



Republic of Zambia

LUMIMBA GAME MANAGEMENT AREA GENERAL MANAGEMENT PLAN



2015 – 2024



**Zambia Wildlife Authority
Private Bag 1
Chilanga
ZAMBIA**

FOREWORD

This General Management Plan (GMP) for Lumimba Game Management Area (LGMA) provides guiding principle for the management of the Game Management Area (GMA) natural resources and development of tourism facilities and infrastructure for a ten-year period and is subject to review after three years from being ratified. The GMP was primed through consultative, interactive and participatory Strategic Planning Process (SPP) involving all key stakeholders. It was financed by the Southern African Regional Science Centre for Climate Change and Adaptive Land Uses (SASSCAL) a joint initiative of Angola, Botswana, Namibia, South Africa, Zambia, and Germany, responding to the challenges of global change. *Its mission is to conduct problem-oriented research in the area of adaptation to climate change and sustainable land management and provide evidence-based advice for all decision-makers and stakeholders to improve the livelihoods of people in the region and to contribute to the creation of an African knowledge-based society.* The plan accentuates the commitment of all concerned, affected and interested stakeholders to checking the balance between the preservation and utilization of the GMA's biodiversity in order to ensure the long-term survival of the GMA natural resources including wildlife resources in a way that aids local, national, regional and international visitors.

The GMP epitomises a significant milestone of the Strategic Planning Road Map for Lumimba Game Management Area as an operational manual. The consultative process demonstrated that natural resources conservation and development activities are not practiced in a void. This complex situation indeed calls for concerted efforts among all stakeholders if we are to cope with these restraints and ensure that the natural heritage of Lumimba Game Management Area is maintained. This GMP is a bankable document that is published in formats implementable and suitable for attracting support and investment from stakeholders, private investors, international aid agencies and the Government of the Republic of Zambia as it contains a Strategic Investment Management Action Plan and Budget upon which project proposals could effortlessly be formulated and floated to collaborating partners for funding.

As we embark on implementing the GMP, we ought to know that it is a convenient, practical, handy and dynamic document, which will be updated and continually revised. It is an important document on which all those concerned and responsible for Lumimba Game Management Area should rely upon. The GMP will succour all stakeholders to remain informed and focused about the management of Lumimba Game Management Area. As such, Zambia Wildlife Authority (ZAWA), Community Resources Boards (CRB), Local Communities, Private Sectors, Public Sectors, Local Authorities, Non-Governmental Organizations (NGO), Community Based Organizations (CBO), Collaborating Partners and others operating within the GMA will be able to compare progress reports received from Lumimba Game Management Area management with the targets set in the GMP for monitoring the performance of the staff directly involved in the management of the GMA. The GMP will be an important tool for forging effective partnerships between different stakeholders. Through this plan, partners for Lumimba Game Management Area will be able to collectively design, establish and implement effective natural resources management systems. This will ultimately bring about the desired cooperation among the key stakeholders. Significantly, the different partners will be able to interact to make collective decisions and to take actions that are germane and standard to all stakeholders.

Kampamba A. Kombe
Ag Director General
Zambia Wildlife Authority

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LIST OF ABBREVIATIONS AND ACRONYMS

ADC	Area Development Committee	LDC	Lundazi District Council
AIDS	Acquired Immuno deficiency Syndrome	LUP	Land Use Plan
AMU	Area Management Unit	MOU	Memorandum of Understanding
AOP	Annual Operational Plan	MTA	Ministry of Tourism and Arts
ART	Anti-retroviral Treatment	NGO	Non-Governmental Organizations
ASL	Above Sea Level	NHCC	National Heritage Conservation Commission
AWDC	African Wild Dog Conservation	NORAD	Norwegian Agency for Development Cooperation
AWP	Annual Work Plan	NP	National Park
BS	Bird Sanctuaries	NPWS	National Parks GMAs & Wildlife Service
CBNRM	Community-Based Natural Resource Management	PA	Protected Area
CBO	Community Based Organizations	PAC	Problem Animal Control
CRB	Community Resources Board	PMED	Planning, Monitoring and Evaluation Department
CRS	Catholic Relief Services	PLA	Participatory Learning Action
°C	Degrees Centigrade	PPP	Public Private Partnership
CP	Corporating Patners	PRA	Participatory Rural Appraisal
DIAO	District Information Agricultural Officer	PUA	Participatory Urban Appraisal
DVO	District Veterinary Officer	RCZ	Reformed Church of Zambia
DWA	Department of Water Affair	RDA	Road Development Agency
EA	Environmental Audit	SI	Statutory Instrument
EDF	European Development Fund	SIMAP	Strategic Investment Management Action Plan
EIA	Environmental Impact Assessment	SLCS	South Luangwa Conservation Society
EIS	Environmental Impact Statement	SLNP	South Luangwa National Park
EMP	Environmental Management Plan	SPP	Strategic Planning Process
EPB	Environmental Project Brief	TCA	Tourism Concession Agreement
EMA	Environmental Management Act No. 12 of 2011	TOC	Technical and Operations Committee of the Authority Board
FMP	Fire Management Plan	ToRs	Terms of References
GEF	Global Environment Facility	UNDP	United Nations Development Programme
GMA	Game Management Area	UNESCO	United Nations Educational, Scientific and Cultural Organization
GMP	General Management Plan	VAG	Village Action rea Group
GRZ	Government of the Republic of Zambia	VS	Village Scout
HIV	Human Immuno Virus	WCS	Wildlife Conservation Society
HWC	Human Wildlife Conflict	WPO	Wildlife Police Officers
ICDP	Integrated Conservation and Development Project	WS	Wildlife Sanctuaries
IEC	Information Education and	WWF	World Wide Fund

	Communication		
IUCN	International Union for Conservation of Nature	ZMD	Zambia Meteorological Department
JSPRF	Justice Solidarity Poverty Reduction Fund	ZCP	Zambia Carnivore Programme
LAU	Limits of Acceptable Use	ZEMA	Zambia Environmental Management Agency
LGMA	Lumimba Game Management Area	ZAWA	Zambia Wildlife Authority
LIRDP	Luangwa Integrated Resource Development Project	ZTB	Zambia Tourist Board
LSA	Luangwa Safaris Association		

DEFINITIONS

Area Management Unit (AMU) is an administrative geographically delineated area unit under ZAWA for wildlife estate in Zambia. An AMU covers one or more National Parks, Game Management Areas and open areas.

Bed-Night Levy is a payment demanded from an operator by ZAWA for the nights spent by clients calculated on the basis of the number of beds available.

Benign Introduction is an attempt to establish species for the purpose of conservation, outside its recorded distribution but within an appropriate habitat and eco-geographical area. This would be permitted under very special circumstances to be determined by Management.

Bush Camp is a small-scale integration of a site, accommodation units, and with minimum equipments to service tourists. The accommodation units are semi-permanent structures.

Camp is an integration of a site, accommodation units, offices or equipment for either tourism or GMA management in and around the GMA. Although the term is comprehensively used, it mainly means the site of accommodation units for tourist (refer to "Lodge and Camp") unless an additional word such as "wildlife", "gate" or "staff" is accompanied with it.

Camp Site is a site provided to tourists for day use or overnight stays with communal facilities. Night accommodation in tents or caravans is permitted. There are several types depending on users or managers as follows:- Public, Private, Walking Safari and Canoeing Safari Camping sites.

Developer means any person who, or entity which, proposes to undertake a new project or to repair or extend an existing project which falls within the list of projects provided for in the First Schedule and Second Schedule who, or which, is responsible for obtaining the appropriate authorisation;

Environment means Land, Water, Air and other external influences and conditions which affect the development and life of an organism including man.

Environmental Impact Assessment (EIA) is a systematic examination conducted to determine whether or not a proposed project, or alteration to an existing project, or alternatives, may have significant adverse or beneficial impacts on the environment.

Environmental Mitigation Audit is the systematic, documented, periodic and objective evaluation of the implementation and performance of the impact management plan included in an environmental impact statement and as included in any authorisation licence, permit or permission pertaining to a proposed project or alteration of an existing project.

Environmental Project Brief or Small Environmental Impact Assessment is a report made by the developer including preliminary predictions of possible impacts of a proposed project on the environment and constituting the first stage in the environmental impact assessment process;

Fly Camp is a site providing accommodation units to tourists for a period not exceeding two nights. The structures are removable tents only, being sometimes based on stamped mud and fenced by grass. Two types are sub-defined. 'Seasonal fly camp' is settled at a place through a season and 'temporary fly camp' is set in a shorter time for walking or canoeing safari.

Grassland is a continuous formation of grasses in association with sedges and other forbs.

Lodge Lease Fee is a fee paid annually to ZAWA by operators for leasing a site to operate a lodge in the National Park.

Management Plan is a document that outlines the basic management and development guidelines for a GMA or Open Area after the systematic assessment of land and water potential, alternatives for land use, economic and social conditions in order to provide the best land use options for addressing land use conflicts / problems and achieving identified land use management objectives over a 10-year period.

Mobile Safari is a type of travel for visitors by vehicle being able to be combined with walking safari, which is conducted by operators, and shifting places designated to stay at nights in the GMA. Operator does not pay for entry fee and camping fee for themselves but for the permission to conduct it in the GMA.

Mitigation Measures include engineering works, technological improvements, management measures and other ways and means of preventing, ameliorating or compensating for adverse environmental impacts and losses suffered by individuals and communities and for enhancing benefits.

Natural Resources are:-

- a) Soils;
- b) Waters;
- c) Plant life and vegetation, including mammals, birds, reptiles, fish, insects and natural products derived from them; and
- d) Any other things, which the Minister of Tourism, Environment and Natural Resources may, by Statutory Order declare to be Natural Resources.

Outpost is a camp for wildlife police officers set in the periphery of the GMA in most cases or in the GMA to service the outlying areas. Entrance and exit gate camps are also included.

Patron is a chief in whose area a Community Resources Board is established.

Project is any plan, operation, undertaking, development, change in the use of land, or extensions and other alterations to any of the above and which cannot be implemented without an authorisation licence, permit or permission from an authorising agency or without approval from a line ministry before entry into a project implementation programme.

GMA Headquarter is an administrative centre for the LGMA, at which there are permanent structures of management facilities and project staff accommodation.

Permanent Structure is a building structure whose base and walls are made of stone or concrete.

Picnic Site is a site provided to day visitors for temporary rest and has sitting facilities to allow visitors take quick meal or snacks. No cooking facilities are provided.

Re-Enforcement / Supplementation will be an addition of animals from other Protected Areas into an existing population of conspecifics inside the Protected Area.

Region is an administrative spatial area under ZAWA for wildlife estate in Zambia. A Region covers more than one Area Management Unit. There are four regions namely; Central Region, Eastern Region, Northern Region and Western Region.

Re-Introduction will be Management's attempt to re-establish in the Protected Area which was once part of the ecosystem or historical range, but from which it was extirpated.

Safari Lodge and Safari Camp is an integration of a site, accommodation units, offices and equipment to service tourists. The accommodation units are permanent structures. Safari lodge refers to a large-scale tourist unit with full catering services.

Savanna is a continuous grassland stratum with widely scattered trees and shrubs.

Sector is an administrative sub-unit under an Area Management Unit.

Semi-Permanent Structure is a building structure with a base made of permanent material such as stone or concrete and removable upper part of tent, reed, grass or wood.

Thicket is a very dense and nearly impenetrable community of shrubs with tall scattered emergent trees clothed by an abundance of climbers.

Tourist is a person who enters the GMA for the purpose of recreation and enjoyment paying appropriate fees.

Translocation will be a deliberate mediated movement of animals out of the Protected Area to other existing populations of conspecifics.

Visitor is a person who temporarily enters the GMA legally, for example, a tourist or government employee on business or a person passing through the GMA

Wetlands are vegetation formations that are sometimes referred to as bogs, fens and swamps.

Woodland is a physiognomic unit with a stratified plant community characterized by an open tree layer where crowns are almost touching or spaced to a distance of more or less one crown apart.

EXECUTIVE SUMMARY

This 10-year (2014-2024) General Management Plan (GMP) has been produced according to the ZAWA Strategic Planning Process (SPP) in order to make the planning process cost effective and relevant to the day-to-day management needs. A participatory approach has been adopted to develop the GMP, which has brought together representatives from all the major Lumimba GMA stakeholders.

Game Management Area Purpose and Exceptional Resources

The purpose of Lumimba GMA as agreed and defined by the deliberations of the stakeholders through the planning workshop process is:-

“To act as a buffer to the four (4) surrounding National Parks (North Luangwa, South Luangwa, Luambe and Lukusuzi) for conservation and protection of the natural, cultural and heritage resources for the benefit of the local community and nation at large for the present and future generations through sustainable utilization.”

The Lumimba GMA contain a number of cultural and heritage sites which reflect a rich traditional, cultural and historical background which include old settlements, sacred sites and area with historical areas. The areas local people continue to live traditional lives where customs, beliefs, knowledge and skills that are essential for survival remain with older people. The alluvial soils found in the valley floor are vitally important to the local population. They have allowed the development of agriculture in the area. The majority of the soil types in the rift valley have substantial potential for agricultural development. The valley plains and ridges are suitable for commercial arable agriculture for field crops including maize, cotton, tobacco, wheat, sorghum, millets, vegetables and rice.

Zoning Scheme

There are four management zones identified in the planning process for Lumimba GMA, namely:-

- a) Development Zone
- b) Forest Reserve Zone
- c) Conservation Limited Use Zone
- d) Tourism Development Zone

Environmental Consideration

The environmental considerations of the General Management Plan for Lumimba GMA provides a formalized approach for dealing with the environmental impacts of the plan with a view to providing enough information to enable management make informed decisions on the environmental consequences of developmental proposals in the GMA. All developments to be implemented are expected to have environmental impact assessment studies undertaken. These impacts need to be assessed and mitigated in order to ensure that developmental projects are consistent with the objectives of this General Management Plan. All developmental projects in Lumimba GMA will be subjected to either an Environmental Impact Assessment (EIA) or an Environmental Project Brief (EPB) as required by the Zambia Wildlife Act No. 12 of 1998 and Environmental Management Act (EMA) No. 12 of 2011. Where as EIAs are site specific, the

Strategic Environmental Assessment (SEA) addresses issues/impacts at higher level. This is undertaken to evaluate the environmental consequences of proposed policies, plans or programmes associated with the management of the whole GMA.

Strategic Investment Management Action Plan

The Strategic Investment Management Action Plan (SIMAP) is developed in respect of the six main themes - Natural Resources, Management and Operations, Local Community, Heritage Resources, Cross-cutting and Management Zoning. This SIMAP will be subject to review every five years.

The SIMAP is executed through a “SMART” approach which ensures that the tasks must be Specific, Measurable, Agreed, Realistic, and Time-bound. Based on their significance, urgency and duration required for implementation, the Action Plans are classified into nine options shown in Table 8.2. The time-frame of implementing the SIMAP is based on three scenarios whose implementation is:-

- a) Scenario 1: Within 2 years of ratifying the GMP;
- b) Scenario 2: Within 2 - 4 years of ratifying the GMP;- and
- c) Scenario 3: Beyond 4 years of ratifying the GMP.

Monitoring Plan

A GMP monitoring framework of this GMP makes up the final section of this document. The framework is designed to provide guidance for the regular assessment of the impacts, positive and negative, resulting from the implementation of the major Management targets and actions laid out in this GMP, and a basis for subsequent adaptive management. The framework includes easily assessable measures for measuring these impacts. Monitoring of GMP impacts is a key aspect of the ultimate success of the plan, in ensuring that the overall benefits from the implementation of this GMP are maximized, and that any negative impacts are appropriately mitigated.

INTRODUCTION

1.1 BACKGROUND

Lumimba Game Management Area No 21, was declared a GMA on 1st February 1971, located in Lundazi District 95km North of Lundazi town and 779 km north-east of Lusaka. It was established through Statutory Instrument No. 67 of 1993. It borders Mfuwe District in the south, Mpika in the west and Musalangu GMA in the north. It has a total human population of 40,616 translating into a population growth rate of about 16.5% for two years and an annual growth rate of 8.3%. It has a total of 5,055 households. The size of Lumimba GMA is 4,500 km² and the nearest National Parks (NP) and ecosystems to the GMA are South Luangwa, Luambe, North Luangwa, Lukusuzi National Parks, Lumimba and Munyamazi GMAs. The Lumimba GMA lies in the valley which floor through the Luangwa River meanders which is part of the East African Rift Valley system and characterized by a flat bottom. The prevailing heat conditions makes favorable and suitable animal habitat.

A Game Management Area allows for co-existence of both human and animal and to large extent the relationship is imbalanced because of competition and conflicts over resources such as crop damage and illegal wildlife off-take. The illegal wildlife off-take in most cases is compounded by the poverty of a rapidly growing and largely cashless rural society who poaches to sustain their lives. The other category of poaching is of commercial purposes which are organized by middle and high class citizenry mostly from urban areas.

1.2 LOCATION AND GENERAL DESCRIPTION

The Lumimba Game Management Area (GMA) starts at the confluence of the Mwasauke and Luangwa Rivers on its southern boundary, following the latter river upstream to its confluence with the Lupita River at Beacon A on the boundary of Luambe National Park No. 4, then up the Lupita River to its confluence with the Kangwa River; and up the Kangwa River to Beacon B at the south-east corner of Luambe National Park to form the eastern and northern boundaries of the GMA to Beacon D on the Luangwa River; which forms the larger part of the western boundary. The Lumimba GMA forms a buffer zone for the four National Parks (South Luangwa, Luambe, Lukusuzi and North Luangwa respectively.) The Lumimba GMA is 4,500 Km² in size found in Eastern Province and at the northern tip end corner of Muchinga Province. The actual districts that share this big protected area are; Lundazi and Chama though the larger massive land is in Lundazi District. The GMA Lies between latitude 12°0'33" South to 12°0'59" South and longitude 32°10'21" East to 32°58'54" East. Further, to the North of the GMA is Lundazi National Forest Reserve No. 24. Somewhere within and up to the middle of Lumimba river is the Lumimba Local Forest No. 231. From the middle to the south of the GMA is the Njobvu Local Forest No. 232. The GMA covers three Chiefdoms namely; Mwanya, Chitungulu and Kazembe respectively.

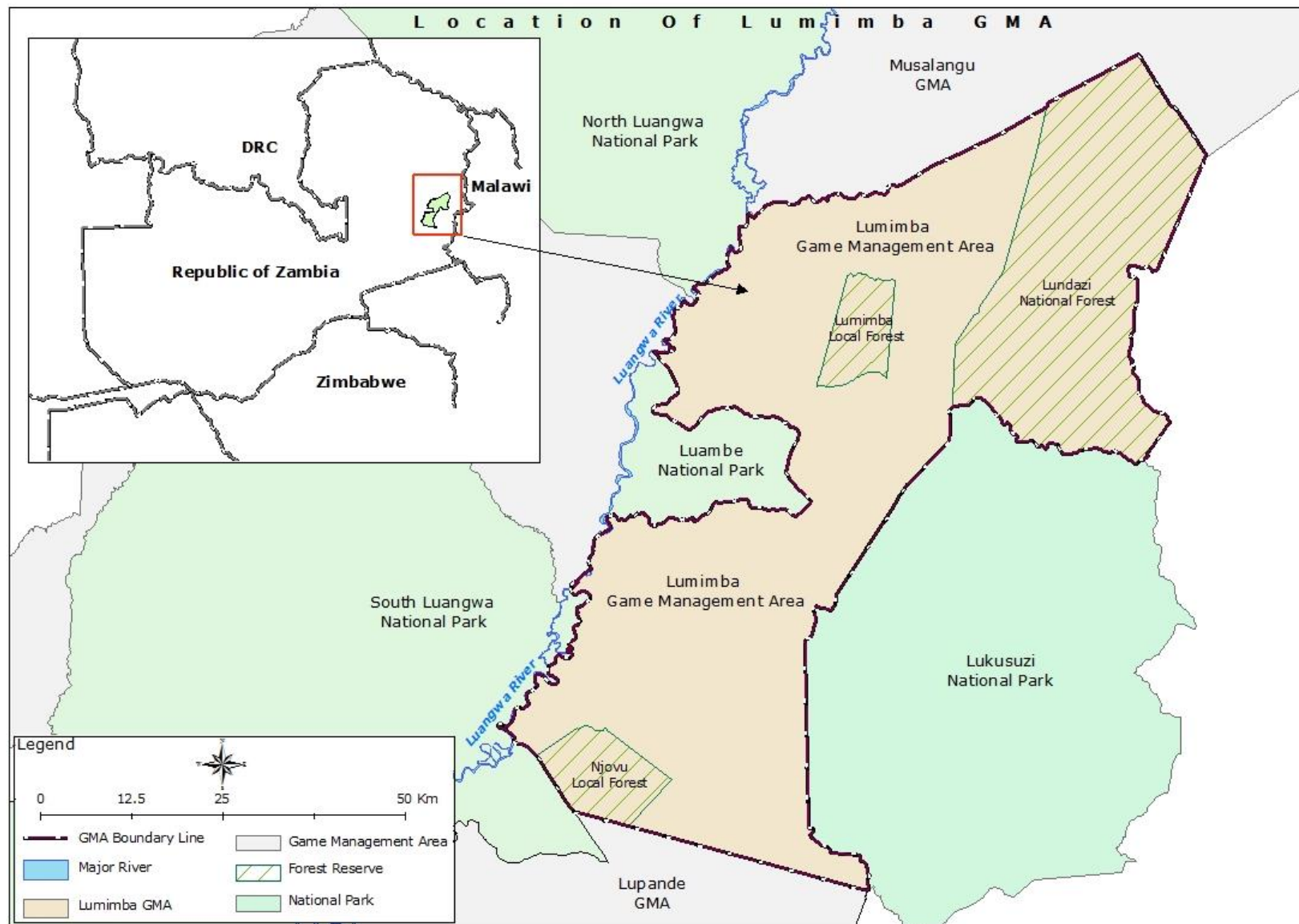


Figure 1.1: Location of Lumimba Game Management Area in relation to other Protected Areas in Zambia

BIOPHYSICAL ENVIRONMENT

2.1 PHYSICAL ENVIRONMENT

2.1.1 Climate

The Lumimba Game Management Area lies within the Agro-Ecological Region I, Zone 2-cv. Region I is commonly referred to as a low rainfall area, with annual rainfall less than 800 mm and high temperatures, or hot weather (ca. annual mean range 16 – 34 oC). The rainfall pattern is controlled by the movements of the Inter-Tropical Convergence Zone and increases from south to north. A tropical continental type of climate with three distinct seasons characterizes it i.e. hot rainy season from late November to April; a cool-dry season, from May-August; and a hot - dry season, from September to early November.

2.1.2 Geology and Soils

The Luangwa Valley is similar in origin to the East African Rift Valley system but is thought to be older because, like the Zambezi valley, it contains Paleozoic and Mesozoic strata, rather than the more recent sediments of the rocks that form the dominant strata of the valley floor and has been laid down over a period of approximately 125 million years, starting 300 million years ago (Utting 1976). A study of the Geological map of the Lumimba Mission Area (Molak, 1978), focusing within the area from the Luangwa River in the west to the range of hills including the Wandu, Ziwe, Kaulasisi and Mpande Hills to the east, and from the Lukuzye River in the south to the Lukusuzi – Lumimba Rivers in the central region of the study area to the Lundazi River in the north, identified local geological units dominated by Alluvium within the Luangwa valley. Recent alluvial sand deposits, lateritic soils and reworked mudstone with channel bars, comprise the characteristic geological formations in the area. East of the valley region are the Upper Karroo rock formations consisting of escarpment gritts, brown, red, medium to coarse grained *sub-arkosic* sandy stones, alternating with poorly sorted conglomerates with fine matrix. Further east to the south-east, the Lower Karroo and Basement Complex Gneisses emerge forming the high lands plateau landscape systems rising to above 1000 m asl with sporadic local hill picks, such as the Wandu, Kachasu and Kazikama Hills.

The geomorphology or land physiographic features are closely matched to the geology of the area. High lands and hilly terrain are associated with the eastern parts of the study area, descending westwards through a steep sloping escarpment zone into subdued dissected and undulating ridge land pediments to a low lying rift valley of the Luangwa floodplains, with local *dambos*, sediment flood pans and lagoons in places.

The soils of the Lumimba GMA have invariably been referred as Luangwa alluvial soils (Brammer, 1974). The soils are mainly heavy black clays, and include the more laomy and sandy soils occurring on slightly higher ground land ridges (old river banks) with mainly sandy soils developed over Karroo rocks. Most of the fertile soils are on loamy ridges developed in old sandy alluvium which has become partly weathered, releasing clay and iron. These soils lie above the normal flood level and are almost black to a depth of 20 to 50

cm or more, gradually becoming dark brown, or somewhat reddish brown in the lower subsoil, with a loam to sandy texture.

These soils are some of the best in terms of plant soil fertility in Zambia, being easy to cultivate, well drained, with good moisture holding capacity and large capacity to hold plant nutrients. Along the Luangwa valley soils are imperfectly drained to poorly drained, very deep, dark yellowish brown to dark brown, friable to firm stratified fine loamy to clayey materials; in places coarse loamy (*orthi-eutric FLUVISOLS*). Flood plain ridges are covered by a complex of imperfectly drained, olive brown to brown, firm sodic clayey soils (*orth-haplic SOLONETZ*, and well drained, very deep, yellowish red to strong brown, friable to slightly firm, slightly weathered and moderately leached clayey soils, having a clear clay increase with depth; in places cracking (chromic *haplic LUVISOLS* with *eutric VERTISOLS*). The escarpment zone with hilly scarps consists of hills and faulted scarps of the Rift Valley on variable slopes. Soil types are characteristically excessively drained to well drained, shallow, dark brown to yellowish brown, friable, stony, gravelly, coarse to fine loamy (*orthi eutric LEPTOSOLS*; rudic phase, with *lithic LEPTOSOLS*). Table 1 presents a general distribution of soil types in Lumimba GMA.

Table 2.1: General distribution of soil type in Lumimba GMA

Mapping Unit	Land physiography	Geology	Field observation description map unit
A13	Luangwa valley	Alluvium	4.0
Vt4	Low floodplain ridges	Alluvium colluvial sediments	3.0; 3.1; 3.1.2
He	Hilly scarps	Lower Karroo	1.0; 1.1; 1.1.2
Pd6	Dissected plateau pediments	Upper Karroo	2.1; 1.1.2
Pu11	Degraded plateau	Basement complex	2.0; 2.1

In the lower positions of the floodplain ridges, the soils become dark brown and more compact in the sub soil. Although in terms of chemical composition the soils are as rich as the ridge counter parts, cultivation is made more difficult due to the heavier consistence. Extensive nearly level land areas are occupied by black *mopane* clays and *dambo* soils. These almost black soils are clayey, crack widely when dry and are very sticky when wet. The soils are most likely affected by sodium and/or potassium in the subsoil. Although most of these soils have more sandy topsoil, they are mostly clayey from the ground surface. It is noted that many of these soils have been badly trampled by large herbivore mammals, like hippopotamuses and elephants which cause local soil degradation by erosion of the top soil.

Mopane soils would be difficult to bring under cultivation, except where soil textures are lighter; none the less heavy equipment would be required. Rice would be the most suitable crop to grow. Irrigation might be needed both in the dry and wet seasons in the dry valley climate. The hills and escarpment zone soils are associated with the land with rock outcrops and stony surface, steep slopes, mostly shallow, moderately shallow to moderately deep. Gravelly textures impeded the soil depth. Soil textures are variable, but mainly coarse loamy sands in surface layers becoming sandy loam to sandy clay loams and sandy clay in the subsoil and lower subsoil, respectively. These soils are unsuitable for arable agricultural land use, and should remain under stringent conservation measures.

2.1.3 Hydrology and Drainage

The natural drainage system in the area is greatly influenced by the Luangwa River, which flows in a north to south drainage to the Zambezi River of which it is a major tributary. Four major river tributaries, namely, the Lukusuzi in the Chasera area in southern part of the area, Lukusuzi River, passing just north of Mwanya, just south of Chitungulu, is the Lumimba River, and in the northern parts is the Lumezi River all of which maintain a westerly drainage flow. Between these rivers a many other river and riverine channels are established forming a strongly dendritic pattern drainage system from the plateau catchment area, the hills and scarp land systems in the east of the study area. Due to strong slope gradients of the terrain, nearly all the natural water course channels experience highly strong water currents with flash floods during the rainy season, resulting in high risks of soil erosion and huge loads of sedimentation materials from upland positions. In the Luangwa Valley drought occurrence is very high and analysis has shown a 60% occurrence resulting in many of the rivers not flowing throughout the year and even the Luangwa River runs extremely low during the hottest months (Sichingabula, 1994; 1995; 1997).

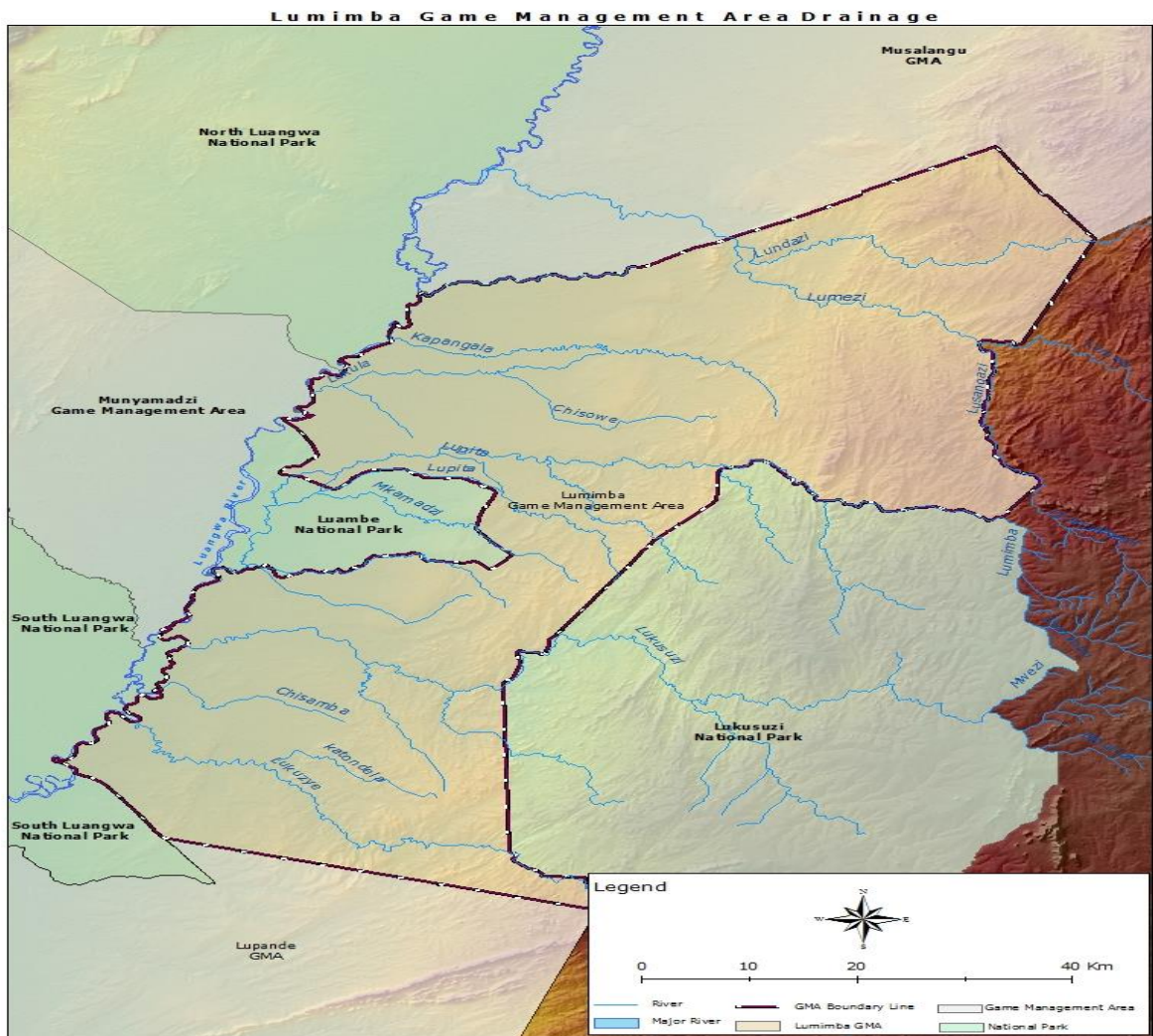


Figure 2.1: Drainage System for Lumimba Game Management Area

2.1.4 Relief and Topography

The largest part of the Lumimba GMA lies within the Luangwa Rift Valley. Accordingly, the land topography and land relief are expressed such that the land elevation, or altitude is lowest along the Luangwa River at about 500 meters above the mean sea level (asl.), rising steadily eastwards, from generally level floodplains to subdued rift valley gently sloping land ridges and undulating secondary river plains associated with the tributaries of the Luangwa River that generally flow westwards from higher grounds in the eastern parts of the GMA. In the extreme east the land relief sharply rises into a shoulder of part of an escarpment zone rising in height elevation from around 600 m asl to more than 1000 meters above the mean sea level on degraded plateau lands characterized by sporadic hilly terrain over a predominantly erosional surface shaped by its local geology, as observed in the Chipata to Lundazi landscape areas.

2.2 BIOLOGICAL ENVIRONMENT

2.2.1 Flora

There is a strong correlation between topography and soil type on one hand and vegetation types on the other hand. The occurrence of various topographic units, lithologies and soil types has given rise to correspondingly different vegetation types each characterized by unique floristic composition, dominant species, structure and physiognomy. The most prevalent vegetation formations in the valley include such physiognomic units as the woodlands, thickets, savanna, grasslands and wetlands.

2.2.1.1 Mopane Woodlands

Mopane woodland is the one of the major vegetation type found in the Lumimba GMA covering the lower lands. Mopane is associated with clay soils. *Mopane Colophospermum* is a very distinctive species, it forms extensive pure stands on the valley floor and lower escarpment slopes.

In the drier parts of its distribution range, mopane dominate most soil types occurring in the GMA, but on the plateau it is confined to particular soil types, which are alkaline and contain high concentrations of sodium salts. The clays in these soils swell on absorbing water, and rapidly become completely impervious. These climatic conditions are unfavourable to the growth of most trees species. The few species such as Mopane that can endure the condition have the ability to absorb water rapidly for the period it is available. Mopane develops a superficial root system which is able to suppress perennial grasses, and it is not uncommon to observe isolated trees in a circle of taller perennial grass, with only sparse annual grasses and herbs under the trees. This suppression of perennial grasses actually promotes surface runoff and soil erosion, and gulleying is a common feature of mopane woodland areas.

The soil characteristics of mopane woodland are in complete contrast to those of miombo woodland, which conserves both soil and water. Mopane can grow on deep, well-drained soils, and many of the finest specimens are on such soils. In such soils, it develops a deep taproot like its woodland associates

2.2.1.2 Miombo Woodlands

The name "miombo" is the plural for "muombo", the Bemba name for *Brachystegia longifolia*, a tree which dominates the north east part and south of the GMA. Miombo woodland is defined as any woodland which is dominated by species of three related genera in the family *Leguminosae*: *Brachystegia*, *Julbernardia* and *Isoberlinia*. Unlike most other leguminous plants, these do not develop nitrogen-fixing nodules on their roots.

Miombo Woodlands is found in higher lands of more than 650m elevations. The eastern part consisting of Lundazi National Forest and North-Western side of section of the GMA is predominantly Miombo woodland. The following are key stone species found in the GMA; *Julbernardia paniculata*, *Brachystegia longifolia*, *Brachystegia Utilis*, *Brachystegia boehmii* and *Isoberlinia angolensis*. Other species of common occurrence are *Uapaca Kirkiana*, *Anisophyllea species*, *Baphia bequaerti*, *Parinari curatellifolia*, *Monotes species*, *Faurea saligna*, *Uapaca nitida*, *Pericopsis angolensis*, *Albizia adianthifolia*, *Albizia antunesiana*, *Albizia versicolor*.

2.2.1.3 Acacia-Combretum Woodlands (Munga)

This woodland occurs in some sectors of the meander belt where the tributaries adjoin the Luangwa River. At higher elevations of about 520 to 600 m, *Acacia-Combretum* (Munga) woodland forms a broad belt outside the floodplains of the main streams, such as the Lukuzye, Chisamba, Lupita, Katondela and Lundazi which run through the GMA. This form of vegetation is an indicator of relatively fertile soils where most villages are sited. The woodland is dominated by species of *Acacia* and *Combretum*. The shrub layer is covered by *Flueggia virosa*, *Margaritaria discoidea*, *Markhamia obtusifolia*, and *M. zanzibarica*. The well-drained areas overlain by sandy soils are inhabited by more or less pure stands of *Acacia tortilis*. *Adansonia digitata*, *Ficus sycomorus* *F. thonningii*, and *Sterculia africana* occur as occasional taxa.

2.2.1.4 Other Types of Vegetation

Besides miombo, mopane and munga there are other woodland types in the Lumimba GMA such as the Montane and Riperian woodlands. They are generally more open in structure than miombo, and lack the characteristic miombo dominants. They occur in areas which are either too dry for miombo woodlands, or too wet during the rainy season. Other vegetation types include riverine, shrublands, grasslands and riverine vegetation. The riverine vegetation found along the rivers, streams and lagoons and dambos usually have a mixture of such as *Faidaherbia albida*, *pilistigma thorniigii* (musekese), and *Acasia species*. Miombo shrublands and thickets are found on the freely draining alluvial and grasslands on the alluvial clay plains.

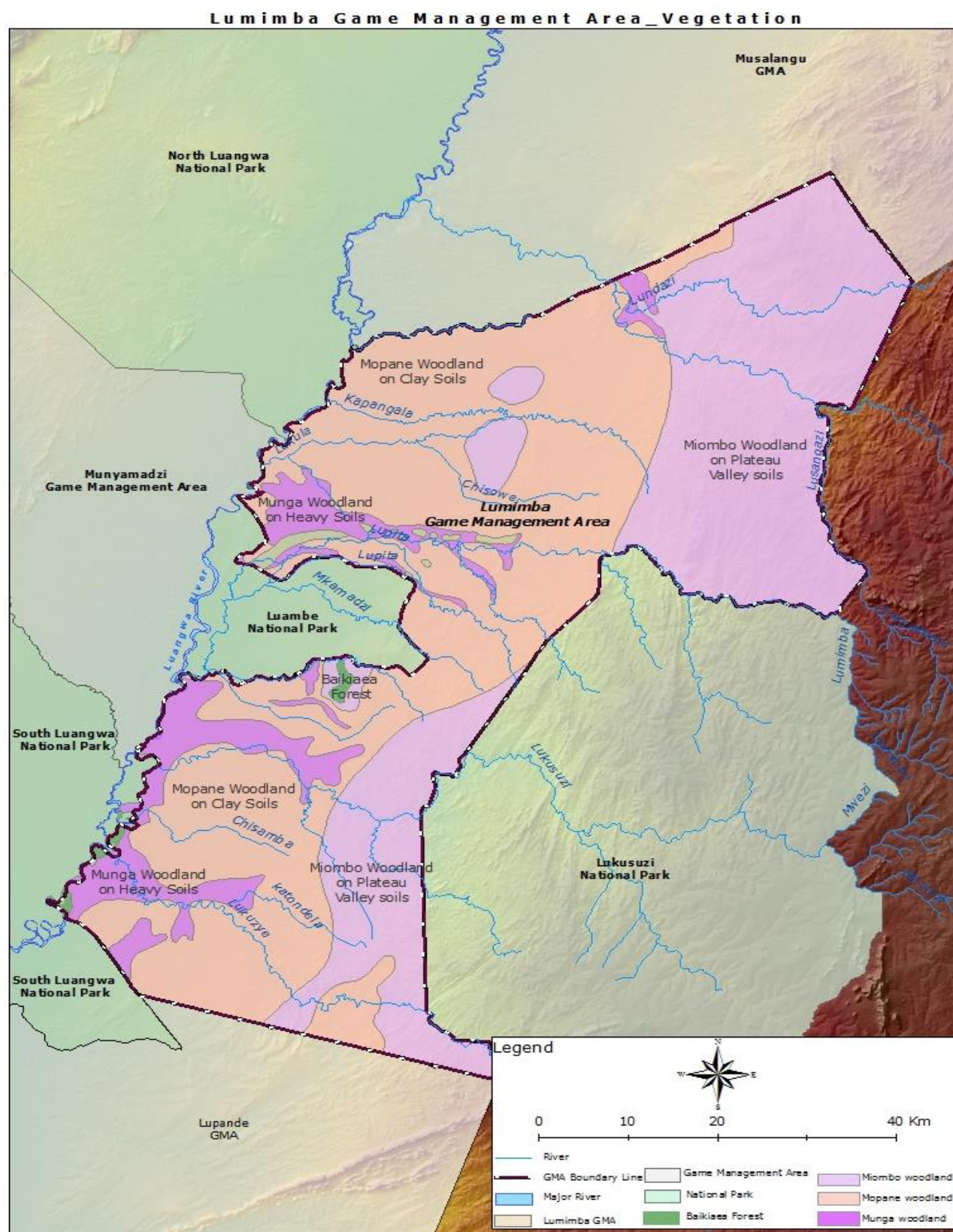


Figure 2.2: Vegetation Types of Lumimba Game Management Area

2.2.2 Fauna

The Luangwa valley is best known for its abundance and variety of large mammals, which attract hundreds of tourists every year. The diverse topography and a mosaic of vegetation types/habitats together with the vastness of the area coupled with the availability of perennial rivers and ox-bow lagoons have created conducive environment for the sustenance of high Biodiversity. Jachmann *et al* (1994) and Jachmann (1998) have established that Luangwa valley contains some of the highest densities of larger mammals in Zambia. The valley is also home for many bird species and about 700 species have been recorded.

2.2.2.1 Mammals

Published research studies (Carr, 1987; Astle, 1989; Owens *et al*, 1994; Masdar, 1990), ZAWA staff and tourist sightings indicate that most of large mammals including endangered, threatened and rare species occurring in Zambia are found in the Luangwa valley. These include elephants, giraffe, eland, hippos, buffalo, zebra, waterbuck, roan, bushbuck, bushpig, warthog, kudu, wildebeest, puku, reedbuck, impala, grysbok, oribi, common duiker; and among the carnivores are: lion, leopard, spotted hyaena, wild dog, etc.; among the primates: baboon, vervet monkey, night ape, bushbaby etc. However, there were twenty-seven (27) mammals recorded to occur in the Lumimba Game Management Area. It is important to mention however that the list is not exhaustive and more species will be added as discovered opportunistically or through surveys. Out of the twenty-seven (27) species, only the Wild dog (*Lycacon pictus*) is listed as endangered under the red list. For near threatened species, Puku (*Kobus vardonii*) and Leopard (*Panthera pardus*) were identified as the two (2) species falling under this category. Three (3) species were listed under the vulnerable category and these were; Elephant (*Loxodonta africana*), Hippo (*Hippopotamus amphibius*) and Lion (*Panthera Leo*).

Table 2.2 : Category of mammals under the IUCN Redlist

No	IUCN category	Number of species
1	Least Concern	21
2	Endangered	1
3	Near threatened	2
4	Vulnerable	3
Total		27

Extinct (EX) – No known individuals remaining, Extinct in the wild (EW) – Known only to survive in captivity, or as a naturalized population outside its historic range, Critically endangered (CR) – Extremely high risk of extinction in the wild, Endangered (EN) – High risk of extinction in the wild, Vulnerable (VU) – High risk of endangerment in the wild, Near threatened (NT) – Likely to become endangered in the near future, Least concern (LC) – Lowest risk. Does not qualify for a higher risk category. Widespread and abundant taxa are included in this category, Data deficient (DD) – Not enough data to make an assessment of its risk of extinction.

Not evaluated (NE) – Has not yet been evaluated against the criteria.

2.2.2.2 Birds

Over 700 species of birds have been recorded in Luangwa valley and a checklist guide to the common and rare birds of Luangwa was produced by the late Norman Carr in his *A Guide to Wildlife of the Luangwa Valley* published by Save the Rhino Trust Zambia reprinted (Carr, 1997). Other useful sources of birds for the Luangwa valley are: Astle (1987); Scott (1993); and Newman (1994). There were fourteen (14) bird species observed during the collection of baseline data within the Lumimba. Categorisation using the IUCN Redlist listed, six (6)

of the species under least concern, one (1) under vulnerable, one (1) under endangered and six (6) have not been evaluated. Grey crowned crane (*Balearica regulorum*) was the endangered species encountered in the Chipuka plains signifying the importance of the area in terms of the bird life. The species has not been recorded to occur in the Lumimba GMA and therefore the area has been added to the grey crowned crane range for the country. Southern ground hornbill (*Bucorvus leadbeateri*) was the only species under the vulnerable category.

Table 2.3: IUCN Redlist category of bird species observed during the baseline data collection

No	Category	Number of species
1	Not evaluated	6
2	Endangered	1
3	Least concern	6
4	Vulnerable	1
Total		14

2.2.2.3 Reptiles and Amphibians

Eleven (11) species are known to occur in the protected area, though this should be taken as a minimum number of species as more work and time will reveal additional species. Out of the eleven species, six have not been evaluated and the other five are listed as least concern. Annually, deaths are recorded from bites of the black mamba implying that there is an abundance of the species within the protected area (pers.comms Sakanga 2012)

Table 2. 4: Category of reptile species under the IUCN Redlist

No	Category	Number of species
1	Not evaluated	6
2	Endangered	
3	Least concern	5
4	Vulnerable	
Total		11

2.2.2.4 Amphibians

The country has recorded seven families, 20 genera and 78 species and subspecies of amphibians. From the recorded amphibians, there are eight species, which occur throughout the country and in Eastern Province. Seven species are listed under the least concern category of the IUCN and the eighth has not been evaluated for the eight species (Simbotwe et.al 1993).

2.2.2.5 Fish

The Luangwa River is fed by a host of rivers and streams within and surrounding areas of Lumimba Game Management Area. Notable among these are Lukuzye and Lukusuzi rivers in Chief Mwanya's area and Lumezi and Lundazi rivers in Chief Kazembe's area. These major rivers are constantly fed by seasonal streams which make them swell with water

during normal rainy seasons in the Lumimba Game Management Area. The water bodies within Lumimba GMA provide the source of fish life and other aqua related species. However the major fish species can be found in Luangwa River where fishing activities of importance take place. However, over twenty (20) fish species were identified by the fishing communities and fishers to be of importance in Luangwa River.

2.2.25.1 Species

Species of commercial value in Lumimba Game Management Area include Tiger fish, Bottle fish, Clarias, various tilapias, mouth brooding Oreochromis and the Labeo.



Labeo altivelis (mpumbu) this fish is observed in the Luangwa River and its tributaries during the rainy season.



Mormyrus labiatus (mukupe)



Hydrocynus vittatus (manda)



Clarias gaipinus. (Mulamba)



Tilapia rendarii (pende)

The Luangwa River is also home to small fish species like barbus, Synodontis, alestes lateralis, schilbe, marcusenus macrolepidotus and petrocephalus.



Synodontis zambezensis (nkolokolo)



Alestes lateralis



Marcacenus macrolepidotus



Barbus

2.2.2.5.2 Endemism and Rearness of Species

Species which are endemic to the GMA and surrounding areas include Bottle fish, Corn Jack (mbuwu) and electric fish (nyesi), while Bottle fish, Mpumbu and Corn Jack (mbuwu), populations have dwindled over the years due to over fishing and use of wrong fishing gear. Mpumbu swims upstream during breeding seasons and thus are trapped by fisher people thereby depleting the species.

CULTURAL RESOURCES AND SOCIO-ECONOMIC SCENARIO OF LUMIMBA GMA

3.1 CULTURAL RESOURCES

Cultural resources carry out numerous functions that are beneficial to humans and even essential to human welfare (*UN Foundation, 2004*). Given the worth of these sites, it is dire that Management have the gen needed to manage these resources meritoriously. Cultural resources in the GMA includes:-

3.1.1 David Livingstone Historic Cross Point

Dr. David Livingstone the famous Scottish Missionary known to be the first White man to see the Mosi O Tunya falls and named it after Queen Victoria also passed through the Luangwa valley and Lumimba GMA to be specific towards the end of 1860s. He had three historic journeys to Africa. It was during his third and final journey that he journeyed through the virgin Lumimba forest through a place called Pelekani in Chief Mwanya's area and crossed the Luangwa River only to later face his death at Chitambo in 1873.

David Livingstone is a highly celebrated and famous explorer who spent considerable time in what today is known as Zambia during his second and third journeys. The historic significance of the Scottish missionary and his 'footprints' in the spread of Christianity and fight against slavery and slave trade has remained as important in our curriculum to date. The site location falls within UTM 8585174, 36L 0394686 and coordinates 12°47.788'S, 032°01.780'E.

Today, John Kopinger, the owner of Chikoko Bush Camp knows what it means to give his tourist clientele a feeling of crossing the Luangwa River from the exact point where David Livingstone crossed about 150 years today. There is also a growing interest by heritage practitioners and UNESCO to document the exact slave trade routes and associated activities of slave trade and slavery in Africa. This route which David Livingstone used through Pelekani area in today's Lumimba GMA before he crossed the Luangwa river in the 1860s is an important historic footprint and should be used for tourism purposes and way of attracting visitors by turning the route into a historic trail into the park or indeed in any ingenious way. Tourists that come to see the Victoria Falls could be invited to this part of wilderness and set foot on where David Livingstone the missionary, Empire builder and warrior against slavery and slave trade passed during his 3rd and final journey.



Figure 3.1 Tyre marks of tourists that drive to the crossing point for David Livingstone on the Luangwa River.

3.1.2 W.A Sayer's Grave (361 0395841, 8583142)

W. A. Sayer is locally known to have been a Tourist, Researcher and tracker of David Livingstone's route in this part of Zambia (today's Lumimba GMA) who met his fate within the Pelekani area in Mwanya's Chiefdom. Here and in 1929, Mr. W. A. Sayer lost his life to gruesome attack by an elephant. This is a historic site which depicts the extent of White involvement in research activities in the hinterland of Zambia, then known as Northern Rhodesia. Tourism and research have remained huge opportunities in the Lumimba GMA. Today, we can use these historic and perhaps unfinished research programmes by men like W.A. Sayer to continue and increase on what and how much we know about our environs, in this case Lumimba GMA. The site is a great opportunity to Educational programmes in areas of conservation, tourism and history. Therefore, it can be packaged for local and foreign tourist, Academicians and educationalists.



Figure 3.2 Grave for the researcher, botanist, tourist and Livingstone's ardent scholar, W. A. Sayer

3.1.3 Chasela Catholic Historic Establishment (36L 0409150, 8579298)

In Chasela village, at location 12° 51.004'S and 032° 09.767'E, some 466 m south west of Chasela Primary school is the historic point at which the Catholic Church first established the Church in Lumimba GMA area. This was a maiden establishment of the Church in Eastern Province. The establishment took place in 1904. Since then, the Catholic Church and its missionary activities have grown over time in Lumimba GMA and areas far beyond. The Church has established many church outposts and schools and has been involved in various humanitarian undertakings in the area.

Therefore, the cornerstone and entry foundation of the Catholics Missionary working in Eastern Province remains an important landmark in this part of the country. It must be protected and preserved for posterity and church history. It should also be well captured at an interpretation center as Catholics have celebrated the first centenary festival in 2004.



Figure 3.3 Chasela, where the Catholics first established their missionary works in Eastern province in 1904.

3.1.4 NUNDWE FALLS (36L 0477679, 86 56446)

Nundwe Waterfalls rests on granitic gneiss rock outcrops on Lundazi River in Njoka area some 40 km from Lundazi town on the Lundazi – Kazembe road. To get there take a north-westerly direction at Lupiya's village near Njoka primary school. Then cross Kamatizi stream and turn left at Mseteka village until you get to Chibwana village. From here, take a north-westerly direction for 370m and get to the banks of Lundazi River watching the

spectacular Nundwe falls. From the main road, it is about 5.35km. The site offers great beauty during the February-April season when the streams and rivers are pregnant and burst their fast cascading waters through the hills into the Lundazi River.

The Nundwe Waterfalls is actually a seasonal waterfall in that it dries up during the dry season but offers a beautiful rock garden then. During the rainy season, the falls cascade over 150m with a vertical fall of about 35m at the highest point and a width of 70m. The place is a sure tourism den.



Figure 3.4 Nundwe waterfalls in Njoka village, now a rock garden

5.5 KAULASISI HISTORIC HILL (36L 0449887, 8654382)

Kaulasisi Hill is located at coordinates 12° 10.321'S and 032° 32.361'E. It is some 3km west of Kazembe Primary School. The site is believed to have been used for hibernation during historic tribal wars in the 18th Century. However, due to foliage it was difficult to reach the reported caves which provided asylum during Bantu wars.



Figure 3.5: The historic and ‘mysterious’ Kaulasisi hill

5.6 KAZILONDO CATARACTS / RAPIDS (36L 0456409, 8649806)

The Kazilondo cataracts are spread over 300 m on the Lumezi River formed by massive rock outcrops which jute out of the riverbed to create an impediment on the fast and smooth running water. In turn water cascades forcefully over the differently sized outcrops creating marvelous scenery of interrupted water flow. The Kazilondo rapids are an attractive seasonal occurrence of falling and cascading water.



Figure 3.6: A section of the Rock outcrops on the Lumezi River that forms the cataracts and cascades during the rainy season, Jan- March

The area is virgin with giant acacia and other tree species that can house adventure hospitality. The site falls within 12° 12.810'S and 032° 35.955'E

3.1.5 OTHER REPORTED HERITAGE SITES

There are other sites of heritage significance which were reported within the Lumimba GMA. However due to time and logistical challenges, these sites were not visited. Nevertheless, the verbal reports were recorded for possible visits in future. The reported heritage sites which were not verified include the following;

- Chitilila Rapids Site on Lundazi River
- Nchenya Rapids site on Lundazi River
- Kaungo Rapids site on Lundazi River
- KapindaMilozi Mythical site
- KamwaNkuku Shrines

3.2 SOCIO-ECONOMIC SCENARIO OF THE LUMIMBA GMA

3.2.1 Population

The population of Lumimba GMA is estimated at 40,616 translating into a population growth rate of about 16.5% and annual growth rate of 8.3%. It has a total of 5,055 households based on the final 2010 Census of Population and Housing survey. The District has two main tribes namely the Bisa and Tumbuka. The Bisa are believed to be the indigenous people of the GMA.

3.2.2 Livelihood Strategies

In general terms, the livelihood of people in the GMA are primarily based on combining strategies and resources relating to livestock production (chicken rearing only), crop-based agriculture and gardens, illegal hunting, fishing, making of baskets and mats, charcoal burning small scale mining and exploitation of income opportunities including employment in the GMA e.g. Village scouts, carpentry and casual work.

(a) Farming

Lumimba has a lot of farmers most of whom are small and medium scale farmers with very few commercial farmers. Maize, groundnuts and sorghum are the main food crops grown while cotton is the major commercial crop that is grown within the GMA. Other crops grown are sweet potatoes, sunflower, millet, cassava, rice. Vegetables such as cabbage, rape, onion, and tomatoe are also grown.

The presence of extension services has helped farmers in the Lumimba GMA to diversify their choice of crops grown each season and in some cases farmers have been introduced to practicing conservation farming methods. However, the slash and burn (Chitemene) method is still widely used to grow finger millet and sometimes maize.

Crops grown include groundnuts, finger millet, sweet potatoes, cassava, sorghum, sunflower, vegetables, cowpeas that are less input demanding and rice which is mostly grown in water logging areas. Maize is the main staple food but has dropped in prominence due to high costs of fertilizers and wild animals which graze on the crop.

(b) Livestock

The populace of the GMA mostly rare chickens unlike other domesticated animals because of the predator animals in the valley as well as inadequate land for domestic animals to graze on. Meanwhile some households in Chasela village in Chief Mwanya keep livestock such as sheep and goats because the law enforcement activities to prevent poaching (illegal hunting) have intensified thereby limiting the community from appropriating game meat for their consumption. The agricultural input supply and marketing system is poor and unpredictable.

(c) Artifacts

The people of Lumimba GMA carve mortars, stools and chairs, axe handles, cooking sticks and doors. Weaved products include baskets, reed mats, and hats which are a source of income which only contributes about 4% of the monthly household budget. Blacksmith products are mainly axe, hoes and pots.

3.2.4 Community Structures

The GMA has three traditional rulers (Chiefs) namely: HRH Chief Kazembe, HRH Chief Mwanya, and HRH Chief Chitungulu. The traditional administrative system involves the Chiefs, Indunas and the headmen. The system of Indunas and headmen is a very predominant form of organising local communities and involvement of the Indunas and headmen is a prerequisite for obtaining local consensus regarding developmental projects. The traditional system manages access to land and undertakes conflict resolution of civil cases. The traditional authority is complimented by formal political authority, which is vested in the area councillor and the area Member of Parliament.

3.2.5 Land Use & Tenure

The Chiefs are the sole custodian of all the land in the GMA. There are two types of land tenure that exist in Lundazi district namely the leasehold and customary. Customary tenure covers a large portion of land. The subjects of the Chiefdoms within the Lumimba GMA do not have title deeds for the land that they are occupying. Even those that stay in self-created farming blocks do not have title deeds. There is no order as to where households could locate their fields. The locations of fields follow family lineages where a household can lay claim a piece of land based on where the ancestors performed their livelihood activities. The general use of the land in the GMA is as follows:

- Hunting
- Forestry
- Farming land
- Settlement schemes and
- Gardening

The people have lived in the GMA since time immemorial. Most of them in the past used the area mainly for hunting, collecting wild fruits and subsistence farming. Currently, the majority of people are not comfortable to live in the GMA because of Human Wildlife Conflict. They think that ZAWA is paying more attention to the plight of animals than people. Because of this, they have negative attitude towards the wild animals. They are also ignorant on the importance of conserving wild life.

Though faced with challenges of Human Wildlife Conflict, people are not willing to relocate outside the GMA but, need to be sensitized on the importance of wildlife so they could change attitude towards nature. The community is doing something about conservation. The Community Resource Boards (CRBs) try to educate and sensitize the community on several conservation programs. These include sensitizing people on crop rotation, discouraging chitemene system, charcoal burning. ZAWA on the other side also sensitize the community on the importance of conserving wildlife as well as enforcing laws and ensure that those who contravene are prosecuted. Fisheries department also enforce fish ban during the breeding season and ensure that people use right nets for fishing.

3.2.6 Income Availability

In Lumimba GMA income is mainly realized through selling groundnuts, sunflower, chickens, cotton and artifact. Maize, finger millet and cassava generate medium earnings

because households have to share between selling and household consumption. This is evident from the baseline data collected in areas such as; Chasela, Sam, Nthumbe, chulu, Mchambwe and Kambwili. Income from crops is received mostly from February to October while income from livestock and carpentry products are received throughout the year. The main areas of expenditure patterns are purchasing farming inputs (in December - February), paying for labour on various farming activities, purchasing school requisites and medicines. Excess funds are spent on clothing, housekeeping requisites and on beer drinking.

3.2.7 Social Facilities

(a) Education

There are a number of incomplete school structures in the GMA reducing the availability of school places for the school going population. This leads to low levels of education among the people of Lumimba GMA. Accommodation for teachers is inadequate at all the schools in the GMA. This demotivates the trained teaching staff as such there are a number of unqualified volunteer teachers in the area. Some Community Schools are run on voluntary basis by some untrained teachers. There are 20 educational facilities within Lumimba GMA as provided for in the table below;

Table 3.1: Education facility in Lumimba GMA

S/n	Facility	Number
1	Community School	06
2	Primary School	13
3	Secondary School	01
	TOTAL	20

The Ministry of Education is responsible for supplying some of the schools with education materials like teaching guidebooks, equipment for practical demonstrations etc. though not adequate.

(b) Transport System

The road infrastructure in the GMA is in a deplorable state. There is no public transport system for both humans and the farm produce in the GMA except Chitungulu Chiefdom. In the rain season, most places in the GMA are cut off due to poor road network

There are no bridges on the Lukusuzi, Lukuzye, Lumezi, Lundazi and Luangwa rivers. Bridges on these rivers and other streams would form important access routes in the GMA and to other areas outside.

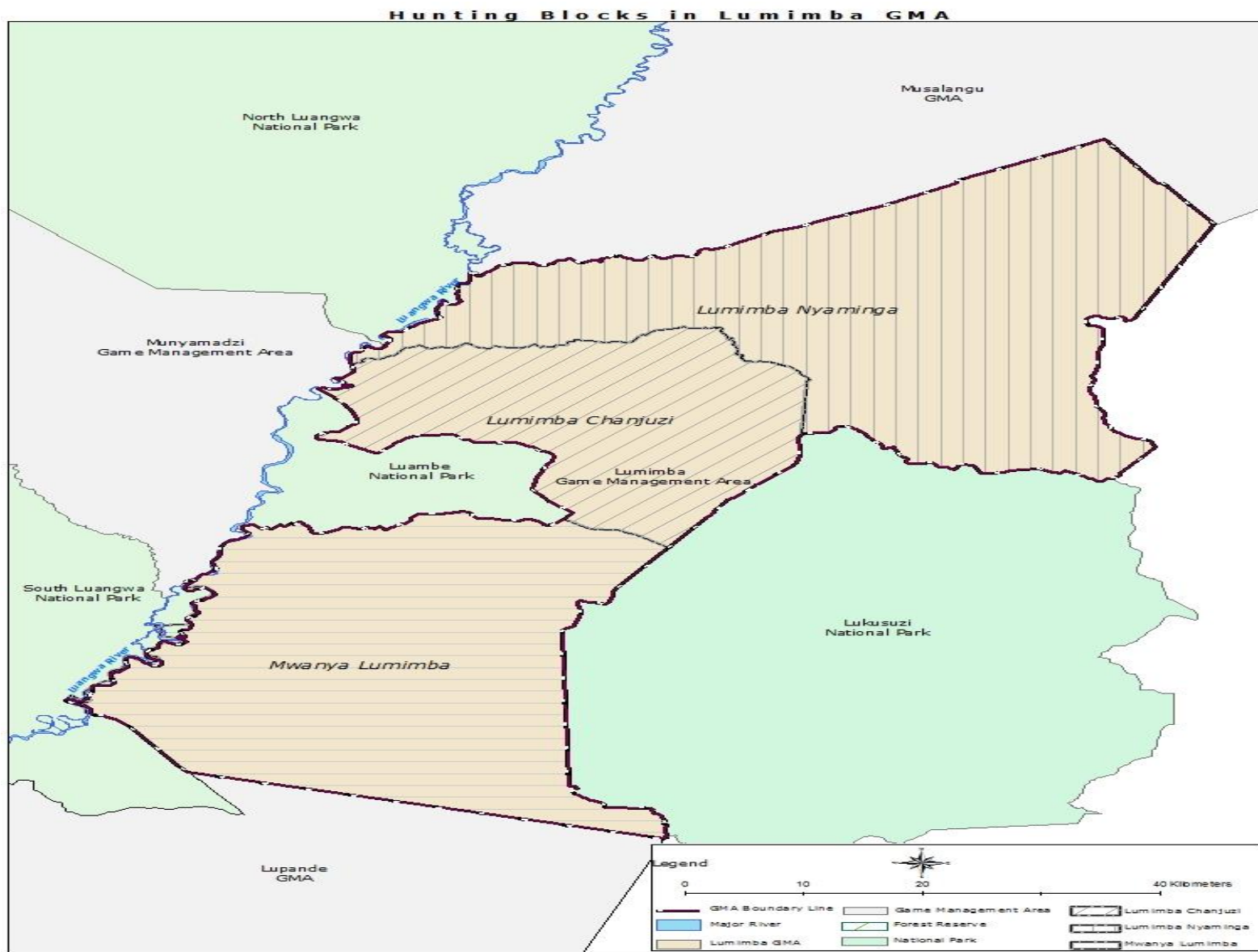


Figure 3.7 Hunting Blocks in Lumimba Game Management Area

3.2.5 Human Wildlife Conflict

Human Wildlife Conflicts has been critical in the Protected Areas and surrounding areas of Zambia. Due to the conflicts brought by elephants, hippos and crocodiles, there has been a negative perception towards wildlife from the communities and this has affected the conservation of species. There has been retaliatory killing of elephants due to the conflicts that the cause in the Protected Areas. While the Lumimba GMA is an important refuge for wildlife, limited studies have been conducted on human wildlife conflicts. Though, there are incidents of HWC recorded, limited analysis is carried out of the data and spatial recording of the data is limited as GPS are limited. However, funding from SASSCAL which made it possible for baseline data collection has also enabled research on human wildlife conflicts to be undertaken for the first time in the GMA.

3.2.6 Infrastructure

3.2.6.1 Transport Facilities

The Lumimba GMA has two gazetted roads; the Chikomeni – Mwanya (D104) passing through the Lukusuzi National Park and (RD 105) passing through the GMA in dry season. The GMA has two operational Airstrips thus; Wakawaka airstrip in Chitungulu Chiefdom and Tafika Airstrip in Mwanya Chiefdom all these accessible only during dry season.

3.2.6.2 Transportation in Lumimba GMA

The road infrastructure in the GMA is in a deplorable state. In addition, there is no public transport system for both humans and the farm produce in the GMA.

3.2.7 Water Supply in Lumimba GMA

There is a problem with clean water supply especially during the hot dry season when most of the seasonal streams are dry. All the three chiefdoms have no access to boreholes. Community members' sole water source is river ponds which are not safe for human intake.

3.2.7.3 Sanitation in the Lumimba GMA

All the three (3) chiefdoms were serviced by pitlatrines. There are no VIP toilets within the GMA.

3.2.8 Waste Mangement

Waste Generation and Disposal: - Currently, Lumimba GMA has no gazetted dumping site for waste.

3.2.9 Electricity and Other Energy Sources

The following are among the available sources of energy used in the district.

3.2.9.1 Electricity

Hydro electricity in the GMA is imported from Malawi and does not cover much of the areas in need of the commodity. The facility has become very unreliable due to repeated power outages experienced in the area.

3.2.9.2 Other Energy Sources

The other energy sources used in the district are:-

- a) **Solar:-** Solar energy is also widely used by rural people. This type of energy is reliable but has limited wattage
- b) **Fire Wood:-** Fire wood is commonly used by the majority of the households because it is cheaper and effective.
- c) **Charcoal:-** Charcoal is commonly used for domestic purpose e.g. cooking.

3.2.10 Communication

Communication is a big challenge in the GMA. In all the three chiefdoms there is inadequate communication network of which even tourist finds it difficult to communicate to their loved ones.

3.2.11 Status of Natural Resources

There are various natural resources within the Lumimba GMA ranging from waters, minerals, flora and fauna some of which are unstable, stable and decreasing in numbers. Table below outlines a summary of the status of natural resources in the GMA.

Table 3.2: Status of Natural Resources in Lumimba GMA

No.	Natural Resource	Use	Status	Impact	Suggested Solution
1.	River Water	<ul style="list-style-type: none"> ➤ Water for domestic use ➤ Fishing ➤ Irrigation 	Unstable water flow	<ul style="list-style-type: none"> ➤ Rainfall Variations ➤ Human activities such as cultivation 	<ul style="list-style-type: none"> ➤ Reduce cultivation on river banks
2	Minerals	<ul style="list-style-type: none"> ➤ Commercial use 	Decreasing	<ul style="list-style-type: none"> ➤ Indiscriminate exploitation of trees ➤ Soil erosion due to excavation 	<ul style="list-style-type: none"> ➤ Reduce mining activities in the area
3.	Grass	<ul style="list-style-type: none"> ➤ Commercial and domestic construction ➤ Grazing 	Stable	<ul style="list-style-type: none"> ➤ Soil erosion resulting into gullies. ➤ Early burning of vegetation. 	<ul style="list-style-type: none"> ➤ Land cover protection.
4.	Trees	<ul style="list-style-type: none"> ➤ Commercial and domestic use e.g charcoal production, poles and timber 	Decreasing	<ul style="list-style-type: none"> ➤ Indiscriminate exploitation of trees. 	<ul style="list-style-type: none"> ➤ Embark on afforestation program ➤ Law enforcement ➤ Conservation awareness campaign
5.	Reeds	<ul style="list-style-type: none"> ➤ Domestic 	Decreasing	<ul style="list-style-type: none"> ➤ Over use 	<ul style="list-style-type: none"> ➤ Reduce human

		purposes as well as commercial e.g making of mats, baskets,		➤ Human activities disturb the growth of reed	activities along the river banks.
6.	Fish	<ul style="list-style-type: none"> ➤ Local consumption ➤ Selling (Small scale) 	Decreasing	➤ Use of wrong fishing method.	<ul style="list-style-type: none"> ➤ Use of suitable fishing gear ➤ Educate the community on fish conservation. ➤ Strict enforcement of fisheries act.
7.	Wild Animals	<ul style="list-style-type: none"> ➤ Tourism attraction ➤ Hunting for trophies. 	Decreasing	<ul style="list-style-type: none"> ➤ Poaching ➤ People have settled on animal corridors 	<ul style="list-style-type: none"> ➤ Increase law enforcement operations. ➤ Review the CBNRM Policy

3.2.13 Community Based Organisations

There are a number of community-based organisations that exist in Lumimba GMA and these include:-

- Three Lumimba Community Resources Boards (CRBs),
- Parent Teachers Association (PTA),
- Village Action Group (VAG),
- Neighbourhood Health Committees (NHC),

3.2.14 NGOs Active in Lumimba GMA

The NGOs active in the GMA are:-

World Vision Zambia who are responsible for improving the welfare of the less privileged in society

3.2.15 Private Sector Activities

3.2.15.1 Tourism Sector

Tourism in the GMA involves both consumptive and non-consumptive. It has stimulated the development of a variety of allied infrastructure and facilities such as, bush camps, campsites and lodges. Visitor Use experience in Lumimba GMA is currently mainly photographic safaris while hunting for both the Safari and resident was suspended in 2012 by Honourable Minister of Tourism and Arts. Only one Lodge is operational though at the time of baseline data collection the facilities were all closed due to the rainy season. However, Dawi Lodge is under renovations/ construction on the Luangwa River bank. Tafika Safari camp which is operating under Remote African Safaris closes as the roads become impassable during rainy season. Chibembe Lodge is none operational and closed in 2003. Also Mwanya Community Bush Camp closed in the year 2009. Hunting safari camps in Lumimba GMA includes: - Mwebe under Muchinga Safaris, Sofram hunting safari camp.

3.2.15.2 Health

There is only one Rural Health Centre in the Lumimba GMA within Chitungulu Chiefdom but, there is no Hospital or Referral Centre. This becomes a challenge especially in the rainy season where patients cannot be referred due to poor road network. Once a hospital is build, this challenge would be alleviated.

CHAPTER FOUR

GMA PURPOSE, EXCEPTIONAL RESOURCE VALUES AND SIGNIFICANT STATEMENTS

4.1 GMA PURPOSE

The purpose of Lumimba Game Management Area is:-

To act as a buffer to the four (4) surrounding National Parks (North Luangwa, South Luangwa, Luambe, Lukusuzi) for conservation and protection of the natural, cultural and heritage resources for the benefit of the local community and nation at large for the present and future generations through sustainable utilization.

4.2 EXCEPTIONAL RESOURCES AND VALUES

The exceptional resources and values for Lumimba Game Management Area are:-

- a) The Luangwa River: - is the mighty River of GMA offering abundant habitation for mammals and reptiles such as hippos, crocodiles and fishes. The River also provides for the mode of transportation in terms of speed boats and canoes.
- b) Presence of wild dogs (endangered species)
- c) Availability of heritage sites and hot springs such as Kalimulilo water falls, Nyani waterfalls and historical sites such as Mpalawe ya Mwase, the rock hill where the first Chief in Mwanya was killed,
- d) Availability of rare fish species (electric fish)
- e) Diverse vegetation types found on the valleys.
- f) Kafula Caves which have steps
- g) Chinefunefu quick sand
- h) Kaulasisi hills which provides a good panoramic view
- i) Ulembe tree which was used for killing animals because it is poisonous.

4.3 GMA SIGNIFICANT STATEMENTS

The Significance Statements for Lumimba Game Management Area are:-

- a) The GMA shares the boundary with South Luangwa National Park, North Luangwa National Park, Lukusuzi National Park, Luambe National Park, GMAs and open areas.
- b) The G.M.A is an integral part of the Luangwa valley eco-system
- c) The G.M.A is rich and has sustainable mineral deposits
- d) The G.M.A is associated with a hippo population which is said to be the largest in the whole world
- e) The G.M.A is host to the rare electric fish and the crested crane
- f) The G.M.A has an important heritage sites such as hot springs and late stone age caves
- g) More than half of the GMA is prime hunting area

CHAPTER FIVE**5.0 MANAGEMENT PROBLEMS AND MANAGEMENT OBJECTIVES****5.1 OVERVIEW**

The management problems and management objectives in the GMA's are categorized into six themes, namely:-

- a) Natural resources management;
- b) Operations and management;
- c) Visitor use and experience management;
- d) Local community associated management
- e) Heritage resources management and,
- f) Cross-cutting management.

Table 5.1 below outlines the themes, management problems and management objectives in Lumimba GMA

Table 5.1. Themes, Management Problems and Management Objectives

Themes	Management Problems	Management Objectives
Natural Resources	Inadequate Research and Monitoring Programs	<ol style="list-style-type: none"> a) To develop and build capacity in ecological monitoring, research, processes and facilities for key stakeholder institutions (e.g. MAL, ZAWA, MET , FD, Mining and CRBs) in the GMA b) To establish databases for biodiversity research capture and dissemination c) To undertake research on endangered species in the GMA
	Illegal Harvesting of Natural Resources (fish, forestry, wildlife, mineral resources).	<ol style="list-style-type: none"> a) To enhance protection measures aimed at reducing illegal off takes of natural resources. b) To enhance settlements within the GMA based on the agreed zonation scheme contained in the GMP in consultations with local leadership, Council and ZAWA.
	Prone to Drought and Floods.	<ol style="list-style-type: none"> a) To acquire climate data and information b) To promote climate change adaption and mitigation technologies
	Land degradation (salinization, soil erosion, low plant nutrient reserves-low phosphorus and carbon) & siltation	<ol style="list-style-type: none"> a) To provide and promote soil, water and land conservation including soil fertility technologies
	Unsafe drinking water	<ol style="list-style-type: none"> a) To enhance awareness in safe water management in the communities of the

		GMA. b) To provide water resources close to the communities
	Prevalence of Human Wildlife Conflicts	a) To promote broad livelihood alternatives b) To develop appropriate land use plans
	Uncontrolled bushfires in the GMA	a) To establish fire management guidelines and implement adequate control mechanisms (e.g community based fire management plan)
	Occurrence of wildlife diseases (e.g. anthrax)	a) To identify hotspots of disease outbreaks and provide monitoring and prevention mechanisms
	Low accessibility infrastructure	a) To construct adequate accessibility (roads, water canals) infrastructure
	Non stratification of the Luangwa River by Fisheries Department	a) To establish fisheries strata along the Luangwa River
	Lack of formal co-management of fisheries resources	a) To strengthen co-management of fisheries resources
		b) To carry out sensitization of co-management fish resources
	Fish depletion	a) To promote the restocking fish exercise
	Illegal fishing practices	a) To promote implementation of customary law
	Low agricultural production	a) To build capacity amongst small scale farmers for high agricultural production
	Lack of inputs and improved seed/hybrids	a) To develop and provide appropriate inputs (e.g seed breeds and equipment)
	Improved agricultural technologies lacking due to inadequate extension services and information	a) To develop and provide appropriate inputs (e.g seed breeds and equipment)
	Soil fertility mining	a) To develop and provide appropriate inputs (e.g seed breeds and equipment)
	Encroachment and Deforestation	a) To strengthen the legal framework for monitoring
	Lack of co-ordination amongst departments involved in natural resources management (Mining, FD and ZAWA)	a) To enhance information sharing amongst departments involved in natural resources management
	Illegal production of charcoal	a) To develop and implement customary laws and bye laws
	Illegal timber harvesting	a) To develop and implement customary laws and bye laws
	Under utilization of Mining	a) To maximise exploitation of mineral

	Resources	resources as an alternative livelihood for the benefit of local people b) To promote value added mineral products as part of tourist attraction in GMA
Operations and Management	Inadequate Operational Logistics.	To acquire adequate operational logistics.
	Lack of transport for operations	To provide adequate transport
	Inadequate field staff	To recruit and train adequate field staff
	Conflicting among competing land uses	To sensitise and to resettle unplanned settler in the Forest Reserve.
	Uncontrolled fires	To control fires in the GMA
	Insufficient funds for operation	To Increase funding for operations
	Inadequate accommodation for staff and offices	To increase and improve infrastructure in the GMA
	In adequate wildlife camps	To increase number of wildlife camps
	Undefined National Park and GMA boundaries	To ensure that the National and GMA boundaries are defined.
	Illegal mining of gemstone	To regulate the mining of gemstones in GMA
Visitors Use and Experience	Uncontrolled movement in hunting areas during hunting periods.	To reduce uncontrolled movement within hunting areas”
	Poor communication network	To put up the telecommunication mask
	Inadequate tourist’s facilities	To increase tourism facilities
	Inadequate Air strips	To increase the number of Airstrips
	Limited participation and support of local communities in tourism activities	To improve the participation and support for local communities in tourism activities
Local Community Associated Management	Poor sanitation & water	To improve sanitation and water.
	Inadequate health facilities.	Adequate health facilities
	Inadequate schools	Adequate schools

	Inadequate financial support of community resources board	To provide prompt financial support to CRBs
Heritage Resources		
	Undeveloped Heritage sites	To develop heritage sites infrastructure
	Poor accessibility of heritage sites	To develop access road infrastructure and site trails
	Inadequate publicity on heritage sites.	To provide information on heritage sites
	Lack of heritage personnel in the Lumimba GMA/districts	To have adequate heritage personnel in Lundazi district
	Inadequate collaboration among the stakeholders of the GMA in heritage resources management.	To improve collaboration among stakeholders
	Lack of local authority development and investment plans on heritage resources	To have development and investment plans on heritage resources at local level
Cross Cutting	Poaching	a) To Increase Community Awareness on heritage sites campaign on Poaching and its negative effects. b) To Increase Man Power to Conduct Anti-Poaching Patrols in the GMA. c) Resettlement of illegal settlers.
	Poor road infrastructure	Construct, rehabilitate/upgrade the road network in the GMA
	Human Wildlife Conflict	a) To encourage innovative human wildlife conflicts mitigation measures like chilli fencing, solar fences chilli blasting, improved agriculture systems, etc b) To conduct population and behavioural studies in HWC prone hot spot.
	Inadequate implementation of the National Gender Policy	Institutionalise and implement the National Gender Policy
	Inadequate implementation of the National HIV and AIDS Policy	Institutionalise and implement the National HIV and AIDS Policy
	Ebola	To increase community awareness campaigns of Ebola pandemic

Areas requiring Research and Monitoring in Lumimba GMA includes among others the following:-

1. Undertake periodic studies of the fauna particularly amphibians, reptiles, birds and invertebrates in order to update the species inventory for the protected area
2. Advocate for funding on to undertake studies on movement patterns of elephants within the Lumimba and surrounding protected areas
3. Lobby for studies on carnivores to be extended further into the protected area to understand particularly the factors leading to attacks of lions on humans
4. Carry out conservation awareness programmes to ensure the community understand the importance of conserving the fauna through production of local language field guides, formation of conservation clubs and airing of programmes on local radio stations
5. Initiate studies on the factors affecting the population status of birds, reptiles and carnivores
6. Ensure that HWCs studies continue even after SASSCAL project closes down. Particular focus should be on the spatial and temporal occurrence of HWCs
7. There is need to employ re-stocking of the fish species in lagoons and river to replenish the stocks.
8. There is need for introduction of Aquaculture
9. The extent and wide spread of baobab trees within Lumimba GMA and why they are not found growing in one place.
10. Need to introduce Village Resource Management Committees (VRMCS)
11. Need to Introduce Tree planting Projects in Schools
12. Need to establish community woodlots as a source of firewood
13. Need to promote use of energy saving stoves in order to reduce pressure on the Mopane trees.

MANAGEMENT ZONE PLAN

6.1 OVERVIEW

This episode presents the Zoning Scheme for Lumimba GMA. The scheme is designed to harmonize and reconcile the different land-use options of the GMA. It identifies geographical areas within which similar land-uses shall be practised. Importantly, it defines what can and cannot take place in different zones with regards to conservation and development effort. The respective delineated zones constitutes the zone description of natural resources status; zone purpose; zone accessibility; zone visitor use and experience; zone permissible activities; zone permissible developments; zone prohibited activities and zone prohibited developments. Therefore, this chapter establishes four zones for the GMA.

6.2 MANAGEMENT PLAN ZONING CONCEPT

Management zoning is concerned with what should be done and where. The aim is to zone the area in such a way that the activities to be undertaken in each zone would be responsive to needs for enhancing food production capacity, socio-economic empowerment of the local community, without compromising the requirements for sustainable natural resources conservation.

6.3 RATIONALE FOR THE ZONING CONCEPT

A number of things were taken into consideration when developing the zoning scheme for the Protected Areas in order to ensure that it:-

- a) Offers protection to all identified exceptional resources and values;
- b) Takes note of the physical limitations imposed by the landscape and important ecological features;
- c) Provides a diversity of appropriate visitor experience and visitor use levels within the set limits;
- d) Protects all sensitive habitats including the island boundary edges;
- e) Offers dispersal areas and control visitor numbers to ensure quality experience and appropriate numbers, types and placement of tourist facilities within the Protected Areas; and
- f) Provides a better means of surveillance by the Protected Areas Management.

6.4 LIMITS OF ACCEPTABLE USE (LAU)

The regulatory principal for setting parameters of use for different zones of the Protected Areas is that tourists use in the Protected Areas will have primary emphasis on the desired conditions of the resources and values rather than the maximum amount of using the Protected Areas could possibly endure. This GMP is not attempting to maximize on the use of resources by determining the "carrying capacity" of how much use and development the Protected Areas can abide. The concept of "carrying capacity" has been found to advocate for mass tourism, which is against the Zambian approach to tourism that requires low numbers of high paying tourists.

Therefore, the planning effort for this GMP espoused the concept of "Limits of Acceptable Use" (LAU) that are gritty for each zone and the entire Protected Areas. The LAU system lays primary accent on the conditions desired (both physical and social), rather than on the maximum amount of use and development the Protected Areas can endure. The zoning scheme developed for the Protected Areas is steered by the LAU concept through defining the desired future conditions, which must be achieved by implementing the different strategies in the plan.

6.5 MANAGEMENT ZONES

There are four (4) management zones that have been identified for the Protected Areas, namely:-

- a) Forest Reserve Zone
- b) Development Zone
- c) Conservation Limited Use Zone
- d) Tourism Development Zone

6.5.1 Zone I - Forest Reserve Zone

Description: - Covers 29 % (1308.10 km²) of the Lumimba GMA and is composed of the Lundazi National forest, Lumimba Local Forest and Njovu Local forest. These forests are distributed as follows; the larger area is on the north eastern part of Lumimba GMA where new settlements have emerged in the Lundazi National Forest, the second largest is located in Mwanya Chiefdom southern part of the GMA while the other one is located at the middle of the GMA and shared by two chiefdoms; Chitungulu and Kazembe.

Purpose: - To provide for conservation and development of forest with a view to securing the biodiversity and ecosystem of the Luangwa River.

Accessibility:- Road and air

Visitor Use and Experience:-

Photographic Safaris	Birding	Lodging	Research and Education
Hunting	Hiking	Management and Operations	Educational Tours
Honey Collection	Wildfruit Collection	Recreation	Prayer/Worship
Timber Collection	Wood and none wood forest products		Caterpillar collection

Permissible Activities:-

Game Viewing	Birding	Management and Operations		Honey collection	Research and Education	
Photographing	Fish Farming	Timber cutting	Sound Recording		Lodging	Damming
Filming and Bird	Hunting	Educational Touring	Wild fruit collecting		Recreation	Grass Cutting
Fuel wood Collecting	Walking Safaris					

Permissible Development:-

Management and Operations Infrastructure	Camp Sites	Picnic Sites	Roads	Recreation Facilities
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Telecommunication Infra.	Bush Camps	Repeater Stations	Bridges and Culverts	Water point
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Prohibited Activities:-

Pollution	Illegal Logging	Cultivation	Settlements	Grazing
Entry without permit	Removal of beacons			Uncontrolled Fires
Fire any tree, under growth and forest produce	Deforestation (Illegal Charcoal production)			

Prohibited Developments:-

Resettlement Scheme	Saw mills	Settlement	Hotels	Farm block
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6.5.4 Development Zone

Description: - The Development Zone Covers 8 % (365.25 km²) of Lumimba GMA and comprise of the Mwanya Settlements Area, along the Lukusuzi River, Chitungulu Area along the Lumimba River and Kazembe Settlement area along the Lumezi River all these fall in the Valley floor within the Lumimba GMA. This zone includes areas with the highest level of infrastructure facilities and services such as human settlement and basic amenities like education and health. This is where Human activities are currently concentrated. (Settlements, Schools, Clinics, Farms, Lodges, Camps, Hunting, etc)

Purpose: - to provide for human settlement and infrastructure development as well as agriculture and other life enhancement activities.

Accessibility: - Road, Air, Water

Visitor Use and Experience:-

Game Viewing	Bird Viewing/Watching	Fishing	Canoeing
Photographic Safaris	Filming and Bird Sound Recording		Research and Education
Hunting	Walking Safaris		Lodging
Entry and Exit point	Management and Operations		
Recreation	Green market		Shopping and refuelling

Permissible Activities:-

Game Viewing	Bird Viewing/Watching	Fishing	Canoeing
Photographing	Filming and Bird Sound Recording		Research and Education
Hunting	Walking Safaris		Lodging
Fuel wood Collecting	Management and Operations		
Recreation	Buying and selling of goods and services		
Harvest of timber product	Wild fruit and fuel wood collection		Grass Cutting
Mining			

Permissible Development:-

Planned Settlement	Schools	Management Facilities	Research and Education Facilities
Airstrips	Roads	Guest houses	Administrative Infr.
Recreation Facilities	Commercial Infr.		Places of Worship
Electricity Installations	Health Centres		Visitor interpretative Centre
Telecommunication Infra.	Bridges and Culverts		Farms and Gardens

Prohibited Activities:-

Pollution	Large scale Farming	Uncontrolled Fires
Wrong size Fishing gear	Deforestation (Illegal Charcoal production)	Game Ranching
Poaching		

Prohibited Developments:-

Large scale farms	Game Ranch	NO further unauthorised developments and settlements
Tourist Facilities		

6.5.2 Zone 2 - Tourism Development Zone

Description: - The Tourism Development Zone covers 8 % (368.58 km²) of Lumimba GMA and this is the area that follows the Luangwa River on the eastern side. The area forms part of the Luangwa Valley floor and partly covering the stretch from the southern tip and follows the Road RD105 cutting across the Lumimba GMA from the Southern tip to the Northern tip.

Purpose: - To provide for consumptive and non consumptive Tourism and related infrastructure development.

Accessibility: - Road, Water, Air

Visitor Use and Experience:-

Game Viewing	Birding	Fishing & Angling	Canoeing and Boating
Non- Consumptive Tourism	Filming and Bird Sound Recording		Research and Education
Consumptive Tourism	Walking Safaris	Rock Paintings	Lodging Recreation
Entry and Exit point	Management and Operations		

Permissible Activities:-

Lodging	Birding	Game Viewing	Grass Cutting	Fishing	Canoeing and boating
Photographing	Filming and Bird Sound Recording				Research and Education
Hunting	Recreation	Walking Safaris	Controlled Quarrying	Educational Touring	
Fuel wood Collecting	Management and Operations				Wild fruit collecting

Permissible Development:-

Lodges	Electricity Installations	Recreation Facilities	Hunting Camps	Water point
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Camp Sites	Bush Camps	Bridges and Culverts	Picnic Sites	Bore holes
Roads	Entry and Exit points	Ferry & Harbour	Places of Worship	Gardens
Telecommunication Infrastructure		Conservation Schools	Visitor interpretative Centre	
Management and Administrative Infrastructure			Research and Education Facilities	

Prohibited Activities:-

Pollution	Large scale Farming	Photographic Safari	Deforestation	Uncontrolled Fires
Wrong size Fishing gear	Illegal Charcoal production	Hunting at Malanga and Chichele hotspots		

Prohibited Developments:-

Farms	Mining	Further Human settlements	Game Ranch
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6.5.3 Zone 3 - Conservation Limited Use Zone

Description: - The Conservation Limited Use Zone covers 55 % (2458.07 km²) of Lumimba GMA and is the largest part of the GMA which forms part of the Luangwa Valley floor and partly covering the escarpment in the eastern side. It has several natural resources such as wildlife, forests including heritage sites (Fossils, Caves, and shrines) and rich mineral resources.

Purpose:- To provide for conservation, consumptive Tourism, and related infrastructure development while allowing sustainable utilisation of other natural resources.

Accessibility:- Road, Air

Visitor Use and Experience:-

Game Viewing	Birding	Fishing	Hiking	Walking Safaris	Canoeing	Hunting	Recreation
Photographic Safaris	Filming and Bird Sound Recording			Research and Education		Lodging	
Entry and Exit point	Wildfruit Collection		Educational Tours		Timber Collection		Prayer/Worship
Honey Collection			Caterpillar collection			Management and Operations	
Wood and none wood forest products							

Permissible Activities:-

Game Viewing	Birding	Hunting	Recreation	Fishing	Canoeing and boating
Photographing	Filming and Bird Sound Recording			Grass Cutting	Research and Education
Fuel wood Collecting		Walking Safaris	Fish Farming	Lodging	Damming
Controlled Quarrying	Management and Operations		Educational Touring		Wild fruit collecting

Permissible Development:-

Management and Operations Infrastructure			Lodges	Research and Education Facilities			Dams	
Camp Sites	Conservation Schools		Bush Camps	Repeater Stations		Picnic Sites	Hunting Camps	
Roads		Electricity Installations		Gardens		Places of Worship		Bore holes
Telecommunication Infra.		Water point		Bridges and Culverts			Recreation Facilities	

Prohibited Activities:-

Pollution	Game Viewing	Large scale Farming	Uncontrolled Fires
Wrong size Fishing gear	Deforestation (Illegal Charcoal production)		Game Ranching/Conservancy

Prohibited Developments:-

Hotels	Resettlement Scheme	Game Ranches	Large scale Farms	Logging
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“However, it should be noted that tourism products are not static and to this effect, ZAWA shall encourage innovation to include any new tourism products that are environmentally friendly and acceptable. Where need be, ZAWA shall adjust the GMP to allow the implementation of such innovations and new business strategies”.

6.6 ANIMAL POPULATION MANAGEMENT

“Management of animal populations will be based on empirical evidence. Depending on the best available information, Re-introduction, Translocation, Re-enforcement/Supplementation, Benign Introduction, Animal capture and live sales etc, will be carried out for management purposes in GMA”.

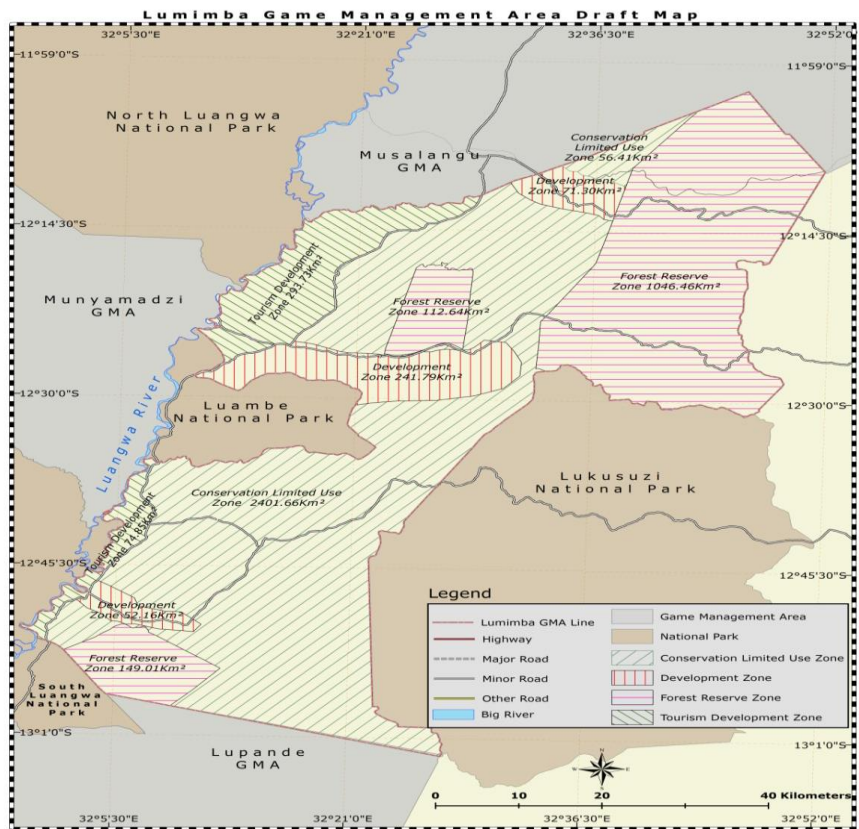


Figure 6.1: Lumimba Game Management Area Management Zones

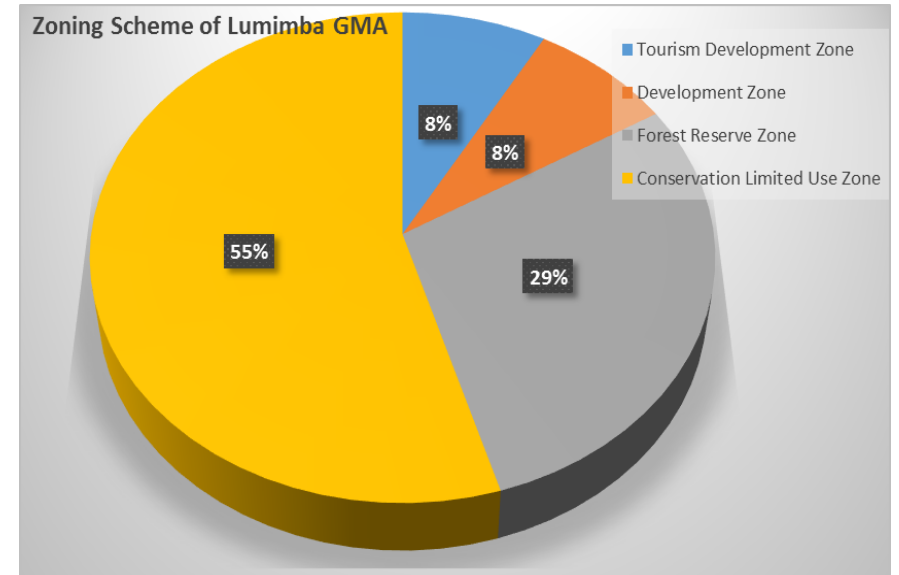


Figure 6.2: Lumimba Game Management Area Management Zones Scheme Percentage (%)

CHAPTER SEVEN

7.0 ENVIRONMENTAL CONSIDERATIONS

7.1 OVERVIEW

The environmental considerations of the General Management Plan for Lumimba GMA provides a formalized approach for dealing with the environmental impacts of the plan with a view to providing enough information to enable management make informed decisions on the environmental consequences of developmental proposals in the GMA. All developments to be implemented are expected to have environmental impact assessment studies undertaken. These impacts need to be assessed and mitigated in order to ensure that developmental projects are consistent with the objectives of this General Management Plan.

7.2 ENVIRONMENTAL IMPACT ASSESSMENT

All developmental projects in Lumimba GMA will be subjected to either an Environmental Impact Assessment (EIA) or an Environmental Project Brief (EPB) as required by the Zambia Wildlife Act No. 12 of 1998 and Environmental Management Act (EMA) No. 12 of 2011.

7.3 STRATEGIC ENVIRONMENTAL ASSESSMENT

Where as EIAs are site specific, the Strategic Environmental Assessment (SEA) addresses issues/impacts at higher level. This is undertaken to evaluate the environmental consequences of proposed policies, plans or programmes associated with the management of the whole GMA.

7.4 MITIGATION MEASURES FOR POTENTIAL NEGATIVE ENVIRONMENTAL IMPACTS

Mitigation measures against negative environmental impacts on the environment for each developmental project shall comply with the appropriate or nearest measures described under the EMA and other relevant legislations in the country. In addition, the Management team for the GMA shall enforce any other measures that would further secure the environment as long as such measures are not practically unreasonable and are well communicated to the affected party.

CHAPTER EIGHT

8.0 STRATEGIC INVESTMENT MANAGEMENT ACTION PLAN

8.1 INTRODUCTION

The Strategic Investment Management Action Plan (SIMAP) is developed in respect of the six main themes - Natural Resources, Management and Operations, Local Community, Heritage Resources, Cross-cutting and Management Zoning. This SIMAP will be subject to review every five years.

The SIMAP is executed through a “SMART” approach. The tasks must be Specific, Measurable, Agreed, Realistic, and Time-bound. Based on their significance, urgency and duration required for implementation, the Action Plans are classified into nine options shown in Table 8.1 below. The time-frame of implementing the SIMAP is based on three scenarios whose implementation is:-

- a) Scenario 1: Within 2 years of ratifying the GMP;
- b) Scenario 2: Within 2 - 4 years of ratifying the GMP;- and
- c) Scenario 3: Beyond 4 years of ratifying the GMP.

Table 8.1: Options, Period, Priority and number of years of implementing the SIMAP

Options	Period	Priority	Number of Years
1	Short Term	High	1-2
2	Short Term	Medium	1-2
3	Short Term	Low	1-2
4	Medium Term	High	2-4
5	Medium Term	Medium	2-4
6	Medium Term	Low	2-4
7	Long Term	High	4-5
8	Long Term	Medium	4-5
9	Long Term	Low	4-5

Table 8.2: The Strategic Investment Management Action Plan

Themes	Management Problems	Management Objectives	Activities	Strategy	Priority	Time Frame	Responsibility Lead & Other Organisations	Estimated Cost (US\$) Per Annum	Possible Sources of Funding
Natural Resources	Inadequate Research and Monitoring Programs	a) Identify research and monitoring programmes	b) Developing a research and monitoring programme c) Holding workshops to disseminate research results to stakeholders	a) Produce and submit research proposals for funding b) Establish databases for biodiversity research capture and dissemination c) Identify research gaps	High Short term	Ongoing	ZAWA, MAL, FD, DOF, MET, CRB	100,000.00	CP, NGOs, ZAWA,
	Illegal Harvesting of Natural Resources (fish, forestry, wildlife, mineral resources).	c) To enhance protection measures aimed at reducing illegal off takes of natural resources. d) To enhance settlements within the GMA based on the agreed zonation contained in the GMP in consultations with local leadership, Council and ZAWA.	a) Recruiting law enforcement staff to undertake patrols b) Sensitizing the local communities on the negative aspect of illegal off-take of natural resources c) Providing alternative sources of livelihoods d) Allocating new settlements within the agreed zones	a) Recruit and train law enforcement officers b) Hold meetings and print sensitization materials c) Identify and provide suitable Enterprises for livelihoods d) Establish and disseminate bye-laws to provide guidelines on suitable zones for settlements	High Short term	Ongoing	ZAWA, DOF, FD, MAL, CRB, District Council, NGOs, Mining	300,000.00	CP, NGOs, ZAWA

Prone to Drought and Floods.	c) To promote measures to mitigate adverse climatic conditions	a) Acquiring climate data and information b) Introducing and promoting drought/flood resistant varieties of crops c) Introducing water harvesting and storage mechanisms	a) Procure and install met equipment to provide monitor local climatic conditions b) Strengthen capacity for conducting research and carrying out extension services c) Identify suitable sites for installation of water harvesting and storage infrastructure facilities	High Short term	Ongoing	MAL, ZAWA, CRB, MET, DMMU, Water affairs	800,000.00	CPs, GRZ, NGOs
Land degradation (salinization, soil erosion, low plant nutrient reserves-low phosphorus and carbon) & siltation	b) To provide and promote soil, water and land conservation including soil fertility technologies	a) Promoting sustainable agriculture b) Disseminating information on integrated soil fertility management with community participation	a) Promote mobile training and demonstrations on sustainable agriculture b) Produce field guides, handbooks/manuals on ISFM techniques c) Translate field guides/handbooks into local languages	High Short term	Ongoing	MAL, CRBs, ZAWA,	20,000.00	NGOs, GRZ
Unsafe drinking water	c) To enhance awareness in safe water management in the communities of the GMA. d) To provide water resources	a) Disseminating information to the local communities on management of water in the GMA b) Identifying suitable sites for water close to the community	a) Hold meetings with the communities b) Undertake surveys to identify sites for boreholes/weirs /tanks/canals c) Install solar/wind boreholes/canals/weirs	High Short term	Ongoing	MAL, CRBs, ZAWA, Water affairs, ZEMA	85,000,000.00	NGOs, GRZ, CPs

		close to the communities							
	Uncontrolled bushfires in the GMA	a) To reduce the incidents of uncontrolled bushfires in the GMA	b) Establishing fire management guidelines c) Sensitizing the community on fire management	a) Develop a community based fire management plan b) Dissemination of information to the community	Medium Short term	Ongoing	ZAWA, MAL, CRBs,	20,000.00	CPs, GRZ, NGOs
	Occurrence of wildlife diseases (e.g. anthrax)	Provide monitoring and prevention mechanisms	a) Assessing the prevalence of disease occurrences b) Identify hotspots locations of disease occurrence and map them out.	a) Train and use of qualified personnel for disease detection equipped with appropriate test kits; b) Sensitize communities	Medium; Short term	On-going	ZAWA ; MoAL_ Vets, CRBs,	30,000	ZAWA, GRZ, NGOs, CPs
Operations and Management	Inadequate Operational Logistics.	To acquire adequate operational logistics.	Preparing budgets for all necessary equipments, organisational capacity and infrastructure requirements	A) Improve communication and systems through source for funding B) Need for accountability and transparency in financial and material resources.	Long term and high priority	On going	GRZ, ZAWA, CRB	200,000	GRZ, CRBs, Local Authorities, Corporative partners etc
	Lack of transport for operations	To provide adequate transport	Prepare tender documents for procurement of vehicles	Sourcing for funds	Short term and high	5 years	GRZ, ZAWA CRBs, Tour operators	100, 000	GRZ, ZAWA CRBs, Tour operators

							and corporate partners etc		and corporate partners etc
	Inadequate field staff	To recruit and train adequate field staff	A) Sourcing fund B) Carrying out recruitment	C) Write proposals D) Identify sources of funding E) Process the application for recruitment	Long term and high	1 to 2 years	GRZ, ZAWA CRBs, Tour operators, Local Authorities	50,000	GRZ, ZAWA CRBs, Tour operators, Local Authorities
	Conflicting among competing land uses	To sensitise and resettle unplanned settler in the Forest Reserve.	A) Zoning Lumimba GMA through participatory strategic planning process Enforce the zonation plan	Implement and enforce all provisions of the GMP	Short and high	On going	GRZ, ZAWA, CRB Traditional and Local Authority	100,000	GRZ, ZAWA, CRB Traditional, Local Authority, corporate partners
	Insufficient funds for operation	To Increase funding for operations	Prepare budgets	A) Source for funds and procure budgeted items B) Ensure accountabilit y and transparency in financial and material resources.	Short and high	On going	GRZ, ZAWA, CRB, NGOs and Corporate partners	100,000	GRZ, ZAWA, CRB, NGOs and Corporate partners etc

	Inadequate accommodation for staff and offices	To increase and improve infrastructure in the GMA	A) Constructing staff and office accommodation B) Rehabilitating and up grading of existing staff and office accommodation	A) Source for funds Hire of contractor to construct, rehabilitate and upgrade office and staff accommodation	Long term and high	On going	GRZ, ZAWA, CRB, Corporative partners, NGO etc	1.400,000	GRZ, ZAWA, CRB, Corporative partners, NGO etc
	In adequate wildlife camps	To increase number of wildlife camps	To identify suitable new site	A) Source for funds B) Hire of contractor to construct office and staff accommodation	Short term an high	1 to 5 years	GRZ, ZAWA, CRBs, Local Authorities Corporative partners, NGO	1,000,000	GRZ, ZAWA, CRBs, Local Authorities Corporative partners, NGO
	Undefined National Park and GMA boundaries	To ensure that the National and GMA boundaries are defined.	Lobby for funds Request Ministry of land to clearly demark boundaries for protected areas.	A) Prepare proposals B) Invite surveys to demarcate boundaries Arrange meetings with ZAWA, Local community through CRBs and Chiefs	Medium term and high	On going	GRZ, ZAWA, CRBs, Chiefs and Local Authorities	20,000	GRZ, ZAWA, CRBs, Chiefs and Local Authorities
	Illegal mining of gemstone	To regulate the mining of gemstones in GMA	To monitor legal and illegal mining activities in the	Monitor and enforce law to stop illegal mining in the GMA	Long term and high	On going	Mine Dept, ZAWA, CRB,	60,000	Mine Dept, ZAWA, CRB,

	.		GMA				Chiefs and Local Authority		Chiefs and Local Authority
	Inadequate financial support of community resources board	To provide prompt financial support to CRBs	Improve on reimbursement of funds to the CRB by ZAWA	a) Revenues must submitted on time	Short term and high	Immediate	ZAWA	140,000	ZAWA
Visitors Use and Experience	Uncontrolled movement in hunting areas during hunting periods.	To reduce uncontrolled movement within hunting areas”	Sensitize the community at the start and end of the hunting season To implement and enforce control measures on human movement on hunting areas	Conduct sensitisation meeting for fishers and local communities	High Medium Term	On going	ZAWA, Civic Leaders, Traditional Leaders, CRB	30, 000	ZAWA, CRB, NGOs, Hunting Outfitters
	Poor communication network	To put up the telecommunication mask	To Lobby the Mobile Communication companies to install telephone mast	Construction of Mobile Telecommunication mast within the GMA	Medium Short Term	2-4 years	GRZ, ZATEC	9000 000	GRZ and ZICTA
	Inadequate tourist’s facilities	To increase tourism facilities	Construct more tourist facilities	Construction of Lodges and Bush Camp	High Short Term	On going	NGOs, CP	1000,000	NGOs, CP
	Inadequate Air strips	To increase the number of Airstrips	To construct more Air Strips	Construction of the Air Strip within the GMA	High Medium Term	2-4	GRZ,CRB, CP	6000,000	GRZ, CP
	Limited participation and support of local communities in tourism activities	To improve the participation and support for local communities in tourism activities	Sensitization of the community to participate in tourism activities	To conduct sensitization meetings within the GMA	High Medium Term	On going	CRBs, NGOs	45,000	ZAWA, Outfitters, CRBs
Local Community	Poor sanitation &	To improve sanitation and	a) Drilling/sinking	d) To construct VIP latrines	Short term and high	On – going	LDC, CRB, MCDMCH,	1,180,000	LDC, CRB, MCOMCH,

Associated Management	water	water.	boreholes b) Construction of VIP latrines c) Sensitizing the community	within the settlement area e) To drill more bore holes in the settlement area.	priority		CPs, etc		CPs, etc
	Inadequate health facilities.	Adequate health facilities	Building more health facilities and lobby for more trained health personnel	a) To construct more healthy centres. b) Three (3) hospitals must be constructed in the settlement areas. c) To construct staff houses in the existing health centres. d) Need for more health trained staff.	Long term and high	On – going	MOH, GRZ, NGOs, COUNCIL etc	1,000,000,000	MOH, GRZ, NGOs, COUNCIL etc
	Inadequate schools	Adequate schools	Build more schools	a) To improve existing high schools & upgrade community schools to primary schools. b) To construct more house facilities for the stuffs	Long term and high	On - going	MOE, CRB, PTA, NGOs, COUNCIL, etc	1,000,000,000	MOE, CRB, PTA, NGOs, COUNCIL, etc
	Inadequate financial support of community	To provide prompt financial support to CRBs	Improve on reimbursement of funds to the CRB by ZAWA	Revenues must submitted on time	Short term and high	Immediate	ZAWA	140,000	ZAWA

	resources board								
Heritage Resources	Undeveloped Heritage sites	To develop heritage sites infrastructure	Constructing camp sites, lodges around heritage sites	Write proposals/concept papers for possible funding	High Short Term	On going	NHCC, ZAWA, CRB, GRZ, CP	100000	NHCC, ZAWA, CRB, GRZ, CP
	Poor accessibility of heritage sites	To develop access road infrastructure and site trails	Constructing access roads and trails to heritage sites	NHCC to apply as road authority to RDA	High Short Term	On going	NHCC, ZAWA, CRB, GRZ, CP	30,000000	NHCC, ZAWA, CRB, GRZ, CP
	Inadequate publicity on heritage sites.	To provide information on heritage sites	Designing Information Education Communication Materials, Packaging and Marketing	<ul style="list-style-type: none"> To produce site inventories, brochures, flyers, adverts and any other Information Education and Communication materials for Lumimba GMA. To effectively market the heritage resources through the Ministry of Tourism Arts and Culture, ZTB, Hospitality Industry (HCAZ) and other key stakeholders. 	High Short Term	On going	NHCC, ZAWA, CRB, GRZ, CP	100000	NHCC, ZAWA, CRB, GRZ, CP
	Lack of heritage personnel in the Lumimba GMA/districts	To have adequate heritage personnel in Lundazi district	Employ Heritage Personnel in Lundazi District	Hire qualified Heritage Personnel	High Short Term	On going	NHCC, ZAWA, CRB, GRZ, CP	150000	NHCC, ZAWA, CRB, GRZ, CP
	Inadequate collaboration	To improve collaboration among	Undertaking joint field operation in resources	<ul style="list-style-type: none"> Sign memorandum 	High Short Term	On going	NHCC, ZAWA,	50000	NHCC, ZAWA,

	among the stakeholders of the GMA in heritage resources management.	stakeholders	conservation	of understanding with all stakeholders <ul style="list-style-type: none"> • Carry out regular joint meetings with all stakeholders • Share Information 			CRB, GRZ, CP		CRB, GRZ, CP
	Lack of local authority development and investment plans on heritage resources	To have development and investment plans on heritage resources at local level	<ul style="list-style-type: none"> • Formation of local Committees. • Capacity build local communities 	<ul style="list-style-type: none"> • To develop strategic management plans at community levels • To form effective committees to monitor developmental activities of heritage resources 	High Short Term	On going	NHCC, ZAWA, CRB, GRZ, CP	50000	NHCC, ZAWA, CRB, GRZ, CP
Cross Cutting Themes	High Incidences of Poaching	a) To Increase Community Awareness on Poaching and its negative effects. b) To Increase Man Power to Conduct Anti-Poaching Patrols. c) To reinforce current anti-poaching facilities. d) Resettlement of illegal settlers.	a) Organising radio programmes. b) Sensitizing Communities within the GMA. c) Organising drama performances. d) Advertising, interviewing and recruiting additional WPO. e) Erecting road barriers (gates) at strategic points.	a) Organise conservation awareness meetings. b) Recruit and train more Anti-Poaching Personnel. c) Mount effective road blocks. d) Relocate illegal settlers.	Long Term and High Priority	On-Going	ZAWA, SLCS, CRBs, NGOs, GRZ	300,000	ZAWA, CRB, GRZ, NGOs, CPs, SLCS
	Poor road infrastructure	Construct, rehabilitate/upgrade	a) Carrying out regular grading of	a) Carry out periodic maintenance of	Long Term and High	On-Going	GRZ, RDA,	5,000,000	GRZ/ Mainstream

		the road network in the GMA	<ul style="list-style-type: none"> b) Replacing and constructing culverts on water crossing points. c) De-silting the culverts where appropriate. d) Re-graveling the roads. e) Constructing and maintaining access road drainages. f) Erecting road signages. 	<ul style="list-style-type: none"> existing roads and road culverts. b) Construct new road links. c) Construct road drainages 	Priority		ZAWA, NGOs, Disaster Mgt. Team		ing Project, RDA, ZAWA, CPs
	Human wildlife conflict	<ul style="list-style-type: none"> a) To encourage innovative human wildlife conflicts mitigation measures like chilli fencing, solar fences chilli blasting, improved agriculture systems, etc b) To conduct population and behavioural studies in specific problem animals 	<ul style="list-style-type: none"> a) Identifying, mapping and securing key animal movement routes/corridors. b) Erecting chilli fencing around crop fields. c) Lobbying for the enactment of law for assistance/compensation of HWC victims and public servitude along rivers. d) Sensitizing communities on how to protect themselves from dangerous animals. 	Implement mitigation measures on HWC.	Long Term and High Priority	On-Going	ZAWA, CRBs, SLCS WCS, NGO	60,000	ZAWA, CRBs, SLCS, GRZ, CPs, MTA
	Inadequate implementation of the	Institutionalise and implement the National Gender	<ul style="list-style-type: none"> a) Determining the current male – female ratio on 	<ul style="list-style-type: none"> a) Screen governance structures to ascertain number of 	Long Term and High Priority	On-Going	GRZ, Ministry of gender and	15,000	GRZ,

	National Gender Policy	Policy	established governance structures. b) Designing a recruitment plan to meet policy needs (minimum of 30% females on all establishments).	representatives/ employees and their gender. b) Address identified shortfalls on the establishments to meet policy needs.			women development.		
	Inadequate implementation of the National HIV and AIDS Policy	Institutionalise and implement the National HIV and AIDS Policy	a) Conducting sensitisation meetings on the importance of the implementation of the National HIV and AIDS policy. b) Holding workshops to dis-stigmatise HIV and AIDS c) Conducting voluntary counselling and testing a)d) Providing ARVs to enhance positive living	a) Identify and train HIV/AIDS peer educators b) Secure ARVs and condoms and distribute according to need c) Conduct voluntary counselling and testing	Long Term and High Priority	On-Going	MOH, DATF, NGOs, ZAWA, CRBs, MDC,	70,000	Zambia National AIDS Council, MOH, NGOs, CPs
	Inadequate Sensitization of Ebola	Implement sensitisation campaigns on Ebola within the GMA	Conduct sensitisation workshops and meetings	a) Put in place preventive measures b) Employ more health personnel	Short term & High Priority	On going	MoH, DMMU, NGOs, CRB, CPs etc	200,000	MoH, DMMU, NGOs, CRB, CPs etc

CHAPTER NINE

9.0 IMPLEMENTATION PLAN

9.1 OVERVIEW

The over arching principal objective of the implementation plan is to guide the mobilization of required resources in order to secure the environment and create a platform for socio-economic development to promote conservation based socio economic development in the GMA. The implementation plan is based on the SIMAP developed in relation to the respective identified management problems, management objectives and the management zones. In addition, a monitoring and evaluation framework will guide the implementation plan.

9.2 MONITORING AND EVALUATION

Monitoring and Evaluation (M and E) of the implementation of the GMP will be done on a continuous basis. This will be used to assess delivery and identify difficulties to ascertain problem areas in which appropriate remedial actions shall be required.

9.3 FEEDBACK

Outcomes of the evaluation will be fed back to the original plan. This process will provide measures to improve management situations and guide further decisions.

Table 9.1: A Five Year Implementing Plan for Lumimba GMA GMP

No	Mgt. Problem	Mgt. Objective	Expected Output	Activities	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Measurable Indicator	Means of Verification	Important Assumption
Natural Resources Management Implementation Plan												
1	Inadequate Research and Monitoring Programs	a) Identify research and monitoring programmes	a) Monitoring tools and systems developed. b) Information for management decisions Generated. c) Research strategies/tools and systems for the valley ecosystem developed	a) Developing a research and monitoring programme b) Holding workshops to disseminate research results to stakeholders						a) Number of research topics identified and researched. b) Number of management decisions informed by research and monitoring output.	a) Research strategy papers/manuals developed. b) Reports of research workshop proceedings.	a) Financial resources mobilised to finance the undertaking of the proposed research activities. b) Organizations transfer of skills through training and information exchange.
2	Illegal Harvesting of Natural Resources (fish, forestry, wildlife, mineral resources).	a) To enhance protection measures aimed at reducing illegal off-takes of natural resources. b) To enhance settlements within the GMA based on the agreed zonation scheme	Sustainable harvesting of natural resources attained.	a) Recruiting law enforcement staff to undertake patrols b) Sensitizing the local communities on the negative aspect of illegal off-take of natural resources c) Providing alternative sources of						a) Number of people arrested and prosecuted. b) Number of patrol man days achieved per quarter. c) Number of community sensitisation workshops held on illegal harvesting of natural resources per quarter.	a) Patrol reports. b) Court records. c) Reports of natural resources awareness campaign meetings or workshops held.	a) CRB have adequate resources to carry out its mandate. b) Adequate resources to undertake patrols. c) Desire of extension Officers to undertake community sensitisation meetings.

		contained in the GMP in consultations with local leadership, Council and ZAWA.		livelihoods d) Allocating new settlements within the agreed zones															
3	Prone to Drought and Floods.	a) To promote measures to mitigate adverse climatic conditions	b) Innovation techniques to adapt to climate variability developed. c) Water for wildlife to drier parts of the GMA supplied. d) Food insecurity mitigated through innovation and technology.	a) Acquiring climate data and information b) Introducing and promoting drought/flood resistant varieties of crops c) Introducing water harvesting and storage mechanisms													a) Number of boreholes drilled and dams constructed in the Lumimba GMA. b) Number of drought resistant crops introduced in the GMA per year. c) Number of food reserves established in the GMA.	a) Yearly aridity / drought situation reports in the GMA. b) Yearly reports on the drilled boreholes and constructed dams. c) Annual reports on introduced drought resistant crops in the GMA and food reverse completion works certification certificates.	Availability of funds to drill bore holes, construct dams and conduct research and mitigate food insecurity.
4	Land degradation (salinization, soil erosion, low plant nutrient)	a) To provide and promote soil, water and land conservation including soil fertility technologies	Land degradation and siltation mitigated through improved soil conservation technique, afforestation, vetiver grass	a) Promoting sustainable agriculture b) Disseminating information on integrated soil fertility management													a) No. of soil research studies conducted. b) Hectarage of degraded land rehabilitated.	a) Soil research study reports. b) Land degradation completion works certification certificates.	Availability of funds to conduct research in soils and rehabilitate degraded lands.

	reserves-low phosphorus and carbon) & siltation		planting and employing appropriate farming techniques.	with community participation															
5	Unsafe drinking water	a) To enhance awareness in safe water management in the communities of the GMA. b) To provide water resources close to the communities	Availability of safe drinking water.	a) Disseminating information to the local communities on management of water in the GMA b) Identifying suitable sites for water close to the community													a) No. of community meetings held on safe drinking water. b) No. of Boreholes drilled. c) No. of VIP latrines built.	a) Community meeting proceeding reports or minutes. b) Drilled boreholes completion works certificates.	Availability of funds to provide safe drinking water.
6	Uncontrolled bushfires in the GMA	To reduce the incidents of uncontrolled bushfires in the GMA	a) Fire management plan for the GMA produced b) Incidences of uncontrolled bush fires reduced	a) Establishing fire management guidelines b) Sensitizing the community on fire management													Number of unplanned occurrences/incidences of fire per annum	Annual reports on the incidences of fires in the GMA	Availability og funds to develop a fire management plan, conduct research on fires and formulate a fire monitoring system.
7	Occurrence of wildlife diseases (e.g. anthrax)	Provide monitoring and prevention mechanisms	a) Assesments of disease occurances done b) Hot spots locations of disease occurance identified	a) Assessing the prevalence of disease occurrences b) Identify hotspots locations of disease occurrence and map them out.													Number of occurrences/incidences of wildlife diseases per annum	Annual reports on the incidences of wildlife diseases in the GMA	Availability of funds to procure equipment for prevention of wildlife diseases

Management and Operations Implementation Plan																
1	Inadequate Operational Logistics.	To acquire adequate operational logistics.	Adequate operational logistics procured and provided.	Preparing budgets for all necessary equipments, organisational capacity and infrastructure requirements										Number of procured operational logistical requirements.	Register of procured operational logistics.	Availability of funds to procure operational logistics.
2	Lack of transport for operations	To provide adequate transport	Adequate operational logistics procured	Prepare tender documents for procurement of vehicles										Number of procured operational logistics	Goods Received Note of procured operational logistics	Availability of funds to procure operational logistics
3	Inadequate field staff	To recruit and train adequate field staff	Adequate field staff	a) Sourcing for logistical support b) Carrying out recruitment										Number of field staff recruited	Report of training/recruitm ent undertaken	Availability of funds to conduct recruitment/trainig
4	Conflicting among competing land uses	To sensitise and resettle unplanned settler in the Forest Reserve.	GMP zonation scheme adopted	a) Zoning Lumimba GMA through participatory strategic planning process b) Enforce the zonation plan										a) GMP for the GMA ratified, approved and operationalised . b) Conformity of the land use options integrated through the annual operational work plans	a) Quarterly, bi-annual and annual operational reports. b) Annual review report of GMP implementat ion	a) Availability of funds to implement the annual operational work plan. b) GMP implementatio n of the Lumimba GMA
5	Insufficient funds for operation	To Increase funding for operations	Adequate funds	Prepare budgets										Increased allocation of funds	Financial reports	Proposals to source for funds
6	Inadequate accommoda	To increase and improve	Adequate infrastructure at all	a) Constructing staff and										Number of officers and housing unit	Construction works	Availability of funds for

	tion staff for and offices	infrastructure in the GMA	ZAWA sectors/sub-sector	office accommodation b) Rehabilitating and up grading of existing staff and office accommodation												constructed	summary reports	construction
7	In adequate wildlife camps	To increase number of wildlife camps	Adequate wildlife camps and staff	To identify suitable new site												Number of wildlife camps established per year	Progress reorts on the construction works	Non availability of funds
8	Undefined National Park and GMA boundaries	To ensure that the National and GMA boundaries are defined.		Lobby for funds Request Ministry of lands to clearly demark boundaries for protected areas.														
9	Illegal mining of gemstone .	To regulate the mining of gemstones in GMA	Reduced incidences of illegal mining activities of gemstones	To monitor legal and illegal mining activities in the GMA												a) Number of reports on illegal mining activities b) Number of monitoring officers recruited	Reports on numbers of monitoring officers employed	Non availability of funds
10	Inadequate financial support of community resources board	To provide prompt financial support to CRBs	Adequate financial support	Improve on reimbursement of funds to the CRB by ZAWA												Amount of money disbursed	Quarterly and annual financial statements and report	Non availability of funds
Visitor Use and Experience Management Implementation Plan																		

1	Uncontrolled movement in hunting areas during hunting periods.	To reduce uncontrolled movement within hunting areas”	Human movement is controlled and its disruptions to hunting minimized	a) Sensitize the community at the start and end of the hunting season b) To implement and enforce control measures on human movement on hunting areas												a) Community sensitization meetings held b) Human movement during hunting period c) Incidences of disruption to hunting from human movement	a) Minutes and progress reports from meetings b) Movement data	Community willing to forego activities in identified areas of GMA
2	Poor communication network	To put up the telecommunication mask	Tower site identified & towers erected	To Lobby the Mobile Communication companies to install telephone mast												Number of mast/ tower constructed per year	Works completion certificates.	Availability of funds.
3	Inadequate tourist’s facilities	To increase tourism facilities	Tourism accommodation in the GMA established	Construct more tourist facilities												a) Visitor Information centre constructed and equipped b) Tourism accommodation constructed	Actual building(s) and certification of works completion	Availability funding
4	Inadequate Air strips	To increase the number of Airstrips	a) Adequate Air strips established b) Planes landing	To construct more Air Strips												Number of tourist increased	Tourist statistics record	Availability of funds
5	Limited participation and support of local communities in tourism	To improve the participation and support for local communities in tourism activities	Participation of local community in tourism activities enhanced	Sensitization of the community to participate in tourism activities												Number of local community participating in tourism activities per CRB	Tourism facilities owned by locals	Willingness of local community participate in tourism activities

	activities																
Local Community Associated Management Implementation Plan																	
1	Poor sanitation & water	To improve sanitation and water.	Sanitation improved through construction of VIP toilets and drilled boreholes.	a) Drilling/ sinking boreholes b) Construction of VIP latrines c) Sensitizing the community											a) Number of boreholes drilled. b) Number of VIP toilets built.	Reports on the number of boreholes & VIP toilets built	Willingness of all stakeholders to cooperate.
2	Inadequate health facilities.	Adequate health facilities	Input allocated to the District increased	Building more health facilities and lobby for more trained health personnel											Number of health facilities built per year.	Completion works certificates.	Availability of funds.
3	Inadequate schools	Adequate schools	Adequate schools constructed and up graded.	Build more schools											Number of schools built per year.	Completion works certificate.	Availability of funds.
4	Inadequate financial support of community resources board	To provide prompt financial support to CRBs	Effective management of the GMA by the CRBs	Improve on reimbursement of funds to the CRB by ZAWA											Amount of money disbursed to the CRB	Annual and quarterly financial reports	Availability of funds

Heritage Resources Management Implementation Plan																	
1	Undeveloped Heritage sites	To develop heritage sites infrastructure	All sites surveyed, mapped, documented and market ed.	Constructing camp sites, lodges around heritage sites											Number of heritage sites surveyed, mapped and marketed per year.	Reports on the heritage sites survey, mapping, and marketing	Cooperation among stakeholders.
2	Poor accessibility of heritage sites	To develop access road infrastructure and site trails	Trails identified and developed with signages leading to the heritage sites.	Constructing access roads and trails to heritage sites											No. of trails and signage posts developed leading to heritage sites.	Works completion certificates.	Availability of funds.
3	Inadequate publicity on heritage sites.	To provide information on heritage sites	Publicity of heritage sites attained through promoting radio education programmes, sensitizing communities on the importance and need to conserve heritage sites and providing brochures and other media materials on heritage sites in the GMA.	Designing Information Education Communication Materials, Packaging and Marketing											Numbers of classified Heritage sites identified i.e. potential for tourist attraction and non tourism cultural heritage.	a) Data collection and survey reports. b) Documentaries produced.	Availability of funds to collect data, produce documentaries and other publicity materials.
4	Lack of heritage personnel in the Lumimba GMA/districts	Presence of Heritage personnel in Lundazi district	Adequate heritage personnel	Employ Heritage Personnel in Lundazi District to spearhead projects in the GMA											Number of personnel hired	Contract of employment, monthly returns	Availability of funds to pay heritage employees.

5	Inadequate collaboration among the stakeholders of the GMA in heritage resources management .	To improve collaboration among stakeholders	Series of meetings aimed at creating net works and coordination among stakeholders in the GMA on the sustainability and protection of the heritage resources held.	Undertaking joint field operation in resources conservation												Number of meetings held per quarter among the stakeholders.	Reports of quarterly meeting proceedings among stakeholders.	Cooperation among stakeholders.
6	Lack of local authority development and investment plans on heritage resources	To have development and investment plans on heritage resources at local level	a) Development and Investment plans on heritage sites developed	a) Formation of local Committees. b) Capacity build local communities												Effectiveness of plans developed and achievements	Number of workshops and meetings held	Willingness of all stakeholders to work together
Cross-cutting Management Implementation Plan																		
1	High Incidences of Poaching	a) To Increase Community Awareness on Poaching and its negative effects. b) To Increase Man Power to Conduct		a) Organising radio programmes. b) Sensitizing Communities within the GMA. c) Organising drama performances. d) Advertising, interviewing and recruiting additional WPO.												a) Increase in the number of animal population numbers. b) Patrol man-days achieved by WPO per quarter. c) Number of snares collected per year. d) Number of awareness sensitisation	a) Reports of annual animal population census. b) Patrol reports. c) Reports of awareness campaign meetings. d) Socio-economic survey reports.	Availability of funds.

		Anti-Poaching Patrols. c) To reinforce current anti-poaching facilities. d) Resettlement of illegal settlers.		e) Erecting road barriers (gates) at strategic points.										campaigns conducted per year. e) Number of alternative livelihood initiatives introduced per year.		
2	Poor road infrastructure	Construct, rehabilitate/upgrade the road network in the GMA	All Road Network in the GMA upgraded to all weather roads and infrastructure improved.	a) Carrying out regular grading of roads b) Replacing and constructing culverts on water crossing points. c) De-silting the culverts where appropriate. d) Re-graveling the roads. e) Constructing and maintaining access road drainages. f) Erecting road signages.										a) Kilometres of road network upgraded per year. b) Number and type of infrastructure upgraded within a period of five years.	Completion certificate works on roads and infrastructure.	Availability of funds from RDA / GRZ to upgrade poor road networks and infrastructure.
3	Human wildlife conflict	a)To encourage innovative human	Human wildlife protocols for reducing HWC developed.	a) Identifying, mapping and securing key animal										Number of HWC occurrences/incidences in the GMA per year.	a) HWC incident reports. b) Human	Availability of funds to mitigate HWC in the GMA.

		<p>wildlife conflicts mitigation measures like chilli fencing, solar fences chilli blasting, improved agriculture systems, etc</p> <p>b)To conduct population and behavioural studies in specific problem animals</p>		<p>movement routes/corridors.</p> <p>b) Erecting chilli fencing around crop fields.</p> <p>c) Lobbying for the enactment of law for assistance/compensation of HWC victims and public servitude along rivers.</p> <p>d) Sensitizing communities on how to protect themselves from dangerous animals.</p>													<p>wildlife protocols.</p>	
4	Inadequate implementation of the National Gender Policy	Institutionalise and implement the National Gender Policy	The National Gender Policy institutionalised and implemented.	<p>a) Determining the current male –female ratio on established governance structures.</p> <p>b) Designing a recruitment plan to meet policy needs of 50-50 male-female representation</p>												<p>Equal participation of male - female on all establishments as per United Nations requirement.</p>	<p>Yearly male – female ratio comparison reports.</p>	<p>Availability of funds to determine the yearly male – female ratio on established governance structures.</p>

5	Inadequate implementation of the National HIV and AIDS Policy	Institutionalise and implement the National HIV and AIDS Policy	The National HIV and AIDS Policy institutionalised and implemented.	<ul style="list-style-type: none"> a) Conducting sensitisation meetings on the importance of the implementation of the National HIV and AIDS policy. b) Holding workshops to dis-stigmatise HIV and AIDS c) Conducting voluntary counselling and testing Providing ARVs to enhance positive living 												<ul style="list-style-type: none"> a) Number of sensitisation meetings / workshops held on the importance and stigmatise of HIV and AIDS per year. b) Number of people attending the voluntary counselling and testing per year. c) Number of people on ARVs per year. 	<ul style="list-style-type: none"> a) Reports of the sensitisation meetings/ workshops on the importance and stigmatise of HIV and AIDS. b) Records of people attending the voluntary counselling and testing. c) Records of people on ARVs. 	Availability of funds to institutionalise and implement the National HIV and AIDS Policy.
6	Inadequate Sensitization of Ebola	Implement sensitisation campaigns on Ebola within the GMA	Adequate sensitisation campaigns on Ebola	Conduct sensitisation workshops and meetings												<ul style="list-style-type: none"> a) Number of sensitisation campaigns held b) Number of preventive measures undertaken 	Sensitisation workshop reports	Availability of funds for Ebola sensitisation campaigns/workshops

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LIST OF APPENDICES

Appendix I: Recommended Size of Land for different Types of Tourism Facilities

No.	Type of Tourism Facility *	Size (Hectares)	Remarks
1.	Safari Lodge	At Most 5	Includes 1 ha for workers compound
2.	Safari Camp	At Most 3.5	Includes 0.5 ha for workers compound
3.	Bush Camp	At Most 2	
4.	Fly Camp	At Most 1	Include seasonal and temporary fly camps
5.	Camp Site	At Most 1	Include high and low cost camp sites

* All tourist facilities should be at a recommended spacing of five (5) kilometers.

Appendix II. Checklist of Mammals in Lumimba Game Management GMA

No	Common name	Scientific	Population status	IUCN Status	Local name
1	Bushbuck	Tragelaphus scriptus	Stable	Least concern	
2	Elephant	Loxodonta africana	Increasing	Vulnerable	Njovu
3	Hippo	Hippopotamus amphibius	Decreasing	Vulnerable	
4	Impala	Aepyceros melampus	Stable	Least concern	Mphala
5	Lichtenstein's Hartebeest	Signmoceros lichtensteinii	Decreasing	Least concern	Nkhozi
6	African Buffalo	Syncerus caffer	Decreasing	Least concern	Njati
7	Cookson wildebeest	Connochaetes taurinus cooksoni			Nyumbu
8	Lion	Panthera leo	Decreasing	Vulnerable	Nkhalamu
9	Common Warthog	Phacochoerus aethiopicus	Stable	Least concern	Munjiri
10	Leopard	Panthera pardus	Decreasing	Near threatened	Nyalugwe
11	Thornicroft's Giraffe	Giraffa camelopardalis thornicrofti			
12	Spotted Hyaena	Crocuta crocuta	Decreasing	Least concern	
13	Klipspringer	Oreotragus oreotragus	Decreasing	Least concern	Chanhoma
14	Puku	Kobus vardonii	Decreasing	Near threatened	Seula
15	Plains Zebra	Equus burchelli	Stable	Least concern	Boli
16	Common Eland	Taurotragus Oryx	Stable	Least concern	Sefu
17	Sharpe's Grysbok	Raphicerus sharpei	Stable	Least concern	Tungwa
18	Sable antelope	Hippotragus niger	Stable	Least concern	
19	Roan antelope	Hippotragus equinus	Decreasing	Least concern	Mpelembe
20	Common waterbuck	Kobus ellipsirymnus			Chuzu
21	Bushpig	Potamochoerus porcus	Stable	Least concern	Ngulube
22	Kudu	Tragelophus strepsiceros	Stable	Least concern	Kamungoma
23	Wild dog	Lycaon pictus	Decreasing	Endangered	
24	Honey badger	Mellivora capensis	Decreasing	Least concern	
25	Vervet monkey	Cercopithecus aethiops			
26	Southern Reedbuck	Redunca arundinum	Stable	Least concern	

27	Common duiker	<i>Sylvicapra grimmia</i>	Stable	Least concern	Nyisha
28	African Civet	<i>Civettictis civetta</i>	Unknown	Least concern	Fungwe
29	Large-spotted genet	<i>Genetta tigrina</i>	Unknown	Least concern	
30	Oribi	<i>Ourebia ourebi</i>	Decreasing	Least concern	Chauzimbi
31	Porcupine	<i>Hystrix africaeaustralis</i>	Stable	Least concern	Chinungu

Appendix III. Checklist of Bird Species in Lumimba GMA

No	Common name	Scientific	Population status	IUCN Status
1	Helmeted guinea fowl	<i>Numida meleagris</i>		Not evaluated
2	Fish eagle	<i>Haliaeetus vocifer</i>	Stable	Least concern
3	Grey crowned crane	<i>Balearica regulorum</i>	Decreasing	Endangered
4	Yellow billed stork	<i>Mycteria ibis</i>	Decreasing	Least concern
5	Swainson's spurfowl	<i>Pternistis swainsonii</i>	Stable	Least concern
6	Grey heron	<i>Ardea cinerea</i>	Unknown	Least concern
7	Egyptian geese	<i>Aloppochen aegyptiacus</i>		Not evaluated
8	Goliath heron	<i>Ardea goliath</i>	Stable	Least concern
9	Cape turtle dove	<i>Streptopelia capicola</i>	Increasing	Least concern
10	Meve's starling	<i>Lamprotornis mevesii</i>		Not evaluated
11	Great cattle egret	<i>Egretta alba</i>		Not evaluated
12	Dark-capped bulbul	<i>Pycnonotus tricolor</i>		Not evaluated
13	Southern ground hornbill	<i>Bucorvus leadbeateri</i>	Decreasing	Vulnerable
14	Sandgrouse Double-banded	<i>Pterocle bicinctus</i>		Not evaluated
15	Southern red-billed hornbill	<i>Tockus rufostris</i>		Not evaluated

Appendix IV. Checklist of Reptiles in Lumimba GMA

No	Common name	Scientific name	Population status	IUCN Red list status	Local name
1	Southern African Rock Python	<i>Python sebae natalensis</i>		Not evaluated	Sato
2	Black mamba	<i>Dendroaspis polylepis</i>	Stable	Least concern	Nkhomi
3	Boomslang	<i>Dispholidus typus typus</i>		Not evaluated	
4	Puff adder	<i>Bitis arietans arietans</i>	Stable	Least concern	Chipili
5	Common egg eater	<i>Dasypeltis scabra</i>	Unknown	Least concern	
6	Striped-bellied Sand Snake	<i>Psamophis subtaeniatus</i>		Not evaluated	
7	Spotted/variegated bush snake	<i>Philothamnus semivariegatus</i>		Not evaluated	
8	Nile crocodile	<i>Crocodylus niloticus</i>		Least concern	Ngwena

9	Common Water monitor	<i>Varanus salvator</i>	Unknown	Least concern	Sangalubilo
10	Black-necked Spitting Cobra	<i>Swartnek poegkobra</i>		Not evaluated	Kafi
11	Leopard Tortoise	<i>Geochelone Pardalis</i>		Not evaluated	Fulu

Appendix IV: List of Amphibians in Lumimba Game Management Area

No	Common name	Scientific	Population status	IUCN Status
1	Square marked toad	<i>Bufo gutturalis</i>	Increasing	Least concern
2	Red toad	<i>Schismaderma carens</i>	Unknown	Least concern
3	Rain frog	<i>Breviceps poweri</i>	Unknown	Least concern
4	African bullfrog	<i>Pyxicephalus adspersus edulis</i>		Not evaluated
5	Ridged frog	<i>Ptychadena oxyrhynchus</i>	Stable	Least concern
6	Puddle frog	<i>Phrynobatrachus natalensis</i>	Stable	Least concern
7	Grey tree frog	<i>Chiromantis xerampelina</i>	Unknown	Least concern
8	Bubbling kassina	<i>Kassina senegalensis</i>	Unknown	Least concern

Appendix V. Checklist of Fish in Lumimba GMA

1. Mud Sucker (mpumbu)
2. Tiger; *Hydrocycon vittatus* (manda)
3. Redbreast bream; *Tilapia rendalli*
4. Threespot bream/Kafue bream; *Oreochromis andersonii*
5. Greenhead bream; *Oreochromis macrochir*
6. Squirker; *Synodontis spp* (nkolokolo)
7. Bottlenose; *Mormyrus longirostris* (mukupe)
8. Corn Jack; *Mormyrus spp* (mukupe)
9. Chassa (mintesa)
10. Bulldog; *Mormyrus macrolepidotus* (chisuse)
11. Clarias gaipinus. (mulamba)
12. Vundu (sampa)
13. Moonlight (nthanga)
14. Nchenga (sebele)
15. Blackback barb; *Barbus barnardi* (Mfita)
16. Slender stonebasher; *Hippopotamyrus ansorgii* (Puma mawe)
17. Red barb; *Barbus fasciolatus* (nsweta)
18. Lung fish (muzongolo)

19. Electric catfish; *Malapterurus electricus* (nyesi)20. Silver Bubble fish; *Clarias spp* (mpata)21. Longtail spiny eel; *Aethiomastacembelus frenatus* (mukunga)

Appendix VI. Transport and Equipment Requirements for Lumimba GMA Management

Item	Existing No.	Total Required	No.	Additional No. Required
Vehicles				
Operational 4 X 4 MV	0	3		0
Tractor & Trailer	0	2		0
Grader	0	1		0
Motor Bikes	0	3		0
Boats				
Speed Boat + Engine	0	1		0
Banana Boat + Engine	0	3		0
Rubber Boat + Engine	0	0		0
Air Boat + Engine	0	0		0
Equipments				
Outboard Engines	0	1		0
Electric Generator	0	3		0
Electric Water Pump	0	3		0
Bore Holes	5	7		2
Water Tanks(2500lits)	0	13		0
Battery Charger	0	2		0
Air Compressor	0	2		0
Solar Panels	5	8		3
Shovels	0	26		0
Hoe	0	26		0
Spade	0	26		0
Slashes	0	30		0
Pick	0	26		0
Weather Screen	0	13		0
Rain Gauge	0	13		0
Communications				
HF Radio Sets	4	0		0
Regulators	8	13		4
VHF Base Stations	2	10		7
VHF Mobile	0	3		0
VHF Hand Held	7	20		13
Hand Held Charges	3	20		17
Fire Arms				
Automatic Rifle	32	40		8
Semi-Automatic Rifles	12	22		10
Sport Rifles	19	20		1
Shotguns	10	18		8
Pistol	0	2		0
Computers				
Desktop Computer	0	9		0
Laptops	0	9		0
Printer	0	9		0
Adapters	0	9		0
Photocopier	0	9		0
GPS Unit	0	18		0
Research Equipment/Tool				

Fire beaters	0	100	0
Field guide books	0	20	0
Preservative (formalin)	0	100	0
Rain gauge	0	9	0
Wind Vain	0	9	0
Stevenson screen	0	9	0
Anemometer	0	9	0
Information Center	0	3	0
Chopper	0	1	0
Air Strip	2	3	1
Office Equipments			
Chairs	4	55	51
Tables	6	22	16
Stapler	0	11	0
Hole Punch	0	11	0
Office sofa	0	2	0
Calculator	0	11	0
Box Files	0	50	0
Wastepaper basket	0	15	0
Filing Cabinet	2	11	9
Office File Tray	4	30	0
Scanner	0	6	0
Fax	0	6	0
Fridge	0	6	0
Staff Houses			
Chikwinda	3	18	15
Ngongomwa	0	18	0
Changachanga	3	18	10
Chakolwa	0	18	0
Chipuka	7	18	0
Zokwe	5	18	13
Kazembe	3	18	15
Mbuzi		18	0

Appendix VII. Staff Requirements/existing wildlife outpost for Lumimba GMA Management

Post	Existing No.	Total Required No.	Additional Required No.
GMA Ranger	1	0	0
Assistant Ranger	0	2	0
Senior Wildlife Police Officers	2	9	7
Wildlife Police Officers	18	63	45
Driver	0	4	0
Coxswain	0	2	0
Community Scouts	0	0	0
Village Scouts	66	80	14
Required and Existing Wildlife Outposts for Effective Management of Protected Area			
Name of existing, Closed or	Existing / Closed	Location of Existing /	Remarks

proposed Outpost	/ new (proposed)	Closed / New	
Chikwinda	Existing	Mwanya	18 staff Houses and 1x3office block need to be constructed.
Ngongomwa	Existing	Mwanya	18 staff houses need to be constructed
Changachanga	Existing	Mwanya	20 staff and Office block is need to be constructed and renovated respectively
Chakolwa	Existing	Mwanya	18 staff Houses and 1x3office block need to be constructed.
Chipuka	Existing	Chitungulu	Renovating the existing structures and build more staff and office block (education centre)
Chanjuzi	Existing	Chitungulu	Renovate the office block and build more staff houses
Zokwe	Existing	Kazembe	Construction of permanent houses
Kazembe	Existing	Kazembe central	New Camp
Mbuzi	Existing	Kazembe	Rebuilding of the Camp with permanent houses
Lusangazi	Closed	Chief Zumwanda	Rebuilding permanent houses
Njoka/Vyasoyo	Closed	Kazembe	Rebuilding permanent houses
Yakobe	Proposed	Mwanya	New Camp

Appendix VIII: Elephant density and distribution in the Luangwa Valley (Fredericks 2012)

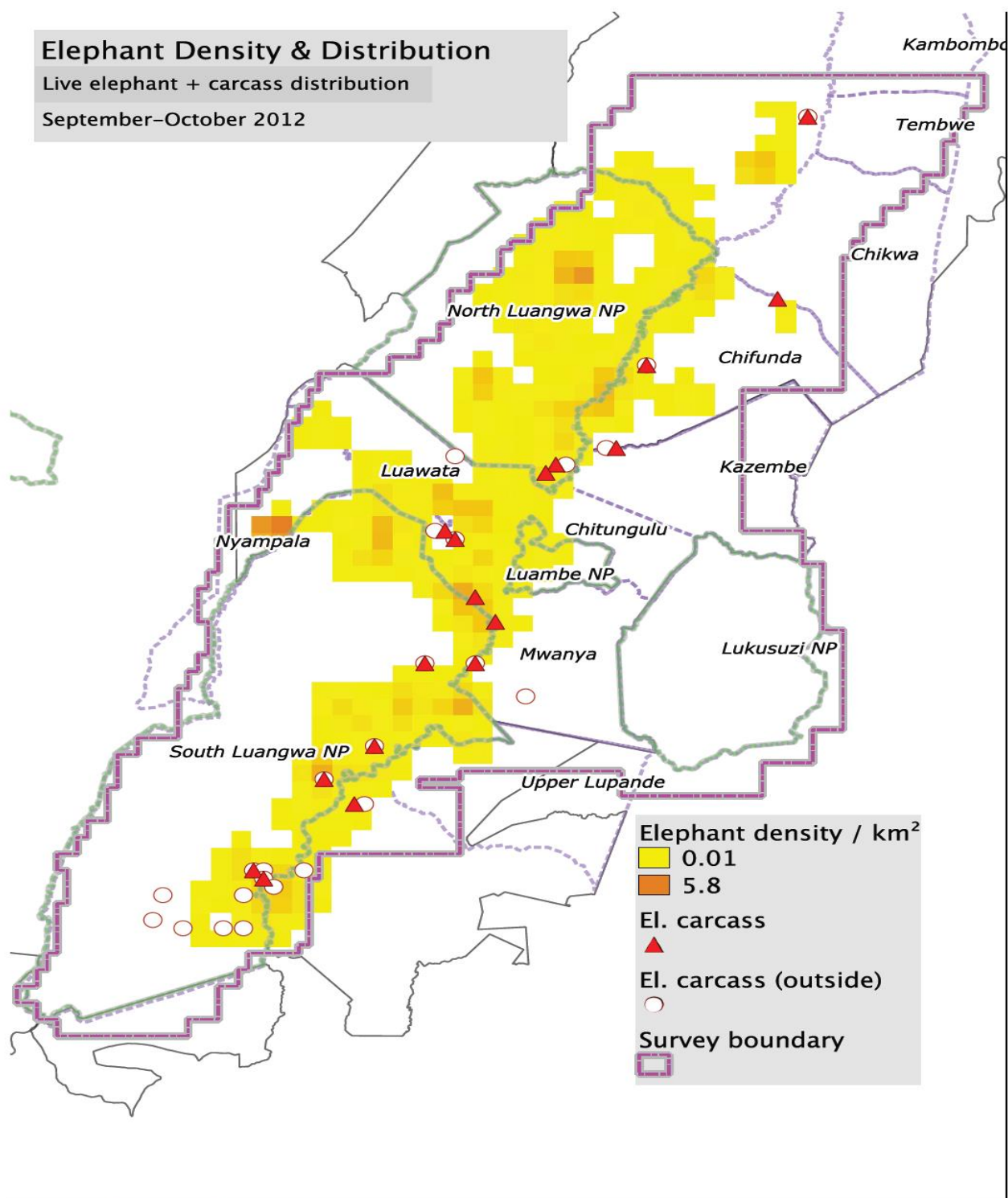


Figure 13: Elephant sightings during survey.

Appendix IX: Puku Density and Distribution in the Luangwa Valley (Fredericks 2012)

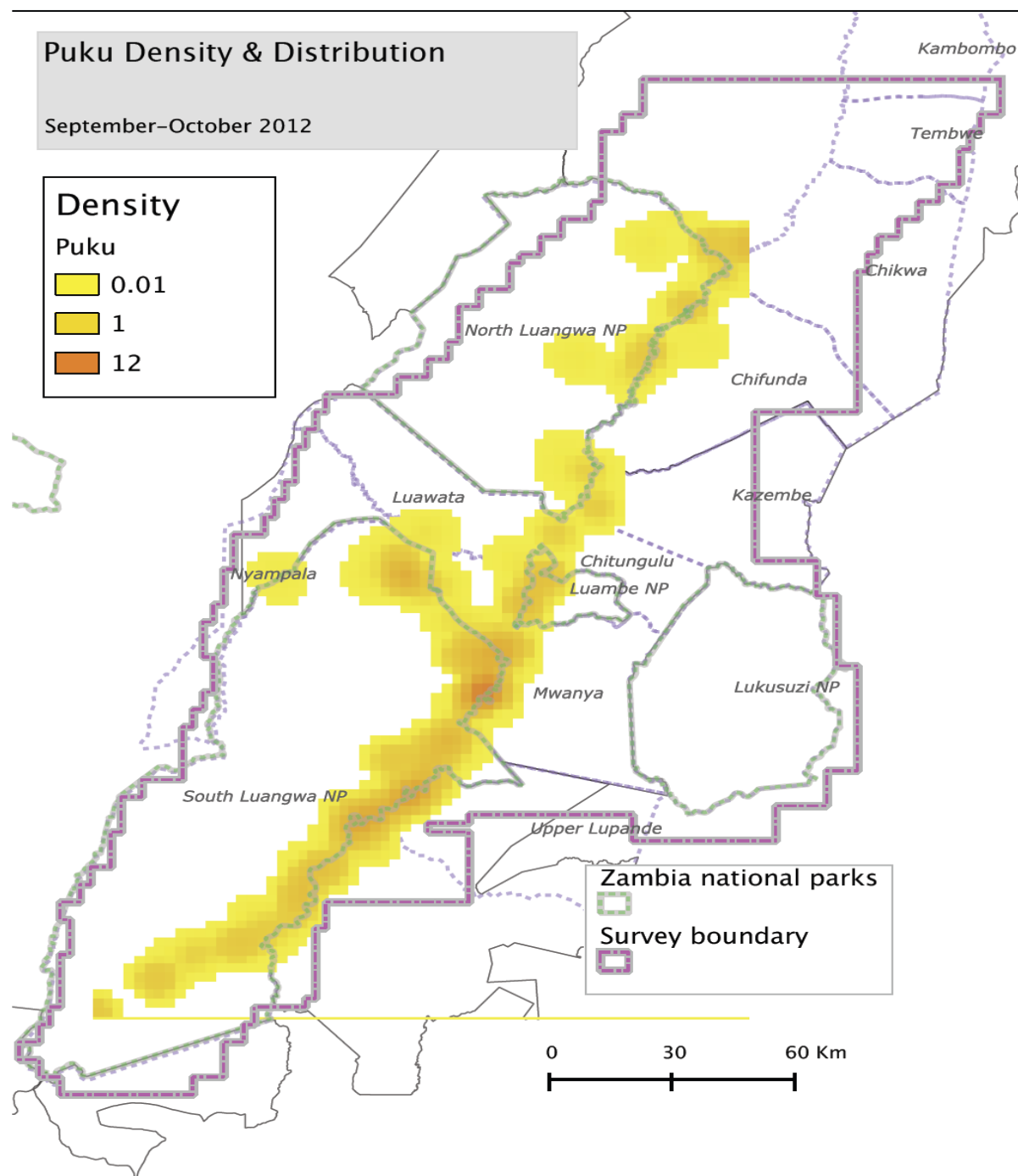


Figure 14: Puku density and distribution, September 2012.

Appendix X: Density and Distribution of impala in the Luangwa Valley (Fredericks 2012)

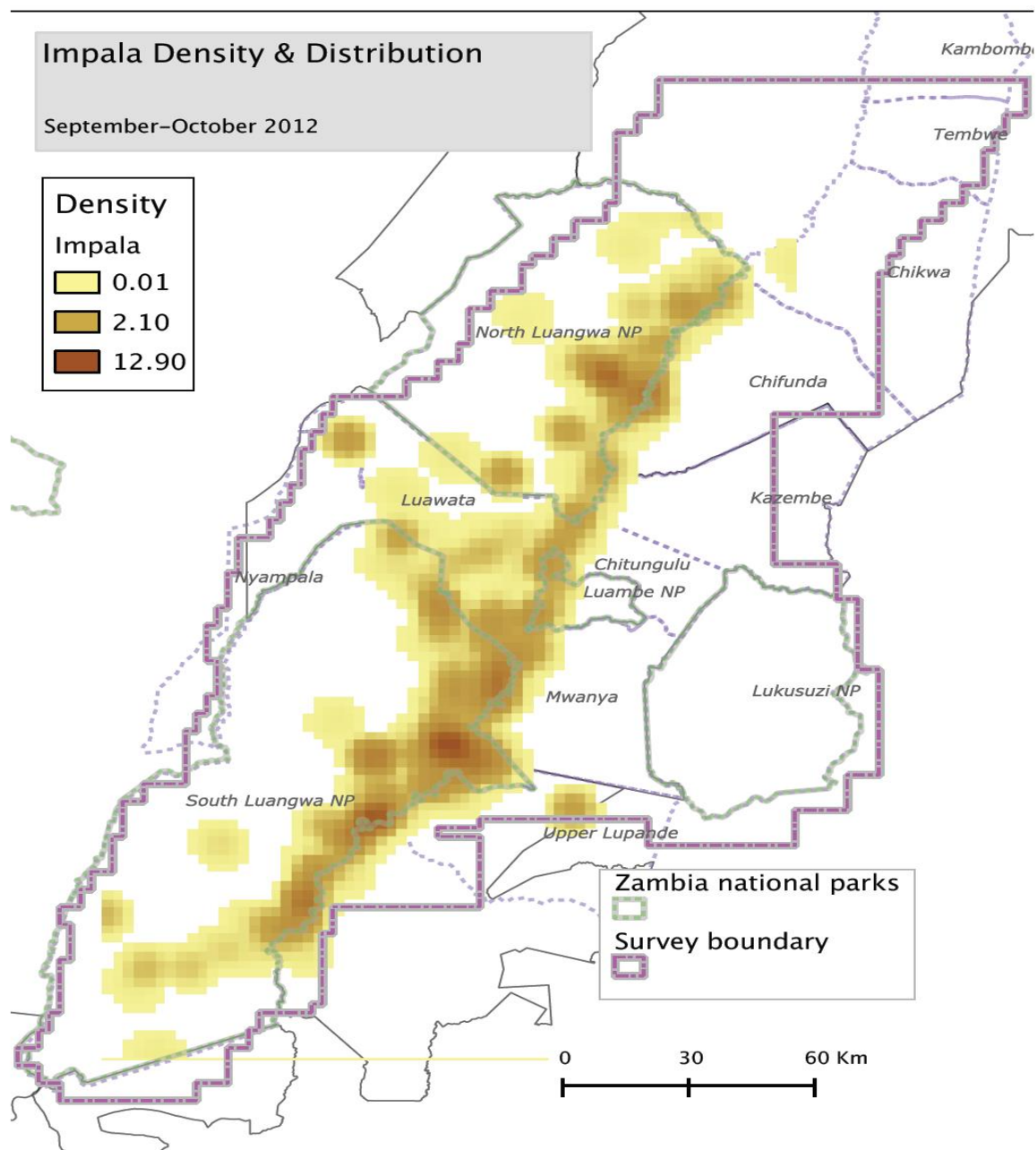


Figure 15: Impala density and distribution, September 2012.

Appendix XI : Density and Distribution of buffalo in the Luangwa Valley (Fredericks 2012)

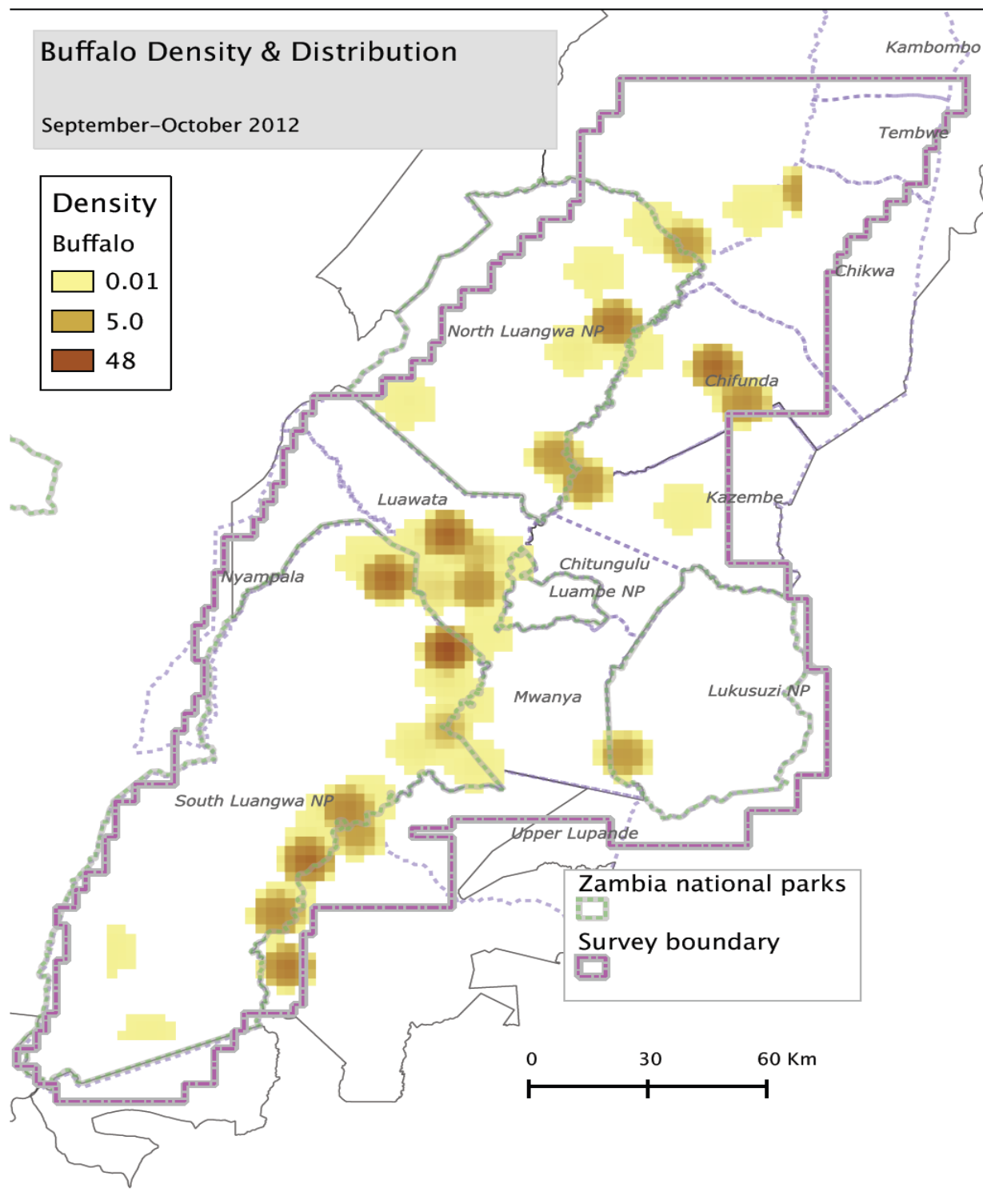


Figure 16: Buffalo density and distribution, September 2012.

Appendix XII. Lists of Invited Participants to the Planning Workshop for Lumimba GMA

Below is a list of Participants who were invited to attend the Lumimba Game Management Area First Planning Workshop on the Preparation of the General Management Plan for Lumimba Game Management Area held from 01st to 05th September, 2014 at Johnesther Conference Hall in Lundazi District.

No.	NAME	ORGANISATION/CHIEFDOM	POSITION
01	Janet Palukani	Lundazi District Administration	District Commissioner
02	Boyd Kaoma	Lundazi Council	Council Secretary
03	Dr. Chisenga Allan	Ministry of Health	District Health Director
04	Christopher Kaoma	Zambia Wildlife Authority	Head of Planning
05	Chipego Hamiwe	Zambia Wildlife Authority	Area Warden ELAMU
06	Sinyala Nyirongo	Zambia Wildlife Authority	Planning Officer
07	Victor Makombe	Zambia Wildlife Authority	Planning Officer
08	Chabala Chiyaze	Zambia Wildlife Authority	Senior Planning Officer
09	Benson Kabungo	Zambia Wildlife Authority	GIS Specialist
10	Lutangu Mulope	Zambia Wildlife Authority	Planning Officer
11	Twakundine Simpamba	Zambia Wildlife Authority	Ecologist
12	Patrick Sakanga	Zambia Wildlife Authority	Park Ranger
13	Amukena Musiwa	Forestry	District Forestry Officer
14	David Mwale	Lundazi Council	Health Inspector
15	Elvis Silembo	Ministry of Agriculture and Livestock	Ag/District Fisheries Officer
16	Chilufya Mulenga	Lundazi Gemstone Association	Chairperson
17	Mumba Martford	Lundazi Gemstone Association	President
18	Victor Syatyoka	National Heritage Conservation Commission	Conservation Officer
19	Joshua Sangambo	ZAWA	Sector-in-charge
20	Phineas Shikwe	ZAWA	Park Ranger
21	Evans Mubita	ZAWA	Sector-in-charge
22	Kampamba Kelvin	MAL	Ag/DACO
23	Chitala Ngona	Chibande	Ward Councilor
24	Kingstone Nyirongo	Kazembe	CRB Chairperson
25	Edwin Ngulube	Chitungulu	CRB Chairperson
26	Make Wali	Mwanya	CRB Chairperson
27	Rueben Zimba	Kazembe	Ward Councilor
28	Alex Banda	Chitungulu	Ward Councilor
29	Findwell Khoza	Chitungulu	Chief Representative
30	Tyson Nkhata	Chitungulu	Chief Retainer
31	Clement Phiri	Mwanya	Chief Representative
32	Aaron Banda	Kazembe	Chief Representative
33	Tenson Mtonga	Kazembe	Secretary
34	Edna Chibuye	Health Department	Environmental Health Technologist
35	Daniel Musonda	Zambia Wildlife Authority	Driver
36	MusiwaMuhau	Zambia Wildlife Authority	Accounts Clerk
37	Michelle Banda	Zambia Wildlife Authority	Secretary
38	Sesele Sokotela	Zambia Agriculture Research Institute	Soil Scientist
39	Goodson N. Nkhazi	Kazembe	Induna
40	Landwell Mwale	Kazembe	Induna
41	Mapopa Chirwa	Lundazi District Council	Assistant Planner
42	Chilufya Chitambala	Fisheries Department	Aqua culturist

Appendix IX. Statutory Instrument for the Gazettment of Lumimba Game Management Area

Government of Zambia

Statutory Instrument No. 67 Of 1993

The Zambia Wildlife Act

(Act No. 12 Of 1998)

Narrative Description of Lumimba Game Management Area

Game Management Area No. 21 Lumimba

Starting at the confluence of the Mwasau and Luangua Rivers, the boundary follows the thalweg of the latter River up stream to its confluence with the Lupita River at Beacon A on the boundary of the National Park No. 4: Luambe; thence up the Lupita River to its confluence with the Kangwa River; thence up the Kangwa River to Beacon B at the south-east coner of National Park No. 4 Luambe; thence following the East and North boundaries of the said National Park to Beacon D on the left bank of the Luangua River; thence following the thalweg of the Luangua River upstream to its confluence with the Kawondo River; thence follow up Kawondo River to the point where it is crossed by the Zokwe – Chifunda; thence in the north - easterly direction on a bearing of 53 degrees30'00'' for a distance of approximately twenty seven point three kilometres; thence in an easterly direction on a bearing of 87 degrees00'00'' for a distance of approximately 14.4 kilometres to Mpande Hill; thence in a straight line in a south-easterly direction to the confluence of Lundazi and Luampamba Rivers; thence in a straight line in a south-westerly direction to the confluence of thr Lumezi and Wasira Rivers; thence down the Lumezi River to its confluence with the Lusangashi River; thence up this River to its confluence with the Kateba River; thence up this River to its source; thence southwards in a straight line to the source of the Kalumba – Musaka Streams; thence down this Stream to its confluence with the Lumimba River; thence down this River to the Beacon erected on the south bank thereof, at a point due north of the Pandebiri Hill; thence southwards in a straight line to the Pandebili Hill; thence a straight line in a south-western direction to Zmiwe Hill; thence a straight line in south-westerly direction to the confluence of the Kadianzeze and Lukusuzi Rivers; thence down the latter River to its confluence with the Pwazi River; thence in a straight line in a southerly direction to the Nyani Falls on the Lukuzye River; thence up this River to where it meets the Chipata – Lundazi District boundary; thence westwards along this boundary to where it meets the north – east boundary of the National Park No. 1: South Luangua; thence north – west wards along the boundary of the said National Park to the point of starting.

The above described area, in extent is 45 square kilometres approximately, situated in the Lundazi District and is shown bordered in yellow on plan No. GMA 21; deposited in the Office of the Surveyor - General and dated the 1st February, 1971.