, heritage and cultural aspects is rapidly gaining ground throughout the world. This is another area where tourism in the Chobe National

Park would be diversified into. The Chobe National Park has a number of archeological sites, which coupled with diverse and spectacular landscapes ranging from sand ridges, extensive grasslands, plains, hills such as Goha, Chinamba are potential tourist's destinations.

In addition, there are a number of ancient riverbeds such as the Ngwezumba and a number of cultural and archeological that has a potential of attracting a wide range of tourists.

The Chobe National Park and environs are endowed with archaeological resources. It is therefore important that attempts are made to properly map these sites and produce information leaflets that would be used to advertise such sites to the local and international community. In order to effectively do this, the DWNP will need to seek the assistance of the Department of Museums and National Arts gallery (DMNAG).

The Department of National Museums and Arts Gallery (DNMAG) maintain a site register, listing all known archaeological resources by location with a detailed description of its extent and significance. The DNMAG have a detailed strategy for managing and preserving the integrity of these sites, this strategy should be adopted. It is therefore imperative that DWNP liaises closely with the DNMAG in the management of archaeological sites in the Chobe National Park.

It should be noted that for any infrastructure development in the Chobe National Park, it a requirement by law (the 2005 EIA Act) that prior to development of such project a detailed Archaeological Impact Assessment (AIA) by a qualified Archaeologist registered with the Department of National Museums and Arts Gallery should be conducted.

5.9 VISITOR SAFETY AND PUBLIC HEALTH

5.9.1 BACKGROUD

Parks are there to provide recreation of to visitors in the natural environment and this therefore entails a degree of risk that is often difficult and impractical to mitigate. It is therefore almost impossible within a national park environment to guarantee complete visitor safety. Almost all activities undertaken in life, there is an element of risk, this is more so in an isolated natural environment such as a National Park. In most cases the inherent risk, freedom and independence of recreating in a National Park adds to the recreational value of a place. It is therefore important that visitors are and should ultimately be responsible for their own safety and that of others within their care.

The responsibility of management is to provide and accord necessary precautions for safety and protection of visitors, those within their care and their property.

There are a number of factors that add to the inherent risk in the Chobe National Park, these may range from dangerous animals such as lions, elephants, buffalo, snakes and other natural factors such as fires and man induced such as theft at public camping sites. In addition, visitors may be exposed to risk by incorrectly using structures and facilities within the Park. Unprepared and inexperienced visitors may expose themselves to increased risk as they lack the knowledge, skills and equipment necessary to safely enjoy what national parks offer.

It should be noted that most of the inherent risks outlined above are beyond the direct control of the management authority or visitors themselves. However, such risks may be mitigated by advising visitors of risks and how to avoid and minimise the same.

In private concessions, it is the duty of concessionaires to inform their clients of the risks and measures that need to be undertaken to mitigate the risks. Game guides have the responsibility of safeguarding and protecting their clients. It is their responsibility to enlighten their clients of the inherent risks of recreating in a national park.

5.9.1.1 Strategy

The park management will ensure that all visitors are made aware of the inherent risks of recreating in the Chobe National park and ways of minimizing such risks.

5.9.1.1.1 Action

The management of Chobe National Park and operators will try to mitigate risks to visitors by making them aware of the risks associated with the park and ways of mitigating the same or avoiding such risks. This will be done through:

1. provision of verbal advice;
2. displays and signs;
3. publications and leaflets displayed at all entry gates and availed to tourists;
4. Prevention of access to areas deemed risky to tourists.

5.9.1.2 Strategy

Ensure that all structures and facilities constructed for visitor use are:

iv. Built such that they meet building and engineering requirements, safety standards as prescribed by the Botswana Bureau of Standards;

v. Located in a place suitable in terms of location and user groups that they are intended for;

vi. Regularly checked

6.0. FIRE MANAGEMENT STRATEGIES

6.1 BACKGROUND

Fire has and continues to be regarded as a negative force in ecosystems, as a result considerable efforts have always been channeled towards suppression of fires whenever they occur. However, observations and research carried out in different savannah ecosystems suggest that fire play an important role. Fires have been used to manage natural habitat for biodiversity conservation. They have been used to control invasive plants. This is especially true in the savannah ecosystems where indigenous communities have and continue to use fire to sustain their livelihoods (Andersen 1996). Mc Keon et.al (1990) suggests that fires tend to maintain a balance between grass, trees and shrubs. In addition fires are credited with enhancing mineralization of the organic matter thus aiding in the nutrient cycle.

However, on some cases, fires have been credited with aiding the decline in birds and small mammal populations. Observations have shown that even areas exposed to extreme devastating fires tend to recover in record time following periods of very good rains.

It therefore appears that adoption of fire suppression strategy is based on a Eurocentric perception of fires. Generally data seems to show that areas where fire suppression strategies are religiously pursued, there is always a massive build up of underground litter and understory biomass. The resultant impact is that such landscapes experience extremely hot fires due to accumulated fuel load.

There is therefore a realization amongst range managers that fire impacts can be effectively managed through prescribed burning. However, there are a number of uncertainties as to what the ideal prescribed burning regime for a particular area should be. This is especially true in African protected areas, where to due to limited financial and material resources, it has been extremely difficult to build a fire history taking into account fire frequency and intensity. This has made it difficult in many places to build a fire history and as a result the long term of fire for most savannah ecosystem is lacking.

6.2. Fires in the Chobe National Park

A review of historical data based on the fire web (Fig. 6.2.1) shows that extensive areas in the Chobe District are frequently burnt every year. Almost 98% of the fires that have been recorded in the Chobe National Park emanate from outside the Park especially on forest reserves and settlements adjacent to the international boundary in the Kwando-Linyanti complex. This would suggest that the majority of these fires are set deliberately by people. In very exceptional circumstances have these fires been caused by lightning bolts. There are no records on the timing of these fires, and frequency

of these fires. It however, suffices to note that most fires in the study area occur between June and October of each year.

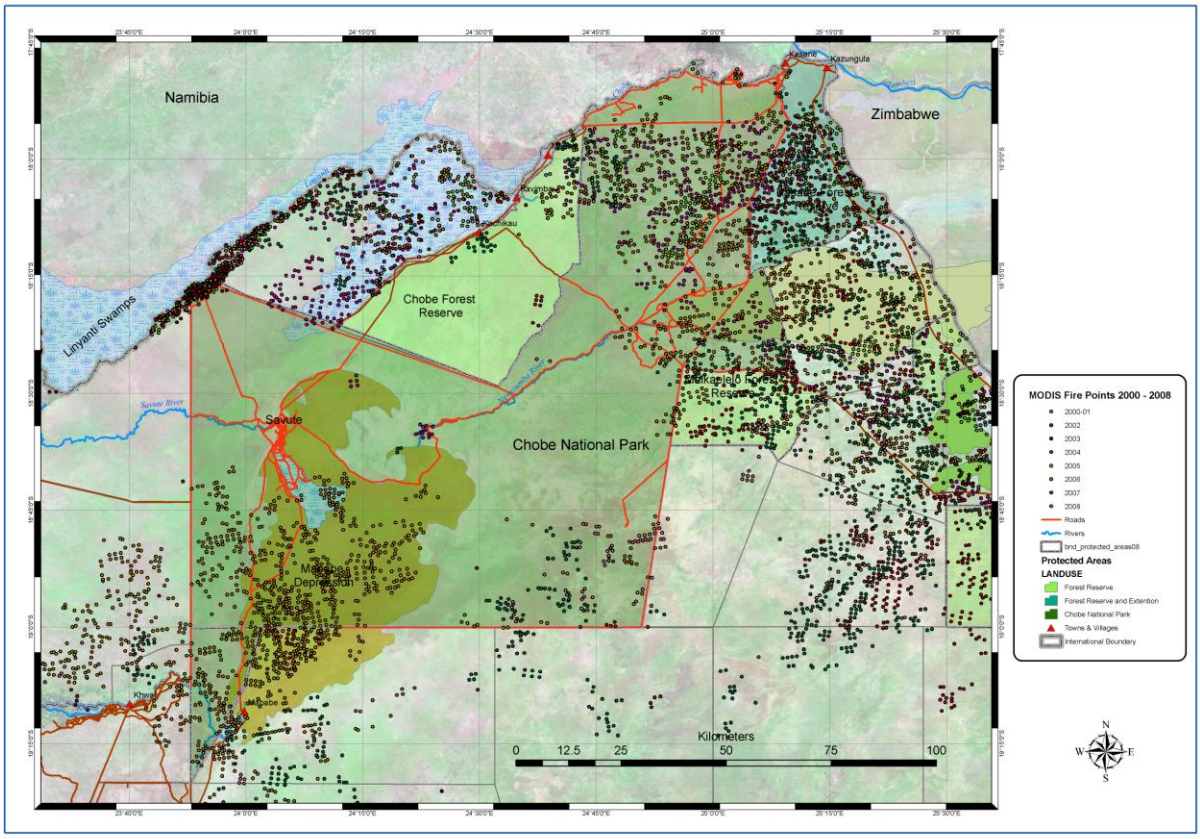

Fig. 6.1: Map Showing Areas Frequently Burnt Areas (2004-2007)

However, only a small fraction (20%) on average of the Chobe National Parks gets burn every year. The most frequently burnt areas are the north-eastern portion of the Park including part of the Nogatshaa medium density tourism zone and the western edge of the Park in the Kwando-Linyanti complex. The rest of the Chobe National Park seems to be well protected by a network of fire breaks. These fire breaks are maintained by the Agriculture Resources Board (ARB), which has now been incorporated in the Department of Forestry and Range Resources (DFRR). The ARB is also responsible for ensuring appropriate measures are taken to protect the veld from fires. The Board is responsible for constructing a network of fire breaks and mobilizing fire suppression teams and providing them with the necessary equipment.

In the Chobe district, there are a number of east-west aligned fire breaks one of which traverses the Chobe National Park, north of Savute parallel to the ancient Ngwezumba channel. In addition to

this fire break, tourist and service roads connecting for example Savute to other management camps in the park serve as fire breaks. In addition to these roads, the DWNP maintains a series of north-south aligned fire breaks from the Ngoma Road to the Chobe River between Kasane and the Ngoma.

There have been a number of studies conducted in Australia, Zimbabwe and elsewhere in Africa, which have demonstrated the impact of different fire regimes on the environment. A key study amongst the many is the one conducted by the Centre for Industrial and Scientific Research Organisation (CSIRO) in the 1980's. This study looked at fire behavior, atmospheric chemistry, nutrient cycling, hydrology, and stream dynamics. In addition, it looked at impacts of different fire burning regimes including:

a. Early annual burning
b. Progressive annual burning regime, whereby fires are lit progressively throughout the dry season as the country dries out;
c. Late burning. This was done to imitate what obtains in most protected areas, even in Botswana and is commonly referred to as uncontrolled burning;
d. No burn

The results from this study confirmed that fires in savannah ecosystem do not have discernible impact even in extreme fire regimes. The results of this study seem to confirm that savannah systems are resilient to fires. The only impacts tend to be confined to riparian vegetation and small mammals with limited home ranges.

The study also found that fire frequency pronounces the discerned impacts as demonstrated by marked contrasts between burnt and unburnt areas. However, the study demonstrated that for optimum plant recruitment and maintenance of biodiversity to be achieved, there is need for portions of the savannah community to be burnt at least once every three to five years.

6.3 FIRE MANAGEMENT STRATEGY

It apparent from the foregoing that fire management should be aimed at *"Providing direction to the management of Chobe National Park on how to use fire as a means of protecting the various vegetation communities in the park, whilst supporting ecologically sound resource management"*.

The adoption of this strategy would premise that:

7. Fire is regarded as a natural phenomenon on the ecological landscape and should therefore not be interfered with. This would be in line with the tenets of the Wildlife and National Parks Act 26, which advocates for minimal interference of natural processes.

8. Fires are an important tool for ecosystem renewal and as such in the event of naturally induced fires, the strategy should be to let nature take its course, whilst ensuring lives, tourist and administrative infrastructure are protected;
9. Prescribed burning can yield positive benefits on the ecological landscape;
10. Adequate resources should be availed towards educating the public on the role and benefits associated with fires on the ecosystem;
11. Riparian vegetation is at greater potential risk and need to be protected.

6.3.1 OBJECTIVES OF THE FIRE MANAGEMENT STRATEGY

The following should be the objectives of the fire management strategy:

viii. Protect park visitors and ensure there is minimal socio-economic disruptions;
ix. Accept the ecological role of fire in the maintenance of ecosystems and critical habitats;
x. Minimise fire damage to Park properties, infrastructure and structures;
xi. Minimise impacts of fire by adopting prescribed burning program in areas adjacent to the Chobe National Park. This could be achieved by working closely with institutions such as the Department of Forestry and Range Resources and also with communities living on the periphery of the park.

6.2.2 PROPOSED ACTIONS

i. For fires within the Chobe National Park, management will undertake appropriate fire response strategy;
ii. For fire that threaten park visitor safety, or park infrastructure will receive full and sustained action until extinguished;
iii. The management of the park will have to develop a fire management plan taking cognizance of the role of fire on the ecological landscape. This will provide for rational use and control of fires;
iv. Prescribed burning is an important tool for managing ecosystems and as a means of minimising hazards associated with uncontrolled fires. This action will need to be adopted.

The Chobe National Park has an extensive network of fire breaks. This merely confirms the fact the fire management objective for the park is *"the initiation of measures to ensure fire damage is confined to a limited area"*. In order to effectively implement this strategy, it is important that in addition to fire breaks, adequate fire suppression equipment including vehicles, water supplies and personnel will have to be provided to enable their deployment whenever the need arises.

Investment in firefighting equipment and personnel is required to initiate an effective fire suppression strategy.

The fire suppression strategy negates the fact that fire has and continues to be used as a management tool throughout Africa. This would therefore suggest that in addition to fire suppression strategy, an attempt should be made to initiate controlled burning strategy. This strategy

could, for example, be used in areas where management feels uncontrolled fires could result in the damage of some unique and special woodland vegetation communities. Another scenario where controlled burning could be used is where management feels that if fires are not controlled, the same would compromise the aesthetic appeal of some landscapes.

7.0 STRATEGY OF MANAGING DISEASE OUTBREAKS

7.1 BACKGROUND

Botswana's tourism is for the most part dependent on wildlife and as a result wildlife is increasingly becoming an important economic, cultural and aesthetic asset that cannot be ignored by all stakeholders. Even veterinary professionals have an interest in the wildlife resource mainly because of the two-way disease transmission between wildlife and domestic animals. In addition, there are zonotic implications of diseases and also wildlife diseases have a potential of impacting on trade.

To deal with inherent risks that wildlife poses to management of disease, the predominant strategy has been to undertake campaigns and schemes designed to eradicate certain infectious diseases. This is especially prevalent amongst domestic animals. It is difficult to manage wildlife diseases in free ranging populations due to technical problems and also because it is ecologically contentious when dealing with indigenous diseases in natural species.

Disease surveillance in wildlife populations is an important undertaking in order to detect presence of infectious and zootic diseases. The adoption of such a strategy is necessary as it allows for the adoption of counter measures. Disease surveillance is particularly relevant today due to increasing human population, which has resulted in increased the probability of contacts between humans and wildlife. This is manifested in increased sporadic epizootic outbreaks characterised by high morbidity and mortality (Morner, T. et al. 2002).

The Chobe National Park covers an area covering approximately 10, 566 square kilometers. The park is surrounded by a number of Wildlife Management Areas (WMA), which are reputed to have the second largest concentration of free ranging elephants in the world. In addition to elephants the parka has a considerable diversity and abundance of wildlife. The park is also a favorite destination for tourists and it is estimated that the park contributes about one and half million dollars to the state coffers.

However, there are fears that increasing and persistent outbreaks of a host of wildlife diseases has a potential of considerably affecting the viability of the Chobe as a tourist destination. The past ten years have witnessed a number of diseases outbreaks in the Chobe National Park and surrounding Wildlife Management Areas (WMA). These diseases include:

iv. Anthrax,

Anthrax is a highly contagious disease for domestic wild animals including human beings. This disease is caused by the bacterium *Bacillus anthraces*. The disease in wild animal population is spread by bloody discharge from nostrils, mouth and anus as well as skin, bones and other tissues.

Observations in the Kruger National Parks and other protected areas in the region also suggest that vultures, scavengers and flies play a role in spreading diseases. Runoff water can also disperse spores to pans or dams and create sources of infection in other areas.

Infection is acquired by drinking contaminated water, grazing on contaminated pasture or by licking contaminated skins bones, blood and carcasses.

The latest outbreak occurred in 2004 resulted in the death more than 265 animals with elephants and buffalo being the species that were heavily affected. It is estimated that 12 elephants and 248 buffalo died from anthrax (Anon. 2004).

v. Tuberculosis

Department of Wildlife and National Parks veterinary officers in 2002 discovered outbreaks of tuberculosis in two families of banded mongoose in the Chobe National Park and also received reports of one outbreak that wiped out a group of meerkats in the Kalahari Desert (Anon 2002).

vi. Rabies

There have been unconfirmed reports also of rabies out breaks amongst wild dogs that is believed to have wiped bands of wild dogs

In response to these disease outbreaks, the Department of Wildlife and National Park's veterinary unit undertook an extensive surveillance program to identify the origin of this outbreak and to initiate measures to contain these disease outbreaks.
During the initial outbreak in the early 1990's, the Department of Wildlife and National Parks drafted a strategy for disease management with specific recommendations on how to manage disease out breaks in Botswana's protected areas.

However, in developing the disease strategy, cognisance will be made of the fact diseases are a natural phenomenon that act as a mechanisms for populations control. The strategy outlined protocols and procedures of dealing with diseased animals including the disposal and handling of carcasses. These protocols were crafted on the basis and inconformity with Botswana's legislation that governs management of diseases in the country.

7.2 STRATEGY:

6. One of the strategies proposed is passive monitoring. This has proved effective in discovering dieses amongst free ranging wildlife. This approach would entail the DWNP officials collecting and submitting wildlife material to diagnostic laboratories in Botswana and outside the country;

7. Undertake a concerted wildlife disease monitoring program by building capability to investigate events of mass mortality and morbidity. In the case the Chobe national Park, the disease that has proved to be more virulent is anthrax;

8. Undertake a sustained passive monitoring program. This should involve routine collection of tissues and sending them for analysis. This approach is effective in discovering various pathogens in association with diseases causing agents;

9. Make an effort to understand the ecological patterns of the wildlife disease under investigation;

10. Introduction of foreign animal diseases or parasites into an ecosystem should be prevented at all costs. However, where translocation are inevitable, this should be done after carefully identifying diseases hazards, risk assessment and risk management.

7.2.1 Actions

8. Collection of blood samples, frozen and preserved tissues and appropriately prepared microbiological samples from randomly selected free ranging wildlife will assist in the ongoing investigations to confirm the presence or absence of disease causing agents;

9. Animals suspected of dying from anthrax should not be cut open;

10. Carcasses of animals suspected to have died from Anthrax should be buried to a depth of at least 3 meters and soils around it should be treated with chloride or lime; Always wear protective clothing when carcasses are buried

11. These carcasses may also be burned in situ without cutting them open;

12. Any carcasses observed in the field should be immediately reported to the DWNP Veterinary Unit or the Department of Animal Health and Production (DAHP) veterinarian;

13. The personnel engaged in the surveillance and disposal of carcasses should avoid direct contact with carcasses suspected of having died of anthrax;

14. The DWNP veterinary Unit to prescribe methods of disinfecting transport and any other equipment used in the control exercise.

8.0 CONSERVATION

8.1. WILDLIFE BIOMASS

The Chobe National Park and surrounding areas are renowned for a large diversity of both flora and fauna. The largest concentration of wildlife biomass is concentrated along and around drainage channels. Based on the 2006 DWNP aerial survey, the population elephants in the Chobe National Park and the surrounding areas ranges between 46,000 and 56,000 individuals (Table 8.1)

Table 8.1: Numbers of Selected Wildlife Species 2003-2007

No.	SPECIES	YEAR				
		2001	**2002**	**2003**	**2004**	**2006**
1	Elephant	33060	32170	31584	30992	36764
2	Zebra	1851	811	2776	1240	2550
3	Warthog	86	192	59	187	217
4	Rhino	-	-	-	-	16
5	Waterbuck	70	55	27	197	200
6	Hippo	93	52	49	50	271
7	Giraffe	732	564	937	1108	713
8	Eland	148	164	186	485	584
9	Kudu	165	156	237	480	366
10	Gemsbok	236	-	55	258	79
11	Roan	237	248	98	21	428
12	Sable	1374	1636	1368	400	606
13	Wildebeest	192	147	-	152	237
14	Impala	1830	1425	854	2093	2537
15	Steenbok	29	73	14	30	62
16	Buffalo	2838	2713	4512	833	6950
17	Ostrich	90	257	414	82	373
18	Lion	73	-	-	-	-
19	Klipspringer	30	-	-	-	-
20	Crocodile	-	182	4	8	26
21	Hyena	15	-	28	-	-
22	Baboon	222	185	-	282	158
23	Lechwe			355	197	-
24	Tsessebe	118	44	77	15	

Apart from the 24 species outlined in table 8. 1 above, the Chobe National park is home to species such as Puku, leopard, cheetah, bat eared fox, black backed jackal, caracal, amongst many others.

The information in table shows that almost 90% of the wildlife biomass in the Chobe is dominated by elephants. It is estimated that during the peak of the dry season when almost all the ephemeral water bodies in the Park have dried up over 55,000 elephants (DWNP 2006 aerial surveys) are in the Chobe National Park and surrounding areas. In the dry season almost all these elephants converge in and around the perennial drainage system of the Chobe River and the Kwando-Linyanti to access water (Fig 8.1). This shows that the movement and distribution of elephants and other wildlife species in the study area is mainly influenced by water availability of water. In the wet season, the elephants are widely distributed throughout their range (Fig. 8.2)

The large elephant population is perceived to be a threat to the woodland vegetation especially along the main drainage systems where closed canopy woodland has been gradually but systematically destroyed by elephants. The closed canopy has been replaced by shrub vegetation and this according to studies conducted during the BONIC project has created favorable habitat for species such impala, Kudu and other browsers. In addition to these species, game birds have also benefitted greatly from changed physiognomic characteristic of the woodland vegetation community.

Therefore contrary to popular belief, increased in elephants numbers have only resulted in the changes in woodland characteristic and not in species composition. It is only in areas where the woodland vegetation has been exposed to a combined assault of uncontrolled late fires and elephants that discernible changes in composition could be observed. This situation would in the event of extended droughts lead to marked changes not only in woodland characteristics but in composition as well.

It is therefore imperative that concerted measures are taken to mitigate the combined impacts of drought, fires and increasing elephant numbers. The 2004 draft Elephant Management Plan outlines in detail a number of strategies and actions that need to be undertaken in the Chobe national park and surrounding areas to protect woodland vegetation to sustain the integrity of the whole ecosystem. In order to mitigate the impacts of elephants on the woodland vegetation community and also promote photographic tourism the provision of artificial watering points is deemed as one of the key strategies especially in parts of the Chobe National Parks that area far away from the Chobe River or the Kwando–Linyanti complex. It is however, important to undertake a detailed baseline inventory prior to commissioning any water points. The baseline data will form the basis of any future monitoring strategy (Mughogho 1995, Vanderwalle 1989). There are about 11 artificial watering points in the Chobe National Park.

The impact of these boreholes in changing the seasonal distribution patterns of wildlife, especially elephants is not fully understood. Concerted observation, however, seem to suggest that the strategy has not fully succeeded in mitigating the numbers of elephants that congregate in and around the

major perennial systems in the dry season. Although no detailed studies have yet been conducted, it appears, the water points have been useful in attracting other species of wildlife to areas where these water points have been established.

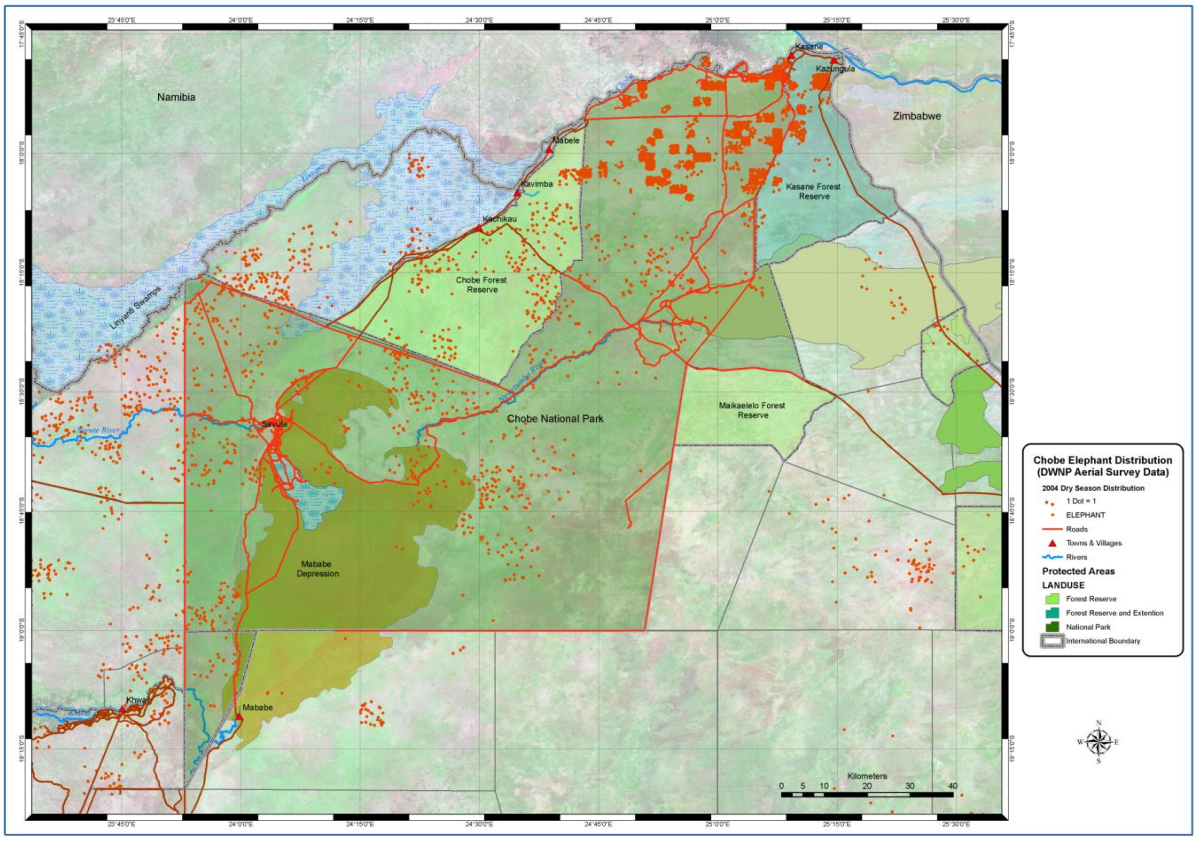

Fig. 8.1: Dry Season Elephant Distribution in Different Land Uses

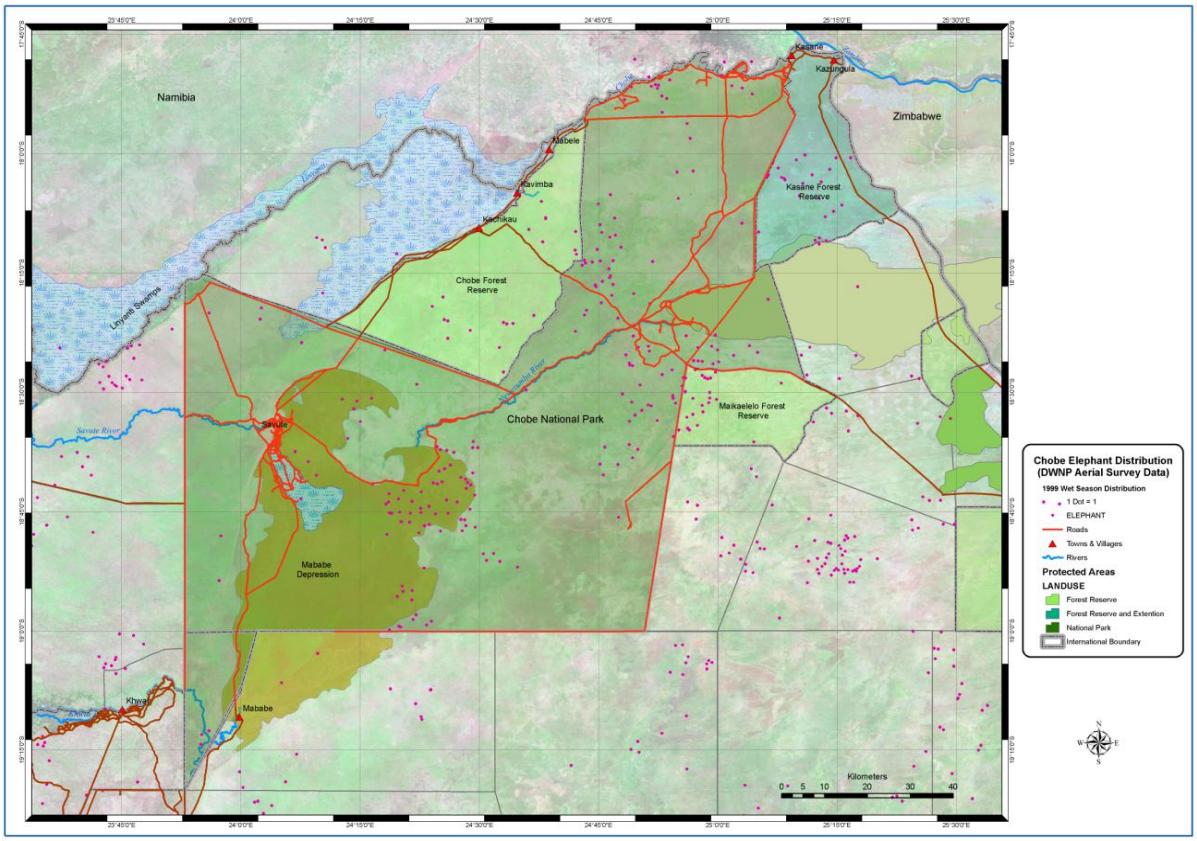

Fig. 8.2: Wet Season Elephant Distribution in Different Land Uses

8.2. WOODLAND VEGETATION

The woodland vegetation is also diverse (Fig. 8.2.1) ranging from closed canopy woodland typical of the Okavango fringing forest dominated by Acacia spp; aspirations of the dry deciduous miombo woodland dominated by *Burkea* and *Pterocarpuis* spp to open savannah grasslands. The type of vegetation, species composition and woodland structure appears to be mainly influenced by soil characteristics, climate, fire and some extent elephant numbers. The assertion that elephants have played a critical role in determining woodland structure and species composition is confirmed by studies conducted during the BONIC project by Makhabu and Mosugelo between 1999 and 2004. The studies by Makhabu and Mosugelo confirmed that increasing elephant numbers have led to a gradual but steady decline in closed canopy mature woodland that dominated most parts of the Chobe district in the 1960's. Increasing human population and changes in settlement patterns have also contributed to changes in woodland vegetation characteristics.

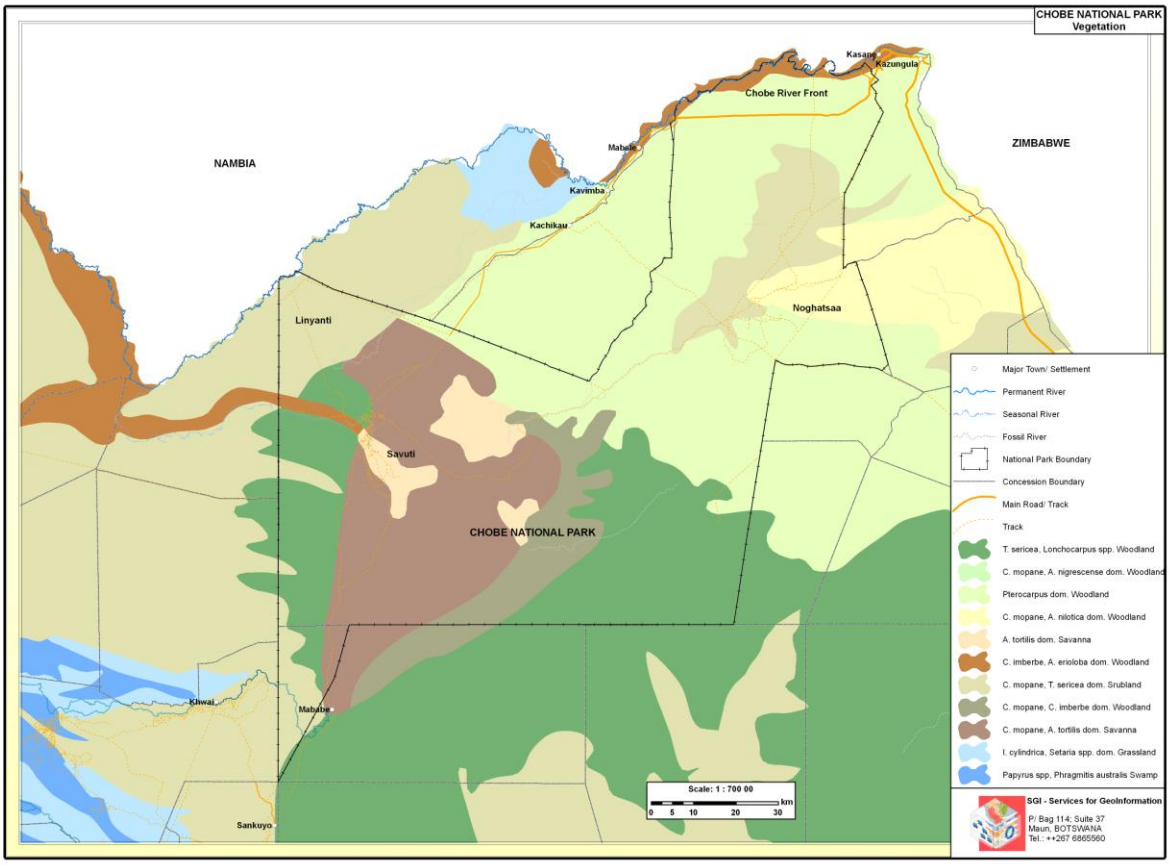

Fig 8.2.1 Vegetation map of the Chobe National Park

Apart from elephants, uncontrolled fires are one of the major threats to the flora and fauna of the Chobe National Park. In order to mitigate the impacts of fire on the woodland vegetation, the DWNP uses a network of firebreaks.

It is therefore recommended that existing fire breaks should be maintained and in addition, pilot prescribed burning should be tried in some of the areas that are frequently burned. This will enable management to determine whether controlled burning is an effective strategy of mitigate fires in the Chobe National Park.

9.0 REVIEW PROVISION OF ARTFICIAL WATERRING POINTS

9.1 BACKGROUND

The provision of artificial water as a management tool is controversial. In Botswana, discussions of on the efficacy of providing artificial watering points to wildlife can be traced to a series of catastrophic events of the 1960's (Child 1972, Bachman 1965). A review of historical records shows that due to shortage of water compounded by inadequate forage due to drought, large numbers of wildlife, especially wildebeest and zebra perished during prolonged droughts of the 1960's.

In Chobe National Park, information from Anon (1991) and Matlhare (1994) suggests that the idea to provide artificial watering points was prompted by concerns that large concentrations of elephant along most of the perennial water systems, especially along the kwando-linyati, and the Chobe Riverfront were having deleterious impact on the woodland vegetation community. It was feared that if this situation is not arrested, massive habitat degradation would occur leading to decline in a number of wildlife species. A decision was therefore made to provide water sources in strategic locations to spread the distribution of elephants over a wider range.

A number of water points were established in savute and the Nogatshaa initially to stem the dry season flow of elephants to perennial drainage systems in the park. It is clear whether the existing water points have succeeded in mitigating the concentration of elephants in and around the Chobe River and the Kwando-Linyanti complex. The use of watering points was extensively examined during the development of the latest (2004) elephant management plan. This plan clearly states that provision as a tool of managing elephant distribution cannot succeed as more artificial would be needed to ensure adequate water is provided.

The existing water points have clear demonstrated that the same is a management strategy that offers an opportunity for enhancing photographic tourism away from the Chobe River front. It is therefore imperative that if tourism is to be extended away from the Chobe River front, additional artificial watering points should be established in the Medium Density Tourism Zones, Low Density Tourism Zones and in Community Use Zones. Therefore, as a tool for enhancing viability of tourism in localized areas, provision of artificial watering points should be encouraged.

However, there have and there continues to be other view points, which argue that the provision of water exacerbates habitat degradation on a wider scale. The practice tends to concentrate wildlife in confined environment resulting in marked change in vegetation in terms of floristic composition and structure. To mitigate the impacts of providing artificial watering points, it is important to put in place a sustained habitat monitoring program. It is therefore important to conduct a detailed and

comprehensive baseline inventory of the various components of the ecosystem before commissioning such water points.

10.0 PARK INTERPRETATION AND EDUCATION SERVICES

10.1 BACKGROUND

National Parks throughout the world, in addition to conserving biological diversity, are places where individuals come for recreational purposes. Park interpretation services offer visitors an opportunity to fully appreciate the conservation values of a park without actually going on a game drive. In this case park interpretation services refer a "*process of providing each visitor find an opportunity to personally with the place"*. It is the management's responsibility to provide such a service and put in place the requisite infrastructure to ensure messages on issues such as heritage and cultural history of the area are easily conveyed. The messages in such facilities should be drawn focusing specifically on features of interest such as:

iv. The role that parks play in conservation and maintenance of biodiversity of indigenous flora and fauna;
v. Exalt the core conservation values of the parks and the role that local communities have and continue to play in the conservation cause;
vi. Presentation of the heritage and cultural history of past and present communities associated with the park as manifested in cultural and archeological artifacts in various parts of the Chobe National Park;

The goal of interpretative services is to increase each visitor's enjoyment and understanding of the Park. Generally, there have been minimal efforts towards developing fully fledged interpretive centers within National Parks and Game Reserves. This is despite the fact that the Environmental Education Unit is well resourced compared to other division within the Department of Wildlife and National Parks. The unit is manned by well trained, enthusiastic and motivated personnel. The unit has the necessary equipment and facilities to enable the development and presentation of first class interpretive materials.

In the past, the Department of Wildlife and National Parks, tried with minimal success to develop natural resources interpretative/education centers with accommodation facilities. These facilities were mainly for use by school groups on education tours. One such facility is the Lechwe centre in the Maun education reserve. This centre was built with financial and material support provided by the Botswana government and Conservation International respectively. The Lechwe centre project was not completed. The structure that was intended to house the interpretive centre is in an advanced state of disrepair and has been vandalized.

In the Chobe National Park, the 2002 management Plan proposed that an education centre with overnight facilities be built at Nogatshaa. This facility has not been built, instead funds that were sourced were used to refurbish and convert the old Ngoma gate staff housing into accommodation units for visiting school groups. In addition, a fire place and a hall that serves as an interpretive centre. The hall has rudimentary static displays comprising of maps, posters and pictures of animals found in Botswana's protected areas. The Ngoma facility does not offer any inspiring interpretative services and therefore does not add to the visitor's enjoyment and understanding of the Chobe National Parks and its role in promoting the conservation cause in Botswana.

10.1.1 STRATEGIC OBJECTIVE

It is therefore recommended that the DWNP management should try to build a modern interpretive and Education centre at the Ngoma gate. In developing such a facility, it is important at the initial that management clearly defines interpretation and education objectives as guided by legislation, mission and vision of the Ministry of Environment, Wildlife and tourism and those of the Department of Wildlife and National Parks.

The envisaged centre should be aimed at:

vii. Increasing visitor awareness and understanding of the values of resources being managed;
viii. Increasing visitor enjoyment;
ix. Informing the visitor/community about purposes and nature of parks;
x. Increasing community support for the organizations programs;
xi. Minimizing visitor impacts.
xii. It is also important to integrate interpretation and education with other communication programs.

In order to achieve the tenets of the above objectives, a modern fully fledged interpretive and education facility with the requisite equipment and presentation material should be built at Ngoma. The centre to be developed will provide educational opportunities for school groups. The centre will have static presentations on various themes particularly relevant to the Chobe National Park.

10.1.2 Actions

In order to achieve the above objectives, the following are the recommended actions;

xii. Prepare a comprehensive interpretive and education program for the Chobe national parks;
xiii. Prepare brochures and fact sheets and maps of the Chobe national park
xiv. Distribute fact sheets and maps to all entry gates and pins some of the information on the bulletin boards provided;
xv. In acknowledgement that funds to develop and print brochures and information sheets are limited, it is recommended that funding proposals be developed and submitted to potential donors; the bulk of these funds should be for construction of a fully fledged

interpretative and education centre to replace the aging and archaic facilities at the old Ngoma gate,

xvi. Design and construct a nature trail near the proposed education centre;

xvii. Provide information broadly outlining location data, history of the establishment, including milestones in the development of the Chobe National Park; In addition any other information such physical features, climate vegetation, communities etc will also need to be presented.

xviii. Faunal information particularly detailing species found in the park, population trends and distribution patterns of the key species such as lions, leopards, elephants, buffalo, rhinocerous, roan and sable antelopes to mention just a few.

xix. Information on cultural heritage such as location and details of important archeological sites is also interesting to visitors to education and interpretative centre. This information is especially interesting when presented with contemporary human history and culture.

xx. It is also important that such an interpretive centre reserve space for presentation of any scientific, research, conservation and management issues to aid in the clear understanding of the dynamics of the Chobe National park.

xxi. The DWNP education Unit will need to organize interpretative walks, talks, slide shows, especially during the school holidays. The objective of interpretive walks is to encourage personal presentations, which is in most cases more fulfilling to the visitor that the use of video or any other automated equipment.

xxii. The centre will need to have a substantial stock of the Chobe National park general information sheet showing all the road network and details of facilities available and what to see and where;

xxiii. The DWNP education Unit will need to organize interpretative walks, talks, slide shows, especially during the school holidays. The objective of interpretive walks is to encourage personal presentations, which is in most cases more fulfilling to the visitor that the use of video or any other automated equipment.

xxiv. The centre will need to have a substantial stock of the Chobe National park general information sheet showing all the road network and details of facilities available and what to see and where;

To ensure that the information on display is relevant to prevailing circumstances, management will need to undertake consistent periodic review and evaluation of the message on offer. This is necessary in order for the static information to be updated.

11.0 DEVELOPMENT OF ANTIPOACHING STRATEGIES AND ACTION PLANS

11.1 SITUATION ANALYSIS

Lawenforcement is critical to sustenance of natural resources (flora and fauna) in protected areas. In Botswana there are a variety of strategies that are used to combat illegal harvesting and trafficking of wildlife resources. These strategies include, foot patrols, intelligence gathering, setting up search and seizure operations through road blocks. Lawneforcement is one of the strategies used to conserve and preserving wildlife resources in Botswana's protected areas. The DWNP has four dedicated antipoaching teams based at Mathathane, Lone Tree, Maun and Kasane. The Kasane Antipoaching Unit (APU) team comprises of twenty two (22) men including the detachment Commander and his assistant. This unit has a fleet of vehicles, boats and guns. This team is supported by a team of intelligence operatives based in Francistown, whose operational base extends to Kasane including the Chobe National Park.

In addition to the DWNP, the Botswana Defence Force (BDF) also has an antipoaching unit that assists the Department of Wildlife and National Parks. The BDF has a number of satellite operational bases scattered in various places within the Chobe National Park. The Botswana Defence Force officers' main responsibility is to assist the DWNP in curbing cross boarder poaching activities. The number of BDF personnel and other resources directed at antipoaching operations are not known as the same is not in the public domain.

In addition to the APU and BDF personnel, there is permanent road barrier at Ngwatshaa, on the Kasane –Francistown road. This barrier plays a deterrent role on poaching and trafficking of wildlife products from the Chobe National Park. In addition to this barrier, the DWNP does from time to time, especially during long holidays set up check points at strategic locations and along main roads in the district, where passersby are randomly checked for contraband.

Chobe National Park is the pilot site for Monitoring Illegal Killing of Elephants (MIKE) program in Botswana. Therefore in line with the tenets of the MIKE program, a dedicated and fully equipped antipoaching unit is stationed in Kasane which does from time to time receive aerials support from the Department of Wildlife and National parks Aviation Unit and the Botswana Defence Force air wing. The consultants are aware that the Chobe National Park is one of the sites piloting the Monitoring of the Illegal Killing of Elephants (MIKE) in Botswana. In line with the MIKE expectations, the Antipoaching Unit is obliged to collect requisite standard data sets that would allow the an assessment of its effectiveness in curbing poaching in the park.

Unfortunately during the field surveys, there was no data that could be used to measure antipoaching effort, determine the spatial coverage of antipoaching effort. It was also difficult ot

establish how many illegal activities apart from elephant carcasses were detected during patrols and what action was taken by the antipoaching teams.

However, it was possible to get some information on the following aspects that give an indication of the extent of poaching and amount of effort in man days spent on antipoaching operations. It is suffices to state that this effort does not include the effort by the Botswana Defence Forces, men and time spent manning check points and the barrier at Ngwatshaa. Therefore figures presented are conservative.

h. Personnel;

The Kasane antipoaching detachment has 20 personnel who are directly involved in antipoaching patrols. On average, each of these individuals spends an average of 15 days in a month on field patrols.

i. Coverage;

It is important to get information on the geographical distribution of antipoaching patrols including antipoaching infrastructure (camps, check points etc) and location of intelligence sources. This information is not available;

j. *Time*;

This variable is defined by the number of days that patrol teams are active in the field, check points are manned or period over which intelligence is actively sought. This is usually measured in patrol days/man days.

Another variable that the consultants will attempt to factor in to measure effectiveness is the amount of resources allocated to antipoaching effort. The information required in order to effectively assess antipoaching activities include:

k. Financial expenditure

This comprises patrols costs: included in this component are vehicle running costs, salaries, uniforms, camp equipment, food, allowances)

l. Patrol effort

This is calculated from number of patrol days/hour and number of scouts. This suggests that antipoaching unit on average spends a total of 300 man days in the field conducting patrols. The Chobe National Parks is 10, number of individuals actually deployed in antipoaching operations in the field; number of individuals manning barriers and personnel providing intelligence;

m. Animals illegally killed

On the basis of the Department of Wildlife and national Parks submission, the level of illegal killing of wildlife in the Chobe especially elephants is increasing (Table 11.1). This level of poaching is on the increase probably due to increasing human population and political instability in neighbouring states. The fact that "hot spots" (Fig. 11.1) are close to international boundaries seems to confirm this assertion.

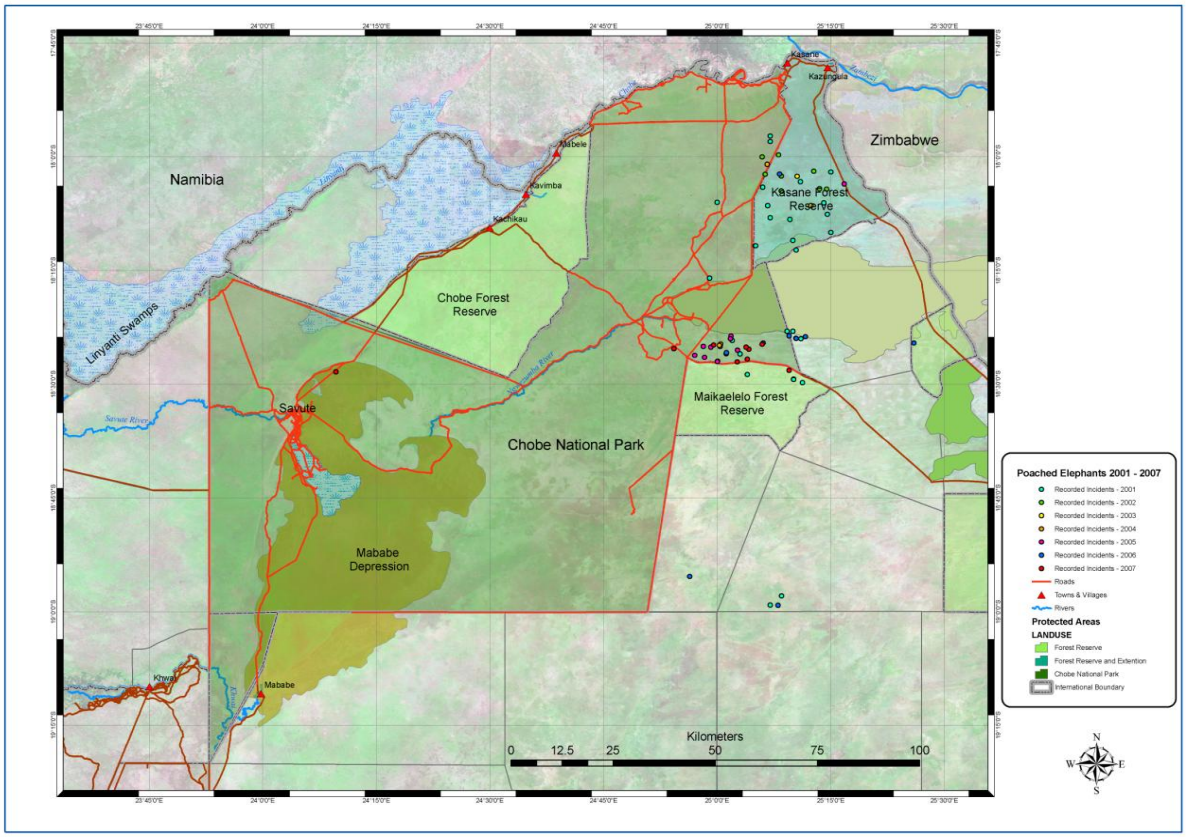

Fig.11.1: Areas Where Wildlife Mortalities Were Recorded

Table 11.1: Illegal Activities Observed in the Chobe National Park (DWNP 2008)

	YEAR					
SPECIES	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Elephants	3	5	10	13	18	
Kudu	0	0	0	1	1	
Buffalo	1	0	1	0	1	
Warthog	2	1	0	0	0	
Giraffe	1	0	1	0	0	
Eland	1	0	2	0	0	
Chobe bushbuck	0	0	0	0	0	
Zebra	0	1	0	0	0	
Impala	1	3	2	2	0	

Duiker	0	0	0	0	0	
Steenbok	0	1	1	0	1	
Waterbuck	0	0	0	4	0	
Sitatunga	0	0	0	0	0	
Sable	0	1	0	0	0	
Ostrich	0	0	2	0	0	
Lion	0	0	0	0	0	
Gemsbok	0	0	0	0	0	
Wildcat	0	0	0	0	0	
Grey parrot	54	0	0	0	0	
Genet	0	0	3	0	0	
Pangolin	0	0	0	0	0	
Porcupine	1	0	0	0	0	
Civet	0	0	3	0	0	
Crocodile	1	0	0	0	0	
Tsessebe	0	0	0	0	2	
TOTAL	65	12	25	20	23	

The data available from the Anti poaching unit is inadequate for an effective evaluation of the effectiveness of antipoaching effort, which usually involves the calculation of Catch per Effort Analysis (Bell 1981, Munthali and Mkanda, 1998) to be undertaken. The catch per unit effort gives an index of encounter rates of illegal activity per unit of law enforcement effort per effort by area and time as expressed in man days.

In order to calculate this index the following formulae is used:

Ç/E =K I

Where C = the "catch", which in this case is the number of encounters with illegal activity per unit area per unit time;

E = the "effort", which in this case refers index of patrol, effort per unit time;

K = capture constant, which defines the relationship between catch per unit effort and the quantity of illegal activity per unit area per unit time;

L = the quantity of illegal activity per unit area per unit time.

11.2 Strategy

Improve reporting procedures to enable effective evaluation and assessment of antipoaching operations. The detachment commander should always compile detailed monthly antipoaching reports detailing the following:

i. The number of patrols conducted
ii. Number of people involved in these patrols

iii. Record of all poaching activities observed and location of such illegal activities,
iv. Record of the number of arrests made,
v. Area patrolled
vi. Number and Geographical position of where carcasses of wild animals observed.

This information is required in order to identify "Hotspots"; that is areas where poaching activities are intense.

11.3 Strategy:

Increase personnel involved in antipoaching patrols in Chobe National Park. The Chobe National park is 10,569 square kilometers and the number of antipoaching personnel for this huge park only 20. This translates to 1 game scout per 528 square kilometers. This figure is far much below what is ideal, which is 1 game scout per 50 square kilometer (Bell 1981). It is acknowledged that a number of government agencies such as the intelligence services, the Botswana defence Forces, and DWNP personnel from other divisions are involved in antipoaching activities. The Chobe National park is huge; there are a lot of gaps that needs to be plugged and this can only be done by recruiting and opening up temporary launching bases in strategic locations within the Park, where such teams can easily be accessed and provided with aerial support and other services required to carry out effective antipoaching operations.

It is therefore recommended that additional staff be provided to enable effective patrol coverage.

12.0 RESEARCH

12.1 BACKGROUND

The ecology of the Chobe National Park has and continues to undergo extensive changes. On the basis of information from early explorers such as Selous in Campbell (1987), Moroka 1984, Sommerlatte 1976 suggests that towards the end of the 17th century due to abundance and concentration of large mammals, woodland vegetation around and along the major perennial drainage systems was completely destroyed. Towards the beginning of the 18th century ivory hunters decimated most of the large mammal, especially elephants for their ivory. This was followed at the beginning of the 20th century with an outbreak of rinderpest that killed most of the other large mammals. As a result the woodland vegetation in most parts of northern Botswana recovered markedly. This saw the proliferation of closed woodland vegetation communities especially along the major drainage systems.

However, by the 1940's the population of elephants and other large mammals had sufficiently recovered and slowly started destroying some of the woodland vegetation communities. By the

1990's the population of elephants had risen to almost 50,000. At this time more and more dead trees were being encountered throughout the elephants range. This raised concerns amongst conservationists and other stakeholders in the conservation cause that the growing elephants population if not checked was going to destabilize the Chobe ecosystem. The failure of elephants to range into countries such as Angola forced elephants to range within northern Botswana with limited excursions into Zimbabwe further exacerbated the impact on the woodland vegetation in the Chobe National Park.

In responses to these concerns the Department of Wildlife and National Park, in 1991 organized a workshop to discuss the elephant problem. The outcome of this workshop was the 1991 Elephant Management Plan. The plan highlighted a number of issues and actions that needed to be undertaken to deal with the elephant problem and safeguard biodiversity in the northern Botswana ecosystem. Amongst the many recommendations suggested was population reduction through culling, increased hunting quotas and other means.

In addition, to population management strategies, the plan outlined a number of priority research studies. Amongst these was the study of elephant population dynamics, habitat preference, seasonal distribution, movement patterns and assessment of the effect of interactions between elephant and their habitats. There have been a number of studies in the Chobe National Park, but none of the population control measures proposed have ever been implemented as a result the elephant population continued rising. It is estimated that by 2007, the population of elephants had risen to almost 170,000 (Anon. 2006). This increased elephants population is threatening the sustainability of the environment and other species.

In order to assess the impact of elephants on the Chobe National Park ecosystem, research studies have been going on in the Chobe National Park and surrounding areas since the 1960's (Child 1960, Sommerlatte 1978, Moroka 1984) and others. In 2004 a comprehensive integrated corroborative research project spearheaded by the governments of Botswana and the Kingdom of Norway was undertaken to fully address and assess the impact of elephants on the woodland vegetation and on other species in the Chobe National Park. This project was known by its acronym, BONIC. The BONIC project was designed to develop competency amongst Batswana to enable them detect, monitor and manage the increasing effects of elephant population on the ecosystem within Chobe National Park. The basis of the study was the understanding that the Chobe ecosystem has undergone profound changes over the past 100 years due to effects of the ivory trade, outbreak of rinderpest and lately unprecedented growth in elephant numbers.

In order to unravel the impacts of elephants on the vegetation and various interactions in the ecosystem, the project adopted holistic approach in recognition of the complex interactions of various facets and issues at play in an ecosystem. Studies undertaken ranged from issues such as soil and nutrient cycling, vegetation dynamics, interaction between large herbivores and vegetation,

abundance and distribution of gallinaceous birds, including aspects of ecology of impala, buffalo, lions and other species in the area.

In addition to BONIC, there have been several studies conducted by DWNP personnel and private researchers. A brief review of these studies are outlined in the draft *Strategic Plan for Wildlife Research in Botswana 2004;* This document was prepared by the Research Division, reviewed studies that have been conducted in Botswana's conservation areas including Chobe National Park.
It is clear from the foregoing that increasing elephant numbers are the main driver of the ecosystem in Chobe National Park and the surround areas and that there is a rich research database that can be used to effectively manage the resources in the park.

The DWNP recognizes the important role that research plays in the effective management and conservation of biodiversity, biophysical process and landscapes. Therefore to ensure resources are sustained, an adaptive management strategy is recommended.

The adoption of the adaptive management principle is based on the following:

iv. The need to have a comprehensive data base of flora and fauna;
v. The need to set measurable objectives and goals;
vi. Setting in place effective monitoring systems;

On the basis of these principles, the following are the priority areas of research:

12.2 MONITORING

The goal of monitoring is to "*Undertake baseline inventory of wildlife populations, their habitats and changes therein*. In the case of the Chobe national park, it is recommended that monitoring efforts should focus on the following aspects:

12.2.1 Baseline Inventory

Compile inventories of ecosystems including plant and animal communities to establish baseline in terms of distribution, abundance and Monitor ecosystems natural processes and wildlife populations

12.2.2 Population Dynamics

It should be recognized that information on sex and age composition together with information on changes in population abundance reflects the overall status of a specific wildlife population in relation to its environment. It is therefore important that a species specific population structure, sex and age composition monitoring program be initiated. This should include movement patterns. These studies should concentrate of the following species; elephants, buffalo, lion, leopard, sable, roan, crocodile.

12.2.3 Human –Wildlife Interactions

Human-wildlife issues are critical to the management and continued support of conservation initiatives by communities living adjacent to conservation areas. It is therefore important to monitor and map incidents of conflicts between wildlife and humans or their activities such as crop and livestock farming in order to identify 'hotspots'. This information is vital for effective deployment of mitigation measures;

12.2.4 Recommended Monitoring Projects:

ix. Conduct aerial surveys to monitor trends in abundance and distribution of the various key species;

x. Conduct species–specific surveys including ground surveys to collect detailed population dynamics data;

xi. Record all human–wildlife conflicts by species and location

xii. Undertake radio telemetry studies to monitor movement patterns, home range and habitat preference for key species.

xiii. Undertake studies of factors affecting wildlife and their habitats; it is recommended that such studies concentrate on monitoring the effect of fences and fire. In the case of fences, there have been so many studies on the impact of fences on wildlife. It is therefore recommended that fencing studies should focus on identifying areas in the wildlife range that would be sensitive to fencing. This information is required in order to draw a proper district fencing plan. This in recognition of the need to make provision for migration routes where fencing should be avoided.

xiv. The effect of fire on the vegetation community has been extensively studied in Botswana and elsewhere. It is therefore recommended that emphasis be placed on monitoring the effect of uncontrolled fires on different vegetation communities in the Chobe National Park.

   a. To do this a number of fixed point photo stations should be established in the various vegetation communities in the park to monitor the long-term effects of fires in different habitats within the Chobe National Park;

   b. In addition to photo stations, the use of remote sensing is recommended as a viable and effective tool of monitoring and trending impacts of various management strategies and ecological interactions especially between fire and vegetation;

   c. Remote sensing could be used to monitor changes in vegetation around artificial watering points.

xv. Undertake studies to assess the impact of various management activities; in this category are studies monitoring the effect of the provision of artificial watering points in the various zones within the Chobe National Park. There have been several studies assessing the

impact of providing water to wildlife in Botswana. Therefore the effects and impact of providing artificial watering points are well known. In order to mitigate these effects, it is important to undertake a rigorous monitoring program of these areas around artificial

xvi. Ornithological studies.

Hermann's (1996), Birdlife Botswana and the DWNP research office in Maun have collected detailed inventory of birds in Botswana. Information that is available include: species composition; numbers; habitat preference, feeding habits, breeding success etc. Adequate baseline data on birds including waterfowls is available in Botswana.

The emphasis' now should be on monitoring studies to assess how various land use activities such as lodges, fire, changes in the flood regime, the impact of elephant and the resultant changes in the physiognomic characteristics of the woodland vegetation affect the diversity, breeding regime and movement patterns of various bird species in the delta.

12.3 APPLIED RESEARCH

12.3.1 Ecosystem function

The Chobe National Park is one of the largest protected areas in Botswana within which many ecosystem processes may be operating relatively independently from direct human intervention. However, very little is known about the factors driving the system, and the relationships between different components. Studies need to be conducted to fully understand the functions and interactions of the various components in this system. The following are the recommended studies:

i. *Migration, Population Dynamics and Effects on Habitat of Elephants.*

Elephant the internal movement patterns of elephants have been adequately studied in northern Botswana. What are outstanding here are the Transboundary movements between Zimbabwe, Namibia and perhaps also Angola and Zambia. More needs to be known in this regard especially regarding the numbers of animals moving and whether these are emigration, immigration or part of seasonal movements within a range. Population trends are well known and monitored through aerial surveys and some demographic data is available.

However, more research into age & sex demography is required to assess birth rates, age specific survival rates, mortalities and so on. If active management of the population should take place, this opportunity should be used to collect data from female carcasses to establish accurate assessment of such demographic data.

ii. *A Study of the Effects Of Translocation On Problem Predators.*

iii. *Investigate The Extent, And Methods Of Non-Lethal Control, Of Problem Animals.*
This is a major management concern in wildlife and communities, extending to parliament level. Wildlife is moving into human settlement areas and visa versa. The DWNP is for the most part restricted to lethal control of problem animals. It is therefore important that research be focused on identifying alternative methods. In addition, studies should be conducted to determine and assess why human-wildlife conflicts are increasing;

iv. *Investigate The Effects of Tourist Activities In High-Density Areas On Animals And The Environment***.**
Botswana is progressively becoming a more popular tourist destination. Despite the high income – low volume policy, there are areas where high numbers of tourists appear to have a major influence on wildlife behaviour, movements and on the environment.

There has been a review recently on the number of bed nights from 16 to 24 , it is therefore important that studies are conducted to assess the impact of these lodges on the ecosystems.

v. *Fire Effects on Range Condition.*
Fires should be monitored as has been suggested under the Monitoring section above. However, research into the specific plant communities of concern need to be undertaken. In Chobe there is need for experimental research on the *Baikiaea plurijuga* and *Ptreocarpus* spp woodlands.

Fires also affect the biodiversity of small animals and research in this area is also needed.

vi. *Specific Ecosystem Studies.*
As previously mentioned, this is a very broad category and mentions possible examples. We feel that specific subsections need to be included here highlighting the ecosystems of concern. For example, hydromorphic grassland ecosystems (Savute, Nogatshaa) because they are limited in extent, are nutritious and important grazing areas for herbivores.

vii. *Miscellaneous Species-Specific Studies.*
This study need to focus, which aerials survey data seems to suggest have been declining, these include: zebra, wildebeest, wild dog, puku, lechwe, Sharpe's grysbok and then other species that are generally rare such as aardvark, aardwolf, pangolin, and so on. The list should be prioritized.

13.0 ENHANCEMENT OF COMMUNITY BENEFITS

13.1. BACKGROUND

Tourism has been identified by the Botswana government as the engine of economic growth that would sustainably bring financial benefits to the country. It emerged during the consultative process that ion general members of the community feel there is need to increase benefits from the resources in Chobe National Park. The members feel that at the moment they are benefiting little from the Chobe National Park serve for the three Community Based Organisation initiatives taking place in the Chobe enclave villages, Pandamatenga and around Lesoma. It also came up during discussion that the community would like to see more community Use Zones established in the Chobe National Park with lodge and public camping sites reserved exclusively for indigenous Batswana, who, it appears are currently not really directly benefiting from tourism in the Chobe National Park. The community acknowledges that some of them have benefited through employment in lodges but feel they could benefit more if they run some businesses in the tourism industry

Interactions with various stakeholders and writings in newspapers and other sources seem to suggest that there is a perception that non-citizen companies and individuals or a few citizens dominate the tourism industry in Botswana. The majority of indigenous citizens play a peripheral role, mainly as workers. It is clear from meetings and discussions with the various stakeholders especially politicians and community leaders that if tourism is to be sustained in the Chobe, there are need for the tourism resource base to be conserved with sustained engagement and direct involvement of indigenous communities on the periphery of the protected areas. These are the people who suffer most of the brunt of the human-wildlife conflicts and derive minimal economic benefits

Events elsewhere have shown that such a situation is not sustainable in the long-term. It is therefore imperative that indigenous Batswana are given an opportunity to invest and derive both utilitarian and financial benefits offered by the country's natural resources. Measures should be put in place that would allow and encourage citizens to fully participate and benefit from the industry.

13.2 The strategic goal: Enhance Community and Indigenous Batswana benefits from Tourism

13.2.1. Actions

The following are some of the actions that should adopted in order to enhance community benefits from tourism:

vi. *Ownership*,

The consultants would take stock of ownership of assets in the tourism economy. Issues that would inform ownership include land, capital and assets etc;

vii. *Increasing strategic representation of citizens in the tourism economy*

There is need to change existing tourism licensing procedures. It is suggested that some activities such as provision of guiding and operation for game viewing services should be reserved for citizens and that establishments that offer accommodation should not also be engaged in offering game viewing services. This will enable more citizen companies and individuals to be engaged as service providers.

viii. Employment equity for citizens in the tourism economy in the Chobe;

ix. *Skill enhancement.*

An examination would be made of strategies that Tourism Operators have put in place to ensure management skills are passed on to citizens. Companies lacking in skills transfer would be encouraged to implement a skills transfer strategy;

x. Promote Establishment of Citizen owned Business in the Park

One of the mechanisms for enhancing local communities and indigenous entrepreneurs' participation in tourism related ventures in the Park is creation of community use zones. There is provision in the Wildlife and National Parks Regulations of 2000, for Community User Zones (CUZ) inside the park. It is therefore proposed that community use zones be increased to enable communities in the Chobe enclave and Lesoma areas benefit from Chobe National Park.

In addition to allowing the establishment of tourism related activities in CUZ, there should be a deliberate policy of according preference to communities and citizen entrepreneurs through selection procedures and concerted enterprise development by providing appropriate support to citizen owned businesses;

xi. *Existing businesses to spend on corporate social development focussing specifically on tourism and tourism related businesses.*

It is apparent that development of citizen and community based tourism enterprises are stifled by lack of access to capital and skills. Therefore it is important that established companies as part of their corporate social responsibility should be encouraged to develop support mechanisms to infuse capacity amongst the local community to develop entrepreneurial skills and access financial resources that would allow their ventures to succeed;

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APPENDIX II: MINUTES OF STAKEHOLDER MEETINGS

1.0 VIEWS OF THE PRIVATE SECTOR

1.1 APPROVAL AND IMPLEMENTATION OF THE PLAN

'The success of a management plan is in the extent in which it is effectively implemented. Consultations and the production of management plans alone without the implementation of the resultant plan is not only a waste of time, effort and energy, but also a waste of resources for both stakeholders and consultants alike' (Private Tourism sector, 2008).

The private sector expressed their frustrations about what they referred to as 'too much consultation but no action' regarding the Chobe National Park. They said they have been contributing to the development of the pervious plans which have never been approved and let alone that, only small parts of the draft plans have been implemented. They feel that ideas they have input into the pervious plans have gone to waste. They said the lack of implementation of recommendations and action items in previous plans as a serious demoralizing factor. They said that many members of the private sector do not honor consultative meetings anymore, such as this meeting, as a result of that.

1.2 NAMIBIAN GOVERNMENT AND COMMUNITIES

The northern boundary of the CNP runs along the Botswana/Namibia-Caprivi Strip border. For the management plan to be implemented affectively, the Botswana Government must therefore, solicit a buy-in from the Namibians such that there is harmonized use and regulation of use of the CNP goods and services by both countries. The restrictions and regulatory measures recommended by CNP plans should apply to all users but not only on the Botswana side as is the case currently. It is of no use and to a larger extent a source of conflict between the two nations of this state is not achieved soon. Some Namibian community members boat into Kasane for shopping purposes and to visit friends using the Chobe River, while some fish the Namibian flood plains of the Chobe River.

It was reported that currently both sides are doing a good job trying not to step on each other's toes. There is a mutual understanding reached by communities and law enforcement agencies in both countries and that is purely based on trust and respect, which probably emanated from the Sedudu case.

1.3 REGARDING THE RIVER FRONT MANAGEMENT PLAN

1.3.1. Vehicles

The main concern was that there is an uncontrolled use of vehicles within the CNP. There is no control over the number, sizes or types of vehicles using the park. Recommendations made were as follows:

1. Allocation of vehicle quotas to camps and lodges based in Kasane. No quotas were suggested and it was decided that the matter rather be left to the DWNP.
2. Mobile safari companies will not have a quota for the river front, but will be allowed to utilize other parts of the CNP. If they want to use the river front then they must utilize the vehicle quotas given to companies they are lodging with in Kasane.
3. Government should control self driven tourists by limiting the number of vehicles permitted per day. Such tourists will enter the park on a first come first entry basis and once the number is reached no more vehicles will be allowed. Should any of the vehicles that went in the first round can come out in time; the same number of vehicles will be allowed to enter.
4. No use of overland trucks to take guests into the CNP. Only supply trucks can be allowed to enter the CNP.
5. Supply trucks should only use supply routes.
6. Speed limit must be enforced. DWNP must seek the help of the Botswana Police to set speed checking points in the CNP from time to time.

1.3.2. Entry Gates

The Sedudu and the Ngoma gates are OK. The new gate proposed to be constructed at Nantanga should be constructed soon. It was reported that some tourists and local communities on transit turn to use the Nantanga road to access the river front, hence overcrowding it in the process.

1.3.3. Roads

There are a lot of illegal roads created mainly during the raining season by people avoiding pools of water on the roads. Illegal roads also results during the maintenance of roads during which alternative roads are created while the main road is under maintenance. Other illegal roads are created deliberately by tourists and locals alike in their quest to get closer to wildlife or avoiding sandy patches.

It was suggested that the DWNP should print large size maps that clearly shows legal roads and tracks and distribute them to all the safari companies, particularly those based in Kasane. Mobile safari companies and self drive tourists can be provided with small maps showing the same to guide them through the park. One such a distribution is made Tour operators found driving outside legal roads and tracks must be fined.

The group felt that all the roads categories as recommended in the 2002 management plan are OK. They also said that developments recommended by the plan for those roads should be implemented. Notwithstanding that the following developments were recommended by the private sector.

1. The river banks roads must be maintained actively to ensure that they do not get degraded and easily eroded during the rainy season. These roads are however needed for optimal game viewing along the Chobe River and as such cannot be closed. Maintenance should be in the form of gravelling and not necessarily grading. Grading has been reported to have negative impacts on the roads in that it lowers the level of the road in comparison to the surrounding environment. This then in turn creates a canal that collects water from the surrounding area causing pooling. Instead of grading pooling areas gravel must be brought in to raise the area slightly above the surrounding ground so that surface run off be away from roads.
2. All the roads in the park must have side drainage in sections that are likely to pool. This will help to keep the roads fairly dry and hence reduce erosion. Soil erosion usually results mainly from self drainage of pooled areas.

1.3.4. Boats

Various issues were discussed regarding the use of motorized boats and they include the following:

1.3.4.1. Permits

All boats entering the Chobe National Park must have permits from the DWNP. Boat cruises must be restricted to the main deep channels to avoid accidents such as elephants overturning boats. Boats moving away from the main channel should be penalized.

1.3.4.2. Engine types

The 2002 management plan recommends that all two stroke engines be replaced by four stroke engines. This recommendation was reiterated during the meeting on the following basis:

1. Two stroke engines are too noisy as compared to four stroke engines
2. Two stroke engines are environmentally unfriendly since they leak fuel (polluting the environment) more than four strokes engines
3. Two stroke engines consume more fuel compared than four stroke engines making them economically unviable.
4. The private sector called for the experimentation of electric motors which are said to be in use in the United States, and other countries. Large size electric motors are being experimented in the U.S. and if successful they will be very appropriate for the Chobe River.

1.3.4.3. Boat sizes

Restrictions on boat sizes were written into the 2002 plan. The same plan encouraged the use of bigger boats so as to reduce the number of boats cruising on the river at a given time. This recommendation was sustained. The plan also makes mention of a DWNP/private sector agreement

on boat sizes which was not annexed. The gathering asked for a copy of the agreement and requested that it be referenced under this review.

1.3.4.4. Boat Speed Limits

The previous management plan recommended two speed limits for two zones. The two speed limits (8km/hr and 15km/hr) recommended by the management plan were sustained.

1.3.4.5. Exemption

Armed forces (Botswana Police, BDF, DWNP, etc) responsible for maintaining law and order should not be subjected to above restrictions, but only when they are pursuing a law enforcement mission.

1.4. ZONING

Zoning as proposed in the 2002 management plan is Ok except for no boating recommendation for Puku Flats. Participants recommended reopening of the Puku Flats for boating, arguing that this move will help ease the pressure on the current boating zone.

1.4.1. Water points and Hides

Participants felt that the two recommended hides are Ok but add two hides at Kolwezi, by the current stretch point and by the stretch point at the junction between Sedudu gate and Kolwezi.

1.5. TOURIST ACTIVITIES

1.5.1. Walking

Ban walking in the CNP altogether. However, walking could be offered in adjacent forest reserves.

1.5.2. Night activities

Ban all night activities (game drives and boat cruises

1.5.3. Game flights

The minimum height of 1000ft is too low. It should be increased to 2000ft.

1.5.4. Fishing

Ban all fishing in the CNP

1.6 STAFF DEVELOPMENT

The Sedudu Jetty and the Nantanga Gate are the two areas that require additional staff. Currently there are two to three officers running the Sedudu Jetty. There are no staff accommodation facilities

at the jetty. These officers commute daily from the Sedudu gate. The BDF camp located south west of the jetty are expected to keep an eye on the river at night.

The DWNP has already proposed developments at the recommended Nantanga gate. The private sector's recommendations towards the development of this gate are:

1. No staff housing. Staff should commute from the Sedudu gate, following the same arrangement as for the Sedudu jetty.
2. Construct a temporary office, preferably prefab, with bathroom facilities.
3. Construct a gate from gum poles only, thatching is not necessary.
4. No payments should be received at this gate. All payments will be made at the Sedudu gate.
5. Staff positions should include at least 1 senior officer, 1 senior game scout, 2 game scouts and 1 cleaner.

1.7 RESEARCH

A number of research project are already underway mainly by the DWNP. The following research activities were mentioned:

1. Larger carnivore distribution
2. Puku and Bushbuck project
3. Vegetation monitoring
4. Disease control project-Anthrax
5. Birds monitoring
6. Fish monitoring-disease survey and stock assessment

The main concern was that the findings of research undertaken in the CNP is not shared and with the private sector. The DWNP keeps information within and fails to organize information sharing and distribution networks and forums/platforms. The private sector recommended that the Research division must create research information sharing forum, help regularly after a certain period of time. The main purpose of the forum should be to inform the private sector and solicit information and/or material support.

The other problem surrounding research in the CNP identified by the private sector is that the DWNP focus studies on species survey and neglect studies on ecological processes, economic issues as well as social aspects.

It was recommended that future research be centered on wildlife counts, boreholes and artificial watering points, impacts of tourism activities (game drives and boat cruises) on the environment.

1.8 VIEWS ON THE CNP MANAGEMENT PLAN

1.8.1 Wild Fire Management

No fire breaks should be allowed inside the CNP. The 2002 management plan recommended boundary cutline to serve also as a fire break. It suggested that two strips 30mk wide separated by 100m bush strip be cleared to mark the park boundary. These recommendations were sustained. Roads and other natural features such as rivers will serve as internal fire breaks. However, it was acknowledged that strong Northeasterly winds do blow fires across large fire breaks such as the Nata/Kasane tarred road.

1.8.2 Problem Animal Control

All the recommendations in the 2002 management plan were sustained. It was however felt that the DWNP should be encouraged to issue out quotas for communal areas adjacent the CNP. Elephants were the targeted wildlife species in this case. The quota was said to have the potential of reducing wildlife populations in communal areas hence reducing wildlife/human conflicts in these areas.

The private sector reiterated the point stressed by the 2002 management plan regarding problem animal control. The plan had encouraged the DWNP to treat issues regarding problem animal control seriously and act promptly to compensations.

1.8.3 Community Involvement

Recommendations in the 2002 management plan were sustained. The DWNP was also encouraged to ensure that the ivory fund disburses money to community based conservation projects. Communities benefiting from the fund may feel positive about and contribute to elephant/human conflicts.

1.8.4 Alien Invasive Species and Domestic Animals Entering the Chobe National Park

Recommendations made by the 2002 management plan regarding alien species should be sustained.

All dogs entering the CNP must be killed spontaneously. Cows and other domestic animals should not be killed but be driven out of the park. With regard to *Salvinia,* it was acknowledged that the since the introduction of the weevil, *Salvinia* has been kept under control. When *Salvinia* spreads, the weevil thrives and multiplies, reducing the amount of *Salvinia* substantially. The weevil then dies off and *Salvinia* spreads again, and the cycle repeats itself.

1.8.5. Fishing

No fishing allowed in the CNP. The Namibian communities were said to be fishing the river and sometimes on the Botswana side. DWNP was encouraged to address the issue by encouraging ministerial or presidential dialogue between the Botswana and the Namibian governments. However, grassroots level intervention was also recommended.

1.8.6 Collection of firewood in the Chobe National Park

There were contradictory comments regarding collection of fire wood in the Chobe National Park. Some people were of the view that people should be allowed to collect within the park. It was pointed out that collecting of fire wood would result in a lot of people wondering about in the CNP, which is the same as walking around looking for wildlife. This would be in contravention of the regulations that prohibits walking in the national park.

The second issue is that there is no firewood allowed to enter the CNP from outside, and at the same time people are not allowed to collect fire wood in the river front. Allowing the collection of firewood within the river front will deplete wood resources in the area since it receives the highest tourist volumes by far than any other parts of the CNP. Lodges located along the river front have been bringing wood from outside and will continue to do so until the issue is resolved.

1.8.7 Waste Management Plan

All recommendations and action items in the 2002 management plan should be sustained. The private sector pointed out that the dumping site at savute should be closed in line with the recommendations in the 2002 management plan. It was also recommended that all none serviceable vehicles and equipment should be removed from the park.

1.8.8. Archeology

All recommendations and action items sustained.

1.8.9. Zoning

The 2002 management plan recommended five tourism zones being the Chobe River Front, the medium density, the low density, the community use zone and the development zone. The private sector endorsed the zoning as recommended by the 2002 plan.

According to the 2002 management plan, it was recommended that no walking be allowed in medium density tourism zones. This recommendation was sustained by the private sector. One of the activities recommended by the 2002 management plan was allowing for night game drives and boat rides. This recommendation was ruled out by the private sector but sustained it on me for researchers and law enforcement officers on duty.

However, the private sector considered evening game drives, but the idea was quickly pushed aside on the bases that there is not enough infrastructural and manpower capacity to handle it. Another activity provided for by the 2002 management plan is that of mokoro rides, but the tourism private sector rejected it on the basis that there are no such activities presently and they do not see mokoro happening in the future given the number of hippos in the river. They also said it is an activity that no tourists have demanded mokoro rides and beside that, it is highly dangerous activity to offer to tourists.

1.8.9.1 Community Use Zones

There has been one community user zone provided for in the 2002 management plan. This is the Mababe triangle, which was a recommended for use by the Mababe community. There was talk that this recommendation has not been implemented due to resistance from the enclave community. Apparently the enclave community wanted a stake in the Chobe National Park in the form of a community use zone. The private sector felt that the enclave communities and other communities surrounding the CNP must benefit from the forest reserves surrounding the CNP. The forest reserves were said to be under the administration of the Department of Forestry and Range Resources (DFRR) which falls within the MWET. It was recommended that negotiations regarding the use of forest reserves for community utilization can be made easy by the fact that the four under the same ministry. The private sector felt the forest reserves could be complemented CNP by offering activities that may be restricted within the CNP such as walking safaris, animal back safaris and many other activities that may not be permitted in the CNP.

1.8.9.2 The Development Zone

In the 2002 management plan zone map, there were three existing and developed lodge sites, those being the Chobe Game Lodge, Savute Safari Lodge and Savute Elephant Lodge. The private sector also reported that four new lodge sites have been advertised for tender to the private sector. One site is at Chinamba, one at Nogatshaa and two Goha hills (and one on the eastern side and one on the west).

1.8.9.3 Boreholes and watering points

The stakeholders expressed disappointment that none of the new boreholes were equipped. The recommendation from the private sector was that boreholes with good quality water and good yield found in the Linyanti, Mababe and Zweizwei areas be equipped as soon as funds to do so can be secured.

The stakeholders also recommended that pumping in artificial watering facilities should be alternated to minimize impacts of wildlife on the surrounding environment. An example given was that one water hole could be filled with water for two successive weeks and then shift onto another one for the next two weeks and so on. The decision as to when to start pumping should be left to the Park management (the DWNP). These area around artificial watering points need to be monitored by the Research Division of the DWNP.

2.0 VIEWS FROM GOVERNMENT DEPARTMENTS

2.1 Implementation of Policies and Management Plan

All the government institutions observed that implementation of government policies, particularly the management plans that involve ecosystem extending across international boundaries such as the Chobe National Park Management Plan. It was observed that activities taking place in Namibia such as fishing are not affected by what obtains in Botswana. On the Botswana side, fishing and hunting are not allowed but the reverse happens on the Namibian side. The movement of boats and vehicles on the Botswana side are confined to daylight hours only. In Namibia, people can use boats on their side of the Chobe River any time of the day. It was suggested that in order to policies and strategies should be harmonized between the two countries. It was hoped that the KAZA offers an ideal fora where some of these issues would be resolved.

Their reactions to specific issues are as follows:

2.2 Use of Vehicles in the Chobe National Park;

2.2.1 Booking System

The number of tourists spending nights in the CNP was said to be well known and well regulated by the booking system. Tourists in most cases book campsites in advance. However, what is still difficult to regulate is the number of tourists using the CNP during the day because especially companies based in Kasane make no bookings in advance for day trips. Government officers suggested that a mechanism should be put in place that can help regulate day use of the CNP. They said what could be tried may be to regulate the number of vehicles entering the CNP for day trips at the entrance gates. They encouraged the DWNP to make an inventory of all day entries into the CNP to help in the development of a quota setting or in the development of other mechanisms that can be used to regulate vehicle numbers.

2.2.2 Licensing

They also encouraged the Department of Tourism to reduce the number of tourism licenses issued for category C (mobile safaris) with activities proposed for the CNP.

2.2.2 Overland, Supply and School Tour Trucks

The above vehicles were identified as a problem. It was suggested that these trucks are noisy and damage roads. It was suggested that a quota on number of trucks entering the park at any given time should be established for supplying trucks for lodges and camps in the park and for overland and school tour trucks.

2.2.3 Roads

1. There was consensus among government officers that the current road network in CNP is a sufficient and no more new road should be developed. The main argument was that a dense road network would make patrols difficult especially during a poaching operation;

2. It was acknowledged that most of the existing roads are not sufficiently maintained and are badly damaged so that even maintaining them might prove difficult. The only solution for such roads is to reroute to allow for the bad sections to recover;

3. Main game viewing road should be graveled to allow Batswana with small single vehicles to visit and view game in the park; However, a survey carried out on tourists visiting the CNP showed that the majority of tourists prefer the roads in their current dirty condition as this adds a 'roughed up' element to their CNP experience. These tourists also pointed out that very bad sections of roads need to be maintained;

4. Efforts should be are made to put in place requisite infrastructure and developments that would attract the clients that the country wants. This infrastructure should be of such a quality that it meets expectations of the clients. An alternative view was that the bad infrastructure especially the poor roads discourages many people from entering the CNP and as such serve to regulate the number of vehicle entering the park;

5. It was recommended that the tourist transit road (west of the primary game viewing road) should be graveled.

2.2.3 Stretch points

1. It was recommended that a new stretch point be established between the Hippo pools and the Hippo pools hide.
2. It was also recommended that the White Sands Rice Paddies be changed from a stretch point into a viewing point.

2.2.4 Gates

1. A new gate at Nantanga was recommended in the same manner that it was recommended in the previous management plan. It was said that the gate would be instrumental in allowing for a two way flow of tourists activities in the river front area. The gate was also recognized as instrumental in helping to regulate and monitor the use of the river as all vehicles using the river front will be recorded. DWNP reported that developments in the Nogatshaa area will start soon and that gate at Nantanga will be useful in regulating tourist and other activities there.

2.2.5 Walking Safaris in the Chobe National Park

1. There were divergent views regarding walking in the park. Some of the workshop participants felt that walking is not allowed in a National Park except for law enforcement agents, soldiers and the DWNP personnel on foot patrols.

Others were of the view that walking safaris were to be allowed in the park provided walking safari guides carry rifles. This would necessitate changing some of the regulations to effectively implement this proposal. Participants felt that instead of walking safaris being carried out in the CNP, adjacent areas with equally high tourism potential, such as forest reserves, should be used for such activities instead. In these areas (forest reserves), walking safaris may be carried out without breaking or confusing the law.

2.2.6 Boating along the Chobe River

1. There was consensus among government officers that there were too many boats (tourists, government and locals) cruising the Chobe River. It was recommended that all safari companies be should be encouraged to stop using smaller speed boats and instead use large boats. Another recommendation was that allocating time slots per a certain number of boats regulate the number of boats.

2. Participants agreed that 2-stroke engine should be banned and replaced by four stroke engines. They also said that the electric engine technology should be explored to the fullest and if such engines could be used in Botswana then safari companies should be encouraged to gradually convert as such engines become available on the market.

3. Participants were also concerned about speedboats cruising on the Chobe River at high speeds. Their concern was that speeding boats disturb tourist activities along the Chobe River. They said that in the same manner that the Botswana Police help control vehicle speed on the roads; they should be invited to use their radar devices to control boat speed along the Chobe River.

4. It was also suggested that a solution to the speed boats problem could be found in allowing larger boats to cruise the river in the mornings and evenings and have speed boats do the same mid day. This was suggested with respect to the fact that mornings and evenings are the best times for game viewing.

5. The puku flats were identified as ecologically sensitive environments. Apparently the area is the only remaining breeding area for puku and a remarkable habitat for water fowl. It was mentioned that the CNP is recognized as an IBA primarily due to the puku flats. The speed limits recommended in the 2002 CNP management plan were adopted without any changes. DWNP was encouraged to enforce the speed limits in collaboration with the Botswana Police.

6. The DWNP Jetty was reported to be working very well. But regulation at night was not possible as DWNP knocked off just after sun set. However, a BDF camp upstream of the jetty does step in at times when the DWNP staff had knocked off.

2.2.7 Waste Management

1. Participants confirmed that the old entrance gate next to Kasane and the Serondela airstrip have not yet been rehabilitated as recommended in the 2002 management plan. They recommended that the areas be urgently rehabilitated.

2. Some participants suggested that there should be a liquid waste disposal site somewhere within the CNP. They said the distance traveled by disposal trucks to Kasane is too long for effective liquid waste management.

3. The Department of Buildings was encouraged to apply for more liquid waste removal vehicles to allow it to keep up with the pressure it is currently facing.

4. Serondela campsite was reported to be littered with cans and plastic bags. The DWNP was encouraged to increase its solid waste removal fleet in order for it to be able so sufficiently service the CNP, particularly with emptying waste bins at hides and stretch points. The DWNP was also encouraged to purchase vehicles and tractors specifically designed for solid waste removal.

5. The DWNP was encouraged to ensure that tourists, particularly mobile safari companies, observe the carry-in carryout principle.

2.2.8 Boreholes and artificial watering points

1. It was strongly recommended that the design for watering points should take into account elephant activities. Participants felt that watering points should be deep enough to hold enough water that can allow for good drinking, mud bathing and other elephant activities.

2. There are concerns that water holes tend to encourage wildlife to congregate such points resulting in degradation and possibly facilitate the spread of diseases such anthrax. They however acknowledged that artificial watering points tremendously increase the tourism potential of marginal areas in the CNP.

2.2.9 Fire Management

1. The Department of Forestry and Range Resources reported that each year they carry out early burning exercises along the Nata/Kasane main road. They said they burn strips of about 30 meters wide, but wild fires still cross over. It was suggested that instead of burning, the shoulders of the tarred road should be graded;

2. Government officers suggested that early burning should be carried out along the CNP boundary to create fire breaks;
3. They also suggested that DWNP must deploy permanent staff to patrol the eastern boundary of the CNP so that they can react to any wild fires at an early stage.
4. They recommended the construction of north to south fire breaks that can counter the common wild fires that are driven by North Easterly and Easterly winds.
5. Government officers reported that the Linyanti area is one part of the CNP that is prone to wildlife fires. They suggested the construction of a network of fire breaks in the area and recommended a width greater than 30m.

2.2.10 Problem Animal Control (PAC)

1. PAC was recognized as one of the serious issue surrounding the CNP. However, participants said the presence of artificial watering points within the CNP satisfies the water needs of most wildlife within the CNP and hence help keep them within the CNP. Elephants therefore do not find reasons for going down to the river where communities are.

2. There was a general consensus that PAC issues needs to be taken out to the people and that vigorous outreach is needed.
3. Participants strongly recommended full refund to the value of the property damaged instead of compensations, as it is the case currently. They said this would change the attitudes of people towards wildlife and towards the DWNP.
4. One solution that was suggested for the reduction of problem animals was the issuing of quotas in communal areas. Hunting the quotas would drive wildlife away from villages back into the CNP.
5. It was also suggested that where community trusts exists, more elephants should be put on their hunting quotas and then ask the trusts to compensate community members with the money generated from the excess elephant quota.

2.2.11 Domestic animals entering the Chobe National Park

1. Government officers said that the Kasane-Kazungula areas are livestock free zones, but some licensed domestic animals such as dogs are permitted. Despite that there are many goats and cows in the area. It was recommended that livestock entering the CNP should be returned to its owner the first time around, but be killed if they go in for the second time.

2.2.12 Archeology

It was reported that some tourists are making alterations to the rock paintings near Savuti. Participants suggested that the National Museum be encouraged to set up a base near the paintings with two or three officers to look after the paintings.

2.2.14 Resources

1. Participants recommended that collection of wood in the CNP should not be permitted for both tourists and locals. Tourists should be allowed to carry wood into the CNP while communities be permitted to gather wood only from community use zones.
2. Participants also recommended that there be no fishing in the CNP apart from community use zones where catch and release spot fishing may be practiced.

3.0 VIEWS OF COMMUNITY REPRESENTATIVES

Community members felt that they could not sufficiently contribute towards the River Front Management Plan because they lacked in-depth knowledge on specifics issues relating to the River front, but are aware of general issues surrounding the Chobe National Park. They said their lack of knowledge on the River front is due to the fact that they are unfamiliar with the area as they keep to the main road in route to their villages. In their submission, Community leaders raised the following concerns:

3.1 Increase in Elephant Population

Community representatives complained about the increase in elephants in the park and were concerned with the destruction on the vegetation resources in and outside the park; They said that desertification is eminent in the CNP as a result of the increase in elephant populations. They suggested culling the elephants so that their numbers could be reduced.

3.2 Opening Times for the Park Gates

The community leaders raised concerns about the current gate opening and closing times as too limiting to the movement of the enclave communities. They said the current late entry system is not working out because emergency situations are unpredictable and as such if an emergency situation arises after hours and the DWNP office is closed, then it is impossible for the locals to enter the park at night. They suggested that the gates should be opened 24 hours for locals only (especially the enclave communities) so that in cases of emergency they could readily access facilities in Kasane and other places. Current times should apply only to tourists.

It was also proposed that late entry for locals should be strictly regulated using permits or any other feasible system. They suggested that the permits then must issued also at the gates at any time of the day.

3.3 Wild Fires

Community representatives complained about an increase in fire frequencies, saying that fires are destroying the CNP. They said that residents of Kasane and other neighboring villages should be allowed to collect fire wood in the park as doing so will reduce the amount of fuel load and hence reduce intensity and levels of spread of wild fires. They accused government officers, especially DWNP, DFRR, BDF and Botswana Police who participate in wild fire fighting, for deliberately setting the CNP on fire so that they can earn field allowance during fire fighting. They said if government officers are denied claims during fire fighting, fire incidences will be reduced.

The community representatives also pointed out that some fires occur in remote places where only government officers patrol, and as the only people going to such areas they must be the ones responsible for fires occurring there.

They also suggested that community members who participate in fighting fires should be allowed to earn allowances when they are out fighting wild fires.

They suggested that the strips on either side of the Sedudu-Ngoma gates and on the Nata-Kasane roads should be widened to effectively stop fires.

3.4 Community Use Zones

Community representatives strongly recommended that there should be more Community Use Zones (CUZ) in the park. The area in between Ngoma gate and Ihaha is the one earmarked for the enclave communities and community representatives said that local involvement in the CNP will help harmonize or change community attitudes about the CNP.

Others were of the view that enclave and other communities around the park must explore and utilise opportunities and tourism potential offered by for example forest reserves, before suggesting for additional CUZs within the CNP.

3.5 Tourism School

Community representatives suggested the DWNP should construct and run a tourism school within the CNP. The school would accommodate and train both tourists and locals in aspects of tourism and nature conservation. Another idea was that may be instead of constructing a new school altogether, the already existing Ngoma Education Center should be expanded to cater for the

school. It was suggested should that be the case then the education centre should simply be a school and not a lodge with accommodation facilities for tourists and the general public.

3.6 Communal Land for Some Enclave Villages

Some community members from Muchenje and Mabele said that the area between the park and the boarder, on their side of the enclave, is too small. They said that a piece of the Chobe national Park should be degazetted to increase the size of the unprotected area around their villages.

3.7 General Comments by Community on the Chobe National Park

1. An increase in tourist activities in the CNP may result in over utilization of the CNP resources. Use should be conservative and adhering to recommended carrying capacities;

2. Gates should be open to locals at all times without any reservations but then the DWNP should intensify patrols throughout the CNP. It was mentioned that neighboring countries do not require permits from their local people when they go through their protected areas. Some community representatives said that they visited the Hwange National Park in Zimbabwe, Kafue National Park in Zambia and Kwamdu National Park in Namibia and in all the cases no permits were required;

3. There were concerns raised about the removal of rhinos from the CNP to other parts of Botswana such as the Khama Rhino Sanctuary. Community representatives felt that a sanctuary within the park should be constructed to house rhino found in and around the CNP. They said removing rhinos to other parts of Botswana reduces the tourism potential of the CNP in that tourists are able to see all the other animals but rhinos;

4. With regard to fisheries, community representatives said that they would like the DWNP to allow locals to fish within the CNP. They said that if the Namibians are fishing on the Namibian side, then Batswana should also do the same on their side to harmonize use by both countries. They say some Namibians do not respect the boundary and sometimes end up fishing on the Botswana side.

5. Community reps suggested solutions to what they referred to as an 'obvious increase in wildlife populations' particularly elephants. They said that the populations can only be reduced by culling, increasing quotas and capturing and trans-locating live animals;

6. By virtue of their location in relation to the CNP, many villages are exposed to high levels of human/wildlife conflicts. Problem animals listed by community representatives include crocodiles, lions, hyenas and elephants. Crocodiles were said to be the ones threatening human lives more than the others. It was mentioned that there exists a crocodile farm in the Kazungula area on the river bank. The farm is said to have released some crocodiles back into the river. Community representatives said because these crocodiles are not wild and were used to being hand fed, they now hunt people because people make an easy prey. They warned that parent must look after their kids and stop them from playing in the water. They recommended that all problem animals should be shot or captured and sold or trans-located to other areas.

3.8 Licensing

Community representatives recommended that the Department of Tourism, in association with the DWNP should suspend issuing of new permits for safari operations (category C) in the park as there are many companies operating in there currently.

The representatives recommended that the DWNP and DoT should monitor and evaluate the current safari operations in the CNP and suspend or penalize companies that are not complying with the laws, policies, regulations and management plans for the CNP.

3.9. Problem Animal Control

Community representatives expressed great discomfort with the compensations given to them for damaged property by the DWNP. They said that the evaluation system for crop damage is not fair. Farmers in the Pandamatenga farms spend a lot of money on soil management, irrigation and on buying seeds. But when crops are damaged the evaluation and compensation is the same for all crops and the same as those for dry land farmers. They suggested that evaluations of crops damaged by wildlife should take into consideration the soil type and crop type. They also said that the evaluation should be carried out by trained and qualified staff. They cited that in some cases a wildlife officer who knows very little about crop production is the one tasked with evaluating damaged crops and expected to come up with a realistic value for the damaged crops.

Community representatives also asked for the DWNP to include hyenas in the list of problem animals that farmers could be compensated for. They said that hyenas cause a lot of damage to small stock and to calves.

Growing chili pepper, increasing artificial watering points within the park and fencing were among the suggested ways in which levels of human/wildlife conflict could be reduced, especially conflict resulting from elephants;

The community representatives proposed that the DWNP should consider monetary compensation for the loss of human life to wildlife. Apparently there is no form of compensation currently, except in a case where the victim was a government employee on duty.

Community representatives were concerned about the lack of a buffer zone between the CNP and the Kasane/Kazungula communal area. They asked for the CNP boundary to be moved away from Kasane and that it should be fenced with a wildlife proof fence to stop wildlife from coming into communal lands.