

REPUBLIC OF MALAWI
DEPARTMENT OF NATIONAL PARKS AND WILDLIFE



GENERAL MANAGEMENT PLAN
NYIKA NATIONAL PARK
2023-2033

March 2024

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APPROVAL

Signed at LILONGWE on this 02 day of MARCH 2024 by the Director of the Department of National Parks and Wildlife in terms of National Parks and Wildlife Act of 1992, as amended in 2004 and 2017



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Director of the Department of National Parks and Wildlife (DNPW),
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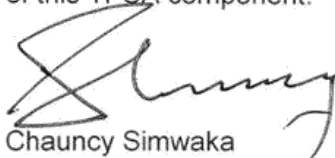
FOREWORD

Protected area management planning is an essential step towards ensuring the proper management of protected areas. The need for protected area management plans has become increasingly critical in this 21st Century as protected areas face increasing complexities in their management. Among others, protected areas are facing increasing threats from illegal wildlife trade, increased human population leading to habitat loss and increased human-wildlife conflict. Unsustainable exploitation of natural resources including those in protected areas is a big contributor to climate change which is inflicting devastating impacts on protected areas' biodiversity and ecosystems. As a result of these factors coupled with higher levels of tourism and protected area resource use, protected area planning has become complex. Critical to the planning of protected areas is the need for the widest possible consultation with stakeholders and the participatory development of objectives that can be agreed and adhered to by all who have an interest in the sustainable use and sustenance of ecosystem services the protected area concerned.

It is, therefore, pleasing to learn that this revised General Management Plan for Nyika National Park has been developed through a lengthy consultative and interactive process with all concerned and relevant stakeholders, particularly local communities, who featured strongly in the review of this management plan. Additionally, preparation of the protected areas plans can be expensive, time and energy consuming. Taking short cuts to these deliverables can be at an expense and perils of our protected areas. Let me, therefore, recognise and thank the Federal Government of Germany through Kreditanstalt für Wiederaufbau (KfW) and Peace Parks Foundation (PPF), who have played a key role in providing financial and technical support which has made this GMP's reviewing exercise possible.

This General Management Plan has comprehensively moved the management planning into the new millennium. While in the past management planning was largely directed towards biological, ecological, physical and cultural aspects, it is encouraging to note that this management plan has gone beyond that historical focus as it reaches out and considers as never before the myriad of use patterns, the special purpose vehicle organisational and management arrangement, the range of economic services generated, the financial aspects and the "benefits beyond boundaries" to the communities in the general landscape of the Malawi-Zambia Transfrontier Conservation Area (TFCA) that includes Nyika National Park.

Let me call upon DNPW as lead agency and its cooperating partners responsible for management of Nyika National Park to ensure that the management strategies detailed in this plan are implemented not only to avoid the degradation of the Park resources caused by a lack of a strategic direction but also to produce a product that positively and significantly contributes to the local, national and regional economies. It is the implementation of the GMP with periodic reviews that will lead to long lasting positive impacts on the Park ecosystem which includes local communities. As a Ministry responsible, we are committed to providing oversight and support towards successful implementation of the GMP. We are aware that the Park is a component of the Malawi-Zambia TFCA and therefore, our belief and conviction that the GMP also provides strategic direction for the development and attainment of the objectives of this TFCA component.



Chauncy Simwaka
SECRETARY FOR TOURISM

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ACRONYMS

AD	Anno Domini	MoU	Memorandum of Understanding
AIDS	Acquired Immunodeficiency Syndrome	MAREP	Malawi Rural Electrification Programme
AZE	Alliance for Zero Extinction	METT	Management Effectiveness Tracking Tool
BC	Before Christ	MZTFCA	Malawi Zambia Transfrontier Conservation Area
CBFiMP	Community Based Fire Management Plan	NGO	Non-Government Organisation
CMA	Co-Management Agreement	NP	National Park
COVID	Coronavirus Disease	NNP	Nyika National Park
CPUE	Catch Per Unit Effort	NVA	Nyika Vwaza Association
DCs	District Councils	NVT	Nyika Vwaza Trust
DNPW	Department of National Parks and Wildlife	PA	Protected Area
EDRR	Early Detection and Rapid Response	PES	Payment for Environmental Services
EGENCO	Electricity Generation Company (Malawi) Limited	PMU	Project Management Unit
ESCOM	Electricity Supply Corporation of Malawi Limited	PPF	Peace Parks Foundation
ESMF	Environmental and Social Management Framework	PPPs	Private Public Partnerships
FY	Future Year	PPWO	Principal Parks and Wildlife Officer
GHI	Global Hunger Index	REDD+	Reducing Emissions from Deforestation and Forest Degradation
GoM	Government of Malawi	RUP	Resource Utilisation Programme
GMP	General Management Plan	SOP	Standard Operating Procedure
HIV	Human Immunodeficiency Virus	SEP	Socio-Economic Profile
HWC	Human-Wildlife Conflict	STA	Senior Traditional Authority
HWCMS	Human-Wildlife Conflict Management Scheme	TA	Traditional Authority
IAS	Invasive Alien Species	TFCA	Transfrontier Conservation Area
IBA	Important Bird Area	TPC	Threshold of Potential Concern
IUCN	International Union of Conservation of Nature	TMU	Transfrontier Management Unit
KBA	Key Biodiversity Area	UNESCO	United Nations Educational, Scientific and Cultural Organization
KfW	Kreditanstalt für Wiederaufbau	VMWR	Vwaza Marsh Wildlife Reserve
		WHS	World Heritage Site
		ZNRC	Natural Resource Committee Zone

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1 INTRODUCTION

1.1 Background and Purpose of the Plan

Nyika National Park (NNP) is one of five other National Parks in Malawi. It occupies a tract of mountain plateau and associated hills and escarpments of 3,134 km² in northern Malawi, centred upon 10°33'S, 33°50'E.

Part of its western boundary coincides with the Malawi-Zambia border, and a section is contiguous with the Zambian Nyika National Park. The two National Parks form part of the Malawi-Zambia Transfrontier Conservation Area (MZTFCA) which was established in 2015 through a bilateral treaty (1 and Figure 2).

Within this TFCA's northern component, Malawi's NNP has a minor link with its counterpart, Vwaza Marsh Wildlife Reserve (VMWR), a remnant corridor (Mphola) connects NNP to VMWR and also connects to Lundazi Forest Reserve on the southeast side of the Park. The Park's physical connection to the TFCA is through Zambia's NNP; along the international border. Ecological connectivity conservation interventions will need to be investigated and identified as mandated by the TFCA structures or partner countries.

A resource use zone (ca. 1,027 km²) covering a strip of approximately five kilometres (aerial distance) within the Park along the Malawian boundary has been established in which a Resource Utilisation Programme (RUP) is being implemented. There is an exception for the Park's surrounding communities to harvest resources beyond programme's 5km radius. The main target community beneficiaries are those within a 5km distance outside the Park (ca. 1190 km²). See Figure 2.

Initially declared in 1965 and named Malawi National Park, the Park received its current name in 1969 and in 1978 the Park was expanded to its present size of 3,134 km² in terms of the Wildlife Act 2017. The reason for the expansion was to protect the catchment and rivers, and accommodate the seasonal migration of animals into the woodlands. The term Nyika means "*where the water comes from*" and links to the purpose of its establishment.

In the Malawi context, the Nyika is an IUCN Category II Protected Area (PA)¹, it has been included on the United Nations Educational, Scientific and Cultural Organization (UNESCO) tentative list of world heritage sites² in 2000.

This General Management Plan (GMP) constitutes a review and update of the 2016 Master Plan (see Section 2.1). The Act mandates the Department of National Parks and Wildlife (DNPW) to conserve, manage and regulate the use of wildlife resources in the country. DNPW is thus the responsible governing authority in all matters of conservation and management of the Park.

The Act further provides that the Director of DNPW may produce a management plan for purposes of the proper management of wildlife and in the particular cross-border wildlife resources to ensure the realisation of common wildlife goals in cross-border areas³. As such, the primary purpose of the management plan is thus to provide the guiding framework for the proper management of the Park and assure the public that this is undertaken in a responsible manner.

Specific purposes are:

- To ensure that the Park is managed to achieve the objectives of legislation and DNPW policy goals, stakeholder expectations, and park conservation management objectives
- For quality assurance, consistency, and prevention of incremental degradation through *ad hoc* decision making
- To gain public involvement in the management of the Park and give the public a way to have their say about management

¹ According to Dudley (2008), large natural or near-natural areas protecting large-scale ecological processes with characteristic species and ecosystems, which also have environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.

² <https://whc.unesco.org/en/tentativelists/1420/>

³ Article 22B and 120B

- To develop a shared understanding of and a vision for the Park – identify the significance of the Park, consolidate legislative and policy issues, integrate various elements of management and convey to the public and management staff how the Park will be protected, and visitors and users provided for
- To provide public accountability – a ‘statement of intent’: what DNPW wants to achieve and how and the criteria by which the performance of Park Management under the plan will be assessed.



Figure 1. Malawi - Zambia TFCA

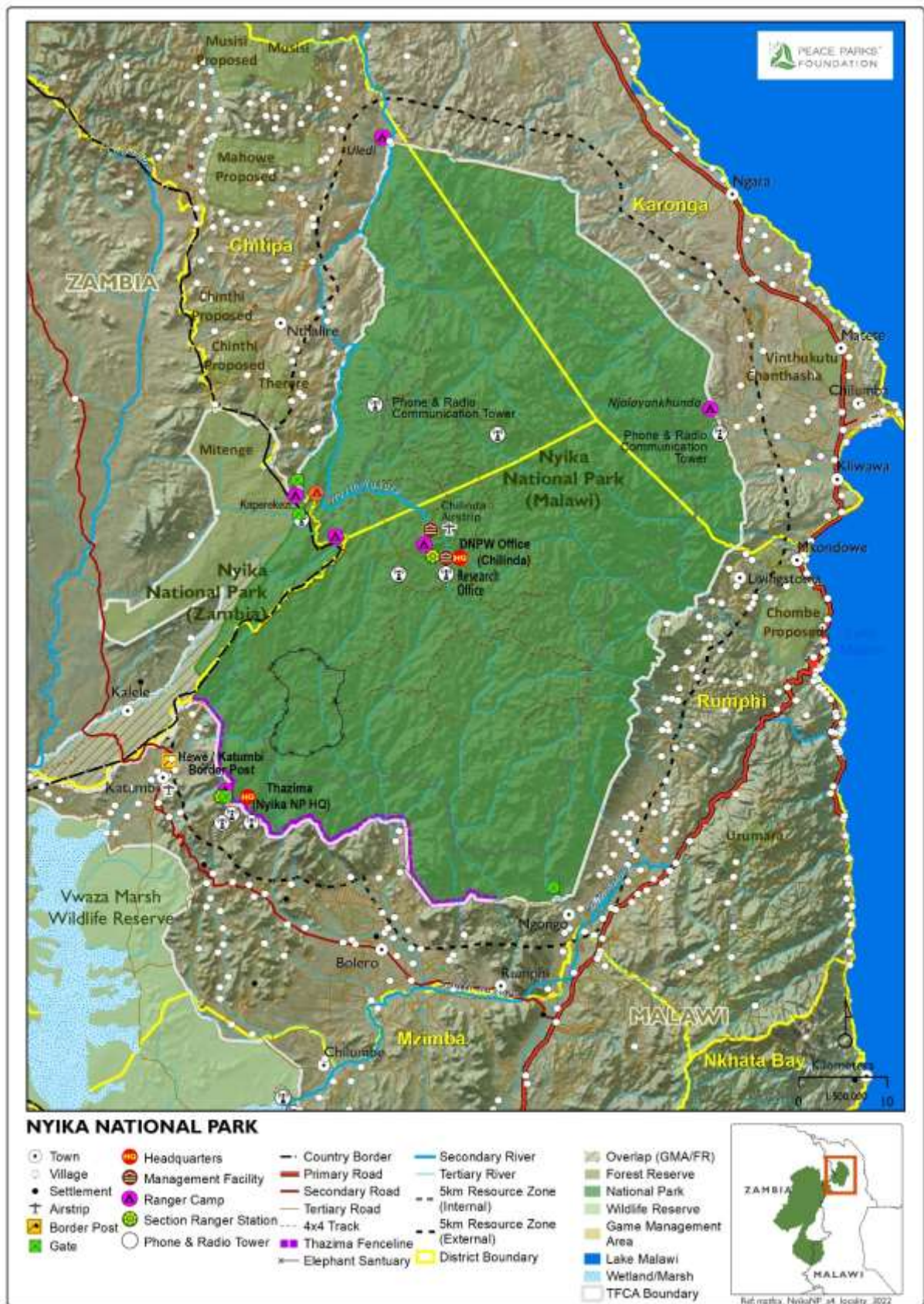


Figure 2. Locality

1.2 Planning and Legal Framework

Protected area management is complex and multi-disciplinary. This plan provides a framework that integrates the various thematic areas of park management. The management plan is, however, not a standalone document – it is aligned to other park plans, strategies, and operational level or subsidiary strategies, plans and protocols of which the hierarchical and dependency relationship is illustrated in Figure 3.



Figure 3. Hierarchical relationship between plans, strategies, & operational protocols of significance to the Park

The various levels of documents and instruments are developed and implemented cognisant of relevant international protocols; national, regional, district and local legal frameworks and land use plans as well as relevant DNPW policies and guidelines.

The (Department of National Parks and Wildlife, 2018) possesses legal and institutional frameworks that recognise the importance of sustainable management of natural resources, including forests and wildlife resources, and are sufficiently integrated into the international regional and global agenda on conservation and sustainable development. Within Malawi, implementation, monitoring and evaluation of legal and institutional frameworks is the mandate of sectoral ministries and departments through district and provincial administrative structures that provide technical support and supervision at community level. Notwithstanding, fiscal and human resource related challenges exist that hinder effective implementation of the current legal and institutional framework – this needs to be considered in the implementation of this management plan.

The legal framework relevant to the management of the Park and under DNPW mandate is listed below, noting that the National Wildlife Policy provides further linkages with other international, regional, and national policies and instruments. However, from an **international perspective**, the Convention on Biodiversity is of relevance as Malawi is a signatory (signed in 1994). The convention recognises the importance of natural assets but also identifies threats⁴ to biodiversity in Malawi including “*habitat loss and fragmentation, overexploitation of biodiversity, invasive alien species, pollution and climate change*”. As NNP is especially impacted by overexploitation and to a lesser extent invasive alien species, and while climate changes are omnipresent over the entire country, it is important to note the three main goals of this convention:

- The conservation of biological diversity
- The sustainable use of its components
- The fair and equitable sharing of the benefits from the use of genetic resources.

⁴ <https://www.cbd.int/countries/profile/?country=mw#measures>

Specific **national instruments** include:

- The **National Parks and Wildlife Act**⁵ and the purpose of PAs⁶ including-
 - To preserve selected examples of biotic communities of Malawi and their physical environment
 - To protected areas of aesthetic beauty and of special interest
 - To preserve populations of rare, endemic, and endangered species of wild plants and animals
 - To assist in water catchment conservation
 - To promote education on wildlife
 - To provide an enabling environment for nature-based tourism in and around them
 - Without prejudice to the foregoing, to provide facilities for studying the phenomena therein for the advancement of science and understanding
 - Without prejudice to the foregoing, to provide facilities for public use and enjoyment of the resources therein.
- The **National Wildlife Policy** and the goal, outcomes, objectives, and guiding principles for PA management-
 - **Policy Goal:**
 - To conserve and manage Malawi's wildlife resources for sustainable development of the country.
 - **Policy Outcomes:**
 - Improved conservation and management of Malawi's wildlife resources
 - Improved private sector investment in wildlife conservation and management
 - Increased stakeholder participation in collaborative management of wildlife resources
 - Mainstreamed climate change, gender, HIV and AIDS in wildlife programmes and policies.
 - **Policy Objectives:**
 - To reduce illegal wildlife use
 - To reduce Human Wildlife Conflict (HWC)
 - To raise awareness and enhance stakeholder participation in wildlife conservation and management
 - To improve and develop protected area infrastructure
 - To promote private sector and community involvement in wildlife conservation and management
 - To promote wildlife research and monitoring
 - To minimise effects of climate change on wildlife and PA boundary communities
 - To mainstream gender and HIV/AIDS in wildlife conservation and management.
 - **Guiding principles:**
 - **State Ownership of Wildlife Resources:**

The ownership of wildlife resources shall rest with the State which shall hold in trust and manage the wildlife resources on behalf of and for the benefit of the people of Malawi. However, it is recognised that those who legitimately use the land on which the resources occur are the primary custodians, and utilisation rights should accrue to them to be exercised within the limits of pertinent legislation.

⁵ 11 of 1992; 15 of 2004; 11 of 2017; G.N. 57/1994

⁶ Article 27

- *Inter-sectoral and International Collaborative Management:* Wildlife conservation and management is a cross sectoral issue and involves ecological systems and processes that are continuous and take place irrespective of international boundaries. Inter-sectoral and international collaboration and cooperation shall be promoted to enhance wildlife conservation and management.
- *Private Sector and Community Participation in the Management of Wildlife Resources:* Recognising wildlife conservation and management as a legitimate form of land use that can be economically competitive to other land uses, and that Government structures in isolation cannot adequately conserve and manage the wildlife resources, Government shall create an enabling environment for the local communities, the private sector, Non-governmental Organisations (NGO) and any other parties with an interest in wildlife conservation and management to be fully involved.
- *Inter- and Intra-Generational Equity:* The conservation and management of wildlife will be based on a long-term view where the present generation makes choices that will benefit future generations.
- *Sustainable Development:* The conservation of the wildlife resources of Malawi shall be done in such a way as to meet the development and environmental needs of present generation without compromising the ability of future generations to meet their own needs.

1.3 Preparation of the Plan

This GMP constitutes a review and update of the 2016 Master Plan in line with the requirements of the Malawi Wildlife Policy 2018 and the 1992 National Parks and Wildlife Act, as amended in 2004 and 2016 respectively.

The 2005 GMP for Nyika National Park was reviewed in 2017 and succeeded in ensuring stakeholder participation through the collaborative management concept as a cornerstone of wildlife co-management with emphasis on working with communities and promotion of benefit sharing as incentives.

Where additional information has been included, source documents have been referenced as appropriate.

1.3.1 Previous Plans

The first plan for Nyika (Department of National Parks and Wildlife, 1976) was produced in 1976 (Mill, 1979) and was based on Forester's (1973) IUCN guidelines for park planning. The second Master Plan (Clarke, 1983) came into effect in September 1983 and the third in 1999 (Mike Jones). The 2004 Master Plan is an updated version of the 1999 Master plan by Jones. The 2016 Master Plan is an updated version of the 2004 Master Plan by Jones. Analysis of the implementation of these previous Master Plans has shown that there is a relatively poor implementation record due to the inadequate allocation of the financial, manpower and material resources required to implement the plans.

1.3.2 Stakeholder Engagement

As this is a review and update of the previous management plan that was never completed and approved, and the stakeholder engagement processes had not been undertaken during the previous reviewing process in 2016, the consultation process undertaken was guided by the approved Stakeholder Engagement Plan for the project.

A consultative approach ensures that valuable inputs on implementation gaps are sourced. A wide range of stakeholders are consulted, including local communities, traditional leaders, Government departments, private sector, academic and research institutions, civil society, faith groups, non-governmental organisations, bilateral and multi-lateral development partners.

Value addition of what stakeholder engagement brings forth in terms of outcomes depends to a significant extent on how well the consultation process has been planned, organised, and executed. To ensure such outcomes, therefore, the team followed a process a detailed account of which is outlined in Annexure A.

1.4 Monitoring and Reporting on Implementation of the Plan

The monitoring and reporting on the implementation of this forgoing plan will be done through the collaboration and partnership made possible through the Co-Management Agreement (CMA) between Peace Parks Foundation (PPF) and DNPW. Through this agreement, a Trust will also be put in place as a legal entity to assist with the improvement of management and development of the Park.

Thus, monitoring and reporting on the implementation of this plan will be done through:

- Annual reports
- Monthly progress reports
- Quarterly technical and financial reports

Additionally, the Management Effectiveness Tracking Tool (METT) has been designed to track and monitor progress towards protected area management effectiveness (see Appendix 6). NNP managers annually conduct this assessment to monitor and report on PA management and on implementation. Reports to donors and support organisations will be submitted as per funding agreements. Park management will also report on projects where other organisations or affiliated partners are delivering projects or associated actions on their behalf.

1.5 Structure of the Plan

This Management Plan contains six chapters followed by References. The six chapters are as follows:

Chapter 1: Introduction

This chapter explains the purpose, structure and focus of the management plan and provides a brief overview of the legal, planning and monitoring and reporting framework for the Park.

Chapter 2: Description

This chapter provides a brief description of the Park's regional context and historical; governance; biophysical; socio-cultural, and economic and development characteristics.

Chapter 3: Situation Analysis

This chapter provides an overview of the significance of the Park and constructs the Park's strategic opportunities and the various challenges, threats and risks currently facing it with a view to guiding activities and interventions over the management plan period.

Chapter 4: Strategic Planning Framework

This chapter discusses the strategic plan and presents the Park's future desired state: vision, mission and strategic management objectives. It also provides a theory of change and how to approach adaptive management.

Chapter 5: Implementation Plan

This chapter fleshes out the priority management responses and programmes that will be implemented over the management plan period to achieve the future desired state.

Chapter 6: Zonation

This chapter details the proposed spatial zonation and how this aligns to tourism and other management activities as well as in relation to neighbouring communities and the integration of NNP into the TFCA.

2 DESCRIPTION

The content of the following sections of the GMP is derived from previous Master Plans. Only where new information has been added, has this been referenced.

2.1 Proclamation History

Previously known as Malawi National Park and encompassing 940 km² of the high plateau, NNP was first declared in 1965. The name was changed to Nyika NP in 1969 and in 1978 the Park was expanded to its present size of 3,134 km² by inclusion of the plateau's northern and southern foothills. The extension of the Park boundary was to protect an important catchment area that supplies the Northern Region with water for domestic consumption, irrigation and to maintain habitat for large mammal migration between the plateau and surrounding woodlands.

This expansion required the resettlement of about 5,000 people. The relocation was undertaken between 1975 and 1978, largely by district government officials. Many families lost their property during the resettlement process and were often placed on inferior land. According to Lee (2020), these memories and facts are still frequent points of discussion amongst villagers.

2.2 Regional Context

2.2.1 Regional Location and Importance

Nyika NP lies astride the Chitipa (north-west; ca. 22%), Karonga (north-east; ca 18%), and Rumphi Districts (south; ca. 60%) of the Northern Region of Malawi with most of the Park within the Rumphi District (see below table). The administrative centre of the Chitipa District is Chitipa, located to the north-west of the Park on the border with Zambia, Karonga District – Karonga (located to the north-east) and Rumphi District – Rumphi (located to the south of the Park). The capital of the Northern Region is Mzuzu, situated about 120km south of the Park.

The Park is important in the regional context from a socio-economic as well as a biodiversity point of view as it protects an important catchment area that supplies the Northern Region with water for domestic consumption, irrigation and as refuge for wildlife.

The Park is contiguous with the much smaller Nyika National Park in Zambia on the western edge of the Nyika Plateau (81km²) - the Nyika Plateau has been classified as one of Africa's Centres of Plant Diversity. It is part of a chain of montane massifs running parallel with the Indian Ocean coast from Ethiopia to the north to South Africa, which form a series of 'biological islands' across the African continent, supporting a high species diversity with many endemics (Stalmans & Anderson, 2021). NNP was also placed on the UNESCO's World Heritage Site tentative list in 2000 as a mixed category site motivated by its uniqueness in the region in terms of biological diversity, landscape, scenery, and climate⁷. It is an Important Bird Area (IBA; criteria A2) and also received Key Biodiversity Area status (KBA; criteria A1a, A1b, A1e, B1, B2) and known to hold a significant population of at least two range-restricted species (see Annexures C and D for the comprehensive species list) and qualified as an Alliance for Zero Extinction (AZE) in 2018.

Table 1. District Coverage of Park

DISTRICT	PERCENTAGE (TOTAL AREA)	AREA (km ²)
Chitipa	22%	699km ²
Karonga	18%	547km ²
Rumphi	60%	1,858km ²

⁷ <https://whc.unesco.org/en/tentativelists/1420/>

2.2.2 Demographics and Surrounding Land Use and Tenure

Country and district context

The area around the Park has been substantially transformed through rural settlement and agriculture with a strong tribal hierarchical structure. The Senior Traditional Authorities (STA) and Traditional Authorities (TA) bordering the Park are the TA Katumbi, TA Chikulumayembere, STA Kachulu, STA Mwalweni and STA Mwahenga in Rumphi District; TA Kyungu and TA Wasambo in Karonga District; and TA Nthalire in Chitipa District (Figure 4).

Most of the surrounding land is regarded as customary land (land that belongs to the people and held in trust and administered by these STA/TAs) with the primary use for agricultural purposes, i.e., cultivation and grazing land and secondary use for village settlements, followed by public land with a small percentage of private leasehold. (Government of Malawi, 2002a, 2002) (Government of Malawi, 2002) (Karonga District Council, 2017).

According to the National Statistics Office (2021) slightly over half of the population in Malawi lives in poverty. Analysis by place of residence shows that 56.6 % of people from rural areas were poor⁸ compared to 19.2 % in urban areas. At regional level, the Northern Region has the lowest proportion of **poor population** (32.9 %). At a district level – Chitipa’s proportion of poor population is 38.6 %, Karonga, 41.1% and Rumphi, 26.4 %. At a country level – the proportion of **ultra-poor population** is 20.5 % (rural 23.6 % and urban 3.3 %), at a regional level – the Northern Region has the lowest levels at 8.6 % with Chitipa District, 14.3 %, Karonga, 10.6 % and Rumphi, 2.9%.

The Global Hunger Index⁹ (GHI) provides an assessment of the level of nutrition and hunger in a country. It measures four variables including, undernourishment, and for children under five years of age, mortality, wasting, and stunting. On the general index, including all the variables above, Malawi’s GHI score has improved from 43 (2000) to 21 (2021), on a scale from 0 to 100 where 0 shows no stress. Worryingly though the proportion of ‘*wasting in children under five*’ was at an alarming 41% in 2021, although this too declined from 55% in 2000. This is an important metric to consider when exploring the role of protected areas in a country and their contribution to people’s well-being especially with climate change and its likely impacts.

Rumphi District’s total population based on the 2018 census survey (National Statistics Survey, 2018) is estimated at 229,161 (with nearly as many females as males) with a population density of 50 people per km². The 2008 population census revealed that the district has a young population that comprises about 44% of the population under the age of 15 years. This is the same as the national rate and implies a relatively high young dependency burden. The Intercensal Annual Growth Rate (2008-2018) is 3.1%. The dominant tribe in the district are the Tumbuka with agriculture being the main economic activity. Maize, cassava, sweet potatoes, bananas, pigeon peas, cow peas, soya beans, ground beans, wheat, chillies, paprika, fruits, macadamia, cashew nuts, groundnuts, tobacco, rice, millet, Irish potatoes, and coffee are the crops grown in the area. A significant area of the district is farmed by tenant farmers - the area bordering the Park are, however, not significantly affected by this development (Government of Malawi, 2002a, 2002).

The total population of the **Karonga District** is estimated at 365,028 (also with nearly as many females as males) with a much higher population density of 106 people per km². The Intercensal Annual Growth Rate (2008-2018) for this district is 3.2%. The two dominant tribes present in the district are the Tumbuka and Ngonde. Agriculture is also the most important economic activity with maize, rice, cassava, bananas, groundnuts, sweet potatoes, and cotton being the most important crops. The district also holds one of the largest cattle populations in the northern region of Malawi. Other economic activities such as trading, handicraft production and the transport business are sectors growing in importance (Karonga District Council, 2017).

Chitipa District is very remotely located bordering Tanzania to the north, Zambia to the west and a large portion of its southern and eastern boundary is NNP. One of the two main roads to Chitipa passes through the Park. The total

⁸ Where the total poverty line is the cost meeting basic nutritional needs (that is, food poverty line) and then allowance for other basic needs (that is, the non-food poverty line). If a person’s total expenditure is below the poverty line, the person is considered poor. An individual with consumption below the food poverty line is considered ultra-poor.

⁹ <https://www.globalhungerindex.org/about.html>

population of this district is estimated at 234,927 (with a nearly equal female to male ratio) with a population density of 54 people per km². The Intercensal Annual Growth Rate (2008-2018) for this district is the lowest of the three districts: 2.8%. The district has a diverse tribal composition consisting of Tumbuka, Sukwa, Ndali, Nyika, Bemba, Senga, Chewa, Phoka, and Henga. Other less common tribes are Namwanga, Wandia, and Mambwe. Agriculture is here also the main economic activity, with tobacco being the main cash crop followed by coffee. Other cash crops include paprika, groundnuts, ground beans, and sesame. Maize, cassava and millet are the main food crops grown. Because of the relatively poor accessibility and remoteness of the district on the Malawian side much of the daily trade is oriented towards Tanzania (Government of Malawi, 2002).

Resource Use Zone around the Park

A target group assessment for the Nyika-Vwaza and Musalangu sub-components of the TFCA was carried out in 2020 which provides insights and understanding of the socio-economic and livelihood aspects of the communities around the Park (Nyanga, et al., 2022). The pertinent findings are briefly summarised below and in other sections of this chapter but for details the study report should be consulted.

According to Nyanga, et al (2022), there are about 96,194 inhabitants within the five-kilometre zone of the Park encompassing 500 villages and 22,014 households.

The survey revealed that households generally have low levels of livelihood diversification and that in the Malawi sub-component, piecework (part time casual work) was found to be the most important income source, followed by agriculture then crafts/art. Households had significantly higher livestock units, agro-based assets and state of housing than those in Zambia although land-size was higher for Zambian households. The average household annual income in Malawi was USD 563.00, almost half of the national average (USD 1,377.00).

The presence of stakeholders such as Total Land Care was reported to have increased community access to climate smart agricultural practices and cooperative farming even though their coverage is limited across the TFCA. Currently, the only other support organisation that is active in the Park is Terra Global Association.

Results from the vulnerability assessment of communities revealed consensus (70%) on their exposure to highly variable climate and other environmental shocks, including pest incidents, loss of livestock and human life to Human Wildlife Conflict (HWC), floods and extreme hotness. The period of November to February was identified as the peak hunger period, which also coincides with increased cases of HWC and reduced access to cash and low average household income.



Figure 4. Traditional Authority (Chieftdom Boundaries)

2.2.3 Regional Infrastructure and Services

The M1 is the main north-south road with east-west secondary roads including the M24 and the M9 that cuts through the Park to the border with Nyika National Park, Zambia and onwards to Chitipa and in a southerly direction to VMWR. The S104 road leads northwest from the M9 via Katumbi to the international border with Zambia. The T305, which is currently being tarred runs parallel to the M1 from Khondowe through Livingstonia meeting up with the M24 to Rumphi. Bitumen upgrades started in 2022 on the Rumphi-Nyika main road.

Border posts are located at Hewe/Katumbi and Mbalachanda at Kaperekezi gate inside the Park, although this is not yet functional or developed and other than Chilinda airstrip the closest airstrip to the Park in Malawi is in Mzuzu.

According to Lee (2020), many communities around the Park are remote; hence accessing basic services, markets, and even wielding political influence are difficult and costly.

2.2.4 Water and Sanitation

The communities in the surrounding areas receive their water and sanitation services from their governing districts. According to the Chitipa District Council Development Plan 2017-2022, Chitipa has over the years experienced low access to potable water and poor sanitation. This has left the communities to rely on unsafe sources of water rendering them vulnerable to water borne diseases such as diarrhoea and cholera. It is therefore necessary to strive for the provision of potable water for the community members to sustain development in the district. It is against this background that Chitipa District Council, through this plan, aims at increasing access to portable water and improved sanitation in the district estimated at 78.8% (IHS IV, 2017).

Similarly, in Rumphi, the proportion of the population that has access to boreholes and gravity fed water in Rumphi is 74%. The remaining population gets its water supply from unprotected sources such as rivers/streams, lakes, swamps and unattended shallow wells. Consequently, water from most of these water sources is a major source of contaminable domestic diseases such as diarrhoea, cholera and bilharzia.

Karonga's (rural areas) main water sources include boreholes and gravity fed scheme taps. The town centre and other peri-urban areas within the district are supplied by the Northern Region Water Board. The districts' communities and schools also have access to poor sanitation services as indicated in the 2017-2022 Karonga District Council's Socio-Economic Profile.

According to (Nyanga, et al., 2022), the most common source of water for communities in Malawi are boreholes, however, involving little treatment practices.

2.2.5 Waste Management

All three district have poor and improper solid waste management. For effective environmental management to take place in the Park, several Standard Operating Procedures (SOPs) will need to be in place and implemented. Over time the list of SOPs may expand, but an initial set should include an SOP for i) Solid Waste Management and ii) Wastewater and Sewage Management.

2.2.6 Electricity/energy

According to (Nyanga, et al., 2022), the most common energy source for domestic use in the communities was firewood followed by charcoal, both key contributors to deforestation. Most have no access to hydroelectric power and so use batteries, solar technologies, and candles for lighting. Electricity Supply Corporation of Malawi Limited (ESCOM) and Electricity Generation Company (Malawi) Limited EGENCO are lead agencies in the Malawi Rural Electrification Project (MAREP). This project aims at increasing access to electricity for over 20% percent of the population in the district through MAREP and construction of an electricity generation plant.

2.2.7 Health and Education Services

Chitipa and Rumphi have poor quality and access to education services at both primary and secondary levels and low education levels among girls and women. (Rumphi District Council, 2010), (Chitipa District Council, 2017) Education

indicators in Karonga have improved over the past 5 years, but in some cases remain below national recommendations; teachers, desks, classrooms, teacher housing, and latrines are still in short supply (Karonga District Council, 2017).

According to (Rumphi District Council, 2010), the number of hospital beds is quite inadequate given the high morbidity rate and the growth of the population since some of the facilities were made available more than two decades ago. This has also been exacerbated by the advent of the HIV/AIDS, which is contributing to a lot of morbidity and mortality in the district. Across the regions, health care services are limited in terms of access and infrastructure.

2.2.8 Extension Services (veterinary, agriculture)

All extension services are provided for through Government of Malawi staff under Community Development and Agriculture and NGOs. There are four major services that are offered across the region, these include: agricultural extension services, crop production services, land resources conservation services, and animal health and livestock development services. The shortage of personnel severely affects the effective provision and delivery of agricultural extension services thereby contributing to low yield and the continued adoption of inefficient farming technologies.

2.2.9 Safety and Security Services (Police; Fire, etc.)

Security services in Rumphi are largely provided in two main categories: as public security services through the Malawi Police Service and as private security services through private security guard services such as Securicor (Malawi Limited), among others. In the Karonga District, safety and security is also provided for through community policing. A representative officer is responsible for conducting community sensitization meetings in addition to their policing duties.

2.3 Park Governance and Management Arrangements

The Parks and Wildlife Policy defines a new institutional framework for the wildlife sector in which the Department of National Parks and Wildlife acts as the focal point and seeks support for wildlife conservation from individuals and organisations from all segments of Malawian society and the international community. To promote collaborative management of wildlife for conservation and sustainable development. In collaborative conjunction with communities, NGOs and the private sector, the DNPW will;

- protect wildlife against illegal use;
- manage the national parks wildlife reserves and other areas under its authority;
- reduce the detrimental effects of wildlife on human life through appropriate measures;
- build up capacity in the sector; and
- develop, co-ordinate and promote wildlife-based tourism.

Notwithstanding these responsibilities, it is important that any future support must be long term and must address these systemic problems. To this end, the CMA between PPF and DNPW will work towards long-term partnership and support for current and future projects.

It is a specific condition that an independent Trust will be established and with a Board of Trustees, it shall be registered to manage the resources and commercialise the natural resource-based opportunities which the Park offers. The Trust will assume these rights and responsibilities as listed below:

- Appointing the Chief Executive Officer of the Trust
- Approving the Annual Work Plan and Budget prepared and submitted by the Project Management Unit (PMU)
- Reviewing and approving the strategic recommendations submitted by the PMU which have impact on community development, conservation development and tourism development aspects of the project
- Reviewing and approving the Annual Technical and Financial Report
- Approving the Land Use Plan and Business Plans for Nyika and Vwaza; and

- Approving all agreements for the development of forest and wildlife projects as well as tourism operators and/or concessionaires.

2.3.1 Resources

The division manager at Thazima controls financial allocations and accounts. There are a few fundamental problems with the financial management system that result in an irregular and unreliable flow of income and make it difficult for park managers to plan and control expenditure. Management has been severely constrained by lack of resources, especially funding in the last three to four decades.

There have been a few financially flush periods where funding has been made available through German Agency for International Cooperation (GIZ) between 1993-2003. Additionally, considerable infrastructure, equipment and training have been delivered under the Nyika-Vwaza Conservation Project, Border Zone Development & GEF Projects to enable staff to manage the reserve effectively. Infrastructure, especially buildings can be very useful and contribute to management efficiency but can also be a liability.

Unfortunately, these 'flush periods' have often resulted in a splurge in building infrastructure, purchasing vehicles and equipment and support staff either directly with salary support or providing funding for rations, uniforms etc. The consequences when the funding cycle ends is a dramatic decline in management's ability to continue while the assets either cannot be used for lack of funds and/or are not maintained. Assets which are not maintained seem to deteriorate exponentially. When the next funding tranche is secured, a large portion is spent repairing the deteriorated assets and the cycle starts again. Furthermore, during this process, government funding may be cut back during the funding cycles, but not restored when it ends. This ebb and flow of funds has proved very disastrous.

A comprehensive list of resources found in the Park are in Appendix 2 and 3.

2.3.2 Law enforcement

Law enforcement in the reserve is undertaken under the auspices of the Malawi-Zambia TFCA Transformative Law Enforcement Strategy, 2020 – 2024 and DNPW standard operational procedures (Use of force, Serious incident reporting, Firearm handling and control, Household search operations, and DNPW code of conduct).

The strategy provides the framework for wildlife management and wildlife related law enforcement within the Park with the following objectives:

- Improving and strengthening field level operations in the protection of wildlife resources
- Minimising wildlife crime and illegal trade in both live and wildlife products
- Enhancing legislation and judicial adjudication of wildlife crime cases
- Enhancing inter-agency collaboration in combatting wildlife crime and illegal trade at national and transboundary levels
- Integrating people and nature into conservation and development processes (i.e., engagement and involvement of community structures in decision making processes).

Successful convictions are recorded by a park level administrator in the DNPW online national database (see Appendix 1).

2.4 Stakeholder Mapping

The key stakeholders of this area include Government; local communities; the private sector; and support organisations.

- How the Park's management engages with stakeholders at international, national and PA levels including relevant institutional arrangements to support the management of the PA include but not limited to:

- Government Ministries and Departments – International (TFCA) and National
- Regional and District Councils
- Traditional governance structures
- Community action units: Natural Resources Committees (NRC); Village Development Committees and Nyika-Vwaza Association
- Private sector (tourism, other relevant sectors)
- Community Based Organisations (CBOs), NGOs and other support agencies.

Current TFCA and PA operational level agreements include:

- Agreement for carbon development, carbon rights and benefits sharing between DNPW and Terra Global Capital, LLC, September 2013
- Co-management agreement between PPF and the Government of Malawi through DNPW, for the sustainable development and management of NNP and VMWR
- Other KfW and other support organisation related projects that benefit THE PARK (inside park and in its resource use zone)

2.4.1 International Level (TFCA)

The TMU engages with Park management team through the TFCA organisational structure below. Through this structure, any international partners that do not engage directly with the DNPW office, do so through the TMU. The TMU's functions which were stipulated in the TFCA treaty were refined during a meeting of the two Departments of National Parks and Wildlife, KfW, and PPF held in Chipata in May 2019. The key functions of the TMU, include amongst several, the following:

- Coordination;
- Interim implementation until a Special Purpose Vehicle (SPV) is put in place, which will take over the implementation responsibilities;
- Project Management;
- Finance Management, Procurement, and Human Resources;
- Joint Operations Coordination; and
- Coordination of implementation of various blocks (Field Coordination)

2.4.2 National Level

Within the Ministry of Tourism, Culture and Wildlife, DNPW is responsible for the management of the Park and has oversight over the buffer zone as regards conservation-related issues. Together with the DNPW, the Department of Agriculture has active extension services. Its focus lies mainly on teaching farmers modern agricultural practices. The Departments of Fisheries and Mining are not active in this landscape but are, however, found present and active at council level in other districts. Settlements in this area are largely controlled by traditional leaders who allocate land. The national forests and forest reserves are administered by the Forestry Department. Other government stakeholders include the Fisheries Department and the Department of Forestry. In both countries, the District Councils are key stakeholders and provide for coordination amongst all relevant stakeholders.

2.4.3 Park level

The stakeholders identified in the list below provide the basis for understanding the Park's management issues and for devising management strategies and interventions to conserve biological diversity, especially regarding the Collaborative Management Programme. However, it must be pointed out that the analysis is from the point of view of DNPW staff.

- Border Zone Communities including NRCs, and the Association
- Traditional Authorities

- Community police forum
- Traditional healers
- Tour operators

Community Action Units

- NRCs are the institutional structure through which DNPW works and liaises with communities within the 5km zone around park. Each member in these committees represents local communities.
- The NRCs of the Park as well as VMWR are represented by the Nyika-Vwaza Association (NVA) for natural resources and rural development.
- Target group assessment and selection criteria for beneficiaries (conservation project interventions)

(Gross & Shaba, 2022) A 5km belt adjacent to the VMWR and NNP was defined as border zone area (DNPW 2018). This zone encompasses communities legitimate to benefit from a resource utilisation programme. For the operation of the resource utilisation programme Natural Resource Committees (NRC) were set up and a collaborative Management Agreement was signed (DNPW, 2017). The NRC is the institutional structure through which DNPW works and liaises with communities. Each member in the committee represents local communities (DNPW 2018). The NRCs of VMWR and NNP are represented by the Nyika-Vwaza Association (NVA) for Natural Resources and Rural Development.

Table 2. Natural Resource Zones and Committees

NO	ZONE	NRC	NUMBER
10	Thazima	Thazima	6
		Mphopwe	
		Kapirinjowera	
		Kapiri	
		Ndyachi	
		Kalinga	
2	Chazale	Kasasa	5
		Mphofwa	
		Lutamiro	
		Chinyausiku	
3	Buma	Khombe	7
		Jalawe	
		Dzenje	
		Kobe	
		Katawa	
		Mbuyu	
		Kawembe	
4	Kawala	Chipulikano	5
		Phopho	
		Zindawiro	
		Mowe	
		Njakwa	
5	Kazovo	Lupalamizi	5
		Khaka	
		Khonjera	
		Katowa	
		kalengamchibu	
6	Ng'onga	Lemba	5
		Linga	
		Fortia	

NO	ZONE	NRC	NUMBER
		Bondi	
		Thandala	
7	Mhuju	Mhuju	7
		Chimyanga	
		Njerekere	
		Mphwaphwa	
		Mbulunji	
		Mubagha	
8	Ntchenachena	Lubagha	5
		Ntchenachena	
		Lura	
		Junju	
		Mphitapasi	
9	Phoka	Chivwanyuma	4
		Kaziwiziwi	
		Phoka	
		Gonero	
10	Chakaka	Dongo	3
		Chirwa	
		Luwona	
11	Livingstonia	Chikale	6
		Vunguvugu	
		Kajoni	
		Nkhota	
		Mahuwi	
12	Mphinga	Mantchewe	6
		Chihanga	
		Chivalawala	
		Chauteka	
		Mtendere	

NO	ZONE	NRC	NUMBER
		Jumbe	
		Yamakwende	
		Lusano	
13	Fulirwa	Njalayankhunda	7
		Mutabwe	
		Kaphika	
		Lusikwa	
		Mutangala	
		Chikwayaya	
		Chiwombwe	
14	Sabi	Ngolowa	6
		Mwakashunguti	
		Chiwembe	
		Honjera	
		Thabilo	
		Mjalibana	
15	Mlare	Chiphapi	5
		Mphanya	
		Mphughu	
		Kasimba	
		Khomo/Mchenga	
16	Bwaye	Zuma	4
		Mtowa	
		Malowe	
		Ntchesamu	
17	Mphanda	Uledi	7
		Chimphusu	
		Muzimero	
		Matipwa	
		Mahowe	
		Kenani	
		Diya	
18	Malambo	Kakunde	5
		Kapelemera	
		Mphanji	
		Salala	
		Rukuru	
19	Jalawe	Balwe	5
		Chimanga	
		Mchina	
		Milambo	
		kanyamana	
20	Gamba	Gamba	5
		Thofwe	
		Nyungwe	
		Kawuwo	
		Kawilo	
21	Therere	Luwungu	3
		Kasuntha	
		Chinyombe	
22	Chisimuka	Chisimuka	6
		Mulawilizi	

NO	ZONE	NRC	NUMBER
		Chiphakasa	
		Chomilo	
		Kazimangwe	
		Swindi	
23	Mphangala	Kalongambale	5
		Thiti	
		Phangala	
		Nkong'onthero	
		Vuvu	



Figure 5. Natural Resource Committee Zones

2.5 Biophysical Characteristics

2.5.1 Climate

The climate of the Park, especially on the plateau, is distinct from that of the surrounding region. The principal causes are high elevations and associated cloudiness. Cooling, particularly in the early mornings, results in condensation and formation of low clouds or mist. This may cover the plateau and hills for several days in succession although it usually clears by mid-morning. Rainfall on the plateau is not usually high for Malawi but the lower temperatures at high elevations result in low evaporation rates. The climate diagram below, (Malawi-Zambia TFCA Project, 2021) shows average monthly precipitation and temperature - average monthly temperatures range from 7°C to 23°C.

Much of the high plateau above 2,200 m however, experiences rainfall averaging 1,000–1,200 mm per annum (Stalmans & Anderson, 2021).

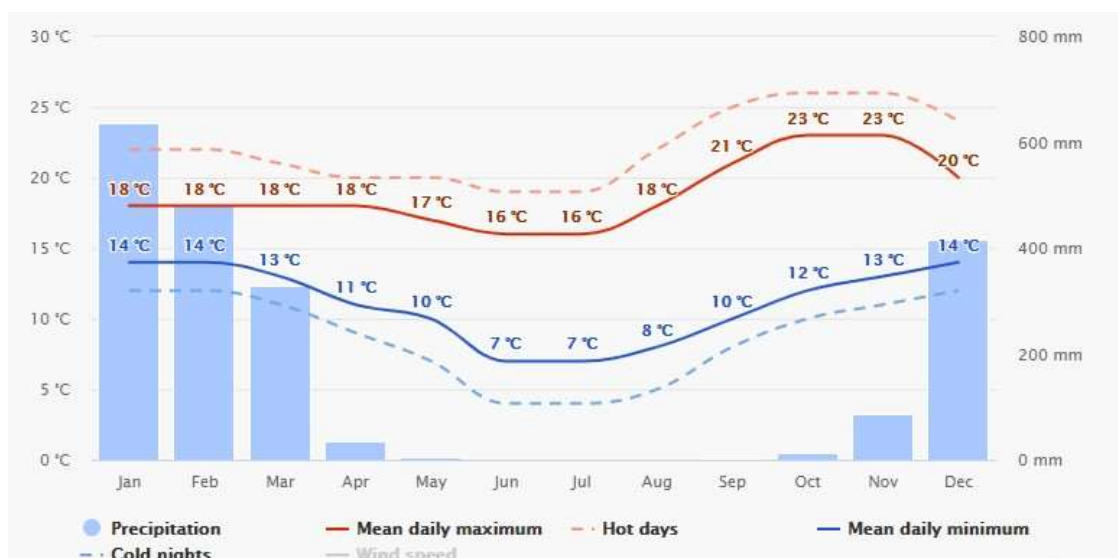


Figure 6. Average Temperatures and Precipitation

Source: Meteoblue, 2021

Over 90% of the total annual rainfall falls in the period from November to April. The rainy season in Central Africa is associated with the movements of the Congo Air Boundary and the Inter Tropical Convergence Zone. These two air circulation systems shift north and south of the equator with the changing incidence of insolation through the year. In-situ convergence and convection are the cause of most rainfall in the region, locally modified by orographic effects. Frost occurs occasionally throughout the Park during the winter months. Frost occasionally occurs throughout the Park during the winter months.

2.5.2 Physiography and Soils

The Park contains six distinct physiographic zones: the eastern escarpment; northern and southern hills; the western escarpment; the plateau; and the Mpanda-Kawozya ridge (a plateau remnant in the northern hill zone). The eastern escarpment is part of the western wall of the Great African Rift Valley, and the plateau is the remnant of an uplifted block created by the tectonic activity that formed the rift.

Most of the plateau (1,800km²) lies at 1,800 m above sea level (ranging from 2,440 m in the west to 2,135 m in the east) and is characterised by wide valleys and moderate relief that varies from 30-50 m in the centre, increasing to 100-300 m at the edge. The escarpment and hill zones are deeply dissected with steep narrow valleys. Overall altitude in the Park ranges from 600 m on the Ruwile River in the northwest to 2,607m at Nganda Hill on the north-eastern side of the plateau – Nganda Hill is the highest point in the Park in the north and Kasaramba at 2,460 m in the southeast.

Landslips in the hill and escarpment zones and mass movement in valleys of the plateau, are the predominant forms of landscape change (Figure 7). The Park has a complex geology (Figure 8) that includes 16 types comprising: gneiss, granulites and schists of the Precambrian basement complex; various granitic and basic intrusions; and limited exposures of Karoo sediments.

There are many landslip scars on the Nyika Plateau, mostly concentrated in the eastern parts on the cordierite gneiss, some relatively fresh and others older and revegetated. These landslips seem to be important in determining vegetation patterns. Many of the forest patches are associated with valley heads on the steeper slopes of concavities formed by former landslip scars. Vegetation is protected from fire in these locations and soil conditions are more favourable.

Soils on the plateau are derived from acid igneous or metamorphic material with a high content of weathering resistant quartz and belong to the humic ferallitic latosol group characteristic of high altitude, high rainfall areas of the tropics. These soils are poorly structured sands, with low pH and low fertility (Figure 9). Soils in other regions of the Park have not been described.



Figure 7. Elevation

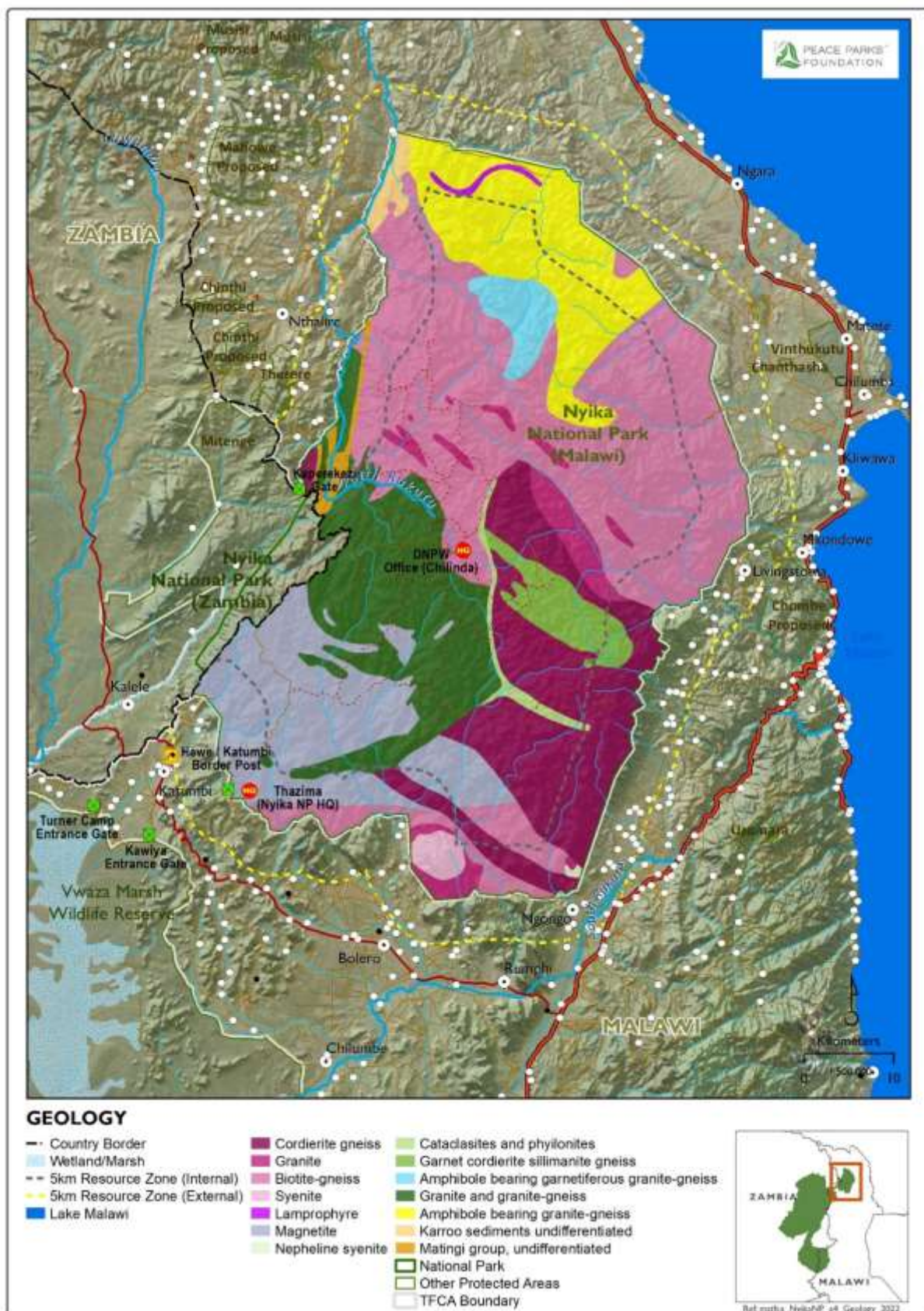


Figure 8. Geology

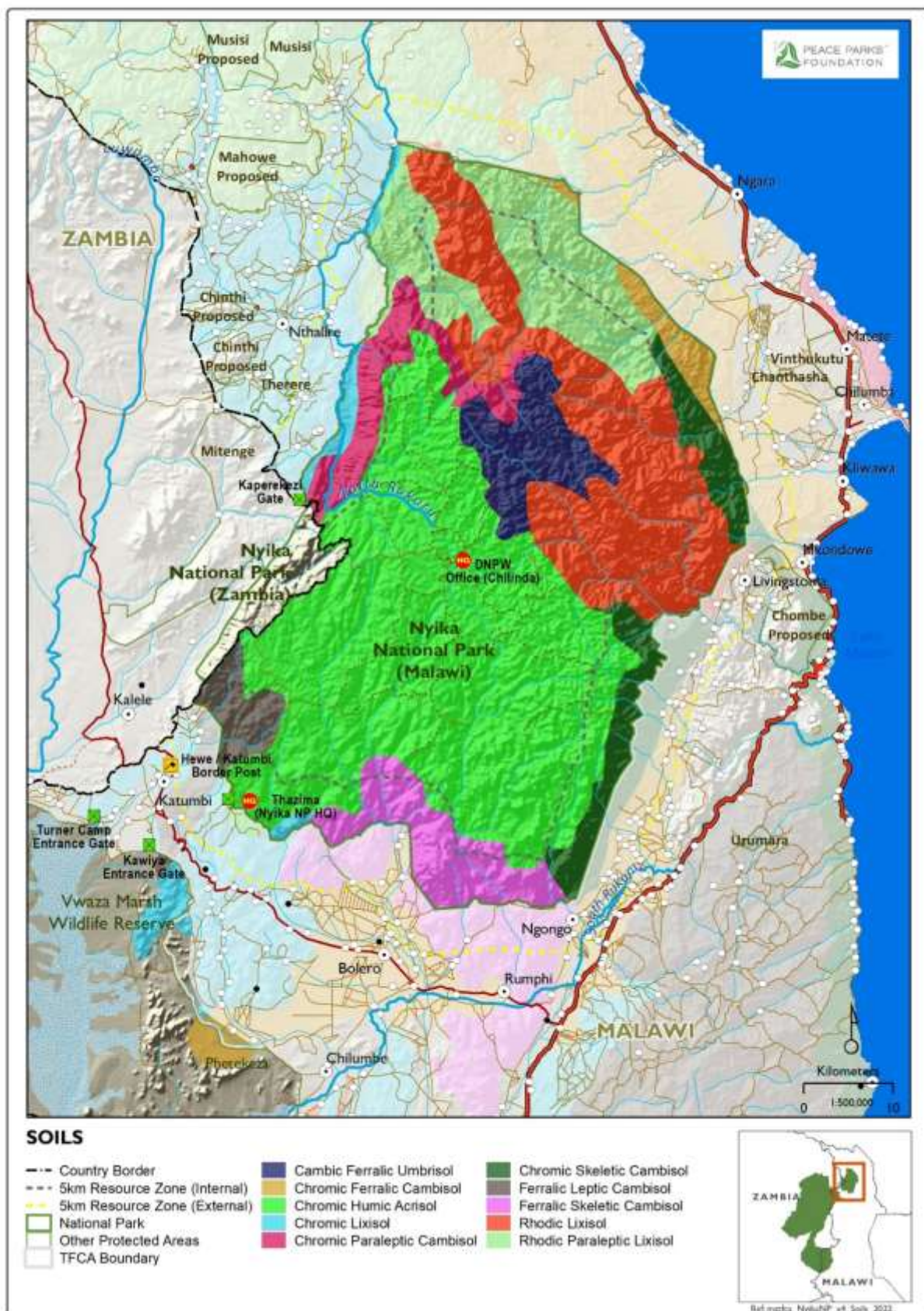


Figure 9. Soils

2.5.3 Hydrology

Nyika is a water catchment of considerable ecological and economic value to the people of the Northern Region of Malawi and Zambia through the Luangwa system. Primary consumptive uses of water are domestic supply and irrigation, while the most valuable non-consumptive use is hydropower generation.

The Park contains six major water catchment areas that drain into Lake Malawi. The western boundary of the Park lies on the watershed between the Lake Malawi/Shire drainage system and the Luangwa drainage system of Zambia. The Chire River in the Zambian Nyika National Park flows westward into the Luangwa. The sub-catchments - Hewe, Runyina, Chilinda-Rumphi, North Rumphi, Wovwe, Nyungwe, North Rukuru are illustrated in (Figure 10).

Draining the Nyika plateau, the main perennial rivers are the North Rumphi, Chilinda (Rumphi), Runyina and North Rukuru. Originating from broad grass-covered dambos on the plateau, they have cut wide and deep valleys. There is only one natural lake on the plateau, Lake Kaulime near Chilinda, formed by a landslide which blocked one of the headwaters of the North Rukuru. Most streams and rivers run throughout the year, and flow rates are measured at a mean annual variation of 28 to 45 percent. Stream flow characteristics are ascribed to high overall rainfall with some rain throughout the year, low evaporation (cloudiness and low ambient temperature), good vegetation cover to promote infiltration, and deep, freely draining soils. The Hewe River originating in the Park, supplies water to the marsh in VMWR.

The value of Nyika as a water catchment is being reduced by the extensive fires that have swept across most of the plateau annually since the 1990s. The fires remove protective herbaceous plant cover which leads to increased sheet erosion. Fire leads to the replacement of grassland and woodland with bracken or phillipea thickets, which provide little basal cover and exacerbate sheetwash.

Water infrastructure development and supply are covered under Section 2.7.



Figure 10. Hydrology

2.5.4 Ecosystems and Vegetation

Overview

The Park protects over 3,000 km² of the Nyika Plateau. Most of the plateau is found above the 1,800 m contour, which usually marks the zone of transition from woodland to montane grassland and forest and creates a moist habitat that hosts a variety of old and new plant species. Over millennia, the mixture of both old and new species has resulted in unique plant diversity, making the Nyika Plateau one of the world's important plant areas. It forms part of the Eastern Afromontane Biodiversity Hotspot and has been classified as one of Africa's Centres of Plant Diversity (designated Af65), (Burrows & Willis, 2005).

The plateau is roughly oval and oriented in a north-easterly direction. Only the wet eastern escarpment is extensively forested. Between 2,100 m and 2,500 m, the central plateau (approximately 60% of the montane area) consists of rolling *Loudetia*—*Andropogon* grassland, interspersed with small patches of low forest (Stalmans & Anderson, 2021).

A list of species prepared by Burrows & Willis (2005) is a synthesis of all the botanical knowledge currently available on the Plateau and the Park. It is based on current understanding of the diversity of plants found on the Nyika Plateau and draws on both published and unpublished information. The checklist was started in 1999, to aid plant collectors on a SABONET-funded regional plant collecting expedition to the Nyika Plateau in March–April 2000; subsequently, the list has been refined, based on the collections made during the expedition. (Annexure B, Annexure C).

Burrows & Willis (2005) list a total of 1,817 recorded species for the plateau. Including the infra-specific taxa and the exotic or naturalised species, the total is 1,891 taxa, grouped in 684 genera and 160 families (Table 3 and Table 4; see Annexure C). With further collecting on the northern, eastern and southern extremities of the Malawian part of the Plateau, and the confirmation of many of the excluded taxa listed in here, the total figure could reach 2,000.

Table 3. Breakdown of Plant Taxa on the Nyika Plateau

TAXA	FAMILIES	GENERA	SPECIES	INFRA-SPECIFIC TAXA	EXOTIC SPECIES
Pteridophyte	22	47	107	2	0
Gymnosperms	3	4	4	0	1
Monocotyledons	24	147	548	10	2
Dicotyledons	111	486	1,158	36	23
Total	160	684	1,817	48	26

Table 4. Largest Families on the Nyika Plateau

NYIKA PLATEAU (TOTAL TAXA: 1,891)	NO. OF SPECIES
Orchidaceae	200
Asteraceae	185
Poaceae	165
Fabaceae (sensu stricto)	159
Rubiaceae	90
Cyperaceae	73
Lamiaceae	65
Euphorbiaceae	41
Apocynaceae (sensu lato)	41
Acanthaceae	33
Scrophulariaceae	33

The top 21 genera (Table 5) are all associated mainly or entirely with the grassland and it can thus be inferred that these genera have achieved their dominance because the Nyika Plateau is such an extensive grassland island.

Table 5. The 21 largest Genera on the Nyika Plateau

GENUS	FAMILY	SPECIES
<i>Habenaria</i>	Orchidaceae	43
<i>Vernonia</i>	Asteraceae	31
<i>Plectranthus</i>	Lamiaceae	26
<i>Crotalaria</i>	Fabaceae	25
<i>Disa</i>	Orchidaceae	22
<i>Helichrysum</i>	Asteraceae	21
<i>Indigofera</i>	Fabaceae	21
<i>Satyrium</i>	Orchidaceae	20
<i>Eulophia</i>	Orchidaceae	18
<i>Eragrostis</i>	Poaceae	16
<i>Panicum</i>	Poaceae	16
<i>Aeschynomene</i>	Fabaceae	15
<i>Hyparrhenia</i>	Poaceae	14
<i>Eriosema</i>	Fabaceae	14
<i>Cyperus</i>	Cyperaceae	14
<i>Scleria</i>	Cyperaceae	14
<i>Buchnera</i>	Scrophulariaceae	13
<i>Sporobolus</i>	Poaceae	12
<i>Bidens</i>	Asteraceae	11
<i>Rhynchosia</i>	Fabaceae	11
<i>Polygala</i>	Polygalaceae	11

The Nyika Plateau, compared to the other areas of the Afromontane archipelago¹⁰, has only a modest level of endemism with a low level of monocotyledon endemism but it is the largest of these systems. Burrows & Willis (2005) records some 637 genera (with 1,782 taxa, excluding pteridophytes). There are almost three taxa for every genus on the Nyika Plateau. The Nyika Plateau is relatively species-poor (0.59 taxa/km²). A single endemic grass species (*Setaria grandis*) was found. Although the Cyperaceae is well represented on the Nyika Plateau—it is the sixth largest family, represented by 72 taxa—no sedge endemics were recorded. It was expected that the grasslands and dambo areas would have a considerably higher number of monocotyledon endemics. Further taxonomic work on the monocot families Cyperaceae, Poaceae, Xyridaceae, and Eriocaulaceae may reveal more monocotyledon endemics.

Within this context, the Park's vegetation has been broadly classified at three levels:

- **LEVEL 1.** At a biome level, four are recognised, namely: *Forest, Grassland, Savanna and Wetlands* (Figure 11).
- **LEVEL 2.** At the Regional Ecosystem level, eight are recognised, namely: *Eastern Escarpment Moist Forest, Plateau 'Island' Forest, Juniperus Montane Forest, Valley and Riparian Forest, Highland Grasslands, Lowland Savanna Woodlands, Miombo Woodland, Wetlands (Dambos, Marshes & Upland bogs)* (Figure 12).
- **LEVEL 3.** Vegetation units, sixteen units are recognised, namely: *Eastern Escarpment Moist Forest, Montane Forest, Subalpine Forest, Western Escarpment Montane Forest, Plateau Valley and Riparian Forest, Juniperus Montane Forest, Escarpment Valley and Riparian Forest, Moist Scarp Woodlands, Dry Scarp Woodland, Montane Woodland and Wooded Grasslands, Lowland Savanna Woodland, Plateau Grasslands, Moist Summit Grassland, Moist Scarp Grassland, Depression Grasslands on Deep Soils, Wetlands* (Figure 13).

¹⁰ The Simen (Simien) Mountains, Ethiopia, Mt. Mulanje, Malawi, the Chimanimani Mountains, Zimbabwe, Mt. Cameroon, Cameroon, and the Nyika Plateau are all mountain blocks with a flora that has evolved in isolation, in much the same way as have the plants on oceanic islands.

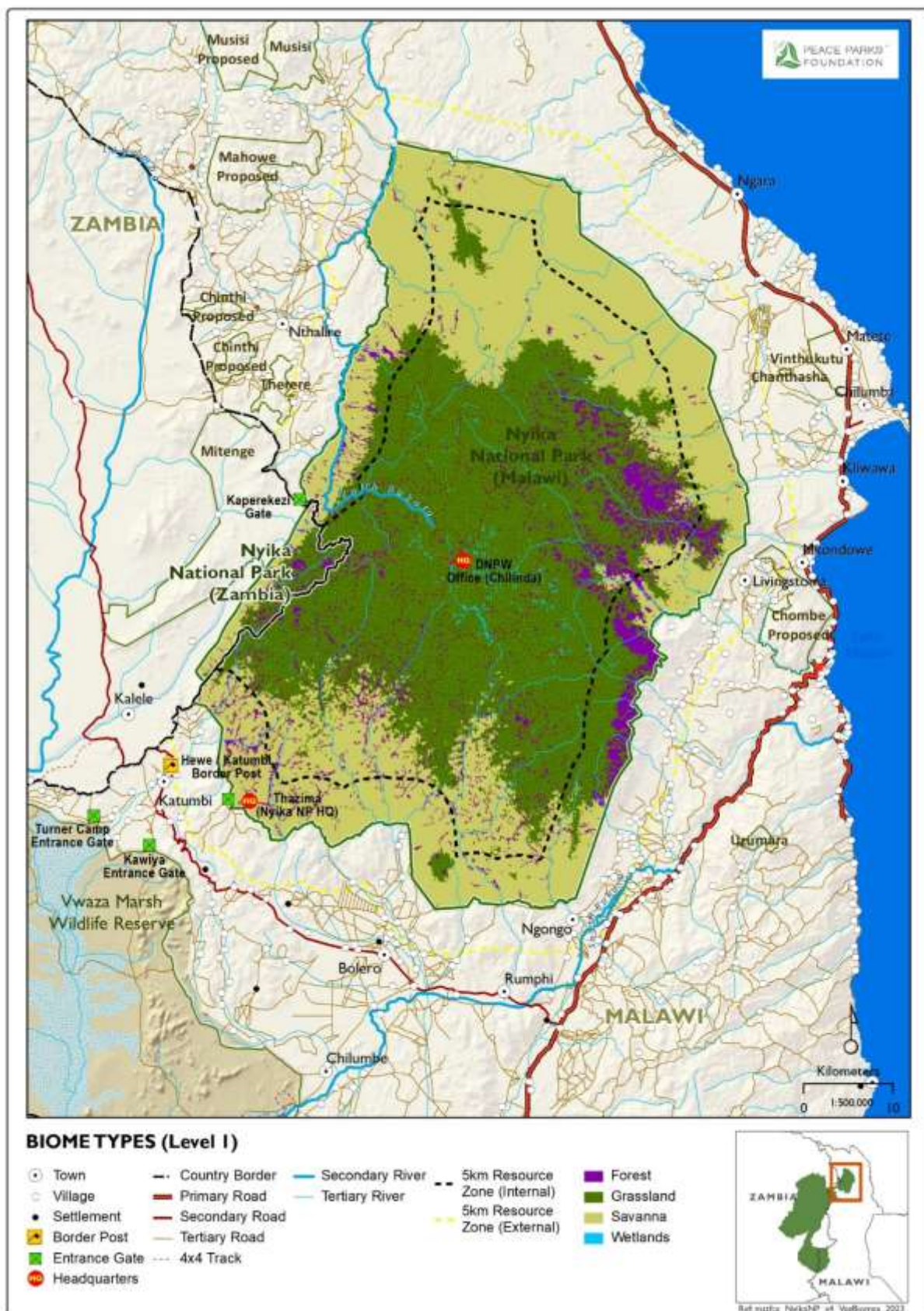


Figure 11. Biome Types

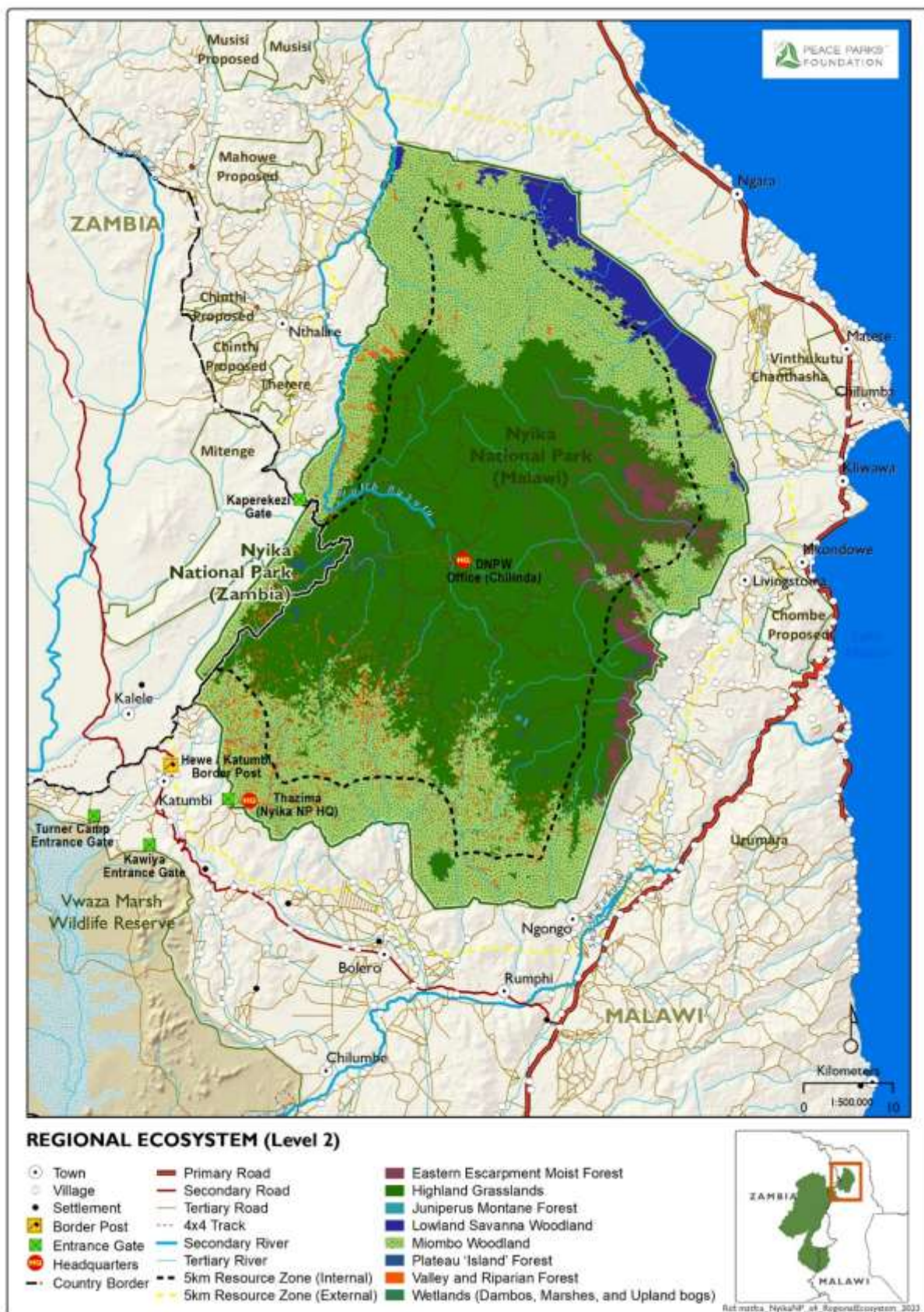


Figure 12. Regional Ecosystem

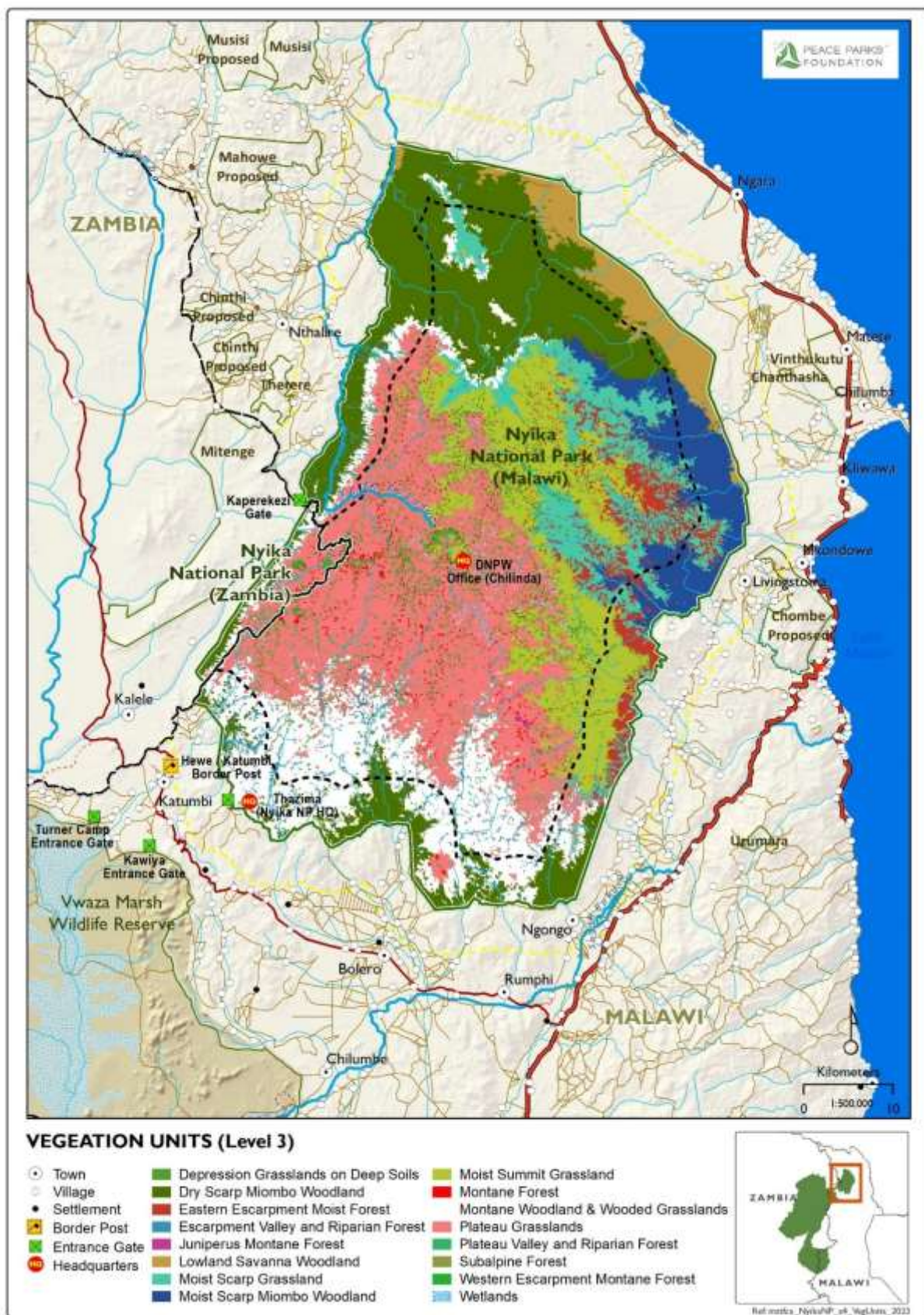


Figure 13. Vegetation Units

The vegetation map provides an extensive list of species in each vegetation unit and details are available in the report. The description of the Biomes is presented below, extracted directly from the Vegetation Map¹¹

FORESTS

- Size and proportions: 23 147 ha or 7.3% of the Park
- Altitude: 1300 to 2445 m, with an average 1880 m
- Rainfall: 1040 to 1480 mm, with an average of 1252 mm per annum
- Canopy height: 8 to 41 m, with an average of 18 m
- Slope: 1.7 to 39 degrees, with an average of 14 degrees

Unlike savanna and grasslands, forests usually do not have a grassy understorey and do not burn. Fire is very harmful to forests and a closed canopy excludes the flammable grassy sward from establishing. Within forests, the canopy of the tall trees usually overlaps whereas in closed woodland the canopy of the taller trees seldom overlaps. The forests are classified into 4 regional ecosystems and 6 vegetation types.

Management remarks: The forest margin has an important function in protecting the forest from desiccating winds and fires. Hot and uncontrolled fires, as well as more flammable invasive alien plants, can increase fire risk along the forest margin and should be managed. Forests also contain specific tree species favoured for their medicinal value or their timber/structural uses. Uncontrolled harvesting may increase their risk of local extinction. Their loss from the canopy may also result in the colonising of the flammable grass sward with the increased light, which increases fire risk.

SAVANNA

- Size and proportions: 140 512 ha or 44.1% of the Park
- Altitude: 580 to 2050 m, with an average 1520 m
- Rainfall: 950 to 1450 mm, with an average of 1140 mm per annum
- Canopy height: 0 to 23 m, with an average of 14 m
- Slope: 0 to 38 degrees, with an average of 15 degrees

Savannas can be distinguished from forest by their grassy sward in the understorey, and from grasslands by the absence of a diversity of tree species, they are the second most abundant biome within. The terms woodland and savanna are often confused. Woodland generally has a stricter definition of wooded formation with an upper stratum dominated by woody species, spaced so that the crowns of trees and shrubs do not overlap (Mucina et al 2022). Savanna is much more variable and includes woodland but so too the more open shrub and small tree dominated “bushveld”, as long as they have a dense grassy sward. Even grassland areas have been included under the concept of the savanna biome.

Within the Park, two savanna regional ecosystems are recognised, namely the Miombo Woodlands and the Lowland Savanna Woodlands. These are then further subdivided up into five vegetation types with the Miombo Woodlands containing four vegetation types and the Lowland Savanna Woodland only one.

GRASSLANDS

- Size and proportions: 153 795 ha or 48.3% of
- Altitude: 1680 to 2603 m, with an average 2190 m
- Rainfall: 1000 to 1450 mm, with an average of 1200 mm pa
- Canopy height: 0 to 20 m, with an average of 11 m
- Slope: 0 to 33 degrees, with an average of 10 degrees

¹¹ Lotter, MC, Burrows, JE. 2023. A vegetation map of the Nyika National Parks of Malawi and Zambia. DNPW Report, February 2023

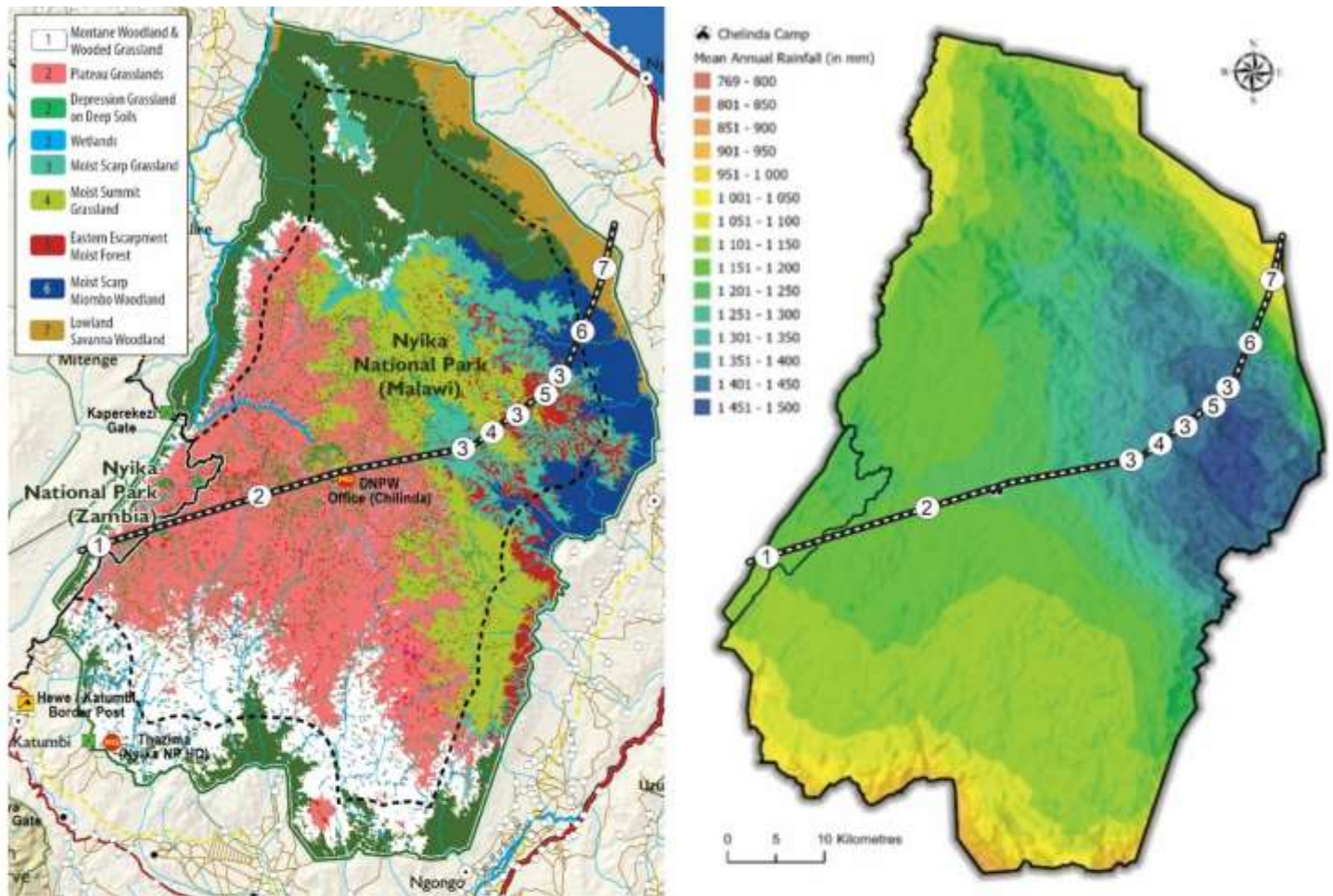
Although grasslands are structurally dominated by grasses (or graminoids), they have a greater diversity of forb species of which many may be more localised than the grass or tree component within the surrounding savannas and forests. Grasslands may contain tree species, but then in these cases the tree component is usually represented by only a few species, such as *Protea*. This is then often described as a wooded grassland, compared to an open woodland that would still have a diversity of tree species even though a very sparse canopy.

Grasslands are the largest biome within the Park, at just over 48%. Two grassland regional ecoregions occur within the grassland biome in the Park, and four grassland vegetation types. It is important to state that the authors of this report do not have enough field knowledge of the grassland biome within the, or access to plot data or well georeferenced plant specimens, to assist with the proper description of these units. Hence, they are well described at a regional ecosystems level, but not at the vegetation type level. However, the authors believe that what is presented are valid units based on the interpretation of satellite and environmental variable data. Hopefully more field work will result in an improved description in the future.

WETLANDS (Dambos, Marshes and Upland bogs)

- Size and proportions: 1 094 ha or 0.3% of the Park
- Altitude: 1830 to 2400 m, average 2260 m
- Rainfall: 1150 to 1300 mm, with an average of 1200 mm pa
- Canopy height: 0 to 10 m, with an average of 5 m
- Slope: 0 to 17 degrees, with an average of 5 degrees

Wetlands have a very low canopy height (expected), it occurs at higher elevation than most other biomes, the Normalised Differential Moisture Index (NMDI) is second only to forest, it occurs on more gentle slopes than all other biomes, solar radiation is very high, and it has the understandably the highest values for the wetland index values.



Profile line reference on Vegetation Map

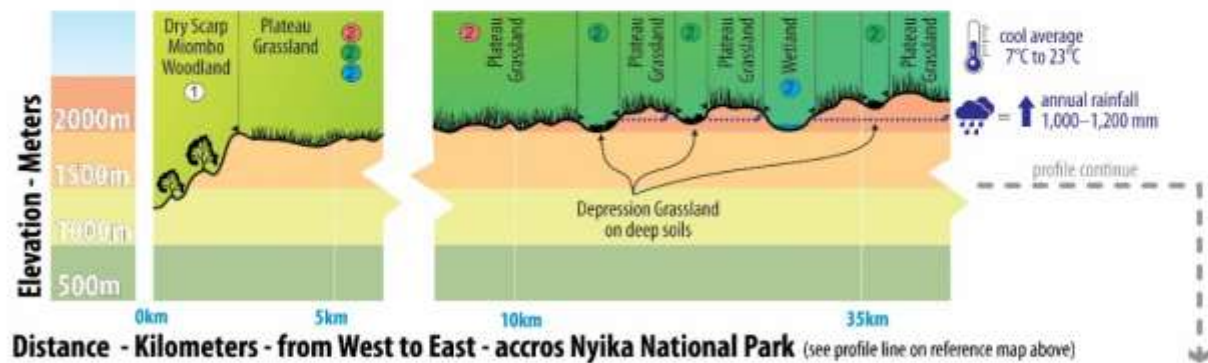


Figure 14. Vegetation vs Elevation cross section

Invasive and alien plants

Biodiversity within the Park is threatened by invasive and alien plant species including *Rubus ellipticus*, *R. niveus*, *Pinus patula*, *Acacia mearnsii*, *A. melanoxylon*, *Lantana camara*, and others. Bracken fern (*Pteridium aquilinum*), an indigenous species is also abundant in the Park and spreading to the detriment of native flora and fauna. Rivers and streams in the Park have been colonised by *Pistia stratiotes* and *Azolla nilotica*. A few exotic species, which are known to be invasive elsewhere, such as *Desmodium uncinatum*, have also been introduced to the staff village and to the tourist lodge.

The spread of alien plants from Chilinda plantation and outlying trial plots is one of Nyika's most urgent management problems: considering the presence of self-sown pines observed in the miombo landscapes around the Chikangawa plantations at elevations of 1,600 to 1,700 m and their spreading nature on Mount Mulanje, most of the Park is potentially exposed to invasion and transformation by *Pinus patula* (Stalmans, 2019). Negative effects of these plant species include increased soil erosion, hotter fires, biodiversity loss, and reduced water catchment outflow.

Bracken fern invasion in the Park has also been an increasing cause for concern with respect to future biodiversity conservation efforts. A study was undertaken in 2018/19 for the Nyika-Vwaza Trust aimed at shedding more light on both the spatial and temporal distribution of bracken fern in the Park as well as assessing the impact of the invasion by comparing plant species diversity and soil physical-chemical parameters in bracken invaded and non-invaded areas.

Results revealed that bracken fern covered 13.7% (20,940.7 ha) of the entire grassland plateau as of 2017 and was distributed more densely within five kilometres of the pine plantation located at the centre of the Park. The results also showed that the area invaded by bracken fern increased by 121.9% between 1986 and 2016 across the grassland plateau, with a 4.06% annual rate of increase. Furthermore, the results indicated significantly lower plant species diversity (richness and evenness) in areas invaded by bracken than non-invaded areas across the grassland plateau, as well as significant variations in soil physical and chemical properties of soils in invaded and non-invaded communities. Given the rate of spread between 1986 and 2016, bracken could invade the entire grassland plateau within the next 40 years if left unchecked. This could result in significant alterations to the soil community and consequent loss of grassland plant species diversity in the protected area on which wildlife depends.

Further monitoring on the distribution of the species as well as research into the factors influencing its spatial-temporal distribution are highly recommended. Additionally, the study recommends that field experimentation of different control options for the invasion should be carried out simultaneous to research on invasion drivers (Kanzunguze, 2019). However, evidence from around the world suggests control is extremely difficult, especially the use of chemicals and disturbing the soil surface in an area where water catchment is important. There does appear to be a link between the spread of bracken and fire frequency and timing, and this is potentially a likely driver given the recent changes to the fire regime (see next section). Other factors such as climate change and increased carbon dioxide may also compound with any other effects.

An economic evaluation of Nyika's water catchments has not been undertaken, but given the agricultural, hydropower generation and aquaculture that depend on rivers that flow from the Park, the value is likely to be considerable. Alien and invasive plant control must thus be a park management priority if the Park is to achieve the purposes for which it was created. Park management has commenced with an alien and invasive plant eradication programme: the experimental plots are in the process of being eradicated, while the Chilinda plantation was reduced from 542 ha to 266 ha between 2008 and 2022. Black wattle removal is almost complete, although there is regrowth in isolated areas.

Fires

Fire has been an important driver of the plateau grasslands which are highly adapted to frequent fires, which improve palatability of the grass and increase vigour under certain conditions. Fire management is complex considering the various landscapes and vegetation types, including the occurrence of alien and invasive species. In contrast with the grasslands, forests are very vulnerable to fire and forest margins are the protection barrier. The

margins however can be especially vulnerable to fire and where a specific frequency and timing within the season fires may open the forest margins and expose the forests to fire which may over time reduce them. This coupled with the importance of water catchment and the possible link with fire and the expansion of bracken fern, means controlling fire frequency and timing, is critical and should be an important focus for management.

Identified and raised management issues include loss of plant species diversity due to high fire frequency and through the expansion of exotic tree species from the Chilinda plantation and forestry trial plots and bracken expansion. Past attempts to remove the plantations and plots have been unsuccessful.

Soil erosion has also been the result of high fire frequency and indirectly; due to poorly designed and maintained park roads.

According to the Malawi-Zambia TFCA Community Based Fire Management Plan (CBFiMP) 2015, Community Based Fire Management Plan is a subset of Community Based Natural Resource management (CBNRM) programme but focusing on fire. It is a strategy which promotes involvement of local communities in the proper application of fires for reducing the impact of pests and diseases, controlling weeds and invaders, generating income from non-timber forest products such as caterpillars, promoting forage production for grazers and hunting. The primary goals of the CBFiMP are:

- To improve fire prevention and suppression
- To reduce hazardous fuels
- To initiate and sustain community involvement in fire management

Stalmans (2019) undertook an analysis of fire frequency between 2002 and 2018 using satellite imagery. Important conclusions from that analysis are:

- There is a trend of the area burnt fluctuating between seasons, a year with a smaller fire area is often followed by a year with a higher percentage burnt
- Fire is confined to the dry season, starting in May with a significant increase in June through to October (see below figure)
- Fire frequency on the grasslands is shown in Table 6: Fire Return Period (2002 – 2018 Historical and current occurrence of large herbivores, this indicates an average fire return period of about 1 to 1,5 years, noting that fire frequency may not be similar across the landscape
- Most fires on the plateau appear to be set by poachers and originate from beekeeper's activities.

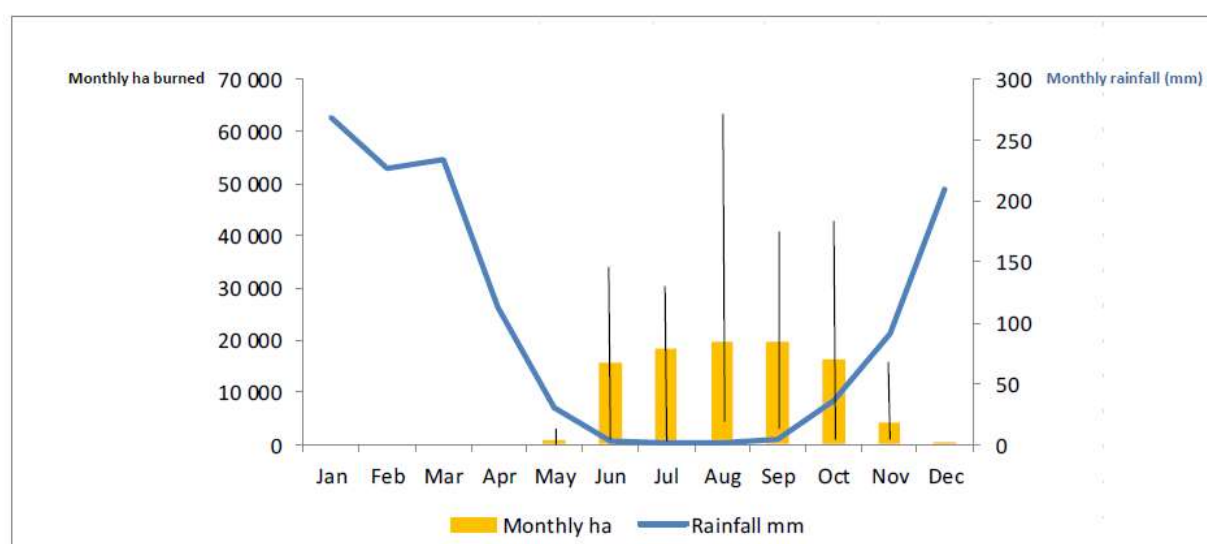


Figure 15. Minimum, maximum and average monthly extent of fire in Nyika NP as documented through the MCD64A product for the period 2002 – 2018 Source: (Stalmans, 2019)

Stalmans (2019) further provides fire management recommendations, however, an operational fire management plan that gives clear direction and assigns responsibilities is essential and not yet in place.

Table 6: Fire Return Period (2002 – 2018)

Source: (Stalmans, 2019)

FIRE RETURN PERIOD FOR THE PERIOD 2002 TO 2018	% OF PARK	% OF GRASSLANDS
1 growing season	18.9	41.0
2 growing seasons	13.5	27.6
3 >growing seasons	38.4	28.1
No fire	29.2	3.3

See 2.5.3 for catchment impacts resulting from indiscriminate fires including erosion and replacement of grassland and woodland.

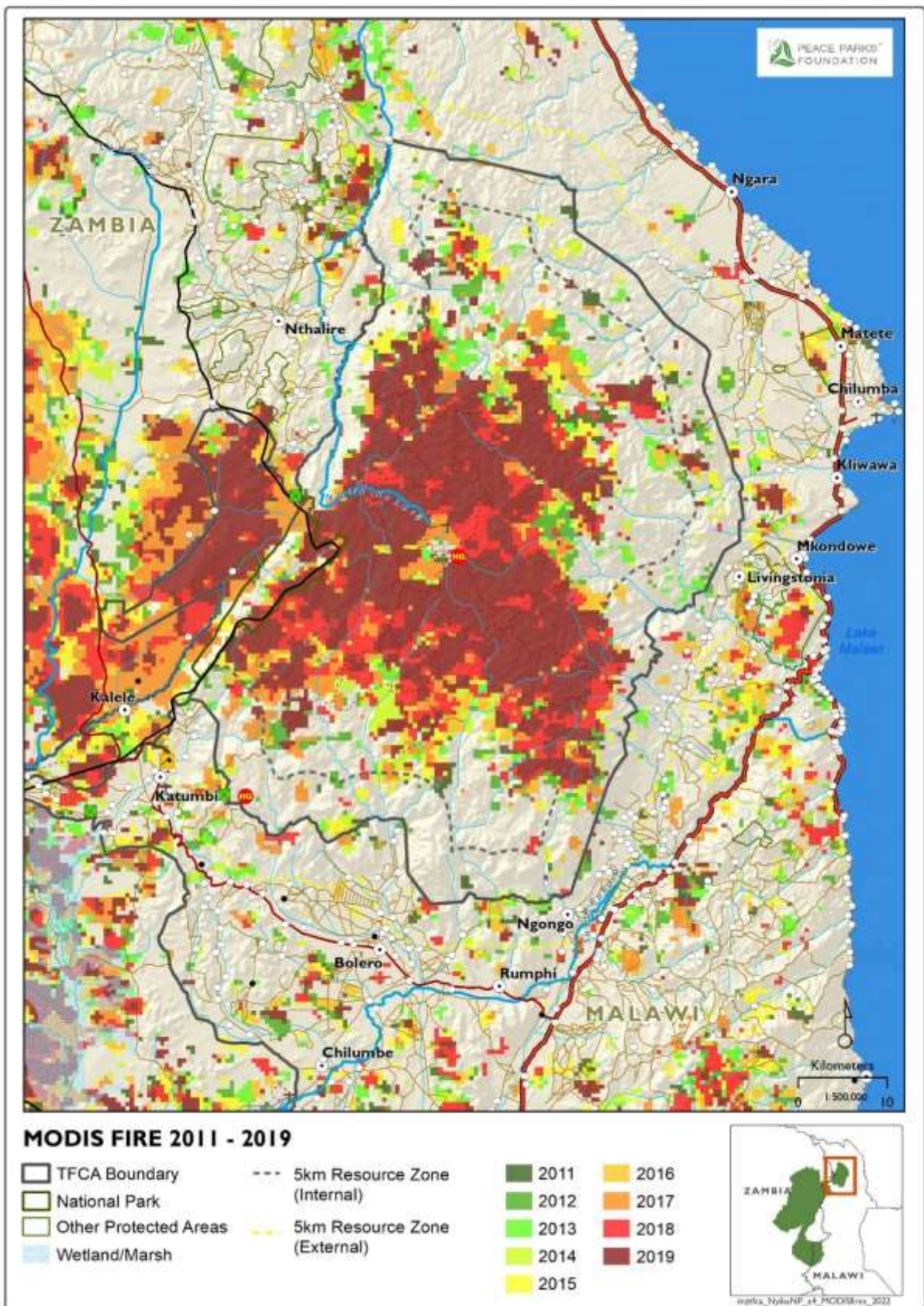


Figure 16. MODIS Burnt Area (2011 – 2019)

2.5.5 Fauna

Overview

Over 95 species of mammals in 24 families, 426 species of birds, 47 species of reptiles in nine families and 34 species of amphibian in five families have been recorded in the Park (see Annexure D).

Inventory of invertebrates has been restricted to butterflies of which there are 200 species.

About 26 species of fish occur in the Park. Park streams on the plateau contains a single species of mountain catfish. Rainbow trout (*Salmo gairdnerii*) and brown trout (*S. trutta*) were introduced for sport angling in the late 1950's and 1975 respectively.

The forest patches of Nyika contain more bird species than any similar forests elsewhere in Malawi and some bird species reach the most southerly limit of their range in the Park (hence the listing as IBA). The breeding population of Wattled crane and Denham's bustard on Nyika's grassland are by far the largest in the country.

Among the animal species, five mammals, 10 birds, two reptiles, two amphibians, and nine butterflies have restricted distributions, or are endemic rare, threatened, or endangered. Taxonomic studies revealed that three birds, two reptile and two amphibian species are endemic to the Park.

The table below sets out historical and current occurrence of larger herbivores in the Park (Stalmans & Anderson, 2021).

Table 7. Historical and Current Occurrence of Large Herbivores

Current status: Inc – increasing; St- stable; Dec- decreasing; Ext – locally extinct, Vag = vagrant, DD – data deficient

COMMON NAME	SCIENTIFIC NAME	STATUS
Elephant	<i>Loxodonta africana</i>	Inc
Hippopotamus	<i>Hippopotamus amphibius</i>	nil
Black rhino	<i>Diceros bicornis minor</i>	Ext
Cape buffalo	<i>Syncerus caffer</i>	DD
Crawshay's zebra	<i>Equus zebra crawshayi</i>	Dec
Eland	<i>Tragelaphus oryx livingstoni</i>	Dec
Greater kudu	<i>Tragelaphus strepsiceros</i>	Dec
Bushbuck	<i>Tragelaphus scriptus</i>	St
Cookson's wildebeest	<i>Connochaetes taurinus cooksoni</i>	Vag
Common waterbuck	<i>Kobus ellipsiprymnus</i>	Vag
Puku	<i>Kobus vardonii</i>	Vag
Southern reedbuck	<i>Redunca</i>	Dec
Impala	<i>Aepyceros melampus</i>	nil
Roan antelope	<i>Hippotragus equinus</i>	Dec
Sable antelope	<i>Hippotragus niger roosevelti</i>	Nil
Lichtenstein hartebeest	<i>Alcelaphus* buselaphus lichtensteinii</i>	Ext
Common duiker	<i>Sylvicapra grimmia</i>	St
Klipspringer	<i>Oreotragus</i>	St
Oribi	<i>Ourebia ourebi</i>	Dec
Warthog	<i>Phacochoerus africanus</i>	DD
Bushpig	<i>Potamochoerus larvatus</i>	St

The Park's wildlife populations have been in decline since the late eighties when the estimated large herbivore biomass was approximately 1,000kg/km². This has declined over the period where in 2002 it was estimated to be below 200kg/km². Using estimates for the 2021 wildlife census indicates that it remains in this region or a bit lower. Stalmans and Anderson (2021) estimate that the likely carrying capacity for the plateau is in the region of 1,500kg/km² and the escarpment approximately 2,000kg/km².

However, because of the importance of area as a water catchment, they recommend a more conservative long-term carrying capacity of 1,000kg/km², as per the late eighties when the system seemed stable and resilient. Species which could potentially and significantly increase in number, and boost the animal biomass include Crayshay's zebra, eland, roan antelope and southern reedbuck and possibly buffalo. This means that the large herbivore productivity of this ecosystem is only at about 20% of its potential. This results in inefficiency, poor trophic cycling and a huge loss in potential protein production, which could offer a sustainable surplus for harvesting.

For most species, the current numbers of even the more abundant, are very low, between 200 and 250 animals, except for common reedbuck, numbers for which were estimated at about 1,800. Eland numbers seem to have declined significantly from 2009 from about 650 animals to about 200. For those species at low numbers, even if poaching can be virtually eliminated and the game could grow at their optimal rate, it will take at least 20 years to attain the stocking rate of 1,000kg/km². Poaching which is at or higher than the annual rate of recruitment will result in a continually declining number of animals. None of these species is considered vulnerable or threatened, elephant whose numbers seem to be increasing is the only endangered large mammal.

The wildlife census report undertaken in 2021 has identified that most of the animals are concentrated around the DNPW offices in what is termed 'a hotspot'. Importantly in previous censuses undertaken in 2009, 2013 and 2015 showed a similar distribution although the 2021 had a higher density of game, but the 2021 technique was different using a helicopter, while the others were a fixed wing aerial count, which makes comparisons between counts very difficult, if not impossible.

An important study undertaken in 2019 examined bushmeat and community benefits around Nyika and Vwaza (Van Velden, 2020; J Van Velden, personal communication, August 2022). The important issues to arise from this study is that:

- Bushmeat plays an important role in food security
- Poorer households consumed more bushmeat and for the richer households, bushmeat was a form of income
- It remained an important aspect of life.

Recommendations included exploring wildlife farming to help combat illegal hunting and that the perceptions of communities are incorporated into planning while illegal hunting and bushmeat consumption must be treated as separate issues.

Illegal harvesting of wildlife is further elaborated under Section 2.7.2

A **strategy for wildlife introduction** was prepared by Stalmans & Anderson (2021) considering the current habitat suitability and carrying capacity and recommendations and guidelines in this regard as well as future faunal surveys are elaborated further in Section 5.1.

Human Wildlife Conflict

Local communities living adjacent to the Park coexist with wildlife, sharing the same landscape and resources. During the past two to three decades, the area has witnessed escalation in HWC and is a significant cause of concern for the communities residing adjacent to the Park, especially in certain hotspot areas. Information and data gathered by the DNPW shows increasing damage by wildlife (elephant, hippo, bush pig, baboon) on the farms of the neighbouring local populations, specifically on the south-western boundary of the Park. The worst affected segments of the local communities are subsistence farmers growing maize, a staple crop. This damage is in addition to predation on livestock, human injury and death. All segments of the local population are affected, i.e., men, women, the elderly and youth. Family units and households occupying the resource use zone of the Park suffer serious loss in harvest due to elephants in search for food and space, negatively impacting on local food security and peoples' livelihoods. According to reports by DNPW over the past two decades, entire crop stands and granaries of maize have been destroyed and lost to increasing frequency of raids by wildlife (Nyanga, et al., 2022).

Nyanga, et al. (2022) reveals a prevailing perception that wildlife has caused more harm to humans than humans have caused to wildlife, with a widespread view that there have been no compensations for property and human loss due to HWC. Communities generally agreed on the interventions such as fencing as well as increased patrols and culling as mechanisms for managing HWC.

HWC management challenges thus both, DNPW and local communities, and killing of wildlife species in retaliation and a decreased support for conservation activities are the consequences. Despite the frustration among those affected, it was observed that a clear HWC reporting system exists and is understood by the communities, with reports moving from the affected to NRC members, DNPW, and traditional authorities in that order.

In order to decrease the pressure of wildlife on the safety of people living adjacent to the Park an electric fence was erected along the southern boundary for wildlife management. It is, however, understood that the construction of a fence is not the only solution to HWC and that longevity and sustainability of HWC management measures need to be embedded in a holistic and integrated system, integrating and collaborating; with clear and defined roles of all partners. The future of conservation in the Park depends on the success of holistic and integrated HWC management and the development of long-term coexistence strategies benefitting both people and wildlife.

A **HWC Management Scheme (HWCMS)** for the VMWR and NNP, Malawi was thus commissioned through TFCA support funding and a report completed in February 2022. The objective of a HWCMS is to develop most effective, suitable and feasible management actions to prevent and mitigate HWC, this scheme takes a step further and integrates sustainable rural and livelihood development with a strong consciousness about the neighbourhood of wildlife and its importance. The scheme also includes a framework for stakeholder engagement and an institutional framework and describes a set of tools and multiple strategies, to implement the HWCMS in an integrated and holistic way.

The HWCMS is accompanied by **HWC Management Manual**, which encompasses a detailed action plan, outlines a curricula and draft decision support systems, as well as monitoring tools for HWC and its management.

According to Goss & Shaba (2022) as part of an investigation undertaken in 2021, the appointment of co-existence officers to work within existing NRC structures and the Park's extension units is important to-

- manage the conflict with fence maintenance (through appointed and remunerated attendants, with equipment), crowd control, develop and capacitate rapid response teams and community sensitisation
- monitor, budget and report to improve strategies
- implement the HWC Management Manual
- develop safe water points.

See Table 19 for the Park's HWC and related law enforcement statistics recorded between 2016-2021.

2.6 Cultural and Historical Characteristics

A study was undertaken in 2003 to document the Park and surroundings areas' cultural and historical heritage besides its natural heritage in response to the request to UNESCO to have the Park included on the World Heritage List – a summary of the study is annexed (Annexure E) and a brief overview provided below.

The study indicated that the area (the Park and a 10km zone around the Park including areas Livingstonia, Nchenachena, Mhuju, Bolero, Hewe, Nthalire and the Sitwe Valley) was endowed with numerous cultural and historical resources that could be developed for the improvement and further development of tourism in the region. The Sitwe Valley is of great interest – it is rich in palaeontological heritage as the area has yielded different fossil species including one prototype dinosaur species *Malawisaurus*.

The Nyika Plateau has been inhabited for at least 3,000 years, firstly by stone-age hunter gatherers and from about 200 AD by iron-age cultivators. The earliest settlements were inhabited by the Phoka who had been established on the eastern escarpment and in the southern hills at the end of the 19th Century. The Park contains several cultural sites where artefacts represent various types of human occupancy since the early Stone Age. These include rock shelters, rock art, iron smelting furnaces and several small mines from which ore was extracted by early smelters.

Nyika is associated with the migration of the Balowoka. The name 'Tumbuka' was derived from the name of an ancient African town in northern Nigeria known as Timbuktu where they originated from. This was around the 6th Century AD. Iron production is associated with the migration of the Tumbuka who later formed the dynasty of Paramount Chief Chikulamayembe and the Nkhamanga Kingdom. These people first came to trade in ivory and the Phoka hoes in exchange for commodities such as beads, cloths, guns etc. However, later the traders from the east brought their spouses for settlement.

Lake Kaulime, the only natural lake on the Nyika Plateau, is surrounded by mystery. It is located eight kilometres west of Chilinda and is about 1,3ha. Oral tradition holds that the lake is the home of a powerful spirit, which takes the form of a great serpent and human being and has healing powers. The snake is believed to have many powers including curing the sick if they manage to touch its tail. It is also said to be the guardian of the Nyika animals, allowing only one animal to be killed by each hunting party.

Chipokabawole is a place on the Nyika where women only were required to leave white beads before proceeding to their destination. Failure to do this resulted in the women going missing. This was more serious with pregnant women as well as those women who in their lifetime had given birth to twins. This was also the case at Lake Kaulime.

The archaeological record on the Nyika Plateau comes from the Later Stone and Iron Age sites located in the Park. The sites have revealed a wide range of cultural material with significant archaeological value. These materials have compared well with other finds from other northern sites, central and southern parts of Malawi and the whole of Sub-Saharan region. The area is a landmark where the study of cultural materials has revealed the occupation of the area by the Late Stone Age settlers who spread right throughout the plateau region and down into the Rift itself. It is also interesting to note that the remains of animals that were hunted are like those animals that were living there in third millennium BC (*dated by radiocarbon from Fingira Cave*). The findings show that fauna species during that time are the same as the animals found in the Park today.

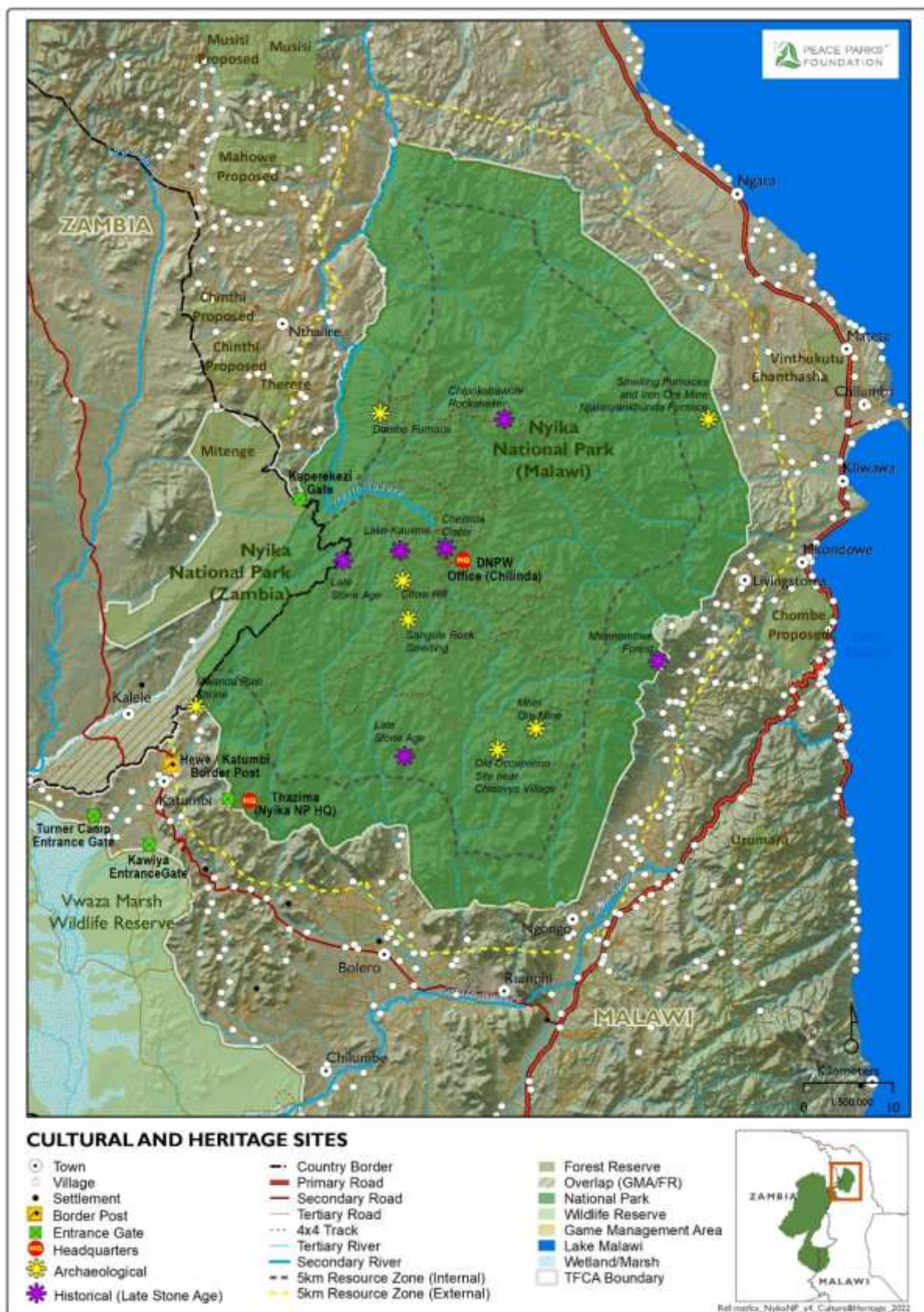


Figure 17: Cultural and Heritage Sites

2.7 Development and Utilisation Characteristics

2.7.1 Infrastructure and Services

The access and transport network within the Park consists of the following:

- Entrance gates at Kaperekezi (west) and Thazima (southwest) on the M9 road. There is a proposal to open another entrance point on the southern boundary of the Park. The purpose of this gate will be to provide a shorter access to the Park approximately 45 km to the nearest tarmac road with the Southwest access point of about 100 km from Rumphu. The southern access will also connect the Park to a historical site at Livingstonia and Lake Malawi.
- A road network of approximately 240 km, mainly unpaved gravel surfaces with gently slopes, some, however, poorly located, aggravating soil erosion and generally not maintained, with the M9 as main arterial through the Park to the border Nyika National Park, Zambia, and onwards to Chitipa. Two bridges have been constructed over water courses to improve access, five bridges to be constructed during 2022.
- A border post (Mbalachanda) with Nyika National Park, Zambia at Kaperekezi Gate though this is not yet developed or functional.
- An airstrip at Chilinda (registered under Category 2 airstrips); however, high altitude, fog or misty and rainy weather conditions do limit the use of this airstrip.

Park management facilities and amenities include:

- Headquarters facilities at Chilinda and Thazima including offices, workshops, staff housing and social amenities (Figure 2; Appendix 2; Table 22)
- A rapid response unit and law enforcement command unit at Chilinda (Appendix 2; Table 23)
- Section ranger camps (Kaperekezi,) and 4 ranger camps (Uledi, Thazima, Kaperekezi and Njalayankhunda)
- Tourism infrastructure located approximately 60km north-east of Thazima Gate including two related hospitality facilities in the area: Chilinda Lodge aimed at the high-end safari market, offering eight double-story log cabins and walkways that link the log cabins to a central dining and lounge area; and a short distance to the south, Chilinda Camp - a self-catering lodge aimed at the mid-market, comprising six rooms in the main facility and four two-bedroomed cottages - the Camp also offers a communal dining room, bar and kitchen.

Currently there is no perimeter fence and the Park is open to the Zambian part of the Transfrontier park – the construction of electric fence has begun and along the southern boundary of the Park for the purpose of wildlife management. An internal 70 km² sanctuary was fenced for the reintroduction of elephant.

Services within the Park include:

- Water supply at camps, via borehole (four), streams and dambos (Appendix 2, Table 21). Besides boreholes, water resource infrastructure includes three small, earth-wall dams just to the south of Chilinda (initially constructed to establish a trout fishery). All spillways have been rehabilitated and stabilised. In addition, the Wovwe River's banks that were being eroded thereby threatening Njalayankhunda camp have been stabilised by gabions on the riverbanks and drainage from houses.
- Sanitation and waste: 47 pit latrines have been constructed across the Park.
- Communications via mobile and radio (four towers are located throughout the Park (Figure 2)

2.7.2 Resource Use

Illegal use of natural resources

The high levels of illegal activity are influenced by the poor socio-economic conditions in surrounding areas. The way people were resettled when the Park boundary was extended in 1978 and rapid human population growth compound these problems. Relations are made worse by crop raiding by baboons and the Department's inability to

provide an adequate protection service. High fire frequency is also partly a symptom of the poor relations between the Parks and neighbouring villagers who set most fires. Park extension services have improved relationships by introducing the Resource Use Programme to some areas since 1995 but lack the resources to service and expand the programme sufficiently.

The following pose a threat to the biodiversity of the Park, besides boundary encroachment, albeit closely related:

- Illegal logging of evergreen forests on the eastern side of the Park poses threat to the biodiversity of the Park. The readily available market for hard wood in Karonga promotes the exploitation.
- The illegal harvesting of orchids
- The poaching of larger mammals (Nyika-Vwaza Trust, 2020).

According to Nyika-Vwaza Trust (2020), there have been several arrests and convictions of poachers in recent years. Local magistrates are also taking the issue more seriously and fines and prison sentences have been imposed. However, it is also recognised that orchid harvesting and sale is an important source of income for some rural families as well as a few entrepreneurial traders. Much work has now been done on the socio-economic aspects of the harvesting and trade and its drivers, as well as on the implementation of existing anti-poaching laws. However, what is still not clear is the possible biological impact past and present harvesting has had on orchid populations and conservation status, or what the effects of other ecological issues – such as a possibly increased incidence of fire and the decreased large herbivore pressure owing to poaching - might be having.

Hardwood logging

Any hardwood logging activities inside the Park are prohibited and considered illegal. Under the resource use activities that are managed by the RUP. Timber harvesting for fuel or any other reason is not part of the resources that can be harvested within the 5km resource use zone and thus this activity is managed under law enforcement. Soft wood from pines can be legally harvested by the communities within the 5km resource use zone.

Orchid illegal off-take

A study undertaken by Lee (2020) regarding wild harvesting of edible orchids reveals that this activity in and around the Park, trading of tubers and baking and selling of a dish called Chinaka, have become a means of livelihood. About 43 species in five genera of terrestrial orchids have been found to be used for making Chinaka – these orchids occur in various types of habitats both inside and outside of the Park boundary, although currently the main hub for Chinaka tuber trade and consumption is the Chitipa District which is also the thoroughfare to/from Tunduma where trade takes place amongst Zambians, Tanzanians, and Malawians.

With rising demands, higher quantity and quality tubers within the Park have attracted harvesters (predominantly male) illegally entering and collecting from the Park. Harvesting is seasonal with highest intensity during the period mid-April to July. Increased law enforcement efforts resulting from the amendment of the Wildlife Act in 2017 have, however, led to fines and imprisonment but are mainly focussed on harvesting inside the Park. Communities apparently now perceive the rules to be stricter, however, the study further reveals that the following “suzgo” (meaning problems) remain at the heart of people’s decisions to take the risk of entering the Park illegally: access to fertilisers, food shortage, school fees and cash needs for clothes and household goods.

There is unfortunately no control or law enforcement in the markets or other ladders of the value chain even though according to Malawi law, any activity without a permit involving endangered species, is illegal. Coordination across sectors to holistically address the Chinaka issue has yet to be galvanized.

Lee (2020) can be consulted for further details and greater insight into the Chinaka value chain as well as potential interventions to support ecologically and socio-economic sustainable use within a cross-border context.

Bushmeat poaching

According to Van Velden (2020) bushmeat hunting and consumption exists at appreciable levels within the communities surrounding the Park. Hunting peaks in the wet season between November to March with about 19% of communities hunting during this period. Hunting during the dry season (June-October) effectively undetectable. Consumption is year-round with about 22% of the population consuming bushmeat in the dry season and 20% in the wet season.

Motivations behind hunting and eating wild meat are multi-faceted and are not only related to economic factors. Taste is a significant factor in consumption of wild meat as has been found elsewhere in Africa. Cultural factors in Nyika were found to be important for both hunting and consumption but that consumption was strongly linked with poverty, but hunting was not. The consumption of bushmeat appears to play a key role in food security or a safety net in lean conditions, but there are indications that hunting may be performed by the wealthier sections in society, or that people become wealthier when they hunt.

Van Velden (2020) offers recommendations regarding interventions in the bushmeat system, however, emphasises that law enforcement and community-based initiatives must work together and the value that wildlife holds must be adequately recognised at all levels.

See Appendix 2 for the law enforcement and related statistics.

Permitted community resource use

In terms of DNPW's collaborate management policy, the Department has embarked on permitting sustainable resource use of specified natural resources within PAs with the aim of contributing towards an improvement of the relationship between PAs and their neighbouring communities. As such, it has undertaken a Resource Utilisation Programme (RUP) and has drafted **Resource Utilisation Programme Guidelines** (2003) to guide DNPW in the implementation of the RUP in the Park.

As part of the RUP, a resource use zone has been defined for the Park covering a strip of approximately 5 km (aerial distance) inside the Malawian boundary of the Park. The main target community beneficiaries are those on a 5 km resource use zone outside the Park, nonetheless the community beneficiaries could stretch up to 10 km.

For the operation of the RUP, NRCs have been set up and collaborative management agreements signed – a particular NRC holds the resource use rights for a defined area but for the exception of bee-keeping – this may be undertaken further afield.

Once the NRC has signed an agreement with DNPW and the occurrence of resources in their resource utilisation area has been determined either through mapping or scientific investigations, the NRC is issued with quotas of resources permissible for harvest. Resource harvesting permits for community members are issued by their respective NRCs.

Resources that may be harvested under permit during certain times of the year and of which quantities are limited include, amongst others, grasses, bamboo, reeds, palm fronds, medicinal plants, wild fruit, mushrooms, fish and insects. When entering the Park, communities should be accompanied by DNPW staff and harvests should be recorded.



Figure 18: RUP Resource Use Zone

3 SITUATIONAL ANALYSIS

3.1 Ecological Significance of the Park and Related Challenges

The Park holds natural assets of international significance: at a broad level there are **three main habitats, namely grassland, forest and wetland**, all of these are among the most valuable and are globally threatened ecosystems mostly through a range of human activities. The high-altitude grasslands and associated wetlands are particularly important in Nyika. The Afromontane grassland is the largest of only five across the African continent making it an African **biodiversity hotspot**.

This ecosystem contains **many endemic and near endemic flora**, of which orchids are especially significant. Associated with this unique habitat are numerous species specifically adapted to this environment including mammals, birds, amphibians and invertebrates, especially butterflies. Importantly it is a **critical water catchment area** and the source for four major rivers supplying Lake Malawi including the North Rukuru and the Luwumba flowing to the Luangwa River in Zambia.

The ecosystems although largely intact are facing threats, especially the Afromontane grassland and associated wetlands. These include:

- An increasing amount of **illegal harvesting of orchids**, this having grown significantly in the last two decades. These are harvested for local consumption and for commercial use, where the cash is highly prized by the local communities.
- The grassland is a highly adapted fire driven ecosystem, however, there is evidence that the **fire frequency and timing have changed**. The previous management implemented fire programme attempted to maintain a three-year burning cycle. Recent fire history points towards a one-to-two-year cycle for more than half of the grassland. The timing is also shifting to fires later in the dry season which are considered hotter as the material is drier and the air temperatures higher. These fires are mostly set illegally by people wishing to create a green flush to poach the herbivores which are attracted to good grazing so created. Furthermore, a lack of management resources means that protecting some of the important and vulnerable forests margins with firebreaks has not been as effective, exposing the forest patches to damage by fire. The last isolated Juniper Forest is therefore vulnerable and has suffered damage due to previous fires.
- **Bracken fern**, an indigenous species, is increasing significantly (about 4% per year) in the grasslands, especially along the drainage lines near the wetlands. This seems to be a common problem in the region and around the world where this widespread species occurs. Research clearly indicates that it reduces the species diversity once it has invaded an area, and once established seems very resilient and stable.
- The experimental forestry plantation which includes **alien pine and wattle plants** is a localised threat as it is a source of seeds which also invade the local surrounding grasslands and are likely to impact water quality and quantity.
- **Illegal harvesting of the herbivores**, of which most populations are showing a decline and are presently stocked way below the likely ecological carrying capacity and therefore remains a threat and a loss of secondary production and trophic cycling.
- The **aggravated soil erosion** mainly due to poorly located and/or maintained roads (and some other infrastructure), reduces water infiltration, increases the silt loads in rivers, dries the soil profile and accentuates flooding, while leaving scars on the landscape, impacting ecosystem functioning and lowering water quality.

3.2 Socio-economic Significance of the Park and Related Challenges

The proclamation of the Park and subsequent expansion resulted in some resettlement of communities who previously lived and used resources within the existing park boundaries. Some of these remain unhappy about the Park boundary alignment and benefits received, although there is a 5km resource use zone within the Park where communities may harvest a limited number of natural resources. These remain confined to forest products and

honey, although honey may be harvested in some areas beyond the resources use zone. Managing community relations between park management and the communities is undertaken via NRCs, clustered into zones and finally through the NVA. A limited number of DNPW extension workers, who are based in the villages, facilitate access to the Park and any other park related issues. HWC is an issue especially in certain areas on the Park boundary and this remains a source of conflict and tension with communities, although recently a fence has been erected to help mitigate this and Park Management has commenced with implementing the HWCMS.

Benefits to communities from the Park remain limited. Collection of forest products and more recently some income from a carbon REDD+ project have provided some cash. **Tourism, often heralded as a benefit, has not been significant.** Only one product at Chilinda has operated, but the business has been and remains extremely marginal, due mostly to poor access. More widely tourism across the region offers some excellent attractions, especially focussed on wildlife such as Majete, Liwonde and the South Luangwa National Parks. Nyika offers an excellent complementary product with a range of activities in a relatively cool environment, from walks, mountain biking, horse trails and guided nature drives. It could therefore add another dimension for these tourists visiting the wildlife destinations.

The **local communities living** within the 5km resource use zone, like most other rural communities in Malawi, are poor, all of whom aspire to a better life, especially for their children. Sadly, child malnutrition and other negative impacts of poverty significantly curtail this realisation, robbing the children of achieving their potential. The scale of illegal activities, whether setting fires, harvesting orchids or bushmeat are mostly survival strategies. Studies have indicated that the communities wish to be better informed about the natural environment and to assist and be more involved with natural resource management.

3.3 Management Implications for the Park

Dealing with these threats requires funding as well as a dedicated, experienced and well-resourced management team. This is difficult to provide in a country with so many significant and more important social needs. Furthermore, government administration is often not ideally structured to firstly dedicate the funding but secondly to provide the staff and support required. It is also not sufficiently dynamic to respond adequately and rapidly to do changing challenges and opportunities. This capacity is further diminished when social expectations, especially of poor local communities and their needs are included in the delivery package.

To further compound these problems, management of Nyika has suffered over the years from **unreliable, insufficient, and unsustainable revenue/grants to fund the essential management interventions required to maintain the system.** Donor funding has often been "lumpy" with periods of more funding often followed by years of no or very limited funding. This type of funding is extremely detrimental because of the resulting impacts, these include:

- Topping up funds for staff or providing funds for additional staff, when funding is stopped these cannot be supported as government cannot 'suddenly' secure the funding needed. Consequently, skills and experience are lost, and management programmes significantly affected.
- Equipment is purchased, operating costs decline or dry up; and the equipment cannot be effectively used, maintained or replaced, further aggravating the management outcomes.
- Infrastructure is developed and it too cannot be maintained, often with severe environmental costs, such as dysfunctional sewage systems or poor maintained roads to mention a few.
- Governments have limited funding and can only provide a fraction of what is needed given the importance of other priorities. Donors stepping into this gap, reduces the pressure on Government, leaving a bigger hole when they depart.
- Furthermore, Governments are not the most flexible and nimble when allocating resources and responding to changed conditions, or incentivising staff. This aggravates the funding situation and the ability to recruit, train and retain competent staff.

Clearly a long term, realistic and reliable funding stream is needed to help reduce or eliminate these consequences and this Plan must lay the foundation to ensure such an outcome. Developing programmes which have the highest impact, which are measurable, and for which the likelihood of securing funding is high must be prioritised. Not everything can always be done. This implies a clearly identified set of strategic and operational objectives with affordable and achievable outcomes which must address the threats while realising the opportunities.

3.4 Opportunities to Unlock Benefits

Notwithstanding the foregoing threats and challenges there are still unrealised opportunities to secure the biodiversity and deliver more benefits for communities. These could potentially include:

- More engagement of and involvement by communities to assist with management of at least some issues, possibly:
 - Assisting with fence maintenance and checking the integrity of the fence to help combat HWC, this is already being piloted and implemented
 - Exploring possibilities to assist with fire control and management in designated areas where benefits could be shared (see carbon income below)
 - Assisting with reducing illegal activities such as orchid and bushmeat harvesting
 - Assisting the control of alien spread from the plantation.
- The wildlife population is currently stocked way below the predicted stocking rate, if this could increase, there is a sustainable, potentially large harvest which could be removed. It is a highly valued and prized protein source in the area, much needed by children especially.
- Improved understanding of the ecosystem and the drivers of some of the threats, through carefully focussed research, will help direct management priorities on critical aspects.
- If access to the Park could be improved, via direct air access through a nearby immigration facility, and with good marketing, tourism could grow, rapidly leveraging off existing local and regional products and complementing them rather than competing due to the nature of the product offered. Improved road access, especially from the east, drawing tourists from the Lake and Livingstonia, could add a much-needed boost to help develop the destination. This will help attract private investment and importantly, skills.
- There is an increasing awareness globally of the value of biodiversity and the benefits it offers, this may provide a potential revenue stream in the future. The grassland may be able to generate carbon payments. Grasslands are significant carbon stores, but these need good management, especially controlling the fire regime. Building investments which would provide sustained funding through for example products such as the Legacy Landscape Fund¹². Funding for ecosystem services or even biodiversity should be explored.
- The communities are organised and have communication and governance structures which are suitable to deal with many of the challenges and capitalise on opportunities.
- Improved governance mechanisms can help improve efficiency and effectiveness, improve staff employment conditions, provide confidence for investors, raise funding, retain revenue, and operate on business principles in a decentralised environment with more autonomy and flexibility.
- The TFCA governance mechanisms provides a very good platform to deal with threat and opportunities which operate across the border.

3.5 Summary

The Park's natural assets still have significant potential and remain largely intact. It remains a resources rich asset, which can **sustainably deliver significantly more tangible outputs to local people without compromising the integrity of the system and its components but without proper management these assets can be diminished or even destroyed and forever lost**. Some of the illegal activities including poaching for bushmeat, harvesting of orchids and setting of fires are, at least to some extent, it could be argued, under the 'control of the local communities'. These current harmful practises are compromising the long-term or indeed medium-term persistence

¹² [weblink \[https://legacylandscapes.org/\]](https://legacylandscapes.org/)

of the species themselves and the wider the ecosystem. Continued attrition of species populations and poor management of the system will result in lower productivity and possible species extinction/s. The natural capital will diminish, taking sustainable products and services with it as it declines. It is possible for a sustainable harvest, and indeed a significantly increased harvest, in the context of bushmeat if this was conducted more appropriately – indiscriminate and inhumane killing benefit few.

To achieve this would require all parties agreeing on a management strategy and agreement with measurable outcomes where the resources can be optimally developed to be used wisely, shared equitably, by harvesting the surplus and protecting the scarce and vulnerable. The communities have institutions to engage and help solve these challenges and realise the opportunities. Park Management for their part must secure the mandate and support to effect the changes needed. The alternative is to maintain the prevailing status quo of an **'island of diminishing plenty in a sea of growing poverty'** that relies increasingly on a fortress conservation approach, driving the stakeholders further apart.

These are significant challenges but there are equally great opportunities. All that is required is a willingness and a framework to solve them and a mandate to do so. This Plan offers Park Management a vision with the supporting framework and policy toolkit to ensure the priorities are focussed on outcomes which will deal with the most important issues efficiently and effectively.

Funding will always be 'inadequate', and the best solutions are **to focus on those aspects which, if allowed to fall and fail, cannot be easily recovered or will be lost forever**. That principle must guide future decision making and help **allocate resources to priorities**. To help guide this there are three important areas to get right, namely:

- Enhancing the resilience and maintaining the diversity of the ecosystem to deliver sustainable and achievable products/resources for the people of Malawi, especially locals
- Strengthening the resilience of communities through real benefit sharing underpinned by meaningful co-management linked to responsibilities with measured outcomes and sanctions for breaches
- Empowering, capacitating and rewarding Park Management to undertake the work needed to deliver on the foregoing.

4 STRATEGIC MANAGEMENT FRAMEWORK

4.1 Future Desired State

4.1.1 Vision

Fully functioning and productive co-managed ecosystem with a full complement of species and value adding enterprises operating to the benefit of Malawi especially local communities.

Tagline: Participatory managed biodiversity hotspot with benefits for all.

4.1.2 Mission

Improving governance to enhance the integrity and productivity of the natural assets to improve and optimise benefit streams for surrounding communities.

4.1.3 Strategic Management Objectives

- Improve community relations and benefits
- Maintain biodiversity and ecological functioning of the ecosystem especially the high-altitude plateau Afro-Montane Grassland and associated wetlands
- Manage the invasives and alien species, especially pines, wattle, eucalyptus and nonalien bracken fern
- Through improved governance, secure a decentralised management mandate to improve efficiency, operate on business principles and reduce operating costs and to secure adequate and sustainable funding

4.2 Theory of Change and Management Programmes

The aspects management needs to address can broadly be split into four categories, namely:

1. Those which are the **result of community activities**, especially illegal harvesting of orchids and wildlife and illegal fires
2. Those where **management may be deemed as the cause**, these include: poorly maintained infrastructure impacting of the natural resources and alien and invasive plants
3. Where the responsibility is **shared between park management and communities**, these include HWC and improving engagement on issues of collaborative nature and governance
4. Those where **management must principally realise the outcome**, these include governance and improved revenue from tourism, carbon, Payment for Ecosystem Services (PES), biodiversity payments and others.

Importantly for management there are benefits to be gained through engaging with communities on resolving (1) above; significantly these aspects currently consume at least 51% of the Park's operating expenses. Increasing resources to resolve these may result in a marginal benefit.

Management must therefore engage with communities to implement critical management interventions to restore trust and build a compact with measurable outcomes which reward the communities for quantifiable improved performance through shared access to the additional natural capital developed and/or mobilised. It is recognised that these will be difficult and surely will experience many challenges, but in the long term the prize must be worth it for everyone, it must be a win-win.

4.3 Expected Outcomes

Through this theory of change the following will be achieved:

- Governance agreement/s will be entered into with communities for shared responsibilities and benefits to:
 - Improve wildlife numbers, this will increase the resilience of the ecosystem through improved production and trophic and nutrient cycling. The increase in numbers will allow for a sustainable harvest, the benefits of which can be shared with the partners
 - Explore expanding the range of natural assets which could be sustainably used

- Contain, limit and possibly eliminate other illegal harvesting and activities
- Improve other management activities such as fence patrols and maintenance of infrastructure as well as exploration of other activities to find joint solutions
- Fire management will be improved so that illegal fires will be reduced or eliminated
- The factors driving the expansion of bracken must be understood and, if deemed essential and feasible, should then be implemented to slow, stop or possibly reverse its spread
- Human wildlife conflict will be managed and operated collaboratively with affected communities to mitigate negative impacts
- Roads and other infrastructure will be developed only when essential after an impact assessment and then to ensure proper maintenance to minimise environmental impacts
- Alien invasive species will be contained, and a follow-up programme implemented to reduce their spread
- Tourism will be developed to help unlock economic benefits and funding
- Other sources of revenue and economic benefits will be explored to improve and diversify the revenue streams
- Governance will be improved to ensure high effectiveness and efficiency with adequate funding through the development and operation of decentralised and autonomous management
- Improved engagement with the Zambian authorities, via the TFCA mechanisms, will help address impacts (positive and negative) on the Park from the Zambian side.

4.4 Adaptive Management

This plan adopts an adaptive management approach which integrates planning, management and monitoring into a framework that allows for managers to learn from the process of managing and thereby to continuously improve their management of a complex environment. Adaptive management requires that baseline data is available on which impacts of a particular action can be measured and monitored, thereby allowing corrective measures to be taken when and if necessary. The setting of appropriate quotas for all resources permitted for harvest necessitates detailed knowledge about the natural history, distribution and density of all species concerned within the Park.

Inherent in this approach is the acknowledgement that it is not possible to have perfect understanding on which to base management decision making. It is, however, possible to make decisions, to act on them and to monitor the outcomes in a manner that one learns and can better inform future decisions. In this context the decisions are ideally considered as hypotheses which are then tested through the management intervention (even if the decision is to do nothing). Monitoring the outcomes will provide feedback to the manager as to the validity of the hypothesis and this knowledge can then guide future decision making.

One of the tools used in the adaptive management approach is the use of a Threshold of Potential Concern (TPC; Biggs, Ferreira, Freitag-Ronaldson, & Grant-Biggs, 2011). Understanding that many states of an environment can vary, and that within a certain range each state is acceptable but that at some stage a state may begin to shift into a range that is “of concern” this threshold becomes a threshold of potential concern or a TPC. For example, if the number of herbivores that are illegally hunted within a protected area is low, it is not necessarily a threat to the value of the protected area, but at some point, the level of loss of animals is likely to result in the system changing, this would be the TPC for herbivore loss.

A key aspect of adaptive management is monitoring and using the results to inform future interventions or approaches. In the case of NNP, a key informant for the adaptive management approach are the results of the periodic METT assessments which have been conducted over the past 3 years. The METT must be adapted to reflect the specific challenges faced by the Park and the opportunities presented. A one size fits all approach may not be appropriate. The METT scores can be used to assist management in guiding priority actions for the next planning period. The Park’s assessment criteria and scores are given in Appendix 6.

5 IMPLEMENTATION PLAN

5.1 Programme 1: Natural Resource Management

5.1.1 Context

Nyika is an extremely important biodiversity asset. It is a high altitude 'biodiverse island' which is also an important water catchment area. It contains several endemic species, driven largely by the very diverse flora and associated invertebrates and vertebrates. Levels of use and abuse of some of the natural assets in some areas are likely to be compromising this very important natural asset.

With little quality monitoring there is a very poor understanding of the status of many species, especially the plants.

The impact of the significant illegal off-take of this together with a seemingly changing fire regime, the rapid spread of bracken, increasing soil erosion, and in some areas the invasion of alien plants is completely unknown, add climate change and the risk factors escalate – there is simply little to no baseline data.

Some wildlife species can multiply rapidly, over 20% per year, this is an important opportunity. Potentially therefore, through better collaboration and co-management, populations could increase rapidly. Troublingly, unlike the wildlife populations, some plants, and habitats, once compromised and impacted can often not recover or be replaced in the wild. This is a significant and unknown risk which needs attention.

The flora remains the Park's most important biodiverse asset and although it is also home to a few larger herbivores, including elephant, these are not the focus from a biodiversity management perspective, but could offer significant tangible benefits if populations increase.

The important biodiversity therefore needs priority attention, and those aspects are:

- Quantities and species of orchids being poached is unknown and has been increasing over the last 10-15 years - an understanding of the scale and location will be helpful to target management interventions;
- The management of fire frequency and timing; as illegal fires are set to aid poaching of herbivores must be contained;
- The spread of alien plants especially from the plantation into the grassland and drainage lines must be contained;
- The accelerated soil erosion rate must be contained
- The rate of spread of bracken fern (*the indigenous species*) is worrying and the impact it has on species diversity where it invades - the dynamics of this needs better understanding with possible interventions
- The basic monitoring of abiotic and biotic components of these systems – requires understanding
- The role of wildlife, especially herbivores and their illegal and unsustainable harvesting - this significantly diminishes the productivity and potential sustainable use of this important asset

The objectives, guiding principles and strategies set out in this section will provide a framework to guide management on the of the aspects listed above. The overriding management strategy is one of minimal intervention and only to be done where anthropogenic factors are significantly impacting the system and the interventions are affordable and will have the desired result and/or where sustainable benefits can be delivered without compromising species resilience and diversity.

Aligned with the overarching Objectives and Vision, the natural resources still present an opportunity to offer increased and wider benefits to the surrounding communities. These must be explored within an accountable and equitable framework which safeguards critical species and supports responsible, humane and sustainable use.

The recent historically low attention paid to conservation management, aside from law enforcement, must be addressed. Detailed plans must be developed to guide monitoring and management. Qualified and adequately resourced staff must be recruited and deployed to develop and implement basic biodiversity monitoring with a focus on directing management interventions to deal with priority issues.

Table 8. Summary Natural Resources Management Implementation Plan

Vision: Illegal activities end, all harvesting is sustainable and local benefits increase				
SPECIFIC OBJECTIVE(S)	GUIDING PRINCIPLE(S)	MANAGEMENT STRATEGY	ACTIONS	TIMEFRAME
Fire Management				
Implement fire regime and minimize illegal fires	Fire management strategies must favour development of a more heterogenous landscape, while focusing on high at-risk habitats, such as forests some forest margins	Develop and implement multiple pragmatic fire management strategies that will ensure landscape heterogeneity	Develop and implement a fully detailed, costed, and resourced Fire Management Plan	FY1 and ongoing
	Options for implementing fire management strategies aimed at reducing and managing wildfires with communities must be explored	Identify/define fire co-management options (including incentives scheme)		
	Cost implications and resource requirements must be defined in a detailed fire management plan	Explore cost effective fire management with high-risk habitats prioritised		
Illegal Activities				
Harvest resources in a legal, optimised, and sustainable manner	Prominence of law enforcement must be maintained with a nuanced co-management thrust towards legal utilisation of selected park natural resources	Sustain implementation of law enforcement and community engagement programmes on legal, sustainable and optimised use of park resources		FY1 and ongoing
	Sustainable use parameters and operating standards aimed at improving ecosystem productivity and diversifying optimised and sustainable harvesting options in the national park must be developed together with communities and adhered to.	Actively engage communities in development of sustainable and responsible resource use parameters and operating standards for optimisation of sustainable harvesting options	Partnering with communities, Explore, Develop, and Implement Co-Management Strategies with measurable outcomes built on formal, mutually agreed compliance and incentive mechanisms	
	Acceptable and unacceptable behaviours must be defined, alongside sanctions for non-compliance and rewards for achievement of outcomes commensurate with the economic and ecological value of resources	Develop sustainable "carrot & stick" mechanisms to encourage shared management solutions with win-win outcomes between park management and communities	Provide Fire Management Training for communities (<i>Define acceptable and unacceptable behaviours</i>)	
			Explore Compliance Incentives and sanctions for non-compliance	
			Define the economic and ecological value of park resources.	

Invasive Alien Species (IAS)				
Manage the expansion of bracken fern and other invasive alien species	Understand the drivers of bracken fern expansion and other invasive alien species.	Exhaustively explore the driving causes of bracken expansion	Identify and monitor the key drivers of IAS expansion	FY2 and ongoing
		Set-up a cost-effective early detection and rapid response mechanism to control spread and ensure no further IAS are introduced into the Park in priority areas	Operationalize an Invasive Alien Species-Early Detection and Rapid Response (IAS-EDRR) system for the Park	
	Interventions must be developed where expansion is known to cause significant and irreversible reduction and/or elimination of threatened and endemic flora and fauna	Develop costed strategies for management (eradication, control & mitigation) of 'high threat' invasives beginning at the Chilinda plantation but also in high-risk areas	Implement IAS management programmes for 'high threat' invasives	
	Environmentally friendly techniques and/or interventions which will have the least negative impact on water quality, runoff and soil erosion must be used			
	Priority programmes for IAS management must begin with species around the plantation followed by a wider programme for other IAS posing known threats to biodiversity in the Park		Develop Monitoring systems for the effectiveness and efficiency of IAS management programmes	
Ecosystem Monitoring				
Understand, monitor and manage (where feasible) important ecosystem drivers	Essential interventions/systems related to threatened flora and water catchment should be prioritised	Develop a monitoring framework which prioritizes water quality & quantity, orchids, IAS, fires, erosion, vegetation, bracken expansion, resource utilisation	Install Hydrological and/or Meteorological monitoring infrastructure	FY2 and ongoing
	Monitoring system should be designed to prioritise providing management guidance where essential interventions are required		Install a Fire-Monitoring and Mapping system	
	Vegetation supports and underpins the value of this ecosystem and must be prioritised, while many threats are not identified and/or understood	A vegetation monitoring system with a focus on high valuable, endemic and threatened species and habitat must be developed	Develop a vegetation management and monitoring plan	
	Ecological processes especially water and other nutrient flows must be maintained and protected	Establish and manage Ecological conservation Connectivity	Identify new and monitor existing connectivity (wildlife movement between the Park and other neighboring protected areas)	

	Wildlife, although important, is not a priority although some species which are threatened globally will need special focus. The role of the different species of wildlife within the Park must be defined and management strategies developed	Wildlife species must be prioritised, and species mix, and likely population densities determined	Develop a Wildlife Management Plan with details for important species and monitoring	
Endemic, Rare and Threatened Species				
Protect and/or conserve threatened and rare endemic species and other species	Priority should be accorded to threatened and rare endemic species	Monitor orchid populations and utilisation trends to reduce illegal harvesting.	Implement the vegetation Management Plan focusing on critical habitats and species Develop an Orchid Management Plan	FY1 and ongoing
	Wildlife monitoring mechanisms should be designed to consider the NNP-GMP and wider TFCA environment.	Set-up affordable and practical monitoring mechanisms for wildlife populations	Monitor the distribution and trends of HWC and Develop and implement an appropriate HWC Management Plan/STRATE <i>(to be aligned and used with reference to the current HWCMS and collaboration with VMWR activities and interventions)</i>	
		Explore the roles, carrying capacities and population dynamics for different herbivore species in the Park	Determine the carrying capacities and population trends (<i>seasonal, annual etc.</i>) of different herbivore species	
		Build sustainable use models and monitoring strategies to improve the growth and production of wildlife resources	Develop a Wildlife Management Plan with details for important species and monitoring	
	Incentive driven schemes involving communities in conservation should be explored and developed further	Explore co-management strategies with communities and if possible, implement an incentive driven scheme	Implement sustainable use strategies	

5.1.2 High level resource considerations and requirements

The estimated steady state operating costs including initial once-off or capital expenses are reflected in the table below:

Table 9. Programme 1: Financial Considerations

ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Natural Resources		
Fauna		
Wildlife Introduction	30,000	-
Game Management Strategy Plan	35,000	-
Monitoring - Census	-	30,000
Sustainable Use strategy	25,000	50,000
Monitor and control SU	40,000	15,000
Law Enforcement	30,000	320,000
Vegetation		
Develop Vegetation Map	<i>Complete</i>	-
Develop Vegetation Monitoring & Management Plan	45,000	-
Monitor & manage Vegetation	20,000	30,000
Fire management (plan implement)	15,000	10,000
Invasive Species Management (plan implement)	25,000	20,000
Water quality and quantity assessment (plan and implement)	75,000	5,000
HWC Management	<i>Incl. in Community</i>	-
TOTAL	340,000	480,000

5.2 Programme 2: Cultural and Heritage Resource Management

5.2.1 Context

Notwithstanding the significance of culture and heritage in the history of Nyika park, it is important that management of the Park takes into consideration the preservation, protection and restoration of some of these important cultural sites. Some of these identified sites and features are threatened by various factors from poachers, natural exfoliation and weathering processes, and mishandling and misuse leading to displacement of artefacts by local communities who access the Park. Cultural and heritage resources management in a protected area requires that these resources be managed alongside all the precious natural resources and wildlife. This will ensure continued appreciation by the local communities and those who visit the Park.

A key feature of cultural and heritage resources that should be included in any plan or intervention associated with the conservation identified assets is that they are an irreplaceable source of identity and inspiration, which can also be an important driving force for sustainable development (UNESCO, 2020), and for this to be effective, authentic trusteeship over the cultural and heritage resources needs to be established.

Table 10. Summary Cultural and Heritage Resources Management Implementation Plan

<i>Vision: Valued, maintained and shared cultural and heritage resources</i>				
OPERATIONAL OBJECTIVE(S)	GUIDING PRINCIPLE(S)	MANAGEMENT STRATEGY	ACTIONS	TIMEFRAME
Resource Management				
• Link cultural and heritage resources with the Park's natural resources • Identify and analyse the significance of resource management needs and problems in collaboration with communities	Communities are holders of the more recent history and their input in identifying and prioritising management interventions is essential	Interventions must have a management/operational plan to support actions	• Source and allocate funding for cultural resources management • Draw and present a multi-year programme to measure progress with annual review linked • Appropriately capacitate staff involved in cultural resource management • Develop and implement a Cultural and Heritage Resource Management Plan	FY3 and ongoing
	Enhanced alignment and integration into other plans and programmes of the Park including tourism, stakeholder engagement and environmental awareness. Cultural linkages and connections with the landscape motivate stakeholder to revere and care for their environment and resources	Management improves, and retains skills, knowledge, and resources needed to do undertake resource management competently		
	There is a long cultural history dating back to the stone age	Use education and knowledge sharing as a management tool and strategy	• Encourage community involvement (<i>especially with nearby and surrounding schools</i>)	FY1 and ongoing

5.2.2 High level resource considerations and requirements

Ongoing implementation associated and estimated costs can only be assessed once the Cultural and Heritage Resource Management Plan has been finalised and approved. For this programme, there are no considered high level financial resources yet determined.

A comprehensive list of the known cultural and heritage resources can be found in Annexure E.

5.3 Programme 3: Community Engagement

5.3.1 Context

Communities lie at the heart of the Park both in terms of managing impacts, positive and negative but also receiving benefits. Underlying this is communication and governance, when these functions effectively relationships are strengthened and trust is built. There have been some positive impacts for communities as a result of the Park and the benefits it has provided; however, there are also underlying tensions and areas of conflict. These occur in all relationships but how they are dealt with and how trust is built suggest there is much work still outstanding in this regard. As mentioned, many of the negative impacts in the Park have their origins within the communities either directly or indirectly. The best method to deal with them is through engagement with a view to finding common ground and seeking win-win solutions. This can be done through the following:

- Improving communication with a view to mitigating negative impacts and thereby
 - Exploring areas where collaboration could be improved
 - Meaningfully sharing more benefits offered by the natural resources
- Developing co-management in at least some aspects of park management with a view to:
 - Improving management effectiveness to improve biodiversity outcomes (the shared fence maintenance is a first step in this regard)
 - Reducing costs
 - Improving a range of benefits

Table 11. Summary Community Development Implementation Plan

Vision: Respectful and accountable relations with shared outcomes				
OPERATIONAL OBJECTIVE(S)	GUIDING PRINCIPLE(S)	MANAGEMENT STRATEGY	ACTIONS	TIMEFRAME
Community Governance				
To contractually enter into a meaningful and outcomes focussed co-management agreement with communities	- The parties must work towards win-win outcomes - Transparency and accountability in all actions is paramount - Management will be undertaken through an overarching governance process and agreement which defines the roles, rights and responsibilities of the parties (<i>Existing agreements may need to be revisited and if necessary refined</i>)	- Park management and communities must develop a detailed performance agreement outlining short, medium and long terms goals with measurable outcomes and benefits linked to the outcomes, the following areas must be agreed: - Fire management and the occurrence of wildfire must be significantly reduced; - Harvesting of orchids must be assessed and based on the resources a management system implemented which may include a range of strategies - Rebuilding wildlife numbers offers a great opportunity to significantly increase responsible annual removals based on sustainable quotas - The range of possible natural resources which can offer benefits is potentially large, but it is proposed to start with the easier to define, measure, and manage and as capacity and experience grows this can be extended - All use must not compromise viability of the natural resources and special attention must be paid to threatened species and habitats - Where possible 'employ' community members to assist with management functions where it is cost effective to do so	Develop and establish broader Co-Management Agreement/s - Develop and implement a Community Action Plan - Develop and implement a Community/ Stakeholder Engagement Plan (<i>Grievance Redress Mechanisms and/or associated Risk Management Strategies, supported by the HWCMS Manual Action Plan¹³</i>)	FY1 and ongoing

¹³ Gross, EM and Shaba, T. 2022.HWCMS Manual. Vwaza Marsh Wildlife Reserve & Nyika National Park, Malawi. TFCA Unit MAZA and KfW

		• Park management must strive to build a sense of ownership and pride in the Park by the communities • Park management must ensure adequate and properly trained staff are available and accessible to communities to manage and control areas of common concern (this requires urgent support and budget)		
Resources Management				
To build meaningful and functional co-management of shared resources To fairly consider what resources could be responsibly and sustainably used to increase benefits	• Sustainability must underpin all transactions, including financial, social, environmental and political • Monitoring and record keeping is essential	• All areas of conflict must be resolved, agreed, and formalised including boundary delineation, access, human wildlife conflict hotspots management and other areas of conflict (<i>working collaboratively with surrounding communities, stakeholders and partners</i>)	• Develop and implement an Environmental Awareness Programme for staff and surrounding communities	FY3 and ongoing
Benefit sharing				
To ensure benefits are linked to performance and agreed outcomes	• Improved benefits mean increased responsibilities with agreed sanctions for transgressions	• High levels of governance are essential and to this end governance arrangements may need to be strengthened and improved to ensure: ○ Transparency, equity, accountability, and responsibility must underpin all relationships ○ Administration and other overheads are contained ○ Control, monitoring, and effective sanctions are critical	• Develop of an integrated Incentives and, Benefits Access and Sharing Strategy	FY1 and ongoing

5.3.2 High level resource considerations and requirements

The estimated steady state operating costs including initial once-off or capital expenses are reflected in the table below.

Table 12. Programme 3: Financial Considerations

ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Community Engagement		
In collaboration with communities explore wider co-management options	75,000	
Improve and support community governance institutions	75,000	45,000
Community partnerships supporting park management activities	<i>Incl. under maintenance in Admin</i>	-
Community Engagement & support <i>incl. HWC</i>	-	90,000
TOTAL	150,000	135,000

5.4 Programme 4: Tourism and Enterprise Development

5.4.1 Context

Malawi has a diverse and scenic landscape made up of lakes, rivers, mountains and valleys, in addition to a rich and diverse culture. However, this vast wealth in tourism is not being fully harnessed. The Malawi 2063 expresses a Vision and aspirations for Malawians, a youth-centric inclusive wealth creating and self-reliant nation by 2063 (National Planning Commission, 2020).

It is important that park management develops and explores the expansion and development of enterprises which will contribute economically to the region and the nation but also importantly to contribute to offsetting the operating expenses of the Park while also contributing towards benefits for local communities. According to With guidance from National Wildlife Policy, DNPW has been promoting private sector involvement in establishment and management of wildlife enterprises. It has been encouraging landowners to consider wildlife conservation and management as a competitive land use option (Department of National Parks and Wildlife, 2021)

Traditionally tourism has provided the most important revenue stream in this regard, it is, however, as shown through COVID, vulnerable and exposed the risks of relying on the revenue earned to fund park operations and support communities. Relying on a single revenue strategy is risky with potentially large impacts. Tourism is also capital intensive, long term and therefore risky. Fortunately, there are, however, other evolving opportunities to generate revenue. Currently the sale of carbon offers exciting and significant potential. This has already been secured in the Resource Use area of the Park and is helping communities. This could potentially be expanded and other revenue streams such as PES, and biodiversity payments also increasingly looking like a possible alternative. This is a rapidly changing landscape, and all opportunities should be explored.

The Park offers a unique landscape and climate at a scale unmatched in the immediate region. This is undoubtedly a unique selling point for tourists especially when viewed as a complimentary product to the typical game experience offered, often in high temperatures especially in the late dry season. This could effectively offer an extended trip for operators who have attracted visitors to the traditional wildlife product, especially to the large South Luangwa offerings, with 44¹⁴ lodges and just under 700 beds in 2016 in and adjacent to the Park - about 46000 visitors in 2016. If 10% of this market could be accessed and grow at 7% a year this would offer an excellent opportunity for launching tourism in this region of Malawi. It is recognised that access has been and remains a problem to unlocking this potential market. The roads are poor and the journey as a result too long for all but the most committed travellers. Possible viable solutions to this include direct international air access to Chilinda with immigration services. This will require some capital investment and approval from aviation and immigration authorities, but initial investigations suggest it is possible. Another option is an alternative road access from the east along the Livingstonia-Rumphi road. This would provide improved access for tourism operators for supplies but also offer a route for travellers along the lake to access the area more easily via the historically important settlement at Livingstonia.

¹⁴ Chidakel, A. Child, B. Muyemgwa, S. 2021. Evaluating the economics of park-tourism from the ground-up: Leakage, multiplier effects, and the enabling environment at South Luangwa National Park, Zambia. *Ecological Economics* 182

Table 13. Summary Tourism and Enterprise Development Implementation Plan

Vision: To grow and expand the income streams to contribute to park management operating costs				
OPERATIONAL OBJECTIVE(S)	GUIDING PRINCIPLE(S)	MANAGEMENT STRATEGY	ACTIONS	TIMEFRAME
Tourism Funding				
To explore all opportunities to increase revenue to the Park to help offset operating costs	Ensure all potential revenue streams offer a cost beneficial return for the Park	- Mobilise funding to unlock the tourism potential through investment in improved access facilities and marketing of tourism investment opportunities - Investigate the expansion of the sale of carbon through sequestration from other areas inside the Park and other payment for services	- To be prepared/Put in place Develop and implement a Marketing and Branding strategy for the Protected Area Develop and Tourism Funding strategy - Review and draft necessary concession agreements and activity agreements/licences/permits - Explore carbon credits and other revenue streams	Ongoing
To ensure all opportunities are cashflow positive after considering all the costs				
Tourism Development				
To explore and if feasible unlock tourism at scale by improving access and removing other major obstacles	- Tourism is best achieved through private public partnerships (PPP) where risks and rewards are shared equitably between the partners - Concession agreements through PPP’s must be fair and balanced, as risks in this sector remain very high and especially with building and developing a new brand and destination - The agreement of other departments, including immigration, aviation, and roads to mention a few will be essential to helping to unlock the potential	Engage with tourism and other investors and operators with a view to soliciting their views on potential viability of park tourism and other products and obstacles to unlocking these	- Develop and implement a Tourism Development and facilities Rollout Strategy (<i>develop and improve the Park’s infrastructure (road, airstrip, immigration facility etc.)</i>) - Develop and implement Communication and Interpretation material - Develop and implement an operational and maintenance standard for all facilities in the Protected Area	FY2 and ongoing

	• Tourism operators understand their markets and their needs and to this end, sites selection should be guided by their needs but with essential environmental and other limitations to ensure a sustainable and responsible outcome • The size of the Park, especially the high plateau offers several exciting opportunities and sites, and these can therefore accommodate a wide range of tourism users from budget travellers to top end • Activities such as horse safaris, hiking, mountain biking, trout fishing and others are potentially excellent attractions to help broaden the market appeal of the offering			
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5.4.2 High level resource considerations and requirements

The estimated steady state operating costs including initial once-off or capital expenses are reflected in the table below.

Table 14. Programme 4: Financial Considerations

ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Tourism and Enterprise Development		
Explore the expansion of carbon revenue	50,000	-
Explore and attract tourism enterprises	120,000	-
Upgrade airstrip and immigration facility	2,000,000	-
Open eastern access road	2,000,000	-
General road improvements and upgrades	3,000,000	-
TOTAL	7,170,000	-

5.5 Programme 5: Management, Administration and Finance

5.5.1 Context

All the programmes are underpinned by management, administration, and finance, it supports all the staff, vehicles, equipment and other as well as securing and administering funding. Operating directly within the Government system as a department offers secured funding (if not adequate) and some certainty for staff, however it is not sufficiently nimble and resourced or structured to respond rapidly to changing environment, especially to secure additional funding and improve the employment conditions for staff and their support needs. A common strategy to address these issues is via a co-management agreement of various forms with an NGO or third party. This offers more flexibility, likely to secure significant additional funding and can improve conditions for staff. Depending on the structure and the institutional arrangement it may permit broader oversight to include not just DNPW and the NGO but also community representation and other. Such a model is currently under discussion and this offers an exciting opportunity.

Table 15. Summary Management, Administration and Finance Implementation Plan

<i>Vision: To Ensure Long Sustainable and Adequate Funding</i>				
OPERATIONAL OBJECTIVE(S)	GUIDING PRINCIPLE(S)	MANAGEMENT STRATEGY	ACTIONS	TIMEFRAME
Park Funding				
To ensure adequate stable and long-term funding is available and secured for the Park's various operations	- Any intervention must significantly contribute to the Strategic Objectives, and the scale of the intervention must be commensurate with the cost, the priority and importantly the expected outcome - Any intervention is costly, and the achievement of an outcome is critical to ensure management effectiveness	- A long term (at least 20 years) strategic business plan is developed, implemented and when necessary, adapted to changing conditions - A shorter term (3 to 5 years) funding strategy is developed and implemented to ensure immediate funding can be mobilised - An annual budget with performance measures is developed annually and reported on at least quarterly with variance explained and contingency plans developed	Develop funding strategies linked to developed lower-level operational plans	FY1 and ongoing
Park Staffing				
To ensure staff are properly trained, equipped, remunerated and motivated to undertake a range of tasks	The deployment of staff, and/or the purchase of equipment, vehicles and supplies as well as the construction of infrastructure all carry liabilities, such as training and development, maintenance and provision for replacement; these aspects must be properly considered and accounted for when considering implementing an activity	Required employee competencies and behaviours; high levels of employee engagement, motivation, and job satisfaction; increased park management efficiencies: attainment of park objectives and satisfaction of key stakeholders	- Develop and implement necessary Human Resource Management Policies - Develop and implement an Environmental Awareness and Education Programme for staff and surrounding communities	FY3 and ongoing
Park Equipment and Infrastructure				

To ensure all equipment and infrastructure is maintained , replaced and operationally serviceable	Management must set clearly defined with achievable goals set against priorities. These must be reported on and lessons learnt and if necessary, corrective action implemented	All equipment and infrastructure must have a maintenance and operational plan to ensure they are maintained in working order with adequate budgets	- Develop and implement an Infrastructure and Equipment policy and Management Systems - Develop and implement an Infrastructure Development Plan	FY1 and ongoing
Park Governance				
To ensure high levels of governance, accountability, efficiency and control are implemented.	- Priority must be afforded to those interventions which will contribute the best outcome to the most significant threats or realise the best opportunities - All outcomes must have a measurable output, and these must be monitored and reported to improve efficiency and effectiveness	- Policies must be developed and implemented to provide a framework for managing human resources, finance, safety and security, vehicle, equipment and infrastructure use and allocations - A long-term co-management agreement is implemented to de-centralise management and to improve efficiency and to explore the possibility of broadening oversight of management performance and park programmes, to include community representation and other third parties. It is assumed in this Plan and the high-level resource requirements estimated in the next section that Nyika and Vwaza will be managed by a joint overarching directorate, formed and operated under a co-management agreement	- Management must develop a work schedule, guided by the framework described herein, and this must be report frequently (ideally quarterly) Develop standard operating procedures and share with the necessary staff to ensure compliance with standards and performance.	FY1 and ongoing

		• The Co-Management Agreement with the communities must support incentives for benefit sharing		
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5.5.2 High level resource considerations and requirements

The estimated steady state operating costs including initial once-off or capital expenses are reflected in the table below:

Table 16. Programme 5: Financial Considerations

ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Finance and Admin		
Financial control and general administration	25,000	284,000
Maintenance	-	260,000
Develop policies and systems	35,000	-
TOTAL	60,000	544,000

A summary of all the Programmes¹⁵ with a total once-off and annual estimated steady state operating budget are presented below:

Table 17. Combined Programmes Financial Considerations

ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Natural Resources		
Fauna		
Wildlife introduction	30,000	-
Game management strategy plan	35,000	-
Monitoring - census	-	30,000
Sustainable use strategy	25,000	50,000
Monitor and control SU	40,000	15,000
Law enforcement	30,000	320,000
Vegetation		
Develop vegetation map	<i>Complete</i>	-
Develop vegetation monitoring plan	45,000	-
Monitor & manage vegetation	20,000	30,000
Fire management (plan implement)	15,000	10,000
Invasive Species Management (plan implement)	25,000	20,000
Water quality and quantity assessment (plan and implement)	75,000	5,000
HWC management	<i>Incl. in Community</i>	-
TOTAL	340,000	480,000
ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Community Engagement		
In collaboration with communities explore wider co-management options	75,000	-
Improve and support community governance institutions	75,000	45,000
Community partnerships supporting park management activities	<i>Incl. under maintenance in Admin</i>	-
Community engagement & support <i>incl.</i> HWC	-	90,000
TOTAL	150,000	135,000
ACTIVITY	TYPE (\$)	
	Once-off	Ongoing
Tourism and Enterprise Development		
Explore the expansion of carbon revenue	50,000	-
Explore and attract tourism enterprises	120,000	-
Upgrade airstrip and immigration facility	2,000,000	-

¹⁵ Apart from Programme 2: Cultural and Heritage Resources

Open eastern access road	2,000,000	-
General road improvements and upgrades	3,000,000	-
TOTAL	7,170,000	-
ACTIVITY	TYPE (\$)	
Finance and Admin	Once-off	Ongoing
Financial control and general administration	25,000	284,000
Maintenance	-	260,000
Develop policies and systems	35,000	-
TOTAL	60,000	544,000
TOTAL ALL PROGRAMMES	7,720,000	1,159,000

6 ZONATION

6.1 Approach

The zonation must reflect the purpose of the Park and ensure the Strategic Objectives can be achieved. Zonation is a useful mechanism to ensure that a range of often incompatible strategies may be accommodated within the Park. With water production and flora conservation the two most important objectives, these must be the main guiding principles which will anchor the zonation. Furthermore, there is also a strong need to optimise community benefits and sustainable use. There already exists a 5km wide Resource Use area around the Park perimeter on the Malawi component park as an initial starting point and this perhaps requires some further refinement, especially if fugitive resources such as wildlife form part of the use resources within this zone.

The highland grassland, wetlands and forests are important natural assets. Currently most of the grassland and many of the high-altitude wetlands fall outside of this zone. These areas may offer additional resources which communities could sustainably use and permitted controlled use may offer important benefits.

The natural assets offer a potential range of benefits to communities but ideally these should be demarcated in areas, which may allow some harvesting with areas of protection, and this may vary over the season and indeed between seasons. A dynamic zonation may in this instance seem more appropriate. Given the existing biodiversity and the need to unlock benefits for communities it is felt that areas such as 'Wilderness' may no longer be relevant in the Malawi Nyika context, although in theory inaccessible areas are likely to retain this character. But irresponsible and very visible development must not scar the landscape.

6.2 Categories of Zonation and Details

The following broad zones are proposed:

6.2.1 Resource use zone

This is an area in which resources may be harvested by the communities to deliver important benefits. Currently this is limited to a rather 'blunt' 5km zone. A more appropriate approach may be to have a 'dynamic resource use zone' in which some harvesting of different resources may be permitted, these may change in time and in place as areas are 'closed' or 'open'.

The default position therefore is that no resources use is permitted anywhere, but it is proposed that much of the Reserve is designated as a Potential Resources Use Zone, where Management, as informed by sustainable use studies, will designate areas where use will be permitted and under what conditions.

If structures are required within this zone (*see Utility Zone*), these should be based on a sensible screening and for larger structures an independent impact assessment undertaken to highlight significant environmental or social impacts. Importantly, for visual impacts on tourism, structures must be carefully positioned so as not to create an 'eye-sore' in an otherwise pristine landscape, careful positioning, use of materials, placement of lights etc can help prevent this, and this is very important especially in the grassland and hilly areas where sightlines are far. Impacts from light pollution must also be considered.

6.2.2 No take or no-use zones – Special zones

These are areas where no harvesting of any resources is permitted. These may be designated over time, by management supported by solid reasons in support of the Strategic Objectives, to offer protection to for example special bird nesting sites such as heronries, fish breeding areas, sites of cultural significance etc. Areas such as wetlands, dambos and peat bogs may require this zonation.

6.2.3 Utility zone

These are areas where park management infrastructure may be developed and facilities to support the Tourism and Enterprise Development Programme. Some areas are identified in the zonation figure below, however further areas

may be designated by management to meet specific needs. These will still be subject to environmental screening and/or environmental assessments.

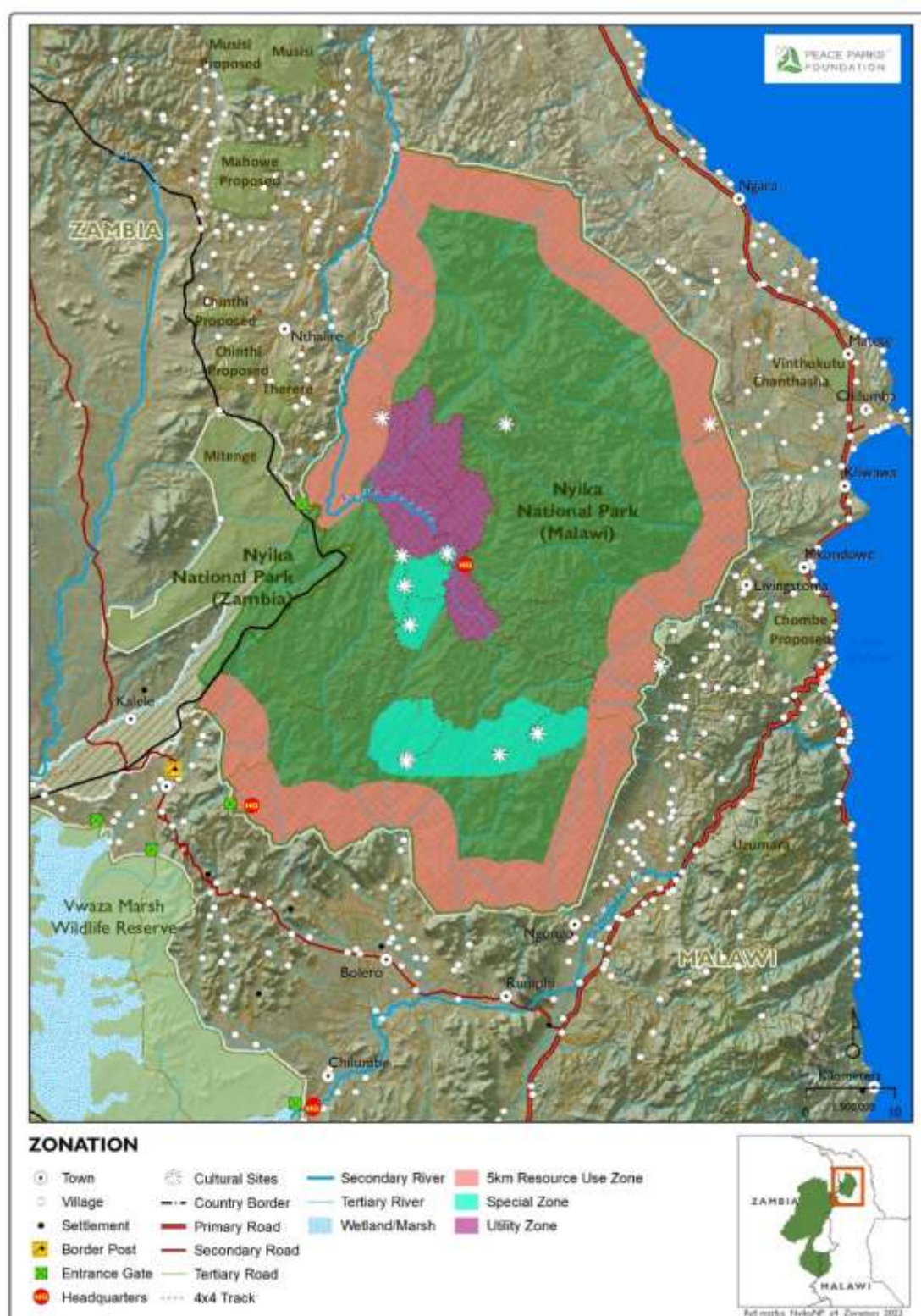


Figure 19. Proposed Park Zonation

The content of this General Management Plan is largely derived from the review of the previous draft management plans and these are thus not continuously cited. Neither are personal communications and inputs by Park Management and experts received during the consultation process, nor are legal instruments such as laws and decrees. However, where new sources have been consulted, and new information included, such sources are cited below.

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APPENDICES

Appendix 1. Law Enforcement Statistics

Table 18. Law Enforcement Data

PATROL EFFORT PARAMETERS									
Parameters	2012	2013	2014	2015	2016	2017	2018	2019	2020
Planned Long Patrols	279	416	252	342	211	139	260	340	284
Effectuated Long Patrols	261	368	134	430	145	122	233	300	265
Planned short Patrols	0	0	0	0	0	0	0	0	0
Effectuated Short Patrols	0	0	0	0	0	11	104	100	189
Planned Man-days	12555	14560	6552	9234	6330	3106	11664	10914	9728
Effectuated Man-days	11745	12880	3484	11610	4350	2560	10800	9695	8729
Number of Patrolters	45	35	26	27	30	33	54	54	47
Patrol Coverage	64	60	64.7	68	51	50	61	63.5	65
Catch Per Unit Effort (CPUE)	0.0782	0.0646	0.2721		0.2034	0.1996	0.0313	0.1567	0.1344
	5	7	0	0.09380	5	1	9	8	9
SERIOUS ILLEGAL ENCOUNTERS									
Poached Elephants	0	0	0	5	0	0	0	0	1
Poached Others	57	72	97	71	22	18	12	50	50
Gunshots heard	32	35	18	42	15	17	7	26	44
Drying Racks	54	19	40	26	18	11	8	45	23
Illegal Camps	84	40	41	67	33	36	15	55	50
Tree Cutting	246	67	73	60	42	13	43	158	180
Timber Sawing	7	4	1	0	9	1	5	42	57
Wildfires	17	29	18	27	13	8	4	56	49
Encroachments	2	2	3	8	1	3	1	2	2
Unarmed Group seen	19	13	87	155	115	12	8	38	44
Snaring	212	392	432	502	500	305	156	699	430
Armed Group seen	25	45	36	0	10	9	10	37	42
illegal Fishing	84	6	10	0	2	0	8	19	13
Orchid Collection	18	9	4	14	33	26	16	206	108
Arrests	37	72	49	60	43	28	35	54	60
Firearms Seized	25	28	39	52	29	24	11	33	21
TOTAL ILLEGALS	919	833	948	1089	885	511	339	1520	1174
Projected CPUE Target						Projected CPUE Annually reducing by 20%			
						Baseline			
						5 yr. Avg CPUE			
						0.1425	0.1140	0.0912	0.0729
							80	80	80
ANIMALS POACHED									
Key species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Poached animals									
Elephant			0	3	0	0	0	0	1
Eland			13	3	0	0	2	1	2
Roan			5	5	0	1	3	4	2
Bushbuck			16	4	4	8	2	4	3
Reedbuck			15	4	11	4	6	5	6
Impala			0	0	0	0	0	0	0
Kudu			0	0	0	0	0	0	0
Common Duiker			9	0	3	4	3	2	4
Common Duiker			9	0	3	4	3	2	4
Porcupine			0	0	1	1	0	0	0
TOTAL ILLEGALS			67	19	22	22	19	18	22
HABITAT DESTRUCTION									
Parameters	2012	2013	2014	2015	2016	2017	2018	2019	2020

Timber Sawing / Logging			0	0	9	1	5	42	57
Firewood collection			0	0	0	1	7	4	3
Plant collection / Orchid			4	14	33	26	16	206	108
Wildfires			18	27	13	8	4	56	49
Encroachment			3	8	1	3	1	2	2
Mining			0	2	1	1	0	0	1
PATROL RECOVERIES/SEIZER									
Parameter	2012	2013	2014	2015	2016	2017	2018	2019	2020
Game meats Kgs			0	0	0	0	0	10	200
Orchid (kg)			0	0	0	10	20	45	108
Rifle			0	0	0	0	0	0	0
Shotgun			0	0	0	0	0	1	0
Muzzle loading Gun			0	0	0	1	0	1	2
Homemade shotgun		28	39	52	29	24	11	33	29
ammunition			11	30	12	15	8	12	50
snare			432	502	500	305	156	699	430
Skins			0	0	0	1	0	0	1
Ivory			0	0	0	0	0	0	36
Hippo Teeth			0	0	0	0	0	0	0
Other weapons			23	31	79	27	25	142	216
MINOR OFFENCES									
Parameters	2012	2013	2014	2015	2016	2017	2018	2019	2020
Other Weapons Seized	133	47	32	92	56	27	25	142	216
Illegals Honey Collection	36	22	7	0	5	2	13	23	29
Livestock Grazing	0	0	10	6	12	2	4	31	88
Firewood Collection	0	0	0	0	0	0	7	0	0

Table 19. Monthly Breakdown of Law Enforcement and HWC (2016 to 2022)

2016													
Activity	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	TOTAL
# Rangers deployed				36	28	24	36	35	35	35	35	35	299
# Patrols (All types)				14	12	9	27	27	16	24	24	24	177
# Man Hours on Patrol				-	-	-	-	-	-	-	-	-	-
# Animals Poached				8	6	4	6	4	1	4	3	1	37
# Road Blocks				-	-	-	-	-	-	-	-	-	-
# Snares				36	8		65	35	29	12	40	2	227
# Gin Traps				-	-	-	-	-	-	-	-	-	-
# Firearms					5		2	5	1	4	2	3	22
# Arrests				3	3	4	4	2	4	5		1	26
Fines issued (MWK)				1,080,000	1,070,000	480,000	120,000	180,000	-	18,000	15,000	-	2,963,000
Fines paid (MWK)				-	-	-	-	-	-	-	-	-	-
# Convictions				3	3	4	2	1	1	-	-	-	14
# HWC cases				-	-	-	-	-	-	-	-	-	-
2017													
Activity	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	TOTAL
# Rangers deployed	35	35	35	35	35	35	35	35	35	35	35	35	420
# Patrols (All types)	24	24	24	24	24	24	24	24	24	24	24	24	288
# Man Hours on Patrol	-	-	-	-	-	-	-	-	-	-	-	-	-
# Animals Poached	1	2	1	8	1	1			2	1	5	-	22
# Road Blocks	-	-	-	-	-	-	-	-	-	-	-	-	-
# Snares	10	-	-	-	-	2	5	5	10	25	27	15	99
# Gin Traps	-	-	-	-	-	-	-	-	-	-	-	-	-
# Firearms	-	3	4	2	2	1	1	-	-	-	-	1	14
# Arrests	1	1	4	2	2	2	2	4	2	3	3	1	27
Fines issued (MWK)	150,000	280,000	-	-	-	-	-	-	-	-	-	-	430,000
Fines paid (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
# Convictions	1	1	1	1	2	-	-	-	-	-	-	-	6
# HWC cases	-	-	-	-	-	-	1	-	-	-	-	-	1

2018													
Activity	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	TOTAL
# Rangers deployed	35	35	35	31	31	31	31	30	31	37	37	57	421
# Patrols (All types)	12	12	12	14	14	75	75	75	80	80	80	130	659
# Man Hours on Patrol	-	-	-	-	-	-	-	-	-				-
# Animals Poached	-	-	-	-	-	-	-	-	8	1	1	6	16
# Road Blocks	-	-	-	-	-	-	-	-	-				-
# Snares	2	16	-	5	5	5	-	-	6		5	20	64
# Gin Traps	-	-	-	-	-	-	-	-	-				-
# Firearms	-	-	-	2	3	2	-	-	-		4	3	14
# Arrests	-	-	1	6	6	6	1	1	-	2	3	4	30
Fines issued (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
Fines paid (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
# Convictions	-	-	1	4	1	6	-	-	1		2	3	18
# HWC cases	-	-	-	-	-	-	-	-	-	-	-	-	-
2019													
Activity	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	TOTAL
# Rangers deployed	57	57	57	57	57	54	54	53					446
# Patrols (All types)	130	69	85	28	28	27	28	31					426
# Man Hours on Patrol	-	-	-	-	-	-	-	-					-
# Animals Poached	-	-	1	1	-	1	-	5					8
# Road Blocks	2	-	-	-	-	-	-	-					2
# Snares	20	17	-	19	19	-	-	59					134
# Gin Traps	-	-	-	-	-	-	-	-					-
# Firearms	3	2	-	5	-	-	1	3					14
# Arrests	4	3	5	7		5	1	2					27
Fines issued (MWK)	40,000												40,000
Fines paid (MWK)	40,000	-	-	-	-	-	-	-					40,000
# Convictions	4	1	2	2		5	1	2					17
# HWC cases	-	-	-	-	-	7	1	-					8

2020													
Activity	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTAL
# Rangers deployed	52	52	50	50	50	49	47	40	34	33	45	42	544
# Patrols (All types)	39	34	37	37	35	44	31	32	39	54	57	37	476
# Man Hours on Patrol	-	-	-	-	-	-	-	-	-	-	-	-	-
# Animals Poached	-	5	-	-	4	3	6	5	-	-	3	-	26
# Road Blocks	-	-	-	1	-	-	-	-	-	-	-	-	1
# Snares	50	27	14	44	108	54	33	12	11	13	14	32	412
# Gin Traps	-	-	-	-	-	-	-	-	-	-	-	-	-
# Firearms	1	1	8	6	-	-	4	2	4	6	1	-	33
# Arrests	4	3	2	5	1	9	11	2	8	7	4	2	58
Fines issued (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
Fines paid (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
# Convictions	2	3	1	-	1	5	6	-	1	2	-	-	21
# HWC cases	-	-	30	-	4	-	-	-	11	-	4	9	58
2021													
Activity	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	TOTAL
# Rangers deployed	40	53	41	45	42	43	44	34	33	35	36	36	482
# Patrols (All types)	21	21	22	24	24	21	23	21	20	22	37	37	293
# Man Hours on Patrol	-	-	-	-	-	-	-	-	-	-	-	-	-
# Anti-poaching Operations	-	-	-	2	-	-	1	1	1	1	-	1	7
# Animals Poached	-	-	2	1	-	-	-	5	-	3	-	1	12
# Road Blocks	-	-	-	-	-	-	-	-	-	-	-	-	-
# Snares	-	-	-	-	-	12	-	105	7	39	33	13	209
# Gin Traps	-	-	-	-	-	-	-	-	-	-	-	-	-
# Firearms	-	4	8	-	-	2	2	4	-	1	1	4	26
# Arrests	-	4	5	3	4	4	1	-	-	-	-	6	27
# Contacts	-	-	2	2	1	1	2	-	1	7	-	-	16
# Footprints	-	-	8	16	12	8	8	-	8	12	7	-	79
# Timber sawing	-	-	1	1	1	1	1	1	1	1	-	-	8
Fines issued (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
Fines paid (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
# Convictions	-	-	1	1	1	1	3	-	-	2	-	3	12
# HWC cases	-	9	3	-	-	6	8	-	7	7	12	1	53

2022													
Activity	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	TOTAL
# Rangers deployed	33	33	35	34	33	37	36	15	34	27	30	26	373
# Patrols (All types)	57	58	54	48	46	49	50	50	65	42	45	37	601
# Man Hours on Patrol	-	-	-	-	-	-	-	-	-	-	-	-	-
# Anti-poaching Operations	-	3	-	-	-	1	4	-	1	1	-	-	10
# Animals Poached	-	2	8	5	3	2	2	-	-	-	-	-	22
# Road Blocks	-	-	-	-	-	-	-	-	-	-	-	-	-
# Snares	63	46	14	82	34	26	69	34	46	36	91	112	653
# Gin Traps	-	-	-	-	-	-	-	-	-	-	-	-	-
# Firearms	-	1	11	4	4	7	6	1	3	5	7	-	49
# Pit saws	1	2	-	3	-	-	-	-	-	-	4	-	10
# Fishing Nets	-	1	-	-	-	-	-	-	-	-	-	-	1
# Arrests	7	5	5	2	3	8	8	-	7	9	4	-	58
# Fireplace	-	1	1	1	1	1	2	2	3	4	3	1	20
# Gunshots	-	2	7	1	4	-	-	1	1	2	4	-	22
# Poachers camp	3	4	5	4	2	4	2	1	1	1	1	-	28
# Contacts	3	2	7	4	3	1	4	1	2	2	4	1	34
# Footprints	20	16	14	23	20	24	26	12	13	14	17	5	204
# Timber sawing	1	1	1	6	1	5	5	-	-	-	3	-	23
Fines issued (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
Fines paid (MWK)	-	-	-	-	-	-	-	-	-	-	-	-	-
# Convictions	1	-	1	1	-	-	-	2	-	2	336	276	619
# HWC cases	8	5	-	-	-	12	-	-	-	23	3	10	61

Appendix 2. Park Resources and Infrastructure

Table 20. Park Finances

There are several fundamental problems that have been identified with the Park finances system that have made it extremely difficult for the Park manager to estimate income or plan and control expenditure.

- Government allocations to the Department of National Parks and Wildlife are distributed to protected areas by National Headquarters and through the divisional offices. This allocation also funds the administrative overhead and often the money remaining for management activities at the protected area level is minimal.
- Expenditure control of the Nyika Treasury Fund income is under the Thazima office. Allocations are based on prioritisation at the protected area level. Funding requests were made to the Principal Parks and Wildlife Officer (PPWO). At the time of writing this GMP, this responsibility was allocated to the Division Manager in Thazima.
- A few small enterprises run under the treasury (e.g. *sawmill, shop, maize mill etc.*) are poorly managed and either run at a loss or generate less profit than they could.
- There is no financial management system with separate sub-accounts that relate to each of the Park's numerous activities. Without such a system the Park manager cannot estimate operation and development costs, generate cash flow projections, or look for more efficient ways to use park revenue.
- Considering the above points, a review and subsequent restructuring of the financial management system, especially at the Park level is recommended.

(In the past) No attempt has been made to estimate the implementation of the management plan for the five-year period. Inflation rates in Malawi have made accurate projections very difficult. Instead, it is recommended that budget projections are made as part of the annual workplan.

Table 21. Water Supply at Camps

CAMP	SOURCE	EQUIPMENT	CONDITION	REMARKS
Kaperekezi	1 Borehole	Handpump	Not in use	Only borehole in use (requires maintenance)
Chilinda	Streams & dambos	1 diesel powered pump	Runner	One in use replaced by Wilderness
		4 hydrams	Not in use	
		4 x 4 500 l storage tanks	Functional	
		1 x 9 000 l storage tank	Functional	
		1 x 2250 l storage tank	Functional	
		2 x 68 000 l storage tank	Functional	Disconnected
	1 Borehole	Capped	Not in use	
Uledi	Stream	Borehole	Functional	
Thazima	1 Borehole	Capped	Not in use	
	Stream	Weir	Fair	
		1 x 72 000 l storage tank	Functional	
		1 x 47 000 l storage tank	Functional	

Table 22. Existing Infrastructure

LOCATION	INFRASTRUCTURE	TYPE	NUMBER	CONDITION / REMARKS
Chilinda	Offices	Research	1	Good
		Management	2	Good
		Toilets	2	Good
		Armoury	1	Good
	Workshops	Mechanical	1	Fair
		Carpentry	1	Fair
		Filling station	1	Fair - Run by tour operator

LOCATION	INFRASTRUCTURE	TYPE	NUMBER	CONDITION / REMARKS
		Carport 4 bay	1	Fair - Shared with tour operator
		Storerooms	5	Fair
	Senior staff housing	Detached brick	4	Fair
		Detached wood	1	Fair
	Junior staff housing	Detached brick	12	Good – Under rehabilitation
		Detached wood	12	Good – Under rehabilitation
	Social amenities	Clinic	1	Good
		Shop with 3 storerooms	1	Poor
		School with 5 classrooms and 1 office	1	Good
Njalayankhunda	Patrol base	Houses PH4D	4	Under rehabilitation
		Houses PH4S	2	Good, under rehabilitation
Kaperekezi	Patrol base	Houses EL	6	Good
		Entrance Gate	1	Good
Uledi	Patrol base	Houses EL	6	Good
Chilinda	Tourist facilities	Chalets	4	Good
		Bedrooms	6	Good
		Bar, kitchen lounge/ dinner	1	Good
	Camping site	Pit latrine shower	1	Good
	Tourist facilities	Reception	1	Good
		Information Room	1	Good
Chilinda	Tourist facilities	Tourist Lodge	1	Very good
	Educational facilities (youth hostel)	Bedroom blocks	5	Good
		Ablution Block	1	Good
		Dining/ kitchen/ storeroom	1	Good
Thazima	Offices	Offices	9	Good
		Armoury	1	Good
		Toilet	4	Good
	Workshops	Carpentry	1	Good
		Carport 4 bay	4	Good
		Mechanical	1	Good
		Storerooms	3	Good
		Toilet	1	Poor
		Generator Shed	1	Good
	Housing	DH7 (mod.)	3	Good
		DH6	4	Good
		EL2A	4	Good
		EL2	13	Good
		Houses double unit	9	Good
		Log houses	1	Fair
	Social amenities	Dispensary	1	Good
		Shop	1	Good
	Tourist facilities	Entrance gate	1	Good
		Gate Housing	1	Good

Table 23. Other Management Infrastructure

LOCATION	OWNER	TYPE	NUMBER	REMARKS
Chilinda	DNPW	Log cabin	1	Now turned into Rapid response Unit and Law Enforcement Command Unit
		Brick house detached	4	
		Pumphouse wooden	1	
		Stable block	1	
		Timber cabin (temporary)	1	

Appendix 3. Transport and Equipment Inventory

Table 24. Existing Vehicles and Plants

TYPE	REG./ SERIAL NO.	CONDITION	UNIT/ LOCATION	REMARKS
Vehicles				
Toyota Land Cruiser pick-up	057MG047	Fair	Management	Runner
Toyota Land Cruiser pick-up	057MG043	Fair	Management	Runner
Toyota Land Cruiser pick-up	907T	Poor	Research	Engine Problems
Nissan pick-up	189T	Poor	Administration	Runner
Bedford 4 x 4, 5 ton	057MG048	Poor	Management	Non-runner
Lorry Nissan	891N	Fair	Management	Runner
Yamaha M/Cp	104U	Poor	Management	Non-runner
Yamaha M/C	105U	Poor	Research	Runner
Yamaha M/C	102U	Poor	Management	Non-runner
Yamaha M/C	111U	Poor	Management	Non-runner
Nissan DC	MG117W	Good	Extension	Runner
Yamaha DT125	MG872V	Good	Extension	Runner
Yamaha MC	MG114	Poor	Management	Non-runner
Yamaha MC	MG113	Poor	Management	Non-runner
Tractor John Deere	MG988U	Good	Management	Runner
Tractor John Deere	MG989U	Good	Management	Runner
Other				
Water bowser	MG992	Poor	Management	Non-runner
Water bowser	---	Fair	Management	Runner
Tractor trailer	---	Good	Management	Runner
Tractor trailer	---	Fair	Management	Non-runner
Log trailer	---	Good	Management	Runner
Tow grader	MG2163	Good	Management	Runner

Appendix 4. Malawi Protected Area Zonation Descriptions

Table 25. Malawi PA Zonation Categories

ZONE	PURPOSE
Utility Area	These are sites for management and visitor purposes where substantial infrastructure may be located.
Resource Use	To increase the value of the Park to neighbouring villages and provide incentives for their collaboration in its protection.
Semi-wilderness	These are tracts of relatively undisturbed but accessible land designated primarily for public use but also available for scientific study.
Special Areas	These are relatively small sites designated to protect unique, unusual, or otherwise important biotic, abiotic, or cultural features.
Wilderness Area	These are relatively large tracts of undisturbed land intended for aesthetic recreational experience and conservation of biological diversity, which may also be valuable for scientific benchmarks.

Appendix 5. Map References and Disclaimer

Table 26. Map Reference List

REF	NAME	SOURCE	DATE
Figure 1	Malawi-Zambia TFCA	PPF delineation based on MZTFCA Treaty	2017
Figure 2	Locality	PPF	
Figure 4	Traditional Authorities (Chieftdom Boundaries)	DNPW Malawi	2022
Figure 5	Natural Resource Committee Zones	DNPW Malawi	2022
Figure 7	Elevation	PPF	2022
Figure 8	Geology	DNPW Malawi 2017 GMP draft	2017
Figure 9	Soils	PPF	2022
Figure 10	Hydrology	PPF	2022
Figure 11	Biome Types	MC Lotter & JE Burrows	2022
Figure 12	Regional Ecosystem	MC Lotter & JE Burrows	2022
Figure 13	Vegetation Units	MC Lotter & JE Burrows	2022
Figure 14	Vegetation Units vs Elevation cross section	MC Lotter & JE Burrows	2022
Figure 16	MODIS Burnt Area 2011 - 2019	NASA Moderate Resolution Imaging Spectroradiometer (MODIS) Fire Data products	2019
Figure 17	Cultural and Heritage Sites	DNPW Malawi	2022
Figure 18	RUP Resource Use Zone	DNPW Malawi	2022
Figure 19	Proposed Park Zonation	PPF	2023

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Appendix 6. Past METT Scores

Table 27. Past METT Results

ASSESSMENT CRITERIA	SCORE			
	2019	2020	2021	2022
1. Legal status: <i>Does the protected area have legal status (or in the case of private reserves is covered by a covenant or similar)?</i>	3	3	3	3
2. Protected area regulations: <i>Are appropriate regulations in place to control land use and activities (e.g. hunting)?</i>	2	2	2	2
3. Law enforcement: <i>Can staff (i.e. those with responsibility for managing the site) enforce protected area rules well enough?</i>	2	2	2	2
4. Protected area objectives: <i>Is management undertaken according to agreed objectives?</i>	2	2	2	2
5. Protected area design: <i>Is the protected area the right size and shape to protect species, habitats, ecological processes, and water catchments of key conservation concern?</i>	2	2	2	2
6. Protected area boundary demarcation: <i>Is the boundary known and demarcated?</i>	2	2	2	2
7. Management plan: <i>Is there a management plan and is it being implemented?</i>	2	2	2	2
8. Regular work plan: <i>Is there an annual work plan?</i>	2	2	2	2
9. Resource inventory: <i>Do you have enough information to manage the area?</i>	2	2	2	2
10. Research: <i>Is there a programme of management orientated survey and research work?</i>	1	1	1	1
11. Resource management: <i>Is the protected area adequately managed (e.g. for fire, invasive species, poaching)?</i>	2	2	2	2
12. Staff numbers: <i>Are there enough people employed to manage the protected area?</i>	2	2	1	1
13. Personnel management: <i>Are the staff managed well enough?</i>	2	2	0	0
14. Staff training: <i>Is there enough training for staff?</i>	2	2	2	2
15. Current budget: <i>Is the current budget sufficient?</i>	2	2	1	1
16. Security of future years' budget: <i>Is the budget secure?</i>	1	1	1	1
17. Management of budget: <i>Is the budget managed to meet critical management needs?</i>	2	2	2	2
18. Infrastructure & Equipment: <i>Is equipment adequate & sufficient</i>	2	2	2	2
19. Maintenance of equipment: <i>Is equipment adequately maintained?</i>	-	2	2	2
20. Education and awareness programme: <i>Is there a planned education programme?</i>	2	2	2	2
21. State and commercial neighbours: <i>Is there co-operation with adjacent land users?</i>	2	2	1	1
22. Indigenous people: <i>Do indigenous and traditional peoples resident or regularly using the PA have input to management decisions?</i>	0	0	-	-
23. Local communities: <i>Do local communities' resident or near the protected area have input to management decisions?</i>	2	2	1	1
24. Visitor facilities: <i>Are visitor facilities (for tourists, pilgrims etc) good enough?</i>	2	2	2	2
25. Commercial tourism: <i>Are visitor facilities (for tourists, pilgrims etc) good enough?</i>	-	2	1	1
26. Fees: <i>If fees (tourism, fines) are applied, do they help protected area management?</i>	3	3	3	3
27. Resource assessment: <i>What is the condition of the protected resource base?</i>	2	2	2	2
28. Illegal access assessment: <i>Are the available management mechanisms working to control access or use?</i>	2	2	2	2
29. Economic benefit assessment: <i>Is the protected area providing economic benefits to local communities?</i>	2	2	2	2
30. Monitoring and evaluation: <i>Are management activities monitored against performance?</i>	1	1	2	2
TOTAL SCORE:	55	57	53	53

ANNEXURE A: STAKEHOLDER ENGAGEMENT AND VALIDATION REPORT

Table 28. List of Key Stakeholders Consulted

STAKEHOLDER	RESPONSIBILITY
Government:	
Relevant Ministries:	
o Department of National Parks and Wildlife	Management of protected areas and collaborative management with the surrounding local communities
o Ministry of Natural Resources, Energy and Mining	Overall responsibility for environmental management and studies including EISs and ESMPs.
o Department of Forestry (Rumphi District Officer)	Forests reserves that could be used as wildlife dispersal areas/corridors
o Department of Tourism (Regional Tourism Officer – Mzuzu)	Tourism information management, and marketing
o Department of Immigration (Regional Immigration Officer – Mzuzu)	Cross border formalities, both tourism and TFCA Officers
o Department of Culture (Regional Culture officer- Mzuzu)	Preservation of cultural artifacts and tradition
o Environmental Affairs Department (Senior Biodiversity Officer – Lilongwe)	Environmental management including EIAs and other environmental issues
District and Municipal Administrations:	
o Rumphi District Commissioner and Director of Planning	District planning and community livelihoods
o Police (Police in-charge Rumphi)	Law enforcement, peace, and order
o Judiciary (Senior Magistrate Rumphi)	Law enforcement and prosecution
o International Coordinator	TFCA bilateral coordination
o Country Manager	TFCA national coordination
o Transfrontier Management Unit	Coordinating implementation of TFCA initiatives in the TFCA - blocks
Community Structures:	
o Chiefs/Traditional Authorities/Patrons	Community mobilisation, custodial of culture
o Village Action Group (Representative)	Community development
o Natural Resources Committee (Representative)	Mobilisation of Community conservation awareness and action
o Zone Natural Resources committee (Representative)	Community conservation
o Nyika - Vwaza Association (Representative)	Coordination of collaborative management between DNPW and Border communities
Support Organisations:	
National Cooperation Partners	
o Total Land Care	Community livelihoods
o Lilongwe Wildlife Trust (Rumphi Coordinator)	Provide support to DNPW and communities
o Mzuzu University National Herbarium and Botanic Gardens (Department of Forestry)	Research and Resource monitoring
International Cooperation Partners:	
o KfW Principal Project Manager	Technical support, fundraising
o Peace Parks Foundation	TFCA technical support, fundraising

Table 29. Broad Stakeholder Engagement Details

CATEGORY	INSTITUTION	DETAILS	COMMITMENT TOOLS	FREQUENCY AND TIMING	RESPONSIBLE ENTITY
Government unit in charge of the project / client	Department of National Parks and Wildlife	Information to be disclosed: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	Rules of Engagement for Project Implementation, management, Contracts Agreements	As per contractual obligations and rules of engagement throughout all task phases	Ministry of Tourism, Culture and Wildlife
		Format: Periodic reports, minutes of meetings and workshop proceedings			
		Engagement strategy: Consultation, Negotiation and partnerships Reporting Participation in project meetings,			
		Methodologies: phone call, meetings, workshops and joint planning sessions			
Project Implementing Agency	Transfrontier Management Unit	Information to be disclosed: Project progress, Implementation procedure, policies, ESMFs, Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	Rules of Engagement for Project Implementation, management, Contracts Agreements	As per contractual obligations and rules of engagement throughout all project phases <i>(Monthly, quarterly) throughout all task phases</i>	Peace Parks Foundation
		Engagement strategy: Partnership meetings, Reporting, project monitoring			
		Methodologies: emails, phone calls, in-person and virtual meetings, reporting, planning, monitoring and supervision			
Community Based Organisation	Nyika-Vwaza Association including Chiefs and Traditional Leaders	Information to be disclosed: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	Co-management agreements, MoUs of co-management	As needed throughout task phases	Nyika-Vwaza Association
		Engagement Strategy: partnership meetings, Review meetings,			

CATEGORY	INSTITUTION	DETAILS	COMMITMENT TOOLS	FREQUENCY AND TIMING	RESPONSIBLE ENTITY
		Methodologies: emails, phone calls, in-person and virtual meeting			
Local Government	District Councils	Information to be disclosed: meeting minutes, planning documents: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	District Executive Committee guidelines	Twice during review phases (<i>Consultation – data gathering and feedback session</i>) As needed throughout task phases	Rumphi District Council
		Engagement Strategy: partnership meetings, project planning, reviews, monitoring			
		Methodologies: emails, phone calls, in-person and virtual meeting			
NGOs	Total Land Care Lilongwe Wildlife Trust	Information to be disclosed: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	Implementation agreements, District Executive Committee guidelines	Twice during review phases (<i>Consultation – data gathering and feedback session</i>)	Total Land care Lilongwe Wildlife Trust
		Engagement Strategy: partnership meetings, project monitoring			
		Methodologies: emails, phone calls, in-person and virtual meeting			
Surrounding communities	NRCs /Villages	Information to be disclosed: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	MoUs, minutes of meetings, consent agreements, SEP	Twice during review phases (<i>Consultation – data gathering and feedback session</i>)	Nyika-Vwaza Association
		Engagement strategy Consultations, information disclosure, negotiations, reporting and joint planning			
		Methodology Community meetings, meetings with leaders, Workshops,			

CATEGORY	INSTITUTION	DETAILS	COMMITMENT TOOLS	FREQUENCY AND TIMING	RESPONSIBLE ENTITY
Universities and Research Institutions	Mzuzu University, University of Livingstonia. Botanic Gardens Forest Research Institute	Information to be disclosed: meeting minutes, planning documents: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	MoUs, minutes of meetings, consent agreements	Twice during review phases (Consultation – data gathering and feedback session)	Mzuzu University, University of Livingstonia. Botanic Gardens Forest Research Institute
		Engagement Strategy: partnership meetings, project planning, reviews, monitoring			
		Methodologies: emails, phone calls, in-person and virtual meeting			
Inter-Agency Committee on Combatting Wildlife Crime (IACCWC)	Judiciary, Police, Immigration, Malawi Revenue Authority, Financial Intelligent Unit, Ministry of Justice, Malawi Defence Force and the Anti-Corruption Bureau	Information to be disclosed: meeting minutes, planning documents: Draft Nyika and Vwaza GMPs, policies and legislation and Business Plans, TFCA Treaty, Project documents, SEP	Implementation agreements, MOUs District Executive Committee guidelines	Twice during review phases (Consultation – data gathering and feedback session)	Ministry of Justice, Ministry of Internal Security Department of Immigration Malawi Revenue Authority Malawi Defence Force Anti-Corruption Bureau
		Engagement Strategy: partnership meetings, project planning, reviews, monitoring			
		Methodologies: emails, phone calls, in-person and virtual meeting			

Table 30. Process Followed for the Preparation the GMP

DATES	DESCRIPTION	LOCATION	COMMENTS
26 April 2021	Inception meeting	Virtual	To introduce the project Approve the project charter
24 -25 August 2021	1 st Stakeholder engagement	Rumphi, Malawi	To introduce the project to the stakeholders and get buy in from them Gather information and background data
3 - 6 October 2022	2 nd Stakeholder engagement	Rumphi, Malawi	Situational Analysis Gathering data
25 October - 01 November 2022	Data gathering exercise	Rumphi, Malawi	Gathering and verifying spatial data
April - June 2023	1 st draft review	Virtual	Review of the GMP first draft by DNPW and KfW
25,27 & 28 July 2023	GMP validation	DOWA & Rumphi, Malawi	Validation of GMP final draft by all stakeholders
2023	Launch of GMP	Malawi	Launch of GMP

Table 31. Stakeholder Consultation Process

STEP	CONSULTATION PROCESS	NYIKA NP PROCESS STEP
1.	Define the objective of the consultation - this is the “ <i>why</i> ” aspect that needs to be answered as priority during engagements with communities.	This task entailed critical review and update of Nyika National Park’s 2017 <i>draft</i> GMP and Vwaza Marsh Wildlife Reserve 2016 <i>draft</i> GMP. This was to be done as all protected areas in Malawi are to have an approved and updated GMP as to be line with the requirements of the Malawi Wildlife Policy (2018).
2.	Identify and create a database of stakeholders, part of the stakeholder mapping. This step addresses the “ <i>who</i> ” aspect (who will take part).	A comprehensive list of key stakeholders who we engaged with and consulted during this GMP process can be found in Table 29. Broad Stakeholder Engagement Details.
3.	Define issues to be discussed - this step is the crux of the consultation. This step addresses the “ <i>what</i> ” aspect.	The outcomes of these workshops were: • To introduce the project to the stakeholders and get their buy-in • To do a situation analysis (<i>challenges, opportunities</i>) and • To gather local information from the stakeholders including (<i>DNPW staff, the Parks’ field teams, surrounding communities, NVA and District officials</i>) • To understand future expectations • To gather background data and information pertaining to the Park
4.	Work out the communication and dissemination arrangements - stakeholder consultations are, in many ways, about sharing accurate information, receiving feedback, and disseminating results.	Prior to facilitating the workshops, the team prepared: • Presentation slides that were used to share known information • Cards, flip charts and writing markers were used to record group discussion notes • Through interactive discussions, a topic was introduced and discussed in plenary or groups the feedback was audio recorded by a member of the planning team. • Printed maps were taken with to the venue where stakeholder commended on the spatial location of sites • English and the local language were used as a medium of communication

5.	Arrange the appropriate venue and time - this is about logistics, how long and where the consultation is to take place. This step takes care of the “ <i>when</i> ” and “ <i>where</i> ” aspects.	- The 1st GMP review stakeholder engagement workshops took place at Country Annex Motel in Rumphi, 24th-26th August 2021. - The 2nd stakeholder engagement workshops took place at Landmark Executive lodge in Rumphi, 3rd-6th October 2022.
6.	How records are to be kept? How is the consultation to be documented? These and related questions need to be answered comprehensively to take care of the “ <i>how</i> ” aspect of the consultation	The stakeholder feedback has been collected and kept in these ways: - Through notes given by stakeholders on flip charts - Minutes and transcribing notes were taken by a facilitating team member - Photographs were taken during the workshop by a facilitating team member - Audio recorded minutes were collected by a facilitating team member - Printed maps were taken and correct spatial feedback was collected - Electronic spatial data was collected

ANNEXURE B: LIST OF PLANT SPECIES

PLANT CHECKLIST OF THE NYIKA PLATEAU

This list – covering ferns, gymnosperms and flowering plants – was compiled by John Burrows and published in *Plants of the Nyika Plateau* edited by John Burrows and Christopher Willis (Southern African Botanical Diversity Network Report No. 31, SABONET, Pretoria, 2005). It was extracted in its entirety from this publication with just some updated nomenclature, including plant families. Further descriptive detail on each listed species and drawings of many of them can be found in the original publication, which is also available as a PDF download at http://www.sabonet.org.za/reports/publications_report31.htm

Covering all known and confirmed plant records from the Nyika Plateau, including those that have been introduced and become naturalised, the list does not cover the significant areas of woodland below the plateau or the Vwaza area. The Nyika, as defined here, occupies an area of 1800 km² above the 1800 m contour line, an altitude that marks the zone of transition from woodland to montane grassland and forest. Both the Malawi section and that portion (about 70 km) of the plateau that lies in Zambia are included.

Species are listed alphabetically by family under *Pteridophytes* (ferns), *Gymnosperms* (conifers and allies), *dicotyledons* and *monocotyledons* (flowering plants). All 33 endemic species – that is species confined to the Nyika Plateau – are indicated with a note. A further 13 species are near-endemics, occurring on the Nyika but also on any of the Viphya Plateau, Makuta and Mafinga Mountains or the Misuku Hills.

Out of a total of 1927 taxa (that is named species, subspecies and varieties) there are 111 pteridophytes (ferns and fern allies), 5 gymnosperms (conifers and allies), 1249 dicotyledon flowering plants and 562 monocotyledon flowering plants. The largest plant families are the Orchidaceae (orchids) with 205 taxa, the Asteraceae (composites) with 195 taxa, the Poaceae (grasses) with 171 taxa and the Leguminosae: Papilionoideae (papilionoid legumes) with 163 taxa.

PTERIDOPHYTA (ferns)

ASPLENIACEAE

Asplenium aethiopicum (Burm.f.) Becherer
Asplenium boltonii Schelpe
Asplenium dregeanum Kunze
Asplenium erectum Willd. var. *erectum*
Asplenium erectum Willd. var. *usambarense* (Hieron.) Schelpe
Asplenium friesiorum C.Chr.
Asplenium hypomelas Kuhn
Asplenium linckii Kuhn
Asplenium lobatum Pappe & Raws. var. *lobatum*
Asplenium loxoscaphoides Baker
Asplenium lunulatum Sw.
Asplenium mannii Hook.

Asplenium megalura Hieron.
Asplenium monanthes L.
Asplenium protensum Schrad.
Asplenium sandersonii Hook.
Asplenium smedsii Pic.Serm.
Asplenium theciferum (Kunth) Mett. var. *concinnum* (Schrad.) C.Chr.

BLECHNACEAE

Blechnum attenuatum (Sw.) Mett. var. *attenuatum*
Blechnum australe L.
Blechnum tabulare (Thunb.) Kuhn

CYATHEACEAE

Cyathea dregei Kunze

Cyathea manniana Hook.
Cyathea thomsonii Baker

DENNSTAEDTIACEAE

Blotiella natalensis (Hook.) Tryon
Pteridium aquilinum (L.) Kuhn var. *aquilinum*
Pteridium aquilinum (L.) Kuhn var. *centrali-africanum* Hieron.

DRYOPTERIDACEAE

Arachniodes foliosa (C.Chr.) Schelpe

EQUISETACEAE

Equisetum ramosissimum Deaf.

GLEICHENIACEAE

Gleichenia elongata Baker
Crepidomanes melanotrichum (Schltdl.) J.P.Roux
Hymenophyllum kuhnii C.Chr.
Sphaerocionium capillare (Desv.) Copel.
Sphaerocionium splendidum (Bosch.) Copel.
ISOETACEAE
Isoetes schweinfurthii A.Braun
Isoetes sp. A

LOMARIOPSIDACEAE

Elaphoglossum acrostichoides (Hook. & Grev.) Schelpe
Elaphoglossum aubertii (Desv.) Moore
Elaphoglossum salicifolium (Kaulf.) Alston
Elaphoglossum spatulatum (Bory) T.Moore

LYCOPODIACEAE

Huperzia dacrydioides (Baker) Pic.Serm.
Huperzia gnidioides (L.f.) Rothm.
Huperzia ophioglossoides (Lam.) Rothm.
Huperzia verticillata (L.f.) Rothm.
Lycopodiella cernua (L.) Pic.Serm.
Lycopodium carolinianum L. var. *affine* (Bory) Schelpe
Lycopodium clavatum L.

MARATTIACEAE

Marattia fraxinea Sm.

OLEANDRACEAE

Arthropteris monocarpa (Cordem.) C.Chr.
Arthropteris orientalis (J.F.Gmel.) Posthumus
Nephrolepis undulata (Sw.) J.Sm.
Oleandra distenta Kunze var. *distenta*

OPHIOGLOSSACEAE

Ophioglossum convexum J.E.Burrows
Ophioglossum lusoaffricanum Prantl
Ophioglossum polyphyllum A.Braun
Ophioglossum rubellum A.Braun

Athyrium schimperii Fée
Didymochlaena truncatula (Sw.) J.Sm.
Diplazium zanzibaricum (Baker) C.Chr.
Dryopteris athamantica (Kunze) Kuntze
Dryopteris inaequalis (Schlecht.) Kuntze
Dryopteris kilemensis (Kuhn) Kuntze
Dryopteris squamiseta (Hook.) Kuntze
Megalastrum lanuginosum (Kaulf.) Holttum
Polystichum transvaalense N.C.Anthony
Polystichum zambesiaceum Schelpe
Tectaria gemmifera (Fée) Alsto

Gleichenia polypodioides (L.) Sm.

GRAMMITIDACEAE

Grammitis rigescens (Willd.) Lellinger

HYMENOPHYLLACEAE

Ophioglossum vulgatum L. subsp. *africanum*
J.E.Burrows var. *africanum*

OSMUNDACEAE

Osmunda regalis L.

POLYPODIACEAE

Drynaria volkensii Hieron.
Loxogramme abyssinica (Baker) M.G.Price
Pleopeltis excavata (Willd.) Sledge
Pleopeltis macrocarpa (Willd.) Kaulf.
Pyrrosia stolzii (Hieron.) Schelpe

PTERIDACEAE

Adiantum lunulatum Burm.f.
Adiantum poiretii Wikstr. var. *poiretii*
Adiantum raddianum C.Presl
Adiantum reniforme L. var. *asarifolium* (Willd.) Cordem.
Anogramme leptophylla (L.) Link
Aspidotis schimperii (Kunze) Pic.Serm.
Cheilanthes farinosa (Forssk.) Kaulf.
Cheilanthes inaequalis (Kunze) Mett. var. *inaequalis*
Cheilanthes multifida (Sw.) Sw. var. *lacerata* N.C.Anthony & Schelpe
Cheilanthes quadripinnata (Forssk.) Kuhn
Coniogramme africana Hieron.
Pellaea pectiniformis Baker
Pityrogramma aurantiaca (Hieron.) C.Chr.
Pteris catoptera Kunze var. *catoptera*
Pteris cretica L.
Pteris dentata Forssk.
Pteris friesii Hieron.

SCHIZAEACEAE

Anemia angolensis Alston
Mohria lepigera (Baker) Baker

Mohria marginalis (Savigny) J.P.Roux
Mohria nudiuscula J.P.Roux
Mohria vestita Baker

SELAGINELLACEAE

Selaginella goudotiana Spring var. *abyssinica* (Spring) Bizzarri
Selaginella kraussiana (Kunze) A.Braun
Selaginella njam-njamensis Hieron.

THELYPTERIDACEAE

Thelypteris bergiana (Schltdl.) Ching
Thelypteris chaseana Schelpe
Thelypteris confluens (Thunb.) Morton
Thelypteris dentata (Forssk.) E.St.John var. *dentata*
Thelypteris friesii (Brause) Schelpe
Thelypteris madagascariensis (Fée) Schelpe
Thelypteris oppositifolmis (C.Chr.) Ching
Thelypteris pozoi (Lagasca) Morton
Thelypteris pulchra (Willd.) Schelpe

VITTARIACEAE

Vittaria guineensis Desv. var. *orientalis* Hieron.

GYMNOSPERMS

CUPRESSACEAE

Juniperus procera Endl.

PINACEAE

Pinus patula Schltdl. & Cham.

PODOCARPACEAE

Afrocarpus falcata (Thunb.) C.N.Page
Podocarpus ensiculus Melville
Podocarpus milanjanus Rendle

DICOTYLEDONS

ACANTHACEAE

Acanthopale confertiflora (Lindau) C.B.Clarke
Acanthus ueleensis De Wild.
Blepharis grandis C.B.Clarke
Brillantaisia kirungae Lindau
Dicliptera maculata Nees
Dicliptera verticillata (Forssk.) C.Christensen
Dyschoriste hildebrandtii (S.Moore) Lindau
Dyschoriste nyassica Gilli
Dyschoriste verticillaris (Oliv.) C.B.Clarke
Hypoestes aristata (Vahl) Roem. & Schult. var. *alba* K.Balkwill
Hypoestes aristata (Vahl) Roem. & Schult. var. *aristata*
Hypoestes forskoolii (Vahl) R.Br.
Isoglossa strigulosa C.B.Clarke — NEAR-ENDEMIC
Isoglossa substrobilina C.B.Clarke
Justicia linearispica C.B.Clarke
Justicia mollugo C.B.Clarke
Justicia nuttii C.B.Clarke
Justicia phyllostachys C.B.Clarke
Justicia striata (Klotzsch) Bullock
Lepidagathis sparsiceps C.B.Clarke
Mellera submutica C.B.Clarke

Metarungia pubinervia (T.Anders.) Baden
Mimulopsis solmsii Schweinf.
Monechma varians C.B.Clarke — ENDEMIC
Peristrophe aculeata (C.B.Clarke) Brummitt
Peristrophe paniculata (Forssk.) Brummitt
Peristrophe pumila (Lindau) Gilli
Phaulopsis imbricata (Forssk.) Sweet
Thunbergia alata Sims
Thunbergia kirkiana T.Anders.
Thunbergia lancifolia T.Anders.
Thunbergia mollis Lindau
Thunbergia petersiana Lindau

ALANGIACEAE

Alangium chinense (Lour.) Harms

AMARANTHACEAE

Achyranthes aspera L. var. *pubescens* (Moq.) C.C.Towns.
Amaranthus hybridus L. subsp. *cruentus* (L.) Thell.
Cyathula cylindrica Moq.

ANACARDIACEAE

Lannea discolor (Sond.) Engl.
Lannea edulis (Sond.) Engl.
Ozoroa insignis Delile subsp. *reticulata* (Baker f.) Gillett
Rhus anchietae Hiern
Rhus longipes Engl. var. *longipes*
Rhus ochracea Meikle var. *ochracea*
Rhus pyroides Burch. var. *pyroides*

ANISOPHYLLACEAE

Anisophyllea boehmii Engl.

ANNONACEAE

Annona senegalensis Pers.
Artabotrys monteiroae Oliv.
Artabotrys stolzii Diels
Friesodielsia obovata (Benth.) Verdc.

APIACEAE

Afrocarum imbricatum (Schinz) Rauschert
Agrocharis incognita (Norman) Heyw. & Jury
Agrocharis melanantha Hochst.
Alepidea peduncularis A.Rich.
Centella asiatica (L.) Urb.
Cyclosporum leptophyllum (Pers.) Sprague
Diplolophium buchananii (Oliv.) Norman
Frommia ceratophylloides H.Wolff
Heracleum abyssinicum (Boiss.) Norman
Heteromorpha arborescens (Spreng.) Cham. & Schltdl. var. *abyssinica* (A.Rich.) H.Wolff
Heteromorpha involucreta Conrath
Heteromorpha kassneri H.Wolff
Hydrocotyle mannii Hook.f.
Lefebvrea abyssinica A.Rich.
Lefebvrea grantii (Hiern) Droop
Peucedanum articulatum C.C.Towns. — ENDEMIC
Peucedanum claessensii Norman

Peucedanum eylesii Norman
Peucedanum linderi Norman
Peucedanum sp. nov. aff. *P. harmsianum* H. Wolff
 — ENDEMIC
Physotrichia heracleoides H. Wolff
Physotrichia muriculata (Hiern) Droop & C.C.Towns.
Pimpinella buchananii H. Wolff subsp. *buchananii* var. *buchananii*
Pimpinella caffra (Eckl. & Zeyh.) D.Dietr. subsp. *conopodioides* C.C.Towns.
Pimpinella duridentata C.C.Towns.
Pimpinella huillensis Engl.
Pimpinella ledermannii H. Wolff subsp. *engleriana* (H. Wolff) C.C.Towns.
Pimpinella nyassica Norman — ENDEMIC
Sanicula elata D. Don
Steganotaenia araliacea Hochst.
Torilis arvensis (Huds.)

APOCYNACEAE (including *Asclepiadaceae* and *Periplocaceae*)

Acokanthera laevigata Kupicha
Ancylobotrys petersiana (Klotzsch) Pierre
Asclepias amabilis N.E.Br.
Asclepias pygmaea N.E.Br.
Asclepias randii S. Moore
Asclepias sp. [= Richards 57]
Asclepias sp. [= Richards 6689]
Aspidoglossum angustissimum (K.Schum.) Bullock
Aspidoglossum breve Kupicha
Carvalhoa campanulata K.Schum.
Ceropegia claviloba Werderm.
Ceropegia filipendula K.Schum.
Ceropegia schliebenii Markgr.
Ceropegia sp. [= Goyder, Paton & Tawakali 3579]
 — ENDEMIC
Cryptolepis oblongifolia (Meisn.) Schltr.
Cynanchum praecox S. Moore
Cynanchum rungweense Bullock
Glossostelma carsonii (N.E.Br.) Bullock
Glossostelma nyikense Goyder — ENDEMIC
Gomphocarpus praticola (S. Moore) Goyder & Nicholas
Gomphocarpus swynnertonii (S. Moore) Goyder & Nicholas
Landolphia buchananii (Hall.f.) Stapf
Margaretta rosea Oliv. subsp. *bidens* Bullock
Pachycarpus goetzei (K.Schum.) Bullock
Pachycarpus lineolatus (Decne.) Bullock
Pachycarpus spurius (N.E.Br.) Bullock
Pentarrhinum abyssinicum Decne. subsp. *angolense* (N.E.Br.) Liede & Nicholas
Periploca linearifolia Quart.-Dill. & A. Rich.
Raphionacme longituba E.A. Bruce
Rauvolfia caffra Sonder
Rauvolfia mannii Stapf
Riocreuxia chrysochroma (Huber) A.R.Sm.
Riocreuxia profusa N.E.Br.

Secamone alpini Schult.
Stathmostelma fornicatum (N.E.Br.) Bullock subsp. *fornicatum*
Tabernaemontana stapfiana Britten
Tacazzea conferta N.E.Br.
Trachycalymma buchwaldii (Schltr. & K.Schum.) Goyder
Trachycalymma cristatum (Decne.) Bullock
Trachycalymma foliosum (K.Schum.) Goyder
Tylophora anomala N.E.Br.
Tylophora erubescens (Liede & Meve) Liede
Xysmalobium undulatum (L.) Ait.f.

AQUIFOLIACEAE

Ilex mitis (L.) Radlk.

ARALIACEAE

Cussonia arborea A. Rich.
Cussonia spicata Thunb.
Polyscias fulva (Hiern) Harms
Schefflera abyssinica (A. Rich.) Harms
Schefflera goetzenii Harms
Schefflera myriantha (Baker) Drake

ASTERACEAE [Compositae]

Acmella caulirhiza Delile
Adenostemma caffrum DC. var. *asperum* Brenan
Ageratinastrum polyphyllum (Baker) Mattf.
Ageratum conyzoides L.
Anisopappus chinensis (L.) Hook.f. & Arn. subsp. *buchwaldii* (O.Hoffm.) S. Ortíz, Paiva & Rodr. Oubiña
Anisopappus chinensis (L.) Hook.f. & Arn. subsp. *chinensis*
Anisopappus kirkii (Oliv.) Brenan
Artemisia afra Willd.
Aspilia kotschyi (Hochst.) Oliv. var. *kotschyi*
Aspilia mossambicensis (Oliv.) Wild
Aspilia natalensis (Sond.) Wild
Aspilia pluriseta Schweinf.
Aster harveyanus Kuntze subsp. *nyikensis* W. Lippert
Aster tansaniensis W. Lippert
Athrixia rosmarinifolia (Sch.Bip.) Oliv. & Hiern var. *foliosa* (S. Moore) Kroner
Athrixia subsimplex Brenan
Berkheya bipinnatifida (Harv.) Roessler subsp. *echinopsoides* (Baker) Roessler
Berkheya echinacea (Harv.) Burt Davy subsp. *polyacantha* (Baker) Roessler
Berkheya zeyheri (Sond. & Harv.) Oliv. & Hiern subsp. *zeyheri*
Bidens acuticaulis Sherff var. *acuticaulis*
Bidens baumii (O.Hoffm.) Sherff
Bidens biternata (Lour.) Merr. & Sherff
Bidens crocea O.Hoffm.
Bidens diversa Sherff
Bidens kilimandscharica (O.Hoffm.) Sherff
Bidens lineariloba Oliv.
Bidens ochracea (O.Hoffm.) Sherff

Bidens pilosa L.
Bidens pinnatipartita (O.Hoffm.) Wild
Bidens schimperii Sch.Bip.
Bidens steppia (Steetz) Sherff
Blumea axillaris (Lam.) DC.
Bothriocline inyangana N.E.Br.
Bothriocline laxa N.E.Br.
Bothriocline longipes (Oliv. & Hiern) N.E.Br.
Bothriocline pectinata (O.Hoffm.) Wild & G.V.Pope
Bothriocline ripensis (Hutch.) Wild & G.V.Pope
Bothriocline trifoliata (De Wild. & Muschl.) Wild & G.V.Pope
Brachythrix glomerata (Mattf.) C.Jeffrey
Brachythrix malawiensis (Wild & G.V.Pope) G.V.Pope — ENDEMIC
Brachythrix pawekiae Wild & G.V.Pope — ENDEMIC
Brachythrix sonchoides Wild & G.V.Pope — ENDEMIC
Brachythrix stolzii (S.Moore) Wild & G.V.Pope
Carduus nyassanus (S.Moore) R.E.Fr.
Chrysanthemoides monilifera (L.) Nordl. subsp. *septentrionalis* Nordl.
Cineraria deltoidea Sond.
Cirsium buchwaldii O.Hoffm.
Conyza aegyptiaca (L.) Aiton
Conyza albida Willd.
Conyza bonariensis (L.) Cronquist
Conyza limosa O.Hoffm.
Conyza pyrhopappa A.Rich.
Conyza steudelii A.Rich.
Conyza stricta Willd.
Conyza subscaposa O.Hoffm.
Conyza tigrensensis Oliv. & Hiern
Conyza welwitschii (S.Moore) Wild
Crassocephalum crepidioides (Benth.) S.Moore
Crassocephalum montuosum (S.Moore) Milne-Redh.
Crassocephalum picridifolium (DC.) S.Moore
Crassocephalum rubens (Jacq.) S.Moore var. *rubens*
Crassocephalum rubens (Jacq.) S.Moore var. *sarcobasis* (DC.) C.Jeffrey & Beentje
Crassocephalum uvens (Hiern) S.Moore
Crassocephalum vitellinum (Benth.) S.Moore
Crepis hypochaeridea (DC.) Thell.
Crepis newii Oliv. & Hiern subsp. *newii*
Dewildemanian stenophylla (Baker) B.L.Burt
Dichrocephala chrysanthemifolia (Blume) DC. var. *chrysanthemifolia*
Dichrocephala integrifolia (L.f.) Kuntze subsp. *integrifolia*
Dicoma anomala Sond. subsp. *anomala*
Dicoma plantaginifolia O.Hoffm.
Dicoma sessiliflora Harv.
Eclipta prostrata (L.) L.
Elephantopus scaber L. subsp. *plurisetus* (O.Hoffm.) Phillipson var. *plurisetus* O.Hoffm.
Emilia coccinea (Sims) G.Don

Emilia guineensis Hutch. & Dalziel
Emilia hockii (De Wild. & Muschl.) C.Jeffrey
Emilia integrifolia Baker
Erigeron karvinskianus DC.
Erythrocephalum zambesianum Oliv. & Hiern
Felicia boehmii O.Hoffm.
Galinsoga parviflora Cav.
Gazania krebsiana Less. subsp. *serrulata* (DC.) Roessler
Gerbera ambigua (Cass.) Sch.Bip.
Gerbera piloselloides (L.) Cass.
Gerbera viridifolia (DC.) Sch.Bip.
Guizotia scabra (Vis.) Chiov. subsp. *scabra*
Gynura scandens O.Hoffm.
Haplocarpha scaposa Harv.
Helichrysum abietinum O.Hoffm.
Helichrysum brassii Brenan
Helichrysum buehnerianum Engl.
Helichrysum foetidum (L.) Moench
Helichrysum forskahlii (J.F.Gmel.) Hilliard & B.L.Burt var. *forskahlii*
Helichrysum goetzeanum O.Hoffm.
Helichrysum herbaceum (Andr.) Sweet
Helichrysum hilliardiae Wild — ENDEMIC
Helichrysum kirkii Oliv. & Hiern var. *kirkii*
Helichrysum kirkii Oliv. & Hiern var. *petersii* (Oliv. & Hiern) Beentje
Helichrysum mechowianum Klatt var. *ceres* (S.Moore) Beentje
Helichrysum mechowianum Klatt var. *vernonioides* (Wild) Beentje
Helichrysum nitens Oliv. & Hiern subsp. *nitens*
Helichrysum nudifolium (L.) Less. var. *nudifolium*
Helichrysum nudifolium (L.) Less. var. *pilosellum* (L.f.) Beentje
Helichrysum odoratissimum (L.) Sweet
Helichrysum patulifolium Baker
Helichrysum pawekiae Wild
Helichrysum quartinianum A.Rich.
Helichrysum setosum Harv.
Helichrysum splendidum (Thunb.) Less.
Helichrysum sulphureo-fuscum Baker
Helichrysum tillandsiifolium O.Hoffm.
Helichrysum tithonioides Wild — ENDEMIC
Hirpicium angustifolium (O.Hoffm.) Roessler
Hypericophyllum compositarum Steetz
Inula glomerata Oliv. & Hiern
Inula mannii (Hook.f.) Oliv. & Hiern
Inula paniculata (Klatt) Burt Davy
Inula shirensis Oliv.
Lactuca calophylla C.Jeffrey
Lactuca glandulifera Hook.
Lactuca lasiorhiza (O.Hoffm.) C.Jeffrey
Lactuca paradoxa Sch.Bip.
Lactuca praecox R.E.Fr.
Laggera brevipes Oliv. & Hiern
Laggera crispata (Vahl.) Hepper & J.R.I. Wood
Launaea nana (Baker) Chiov.
Launaea rarifolia (Oliv. & Hiern) Boulos var.

rarifolia

Lopholaena dolichopappa (O.Hoffm.) S.Moore
Melanthera albinervia O.Hoffm. subsp. *albinervia*
Microglossa densiflora Hook.f.
Microglossa pyrifolia (Lam.) O.Kuntze
Nidorella auriculata DC.
Nidorella resedifolia DC.
Nidorella spartioides (O.Hoffm.) Cronquist
Osteospermum monocephalum (Oliv. & Hiern)
T.Norl.
Osteospermum nyikensis Norl. — ENDEMIC
Pentanema indicum (L.) Ling
Pleiotaxis pulcherrima Steetz
Pseudognaphalium luteo-album (L.) Hilliard &
B.L.Burt
Schistostephium artemisiifolium Baker
Schistostephium mollissimum Hutch.
Senecio erubescens Aiton
Senecio hochstetteri Sch.Bip.
Senecio inornatus DC.
Senecio latifolius DC.
Senecio oxyriifolius DC.
Senecio pachyrhizus O.Hoffm.
Senecio pergamentaceus Baker
Senecio ruwenzoriensis S.Moore
Senecio sessilis Oliv. & Hiern
Senecio syringifolius O.Hoffm.

Sigesbeckia abyssinica (Sch.Bip.) Oliv. & Hiern
Solanecio mannii (Hook.f.) C.Jeffrey
Sonchus luxurians (R.E.Fr.) C.Jeffrey
Sonchus oleraceus L.
Sonchus schweinfurthii Oliv. & Hiern
Stoebe kilimandscharica O.Hoffm.
Stomatanthes africanus (Oliv. & Hiern) R.M.King &
H.Rob.
Stomatanthes zambiensis R.M.King & H.Rob.
Tagetes minuta L.
Tolpis capensis (L.) Sch.Bip.
Tolpis mbalensis G.V.Pope
Vernonia acrocephala Klatt.
Vernonia adoensis Sch.Bip.
Vernonia alticola G.V.Pope
Vernonia amblyolepis Baker
Vernonia amygdalina Delile
Vernonia bainesii Oliv. & Hiern subsp. *bainesii*
Vernonia biafrae Oliv. & Hiern
Vernonia calyculata S.Moore
Vernonia chloropappa Baker
Vernonia colorata (Wild) Drake subsp. *oxyura*
(O.Hoffm.) C.Jeffrey
Vernonia erinacea Wild
Vernonia exsertiflora Baker var. *exsertiflora*
Vernonia fractiflexa Wild — ENDEMIC
Vernonia gerberiformis Oliv. & Hiern
Vernonia griseopapposa G.V.Po

ANNEXURE C: LIST OF FAUNAL SPECIES

LIST OF LARGE MAMMALS RECORDED IN NYIKA NATIONAL PARK

Order INSECTIVORA: INSECTIVORES

Family Soricidae: Shrews

Suncus varilla

Suncus lixus

Crocidara occidentalis

Crocidara fuscomarina

Crocidara hildegardeae

Crocidara luna

Crocidara zaodon

Lesser dwarf shrew

Greater dwarf shrew

Giant musk shrew

Bi-coloured musk shrew

Short-footed musk shrew

Grey-brown musk shrew

Osgoode's musk shrew

Order MACROSCOLIDIDEA: ELEPHANT SHREWS

Family Macroscelididae: Elephant Shrews

Rhynchocyon cirnei

Ephantulus bracyrhnchus

Chequered elephant shrew

Short-snouted elephant shrew

Order CHIROPTERA: BATS

Suborder Megaehiroptera: Fruit-Bats

Family Pteropodidae: Fruit-Bats

Epomophorus wahlbergi

Epomophorus cryturus

Eidolon helvum

Wahlberg's epauletted fruit bat

Peter's epauletted fruit bat

Straw-coloured fruit bat

Suborder Microchiroptera: Insectivorous Bats

Family Rhinolophidae: Horseshoe Bats

Rhinolophus blasii

Rhinolophus clivosus

Rhinolophus hildebrandti

Rhinolophus simulator

Peak-saddle horseshoe-bat

Geoffroy's horseshoe-bat

Hildebrandt's horseshoe-bat

Bushveld horseshoe-bat

Family Vespertilionidae: Vesper Bats

Pipistrellus kuhlii

Miniopterus scheibersii

Kuhl's pipistrelle

Schreiber's long-fingered bat

Order PRIMATES: PRIMATES

Family Ceropitheeidae: Monkeys and Baboons

Cercopithecus albogularis

Cercopithecus pygerythrus

Papio cynocephalus

Blue monkey

Vervet monkey

Yellow baboon

Order LAGOMORPHA: HARES

Family Leporidae: Hares

Lepus saxatilis

Pronolagus rупenstris

Scrub hare

Red rock hare

Order RODENTA: RODENTS

Family Sciuridae: Squirrels

Paraxerus cepapi

Paraxerus lucifer

Smith's bush squirrel

Black-banded bush squirrel

Family Muridae: Rats and Mice

Bearmys hindei
Cricetomys gambianus
Dendromus melanotis
Dendromus mesomelas
Dendromus nyikae
Tatera boehmi
Otomys denti
Otomys typus
Acomys spinosissimus
Aethomys chrysophilus
Aethomys nyikae
Dasymys incomtus
Lemniscomys rosalia
Lophuromys fluvopunctatus
Mus minutoides
Mus triton
Pellom's fallax
Praomys delectorum
Mastomys natalensis
Rattus rattus
Rhabdomys purni
Grammornys cometes
Zelotomys hildegardae

Lesser pouched rat
Gambian giant rat
Dark-eyed climbing mouse
Brant's climbing mouse
Nyika climbing mouse
Boehm's gerbil
Kemp's vlei rat
Tanganyika vlei rat
Peter's spiny mouse
Red veld rat
Nyika veld-rat
Shappy rat
Single-striped grass mouse
Harsh-furred rat
Pygmy mouse
Grey-bellied pygmy mouse
Groove-toothed mouse
Soft-furred mouse
Multimammate mouse
Black rat
Striped mouse
Thicket rat
Hildegard's mouse

Family Bathyergidae: Mole-rats

Heliophobius argenteocinereus
Cryptornys hottentots
Cryptornys mechow

Silvery mole rat
Hottentot mole rat
Giant Angolan mole rat

Family Gliridae: Dormice

Graphiurus murinus

Cape African dormouse

Family Hystricidae: Porcupines

Hystrix africae ausiralis

Cape porcupine

Family Thryonomyidae: Cane rats

Thryonomyidae gregorianus

Lesser cane rat

Order CARNIVORA: CARNIVORES**Family Canidae: Dogs, Jackals, Foxes**

adustus

Side striped jackal

Family Mustelidae: Otters, Weasels and Ratel

Aonyx capensis
Lutra maculicollis
Mellivora capensis
Poecilogale albinucha

Cape clawless otter
Spotted-necked otter
Honey badger or ratel
African striped weasel

Family Viverridae: Genets, Mongooses etc.

Nandinia binotata
Civettictis civetta
Bdeogale crassicauda
Herpestes ichneumon
Galerella sanguinea
Helogale parvula

Two-spotted palm civet
African civet
Bush-tailed mongoose
Egyptian mongoose
Slender mongoose
Dwarf mongoose

Family Hyaenidae: Hyenas

Crocuta crocuta

Spotted hyena

Family Felidae: Cats

Acinonyx jubatus
Panthera leo
Panthera pardus
Felis serval
Felis caracal

Cheetah
Lion
Leopard
Serval
Caracal

Order HYRACOIDEA: HYRAXES

Family Procaviidae

Heterophyrax brucei
Dendrohyrax arboreus

Yellow-spotted rock hyrax
Southern tree hyrax

Order PROBOSCIDEA: ELEPHANTS

Family Elephantidae

Loxodonta africana

African elephant

Order PERISSODACTYLA: ODD-TOED UNGULATES

Family Equidae: Asses, Horses and Zebras

Equus burchelli

Burchell's zebra

Order ARTIODACTYLA: EVEN-TOED UNGULATES

Family Suidae: Pigs

Potamochoerus porcus
Potamochoerus aethiopicus

Bush pig
Warthog

Family Hippopotamidae: Hippopotamuses

Hippopotamus amphibius

Hippopotamus

Family Bovidae: Buffaloes, Antelopes etc.

Syncerus caffer
Tragelaphus scriptus
Tragelaphus strepsiceros
Taurotragus oryx Eland
Cephalophus monticola
Cephalophus monticola
Sylvicapra grimmia
Redunca arundinum
Kobus vardonii
Hippotragus equinus
Stigmoceros lichtenstenii
Oreotragus oreotragus
Raphicerus sharpei

African buffalo
Bushbuck
Greater kudu

Blue duiker
Red duiker
Common duiker
Common reedbuck
Puku
Roan antelope
Lichtenstein's hartebeest
Klipspringer
Grysbok

LIST OF BIRDS RECORDED IN NYIKA NATIONAL PARK

PODICIPEDIDAE

Tachybaptus ruficollis

Dabchick (Little grebe)

PELECANIDAE

Pelecanus oriocrotalus

White pelican

PHALACROCORACIDAE

Phalacrocorax africanus

Reed (long-tailed) cormorant

ARDEIDAE

Ardeola ralloides

Common squacco heron

Ardeola ibis

Cattle egret

Egretta alba

Great white egret

Egretta intermedia

Yellow billed egret

Egretta garzetta

Little egret

Ardea melanocephala

Black headed heron

SCOPIDAE

Scopus umbretta

Hammerkop

CICONIIDAE

Ciconia ciconia

White stork

Ciconia nigra

Black stork

Ciconia abdimii

Ahdim's (white-bellied) stork

Anastomus lamelligerus

Openbill stork

Ibis ibis

Yellow billed stork

THRESKIORNITHIDAE

Bostrychia hagedash

Hadedda

Plegadis falcinellus

Glossy ibis

Platalea alba

African spoonbill

PHOENICOPTERIDAE

Phoenicopus ruber

Greater Flamingo

ANATIDAE

Dendrocygna bicolor

Fulvous tree duck

Sarkidiornis melanotos

Knob billed duck

Arnas sparsa

African black duck

Arnas undulata

Yellow billed duck

Arnas erythrorhynchos

Red billed teal

Oxyura punctata

Maccoa duck

Netta erythrophthalmus

Southern pochard

SAGITTARIIDAE

Sagittarius serpentarius

Secretary bird

ACCIPITRIDAE

Aegypius tracheliotus

Lappet faced vulture

Trygoniceps occipitalis

White backed vulture

Gyps bengalensis
Neophron monachus
Gypothierax angolensis
Circus macrourus
Circus pygargus
Circus aeruginosus
Circus ravinourous
Polyboroides radiatus
Terathopius ecaudatus
Circaetus pectoralis
Circaetus cinereus
Circaetus cinerascens
Accipiter melanoleucus
Accipiter rufiventris
Accipiter tachiro
Accipiter badius
Melierax metabates
Kaupifalco monogrammicus
Buteo augur
Buteo buteo
Buteo oreophilus
Lophaetus occipitalis
Stephanoaetus coronatus
Polemaetus bellicosus
Hieraetus spilogaster
Hieraetus pinatus
Hieraetus dubius
Aquila verreauxi
Aquila rapax
Aquila nipalensis
Aquila pomarina
Aquila wahlbergi
Haliaeetus vocifer
Millvus migrans
Pernis apivorus
Aviceda cuculoides
Elanus caeruleus
Macheiramphus alcinus

PANDIONIDAE

Pandion haliaetus

FALCONIDAE

Falco biarmicus
Falco peregrinus
Falco subbuteo
Falco disckinsoni
Falco vespertinus
Falco amurensis
Falco naumanni
Falco tinnunculus

PHASIANIDAE

Francolinus coqui
Francolinus shelleyi
Francolinus levaillantii

White backed vulture
Hooded vulture
Palm nut vulture
Pale harrier
Montagu's harrier
European marsh harrier
African marsh harrier
Gymnogone
Bateleur
Black breasted snake eagle
Brown snake eagle
Western banded snake eagle
Black goshawk
Red breasted sparrow hawk
African goshawk
Little banded goshawk
Dark chanting goshawk
Lizard buzzard
Augur buzzard
Steppe buzzard
Mountain buzzard
Long crested eagle
Crowned eagle
Martial eagle
African hawk eagle
Booted eagle
Ayre's hawk eagle
Black eagle
Tawny eagle
Steppe eagle
Lesser spotted eagle
Wahlberg's eagle
African fish eagle
Black kite
Honey buzzard
African cuckoo hawk
Black shouldered kite
Bat hawk

Osprey

Lanner
Peregrine
European hobby
Dickinson's grey kestrel
Western red footed falcon
Eastern red footed falcon
Lesser kestrel
Rock kestrel

Coqui francolin
Shelly's francolin
Red winged francolin

Francolinus hildebrandti
Francolinus afer
Coturnix delegorguei
Coturnix chinensis

Hildebrandt's francolin
Red necked francolin
Harlequin quail
Blue quail

NUMIDIDAE

Numida meleagris

Helmeted guinea fowl

TURNICIDAE

Turnix sylvatica

Kurrichane buttonquail

GRUIDAE

Burgeranus carunculatus
Balearica pavonina

Wattled crane
Crowned crane

RALLIDAE

Crex crex
Sarothura rufa
Sarothura affinis
Fulica cristata

Corn crane
Red chested flufftail
Red tailed flufftail
Red knobbed coot

OTIDIDAE

Otis denhami
Eupodotis melanogaster

Denham's bustard
Black bellied bustard

CHARADRIIDAE

Varnellus senegalus
Charadrius hiaticula
Charadrius tricollaris
Charadrius asiaticus

Senegal wattled plover
Ringed plover
Three banded plover
Caspian plover

SCOLOPACIDAE

Tringa nebularia
Tringa stagnatilis
Tringa glareola
Tringa ochropus
Tringa hypoleucos
Gallinago media
Gallinago nigripennis
Calidris ferruginea
Calidris minuta
Calidris alba
Limicola falcinellus
Philomachus pugnax

Greenshank
Marsh sandpiper
Wood sandpiper
Green sandpiper
Common sandpiper
Great snipe
Ethiopian snipe
Curlew sandpiper
Little stint
Sanderling
Broad billed sandpiper
Ruff

RICURVIROSTRIDAE

Himantopus himantopus

Black winged stilt

BURHINIDAE

Burhinus capensis

Spotted dikkop

GLAREOLIDAE

Cursoruis temminckii
Glareola pratincola

Temminck's courser
Common pratincole

LARIDAE

Larus cirrocephalus
Chlidonias leucoptera

Grey headed gull
White winged black tern

COLUMBIDAE

Columba arquatrix
Streptopelia lugens
Streptopelia semitorquata
Streptopelia capicola
Streptopelia senegalensis
Turtur chalcospilos
Aplopelia larvata
Treron astralis

Olive (Rameron) pigeon
Pink breasted turtle dove
Red eyed dove
Cape turtle dove
Laughing dove
Emerald spotted wood dove
Lemon (cinnamon) dove
African green pigeon

PSITTACIDAE

Poicephalus robustus

Brown necked parrot

MUSOPHAGIDAE

Tauraco livingstonii
Tauraco porphyreolophus

Livingstone's turaco (green loerie)
Purple crested turaco (loerie)

CUCULIDAE

Clamator glandarius
Clamator jacobinus
Clamator levaillantii
Cuculus solitarius
Cuculus clamosus
Cuculus canorus
Cuculus gularis
Chrysococcyx klaas
Chrysococcyx caprius
Chrysococcyx cupreus
Centropus superciliosus

Great spotted cuckoo
Jacobin (black and white) cuckoo
Levaillant's (striped crested) cuckoo
Red chested chuckoo
Black cuckoo
European cuckoo
African grey cuckoo
Klaas's cuckoo
Didric cuckoo
Emerald cuckoo
White browed coucal

TYTONIDAE

Tyto capensis

Grass owl

STRIGIDAE

Otus scops
Bubo africanus
Bubo lacteus
Strix woodfordii
Asio capensis

Scops owl
Spotted eagle owl
Giant eagle owl
Wood owl
Marsh owl

CAPRIMULGIDAE

Caprimulgus europaeus
Caprimulgus pectoralis
Caprimulgus poliocephalus
Caprimulgus tristigma
Macrodipteryx vexillarius

European nightjar
Fiery necked nightjar
Mountain nightjar
Freckled rock nightjar
Pennant winged nightjar

APODIDAE

Schoutedenapus myoptilus
Cypsiurus parvus
Apus melba
Apus aequatorialis
Apus barbatus
Apus apus
Apus affinis
Apus caffer

Scarce swift
African palm swift
Alpine swift
Mottled swift
African black swift
European swift
Little swift
African white rumped swift

COLIIDAE

Colius striatus

Speckled mousebird

TROGONIDAE

Apaloderma narina
Apaloderma vittatum

Narina trogon
Bar tailed trogon

ALCEDINIDAE

Ceryle maxima
Ceryle rudis
Alcedo semitoquota
Ispidina picta
Halcyon albiventris
Halcyon leucocephala

Giant kingfisher
Pied kingfisher
Half collared kingfisher
Pigmy kingfisher
Brown hooded kingfisher
Chestnut bellied kingfisher

MEROPIDAE

Merops apiaster
Merops persicus
Merops siperciliosus
Merops nubicus
Merops pusillus
Merops ballockoides
Merops hirundineus

European bee-eater
Blue cheeked bee-eater
Malagasy (olive) bee-eater
Carmine bee-eater
Little bee-eater
White fronted bee-eater
Swallow tailed bee-eater

CORADIIDAE

Coracias garrulus
Coracias caudata
Eurystomus glaucurus

European roller
Lilac breasted roller
Broad billed (cinnamon) roller

UPUPIDAE

Upupa epos

Hoopoe

PHOENICULIDAE

Phoenicalus purpureus
Ohoenicalus cyanomelas

Red billed wood hoopoe
Scimitar billed wood hoopoe

BUCEROTIDAE

Tockus nasutus
Tockus alboterminatus
Bycanistes bucinator
Bycanistes brevis
Bucorvus cafer

Grey hornbill
Crowned hornbill
Trumpeter hornbill
Silvery checked hornbill
Southern ground hornbill

CAPITONIDAE

Lybius torquatus
Pogoniulus lenconystax
Pogoniulus corysconus
Pogoniulus bilineatus

Black collared barbet
Moustached greentinkerbird
Yellow fronted tinkerbird
Golden rumped tinkerbird

INDICATORIDAE

Indicator variegatus
Indicator indicator
Indicator minor
Indicator meliphilus
Prodotiscus zambesiae

Scaly-throated honeyguide
Greater honeyguide
Lesser honeyguide
Eastern honeyguide
Eastern green honeyguide

PICIDAE

Campethera bennetti
Campethera abingoni
Campethera cailliautii
Dendropicos fuscescens
Mesopicos griseocephalus
Thripias namaguus

Bennetts woodpecker
Golden tailed woodpecker
Little spotted woodpecker
Cardinal woodpecker
Olive woodpecker
Bearded woodpecker

EURYLAIMIDAE

Smithornis capensis

African broadbill

PITTIDAE

Pitta angolensis

African pitta

ALAUDIDAE

Mirafra africana
Mirafra rufocinnamomea
Calandrella cinerea

Rufous naped lark
Flapped lark
Red capped lark

HIRUNDINIDAE

Riparia cincta
Riparia riparia
Hirundo rustica
Hirundo angolensis
Hirundo atrocaerulea
Hirundo smithii
Hirundo albigularis
Hirundo senegalensis
Hirundo daurica
Hirundo cacullata
Hirundo abyssinica
Hirundo griseopyga
Hirundo fuligafa
Delichon urbica
Psalidoprocne pristoptera
Psalidoprocne albiceps

Banded sand martin
European sand martin
European swallow
Angola swallow
Blue swallow
Wire tailed swallow
White throated swallow
Mosque swallow
Red rumped swallow
Greater striped swallow
Lesser striped swallow
Grey rumped swallow
African rock martin
House martin
African saw-wing
White-headed saw-wing

DICRURIDAE

Dicrurus adsimilis

Fork tailed drongo

ORIOLIDAE

Oriolus oriolus
Oriolus auraatus
Oriolus larvatus

European golden oriole
African golden oriole
Black headed oriole

CORVIDAE

Corvus albus
Corvus albicollis

Pied crow
White necked raven

PARIDAE

Parus griseiventris
Parus leucomelas
Parus rufiventris

Miombo grey tit
White winged black tit
Rufous-bellied tit

REMIZIDAE

Retniz caroli

Grey penduline tit

SALPORNITHIDAE

Salpornis spilonota

Spotted creeper

TIMALIIDAE

Alcippe abyssinica
Malacocincla pyrrhoptera
Turdoides jardineii

Mountain babbler
Mountain illadopsis
Arrow marked babbler

CAMPERPHAGEDAE

Coracina pectoralis
Campephaga phoenicea

White breasted cuckoo shrike
Black cuckoo shrike

PYCNONOTIDAE

Pycrionotus barbatus
Andropadus virens
Andropadus tephrolaemus
Anderopadus milanjensis
Chlorocichla flaviventris
Phyllastrephus terrestris
Phyllastrephus cerviniventris
Phyllastrephus flavostriatus

Black eyed bulbul
Little green bulbul
Olive breasted mountain bulbul
Stripe checked bulbul
Yellow bellied bulbul
Terrestrial bulbul
Grey-olive bulbul
Yellow streaked bulbul

TURDIDAE

Saxicola rubetra
Saxicola torquata
Oenanthe oenanthe
Oenanthe pileata
Cercomela familiaris
Thamnolaea arnoti
Thamnolaea cinamomeiventris
Monticola angolensis
Erythropygia leucophrys
Erythropygia barbata
Alethe fuelleborni
Alethe anomala

Whinchat
Stonechat
European wheatear
Capped wheatear
Familiar chat
White headed black chat
Mocking chat
Miombo rock thrush
White browed scrub robin
Central bearded scrub robin
White breasted alethe
Olive-flanked robin

Sheppardia sharpei
Pogonocichla stellata
Cossypha natalensis
Cossypha caffra
Cossypha heuglini
Turdus abyssinicus
Turdus libonyanus
Turdus gurneyi

Sharpe's akalat
Starred robin
Red-capped (Natal) robin
Cape robin
Heuglin's robin
Mountain thrush
Kurrichane thrush
Orange thrush

SYLVIIDAE

Bradypterus baboecalus
Bradypterus mariae
Bradypterus cinnamomeus
Scheonicola brevirostris
Acrocephalus schoenobaenus
Chloropeta natalensis
Chloropeta similis
Sylvia borin
Sylvia atricapilla
Sylvia communis
Parisoma lugens
Phylloscopus trochilus
Phylloscopus ruficapilla
Prinia subflava
Heliolais erythroptera
Apalis thoracica
Apalis flavida
Apalis porphyrolaema
Apalis cinerea
Camaroptera brachyura
Camaroptera stierlingi
Eremomela icteropygialis
Eremomela scotops
Sylvietta ruficapilla
Sylvietta rufescens
Hyliota flavigaster
Cisticola erythrops
Cisticola cantans
Cisticola woosnami
Cisticola hunteri
Cisticola aberrans
Cisticola lais
Cisticola njombe
Cisticola natalensis
Cisticola fluvicapilla
Cisticola ayresii

Little rush warbler
Forest scrub warbler
Long tailed scrub warbler
Broad tailed warbler
Sedge warbler
Yellow warbler
Yellow mountain warbler
Garden warbler
Blackcap
Whitethroat
Brown warbler
Willow warbler
Yellow throated warbler
Tawny flanked prinia
Red winged warbler
Bar throated apalis
Yellow breasted apalis
Chestnut throated apalis
Brown headed (grey) apalis
Bleating bush warbler
Eastern barred warbler
Yellow bellied eremomela
Green capped crombee
Red capped crombee
Long billed crombee
Yellow bellied hyliota
Red faced cisticola
Singing cisticola
Trilling cisticola
Mountain cisticola
Rock cisticola
Wailing cisticola
Churring cisticola
Croaking cisticola
Short tailed neddicky
Crackling cloud cisticola

MUSCAPIDAE

Muscicapa striata
Muscicapa albicollis
Muscicapa adusta
Muscicapa caerulescens
Myopornis boehmi
Myioparus plumbeus
Malaenornis chocolatina
Malaenornis pammelaina
Bradornis pallidus

Spotted flycatcher
Collared flycatcher
Dusk flycatcher
Ashy flycatcher
Boehm's flycatcher
Lead coloured flycatcher
Slaty flycatcher
Black flycatcher
Mouse coloured flycatcher

Batis capensis
Batis molitor
Elminia albicauda
Trochocerus albonotatus
Terpsiphone viridis

Cape batis
Chinspot batis
White tailed blueflycatcher
White tailed crested flycatcher
Paradise flycatcher

MALACONOTIDAE

Nilaus afer
Dryoscopus cubla
Tchagra minuta
Tchagra australis
Tchagra senegala
Laniarius ferrugineus
Laniarius fuellehorni
Malaconotus sulphureopectus
Malaconotus nigrifrons
Malaconotus blanchoti

Brubru
Southern puffback
Marsh tchagra
Three streaked tchagra
Black crowned tchagra
Southern boubou
Fulleborn's black boubou
Orange breasted bushshrike
Black fronted bush shrike
Grey headed bush shrike

MOTACILLIDAE

Motacilla flava
Motacilla clara
Motacilla aguimp
Anthus novaeseelandiae
Anthus vaalensis
Anthus similis
Anthus trivialis
Anthus lineiventris

Yellow wagtail
Long-tailed wagtail
African pied wagtail
Richard's pipit
Buffy pipit
Long billed pipit
Tree pipit
Stripped pipit

LANIIDAE

Lanius collurio
Lanius cristatus
Lanius minor
Lanius collaris
Lanius souzae

Backed red shrike
Red tailed shrike
Lesser greyshrike
Fiscal shrike
Souza's shrike

PRINOPIIDAE

Prioriops plumata
Prioriops retzii

White helmet shrike
Red billed helmet shrike

STURNIDAE

Onychognathus walleri
Onychognathus morio
Onychognathus tenuirostris
Lamprotornis chloropterus
Cinnyricinclus leucogaster
Creatophora cinerea

Waller's red winged starling
Red winged starling
Slender billed starling
Lesser blue-eared starling
Amethyst starling
Wattled starling

NICTARINIIDAE

Anthreptes anchietae
Anthreptes longuemare
Anthreptes collaris
Nectarinia olivacea
Nectarinia verticalis
Nectarinia amethystina

Anchieta's sunbird
Violet backed sunbird
Collared sunbird
Olive sunbird
Green headed sunbird
Black sunbird

Nectarinia senegalensis
Nectarinia talatala
Nectarinia venusta
Nectarinia afra
Nectarinia chalybea
Nectarinia mediocris
Nectarinia famosa
Nectarinia johnstoni
Nectarinia kilimensis

Scarlet chested sunbird
White bellied sunbird
Yellow bellied sunbird
Greater double collared sunbird
Lesser double collared sunbird
Eastern double collared sunbird
Malachite sunbird
Scarlet-tufted malachite sunbird
Bronze sunbird

ZOSTEROPIDAE

Zosteropidae senegalensis

Yellow white-eye

PLOCEIDAE

Ploceus baglafecht
Ploceus bertrandi
Ploceus xanthops
Ploceus intermedius
Ploceus ocularis
Anaplectes hordeaceus
Euplectes hordeaceus
Euplectes capensis
Euplectes psammocromius
Euplectes albonotatus
Euplectes ardens
Petronia superciliaris

Baglafecht weaver
Bertram's weaver
Large golden weaver
Cabanis's masked weaver
Spectacled weaver
Red headed weaver
Black winged bishop
Yellow rumped bishop
Mountain marsh whydah
White winged widow
Red collared widow
Yellow throated sparrow

VIDUIDAE

Vidua macroura
Vidua funerea
Vidua paradisaea
Vidua obtusa

Pin tailed whydah
Black widow finch
Paradise whydah
Broad tailed paradise whydah

ESTRILDIDAE

Pytilia afra
Mandingoa nitidula
Cryptospiza reichenovii
Hypargos niveoguttatus
Lagonosticta rubricata
Uraeginthus angolensis
Estrilda perreini
Estrilda melanotis
Estrilda astrild
Amandava subflava
Lonchura cucullata
Lonchura bicolor

Orange winged pytilia
Green twinspot
Red faced crimson wing
Red throated twinspot
Brown backed firefinch
Southern blue waxbill
Black tailed gray waxbill
Sweet waxbill
Common waxbill
Orange waxbill
Bronze mannikin
Red-backed mannikin

FRINGILLIDAE

Emberiza cabanisi
Emberiza flaviventris
Emberiza tahapisi
Serinus mozambicus
Serinus sulphuratus
Serinus canicollis
Serinus citrinelloides

Cabanis's yellow bunting
Golden breasted bunting
Cinnamon breasted rock bunting
Yellow eyed canary
Bully canary
Cape canary
African citril

Serinus triolatus
Serinus reichardi
Serinus mennelli
Linurgus olivaceus

Streaky seedeater
Stripe breasted seedeater
Black eared seedeater
Oriole finch

LIST OF REPTILES RECORDED IN NYIKA NATIONAL PARK

GEKKONIDAE

Hemidactylus mabouia
Lygodactylus angularis

House gecko
Angle-throated gecko

AGAMIDAE

Agama hispida armata

Spiny agama

CHAMAELEONIDAE

Chaemeleo goetzei nyikae
Chaemeleo dilepsis dilepsis
Rhampholeon nchisiensis

Nyika chameleon
Flap-necked chameleon
Dwarf chameleon

SCINCIDAE

Mabuya varia varia
Mabuya varia nyikae
Mabuya striata striata
Mabuya hildae
Ablepharus wahlbergii

Savanna variable skink
Nyika variable skink
Two-stripped skink
Hilda's skink
Savanna snake-eyed skink

CORYDILIDAE

Chamaesaura miopropus miopropus

Montane snake lizard

LACERTIDAE

Latastia johnstoni

Long-tailed lizard

BOIDAE

Python sebae

African python

COLUBRIDAE

Lycophidion capense
Boaeden fuliginosus fuliginosus
Natriciteres olivacea olivacea
Duberria lutrix shirana
Crotaphopeltis hotamboeia hotamboeia
Telescopus semiannualatus semiannualatus
Philothamnus irregularis irregularis
Philothamnus semivariegatus semivariegatus
Hemirhagerrhis nototaenia nototaenia
Psammophylax tritaenatus variabilis
Rhamphiophis oxyrhynchus rostratus
Dromophis lineatus
Psammophis subtaeniatus sudanensis
Dispholidus typus
Thelotornis kirtlandii capensis
Dasypeltis scabra scabra

Wolf snake
House snake
Olive marsh snake
Shire slug-eating snake
Savanna white-lipped snake
Tiger snake
Green water snake
Spotted bush snake
Dark spotted snake
Montane grass snake
Beaked snake
Lined snake
Northern stripe-bellied snake
Boomslang
Western vine snake
Egg eating snake

VIPERIDAE

Causus rhombeatus
Bitis arietans arietans
Atheris nitschei rungweensis

Common night adder
Puff adder
Rungwe bush viper

LIST OF AMPHIBIANS RECORDED IN NYIKA NATIONAL PARK

PIPIDAE

Xenopus laevis laevis)

BUFONIDAE

Bufo guttaralis *Bufo pussillus*

Bufo taitanus

Bufo lonnbengi

Schismaderma carens

RANIDAE

Rana angolensis

Strongylopus fasciatus fuelleborni

Ptychadena porosissima

Ptychadena oxyrhynchus

Ptychadena uzungwensis

Phrynobatrachus natalensis

Phrynobatrachus mababiensis

Phrynobatrachus parvalus

ARTHROLEPTIDAE

Arthroleptis xenochirus

Arthroleptis stenodactylus

Arthroleptis xenolactyloides

HYPEROLIIDAE

Hyperolius puncticulatus

Hyperolius pictus

Hyperolius quinquevittatus mertensi

Hyperolius nasutus

CHECKLIST OF FISHES FOUND ON THE NYIKA PLATEAU AND IN VWAZA MARSH WILDLIFE RESERVE

This checklist is compiled from sampling by Denis Tweddle, supplemented by collections by W. Kadye for the slopes of the Nyika Plateau. Species are listed in accepted scientific order under family (in bold). Nomenclature follows Bill Eschmeyer, Catalog of Fishes (www.calacademy.org/scientists/projects/catalog-of-fishes).

The four columns reflect the different localities and habitats. Only two species occur on top of the plateau, but other species penetrate the boundaries of the Nyika National Park on the lower slopes in the tributaries of the North Rukuru River and South Rukuru River flowing from the plateau. The two rivers have marked differences in species composition and are therefore presented in separate columns. The Vwaza Marsh is on the South Rukuru system but has very different slow-flowing streams, in contrast to the fast-flowing tributaries of the Nyika slopes.

Abundance is indicated as follows: + = present, ++ = common, +++ = abundant, ? = absent from the marsh streams and Lake Kazuni but likely to be present in the fast-flowing outflow from the lake.

Scientific Name	English Name	Nyika Plateau Streams	N Rukuru Upland tributaries	S Rukuru Upland tributaries	Vwaza Marsh
SALMONIDAE					
<i>Oncorhynchus mykiss</i>	Rainbow trout	++			
MORMYRIDAE					
<i>Hippopotamyrus cf. ansorgii</i>	Nyika stonebasher		+		
CYPRINIDAE					
<i>Opsaridium tweddleorum</i>	Dwarf sanjika		+		
<i>Labeobarbus johnstonii</i>	Malawi short-barbel yellowfish		++		
<i>Labeobarbus nthuwa</i>	Nthuwa, South Rukuru yellowfish			+	?
' <i>Barbus</i> ' <i>trimaculatus</i>	Threespot barb		+	+	+
' <i>Barbus</i> ' <i>kerstenii</i>	Redspot barb			++	+++
' <i>Barbus</i> ' <i>lineomaculatus</i>	Linespot barb			++	++
' <i>Barbus</i> ' sp. (new species, small spotted)				++	++
' <i>Barbus</i> ' <i>paludinosus</i>	Straightfin barb			++	++
' <i>Barbus</i> ' <i>radiatus</i>	Beira barb			++	++
' <i>Barbus</i> ' <i>seymouri</i>	Seymour's barb			+	+
<i>Labeo cylindricus</i>	Redeye labeo			++	++
MASTACEMBELIDAE					
<i>Mastacembelus shiranus</i>	Malawi spiny eel		+		
AMPHILIIDAE					
<i>Amphilius cf. uranoscopus</i>	Mountain catfish	++	++	+++	?
<i>Zaireichthys maravensis</i>	Malawi sand catlet			+	+
<i>Zaireichthys monomotapa</i>	Monomotapas and catlet			+	+
MOCHOKIDAE					
<i>Chiloglanis sp. (new species)</i>	Suckermouth catfish		++	++	?
CLARIIDAE					

<i>Clarias gariepinus</i>	Smoothhead catfish	+	+
<i>Clarias liocephalus</i>	Smoothhead catfish	+	?
CICHLIDAE			
<i>Astatotilapia calliptera</i>	Eastern River bream	+	+
<i>Pseudocrenilabrus philander</i>	Southern mouthbrooder	++	++
<i>Oreochromis shiranus shiranus</i>	makumba	++	++

LIST OF BUTTERFLIES RECORDED IN NYIKA NATIONAL PARK

Species marked with an asterisk (*) are endemic to Nyika National Park

<i>Coeliades forestan</i>	<i>Borbo fallax</i>	<i>Borbo sirena</i>	<i>Spindasis homeyeri</i>
<i>Celaenorrhinus zangua*</i>	<i>Borbo perobscura</i>	<i>Borbo</i>	<i>Lipaphnens aderna</i>
<i>Celanorrhinus galenus</i>	<i>micans</i>		<i>spindasoides</i>
<i>Eagris sababius ochereana</i>	<i>Borbo gemelli</i>		<i>Axiocerses lambana</i>
<i>Calleagris jamesoni</i>	<i>Borbo borbonica borbonica</i>		<i>Axiocerses amanga</i>
<i>Calleagris hollandi</i>	<i>Gegenes niso brevicornis</i>		<i>Axiocerses punicea</i>
<i>Eretis djaelaetae</i>	<i>Papilio dardanus dardanus</i>		<i>Axiocerses sp. nov*</i>
<i>Eretis melania</i>	<i>Papilio mackinnoni theodori</i>		<i>Aloeides grisens</i>
<i>Sarangesa lucidella</i>	<i>Papilio thurani cyclopsis*</i>		<i>Lolans sidus</i>
<i>Abantis zambisiaca</i>	<i>Papilio nireus lyaens</i>		<i>Lolans nasissi</i>
<i>Abantis paradisea</i>	<i>Papilio ephidicephalus</i>		<i>Lolans violacea</i>
<i>Spialia spio</i>	<i>mkuwadzi</i>		<i>Lolans bowkeni nyasana</i>
<i>Metisella medea nyika*</i>	<i>Papilio demodocus</i>		<i>Lolans coeculus coeculus</i>
<i>Metisella orientalis</i>	<i>Papilio jacksoni nyika</i>		<i>Lolans pumelae</i>
<i>orientalis</i>	<i>Graphium anglolanus</i>		<i>Lolans silarus</i>
<i>Metisella quadrisignatus</i>	<i>anglolanus</i>		<i>Lolans crawshayi</i>
<i>quadrisignatus</i>	<i>Colias electro Hecate</i>		<i>Lolans lalos lalos</i>
<i>Metisella perexcellens</i>	<i>Eurema hecabe selifera</i>		<i>Lolans condoni</i>
<i>perexcellens*</i>	<i>Eurema de Jardinini regularis</i>		<i>Lolans sp. nov*</i>
<i>Metisella fomorsa Formosa</i>	<i>Eurema brigitta</i>		<i>Hypolycaena philippus</i>
<i>Metisella decipiens</i>	<i>Catopsilia florella</i>		<i>Hypolycaena pachalica</i>
<i>Ampittia capenas capenas</i>	<i>Nepheronia argia</i>		<i>Hypolycaena auricostalis</i>
<i>Kedestes barberae barberae</i>	<i>mhondana</i>		<i>Dendorex cameronia</i>
<i>Kedestes wallengrenii</i>	<i>Appias sabina phoebe</i>		<i>katanga</i>
<i>fenestratus</i>	<i>Belenois zochalia</i>		<i>Dendorex caerulea</i>
<i>Kedestes brunneostigma</i>	<i>agrippinides</i>		<i>Dendorex zeloides</i>
<i>Gorgyra johnstoni</i>	<i>Belenois rubrosignata</i>		<i>Dendorex antalus</i>
<i>Gorgyra bibulus</i>	<i>kongwana</i>		<i>Dendorex magda</i>
<i>Parosmodes moranti</i>	<i>Belenois thysa thysa</i>		<i>Dendorex cf. eandata</i>
<i>moranti</i>	<i>Mylothris sagala dentatus</i>		<i>Dendorex lorisona coffea</i>
<i>Acleros mackenii</i>	<i>Mylothris crawshayi</i>		<i>Capys disjunctus connexivus</i>
<i>Semelea pulvina</i>	<i>crawshayi*</i>		<i>Lycaena abbotti</i>
<i>Semelea arela</i>	<i>Mylothris meppellii</i>		<i>Anthene definita definita</i>
<i>Chondiolepis telisignata</i>	<i>rhodesiana Alaena sp. nov*</i>		<i>Anthene bobleyi</i>
<i>Artitropa redueta</i>	<i>Alaena sp. nov*</i>		<i>Anthene ligures</i>
<i>Platylesches ayresii</i>	<i>Spalgis lemolea</i>		<i>Anthene lasti</i>
<i>Platylesches lamba</i>	<i>Aphnaeus erihssoni</i>		<i>Anthene kersteni</i>
<i>Platylesches picanini</i>	<i>mashuanae</i>		<i>Anthene liodes</i>
<i>Platylesches ratsa ratsa</i>	<i>Aphnaeus marshalli</i>		<i>Anthene rubricinetus</i>
<i>Platylesches robustus</i>	<i>Spindasis natalensi</i>		<i>anadema</i>
<i>robustus</i>	<i>Spindasis victoriwe</i>		<i>Triclema nigeriae</i>
<i>Zenonia zeno</i>	<i>Spindasis mozambica</i>		<i>Cupidopsis jobates jobates</i>

Cupidopsis cissus
Petrealaea sichela sichela
Lampides boeticus
Uranothauma crawshayi
Uranothauma cordatus
Uranothauma cuneatum
Uranothauma nubifer
Uranothauma williamsi
Uranothauma poggei
Uranothauma falkensteini
Uranothauma vansomeri
Uranothauma antinoree
felthami
Uranothauma heritsia virgo
Cacyreus virilis
Cacyreus palaemon
Harpencyreus juno
Harpencyreus marungensis
marungensis
Harpencyreus hazelae
Leptotes jeanneli

*Charaxes dowsetti**
Cymothoe cottrelli
Cymothoe thebane blasi
Crenidomimas corcorcia
Euphaedra mardania orientis
Euphaedra zaddachi
Hamanummida daedalus
Psendargynnis hegemo

Leptotes marginalis
Castalius ertli
Zizeeria knysna
Actizera stellata
Azanus mirza
Azanus moriqua
Azanus natalensis
Eicochrysops messapus
mahallakoena
Eicochrysops eicetrochilus
*Eicochrysops unigemmata**
Lepidochrysops barkeri
Lepidochrysops dolorasa
Lepidochrysops pampolis
*Lepidochrysops nyika**
Lepidochrysops intemedi
*cottrelli**
Lepidochrysops cupreus
*Lepidochrysops chalceus**
Charaxes achaemenes
achaemenes

Charaxes brutus natatensis
Charaxes ansorgei levicki
Charaxes pollux geminus
Charaxes druceanus
proximans
Charaxes macclounii
Charaxes baumanni whytei
Charaxes guderianus
guderianus
Charaxes aubyni australis
Charaxes nyikensis
Charaxes violetta violetta
Charaxes xiphares
brevicandalus
Charaxes bohemani
Charaxes varanes
viologeses
Charaxes acumimatus nyika
Charaxes canidope
canidope
Charaxes dilutus dilutus

LIST OF AQUATIC MACROINVERTEBRATES FROM NYIKA NATIONAL PARK AND VWAZA MARSH WILDLIFE RESERVE

This checklist covers aquatic macroinvertebrates recorded from the Nyika National Park and Vwaza Marsh Wildlife Reserve. It was compiled by Harold Sungani and others from their study (Sungani, H., Ngochera, M., Genner, M., Kamtamba, K. & Chiwanda, V., 2022. Distribution and diversity of aquatic macroinvertebrate assemblages in Nyika and Vwaza Reserves in Malawi. Research Report Nyika-Vwaza Trust (UK), Mzuzu, Malawi).

The list is arranged in zoological order under Phylum by Class, Order, Family, along with common names. The species presence in the two reserves are denoted by letters (N = Nyika, V= Vwaza, NV = Nyika and Vwaza).

Class	Order	Family	Common Names	Location
Annelida				
Clitellata	Oligochaeta	-	worms	NV
Anthropoda				
Euchelicerata	Araneae	Tetragnathidae	orb weaver or long jawed spiders	V
Insecta	Coleoptera	Dytiscidae	predaceous diving beetles	NV
Insecta	Coleoptera	Gyrinidae	whirligig beetles	N
Insecta	Coleoptera	Halplidae	crawling water beetles	N
Insecta	Coleoptera	Hydrochidae	crawling aquatic beetles	NV
Insecta	Coleoptera	Hydrophilidae	water scavenger beetles	NV
Insecta	Coleoptera	Limnichidae	minute marsh loving beetles	NV
Insecta	Coleoptera	Noteridae	burrowing water beetles	NV
Insecta	Coleoptera	Psephenidae	water penny beetles	N
Insecta	Coleoptera	Scirtidae	marsh beetles	N
Insecta	Diptera	Ceratopogonidae	biting midges	NV
Insecta	Diptera	Chironomidae	chironomids, nonbiting midges, lake flies	NV
Insecta	Diptera	Culicidae	gnats	N
Insecta	Diptera	Dixidae	meniscus midges	N
Insecta	Diptera	Simuliidae	black flies	NV
Insecta	Diptera	Tipulidae	crane flies	N
Insecta	Ephemeroptera	Baetidae	small mayflies, small minnow mayflies	NV
Insecta	Ephemeroptera	Caenidae	small squaregill mayflies	V
Insecta	Ephemeroptera	Heptageniidae	flat-headed mayflies	N
Insecta	Hemiptera	Belostomatidae	giant water bugs	NV
Insecta	Hemiptera	Corixidae	water boatmen	N
Insecta	Hemiptera	Gerridae	water striders, pond skaters	NV
Insecta	Hemiptera	Nepidae	water scorpions	V
Insecta	Hemiptera	Notonectidae	backswimmers	NV
Insecta	Hemiptera	Pleidae	pygmy backswimmers	V
Insecta	Hemiptera	Veliidae	riffle bugs	NV
Insecta	Lepidoptera	Crambidae	aquatic caterpillars, snout moths	N
Insecta	Odonata	Aeshnidae	aeshnid, hawker or darner dragonflies	N
Insecta	Odonata	Calopterygidae	broad-winged, demoiselles, or jewel-wing damselflies	N
Insecta	Odonata	Corduliidae	emerald or green-eyed skimmer dragonflies	N
Insecta	Odonata	Gomphidae	club-tailed dragonflies	
Insecta	Odonata	<i>Macromiidae</i>	cruiser dragonflies	V
Insecta	Plecoptera	Nemouridae	brown stoneflies	N
Insecta	Plecoptera	Perlidae	common stoneflies	N
Insecta	Pterygota	Elmidae	riffle beetles	NV
Insecta	Trichoptera	Calamoceratidae	sleeping bag caddisflies	V
Insecta	Trichoptera	Hydropsychidae	net-spinning caddisflies	NV
Insecta	Trichoptera	Leptoceridae	long-horned caddisflies	N

Class	Order	Family	Common Names	Location
Insecta	Trichoptera	Philopotamidae	finger-net caddisflies	NV
Insecta	Trichoptera	Polycentropodidae	tube-making caddisflies	N
Malacostraca	Decapoda	Potamonautidae	African freshwater crabs	N
Malacostraca	Isopoda	Asellidae	common water slaters	V
Mollusca				
Bivalvia	Sphaeriida	Sphaeriidae	pea clams	NV
Bivalvia	Unionoida	Unionidae	freshwater mussels	NV
Gastropoda	-	Lymnaeidae	pond snails	N
Gastropoda		Ampullariidae	apple snails	N
Gastropoda	Architaenioglossa	Viviparidae	river or mystery snails	V

ANNEXURE D: CULTURAL AND HISTORICAL SITE

These descriptions and coding of recorded cultural and historical sites are those found in H. H. Simfukwe, 2003 (*unpublished*).

Table 32. Cultural and Historical Sites and Descriptions

CODE	SITE NAME	DESCRIPTION
Nyika 1	Mwanda Mountain	The mountain is located on the borderline between Malawi and Zambia to the northwest of Chisimuka in the Hewe area. The Mwanda Peak rises 2,147m above the sea level. There are interesting rocks on the ridge to the southeast of the mountain, and the remains of iron smelting furnaces. The site of the rain making shrine is found there. The mountain is also said to have hosted refugees during the Ngoni raids.
Nyika 2	Mwanda Rain Shrine	The Mwanda Shrine is located below the Mwanda Hill. The exact location was not shown since the site is sacred. No ordinary person is allowed to go near the spot of rain making ceremonies. According to the Mlombochi family, the clan responsible for rain making rituals, the spot is marked by Mphanji (a rock shelter) and in this shelter a big pot is located, which contains black cloths, coins, white beads and around the pot are the huge and heavy Phoka hoes. These items are taken there whenever the site is visited. The ceremonies are done whenever there is drought and long spells of rain as well as when the rainfall is heavy, heavy enough to destroy crops and homes of people.
Nyika 3	Kambumbe Muyombo Tree	This site is marked by miombo trees (<i>Brachystegia</i> sp.). This is where the first prayers are conducted before proceeding to the next site called Kapokambavi. From this point, nobody is allowed to take an axe to the rain shrine. If the rule is ignored the axe would slide and fall into a pool on the Hewe river. At this pool, prayers are also conducted, after which the rain making spot on the foot of Mwanda Hill is reached.
Nyika 4	Kambumbe 1 Hut Remains	This site is on a ridge west of Kambumbe hill. The site is marked by several spots of mounds of hut remains where refinery and forgery of the iron bloom into hoes, axes, spears and animal bells were done. About 10 such spots have been located.
Nyika 5	Kambumbe 2 Hut Ruins:	This is another site with hut remains situated west of Kambumbe hill about 50m from the Kambumbe iron furnace. The remains are scattered all over the place. This was used for iron bloom refinery.
Nyika 6	Kambumbe Iron Furnace	This site is located to the west of Kambumbe Hill on the southwest bank of a stream. This is a standing kiln measuring about 1.15m high, about 1m in diameter at the base and the thickness of the kiln walls is between 8 to 10 cm. The circumference of the kiln at the base is 3 m.

CODE	SITE NAME	DESCRIPTION
Nyika 7	Hewe River Iron Furnace	This site is located on the eastern bank of the Hewe river about 60 metres from the hut ruins. The furnace is now in ruins probably knocked down by a falling tree near it. The foundation measures about 1m in diameter and the walls of the furnace measure about 8cm in thickness.
Nyika 8	Chisanga Falls and Rain Shrine	These are a series of waterfalls and rapids on the North Rukuru river where it drops down the western escarpment. There are three principal falls, the longest plunging 120m. The fall was also a rain shrine for people from the Chisanga village. Even during times of epidemic outbreak people went to pray there.
Nyika 9	Chisanga Iron Age Site	This site is located on a path leading to the falls at a distance of about 100m from the falls. The site is marked by a pile of stones brought by people who visit the waterfalls. The cultural materials exhibited include potsherds and tuyere pipes a sign that there is probably an iron smelting kiln in the vicinity.
Nyika 10	The Royal Corps Emblem	This monument is about 1 km from the Zovochipolwe forest on the Chilinda – Nthalire road. The emblem looks like a black ant painted on a white background of a rock face right by the side of the S77 road. The emblem is of the British Royal Corps of Engineers unit who built the road in the early 1970s. The faceless monument is also used to commemorate this event.
Nyika 11	Lake Kaulime	This is the only lake formed by natural damming up of one of the headstreams of the North Rukuru in the Nyika National Park. Its high water is about 1.3 ha in area. It is located 8 km west of Chilinda. It is said to have served as a spiritual sanctuary harbouring a serpent and human like being through which the Nyika people communicated with God. There are still strong beliefs that the lake is a home of a powerful spirit in the form of a big snake. It has many powers including curing the sick if they manage to touch its tail or drink water from this lake. This 'Spirit' also looks after the animals of the plateau as being his and only permits one to be killed at one time. Cullen Young shot two bull elands on one day in 1913 and after killing the second one his servant remarked <i>"You will not shoot an eland again; the spirit is angry if more than one of his oxen is killed"</i> . Despite many chances and some incredible misses he did not kill another eland for twelve years! Cullen refers to the spirits of Kaulime as a curse. It is also believed that it was a shrine where people went to pray for the rains.
Nyika 12	Chilinda Bridge	This bridge is located 17km south of Chilinda. Scattered Later Stone Age waste occurs on both sides of the river by the bridge. Many flakes and core scrapers were observed and a few collected.
Nyika 13	Chowo Rock Shelter	This shelter is located 3km east of Chowo rock. The shelter floor was excavated and produced the only 75 cm thick stratified Iron Age deposits.
Nyika 14	Nyika Champaninga Rockboulder:	This is a large rock boulder with three shelters around it. It is located to the west of Chakomanakazi ridge on the eastern bank of a stream. The shelter is used by poachers for lodging. No cultural materials were observed.
Nyika 15	Chipokabawole Rockshelter	This shelter is about 1km to the southwest of Champaninga rockboulder. The site was used as a refuge hideaway. Women usually went missing if they did not leave white beads at the site. The word Chipokabawole in literal translation simply means snatching wives away.
Nyika 16	Nyankhufuntha Cave	This cave is located to the west of Champaninga and faces south. Cultural material collected are potsherd probably belonging to the 19th century period. The cave is 20m deep. The word Nyankhufuntha means the insane implying that some meaning concerning insanity is attached to this site.
Nyika 17	Mtazi Rock Iron Furnace	This site is on the old game patrol hut near confluence of the tributaries of Mswenhi River. The site was not relocated due to heavy vegetative growth.
		The cave is located on the Fingira Dome, at 22km south of Chilinda. The cave measures about 11m deep, 20m wide and about 12m high. On the back wall are some geometric paintings in red and white belonging to the early phase found elsewhere in Malawi. The cave was

CODE	SITE NAME	DESCRIPTION
Nyika 18	Fingira Cave	excavated up to 85cm deep. A area of 150cm ² was excavated to bedrock and yielded 7, 350 artefacts, of which 1,634 were flakes and of these 20 were tools, mostly scrapers, lunates and backed blades. Considerable amounts of bone fragments were recovered many of them being worked into points or awls. The bones represent a wide range of reptiles, birds, rodents, monkey, carnivores, zebra, pig and at least four species of bovids, a list which corresponds well with the game still seen on the Nyika today. Human bones were also found, belonging to several individuals. Apart from these a complete skeleton (except for the hand and foot bones) was discovered near the entrance of the cave. The skeleton material belongs to a short statured individual exhibiting both Negroid and Bushmen features and is comparable to that from Hora (Sandelowsky and Robinson, 1968). Charcoal sample from Fingira have been dated to 1310 ± 80 BC (UCLA – 1258) and 1480 ± 80 BC (UCLA – 1259) (Fagan, 1969). Fingira is believed to have been abandoned as a shelter around 900 BC The Fingira Cave was a sacred site. No ordinary person was allowed to go to the place except only those who were involved in the rain making ceremonies and other major catastrophes befalling the inhabitants of the Park. It is also said that the cave was used as a place for refuge during the Ngoni raids.
Nyika 19	Chikomanamkazi Hill	This hill is located about 5km southwest of the Chowo rock shelter. A large rock shelter is located about halfway up on the eastern side. This shelter is known as Libwechibubu. Lithic materials belonging to the Late Stone Age period were found and outside some pottery sherds belonging to the Mwamasapa type, others resembling those from Kafyenengo were collected (Robinson and Sandlowsky, 1968).
Nyika 20	Chosi Hill	This hill is located 12km southwest of Chilinda. It provides a pleasant view of the rolling grasslands in all directions. To the south is Fingira Hill, to the southwest is Vitinthiza Hill, to the northeast is Nganda Hill, to the southwest is Mwanda Hill and to the northwest is Domwe Hill. Around the base of the outcrop on the hill, Late Stone Age artefacts are scattered. Clark first described the site in 1968.
Nyika 21	Old Occupation Site <i>Near Chisavya Village</i>	The site is approximately 3km northeast of Fingira Hill on the southeastern slopes of Nyambwani. Huts appear to have been built on small-levelled platforms and use may also have been made of natural ledges (intrusion of dolerite) which almost look like terraces. Pottery burnt daga and grindstones were eroding out on the surface.
Nyika 23	Fingira Iron Smelting Site	The site is marked by numerous iron slags, tuyere pipes (air pipes) and ruins of the furnace. It is located on the ridge behind Fingira cave. Two decorated sherds were collected which are similar to the later material collected from Chowo area
Nyika 24	Ncherenje Ore Mine	This site contains a complex network of numerous small, shallow surface workings, two relatively large deep excavations, and a large number of vertical shafts with associated horizontal underground passageways, all of which are excavated in the deeply weathered regolith. The most common type of excavations on the site consists of shallow pits and trenches that are not more than 2 meters deep. It appears that many of these diggings may have been unsuccessful and were abandoned due to weathered bedrock. Also on the sites, there are generally deep steep sided, elongated trenches that are excavated almost entirely within the regolith and soil zone. It shows clearly that relatively large quantities of ore may have been removed from these excavations.
Nyika 25	Mbiri Ore Mine	This mine consists of a single, irregularly shaped open excavation with a small side tunnel at the bottom. The depth below the surface is irregular but averages about 2.5 meters. This excavation is distinct from those at Ncherenje because the ore recovered appears in part to consist of only partially weathered, hardened rock. This material is of much higher grade than any of the material recovered at Ncherenje.
Nyika 26	Nganda Peak	Nganda Hill is located 29km from Chilinda and is the highest point in the Nyika National Park. It rises 2,605m above the sea level The point provides a scenic panoramic view of the Malawi trough, the Malawi Eastern Rift Shoulders of the Livingstone Mountains in southern Tanzania,

CODE	SITE NAME	DESCRIPTION
		some parts of Karonga as well as Kyela town in Tanzania. Other viewpoints in the Park that command panoramic scenery include: Domwe, Jalawe Rock, and Kasaramba besides Chosi.
Nyika 27	Bleak House	A disused building known to the Park personnel as bleak house is located on the Kawozya–Mpanda Ridge inside the northern boundary of the Park and was constructed around 1900. The setting is perhaps one of the most beautiful in the Park with views across Lake Malawi to southern Tanzania as well as back on to the Nyika Plateau. It is a single storey house constructed of three brick courses, the outermost being of burnt brick. It contains four compact rooms. It was built by the Livingstonia mission which sought to expand the mission's influence towards Karonga because the place offered a healthier climate than the lakeshore.
Nyika 28	Vipiri Iron Furnace	The site is on a ridge west of Vipiri 4 Hill. The spot covers an area of 36km ² and comprise ruins of the kiln and the foundation. The whole area is littered with numerous tuyere pipes and iron slags. This indicates that the smelting process and the refinery process were done at the same spot.
Nyika 29	Vipiri Rock shelter	This rock shelter is situated on Vipiri 4 Hill on the western side with the shelter faces west. It measures about 30m in lengths and 10m in high. Potsherds including a rim were collected. These sherds are probably recent going as far back as 19th century.
Nyika 30	Mwenembwe Forest	This forest is situated to the south of the Park. Historically it is known to have provided shelter to the Phoka people during the Ngoni raids around 1860s. There are also some rock shelters within the forest that provided temporary shelters to Phoka refugees.
Nyika 31	Chilinda Crater	The Chilinda meteorite site is located east of Dam 1 behind the Chilinda lodge around Chalet no.4 in the pine plantation. The actual spot is marked by a pond with reeds growing in it. This crater was formed by a falling meteorite around 1960 and is about 80m in diameter and 6m deep. The object fell into the plantation, and the fall was accompanied by a bright light and a loud explosion and was directly followed by a short-lived windstorm, a portion of the plantation was destroyed in the vicinity of the crater; trees were scotched and flattened radially outward for 100m and a small landslide resulted.
Nyika 32	Chibambala Iron Smelting Site	This site is about 1.5 km from the S77 road from Rumphi to Nthalire. It is marked by a lot of iron slags and tuyere pipes. No kiln was seen but it is an indication that there is a kiln around.