

Management Plan

Mudumu National Park

2013 / 2014 to 2017 / 2018



Ministry of Environment and Tourism
Directorate of Regional Services and Parks Management



Republic of Namibia







Republic of Namibia
Ministry of Environment and Tourism

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Foreword

National parks are a vital tool for conserving Namibia's essential biodiversity. By managing parks, their irreplaceable assets and unlimited potential will be conserved for future generations. In addition, every year Namibia's National Parks draw large numbers of tourists to Namibia, generating employment and stimulating development nationwide. National Parks also provide a unique opportunity to benefit local communities through rural development while providing research, education and recreation opportunities.

Proclaimed in 1990, the year of Namibia's independence, the Mudumu National Park is a vital place that celebrates freedom not just for the country but also for wildlife. Due to the absence of fencing and its geographic location, Mudumu serves as a crucial transboundary link in a wildlife migration highway that connects Angola, Namibia and Botswana.

Conservationists have established that the principal commuters on this highway are elephants. Elephants move freely through the park, the surrounding waterways, and across the main roads of the area. Although rhino are absent, the other Big Four occur here and the park is one of the few places in Namibia where you find Cape buffalo. Mudumu is also a place of predators.

This management plan sets out the objectives and guidelines for the management and development of the Mudumu National Park. As such, it represents the policies and intentions of the Ministry of Environment and Tourism (MET) on how the park should be managed.

Park neighbours, traditional authorities, line Ministries, Regional Councils, conservancies, private sector, tourists, contractors, organisations, institutions, parastatals, researchers, professional hunters, and any entity or individual dealing with the park, in any way, must ensure that any actions and decisions relating to this park are in accordance with the park management plan. In addition, specific rules and regulations in accordance with the applicable legislation will apply.

Shorter-term operational plans or work plans will also be developed in accordance with the activities provided in the park management plan. These will identify specific or annual prioritised actions, which need to be performed to address the priorities specified in the park management plan.

The park management plan must be viewed as valuable and central document by all management and policy level staff involved with a specific park. They should be familiar with its contents, and should make use of it to familiarise new staff with the aims, objectives, management principles and strategies for the park. It is every staff member's (involved with Mudumu National Park) responsibility to ensure that the park management plan is implemented accordingly.

Uahekua Herunga, MP
MINISTER

Preface

In a briefing paper presented to the Namibian Cabinet in 1999, the North East Parks were identified as development engines for the region, due to their natural assets and the resulting tourism potential. While this management plan applies specifically to Mudumu National Park, it takes particular account of the Park's position within a wide, regional network of conservation areas: conservancies, community forests and conservation zones in neighbouring countries.

The management plan for Mudumu National Park was derived from several workshops involving the management of the MET, local communities and other stakeholders. The plan has been designed and structured to be priority focused and action oriented, to facilitate implementation and the achievement of outputs and outcomes.

It gives a brief background to the Park, including its purpose and objectives, and placing it in a regional setting, before focusing on park management aspects. Chapter 2 focuses on the management of natural resources in the Park while Chapter 3 addresses aspects of regional conservation, park neighbours and resident relations. The zonation of the Park is detailed in Chapter 4. The management of prospecting and mining, and tourism development are covered in Chapters 5 and 6, respectively. Detailed management considerations for infrastructure are included in Chapter 7, while the last chapter covers aspects of administration and management.

The plan is designed around a uniform structure for easy reference and use and should be used in conjunction with park legislation and regulation. The plan therefore articulates, at the strategic level, the 'What' must be done; with a brief description of the 'Why' these actions must be implemented to attain the specified objectives. It is imperative to operationalize these actions in a clear and detailed annual work plan.

The Ministry of Environment and Tourism would like to thank all its staff members, partners and stakeholders who participated in developing this management plan, specifically the Caprivi Parks Consultants, a partnership of Namibian firms appointed to help implement the Bwabwata Mudumu Mamili Parks Project which is co-funded by the Government of the Republic of Namibia and the German Government through KfW, who facilitated the compilation of the plan.

Simeon N. Negumbo
Permanent Secretary

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Abbreviations and Acronyms

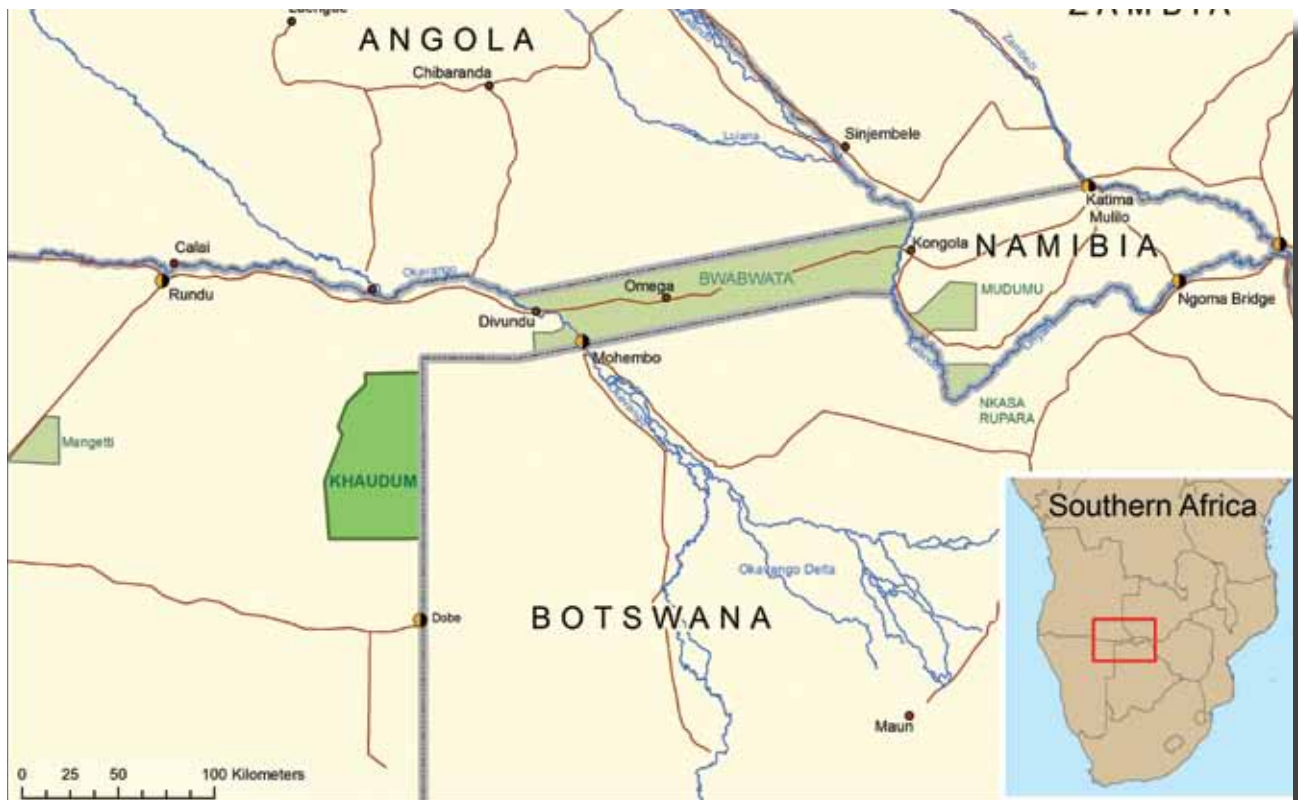
BMM	Bwabwata, Mudumu and Mamili National Parks
DSS	Directorate of Scientific Services
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
FMD	Foot-and-mouth disease
HWC	Human-wildlife conflict
IBMS	Incident Book Monitoring System
IUCN	International Union for the Conservation of Nature
KAZA TFCA	Kavango Zambezi Transfrontier Conservation Area
MET	Ministry of Environment and Tourism
NBRI	National Botanical Research Institute
Pty Ltd	Propriety Limited



Chapter 1

Introduction

Shaped by water, woodlands, floods and fire, human history and ancient animal migration routes, the parks of Namibia's north-eastern regions, including Mudumu National Park, are rich in biodiversity and history. Effective management of the North-East Parks will ensure the conservation of important habitats, safeguard corridors for regional wildlife migration; provide engines for economic growth in poor rural areas; and provide access to natural areas for local, regional and international visitors.



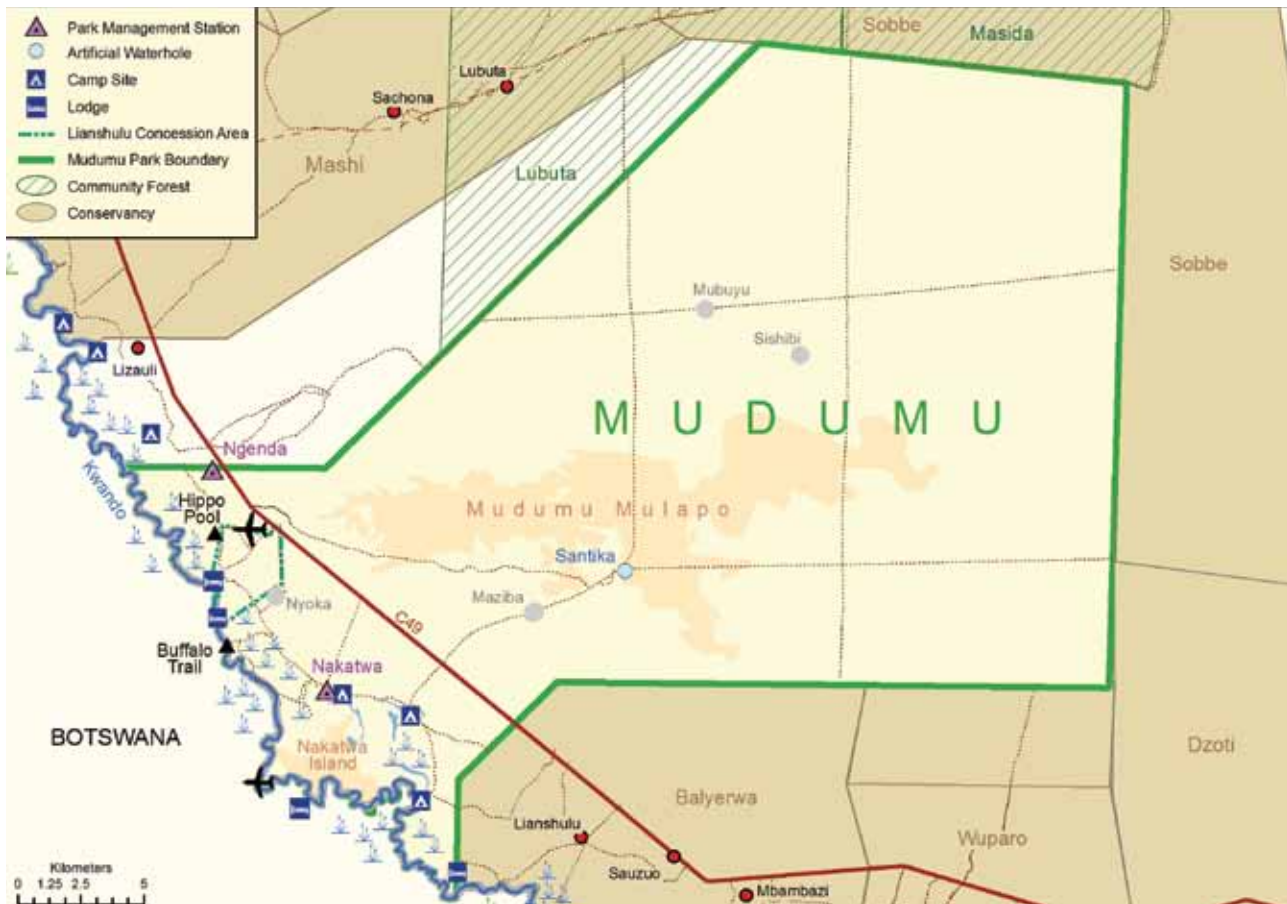
Map 1: Namibia's North-East Parks lie close together in an area surrounded by Angola, Botswana, Zambia and Zimbabwe, and transected by the Kwando, Kavango and Zambezi Rivers.

1.1 Overview of Mudumu National Park

Mudumu National Park covers an area of 737 square kilometres along the Kwando River. The Park is situated approximately 35 kilometres south of Kongola, bordered by Botswana to the west, Mashi Conservancy to the north, Sobbe to the east, and the Balyerwa, Wuparo, and Dzoti Conservancy to the south, as illustrated below in Map 2.

The Park is centred on the Mudumu Molapo fossil river course, a seasonally dry, open channel that drains the primarily Mopane woodlands of the hinterland to the east.

Without any fences, Mudumu forms a crucial transboundary link for wildlife migration and seasonal dispersal between Angola, Botswana, Namibia and Zambia and for seasonal migrations to and from the rivers. One of Mudumu's main purposes is to serve as a core wildlife area, supplying wildlife to neighbouring conservancies that can then sell trophy hunting rights to professional hunting outfits and develop tourism on their own land.



Map 2: Mudumu National Park borders the Kwando River.

Natural Environment

Mudumu’s natural environment is different from that of the Kalahari woodland system across the Kwando River in Botswana, even though there are no real physical barriers to dispersal by plants – apart from the river itself. This difference is mostly the result of a difference in soil types, with Mudumu’s soils being dominated by heavy clay soils interspersed with sandy patches as opposed to the predominantly deep sandy soils on the Botswana side. This difference in soil characteristics has in turn led to a marked difference in vegetation structure and species composition.

The main river channel is supplemented by several smaller channels and oxbow lakes, leading to a constantly changing arrangement of dry and wet areas and the presence of some permanent islands. The river front is characterised by a tall closed woodland to forest fringe (climax vegetation), which has however mostly been transformed to open shrublands by elephant. The depth of the water table, which appears to change over long periods linked to wetter and drier cycles in the region, is a further important determinant of vegetation structure.

Apart from the distribution of soil types and the presence of elephant, fires are the main determinants of vegetation structure and species composition. In particular, hot fires that usually start outside the Park in the late dry season may result in marked changes in vegetation structure. These fires seldom cause as much damage in the Mudumu Molapo woodland vegetation type as in the more sandy soil types where fuel loads are more often high enough to sustain hot fires.

The Park contains some of the best-preserved tall Mopane woodlands in Namibia, and some excellent examples of *Burkea africana* veld.

The unfenced Mudumu forms part of the Mudumu North and Mudumu South complexes, groups of formally protected areas, conservancies and forestry management areas that stretch from Bwabwata East to Nkasa Rupra. Joint management of several aspects of the complexes ensures the coordination of wildlife management activities across the whole region and ensure that benefits of wildlife conservation to the neighbouring communities are maximised.

History of Mudumu National Park

Mudumu National Park was proclaimed in 1990, shortly before Namibia's Independence. Prior to its proclamation, Mudumu was settled and used by the Mafwe and Mayeyi people. In 1945, following tsetse fly infestation, local residents moved away from low lying areas and much of the Park was designated as traditional hunting grounds. The area remained a traditional hunting area up to 1987 when an agreement was signed between the Mafwe Traditional Authority and the Department of Agriculture and Nature Conservation to officially proclaim Mudumu as a State protected area.

In 1989, the Administrator General of South West Africa approved the declaration of Mudumu as a National Park. In his declaration, the Administrator General imposed a condition that the park boundaries be better planned and consolidated prior to the development of cut lines. Due to the presence of numerous villages within the proposed park boundary, major changes had to be made and the current de facto park boundary differs dramatically from that in the official gazette.

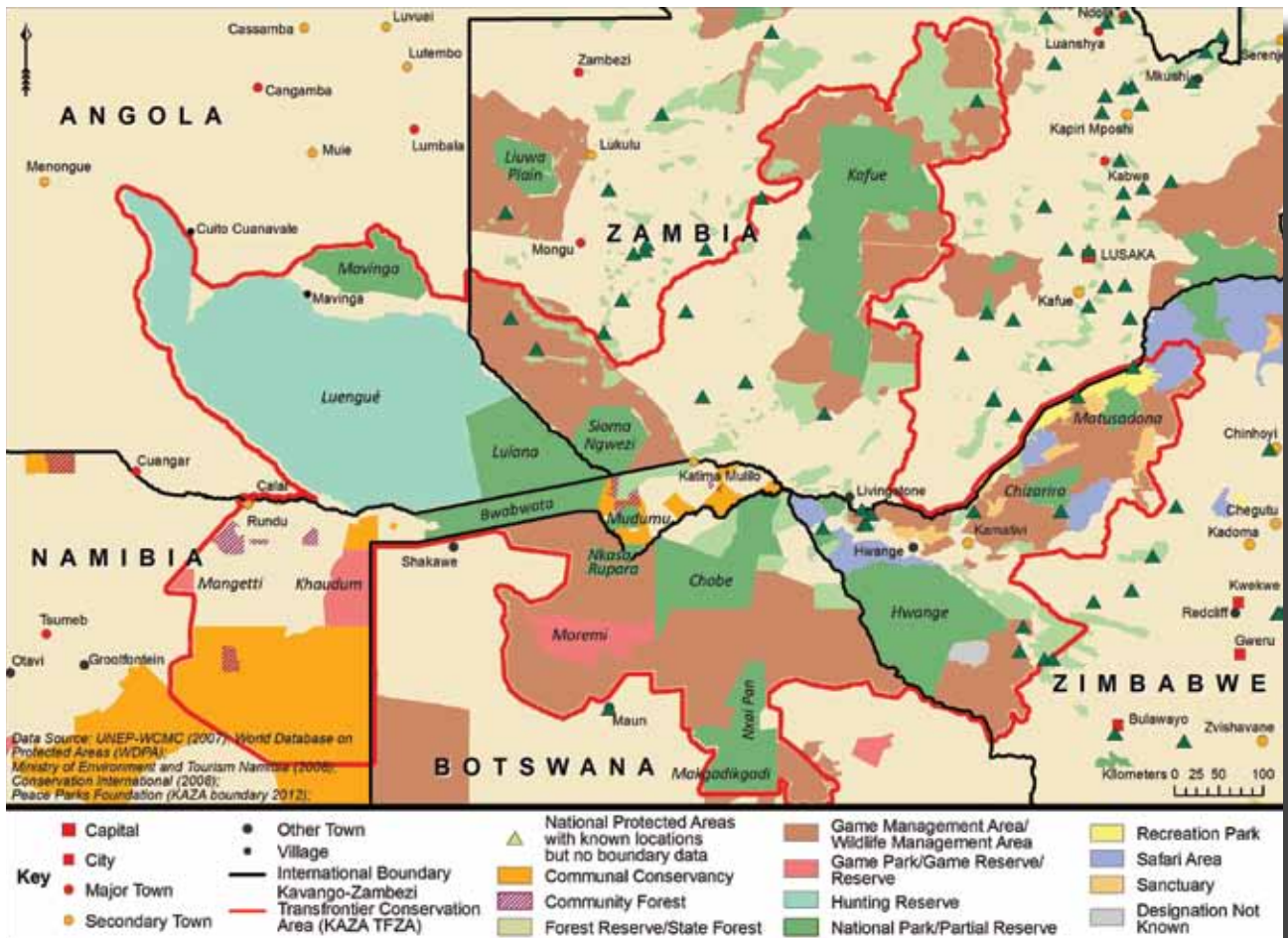
Following independence, the Ministry of Environment and Tourism (MET) immediately started a socio-ecological survey that included Mudumu National Park and surrounding areas. One outcome of the survey led to the introduction of legislation in 1996 to enable residents on communal land to form conservancies, thus granting them the same rights over wildlife and tourism as private landowners. To date, five conservancies have been registered around Mudumu – Wuparo (1999), Mashi (2003), Sobbe (2006), Balyerwa (2006) and Dzoti (2009), meaning that the Park's entire boundary is now adjacent to proclaimed conservation areas.

In 1998, also following recommendations of the socio-ecological survey, a vision for the North-East Parks was developed. This paper documented the vision shared by stakeholders for conservation, tourism development, equity and the creation of partnerships in the parks. Cabinet approved this vision in 1999. Under this Cabinet Decision, MET was instructed to provide conditional tourism rights inside Mudumu to the neighbouring communities. In 2009 this instruction became the basis for preparation of a tourism development for the Park, which was subsequently approved and is currently being implemented.

KAZA TFCA

Supporting large herds of elephant and buffalo, plus rare and endangered species such as roan and sable antelope, the North-East Parks, including Mudumu National Park, constitute important corridors for animal movement within the greater region in Namibia and surrounding countries. It is in this context that the North-East Parks form the geographical heart of the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA). This massive area includes numerous proclaimed national parks (including Mudumu), game reserves, community conservation areas, forest reserves, and iconic tourism destinations such as the Victoria Falls and Okavango Delta. KAZA TFCA aims to broaden the protected areas network, thus increasing biodiversity, expanding historical game migration routes and drawing more tourists to the area. In a place where local people often bear the costs of living with wildlife, KAZA TFCA aims to make the protection of wildlife and wild places economically more attractive to rural communities.

With a strong history of community and conservancy involvement, Namibia's North-East Parks and neighbours are well-placed to take advantage of KAZA. Namibia's establishment of conservancies is recognized as among the most successful efforts by developing nations to enhance natural resource management by increasing local responsibility and ownership over wildlife. Rural residents benefit financially from wildlife and tourism through a range of activities, including harvesting quotas, trophy hunting, sale of live game, and from tourism concessions.



Map 3: The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), a five-country initiative involving Angola, Botswana, Namibia, Zambia and Zimbabwe encompasses an area of about 440,000 square kilometres.

Economic opportunities

Tourism is a major socio-economic asset of Mudumu National Park. It can offer income, albeit limited, to local residents, jobs and business opportunities to communities and entrepreneurs, and economic benefits to the region and Namibia as a whole.

The formally protected areas, such as Mudumu, are too small to conserve all ecological processes and services adequately on their own. The effectiveness of conservation also gains as it increases in scale: the greater the area under conservation status and management, the larger the benefit. It is therefore in everyone’s interests to promote conservation activities, compatible land-use practices, and management and development initiatives, ultimately to benefit all collaborating partners throughout the broader area around Mudumu National Park and the North-East Parks.

It is also important to develop synergies with cropping and livestock activities and mitigate conflicts between land uses. For example, the adoption of planned grazing and herding of livestock can improve pastures, crop yields and decrease predator livestock conflicts significantly. Local planning is also required to ensure that grazing areas are secured for livestock and wildlife over the long term.

1.2 Purpose

There are several reasons for the compilation and publication of this management plan. First, the plan describes the objectives, principles and strategies for the management of Mudumu National Park so that all interventions can be planned, focused and co-ordinated according to agreed principles.

As an official document issued by the MET, the management plan is secondly a statement of commitment that binds its staff to manage Mudumu National Park according to provisions of the plan. While senior public servants of the MET are ultimately accountable for implementation of the plan, the document also makes clear the responsibilities of other staff, in particular those appointed to manage the Park.

Thirdly, the plan obliges the wide variety of people and organisations (private sector contractors, public service agencies, neighbours, tourists, etc) associated with Mudumu National Park (and the other North-East Parks) to ensure that all their activities are congruent with provisions of the plan.

Finally, implementation of the principles provided in this plan will reduce the need for reactive, unplanned responses to unexpected events. Indeed, the management plan should provide guidance over the next five years.

1.3 Objectives

- **To protect and maintain biodiversity** - this captures all the management strategies directly related to the MET's first core function of protecting and maintaining biodiversity. This specifically includes the protection of indigenous species, red data species, diversity of habitats and natural ecological processes, law enforcement, monitoring and research as well as rehabilitation of human-degraded habitats.
- **To maximise regional economic development, based on the principle of sustainable utilisation** - this captures all the management strategies directly related to the MET's second core function of maximising the sustainable economic benefit from biodiversity. This includes all aspects of tourism management and direct consumptive use of resources by local people. The aim is to support the MET's strategic theme of rural development by utilising the basic resource of biodiversity.
- **To develop, implement and maintain effective and efficient systems, infrastructure and equipment that can support core functions** - this captures all management strategies related to the non-human resources that the Park Warden can use in his/her management activities (infrastructure, equipment and the management system itself), as well as an outreach programme.
- **To develop, implement and maintain an efficient and sensitive human resources management programme** - this captures all management strategies related to the Park's human resources. This is the main theme through which health, education and gender issues can be mainstreamed into park activities.
- **To develop, implement and maintain regional conservation synergy through effective interaction with all park neighbours** - this captures all management strategies related to liaison with park neighbours, including local communities, conservancies, other ministries, regional development planning institutions (government and non-governmental organisations) and processes, regional and local business and neighbouring countries. The latter is specifically included with reference to the KAZA TFCA initiative.
- **To develop, implement and maintain an efficient and functioning management system** - this captures all management strategies related to the design, review, revision and implementation of the Park's operational plans (annual work plan, monthly work plans, development plans, and financial planning systems). It also includes the monitoring of effectiveness of planning systems, in terms of both the biodiversity resource and the achievement of annual targets.

Bwabwata Modumu Mamili Parks Project in Namibia
Our Parks. Our Partners. Our Future



Background
 The Bwabwata Modumu Mamili Parks Project is an integral part of the Bwabwata Modumu Mamili Parks Project. The Ministry of Environment and Forestry (MEF) and the private sector have entered into a partnership to develop and manage the Bwabwata Modumu Mamili Parks Project. The project is a partnership between the Ministry of Environment and Forestry (MEF) and the private sector. The project is a partnership between the Ministry of Environment and Forestry (MEF) and the private sector. The project is a partnership between the Ministry of Environment and Forestry (MEF) and the private sector.

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Mahango Park Station
Before, during and after



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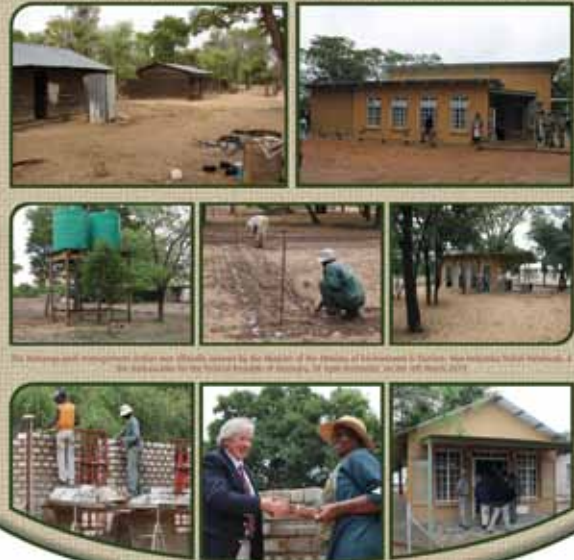


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Chapter 2

Management of natural resources

The biodiversity in the Bwabwata, Nkasa Rupara and Mudumu complex is unique within Namibia. This is primarily due to the Kavango, Kwando and Linyanti Rivers and their associated habitats as well as the relatively higher rainfall experienced within this region. Many species of plants, game, birds and other animals are supported by the riparian forests and wetlands of these rivers, which include rapids, open water, swamps and pans. There are also a number of special features away from the rivers that deserve special management, particularly the drier woodlands and grasslands. The structure and composition of these are currently threatened by the scale and frequency of fire, while wildlife poaching has been a problem in the past and continues to be so in specific areas. Although the protected areas are relatively large, appropriate land uses in adjoining areas are crucial to preserve natural processes, conserve biodiversity and optimise economic benefits.

The high potential for tourism offered by the rivers and their associated habitats can be used to generate economic benefits for both local people and Namibia generally. Biodiversity and landscape features must thus be managed in a way that optimises these benefits, without excluding large, so-called “wilderness” areas from sustainable tourism activities. Simultaneously, negative impacts from human uses must be avoided for these economic benefits to be sustainable.

2.1 Habitats and special sites

Vegetation within the Park will be managed to achieve the overall objective of maintaining open ecosystems that form part of the larger Kalahari woodland system. Essential ecological processes, such as fire, will be managed to obtain the best outcomes for biodiversity in general. To assist in the management of activities and developments, vegetation types have been divided into habitat categories on the basis of their scarcity, sensitivity and threats that the habitats face in the Park and elsewhere. These different categories will direct management and the allocation of budgets, resources and activities, and the categories will require different levels of environmental impact management during the development of infrastructure or economic activities.

Sensitivity, scarcity and threats are not static, and can be expected to change as different pressures or forces are brought to bear on the Park and its surrounding areas.

Objective

To actively maintain and rehabilitate all habitats in the Park, but with special emphasis on riparian forests, rivers, floodplains, swamps, sensitive plant communities, and to minimise the negative impact of fire on woodlands and optimise its use as a management tool.

Strategies and Principles

Two categories are recognised for park habitats. A habitat’s significance may be adjusted as conditions change, and additional habitats may be added. The habitats and their status are:

Very important: All rivers, floodplain and swamp (wetland) areas, and riparian forests;

Important: Omiramba grasslands and pans and fringe woodland, Mopane woodlands; and deciduous woodlands.

In addition, exceptional sites have been zoned as special management areas that contain features of particular significance such as unique plant communities, important animal habitats, special landscape features, cultural sites, etc.

Tools to manage habitats include the use of fire, the use of mechanical and/or chemical interventions, adjusting wildlife numbers and species ratios, changing the distribution and temporal management of man-made water points, re-establishing plant populations, protecting specific high-value areas against damage by elephants, and rehabilitating degraded areas.

Activities

- a) Key habitats, special sites and invasive alien species should be clearly identified and mapped, and management guidelines developed in year two.
- b) The status and threats to habitats and special sites must be reviewed every five years and new management strategies developed to counter any significant threats. Should this be necessary, this plan must be systematically revised to reflect changes.
- c) Threats posed by aliens must continually be assessed and addressed.
- d) An active, adaptive fire management programme (see below) must be used to achieve specific stated habitat objectives (e.g. to create habitat for rare species like roan or oribi).



2.2 Fire

Fire has, and will continue to play an important role within the Park. For example, frequent intense fires over large areas of the Park have led to the degradation of woodlands, while conversely, an absence of burning has caused the developments of shrub thickets or bush encroachment in certain areas. Appropriate protective measures may therefore be needed for rehabilitation and/or to limit degradation and fire may also be used as a management tool to achieve other objectives. These measures include the reduction of fuel loads, early dry-season burning and the control of run-away wildfires.

Objective

To use fire as a management tool for actively maintaining and rehabilitating all habitats in the Park.

Strategies and Principles

- a) a) An adaptive burning strategy for each habitat must be developed since different habitats may require different fire regimes, and should include:
 - the spatial designation of the habitats on maps;
 - the purpose of fire management for each area;
 - an outline of the specified fire regime, which should include burning frequency, the percentage of area to be burnt in a season or burning cycle, the type of burn, and the season of burn.
- b) The burning strategy will guide the development of a three-year burning plan. The plan must be revised late in the wet season of each year to take into account:
 - the extent and severity of the previous seasons' fires;
 - the current standing biomass (fuel loads) in different areas of the Park;
 - the need to protect life and property;
 - the availability of forage and refuge for wildlife, especially for 'Important Species'; tourism requirements and logistical considerations.
- c) c) Management should strive to prevent the occurrence of extensive wildfires that burn more than 35% of a contiguous area in a season (with this target being regularly reviewed in the context of fire monitoring data). Appropriate pro-active fire management strategies must be developed to reduce extensive burns. The strategies are to:
 - take account of past woodland losses due to killing of mature trees and lack of recruitment and regeneration, and address these in the future;
 - institute preventive measures such as fire breaks near park boundaries and to protect property;
 - ensure the reduction of fuel loads to minimise the severity of fires;
 - use early burning as a strategy to reduce the danger of late season hot wildfires;
 - take note of the impact of fires on tourism;
 - use natural boundaries (rivers, areas of low vegetation cover, areas with low fuel loads, etc) as firebreaks rather than linear barriers such as roads and firebreaks.
- d) Proactive fire management must be used to protect infrastructure.
- e) Park staff will work with residents and neighbours (communities, other departments and institutions, other countries) to manage burning with specific reference to the Park's position in the KAZA TFCA.
- f) f) Fires will only be controlled or suppressed under the following conditions:
 - when they pose a threat to life or property;
 - once the specific goals of set fires have been met;
 - if they are likely to burn excessive areas or threaten the survival of certain species and/or habitats.
- g) Plant species and communities, which are identified as important and potentially threatened by fire, are listed in Appendix 2. They may well require special management attention, which must be implemented to an extent both practical and appropriate.

Activities

- a) Develop a burning strategy that addresses the specific requirements of each habitat or sub-habitat in year one.
- b) Develop a three-year burning plan which will be revised at the end of each summer growing season, based on the results of the previous season's fire patterns, and on monitoring data.
- c) Establish a burning 'team' to evaluate past burns and future possible burning areas in year two.
- d) Continually improve the knowledge and understanding of fire in these ecosystems.
- e) Establish a fire monitoring programme, based on a burn register and making use of remote sensing data provided by the National Remote Sensing Centre, Directorate of Forestry, Ministry of Agriculture, Water and Forestry, as well as field surveys to detect fire effects.
- f) Establish fire emergency procedures in year two.
- g) Establish forums with local communities and other agencies to manage burning in year two.

2.3 Rehabilitation

Human activities have led to the degradation of many areas in and around Mudumu National Park. The activities include clearing of land for the construction of road borrow pits, hunting camps and ad hoc infrastructure.

Objective

To rehabilitate degradation caused by humans especially where it severely impacts on ecosystem functions and processes, and where rehabilitation is practical and appropriate.

Strategies and Principles

The visual or other impacts of degraded areas must be assessed against the costs and benefits of rehabilitation.

Activities

- a) Identify and map areas where ecosystem functions or processes are compromised by human activities every year.
- b) Explore the possibility of allowing tourism operators to rehabilitate areas allocated to them within concessions every year.
- c) Liaise with the National Heritage Council and other agencies to ensure that important cultural, historical or other assets are not lost or inadvertently damaged during rehabilitation.

2.4 Wildlife population management and introductions

Appropriate and strategic management of wildlife is required for a number of reasons. First, several animal species in Mudumu National Park have been identified as priorities for management within Namibia. Second, some species of large mammals have become locally extinct, uncommon or rare in the Park. Third, the North-East Parks form part of important corridors for animal movement across the greater region of Namibia and surrounding countries. Fourth, there is a need to increase wildlife numbers to develop the tourism potential of the North-East Parks. Finally, some species cause human-wildlife conflicts, which increase tensions between local residents and the MET.

A variety of interventions may be employed to manage wildlife, although not all are appropriate for use in Mudumu National Park. Interventions include the provision and innovative management of artificial water sources; creation of wildlife corridors and grazing areas around the Park that can act as buffer zones; reintroduction of species; monitoring of populations; patrolling; fencing; park zonation; and control of livestock and wildlife/livestock diseases.

Objective

To sustainably manage, and reintroduce where necessary, the full complement of species that occurred recently, with special emphasis on wetland and priority species (listed in Appendix 2).

Strategies and Principles

- a) Identify (through appropriate research), remove or minimise factors that lead to local species extinctions or significant declines in their numbers.
- b) Where practical, manage wildlife populations to:
 - maintain the ecological integrity and sense of place of the Kwando-Linyanti swamps, riparian woodland and forest;
 - develop and maintain tourism attractions of high quality;
 - allow sustainable use of fauna;
 - support management practises that improve habitat for fauna both inside and outside the Park.
- c) Manage key species which have been prioritised by the MET (such as sable, roan, oribi, tsessebe and lechwe) to achieve conservation targets for those species.
- d) Ensure that only appropriate species, and no 'genetically exotic species'¹, are introduced and that re-introductions are cost-effective.
- e) Promote the Park as breeding area from which animals can move into surrounding conservancies.
- f) Permit the migration and movement of fauna where possible, and investigate anthropogenic factors that may limit movements (such as inappropriate land-use practices on the Park boundaries), with a view to eliminating them.



Activities

- a) Implement and maintain the Incident Book Monitoring System (IBMS) to monitor populations of key species every year.
- b) Investigate, and if necessary develop strategies to meet population performance targets for important species which are threatened or rare in year two.
- c) Develop effective anti-poaching programmes to eliminate or reduce the impact of poaching, as a major potential threat to the economic value of the Park and surrounding areas in year one and two.
- d) Take the following steps before species are re-introduced or populations bolstered through introductions:
 - explore what management actions may be taken to create conditions for the species to increase or re-populate the areas;
 - undertake appropriate research to understand why populations are low or locally extinct, and to determine whether causal factors can be eliminated;
 - develop re-introduction plans to ensure that pre-release and post-release management strategies and resources are in place.

2.5 Artificial water points and management

The provision and management of artificial water is a complex matter. On the one hand, rivers provide perennial sources of water for many animals, but certain other species have evolved to occupy areas that are devoid of surface water for much of the year. While the provision of artificial water may increase populations of these species, it may affect other species adversely. These impacts are often poorly understood and any intervention to supply water must therefore always be carefully considered.

¹Only animals of the same genetic origin as those already present in and around Mudumu National Park.

Objective

To maintain the current status quo with regards to water distribution, with periodic evaluation thereof. In general, additional artificial water points for wildlife within the Park are discouraged. However, subject to risk analysis, water may be strategically located (a) to increase the numbers of vulnerable, rare or threatened species, (b) to attract wildlife away from riparian fringes that suffer the impacts of dense populations, and (c) for economic reasons, such as tourism or trophy hunting, provided this does not adversely impact on priority habitats or important species.

Strategies and Principles

- a) The provision of any artificial water points must demonstrably contribute to one or more of the goals of the above objective. The goal(s) must always be clearly stated.
- b) The effects of water points must be reviewed regularly in the light of objectives.
- c) Total benefits (environmental and economic) must outweigh the likely management and environmental costs.
- d) In natural ecosystems water may be a highly variable resource; provision of artificial water should, as far as possible, mimic natural variability over time and space.
- e) For the placement of any additional artificial water points deemed essential, the following should be considered:
 - the preferable location of water points near existing natural pans to supplement ephemeral pan supplies;
 - the possible location of water points in conservancies and in multiple-use areas to encourage dispersal to these areas where wildlife can contribute to sustainable uses such as trophy hunting.
- f) Where artificial water points are used for tourism, conservation objectives will remain as the highest priority; as a result such water points may be decommissioned or left dry to promote conservation or if serious negative environmental impacts occur.

Activities

- a) Conduct risk analyses for all artificial water points in year three.
- b) Map all artificial water holes and establish a baseline monitoring system to assess negative impacts on vegetation and key animal species; particular attention must be paid to roan, sable and tsessebe and other priority species in year two.
- c) Maintain a register of all artificial water points; this must include the purpose of each point and its associated monitoring data from year one.
- d) If possible, develop a water-point rotation strategy to encourage wildlife movement.
- e) Liaise with other Ministries to ensure any water provision in the area does not conflict with objectives of this management plan.

2.6 Domestic animal management

While domestic animals are important resources for neighbouring communities of Mudumu National Park, the animals must be managed to contain associated risks. Domestic animals are therefore not allowed inside Mudumu National Park.

Objective

To ensure that no domestic animals are allowed inside Mudumu National Park.

Strategies and Principles

- a) Good Park-neighbour relations must be maintained in order to ensure cooperation from park neighbours in keeping domestic animals out of Mudumu.
- b) The official Park policy on domestic animals is clearly communicated to regional and traditional authorities as well as neighbouring communities.

Activities

- a) All domestic animals must be removed from Mudumu National Park, and efforts must be made to contact owners and communicate the Park's policy on domestic animals to them.
- b) Policy decision on domestic animals should be clearly communicated to regional and traditional authorities during regular interactions.



2.7 Fencing

Mudumu National Park is an unfenced open system and as such forms an important link for wildlife migration in the area.

Objective

To maintain open systems for the largest possible landscape integrity and to allow for free wildlife migration.

Strategies and Principles

- a) Mudumu National Park should remain an unfenced open system and border fencing of the Park should not be considered as a management option

2.8 Human wildlife conflict management

The unrestricted movement of wildlife between the Park and surrounding areas leads to serious conflicts between humans and wildlife. In addition to damage suffered by people, conflicts pose a significant threat to the viability of conservation in and around the Park. Ways of mitigating the impacts of conflicts therefore need to be found and managed.

Objective

To actively engage with communities to ensure there are effective and responsive mechanisms in place to minimise conflicts.

Strategies and Principles

- a) Due to the mobility of wildlife, HWC will be managed at a local level and collaboratively between park managers, conservancies, community forests and other relevant stakeholders.
- b) Within the parameters allowed by legislation, greater decision-making authority will be given to local MET officials to manage problem animals.
- c) In line with national policy on HWC management, plans and operating protocols will be developed collaboratively with Park neighbours.

Activities

- a) Develop and refine HWC management plans and procedures in collaboration with local communities, and ensure these are widely communicated to community members and relevant staff within MET every year.
- b) Implement protective and mitigation measures with communities neighbouring the park every year.

2.9 Diseases and parasites

Many diseases and parasites are a threat to people and the economy of the region. Some, such as malaria, are detrimental to humans while others are exclusively animal diseases. Management of these diseases and their control have wide ramifications, including environmental impacts.

Objective

To work with other relevant public service agencies to find solutions to the management and control of notifiable and contagious human, livestock and wildlife diseases.

Strategies and Principles

- a) Wildlife introduced from other areas should not be infected with exotic diseases such as TB or with diseases that are already endemic to the area.
- b) National veterinary regulations should be adhered to.
- c) Fences may only be used to control the risk of diseases when this is absolutely essential and following environmental assessment and feasibility studies.

Activities

Work with other government agencies and local institutions such as conservancies and community forests to find environmentally acceptable solutions to the control of human, livestock and wildlife diseases and ensure that appropriate technologies and methods are applied.

2.10 Alien species

Alien species are species that were introduced since historical times by humans into habitats far outside their native range. These species have the potential to cause significant ecological damage, often out-competing native species or changing the environment to such an extent that entire indigenous ecosystems may become threatened. Not all alien species are invasive, however, the chances of an invasive species being introduced increased rapidly with the number of alien introductions. It is therefore widely accepted that alien species should be controlled, or better still, removed from areas where biodiversity conservation is the main objective.

Mudumu National Park is relatively free of alien species, with some exceptions being the noxious aquatic weed *Salvinia molesta* (which is aggressively invasive) and garden ornamentals such as *Bougainvillea*.

Objective

To ensure that alien species are controlled or removed in the park.

Strategies and Principles

- a) Staff must be vigilant and report any occurrences of alien species immediately.
- b) Where practical, manage wildlife populations to reduce or eliminate the impacts of alien species, with an emphasis on species that pose an immediate and high threat, such as the aggressive invasive aquatic weed *Salvinia molesta*, or domestic cats that may cross-breed with wild species.
- c) Alien species control must be planned and implemented in a systematic manner with clear targets, and the results must be monitored regularly.

Activities

- a) Clearly identify and map key habitats, special sites and invasive alien species, and develop management guidelines for each in year two.
- b) Manage and where practical eradicate invasive alien species throughout Mudumu National Park.
- c) Continually assess and address threats posed by all alien species.

2.11 Law enforcement and wildlife crime prevention

The illegal use of natural resources, particularly for commercial purposes, generally poses a threat to conservation and remains a major management issue for MET. As illegal activities are generally conducted in unsustainable ways, they further undermine the ability of the environment to support growing human populations and plant and animal life. Poaching of plants and animals, cutting down of trees and unsustainable land uses are a few examples. In addition to these illegal activities, people may also enter the Park to intimidate, harm and rob tourists.

To ensure that the Park is able to offer a product of high quality to tourists, it is important to undertake law enforcement at the appropriate scale and apply a zero tolerance approach on the illegal use of resources and inappropriate use of the Park in general.

Objective

To control and limit the illegal use of wildlife and natural resources within Mudumu National Park and, through all efforts possible, to ensure the safety and security of tourists.

Strategies and Principles

- a) Develop a practical, harmonised approach to the implementation of law enforcement within the context of this management plan, relevant legislation and regulations, by working closely with neighbouring communities and Namibian Police.
- b) Plan, develop and implement an efficient and effective tourism management and access control system.
- c) Ensure security and anti-poaching patrols and surveillance are conducted for all natural resources (including harvesting and theft) in partnership with neighbouring communities, at regular but unpredictable intervals.
- d) Develop a system of rewards (financial or otherwise) for the reporting of illegal activities and let it be widely known in the area.
- e) Ensure that MET staff are adequately trained in law enforcement to ensure that they operate within relevant policies and laws and to preserve and collect evidence so that arrests result in convictions.

Activities

- a) Develop (with relevant partners) a practical plan for implementing law enforcement in the context of this management plan and relevant legislation in the first year. This plan will include but not be limited to sections



on patrolling (foot, boat, vehicle), roadblocks, informer network, and communication with a particular focus on identified poaching problem areas.

- b) Regularly review and inspect poaching problem areas: Mubuyu cutline, Santika cutline, Kansoko cutline (North-East corner close to Masida area and midway between northern and southern boundary), Balyerwa and Ngenda areas each year.
- c) Develop (with relevant partners) an effective tourism management and access control system with particular attention to holiday seasons in year three.
- d) Develop good relations with all tourism operators and, with their help, develop a systematic reporting process whereby they can report any illegal or illicit activities that they observe during their normal activities.
- e) Disseminate information on law enforcement approaches and reward schemes.
- f) Carry out regular patrols to ensure a high level of presence and visibility.

2.12 Environmental impact assessment and management

Activities associated with both conservation management and tourism may degrade or change vegetation, disturb or alter animal populations, destroy archaeological artefacts and sites, and affect cultural habits and social systems. The assessment and subsequent management of these potential impacts are key principles in ensuring that the utilisation of Park resources is done sustainably.

Objective

To prevent and mitigate negative effects and enhance positive effects of conservation management and tourism activities on the environment, by conducting a due environmental impact assessment and management process.

Strategies and Principles

- a) Environmental Impact Assessments are to follow relevant legal and policy guidelines as provided by Namibia's Environmental Management Act of 2007.
- b) Some conservation management activities undertaken in the normal course of biodiversity protection are intended to affect habitats or populations of species. Such types of conservation management actions (e.g. burning regimes, elephant management and the provision of water) are not subject to a formal environmental assessment process, but decisions should always be taken within the framework of adaptive management and be fully informed of potential outcomes and risks.
- c) Guidelines provided for each zone in the Park are the key management tool to guide the environmental assessment and management process during planning and implementation of tourism activities and the development of any infrastructure to be used for park management.
- d) Environmental management should always include a careful evaluation of potential impacts and of ways to prevent, avoid or mitigate these impacts to a point where the environmental cost is commensurate with the overall purpose of the Park as well as with any legal requirements.

Activities

- a) Ensure that zonation plans and guidelines are followed in the planning and implementation of all activities and developments.
- b) For tourism related activities and developments make use of the environmental management plan developed in association with the BMM Parks Tourism Development Plan.

2.13 Consumptive resource utilisation

It is widely agreed that while protected areas should serve the purpose of conservation, natural resources within those areas may be used on a sustainable basis for economic and social gain. Given Mudumu's size and its role as a corridor and as a core area for wildlife, the consumptive use of wildlife through trophy hunting is not recommended here, but is encouraged in the conservancies surrounding the Park. However, selective hunting of game for traditional festivals may be allowed at times when the required species or numbers cannot be hunted elsewhere.

Objective

To ensure that hunting is allowed for special occasions in Mudumu National Park to supply the needs of park neighbours with venison for festivals and other activities for own use.

Strategies and Principles

- a) All resource utilisation should be economically and ecologically sustainable, and conform to policies established for habitats, wildlife and park zonation.
- b) Determination of number of individual animals hunted will be carried out according to adaptive management principles.
- c) All hunting must be cost effective, and should take into account the full costs of managing the resource, including the costs of control, monitoring and effects on the environment.
- d) MET will only harvest wildlife in specially identified zones for annual festivals of traditional authorities and for other important functions.
- e) The Park may be used as a source of wildlife for introduction to other areas.

Activities

- a) Before any harvesting is undertaken, assess the resource to ensure that ecological objectives are not violated.
- b) Before any harvesting is undertaken inside the Park, determine the feasibility of replenishing natural resources for consumption on community land.
- c) Implement park zonation for hunting activities to prevent impacts on other users.
- d) Establish procedures and protocols for how, where and when the harvesting will be conducted and managed.

2.14 Research

Park management decisions and activities should be based on accurate available information. This section specifies strategies and activities for the acquisition of such data, including the commissioning of research.

Objective

To base park management on pertinent available information and data to support an adaptive management approach, and to create a research-friendly environment, encouraging non-invasive research within the Park.

Strategies and Principles

- a) A coordinated approach to research will be created between park staff and other research agents, such as the Bwabwata Ecological Institute, the directorate responsible for wildlife research and the National Botanical Research Institute (NBRI).
- b) A supportive environment will be created for national and visiting scientists, including the facilitation of research permits, with preferential support given to applied research projects in support of priority park information or management needs.
- c) A prioritised and open-ended list of key research topics will be developed for the Park and disseminated to appropriate research institutions.
- d) Research will be supported, primarily through collaboration, and will focus on the following:
 - high value areas such as wetlands and riparian forests, as well as game movements and re-introductions, paying particular attention to the appropriate ecological spatial scale and context;
 - improving management effectiveness, especially that which pertains to human-wildlife conflict, fire, community wildlife-and-tourism-related impacts;
 - the socio-economic impact of the Park.
- e) Appropriate mechanisms will be developed to ensure that optimum feedback and other values from national and visiting researchers are obtained to inform park management decisions on all levels.

Activities

- a) Identify gaps in knowledge relating to management and where appropriate, through collaboration, find solutions to improve the understanding of the natural system and the socio-economic benefits from the Park in year two.
- b) Develop an open-ended list of priority research topics based on information needs for the management of Mudumu National Park in year one.
- c) Ensure research outputs and findings are made available to park staff and integrated with monitoring data to inform park management decisions on all levels.

2.15 Monitoring

While monitoring at Mudumu National Park relates both to natural resources as well as to management effectiveness, this section only focuses on natural resource monitoring.

Regular monitoring and data collection will feed into adaptive management and decision-making for Mudumu National Park and inform all relevant management decisions. Modern methods such as the Incident Book Monitoring System (IBMS) will be used to collect data on the variables to be monitored. The IBMS will allow for comparison between parks, obviously accounting for bio-geographic, climate and environmental differences.

Objective

To monitor a limited number of carefully selected indicators of ecosystem integrity (in general) and wildlife population dynamics to allow for timely and judicious adaptive management.



Strategies and Principles

- a) Monitoring will focus on key indicator processes, impacts, habitats and species, with an emphasis on ensuring regular data collection at appropriate intervals, cost efficiency and sustainability.
- b) Monitoring systems shall apply approved tools already being widely used, e.g. IBMS, and shall also continue with systems already established and running within the Park.
- c) Monitoring systems will be balanced to ensure that the entire range of critical information needs is covered.
- d) Information will be made widely and freely available, in accessible format to all stakeholders to feed into adaptive management decision-making.

Activities

- a) Develop an appropriate monitoring framework to include the monitoring requirements of Mudumu National Park, and incorporate ongoing monitoring initiatives and where appropriate, adapt other national systems such as the IBMS with appropriate training for staff and other implementing partners in year two.
- b) Make time-series data and analysed information available for adaptive management and for distribution to interested stakeholders, decision-makers and the general public in year two.

Chapter 3

Regional conservation, park neighbour and resident relations

The Mudumu National Park is too small to conserve all regional ecological processes and services adequately. The effectiveness of conservation also gains from scale: the greater the area under conservation management, the larger the benefit. For example, animals have larger areas over which they can move, a greater variety of attractions are available for tourists, and management costs are significantly lower. Benefits therefore increase exponentially. Moreover, relationships between parks and neighbouring communities are more harmonious if they also derive benefits from conservation.

It is therefore in everyone's interests to promote conservation activities, compatible land use practices, and management and development initiatives to the benefit of all collaborating partners throughout the broader area around the Park. This will be achieved through effective and collaborative management, monitoring and development with local and international neighbours. Good working relations must be pursued with all neighbours to achieve regionally integrated conservation.

Collaboration and integration will occur at three levels: internationally through the KAZA TFCA initiative, locally through liaison and collaborative management with communities and public service agencies, and finally with the private sector.

3.1 Transfrontier conservation

The North-East Parks including Mudumu National Park form a critical component of the KAZA TFCA shared by Angola, Botswana, Namibia, Zambia and Zimbabwe.

Objective

To manage the park within the context of a regionally integrated conservation area that encompasses neighbouring Namibian conservation areas and communities, and conservation areas in Angola, Botswana, Zambia and Zimbabwe.

Strategies and Principles

- a) Where appropriate and to the greatest extent possible, management of the Park should harmonise with management approaches used for other conservation areas in Namibia and neighbouring countries.
- b) KAZA TFCA institutions will be used for purposes of collaboration and dialogue with conservation managers in Angola, Botswana, Zambia and Zimbabwe.
- c) The integrity of the Namibian natural resources will not be compromised by activities or requirements of neighbouring countries.

Activities

- a) Collaborate at the appropriate level with and through KAZA TFCA structures and other inter-governmental cross-border structures to ensure that the objectives of this plan are aligned with the plans and objectives of other conservation areas in Namibia and in neighbouring countries.
- b) Encourage and support knowledge and information exchange programmes between conservation managers in Namibia and neighbouring countries.
- c) Develop and conduct joint management activities with neighbouring countries.

3.2 Regional land use planning and landscape level management

A number of ministries are responsible for various planning programmes within and around the Park. It is important that key provisions of this management plan and other MET plans be accommodated within these planning initiatives.

Objective

To liaise with other ministries to ensure that requirements for the management of the Park are incorporated into regional land use plans where appropriate.

Strategies and Principles

- a) MET should cooperate with relevant authorities in the regional planning process to ensure that the conservation of biodiversity is recognised as a vital use of land and a component of the regional landscape.
- b) Land-use planning outside the Park should be influenced in such a way that it is aligned and fully integrated with zonation plans for the Park and conservancies.
- c) MET management must keep abreast of all regional government initiatives, and ensure that Park plans are brought to the attention of relevant authorities.

Activities

- a) Ensure that the key elements of this management plan are accommodated in all regional planning.
- b) Ensure that regional authorities are fully aware of the economic impacts of the Park and of the negative impacts that inappropriate planning will have on conservation and its ability to contribute to the regional economy.
- c) Pro-actively embark on planning at the local and regional level to mitigate conflicts and maximise synergies between land uses.

3.3 Park residents and neighbours

Mudumu National Park can contribute to the prosperity of local communities through the establishment of viable businesses based on natural resources. Communities around the Park therefore have much to gain, especially if it is managed as a core area from which economic benefits extend to beyond the park borders. However, such a scenario is only possible if relations between park management and communities are constructive. The interactions must be based on trust so that the wider landscape of the Park and community areas can be managed and developed for mutual benefit.

The need to encourage, support and use established joint management structures such as the Mudumu North Complex and Mudumu South Complex is critical for engagement between the Park and its neighbours. Simplicity, operational efficiency and the achievement of goals are vital to the success of these structures. Following this, the obligations of park managers and community members should also guide the process.

Objective

To maintain relationships between the management of the park and the existing regional joint management structures for the mutual benefit of communities and the objectives of the Park.

Strategies and Principles

- a) Engage with communities through appropriate structures and according to the National Policy on Protected Areas, Neighbouring and Resident Communities to
 - agree on areas and activities for joint management;
 - agree on working arrangements to achieve shared visions and goals;
 - leverage benefits from the Park, and optimise economic benefits from natural resources;

- achieve regional conservation priorities.
- b) Use existing joint management structures and community institutions.
- c) As specified, supply wildlife to, and use it in neighbouring areas, subject to agreed joint management plans.
- d) The rights and obligations of the various parties should be defined and secured in joint management agreements between appropriate institutions.
- e) The communities must be partners in the formulation of ongoing joint management policies and procedures which should be binding to both park managers and communities.
- f) The MET will be guided by the National Policy on Tourism and Wildlife Concessions on State Land (2007) when awarding any tourism rights to communities. In addition, the MET will do its very best to:
 - give priority to concessions that add security to the Park, promote corridors between conservation areas and those that improve conservation in areas that surround the Park;
 - reach agreement on the management of the broader landscape and the benefits that may be achieved through wider planning, often beyond the park boundaries;
 - devolve the responsibility to achieve national and international development and conservation goals to all participants;
 - support the development and long term economic and environmental sustainability of conservancies and community forests.

Activities

- a) Identify areas that are critically important for biodiversity, engage with the relevant communities and explore opportunities for leveraging benefits to communities for the protection of these areas.
- b) Actively support and take part in the Mudumu North and South Complex joint management structures.

3.4 Private partnership

The private sector, either through small local enterprises or large businesses can contribute in various ways to the achievement of the vision and objectives of the Park.

Strategies and Principles

- a) Partnerships with the private sector must achieve one or more of the following outcomes:
 - add value to the product, including conservation and biological diversity;
 - reduce the risk to government of some activities and investments;
 - bring investment and skills development;
 - provide employment and other economic benefits.
- b) Partnerships must be driven by needs and initiated by the MET, and may not detract from the core function of the Park.
- c) Certain functions and activities may be outsourced, but ultimate control and responsibility will vest with the MET.
- d) All partnerships must be restricted to parties that understand and contribute to the achievement of the vision, goals and policies of the MET and this management plan, and must:
 - be regulated by formal contractual agreements that define the roles, responsibilities, term and other conditions of operation;
 - comply with relevant policies and procedures, in particular the concessions policy;
 - be cost-effective to the MET.

3.5 Environmental education

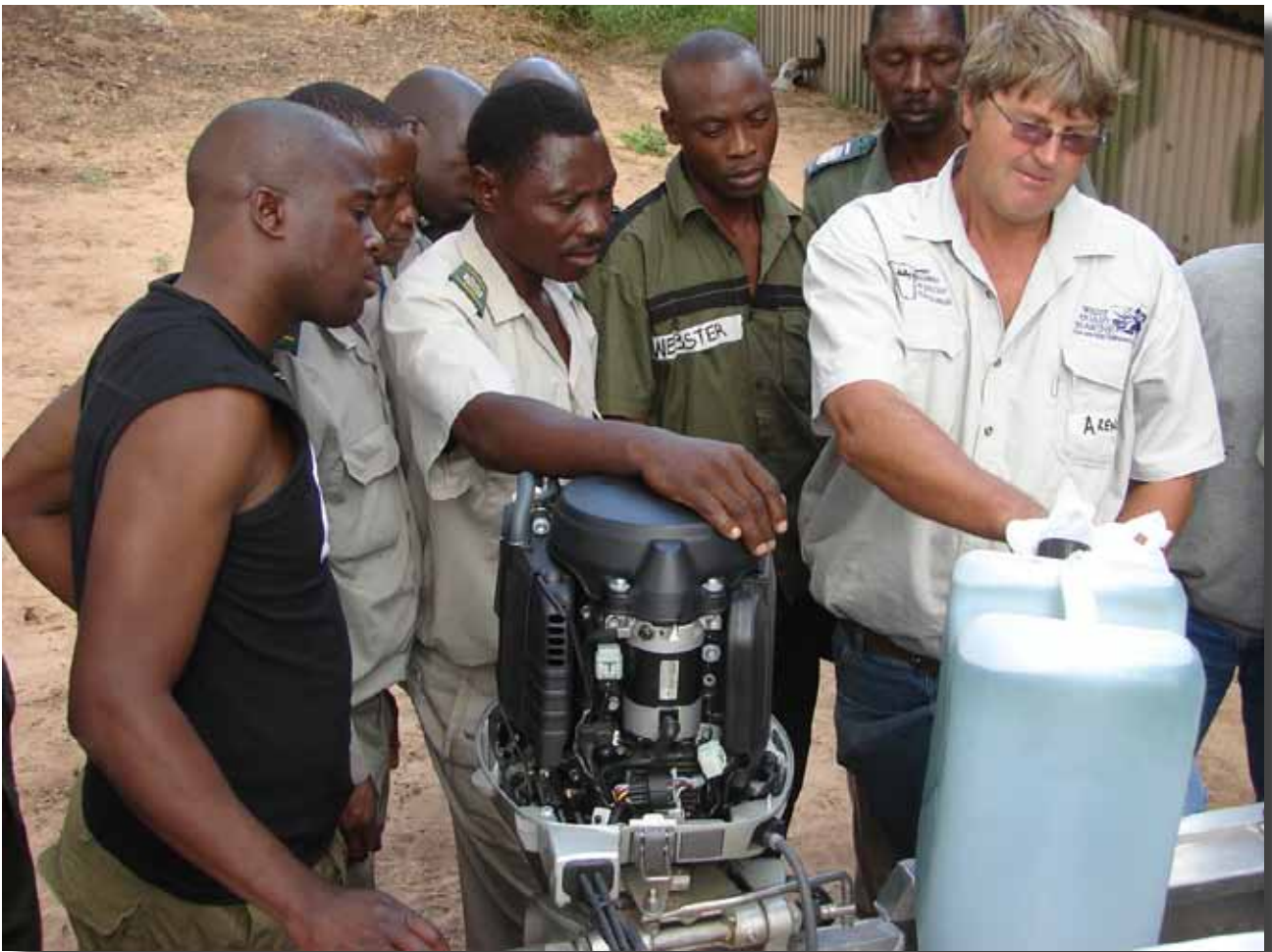
Education plays an important role in building strong environmental awareness among people, especially the youth. This is critically important around Mudumu National Park where communities need to understand the regional, national and international importance of conservation areas and their biodiversity. The MET should identify and implement mechanisms to ensure that local people have access to the Park. Particular attention should be paid to school children, leaders and business people.

Strategies and Principles

- a) Ensure that the Park is open and accessible to local people through formal interactions with schools and environmental groups.
- b) Interact with other public service agencies or donors to support environmental education.
- c) Engage with custodians of indigenous knowledge to use this information for environmental education.
- d) Actively pursue an environmental education programme through directed outreach activities.

Activities

- a) Develop and implement a strategy for promoting environmental education in the Park in year two.



Chapter 4

Zonation

As an important tool for planning and managing parks, zonation helps prioritise management activities and resources, focuses economic opportunities, and provides guidance for medium to long-term development.

The determination of zones follows a hierarchy of requirements and objectives. Those of primary importance are the legally delimited areas of the Park, the scarcity and sensitivity of natural resources, as detailed in the chapter on the management of natural resources, and features that require special management, for example as a result of heritage or social factors, would also be addressed in the primary layer. Economic and management uses are zoned at a secondary level, taking into account the objectives of the Park, as well as management, social and practical considerations, such as existing or planned infrastructure. Special attention is given to the potential for tourism and its marketability.

Objective

To ensure that zonation of the park is based on formally agreed and/or legislated uses and ecological criteria, and then on economic and management factors to achieve the purposes of the Park.

Strategies and Principles

- a) Zonation will be applied to:
 - comply with formal agreements or legislation;
 - protect scarce and sensitive landscapes, habitats and organisms;
 - protect important ecological processes, such as game movements;
 - protect cultural, heritage and other important sites;
 - achieve the economic goals of the Park;
 - achieve specific management requirements.
- b) The following will be used in applying this hierarchy:
 - habitats will be classified into zones according to sensitivity, scarcity and threat using an appropriate scale such as high, medium and low;
 - all unique landscape features, plant assemblages, cultural, historical or heritage sites should be identified and zoned appropriately to ensure correct conservation management;
 - areas for tourism and other public must be identified in pursuance of the broader economic objectives of this management plan;
 - areas allocated for public use areas must be located in zones where environmental costs are least and economic benefits greatest. Environmental Impact Assessments (EIA) are to be undertaken if significant environmental costs are anticipated;
 - all developments inside the Park should be subject to a cost/benefit analysis through an environmental assessment process. The analysis should examine all costs and benefits, including those of an ecological, economic, social and political nature;
 - activities or developments are not automatically precluded from zones having 'high conservation' status. However, higher levels of EIA scrutiny will be required in these zones.
- c) The zonation may be reviewed periodically if new information becomes available. The following principles apply to amendments:
 - zones of primary importance will be modified if new legislation or Cabinet decisions are passed requiring amendments to boundaries, or if information shows that existing economic or management uses have, or may have high negative impacts;
 - modifications to tourism zones may require consultation with affected parties if existing rights have to be altered.

Activities

- a) Implement the zonation system prescribed in this document during park level operational planning each year.
- b) Continually assess zones and sites allocated for economic purposes to ensure that socio-economic goals are optimised. This should be done in collaboration with interested and affected parties.
- c) Continually update and refine the habitat zones as new information is obtained.



Chapter 5

Prospecting and Mining

The commercial value for Mudumu National Park for mining is expected to be low and the Park does not have a history of large-scale commercial exploration and mining activities. The relatively small size of the Park makes it environmentally sensitive to mining activities. Prospecting and mining within the Park should therefore comply with the relevant conservation, environmental and economic regulatory framework. The potential economic value of prospecting and mining for Namibia is acknowledged, but both environmental and other socio-economic costs should be taken into consideration before commencing any activities.

Objective

To ensure that any future prospecting and mining activities are controlled and that rehabilitation and restoration will take place. In addition, to attempt to prevent any prospecting and mining activities in very sensitive areas in order to limit any negative impacts to the character, ecology and tourism potential of the Park.

Strategies and Principles

- a) Key zones categorised for high conservation values will be demarked and closed to prospecting and mining.
- b) Prospecting and mining in other parts of the Park will only commence when rehabilitation is guaranteed.
- c) Any prospecting and mining activities are done in accordance with the National Policy on Prospecting and Mining in Protected Areas.
- d) The long-term national benefits from the use of the land for mining must clearly outweigh benefits from other appropriate forms of land use, such as recreation and sustainable tourism. The onus is on the proponent to demonstrate such national comparative benefits, taking into account ecosystem services and non-monetary benefits of peoples' perceptions and how residents and visitors wish to use their countryside.
- e) Applying safeguards is a key strategy for avoiding and/or reducing impacts to acceptable levels. All prospecting and mining activities MUST be preceded by an EIA in accordance with the word and spirit of Namibia's EA Policy (1995) and legislation (Environmental Management Act No. 7 of 2007, and Minerals (Prospecting and Mining) Act, 2003.). The logical consequence of the EIA is the compilation of an EMP. The EMP must define objectives as well as both outcomes and the methodology (in some detail) as to how the outcomes will be achieved.
- f) The costs of any reclamation, restoration and/or decommissioning must be included in any feasibility (cost-benefit) studies and in any agreement, concession, mining licence or exclusive prospecting licence (EPL).
- g) Bio-prospecting, if it is to occur, and other uses of biodiversity must take place within a formal agreement. This may require an EIA and EMP to determine the impact and rehabilitation needs.
- h) Mining areas should be rehabilitated and/ or landscapes restored. Priority areas should be identified with MET and an approach put in place for rehabilitation/ restoration.

Activities

- a) Compile an inventory of all prospecting and mineral licenses in the Park, noting type of license, its boundaries, conditions of approval, ownership, status, timeline and contact person in year two.
- b) Develop and implement a monitoring schedule

Chapter 6

Tourism development and management

Tourism in the Park has potential to bring socio-economic benefits to the neighbouring communities, the region and the State as a whole. This may be achieved by generating income from entry and concession fees, creating jobs and business opportunities and attracting investment. Furthermore tourists derive information, and aesthetic and recreational enjoyment from their visits to the Park.

The Park's tourism attractions include its wetlands and associated birdlife, its large intact Mopane woodland, the opportunity of seeing rare and endangered wildlife such as roan and sable, as well as large herds of elephant, lion and various wetland species. Game-viewing in Mudumu is best in the dry season when wildlife drinks regularly at the Kwando River. At other times of the year tour operators complain that Mudumu has little to offer other than a scenic river / lagoon front and birdlife.

Current visitor numbers are low (in the context of Namibian parks and the North-East Parks in particular). This is due primarily to the closure in 2010 of the Lianshulu Lodges due to poor performance related to the global economic crisis. Furthermore, low visitor numbers are related to the limited and seasonal attractions on offer, and the Park's location in terms of established destinations, tourism routes and gateways. In 2011 the Park received 2,843 tourists and N\$124,980 was generated from entry fees.

There are two lodges situated on the Kwando River and operated under the Lianshulu Lodge Concession. In 2010 these lodges closed and only reopened in 2012. There are four rustic, unserviced campsites on the Nakatwa Lagoon that are operated free-of charge by MET although this is considered to be an undesirable arrangement to Park management and the neighbouring communities.

Immediately north of the Park is one lodge and campsite (operated as a joint venture between private sector and the Mashi Conservancy) and to the south there is one lodge (operated as a joint venture between private sector and the Balyerwa Conservancy). The Park also serves as an important core wildlife area in support of trophy hunting concessions in the five adjacent conservancies.

Objective

To promote tourism in the Park in order to help address the socio-economic needs of the region (particularly adjacent communities), while also providing access to wetland and woodland tourism experience for local, regional and overseas tourists, without compromising the conservation and integrity of the natural resources.

Strategies and Principles

- a) In developing tourism in the Park MET will be guided by the BMM Parks Tourism Development Plan, this management plan, the Cabinet Decision (18th/20.07.99/004), the National Policy on Tourism for Namibia (2008) and the National Policy on Tourism and Wildlife Concessions (2007).
- b) Based on the Cabinet Decision of 1999 regarding the North-East Parks (18th/20.07.99/004), MET should award tourism rights inside the Park to the neighbouring communities.
- c) Tourism developments or activities may be undertaken by MET, or by external partners such as communities or the private sector. Tourism developments or activities undertaken by communities or the private sector must be done in accordance with the concessions policy and regulated through written agreements (see Appendix 3 for tourism concession recommendations for Mudumu National Park).
- d) MET should use existing stakeholder forums, such as the Mudumu North and South Complexes or the Mudumu Landscape Committee, to ensure effective cooperation and liaison, and create synergy in the management of tourism in and around the Park.
- e) MET should engage with the KAZA TFCA project to ensure strategic interventions are implemented that will

increase the viability of tourism in the Park.

- f) Feasibility studies should precede any tourism developments or concessions inside the Park. Such studies should include, among other components, a cost/benefit analysis whereby objectives are stated, and where financial/economic, environmental and social costs and benefits are evaluated. This would include costs and benefits to all relevant parties, such as MET, communities, and the private sector.
- g) Tourism developments in the Park should (a) cover the full² cost to the MET of managing and developing the products and related infrastructure, and/or (b) meet defined socio-economic goals, and/or (c) meet defined access goals in terms of attracting local, regional and overseas tourists into the Park.
- h) MET will plan and develop tourism in the Park to take account of different source markets, product types and affordability, and the experience required by the respective markets.
- i) Tourism zonation (see BMM Parks Tourism Development Plan) may be periodically reviewed in line with changing demands and environmental considerations, while being mindful of the possible impacts on any existing products.
- j) High levels of exclusivity should only be considered where the economic returns are also high, or where potential environmental impact is high if there are too many different users.
- k) The maintenance of accommodation facilities and support infrastructure (water, sewerage, electricity, etc.) will be the responsibility of the operator of the facilities. The standards for these must be agreed to, monitored and controlled by the MET.
- l) The density of visitors can affect enjoyment or experience of an area. If densities increase to unacceptable levels, MET may impose temporary or permanent limits on the number of users or use other mechanisms to ensure that tourism experiences are commensurate with the type of product offered.

Activities

- a) Periodically review the recommended tourism developments and activities for the Park (see BMM Parks Tourism Development Plan), taking into account the purpose of the Park, the needs of different target markets, and the intended experience offered to tourists.



²Includes administration, infrastructure, staff time, equipment, marketing and supplies, as well as any opportunity costs, which may be relevant.

- b) Implement the Park's tourism use zones (see BMM Parks Tourism Development Plan (2009)), based on the following:
- environmental zonation and considerations;
 - proximity of services and support infrastructure;
 - the sense of place offered by an area;
 - the need to separate different users groups, especially in small areas;
 - optimisation of economic benefits and costs.
- c) Based on the Cabinet Decision of 1999 regarding the North-East Parks (18th / 20.07.99 / 004), identify priorities for the award of tourism rights to neighbouring communities and start implementation in accordance with the concessions policy.
- d) Clearly state and monitor the objectives of each tourism product or concession to ensure they are achieved, and to implement corrective action where objectives are not being met.
- e) Identify priorities for visitor management such as maps, interpretative materials, visitor facilities, etc. from this management plan and other associated plans, and start implementation.
- f) Through the KAZA project, MET should engage with the Botswana government to investigate and implement border crossing strategies that will optimise the viability of tourism products in and adjacent to the Park.
- g) Address accessibility within the Park by evaluating and realigning the track network, particularly in the eastern woodland, which has potential for tourism activities, but currently has a limited track network.



Chapter 7

Infrastructure

Infrastructure within the Park can play a critical role in realising the economic potential of the Mudumu National Park, and in improving management efficiency. However, infrastructure may also have negative impacts on landscapes, biota and tourism if not properly planned, designed, located and developed.

Existing old buildings at Nakatwa and Santika should be removed and the sites rehabilitated according to MET guidelines and, where possible, old building material should be incorporated into new structures.

Infrastructure requires maintenance if it is to function properly. Annual budget allocations for maintenance can be kept low if these fixed improvements are properly designed, appropriately located, constructed by skilled contractors using materials of good quality, staff are properly trained, quarterly inspections are carried out on time and small maintenance tasks are carried out immediately.

Objective

To keep infrastructure to a minimum; to properly design, build and maintain all infrastructure that contributes to the overall purpose of the Park.

Strategies and Principles

- a) Decisions about building park management infrastructure will be based on strategic planning and feasibility studies using a master plan approach.
- b) Infrastructure dedicated to park management and to tourists should be physically separated, for example at park entry stations.
- c) Where appropriate, infrastructure planning should be done in consultation with neighbouring communities to optimise conservation and economic objectives.
- d) Infrastructure design should take cognisance of the Park's major ecological drivers: elephants, flooding of low-lying areas and fire.
- e) All infrastructure must be planned in appropriate zones, and be approved in terms of MET procedures and development policies.
- f) Before any new fixed infrastructure is developed, annual maintenance costs must be estimated and provided for in annual budgets.
- g) All developments in the Park must comply with the Environmental Management Act (2007), and have environmental clearances issued by the appropriate authority.
- h) Developments should have access to support services, such as reliable sources of water, telecommunications, electricity (unless solar is used), and road access.
- i) Water, electricity and communication lines should be visually unobtrusive, for example by being buried and/or aligned along roads.
- j) All national infrastructure standards must be followed, for example those on water extraction and discharge, engineering and design standards, etc.

Activities

- a) MET will develop an infrastructure master plan for all park infrastructure.
- b) Given the current poor condition of park infrastructure, MET will actively raise funds and undertake infrastructure upgrade projects as a high priority.
- c) MET will compile annual maintenance plans for all new and existing infrastructure, specifying planned works, cost estimates and the need for any specialised skills.

7.1 Access and roads

The Park is traversed from north-west to south-east by the proclaimed gravel road MR125, which is currently being upgraded to bitumen standard. There are two main access points to the Park, both of which have no controlled entry gates, although at the time of writing, a control point was under construction at the northern entrance. A reasonable network of tracks, mainly along the Kwando River, traverses the Park, although in the eastern woodlands this network could be improved to make it more accessible for tourists and park staff (especially in the wet season when some tracks become waterlogged and muddy).

Strategies and Principles

- a) Official entry points should be kept to a minimum. They must be signposted and the entry control measures must be commensurate with their costs and benefits.
- b) The following must be complied with at controlled entry points:
 - opening and closing times are agreed and publicised;
 - a register is maintained of all people and vehicles entering and leaving;
 - an operating protocol is agreed and enforced;
 - all permits or entry fees are collected and paid, and there is an audit procedure.
- c) At official park entry points, visitor facilities and management infrastructure must be physically separated.
- d) To add value to the benefits of conservation and tourism, concessions for special access may be giving to lodges, tour operators/concession holders provided the benefits outweigh the cost of management.
- e) MET should engage with relevant authorities to reduce the impacts of public roads, road network extension around the park periphery and within the Park including use of signage and enforcing speed reductions in strategic areas.
- f) Where possible, the impacts of roads and tracks on biodiversity and tourism must continually be assessed and options explored to minimise the impacts.
- g) Environmental clearance, an EMP and approval by MET are required before any road-building material is collected in the Park. Where necessary, the reclamation of the site of extraction must be secured with a performance bond.



- h) Park roads should be kept to a minimum, and be designed to be cost-effective so that development and maintenance costs (financial and environmental) are commensurate with the benefits of the roads.
- i) Existing road networks are to be reviewed and recommendations made regarding any changes including the realignment of roads to improve tourism, to reduce environmental impact and to improve management efficiency.
- j) Where possible, road construction needs to be done with minimal use of local material and disturbance of soil, to ensure minimal environmental and visual impact. The grading of un-surfaced park roads is discouraged.
- k) The park road network must be provided with appropriate branded park signage.

7.2 Buildings

New management infrastructure is currently being constructed at Ngenda, located on the northern boundary of the Park. All other infrastructure at Nakatwa and Santika is dilapidated and in a state of neglect.

Strategies and Buildings

- a) Restrict building height and ensure that the building style blends with the environment to reduce visual impact.
- b) Use building materials produced in an energy-efficient manner³, including local and recycled materials, provided they are cost effective.
- c) Use water and energy efficient fittings in all facilities.
- d) Design buildings in a way that they are protected from damage by elephants, fire and flooding.
- e) Use cross ventilation, high ceilings, cavity walls and other passive cooling methods as far as these are practical.
- f) Position buildings to maximise cooling in summer and heating in winter.
- g) Design compact development sites to minimize disturbance footprints.
- h) Standardise materials, fittings and fixtures for easy maintenance.
- i) Ensure that structures containing fuels meet national requirements, and erect containment structures to minimise the effects of leakage and spillages.
- j) The location of staff accommodation should be determined to optimise:
 - management efficiency;
 - proximity to entrance gates;
 - proximity to visitor areas;
 - proximity to services such as schools, clinics, shops, etc;
 - the desirability of being accommodated in nearby towns or formal settlements.
- k) Staff facilities must comply with acceptable safety standards for people who reside in the Park and commute to work, and comply with MET staff housing policy.

7.3 Tourism infrastructure

For the purpose of this plan tourism infrastructure includes accommodation and all its associated support infrastructure (which should be constructed and maintained by concessionaires), as well as facilities provided by MET specifically for visitors, such as park entry facilities, access roads and tracks, signage, view points, hides, etc. Such infrastructure should adhere to the relevant strategies and principles specified within this chapter.

Strategies and Principles

- a) Tourism infrastructure should be commensurate with the needs of the dominant markets visiting the Park and their specific needs. In the case of Mudumu National Park, the majority of visitors seek a 'natural bush experience'. Infrastructure should therefore be simple, unobtrusive, rustic and in keeping with maintenance of a 'bush experience'.
- b) Tourism infrastructure should be located in accordance with a cost-benefit analysis to maximise tourism appeal and value, while complying with zonation parameters and other conditions, which may be applicable.
- c) Infrastructure should be located as close to existing services and major access routes as the product will allow.
- d) Environmental guidelines for tourism infrastructure should be prepared and included as part of all concession agreements and works contracts.

3 This implies materials, which are energy efficient in their manufacture and transport to site.

7.4 Airstrips and aircraft

The 1,300 metre gravelled, unfenced Lianshulu airstrip is located approximately 3 km south of Ngenda in Mudumu National Park. The airstrip is mainly used for fly-in tourism, natural resource management purposes (i.e. game counts, game capture, etc.) and visits by officials and consultants. The airstrip was developed by and falls under the responsibility of MET. The airstrip is managed and maintained by Lianshulu Lodges Pty Ltd under a written concession agreement with MET.

Strategies and Principles

- a) While airstrips provide important access to the Park for tourists and management, new airstrips should only be considered following thorough investigations.
- b) Where possible, existing airstrips should be used and new ones should be located outside the Park.
- c) Construction of new airstrips and major renovations of existing ones should require environmental clearance certificates.
- d) Helicopters should use airstrips and helipads should only be permitted if there is no impact on other park users.
- e) A 'no flying' restriction below 1,000 metres will generally apply, and no low level aerial sightseeing will be permitted without written approval by MET.
- f) Noise pollution and disturbance of other park users will be avoided as far as possible.
- g) Use of airstrips inside the park will only be done so with permission from MET.

7.5 Waste management

The disposal of waste is often problematic in remote areas, and the volume of waste will grow as the use of the Park increases. The proper treatment and discharge of wastewater is especially critical where developments are close to wetlands and boreholes

Strategies and Principles for solid waste

- a) Management should be based on the principle of "use less, use the correct materials and recycle more".
- b) In the long term, management will strive to remove all waste from the Park to formal waste management sites, although biodegradable waste may be composted where appropriate and environmentally feasible.
- c) Tourism providers and employers of staff living in the Park are responsible for the removal of their own household waste, or that generated by tourists and staff, to approved waste disposal sites.
- d) Waste storage facilities must be properly enclosed to prevent access by wildlife and pollution by wind-blown litter. These facilities must be approved by the MET and may hold waste for a maximum of 28 days; shorter periods will apply if high volumes accumulate and health issues arise.
- e) Where practical, waste must be sorted for recycling.
- f) Transport of waste to storage or dumpsites must be in properly constructed vehicles or containers to ensure that no littering occurs.
- g) All new and existing developments must develop an EMP for waste management.

Activities for solid waste

- a) Park management must assess existing sites and if necessary initiate a monitoring programme to ensure they comply with national legislation, policy and standards.
- b) Disposal sites/temporary storage sites that are found to be inadequate, especially where water is being polluted, or at risk, must receive urgent attention to resolve any problems, if necessary closing the existing sites and relocating them.
- c) Park management must develop an appropriate waste management procedure and enforce compliance by all staff, tourism providers and other agencies.



Strategies and Principles for liquid waste

- a) Liquid waste must be processed according to the most appropriate system, taking into account the practicalities, volumes of waste, availability of water, costs of disposal and environmental impact.
- b) The MET and other relevant ministries must approve all liquid waste handling systems, which should comply with national standards and legislation.
- c) The pollution of groundwater is to be avoided, but also monitored, if necessary by enlisting the help of relevant government departments.
- d) Any toxic substances and the disposal of the empty containers must comply with national regulations and the use of all cleaning and other potentially toxic substances must be approved by MET.

Activities for liquid waste

- a) Park management must assess the existing sites and if necessary initiate a monitoring programme to ensure that they comply with national legislation, policy and standards.
- b) Those found to be inadequate, especially where water is at risk of or is being polluted, are to receive urgent attention and a strategy implemented to resolve any problems.

7.6 Human safety

Wildlife and wildfires pose a threat to tourist and staff safety within Mudumu National Park. Park management must monitor those instances and areas where this is likely to happen. Proactive action can often prevent or minimise these problems and therefore strategies and activities for human safety need to be set and implemented.

Strategies and Principles

- a) Protective barriers, e.g. trenches or electric fencing, should be erected where the threat of elephants is likely to be high. These barriers should be monitored to assess their effectiveness.
- b) Clearing of firebreaks or regular back-burning around key infrastructure should be done to minimise risks to staff and visitors. Other strategies and activities related to fire management outlined in this plan should be adhered to.
- c) Proactive and adaptive management principles should be applied to human safety in the Park, particularly if new threats have been identified or incidents occurred.
- d) Notices and warning signs must be displayed in appropriate places and in several languages.
- e) Access to the Park is conditional on a waiver of liability for visitors and families of staff.
- f) Actions, which will increase the likelihood of injury or death must be prohibited and drawn to the attention of all park users. These may include feeding animals, and straying from vehicles, etc.
- g) Facilities must be designed and developed to ensure risk to life or property is minimised, while allowing visitors to still enjoy the wildlife viewing and tourism experience.

Activities

- a) All protective and precautionary measures, such as barriers, firebreaks, notices, and signs should be regularly maintained and assessed for their functionality and effectiveness.
- b) New threats or human safety incidents need to be monitored and acted upon immediately by park management and staff.

7.7 Fencing

The Park does not have any border fences to allow for free wildlife migration. However, there are a few fences within the Park to protect existing infrastructure and for human safety.

Objectives

To protect existing infrastructure from wildlife damage and in return to prevent harm to wildlife by accidents, as well as to guarantee human safety within Mudumu National Park.

Strategies and Principles

- a) As an unfenced open system, no strategies and principles for border fence maintenance are necessary. Should this approach change at any point, such strategies and principles need to be developed in line with the regulations relating to Nature Conservation Ordinance Number 4 of 1975 (as amended).
- b) Appropriate fencing and protective barriers, e.g. electric fencing, should be erected to keep wildlife away from existing infrastructure to ensure the safety of people, to protect the infrastructure from potential damage as well as protecting the wildlife from potential harm.
- c) Fences and barriers should be monitored to assess their effectiveness and removed, replaced or upgraded if their intended purpose is not achieved.

7.8 Water supply

Water provision within the Park is critical for use by park staff and tourists. Water for domestic consumption is currently supplied primarily from the river by means of engine driven pumps. These installations pose a threat of fuel and oil spillage into the river system, and also pose health risks to staff and tourists.



Objective

To provide potable water for domestic use within Mudumu National Park to a sustainable and environmentally appropriate standard

Strategies and Principles

- Where appropriate, all domestic water supply should be of potable quality from boreholes.
- Any domestic water supply from river water should be treated to prescribed quality.
- Any river abstraction installation should be constructed and located in such manner as to prevent fuel and oil spillage into the river.

Activities

- All domestic water supply installations should be regularly maintained and assessed for their functionality and effectiveness.
- Park management must monitor all water supply installations on a continuous basis and when found not to be compliant, to be acted on immediately.

Chapter 8

Administration and management

Since management and administration underpin all operations, an efficient administrative structure is required to support financing, procurement, human resources, stores and supplies, and maintenance of the Park. Many of these aspects are controlled by public service and/or MET policy, procedures or legislation. These measures limit the autonomy of park administrators and managers. Innovative operating procedures could nonetheless be implemented to address issues specific to local conditions.

Objective

To ensure compliance with public service policies and procedures within which an efficient operating system is implemented for the conservation and economic development of Mudumu National Park.

Strategies and Principles

- a) **MANAGEMENT PLAN:** The current document represents Mudumu National Park's management plan that includes the following minimum components: the purpose and objectives of the Park; a summary of core ecological, social, and economic principles and drivers. The management plan must be in standardised, useable, practical format that is easy to implement and adapt and complies with the MET's 'Framework and Guidelines for Development of Park Management Plans'. Mudumu National Park further has an operational plan that summarises and guides all the normal activities and developments conducted by park management. This operational plan comprises eight management tools: 1) a summary of the policy framework, 2) an annual work plan, 3) a monthly work plan, 4) a development planning calendar, 5) zonation plan and guidelines, 6) a financial planning system, 7) a compilation of background information, and 8) a monitoring and evaluation system.
- b) **LAW ENFORCEMENT:** Illegal hunting remains a major management issue for MET as well as conservancies and community forests since poaching poses a major risk to wildlife and tourism products. Vigilance against wildlife crime is therefore a very high management priority.
- c) **COMMUNITY INVOLVEMENT:** Since communities have close links to the Park and its natural resources, mechanisms must be found that improve management efficiency by employing or outsourcing work to local people, and through joint implementation of key activities such as law enforcement, fire management, etc.
- d) **RESEARCH AND MONITORING:** An active monitoring system of carefully selected and agreed indicators, both bio-physical and socio-economic, is essential if management effectiveness is to be improved and adapted as conditions change. Monitoring systems, such as the IBMS must therefore provide key information, especially regarding threats or opportunities. Monitoring on an operational level is not limited to the natural resource base, but also includes management efficiency as detailed in Tool 8 – Monitoring and Evaluation System of the operational plan. Research will be supported, primarily through collaboration, and will focus on the following:
 - high value areas such as wetlands and riparian forests, as well as game movements and re-introductions;
 - improving management effectiveness, especially that which pertains to human-wildlife conflict, fire, community wildlife-and-tourism-related impacts;
 - the socio-economic impact of the Park.
- e) **HUMAN RESOURCES** play a critical role in the management of the Park, and therefore training and continuous staff development are essential. The MET policy on HIV/AIDS must be implemented. Procedures should be implemented to redress past gender imbalances.
- f) **FINANCIAL CONTROL AND FUNDING:** Financial controls as required under MET and other policies and legislation must be complied with. However, a broader, proactive business approach that continually resets targets of performance must be adopted. Resource and cost estimates must be monitored to ensure that targets for specific deliverables are met and improvements made. Alternative sources of funding should continually be explored to improve the management and operating efficiency of the Park.
- g) **GENERAL ADMINISTRATION:** Mechanisms, which improve effectiveness of delivery, must always be explored. All assets must be accounted for, maintained and applied to their intended uses. Where appropriate, new technologies, equipment and fixed infrastructure must be explored and introduced.

Activities

- a) Prepare and implement the eight management tools of the operational plan for Mudumu National Park, namely a summary of the policy framework, an annual work plan, a monthly work plan, a development planning calendar, a zonation plan and guidelines, a financial planning system, a compilation of background information, and a monitoring and evaluation system.
- b) Formulate annual work plans with outputs and budget allocations (this task falls to park managers) that are agreed to by senior staff. Monitor implementation of the plans. Plans are to address major challenges and should ensure that important opportunities are optimised, for example:
 - activities must be resourced with appropriate staff, equipment and funding;
 - mechanisms should be provided to overcome challenges;
 - opportunities to review and modify work plans must be created, and adaptive management applied as circumstances change;
 - work plans with expected deliverables and dates should always be communicated to people responsible for these functions.
- c) Decision makers at all relevant levels should support park managers in their endeavours to implement this plan.
- d) Ensure that all MET assets are accounted for, protected and maintained in working order and deployed to contribute towards this plan.
- e) Monitor any changes in legislation and advise on their impact on the Park and associated operations.
- f) Identify gaps in knowledge relating to management and where appropriate, through collaboration, find solutions to improve the understanding of the natural system and the socio-economic benefits from the Park.
- g) Establish a system of monitoring and recording all aspects of the Park so that control can be exercised and management improved, especially with respect to:
 - the socio-economic benefits which result from the Park;
 - the development and responsible operation of tourism products;
 - compliance with all collaboration agreements;
 - adherence to budgets, and accountability for finances.
- h) Develop a respectful and efficient working relationship with staff and other stakeholders, especially neighbouring communities.
- i) Make recommendations and follow up on any reviews or changes to this plan, relevant legislation, development requirements, funding, research and other management related issues.

Park: MUDUMU NP		Year: 2											
TASK:		1	2	3	4	(5)	(6)	7	8	9	10	11	12
LAW ENFORCEMENT	RANGERS	///											
DAILY FOOTPATROL	RANGERS		///	///	///			///	///	///	///	///	///
CAMPING PATROL	RANGERS											///	///
BOAT PATROL	RANGERS												
WEEKLY ACTIVITY MEETING	RANGERS							///					
MONTHLY VEHICLE COUNT	RANGER/W												
VEHICLE & TOURIST PATROL	RANGER				///								
INCIDENT BOOK MONITORING	RANGER				///								
GATE STAFF													

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Glossary

ALIEN SPECIES: Any plant or organism that has been introduced to by humans into habitats far outside their native range, either directly or indirectly and intentionally or unintentionally. These species have the potential to cause significant ecological damage, often out-competing native species or changing the environment to such an extent that entire indigenous ecosystems may become threatened. Not all alien species are invasive, however, the chances of an invasive species being introduced increased rapidly with the number of alien introductions.

CONSERVATION: The management of the human use of the biosphere so that it will yield the greatest sustainable benefit to present generations, while maintaining its potential to meet the needs and aspirations of future generations. It includes preservation, maintenance, sustainable use, restoration and enhancement of the natural environment.

HABITAT: The natural home of a plant or animal species. Generally those environmental features or characteristics of an area, which are essential to the survival of an animal or a plant.

OMURAMBA: Herero word for an ephemeral river, plural omiramba.

SUSTAINABLE: Using a resource so that the resource is not depleted or permanently damaged

SUSTAINABLE USE / UTILISATION: Harvesting of a given species of plants or animals in such a way that their stocks do not decline in number over time.

WILDLIFE: All the indigenous biota, which occur within the area.



Appendices

Appendix 1

Biophysical zonation of the North-East Parks and its application to Mudumu National Park

Introduction

The management plan for Mudumu National Park prescribes the two core purposes of the Park, namely to protect biodiversity and to maximise the potential for regional economic development. The plan further explicitly recognises the position of Mudumu National Park in KAZA TFCA.

The management plan also prescribes the zonation scheme to be used. This is applied as different layers in a hierarchical manner, with the legally prescribed or agreed land uses zoned first, followed by zonation of the biological and physical aspects of the parks, and finally by zonation of the economic uses.

The approach taken therefore allows economic uses in most areas, but only after assessment of environmental impacts and with significant regulation. Crucially, and in line with the prescriptions of the MET Concessions Policy, utilisation is to be regulated through the standard process of EIA. In the zonation of Mudumu National Park emphasis is thus placed on guiding the level and intensity of the EIA process.

For comparative purposes, and in order to contextualise Mudumu within the region and relative to the other North-East Parks, this appendix describes the approach to biophysical zonation of all the North-east Parks. The term biophysical here includes two aspects:

- a) It defines zones based on the sensitivity, scarcity and threat to different habitats, and in terms of their social, cultural, historical or biological uniqueness. These represent the Habitat and Special Management Zones.
- b) It defines the positions of infrastructure development sites related to a) park management, and b) tourism developments.

In addition, rules and guidelines applicable to the respective zones are described, and maps that define the zones for each of the parks are provided.

Types of zones

- **Very important:** All rivers, floodplain and swamp areas, and riparian forests;
- **Important:** Omuramba grasslands and pans and fringe woodland, mopane woodlands in Mudumu; and deciduous woodlands.

SPECIAL MANAGEMENT ZONES

Sites that contain features of particular significance such as unique plant communities, important breeding sites, special landscape features, cultural, historical or archaeological sites, highly erodible soils, etc.

INFRASTRUCTURE DEVELOPMENT SITES

These are divided into those that relate to park management, and those that relate to tourism use. Park management zones consist of sites where management buildings, including housing, offices, and workshops and related infrastructure are located. This includes infrastructure of other ministries, which is accommodated inside parks.

The boundaries of the management-related infrastructure development sites have been determined in the park

planning process, an EIA process was conducted and an EMP drafted. Tourism-related infrastructure development sites include actual and potential sites of lodges, campsites, and picnic sites, but none of these have undergone an EIA process yet. Some tourism development sites have not yet been identified, in particular those that form part of concessions that will have to undergo an EIA process before the sites are determined.

Zonation maps

Habitats in Bwabwata, Mudumu and Mamili were identified using the Caprivi Vegetation Map as a basis. Each vegetation type was assigned a diversity and conservation value.⁴ These values, together with the basic division between riparian, omuramba and woodland habitats, were used to define the zonation.

All riparian and wetland vegetation (floodplain grasslands, and riparian thickets, woodlands and forests), and open water types were assigned to the Very Important category. All omuramba grasslands and their associated fringe woodlands were assigned to the Important category. Mopane woodlands in Mudumu were also assigned to this category because of their intact state, the presence of many tall, mature trees, and the special nature of the clay and clay-loam soils on which they occur. All deciduous woodlands, comprising mainly *Baikiaea* and *Burkea*-dominated woodlands with differing canopy cover and stature of the woody species were grouped in the Less important category. More detail on this process can be found in the full Zonation Report.⁵

Because the zones were based on vegetation types, they tended to have very convoluted boundaries, which were often not visible on the ground. Where relevant and for practical management purposes, these boundaries were then moved to the closest roads. In Mahango the national road now separates the Very Important zone from the other zones.

Cross-cutting guidelines and rules for zones and uses

- a) An important principle to be used during the EIA process is that tourism facilities and activities should maximise social, economic or political benefits and minimise environmental costs.
- b) Proposed developments (including tourism and management infrastructure or road developments) must be evaluated against the total number of developments recommended in this management plan and any tourism development plans for the parks.
- c) Development will not be permitted in areas that have a special appeal. These areas are zoned as *Special Management Areas*.
- d) The whole region has a long history of settlement and contains some pre-historical sites that have not been adequately mapped. EIA processes must thus consider the potential occurrence of sites of archaeological significance in proposed development areas.
- e) Preference must be given to developments close to park boundaries and existing service infrastructure such as major access roads, power lines and so on.
- f) Where possible new developments should be done on so-called *brownfield* sites (sites that have previously been impacted, such as old military bases).
- g) In keeping with the general aim of sustainable utilisation, preference will be given for developments with small environmental footprints. This means that low-impact building materials⁶ and techniques must be used and energy and carbon budgets minimized.
- h) Sites may be secured against large mammals or predators through the use of appropriate fencing material, and against fires through the use of firebreaks. Fencing material should blend in as much as possible with the immediate environment.
- i) The emphasis is on managing total environmental impact, from construction or implementation to operational environmental impacts.

⁴C.J. Hines in Mendelsohn, J. & Roberts, C. (1997) An environmental profile and atlas of the Caprivi. Directorate of Environmental Affairs, Ministry of Environment and Tourism, Republic of Namibia.

⁵Bwabwata, Mudumu and Mamili Parks Project, BMM Project: Park-level Biophysical Zoning. 2009. Addendum to Project Report of the Park Operational Planning Component, Ministry of Environment and Tourism, Republic of Namibia

⁶For example, locally-sourced materials usually have less embedded energy than materials that have to be transported from far, steel has less embedded energy than concrete for a similar range of structural strengths, and second-hand building materials have already discounted some of the embedded energy.

- j) In general, road construction should be minimised to conform to the agreed road network. Emphasis must be placed on the re-alignment and upgrading of existing roads, rather than construction of completely new roads. New road construction will be allowed only with a very good justification. Where roads are re-aligned, redundant roads should be ecologically restored.
- k) EIA processes for all road construction activities should include at the very least a scoping and an EMP.
- l) Each development proposal will be required to show, even in broad terms, how it will minimise waste and carbon production and energy use (the detail of these plans will depend on the total extent of the proposed development or activity). In addition, waste management protocols must be drafted wherever relevant, with the general aim to reduce, re-use and recycle (in that order of priority).
- m) Commercial tourism operations are required to dispose of their waste outside the parks in a properly appointed facility designed for that purpose. No permanent waste disposal is allowed inside the parks.
- n) No potentially polluting activities (such as frequent vehicle servicing and/or other mechanical maintenance or repair activities) may be conducted in any zone. Within reasonable limits, vehicles may undergo small services, providing all hydrocarbon fuels, lubricants and waste products are handled according to national regulations and in line with the applicable EMP, and disposed of outside the Park in a properly appointed facility.
- o) Where relevant, handling, storage and disposal of all hydrocarbon or any other potentially polluting substances must be an explicit part of all EMPs. The use and storage of pesticides and herbicides are not allowed, except in small quantities such as may be required to control insect pests in dwellings.
- p) The regulatory framework for hunting provided by the Nature Conservation Act of 2004 takes precedence over these guidelines. However, the following additional measures apply to hunting in the North-East Parks. Hunting activities – including the construction of camps or roads, hunting on foot, and use of vehicles or boats during hunts – will not be limited to specific zones, and are thus subject to the same usage rules as any other form of tourism or consumptive use. In certain places where photographic tourism and hunting overlap, and depending on the terms of concession contracts, hunting may be limited to certain times of the year when normal tourist access may be controlled.
- q) No off-road driving is permitted in any zone.

Guidelines and rules for each zone

VERY IMPORTANT HABITAT ZONE

Environmental impact assessment (EIA) process

- a) There is a very high likelihood that a full EIA will be required for any development in this zone. The justification for anything less than a full EIA must be strong. At the very least the EIA process will include a scoping and an EMP. In each case the benefit of placing a development in this zone must be compared with the option of placing it in an *Important* or *Less Important Zone*.
- b) The EIA process must include the potential cumulative impacts of all tourism activities, including number and periodicity of game drives and boat trips, as well as the environmental impact of existing and other planned lodges.

Construction guidelines

- c) Although some level of EIA will still be required, locating a development on a *brownfield* site will mean less chance that a full EIA will be required. *Greenfield* sites can be used, but this must be well justified and the EIA process must show not only that the impacts will be minor or positive, but that they can be easily managed.
- d) Non-permanent structures are preferred for tourism developments, with a strong emphasis on using low-impact building materials and building methods (in terms of energy, carbon and waste).
- e) Where possible, fencing should preferably be limited to a few electrified strands. Other types of fencing may be needed provided there is an appropriate justification.

Management approach and particular activities

- f) Park management must prioritise their resources to reduce or eliminate threats to these areas.
- g) Management actions must include the monitoring and regulation of tourism activities.
- h) The provision of artificial water to attract game is not allowed in this zone.
- i) No waste storage, other than temporary storage for sorting activities, is allowed in this zone. No permanent waste dumpsites are allowed here.
- j) A road that has become redundant because it has either been re-routed or replaced must be restored. Trenches dug for services (water, sewer or power lines) must be restored, regardless of whether it is inside a concession

construction area or not.

General tourism rules and guidelines

- k) Where concession agreements permit, motorised boating access is allowed on open water, but number of boats and density must be subject to an assessment of cumulative impacts.
- l) The intensity and frequency of both land- and water-based game viewing and other recreational uses will be frequently reviewed in terms of single and cumulative impacts on ecological processes and/or biodiversity properties and/or physical geography. Limits for either or both aspects may consequently be changed as part of the overall adaptive management approach.
- m) Where applicable boat speed must be kept below non-wake speed at all times; fuel and oil to be stored at least 50 m from water; fuel to be kept in floatable watertight containers; the volume of all fuel and oil to be stored on site to be determined in the EIA process as part of each concession. Boats to have maximum 50 hp motors.

IMPORTANT HABITAT ZONE

Environmental impact assessment (EIA) process

- a) The likelihood that a full EIA will be required is smaller than in the Very Important Zone. At least an environmental scoping and a full EMP may be necessary for new structures and activities.
- b) The EIA process must include the potential impacts of all tourism activities, including number and periodicity of game drives, and must assess these in view of potential cumulative impacts across the whole Park

Construction guidelines

- c) Developments should ideally be located on sites that are already impacted. Greenfield sites can be used, but these must be well justified.
- d) Semi-permanent structures (e.g. wood and thatch with concrete bases) are permitted, within the limits imposed by the specific site conditions, such as by the clay soils in Mudumu.

Management approach and particular activities

- e) This zone has lower priority in the allocation of management resources for reducing or eliminating threats. Management actions must still include the monitoring and regulation of tourism activities, but the frequency and intensity of such monitoring may be less than in the Very Important Zone.
- f) Subject to the conditions defined in the management plan, artificial water provision is allowed. Conditions include the definition of the intended purpose of the water provision, an appropriate risk analysis, and a management strategy. The risk analysis must include clear ecological and/or economic goals, potential cumulative effects on the wildlife, habitat structure and ecological processes. The management strategy must consider all options, which range from seasonal or even longer-term closing of the water hole through to continuous operation.
- g) No waste storage, other than temporary storage for sorting activities, is allowed in this zone. No permanent waste dumpsites are allowed here.
- h) A road that has become redundant because it has either been re-routed or replaced must be restored. Trenches dug for services (water, sewer or power lines) must be restored, regardless of whether they are inside a concession construction area or not.

General tourism rules and guidelines

- i) The intensity and frequency of game viewing and other recreational uses will be frequently reviewed in terms of their single and cumulative impacts on ecological processes and/or biodiversity properties and/or physical geography. Limits of use may consequently be changed as part of the overall adaptive management approach.

SPECIAL MANAGEMENT ZONE

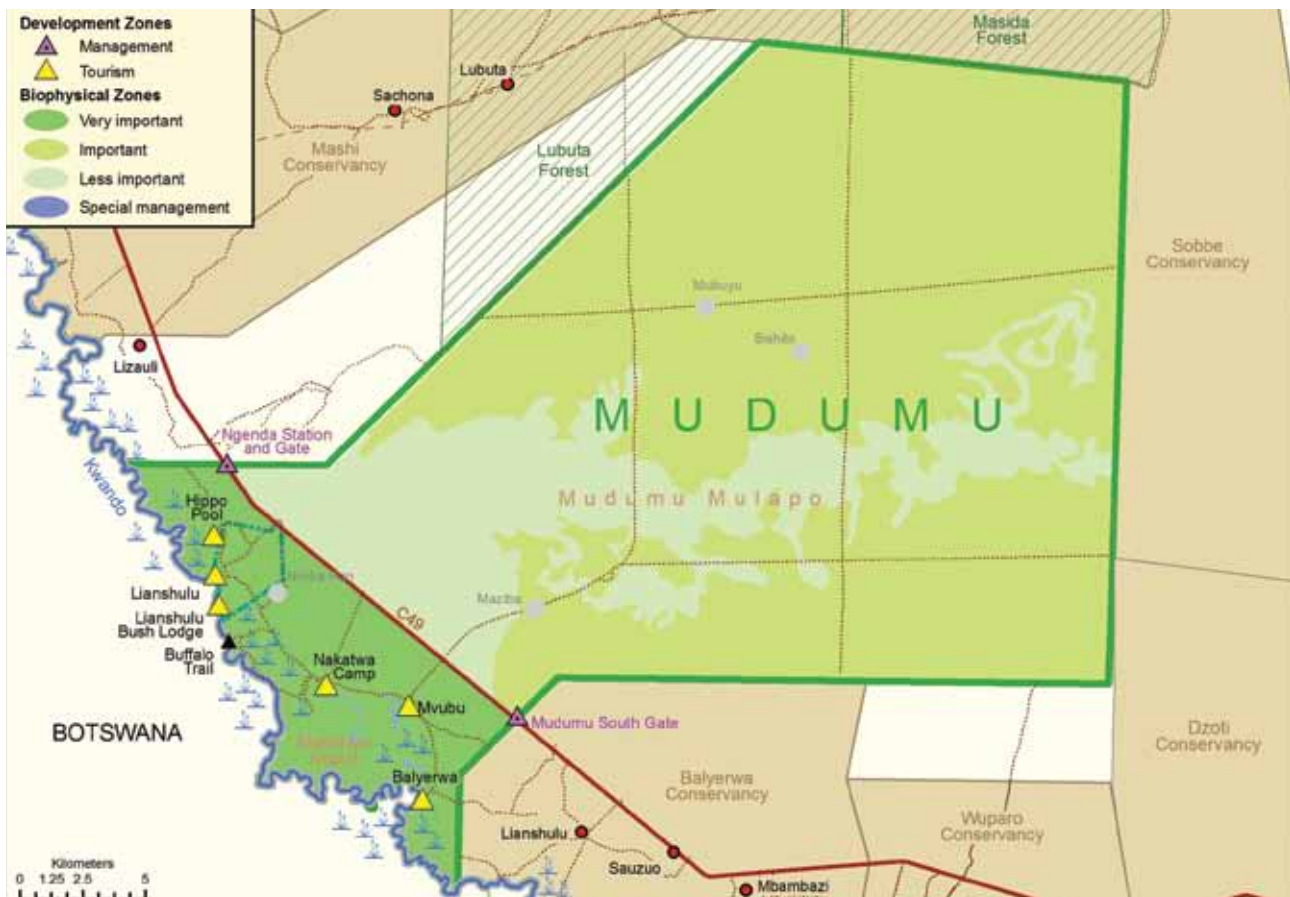
- a) No construction of any infrastructure will be allowed, other than that required to protect specific areas (such as grave sites) if this proves to be necessary.
- b) Site-specific guidelines will regulate activities conducted there. For instance, some Special Management Zones in Mahango Core Area are Baobab trees where picnicking may be allowed, while highly erodible soils in Mahango are generally off-limits to vehicle or foot access (except on existing roads). Some grave or sacred sites that have special cultural significance may also be off-limits.
- c) Special Management Zones that are defined because of their unique species or other biological features may be fenced (using appropriate material) to secure them from elephant or other agents that may cause damage.
- d) Except in very unique situations, no hunting, including commercial and management hunting or culls, is allowed in any Special Management Zone.

INFRASTRUCTURE DEVELOPMENT SITES

- Development of these sites will be subject to the environmental and other guidelines outlined in this plan and Appendix. Additional development zones may be added following the conclusion of concession agreements and further planning at park level. However, the total number and extent of these development zones will be subject to the assessment and management of potential cumulative impacts by all developments.
- Construction is allowed here, within the limits imposed by the management plan, business plan for Bwabwata, Mudumu and Mamili, tourism development plans, specific concession agreements, and guided by the MET's Concessions Policy and the strategic objectives of the North-East Parks. These limits, and the approved extent of construction within each development area, must be reviewed from time to time.
- Some sites may be secured against large mammals or predators through the use of appropriate fencing material, and against fires through the use of firebreaks.
- Waste production must be minimised through implementation of sound strategies that focus on reduce, re-use and recycle.
- Energy use must be minimised through adopting appropriate technologies and sensible energy use policies.

Zone descriptions and guidelines for Bwabwata National Park

Descriptions of the zones in Mudumu National Park are provided in the map below. The key properties that should be considered during the EIA process are listed for each zone, as well as general guidelines and rules for use and management, and red flags (critical issues that have to be incorporated in planning and management). Locations for tourism developments are indicated as point features on the maps. The scale of these maps prevent more detailed mapping of these areas; moreover, the exact location of some of them still need to be determined as part of a concession agreement and its associated EIA process.



Map 4: Habitat zones and infrastructure development sites in Mudumu National Park. The exact locations of Hippo Pools, Mvubu and Balyerwa camp sites are subject to concession agreements to be negotiated.

Mudumu National Park

Zone descriptions	Key properties	Specific rules and guidelines
<h3 style="margin: 0;">Very Important Zone:</h3>		
<ul style="list-style-type: none"> • An area bounded in the east by the main Kongola-Sangwali road, in the west by the Kwando River, and in the north and south by the northern and southern park boundaries respectively. It includes the riparian woodlands (which also include some Mopane woodland), floodplains and grasslands associated with the Kwando River. 	<ul style="list-style-type: none"> • Contains some excellent examples of closed riparian woodland, including <i>Diospyros mespiliformis</i> and various mixed types (with <i>Combretum imberbe</i> prominent), as well as tall Mopane clumps. These clayey areas are closely interspersed with sandy areas dominated by <i>Terminalia sericea</i>. Some of these are being impacted by elephant that remain close to the River during the dry season. • Includes numerous small islands, some of which contain good examples of mangosteen (<i>Garcinia livingstonii</i>) bush clumps. • Floodplains and associated grasslands are habitat for wetland grazers (lechwe and reedbuck) and buffalo, as well as potentially for oribi and puku. • Important corridor for elephant moving from Botswana to Angola and Zambia. • Also includes roan and sable habitat • Important access to water for elephant breeding herds. • Soils are loamy clays and clays. 	<ul style="list-style-type: none"> • Only concession and park management motorised boats are allowed on open water, no public boats of any type. • Boats to be launched at designated launch site/s only. • No motorised access to floodplains allowed, except at designated game viewing and lookout points. • Where possible, current roads to be re-routed (e.g. road between Lianshulu and Nakatwa) to optimise tourist experience, and old parts rehabilitated. • Tourist access to the floodplain and/or river bank should be via frequent link roads from main tourist route to game viewing areas located at optimal positions along the edge of the main channel, back channels or floodplains (dependent on BMM Tourism Development Plan). • Only non-permanent patrol camps (using tents that are removed after patrol period). <div style="border: 1px solid red; padding: 5px; margin-top: 10px;"> <p style="color: red; margin: 0;">Red flags</p> <ul style="list-style-type: none"> • Disturbance of floodplain and grassland species, particularly those that breed there. • Interference with elephant movement routes </div>

Mudumu National Park

Zone descriptions	Key properties	Specific rules and guidelines
Very Important Zone:		
<ul style="list-style-type: none"> An area bounded in the east by the main Kongola-Sangwali road, in the west by the Kwando River, and in the north and south by the northern and southern park boundaries respectively. It includes the riparian woodlands (which also include some Mopane woodland), floodplains and grasslands associated with the Kwando River. 	<ul style="list-style-type: none"> Contains some excellent examples of closed riparian woodland, including <i>Diospyros mespiliformis</i> and various mixed types (with <i>Combretum imberbe</i> prominent), as well as tall Mopane clumps. These clayey areas are closely interspersed with sandy areas dominated by <i>Terminalia sericea</i>. Some of these are being impacted by elephant that remain close to the River during the dry season. Includes numerous small islands, some of which contain good examples of mangosteen (<i>Garcinia livingstonii</i>) bush clumps. Floodplains and associated grasslands are habitat for wetland grazers (lechwe and reedbuck) and buffalo, as well as potentially for oribi and puku. Important corridor for elephant moving from Botswana to Angola and Zambia. Also includes roan and sable habitat. Important access to water for elephant breeding herds. Soils are loamy clays and clays. 	<ul style="list-style-type: none"> Only concession and park management motorised boats are allowed on open water, no public boats of any type. Boats to be launched at designated launch site/s only. No motorised access to floodplains allowed, except at designated game viewing and lookout points. Where possible, current roads to be re-routed (e.g. road between Lianshulu and Nakatwa) to optimise tourist experience, and old parts rehabilitated. Tourist access to the floodplain and/or river bank should be via frequent link roads from main tourist route to game viewing areas located at optimal positions along the edge of the main channel, back channels or floodplains (dependent on BMM Tourism Development Plan). Only non-permanent patrol camps (using tents that are removed after patrol period). <div style="border: 1px solid red; padding: 5px; margin-top: 10px;"> <p>Red flags</p> <ul style="list-style-type: none"> Disturbance of floodplain and grassland species, particularly those that breed there. Interference with elephant movement routes. </div>





Mudumu National Park		
Zone descriptions	Key properties	Specific rules and guidelines
Important Zone:		
<ul style="list-style-type: none"> All mopane woodlands including those that are mixed with <i>Burkea</i> woodlands and that surround the Mudumu Molapo are included here, by virtue of their intact state. 	<ul style="list-style-type: none"> This zone contains particularly good examples of mopane (<i>Colophospermum mopane</i>) woodlands. May contain camel thorn where soils are better drained, and typical sandy species such as <i>Burkea africana</i> and <i>Terminalia sericea</i>. This zone is habitat for roan, sable and tsessebe, which are all rare and highly valuable. Contains a few pans, some of which may remain wet throughout the year and thus represent a valuable wildlife resource. Soils are mostly heavy clays interspersed with loamy clays and pockets of reworked sand. 	<ul style="list-style-type: none"> Less suitable for roads than the Less Important Zone. Where necessary, current roads to be re-routed to avoid clayey areas, and old parts rehabilitated. <div style="border: 1px solid red; padding: 5px; margin-top: 10px;"> <p>Red flags</p> <ul style="list-style-type: none"> None </div>

Mudumu National Park		
Zone descriptions	Key properties	Specific rules and guidelines
Special Management Zone:		
<ul style="list-style-type: none"> None 		

Appendix 2

Species of special concern in the North East Parks

Plant species of special concern in Mudumu National Park		
Scientific name	Common Name	Comments on Status
<i>Acacia erioloba</i>	Camel thorn, Munthu ¹ , Muhobo ² , Muthu ³	Protected, important useful woody species
<i>Acacia sieberiana</i>	Paperbark acacia, Muheneva ¹ , Mughombe ³	Protected
<i>Adansonia digitata</i>	Baobab, Livuyu ¹ , Mubuyu ² , Divuyu ³	Protected, important useful woody species
<i>Baikiaea plurijuga</i>	Rhodesian teak, Uhahe ¹ , Mukushi ² , Mukuthi ³	Protected, important useful woody species
<i>Berchemia discolor</i>	Bird plum, Wild date, Mukerete ^{1,3}	Protected, important useful woody species, fruit tree
<i>Boscia albitrunca</i>	Shepherd's tree, Munkudhi ¹ , Muhepu ³	Protected, important useful woody species
<i>Burkea africana</i>	Red syringe, Mutundungu ¹ , Musheshe ² , Muhehe ³	Protected, important useful woody species
<i>Colophospermum mopane</i>	Mopane, Mupane ²	Protected, important useful woody species
<i>Combretum collinum</i>		Important useful woody species
<i>Combretum imberbe</i>	Leadwood, Munyondo ¹ , Mubimba ² , Muzwile ² , Munyondo ³	Protected, important useful woody species
<i>Combretum psidioides dinteri</i>	Mupupu ³	Important useful woody species
<i>Combretum psidioides psidioides</i>	Mupupu ^{2,3}	Important useful woody species
<i>Diospyros lycioides lycioides</i>	Monkey plum, Shihorowa ¹ , Muvitji ³	Important useful woody species
<i>Diospyros lycioides sericea</i>	Wild persimmon	Important useful woody species
<i>Diospyros mespiliformis</i>	Monkey guava, African ebony, Utunda ¹ , Muchenje ² , Mukuchumwa ² , Mutunda ³	Important useful woody species
<i>Elaeodendron transvaalense</i>	Kakere ²	Protected, important useful woody species
<i>Ficus burkei</i> (formerly: <i>F. thonningii</i>)	Mutata ¹ , Uhoru ¹ , Muminamboma ² , Mutata ³	Protected
<i>Ficus sycomorus sycomorus</i>		Protected, important useful woody species, fruit tree
<i>Friesodielsia obovata</i>	Mukondekonde ^{1,3}	Important useful woody species, fruit tree
<i>Garcinia livingstonei</i>	Mangosteen, Ghushika ³	Important useful woody species, fruit tree
<i>Grewia bicolor</i>	Ngogo ¹ , Muwhana ² , Mungovo ³	Important useful woody species
<i>Grewia falcistipula</i>	Maka ^{1,3} , Shimaka ^{1,3}	Important useful woody species

<i>Grewia flavescens</i>	Makore ³	Important useful woody species
<i>Grewia schinzii</i>	Mudu ¹ , Maka ³	Important useful woody species
<i>Grewia vilosa</i>	Mudu ¹ , Dikorodyongombe ³	Important useful woody species
<i>Guibourtia coleosperma</i>	False mopane, Rhodesian mahogany, Ushivi ¹ , Muzaule ² , Mushi ³	Protected, important useful woody species
<i>Hyphaene petersiana</i>		Important useful woody species, fruit tree
<i>Kigelia africana</i>	Sausage tree, Uvunguvungu ¹ , Mupungopungo ² , Muzungulu ³	Important useful woody species
<i>Ochna pulchra</i>	Udjwe ¹ , Muywela ² , Munyelenyele ² , Ghuywe ³	Protected
<i>Peltophorum africanum</i>	African wattle, Muparara ¹ , Munyele ² , Muyeve ³	Protected, important useful woody species
<i>Philenoptera nelsii</i>	Apple leaf, Mupanda ¹ , Mukololo ² , Mukororo ³	Protected, important useful woody species
<i>Philenoptera violacea</i>	Mupanda ¹ , Mukololo ² , Mukororo ³	Protected, important useful woody species
<i>Phoenix reclinata</i>	Wild date palm, Shikerewa ¹ , Sipupa ² , Dikhindu ³ , Makindhu ³	Important useful woody species, fruit tree
<i>Piliostigma thonningii</i>	Camel-foot, Mupapama ^{1,3} , Mubaba ²	Important useful woody species
<i>Pterocarpus angolensis</i>	Kiaat, Dolf, African teak, Ughuva ¹ , Mukwa ² , Ghughuva ³	Protected, important useful woody species
<i>Schinziophyton rautanenii</i>	Manketti nut, Ugongo ¹ , Mwangwamui ² , Mungongo ² , Mughongo ³	Protected, important useful woody species, fruit tree
<i>Sclerocarya birrea caffra</i>	Maroela, Uwongo ¹ , Mulala ² , Ghuge ³ , Murwa ³	Protected, important useful woody species, fruit tree
<i>Securidaca longepedunculata</i>	Violet tree, Muviyu ¹ , Muinda ² , Mwindu ² , Muruturu ³	Protected, important useful woody species, fruit tree
<i>Syzygium cordatum</i>	Mukwe ³	Important useful woody species, fruit tree
<i>Terminalia prunioides</i>	Purple-pod terminalia, Uhama ¹ , Mulumba ² , Mutororo ³	Important useful woody species
<i>Terminalia sericea</i>	Silver terminalia, Mugoro ¹ , Namasimba ² , Mushosho ³	Important useful woody species
<i>Ximenia americana</i>	Sour plum, Mutemyahambya ³	Important useful woody species, fruit tree
<i>Ximenia caffra</i>	Wild plum, Hambya ³	Important useful woody species, fruit tree
<i>Ziziphus mucronata mucronata</i>	Buffalo thorn, Mukete ¹ , Mukekete ^{1,3}	Protected, important woody species

¹ local plant name in Rumanyo/Gciriki ² local plant name in Silozi ³ local plant name in Thimbukushu

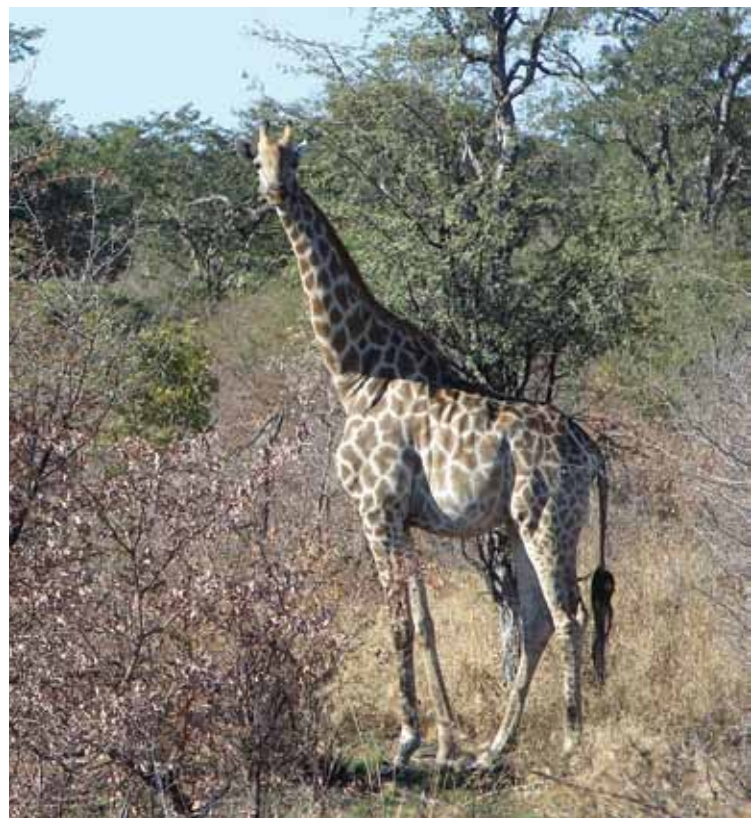


Bird species of special concern in the North East Parks

Common name	Scientific name	IUCN status
African Finfoot	<i>Podica senegalensis</i>	Endangered
African Fish-Eagle	<i>Haliaeetus vocifer</i>	Vulnerable
African Marsh-Harrier	<i>Circus ranivorus</i>	Endangered
African Skimmer	<i>Rhynchops flkavirostris</i>	Vulnerable
Bateleur	<i>Terathopius ecaudatus</i>	Endangered
Bittern	<i>Botaurus stellaris</i>	Critically endangered
Black Stork	<i>Ciconia nigra</i>	Endangered
Black-cheeked Lovebird	<i>Agapornis nigrigenis</i>	Critically endangered
Black-winged Pratincole	<i>Glareola nordmanni</i>	Near threatened
Booted Eagle	<i>Hieraeetus pennatus</i>	Endangered
Crowned Crane	<i>Balearica regulorum</i>	Near threatened
Egyptian Vulture	<i>Neophron percnopterus</i>	Regionally extinct
Great White Pelican	<i>Pelecaus onocrotalus</i>	Vulnerable
Lappet-faced Vulture	<i>Torgos tracheliotus</i>	Vulnerable
Lesser Kestrel	<i>Falco naumanni</i>	Near threatened
Marabou Stork	<i>Leptoptilos crumeniferous</i>	Near threatened
Martial Eagle	<i>Polemaetus bellicosus</i>	Endangered
Pallid Harrier	<i>Circus macrourus</i>	Near threatened
Pel's Fishing Owl	<i>Scotopelia peli</i>	Critically endangered
Peregrine Falcon	<i>Falco peregrinus</i>	Near threatened
Rock Pratincole	<i>Glareola nuchalis</i>	Endangered
Rufous-bellied Heron	<i>Butorides rufiventris</i>	Endangered
Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>	Endangered
Slaty Egret	<i>Egretta vinaceigula</i>	Endangered
Tawny Eagle	<i>Aquila rapax</i>	Endangered
Wattled Crane	<i>Grus carunculatus</i>	Endangered
White-backed Vulture	<i>Gyps africanus</i>	Near threatened
White-headed Vulture	<i>Trigonoceps occipitalis</i>	Vulnerable
Yellow-billed Oxpecker	<i>Buphagus africanus</i>	Endangered

Mammal species of special concern in the North East Parks

Common name	Scientific name	Comments on status
Swamp Musk Shrew	<i>Crocidura mariquensis</i>	Status insufficiently known
Hairy Slit-Faced Bat	<i>Nycteris hispida</i>	Status insufficiently known
Damara Woolly Bat	<i>Kerivoula argentata</i>	Status insufficiently known
Lesser Woolly Bat	<i>Kerivoula lanosa</i>	Status insufficiently known
Greater Long-Fingered Bat	<i>Miniopterus inflatus</i>	Status insufficiently known
Pygmy Gerbil	<i>Gerbillurus paeba</i>	Endemic, status insufficiently known
Woosnam's Desert Rat	<i>Zelotomys woosnami</i>	Rare
Vlei Multimammate Mouse	<i>Mastomys shortridgei</i>	Rare
Small Spotted Cat	<i>Felis nigripes</i>	Specially protected
African Wild Cat	<i>Felis lybica</i>	Vulnerable
Serval	<i>Leptailurus serval</i>	Status insufficiently known
Lion	<i>Panthera leo</i>	Specially protected
African Civet	<i>Civettictis civetta</i>	Status insufficiently known
Rusty-Spotted Genet	<i>Genetta maculate</i>	Status insufficiently known
Water Mongoose	<i>Atilax paludinosus</i>	Status insufficiently known
Selous' Mongoose	<i>Paracynictis selousi</i>	Status insufficiently known
White Tailed Mongoose	<i>Ichneumia albicauda</i>	Status insufficiently known
Brown Hyaena	<i>Parahyaena brunnea</i>	Status insufficiently known
Cape Fox	<i>Vulpes chama</i>	Vulnerable
Bat-Eared Fox	<i>Otocyon megalotis</i>	Vulnerable
African Wild Dog	<i>Lycaon pictus</i>	Specially protected
Spotted-Necked Otter	<i>Lutra maculicollis</i>	Specially protected
African Clawless Otter	<i>Aonyx capensis</i>	Specially protected
African Striped Weasel	<i>Poecilogale albinucha</i>	Status insufficiently known
Hippopotamus	<i>Hippopotamus amphibius</i>	Specially protected
Bush Pig	<i>Potamochoerus larvatus</i>	Specially protected
Giraffe	<i>Giraffa camelopardalis</i>	Specially protected
Reedbuck	<i>Redunca arundinum</i>	Status insufficiently known
Waterbuck	<i>Kobus ellipsiprymnus</i>	Specially protected
Red Lechwe	<i>Kobus leche</i>	Vulnerable
Puku	<i>Kobus vardonii</i>	Specially protected
Roan Antelope	<i>Hippotragus equines</i>	Specially protected
Sable Antelope	<i>Hippotragus niger</i>	Specially protected
Tsessebe	<i>Damaliscus lunatus</i>	Specially protected
African Buffalo	<i>Syncerus caffer</i>	Specially protected
Sitatunga	<i>Tragelaphus spekei</i>	Specially protected
Chobe Bushbuck	<i>Tragelaphus scriptus</i>	Specially protected
Eland	<i>Tragelaphus oryx</i>	Status insufficiently known
Black Rhino	<i>Diceros bicornis</i>	Specially protected
African Elephant	<i>Loxodonta Africana</i>	Specially protected



Reptile species of special concern in the North East Parks		
Common name	Scientific name	Comments on status
Nile Crocodile	<i>Crocodylus niloticus</i>	Protected
Kalahari Tent Tortoise	<i>Psammobates oculiferus</i>	Specially protected
Speke's Hinged Tortoise	<i>Kinixys spekii</i>	Specially protected
Tropical House Gecko	<i>Hemidactylus mabouia</i>	Rare
Tree Agama	<i>Acanthocercus atricollis</i>	Status insufficiently known
Veld Leguaan	<i>Varanus albigularis</i>	Vulnerable
Water Leguaan	<i>Varanus niloticus</i>	Specially protected
Southern African Python	<i>Python natalensis</i>	Specially protected
Cape Centipede Eater	<i>Aparallactus capensis</i>	Status insufficiently known
Common Purple-glossed Snake	<i>Amblyodipsas polylepis</i>	Status insufficiently known
Eastern Congo Stiletto Snake	<i>Atractaspis congica</i>	Status insufficiently known
Blotched Wolf Snake	<i>Lycophidion multimaculatum</i>	Status insufficiently known
Grey-bellied Grass Snake	<i>Psammophylax variabilis</i>	Status insufficiently known
Ornate Water Snake	<i>Philothamnus ornatus</i>	Status insufficiently known
White-lipped Snake	<i>Crotaphopeltis hotamboeia</i>	Status insufficiently known
Rhombic Night Adder	<i>Causus rhombeatus</i>	Status insufficiently known

Appendix 3

Tourism concession recommendations for Bwabwata National Park

Tourism concession recommendations for Bwabwata National Park		
Concession name	Concession type	Implementation method
Mudumu North Concession (Lianshulu) – currently being implemented	Renewal and restructuring of the existing lodge concession Upper / mid-market lodge concession with a satellite camp (combined total of 56 beds)	Awarded directly by the State, but with an empowerment plan to directly benefit each of the five neighbouring conservancies
Mudumu South Concession (Nakatwa)	New middle market lodge concession with an upper market satellite camp (combined total of 60 beds)	Awarded by the State via tender, but with an empowerment plan to directly benefit each of the five neighbouring conservancies
Mudumu Campsite Concession	New campsite concession with at least four exclusive development areas (e.g. Mvubu, Balyerwa Boat Launch, Hippo Pool and Maziba)	Direct award to the Balyerwa Conservancy, with the option to sub-contract a private partner via tendering or direct negotiations with an incumbent







implemented by

KFW