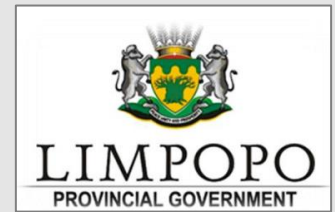




environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



Mapungubwe Cultural Landscape World Heritage Site

ENVIRONMENTAL MANAGEMENT FRAMEWORK

DESIRED STATE REPORT

FINAL

November 2014





EXECUTIVE SUMMARY

Introduction and background

The Department of Environmental Affairs (DEA), in collaboration with the Limpopo Department of Economic Development, Environment and Tourism (LEDET) and South African National Parks (SANParks), embarked on a process to develop an Environmental Management Framework (EMF) for the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS). Nema Consulting was appointed to prepare the MCLWHS EMF.

An EMF is a study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific activities may best be practiced and to offer performance standards for maintaining appropriate use of such land. An EMF includes a framework of spatially represented information connected to significant environmental (i.e. ecological, social and economic) parameters, such as ecology, hydrology, infrastructure and services.

This report represents the Final Desired State Report (Volume 2) of the MCLWHS EMF process and serves to build on the status quo evaluation by establishing an environmental vision for the MCLWHS which is translated into a spatial representation via a mapping exercise.

In order to address the triggers for sustainable development in Mapungubwe and the priority environmental opportunities and constraints, some of the key objectives of the EMF include facilitating environmental decision-making and providing strategic guidance on environmental, economic and social issues in the district.

The MCLWHS is situated in the northernmost district in the Limpopo Province. It lies on the international borders of South Africa, Zimbabwe and Botswana and falls predominantly within the Vhembe District Municipality and the Musina Local Municipality.

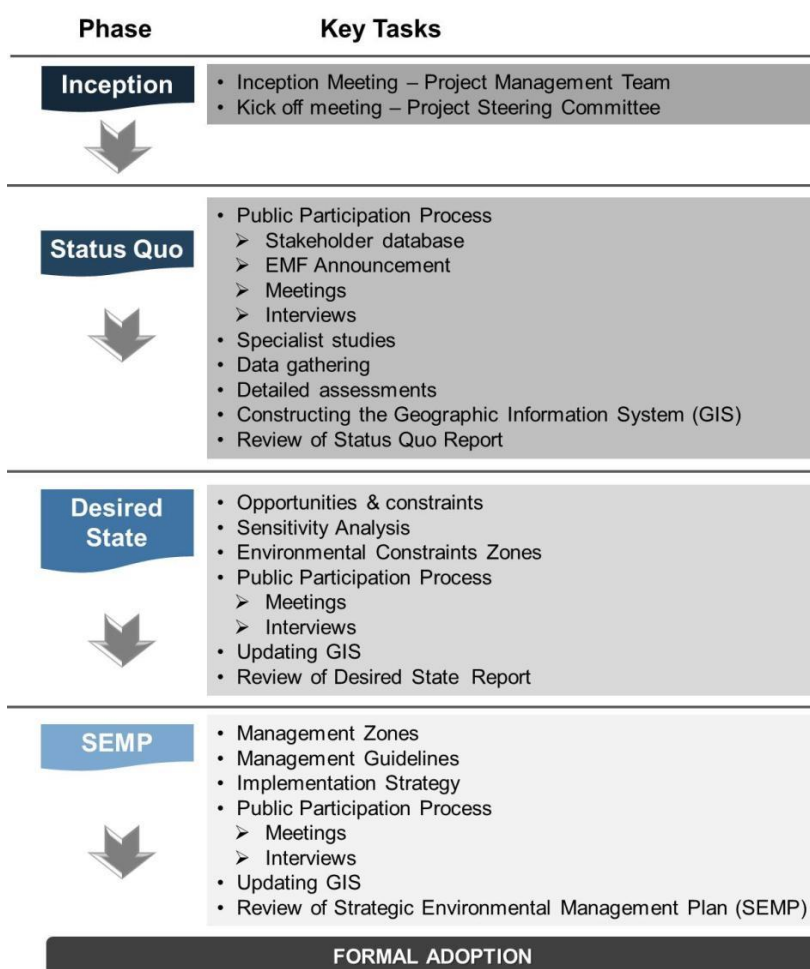
The catalysts for initiating this EMF fall within the following categories:

- 1.** Significant environmental factors (e.g. protection of natural resources to ensure that the associated environmental goods and services are not jeopardised);

2. Development pressures (e.g. promoting investment initiatives in the identified nodes);
3. Environmental threats (e.g. incompatible land use practices); and
4. Resource management issues (e.g. conservation of cultural heritage resources, land transformation and degradation).

EMF Development Approach

The EMF development approach, which is outlined in the figure to follow, is consistent with the requirements stipulated in the National Environmental Management Act (Act No. 107 of 1998) and the EMF Regulations (GN No. R547 of 18 June 2010).



Public Participation

As a minimum, the Public Participation Process (PPP) for the MCLWHS EMF aims to comply with Regulation 3(2) of the EMF Regulations (2010). The main purpose of the PPP includes:

1. To inform Interested and Affected Parties (I&APs) of the EMF process and its objectives;
2. To provide an opportunity for inputs from I&APs; and
3. To give feedback to I&APs with the opportunity for them to respond.

The PPP follows the phases of the overall EMF development process, and is executed to coincide with the outcomes associated with each milestone of the framework.

The key tasks undertaken as part of the PPP for the Desired State phase include the following:

- ❖ Update and add to a database of I&APs that was started during the Status Quo phase;
- ❖ Convening a public meeting where the Desired State process was explained and the attendees were asked to supply relevant information including spatial data;
- ❖ Holding targeted meetings with authorities, stakeholders and I&APs;
- ❖ Lodging the Draft Desired State Report in the public domain for review; and
- ❖ Maintain a Comments and Response Report throughout the Desired State phase.

Transition from Status Quo to Desired State

With the foundation of the EMF set through the Status Quo Phase, the next step is to determine a realistic desired state for the environment in the EMF study area.

Establishing the desired state includes setting a vision for the study area and providing the environmental management context for the management zones and related requirements for the various environmental features for the Strategic Environmental Management Plan (SEMP). It will also focus on addressing the imperatives that lead to the instigation of the EMF development process.

The approach to defining a desired state in the study area is based on the following:

- ❖ Management priorities;
- ❖ Sensitivity analysis;

- ❖ Development pressures and trends;
- ❖ Development opportunities and constraints; and
- ❖ Aspirations of Interested and Affected Parties.

An Environmental Management Zone (EMZ) represents a specific demarcated area that requires active control to ensure that its potential is realised and sensitive features are adequately safeguarded. The following EMZs were delineated for the EMF study area:

- ❖ Mapungubwe National Park & World Heritage Site;
- ❖ Buffer Zone (2009);
- ❖ Terrestrial Biodiversity;
- ❖ Surface Water;
- ❖ Groundwater;
- ❖ Agriculture;
- ❖ Heritage and Cultural Resources; and
- ❖ Terrain.

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LIST OF ACRONYMS & ABBREVIATIONS

CBA	Critical Biodiversity Area
CLWHS	Cultural Landscape World Heritage Site
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Minerals Resources
DWS	Department of Water and Sanitation
ECZ	Environmental Constraint Zone
EIA	Environment Impact Assessment
EMF	Environmental Management Framework
EMZ	Environmental Management Zone
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Area
GMTFCA	Greater Mapungubwe Transfrontier Conservation Area
GIS	Geographical Information System
GN	Government Notice
IDP	Integrated Development Plan
I&APs	Interested and Affected Parties
LEDET	Limpopo Department of Economic Development, Environment & Tourism
MNP	Mapungubwe National Park
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NWA	National Water Act (Act No.
PPP	Public Participation Process
RDMs	Resource Directed Measures
RHP	River Health Programme
RQOs	Resource Quality Objectives
SANPARKS	South African National Parks
SDCs	Source Directed Controls
SDF	Spatial Development Framework
SEMP	Strategic Environmental Management Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VBR	Vhembe Biosphere Reserve

DEFINITIONS / GLOSSARY OF TERMS

Attributes

The quality ascribed to an element in the environment that distinguishes it in character, form or nature from other elements in the environment.

Management Guidelines

Specific provisions applied in the management of each individual attribute or activity associated with the respective Management Zones.

Environment

The surroundings in which humans exist and which comprise:

- *The land, water and atmosphere of the earth;*
- *Micro-organisms, plant and animal life;*
- *Any part or combination of a) and b) and the interrelationships among and between them; and*
- *The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that can influence human health and well-being.*

Environmental Feature

Elements and attributes of the biophysical, economic and social environment that comprise a data category.

Environmental Management Framework (EMF)

The study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific activities may best be practiced and to offer performance standards for maintaining appropriate use of such land.

Geographical Areas

A logical spatially demarcated area defined by an EMF as being sensitive, requiring specific management intervention to ensure its future environmental integrity.

Management Zones

Specific demarcated geographical area, represented spatially on a map illustrating a specific sensitive feature which needs to be managed in a pro-active and dedicated way.



INTRODUCTION

SECTION 1

1 INTRODUCTION

1.1 Background

The Department of Environmental Affairs (DEA), in collaboration with the Limpopo Department of Economic Development, Environment and Tourism (LEDET) and South African National Parks (SANParks), embarked on a process to develop an Environmental Management Framework (EMF) for the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS). Nemai Consulting was appointed to prepare the MCLMWHWS EMF.

According to the EMF Regulations (Government Notice No. R547 of 18 June 2010), an EMF is a *study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land uses may best be practiced and to offer performance standards for maintaining appropriate use of such land*. An EMF includes a framework of spatially represented information connected to significant environmental (i.e. ecological, social and economic) parameters, such as ecology, hydrology, infrastructure and services. A key function of an EMF is to proactively identify areas of potential conflict between development proposals and critical/sensitive environments (DEAT, 1998).

As shown in **Figure 1**, the two major components of the MCLWHS EMF will entail Public Participation and Technical Development. Once the EMF is finalised, it will undergo promulgation and gazetting in order to render it as a formal decision-making tool in the environmental and planning arenas.

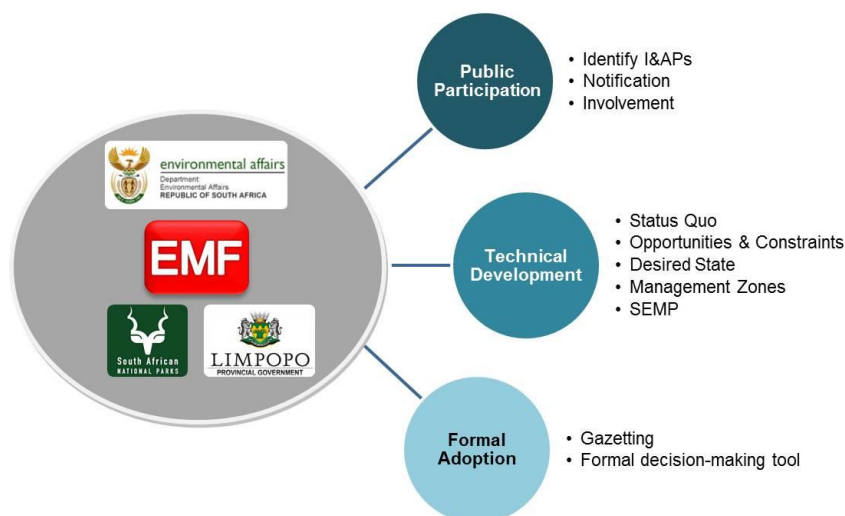
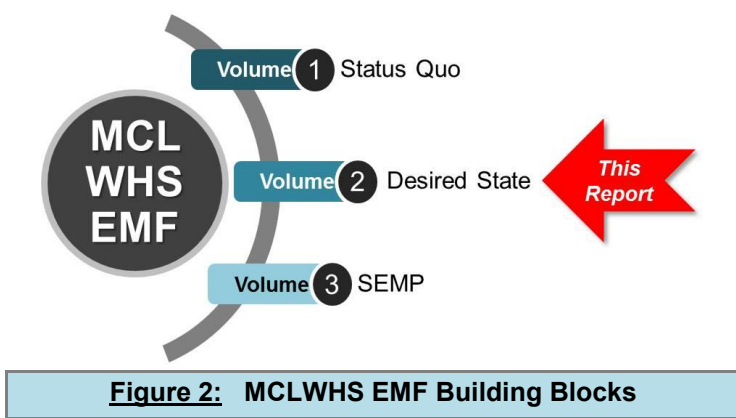


Figure 1: EMF Components

As part of the MCLWHS EMF development process, the following deliverables will be produced: Status Quo Report, Desired State Report and Strategic Environmental Management Plan (SEMP).



This report represents the Desired State Report (**Volume 2**) of the EMF process and serves to build on the status quo evaluation by establishing an environmental vision for the MCLWHS which is translated into a spatial representation via a mapping exercise.

1.2 EMF Study Area

The EMF Study area includes the core of the MCLWHS as well as the 2009 proclaimed buffer zone (**Figure 4**). Note that the new buffer zone will be incorporated into the EMF once it has been gazetted, by following due process.

Mapungubwe (meaning 'hill of the jackal') is situated in the northernmost district in Limpopo (see **Figure 3**). It lies on the international borders of South Africa, Zimbabwe and Botswana. Mapungubwe falls predominantly within the Vhembe District Municipality and the Musina Local Municipality. A small part of the buffer zone in the south-western corner is situated in the Capricorn District Municipality and the Blouberg Local Municipality.

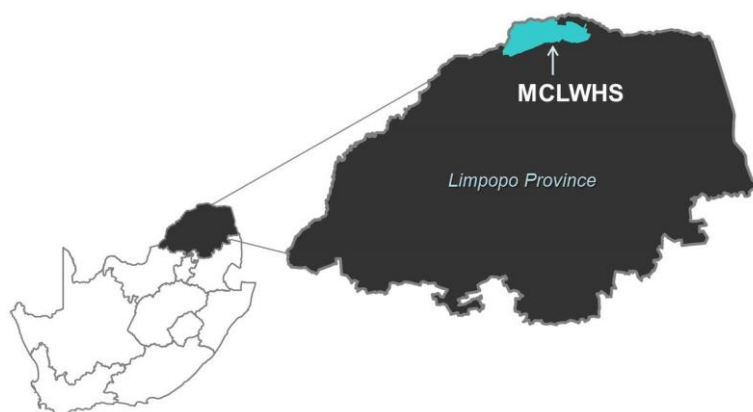


Figure 3: MCLWHS & Buffer National and Provincial Geographical Context

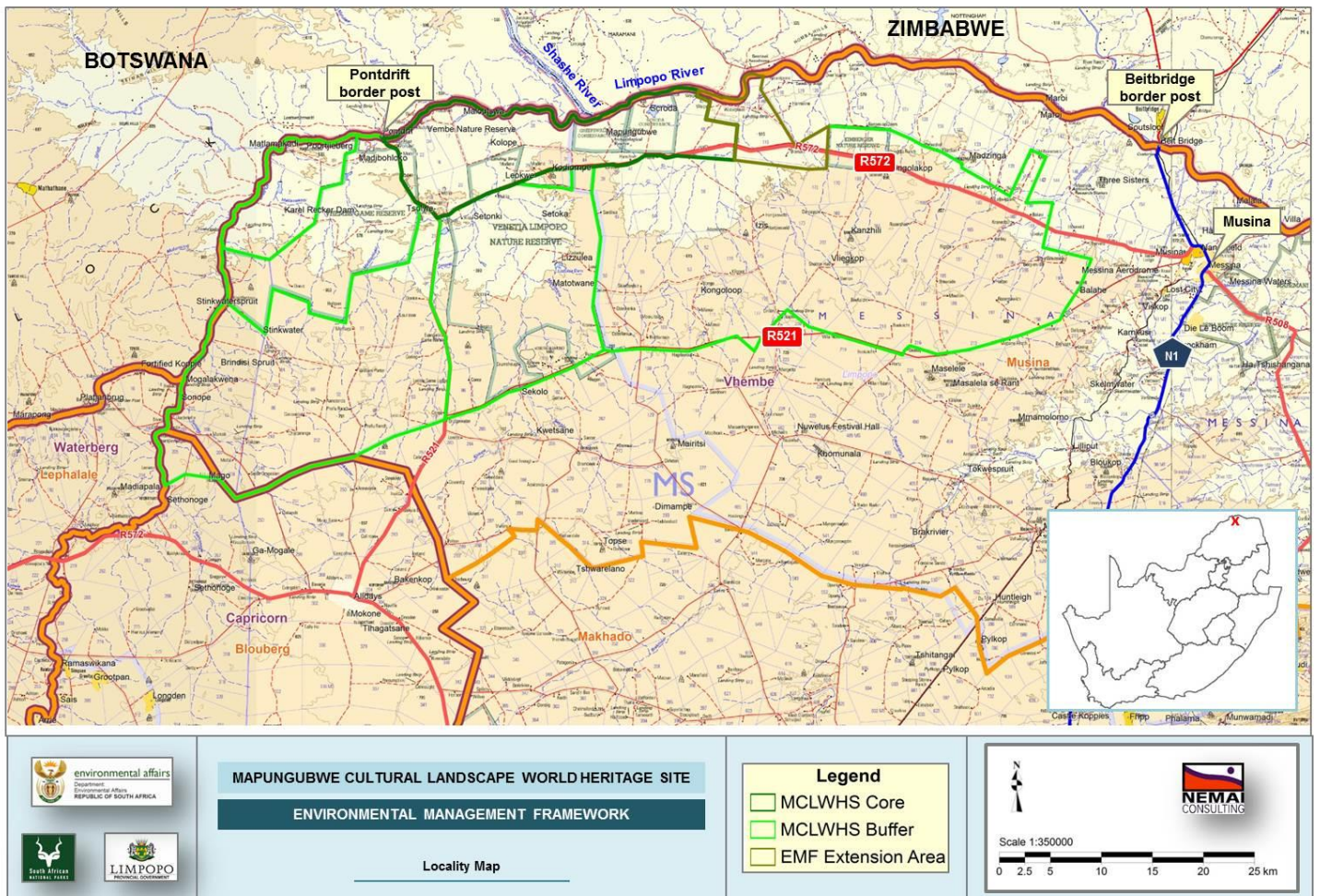


Figure 4: Locality Map – EMF Study Area

The coordinates of the MCLWHS are as follows:

- ❖ NW corner 22°12'56"S 29°08'22"E;
- ❖ NE corner 22°10'10"S 29°29'04"E;
- ❖ SE corner 22°14'15"S 29°31'35"E; and
- ❖ SW corner 22°17'40"S 29°12'00"E.

1.3 MCLWHS Boundaries

1.3.1 Core Area

The core of the WHS is 28 168.66 ha in extent and is made up of 22 original farms (DEA, 2013). According to the WHS nomination dossier (DEAT, 2002), the boundaries of the MCLWHS correspond to the Vhembe-Dongola National Park which was later re-named to the Mapungubwe National Park (MNP). These boundaries are as follows (**Figure 4**):

- ❖ North - Limpopo River;
- ❖ West - Alldays-Pont Drift road;
- ❖ South - Messina-Pont Drift road and the boundary of the farm Riedel; and
- ❖ East - the boundary of the farm Riedel and the western side of the irrigated lands on the farm Weipe.

The prominent land uses in the WHS and its buffer include conservation, agriculture and mining as well as the other related developmental activities such as tourism and infrastructure development.

1.3.2 2009 Proclaimed Buffer Zone

The 2009 proclaimed buffer zone is significant in size as it covers approximately 237 100 ha of land on the western, southern and eastern part of the core (DEA, 2013).

The buffer zone comprises the following (**Figure 5**):

- ❖ Venetia-Limpopo Nature Reserve;
- ❖ Vhembe Nature Reserve;
- ❖ Limpopo Valley Game Reserve as well as privately owned land including land owned by Anglo American Coal; and
- ❖ Privately owned land in the north-western and south-western part of the buffer zone.

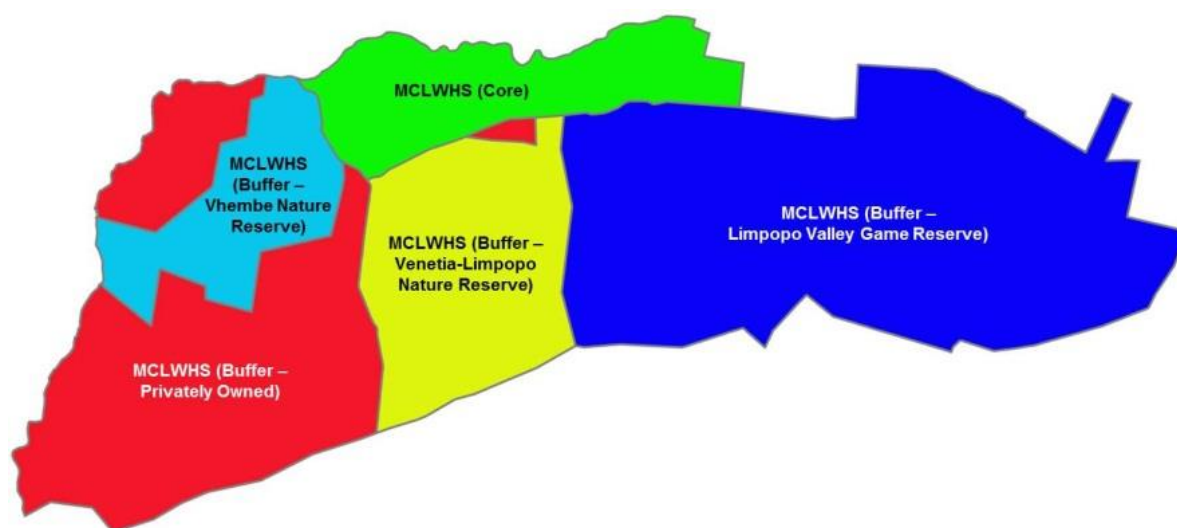


Figure 5: Core Area and 2009 Buffer Zone of MCLWHS

1.3.3 Proposed New Buffer Zone

A study was commissioned to review the size of the 2009 proclaimed buffer and align land uses to the promotion of conservation and biodiversity in and around the core of the MCLWHS. According to the audit of land use activities (DEA, 2013), there is a strong view that the 2009 Proclaimed buffer zone is too large and therefore not practical for a coherent environmental management plan as well as for a balanced approach considerate of the South African development priorities around the world heritage property, in the context of competing land uses.

The new buffer zone which is 104 800ha in size is significantly smaller than the existing buffer zone which is currently 237 000ha in size. **Figure 6** shows the proposed new buffer zone that is outlined in blue. On 26 June 2014, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) approved the new buffer zone boundaries.

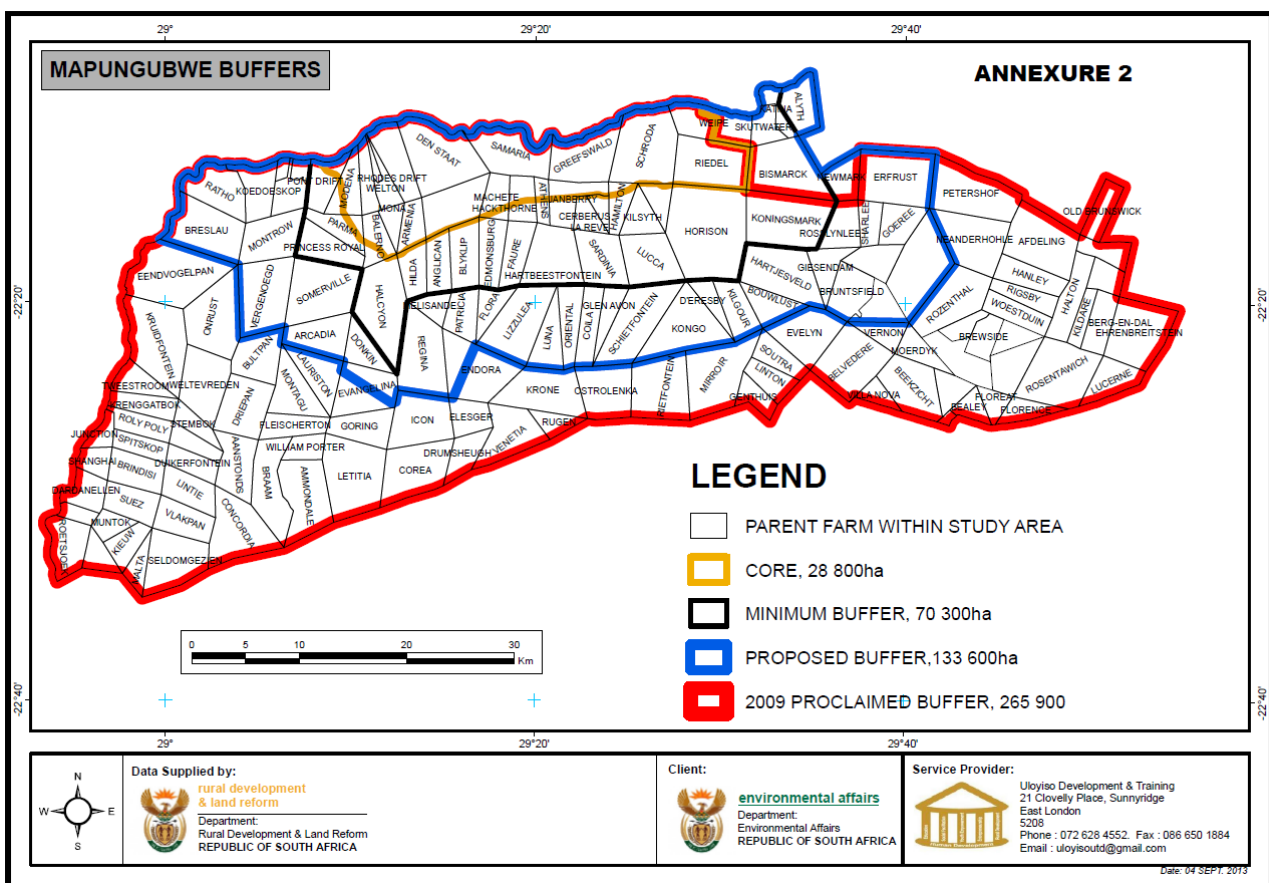


Figure 6: Proposed New Buffer Zone of MCLWHS

At a public meeting held on 16 July 2014, there was strong resistance expressed from the stakeholders present to the proposed reduction of in the size of the buffer zone. Concerns were expressed about the lack of public consultation during the process and questions were raised about what criteria was used in order to determine the new buffer

1.3.4 Extended area

No official buffer zone existed to the east of the WHS, where threats exist due to current and proposed land uses (notably mining and to a lesser extent agriculture). The EMF Study area was thus extended to include the gap between the current core area and Vele Colliery (as shown in **Figure 7**).

It should be noted that the extended area forms part of the new buffer zone.

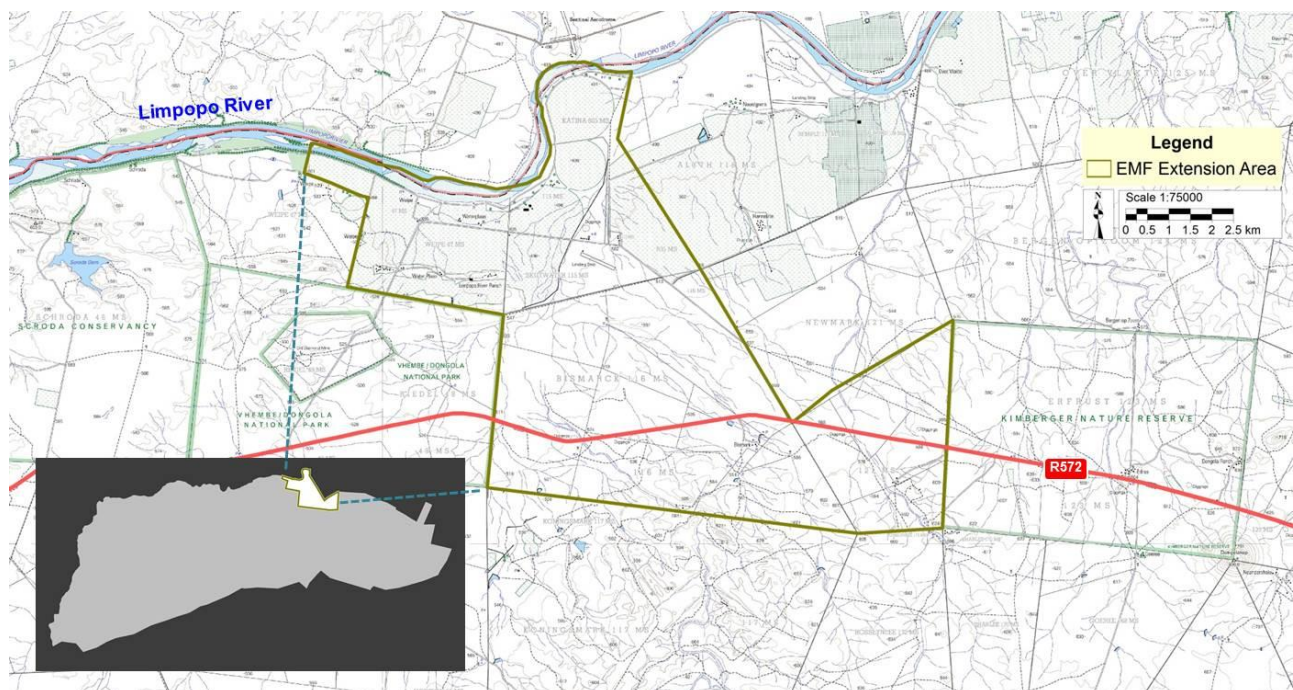


Figure 7: MCLWHS EMF Extension Area

1.4 EMF Objectives

As the norm, an EMF aims to achieve the following:

- Promoting sustainability;
- Securing environmental protection; and

- Promoting cooperative environmental governance.

Within this context, the primary objectives of the MCLWHS EMF include the following:

1. To facilitate decision-making to ensure sustainable management of significant environmental features in the WHS and its buffer zone;
2. To provide strategic guidance on environmental, economic and social issues in the WHS and its buffer;
3. To identify environmentally sensitive areas;
4. To identify the environmental and development opportunities and constraints;
5. To assess the economic and environmental potential of the area;
6. To provide a decision support system in respect of environmental issues and priorities in the EMF area;
7. To include existing policies as frameworks for establishing values, guidelines and standards for future developments; and
8. Review the compatibility of listed Environmental Impact Assessment activities with the delineated Geographic Areas.

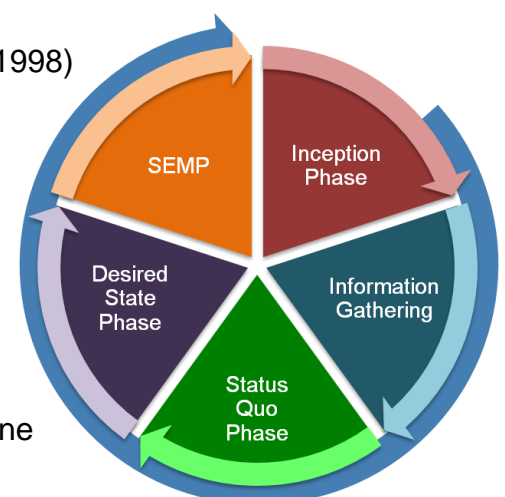
In its formal context, the EMF that is adopted by the Minister or MEC will be taken into consideration when reviewing applications for environmental authorisation in or affecting the areas to which the EMF applies.

1.5 EMF Development Approach

The EMF development approach is consistent with the requirements stipulated in the following primary legislation that governs the process:

- ❖ The National Environmental Management Act (Act 107 of 1998) (NEMA), in particular Sections 2, 23 and 24; and
- ❖ The EMF Regulations (GN No. R547 of 18 June 2010), which make provision for the development, content and adoption of EMFs as a proactive environmental management decision support tool.

In addition, the MCLWHS EMF also conforms to the Guideline



on Environmental Management Frameworks in terms of the EMF Regulations of 2010, Integrated Environmental Management Guideline Series 6 (DEA, 2010).

1.6 EMF Methodology

An overview of the methodology to develop the EMF is broadly presented in Figure 8 below.

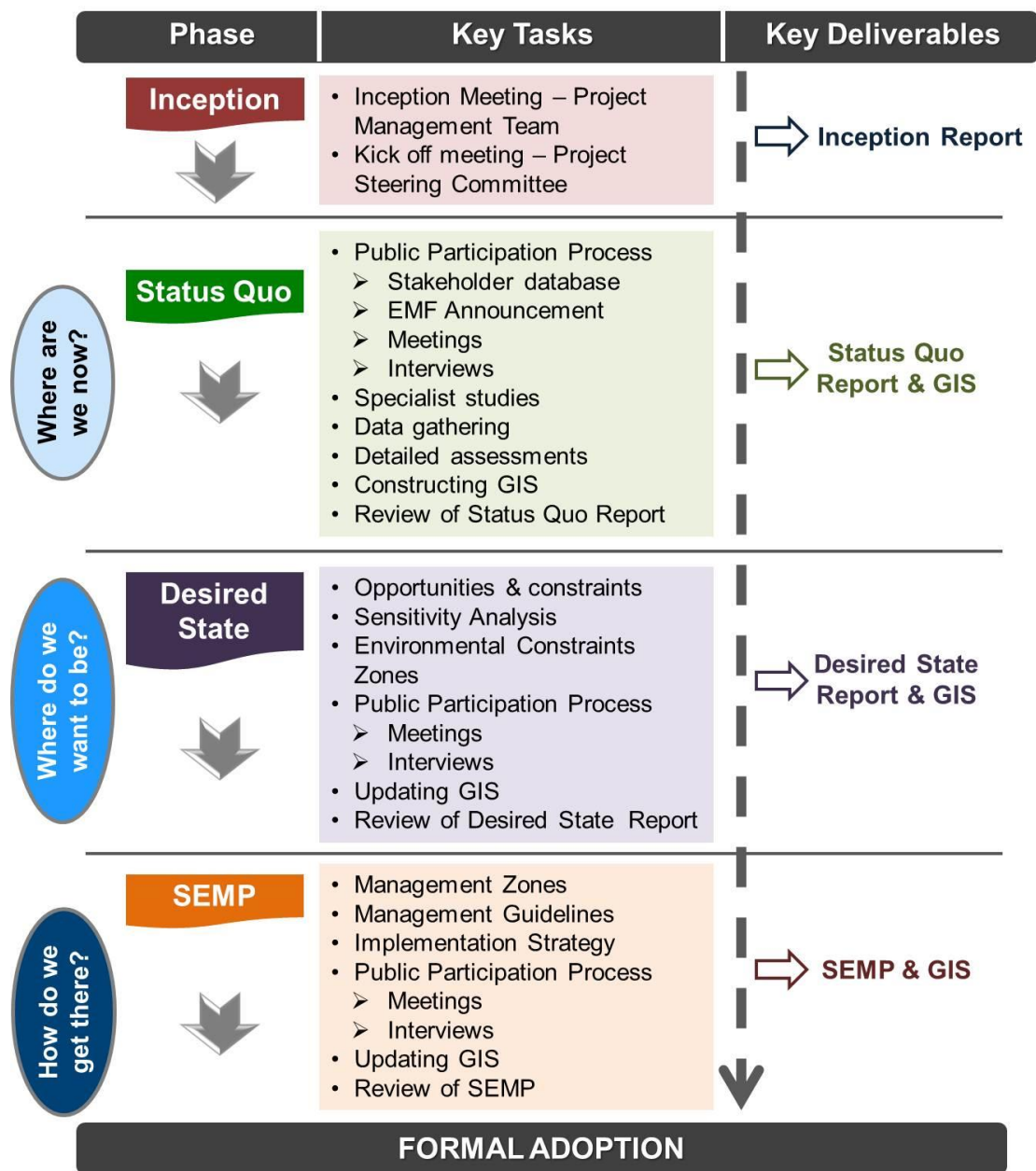
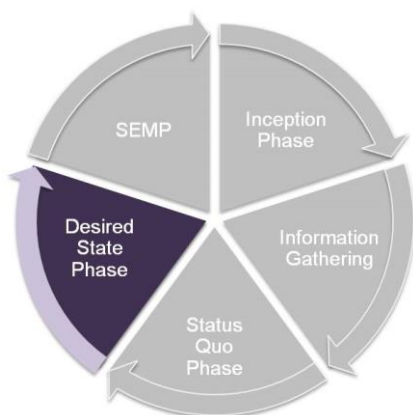


Figure 8: Broad Overview of EMF Development Process

1.7 Establishing a Desired State

With the foundation of the EMF set through the Status Quo Phase, the next step is to determine a realistic desired state for the environment in the study area.



Establishing the desired state includes setting a vision and providing the environmental management context for the management zones and related requirements for the various environmental features for the SEMP. It also focuses on addressing the imperatives that lead to the

instigation of the EMF development process (refer to MCLWHS EMF Volume 1: Status Quo Report), which include the following:

1. Significant cultural heritage resources

- Mapungubwe was inscribed on the World Heritage List in 2003. This prestigious status needs to be maintained and the Outstanding Universal Values of the MCLWHS require appropriate safeguarding. Some of the significant features include
 - Remains of palaces (Mapungubwe period);
 - Archaeological remains testifying to Mapungubwe's growth 900-1200 A.D.
 - Remains of early settlement including Stone Age, Iron Age, Early Farming Communities as well as Rock Art
- Meeting the commitments made to ensure that Mapungubwe was declared a World Heritage Site including:
 - Reducing competing land uses within the Core area by acquiring certain properties
 - Defining the TFCA as it is to provide an additional layer of protection beyond the Buffer Zone.

2. Significant environmental factors, for example:

- The core of the WHS is a national park that needs to be conserved.

- The MCLWHS forms one of the core areas of the Vhembe Biosphere Reserve (VBR), with associated high biodiversity.
- The MCLWHS forms part of the proposed Greater Mapungubwe Transfrontier Conservation Area (GMTFCA) between South Africa, Botswana and Zimbabwe. The TFCA is based on a combination of catchment, cadastral and cultural boundaries and aims to provide insight into the ecological, environmental and economic parameters within which the TFCA development will take place.
- The impacts of climate change

3. Development pressures and competing land uses within and surrounding the MCLWHS are significant. The major driving forces are:

- Mining
- Agriculture; and
- Tourism and game farming to a much lesser extent

4. Socio-economic factors include:

- In the greater Musina Local Municipality, agriculture and mining are the main contributors to the economy at 35% and 30%, respectively. Tourism is also a key economic contributor which is reliant on the ecological and cultural features in Mapungubwe.
- The MCLWHS is strategically located in terms of two international border posts (Pontdrift – Botswana; Beitbridge – Zimbabwe) and is situated in close proximity to the town of Musina.
- The general area is underlain by rich deposits of mineral resources.
- Outstanding land claims on portions of Mapungubwe

5. Institutional Factors

- Due to the various environmental features (heritage, biodiversity, protected areas, water resources, mineral resources, etc.) and land uses (conservation, mining, agriculture) and associated legislation that governs their management, there are several public sector authorities from the three spheres of government (national, provincial and local) that have a mandated role to play in the greater

area therefore cooperative governance is central to the management of the MCLWHS.

- Compliance and enforcement of potential impacting land uses need to be stringently executed and effectively coordinated.
- Stakeholder engagement needs to be adequately pursued and promoted.

The approach to defining a desired state in the study area is based on evaluating and integrating the factors shown in the diagram to follow.

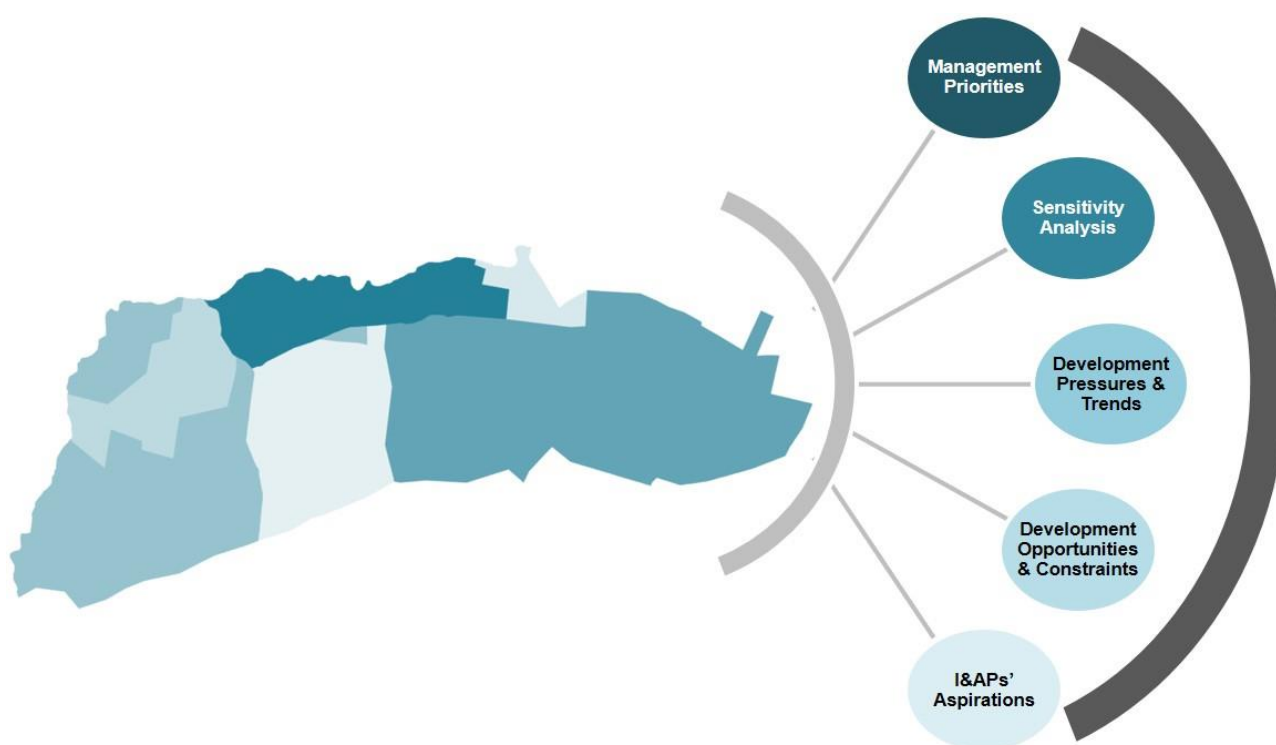


Figure 9: Factors influencing the ‘Desired State’

The Management Priorities, which are strongly rooted in the outcomes of the Status Quo phase, express the desired state. The remaining factors in the above diagram contribute towards the spatial representation of the area’s desired state. These factors are expanded upon in the ensuing chapters.

1.8 Gaps, Assumptions and Limitations

It is expected that the draft EMF and each of the ECZs and EMZs will undergo rigorous review and scrutiny by the relevant parties that will be involved with the application of the

outcomes of the EMF, the implementation of its Management Guidelines or are potentially affected by the framework. Following the requisite amendments and incorporation of comments, this decision support tool should be regarded as a concept EMF until the requirements of DEA can be satisfied. Please note that the new buffer zone will be incorporated into the EMF once it has been gazetted, by following due process

The following information gaps and limitations accompany the Desired State Report:

- ❖ Due to the iterative nature of uncovering information for the study area, it is accepted that more accurate and supplementary information may become available subsequent to the finalisation of the EMF. A plan-do-check-act approach is thus advocated, where the framework will undergo a cycle of planning and implementation which needs to be followed by revisions and updating by DEA. Ground-truthing is also crucial, especially for significant environmental attributes, which needs to feed into the evolving EMF.
- ❖ Limited information was obtained on groundwater (e.g. groundwater quality, vulnerability). Further investigation is required regarding the sensitivity of groundwater in the study area and the level of protection required for this resource.
- ❖ An assessment of cumulative impacts of climate change on all developments in the area has not been undertaken as well as an assessment of the cumulative impacts regarding water uses in the study area (although information was sourced with regards to water use entitlements as part of the agriculture study).
- ❖ Information on the mining rights is regarded as sensitive and detailed information regarding mineral resources could not be sourced. The future implications of mining in the study area need to be considered in terms of development pressures in the subsequent version of the framework. Efforts have been made to confirm the accuracy of the information pertaining to mineral resources and prospecting rights within the study area with the Department of Mineral Resources (DMR). These efforts have had limited success.
- ❖ Areas where conflict between development pressures and environmental sensitivity were identified were dealt with in the demarcation of the EMZs through a conservative and risk-averse approach. Nonetheless, opinions may vary as to the acceptable manner in which development pressures influenced the delineation of the EMZs. Despite efforts, limited information was sourced with regard to sector-related

developments earmarked for the MCLWHS and the EMF may thus not holistically consider all the development pressures in the MCLWHS.

- ❖ Although efforts were made to engage with the land claimants during the EMF development process, further consultation is recommended to convey the implications of the framework for future development in the MCLWHS in order to garner the necessary support in this regard.
- ❖ The ECZs and subsequent EMZs were delineated and rated based on pre-determined (and available) criteria that were fed into a spatial model. Through further data refinement and the inclusion of new spatial information, the precision of the EMZs can be enhanced. Input from stakeholders could also lead to the re-adjustment of weightings, which could lead to the fine-tuning of EMZs' rating system.
- ❖ Through the Project Steering Committee and direct consultation, the project team endeavoured to obtain existing policies, strategies, plans and programmes, as well as information regarding earmarked developments that are relevant to the MCLWHS. However, any additional information and spatial data sourced during the review of the EMF will need to be incorporated as required.



Management Priorities

SECTION 2

2 MANAGEMENT PRIORITIES

2.1 Visioning

The purpose of setting a vision is to articulate a collective statement of future desired state for the study area.

The vision of the government of the Limpopo province in terms of the Provincial Growth & Development Strategy (2005) was to establish a peaceful, prosperous, united, dynamic and transformed province by stimulating, promoting and sustaining unity and an enabling environment conducive for economic development, social justice and improved quality of life for all its people.

The Limpopo Employment, Growth and Development Plan for 2009 – 2014 states that the objective of the plan is to introduce to the people of the province an economy which is able to improve their quality of life through the creation of decent jobs and sustainable livelihoods, the erection of reliable health care infrastructure; building of houses of an acceptable standard; provision of social development; comprehensive rural development, food security and land reform.

There is a strong emphasis on development the economy which is also articulated in the Musina Spatial Development Framework (SDP) (2011) with a focus on mining as the largest contributor to the local economy in terms of GVA. Musina town has been identified as a provincial growth point and is a key district development priority area while Tshipise serves as a local service point in the Musina Municipality. These areas are connected by development corridors and include:

- ❖ Beit Bridge Complex / Limpopo Belt which hosts a number of minerals, the most important of which include: Iron, Dolomite, Diamonds, Marble and Graphite;
- ❖ The Tuli, Mopane, Tshipise and Pafuri coal fields;
- ❖ Tshipise magnesite field; and
- ❖ Mussina copper.

The SDP also refers to other initiatives for economic development including the Greater Mapungubwe Transfrontier Conservation Area (GMTCA) which was identified as a

significant component that could lead to regional growth and development, in a region that has limited options.

The possible impact of mining and other developments on the GMTCA or on the integrity and World Heritage status of Mapungubwe is not addressed in the SDF.

The Limpopo Government Local Economic Development (LED) unit has several development programs in the Vhembe District Municipality. These projects are focused on the agriculture, tourism and mining sectors.

2.2 Feature-based Management Priorities

Environmental Management Priorities emanate from the issues, opportunities and constraints identified during the EMF status quo assessment, and through feedback received during Public Participation. The Management Priorities for the environmental features (see in **Figure 10**) in the study area are listed in the tables to follow.

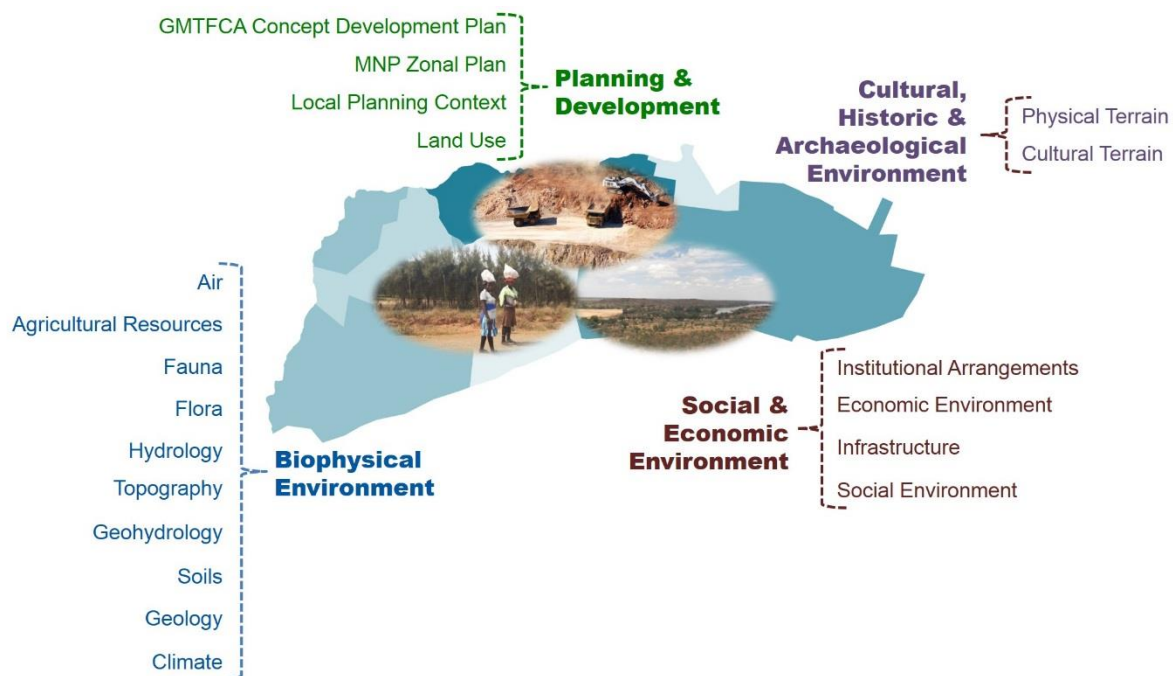


Figure 10: EMF Study Area's environmental features

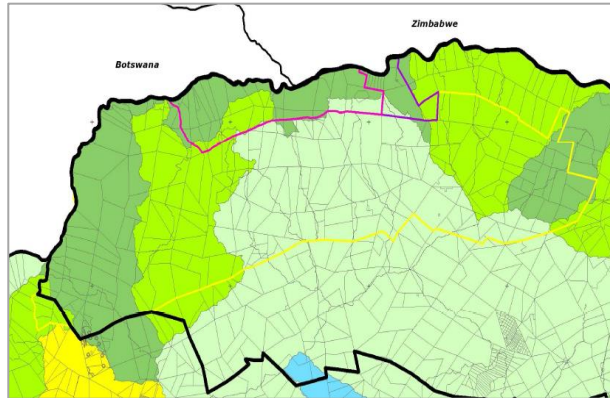
Table 1: Environmental Management Priorities in EMF Study Area

Note: Management Priorities in italics denote possible linkage with spatial elements for mapping purposes (current/future).

CLIMATE	Management Priorities
	<ul style="list-style-type: none"> • Create climate change awareness. Develop strategy to combat climate change and promote sustainable energy solutions. Develop strategies to protect farmers without access to irrigation systems. • Air quality monitoring to include greenhouse gasses. • Manage impacts of climate change on water resources. • Stormwater harvesting to be promoted. • Implement Water Conservation and Demand Management. • <i>Areas important for climate change resilience (e.g. riparian corridors and buffers, wetlands, areas of high plant endemism, refuge sites including southfacing slopes and kloofs and priority large unfragmented landscapes) need to be managed and conserved.</i>
TOPOGRAPHY	Management Priorities
	<ul style="list-style-type: none"> • <i>Conservation of sensitive topographical features that support biodiversity and contribute towards the visual quality.</i> • Establish corridors for alignment of linear-type developments especially mining infrastructure such as pipelines and power lines. • Place linear infrastructure underground where possible such as pipelines.

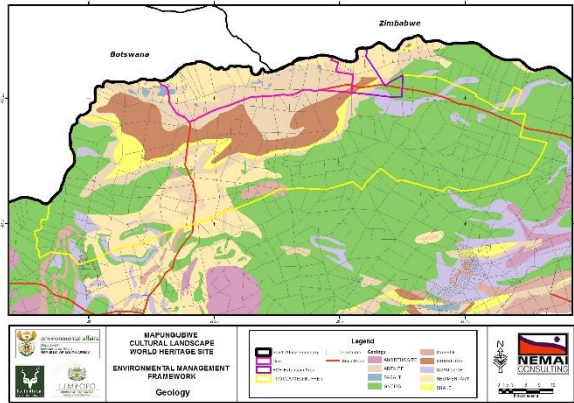
GROUNDWATER

Management Priorities



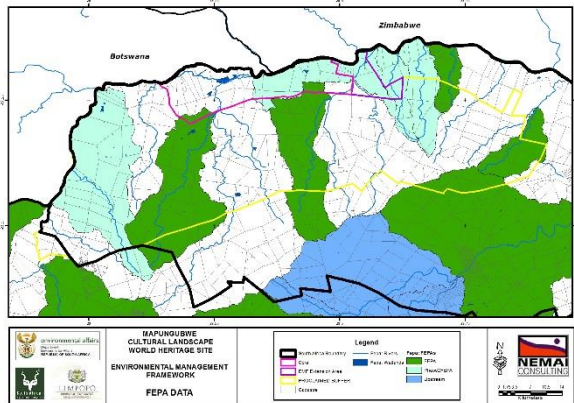
- Optimal use of groundwater resources. Underground water utilization investigation. Determine fitness for use.
- *Regulate and prohibit land-based activities which may affect the quantity and quality of groundwater once site specific studies have been conducted and the results known.*
- *Create awareness of Tuli Karoo sub-basin transboundary aquifer and pursue transboundary management of water resources (e.g. upstream impacts, institutional relationships).*
- Establish an understanding of the groundwater resources' vulnerability to pollution.
- Understand the ecological reserve determination for the catchment area of the MCLWHS that will inform other water use constraints
- Institute adequate source-directed controls to manage potential impacts to groundwater resources, which could include:
 - Authorisations, licences and permits;
 - Standards to regulate quality of waste discharges;
 - Requirements for on-site management practices (e.g. to minimise waste at source and to control diffuse pollution);
 - Requirements for clean-up and remediation of water resources that have already been polluted.
- Groundwater monitoring programme.
- Prevent intrusion of polluted surface water.
- Provision of adequate sanitation and waste management services.
- Continue the process of trying to obtain existing data on groundwater quality and quantity from stakeholders, especially those in the mining sector.

GEOLOGY Management Priorities

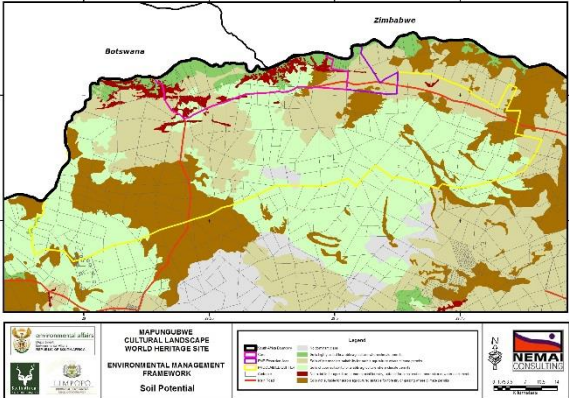


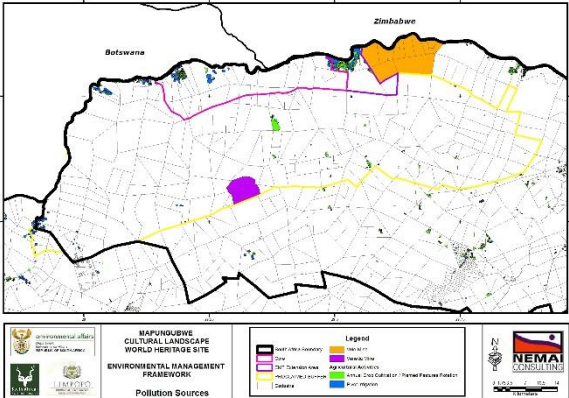
- Developments to consider Development Potential Zones, based on the geology, soil land types, drainage and slope gradients.
- *Detailed geotechnical assessments to be conducted, based on the types of developments.*
- Coordinated compliance enforcement and monitoring of mining activities of those mining rights that were issued prior to the declaration of the MCLWHS is important to reduce potential impacts on the MCLWHS.
- Current prospecting licences undergoing conversion and future prospecting licences will be restricted in the buffer zone.

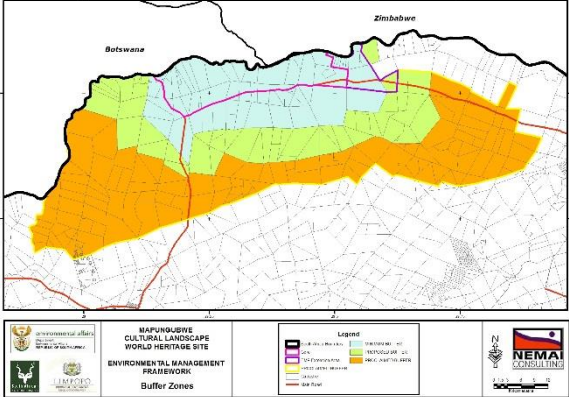
SURFACE WATER Management Priorities



- To manage the biodiversity within the expansive Limpopo-Shashe Transfrontier Park initiative.
- To encourage MCLWHS participation in relevant water use fora and to ensure that communication channels are established between the park and other stakeholders sharing groundwater
- The Ecological Reserve of the catchments of the MCLWHS should be established in order to understand the constraints on water use
- *Develop an adaptive management programme for wetlands;*
- The most important areas requiring restoration or rehabilitation are the terrestrial field layer, redundant infrastructure, and the Kolope / Maloutswa wetlands;
- Developing the Golope/Maloutswa wetland as a key biodiversity feature in MCLWHS

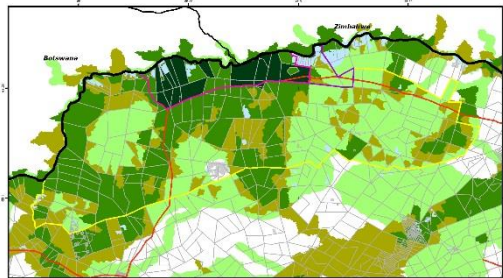
SOIL	Management Priorities
 <p style="text-align: center;">MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE ENVIRONMENTAL MANAGEMENT FRAMEWORK Soil Potential</p>	<ul style="list-style-type: none"> • Education and training on best practices in subsistence farming. • Agricultural development to consider soil conditions especially as much of the soils can support livestock and game farming only. • Mining activities should not extend onto soils that can support crop farming. Assessments should be undertaken that determine the relative impacts of the proposed activities on the environment and economy in order to direct what activities should or should not take place • Provision of adequate sanitation and waste management services. • <i>Identify and avoid disturbing areas where the soil has a high erodibility factor.</i> • Maintain adequate stocking rates and veld management. Prevent overgrazing to curb erosion and soil degradation. • Pollution prevention and remediation measures.

AIR	Management Priorities
 <p style="text-align: center;">MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE ENVIRONMENTAL MANAGEMENT FRAMEWORK Pollution Sources</p>	<ul style="list-style-type: none"> • Finalise and implement Air Quality Management Plan for the district. • Institute air quality monitoring programme especially mining areas and other areas that are pollution sources. • Detailed emissions inventory to be developed for the district. • Growth in the greater area must be partnered with new infrastructure for electricity supply to prevent use of wood fires as an energy source. • Promotion of energy efficient heating and lighting. • Awareness campaigns to be conducted regarding the dangers of local communities burning waste, as a means of disposal. • Establishment of municipal by-laws governing the burning of waste.

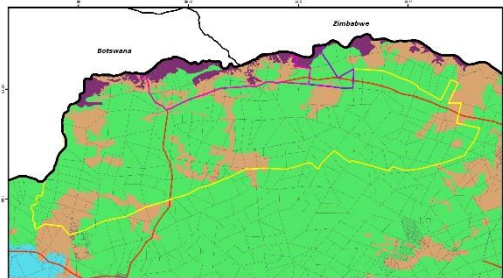
PROTECTED AREAS/BUFFER ZONES	Management Priorities
	<ul style="list-style-type: none"> • Support and facilitate land planning and practices that safeguard and enhance the following: <ul style="list-style-type: none"> ○ Overall biodiversity values in the MCLWHS ○ Ecological corridors; ○ Ecotourism developments • Protection of core and buffer zones and transitional zones. • A buffer zone policy to be developed by the DEA/SANParks that clearly indicates which land uses can / cannot take place within the zone • More signage to be erected at strategic points to make people aware that they are entering a WHS • Advocate community conservation ventures and commensurate activities in buffers. • Resolve conflicting land uses • Clarity regarding land tenure • Maintain working relationships between the various spheres of government to ensure a collaborative effort to conserve MCLWHS protected areas and adjoining buffer zones. • More public and stakeholder engagement regarding the establishment of a new buffer zone for the MCLWHS

TERRESTRIAL ECOSYSTEMS

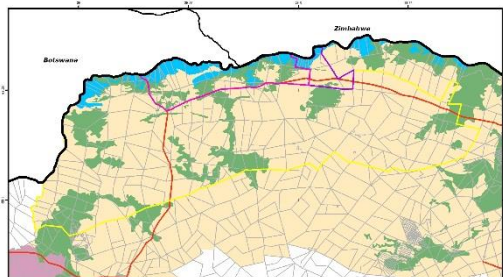
Management Priorities



MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE ENVIRONMENTAL MANAGEMENT FRAMEWORK CBA Categories



MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE ENVIRONMENTAL MANAGEMENT FRAMEWORK Vegetation

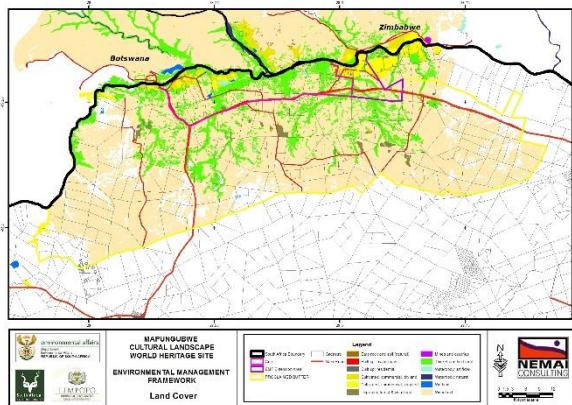
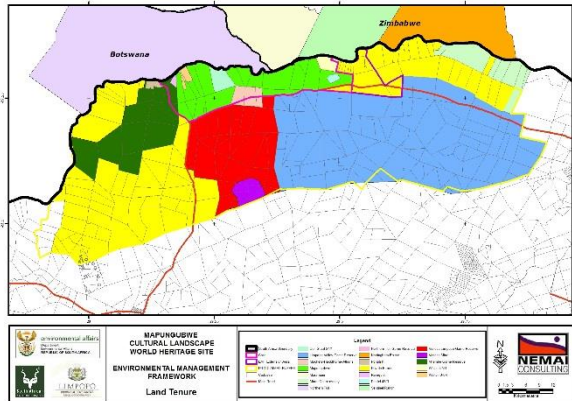


MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE ENVIRONMENTAL MANAGEMENT FRAMEWORK Vegetation Types

- Support and facilitate land planning and practices that enhance the following:
 - Biodiversity values and the role the region can play in conserving the Soutpansberg Centre of Endemism;
 - Objectives of the Greater Mapungubwe Transfrontier Conservation Area;
 - Economic objectives based on wildlife industries that are compatible with the regions overall biodiversity values including ecotourism developments.
- Conserve and maintain the fence that protects the gallery forest (which is listed as Critically Endangered) from elephants.
- Restore and conserve biodiversity and ecosystem patterns and processes.
- The MCLWHS be used to meet biodiversity conservation objectives and targets
- To promote the restoration of the Limpopo/Shashe River system and its tributaries to deliver basic ecosystem functions to surrounding environments.
- Rehabilitation of old lands, with emphasis on re-establishment of riparian woodland.
- Restoration of the wetlands to as large an extent as possible, or to their natural state.
- Conserve long-term viable and representative sensitive and threatened vegetation types and control development pressure in key sensitive areas.
- Any irreconcilable activities in close proximity to ecologically sensitive habitats or initiatives / wildlife industries compatible with regions overall biodiversity objectives (e.g. wetlands, rivers and conservation areas) should be discouraged or strictly controlled.
- Rehabilitate Kalopi/Maloutswa wetland and pans, which are threatened by water-use locally and upstream; agriculture and fish-farming and all the structures erected to manipulate water flow; and fragmentation of the aquatic features themselves.
- Remove and control invasive alien vegetation because the invasion of alien invasive species is a major problem affecting Protected Areas.
- Implement effective veld fire management strategies and guidelines in accordance with requirements to maintain biodiversity.
- Control illegal harvesting, particularly in and adjacent to important biodiversity hotspots. Harvesting of medicinal plant species must be confined to areas where the plant populations are large enough to sustain commercial harvesting
- Control and prevent the illegal removal of terrestrial species.
- Ensure that the habitat required for the Southern Ground-Hornbill remains intact as this species population in the Limpopo Valley is extremely valuable as populations to the south are locally extinct.
- The use of signage and roadside fencing to direct wildlife to cross roads through existing culverts to reduce incidents of road kill as well as the clearing of road verges of vegetation in order to make both the animals and vehicles more visible
- National and local government structures must facilitate sustainable trade in medicinal plants and continue to monitor and regulate the use of medicinal plant species.

SOCIO-ECONOMIC ENVIRONMENT

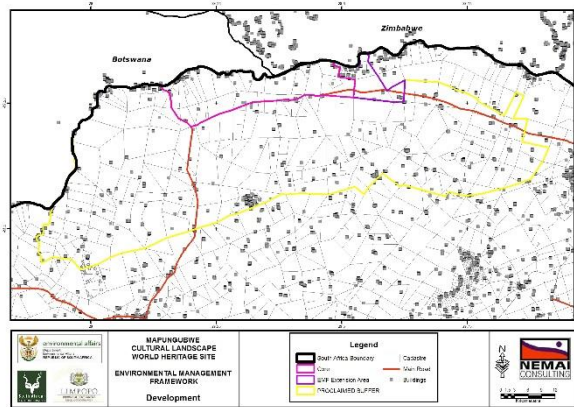
Management Priorities



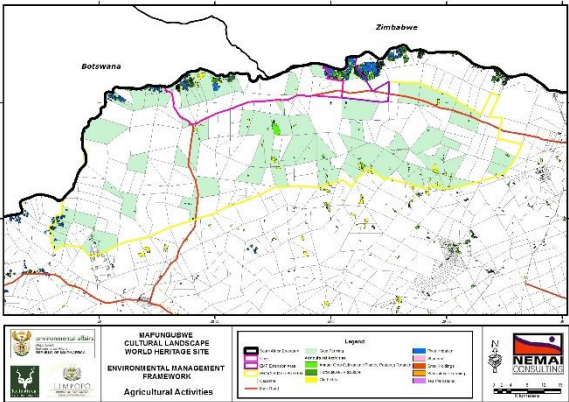
- EMF to be aligned with Provincial strategies including LED Strategies, SDFs, etc
- The cultural heritage of the landscape serves as a comparative advantage and the Provincial government should exploit the opportunities that this proclaimed UNESCO site offers.
- Those who visit the GMTFCA will automatically enter MCLWHS. This should be used when marketing Mapungubwe and it should be used to generate more interest into the area.
- The site must be efficiently managed and controlled in order to avoid trampling of deposits, graffiti, damage to paintings and other artefacts, and removal of archaeological material such as pottery and beads.
- The area will require monitoring and signage of where visitors will be allowed. Conservation is intrinsic to tourism. If the cultural and heritage resources at the MCLWHS are not conserved, there will be no tourism attraction to the area.
- Development needs to take place in a sustainable manner so that the natural landscape is not altered.
- Settle land claims expeditiously
- Provision of adequate services and social amenities.
- Poverty alleviation and job creation, capacity building especially in the tourism business
- Growing the economy (Local Economic Development).
- Developments that serve the people of the Musina LM and Vhembe DM in terms of their psychological, physical, developmental, cultural and social interests equitably.
- Ensure good governance in environmental management, including ensuring openness and transparency, participation, accountability, effectiveness, coherence and consistence.
- Focus environmental education initiatives initially around sensitive areas. Where appropriate, build educational component into tourism attractions to ensure proper environmental management of sensitive areas.
- Optimise tourism potential.

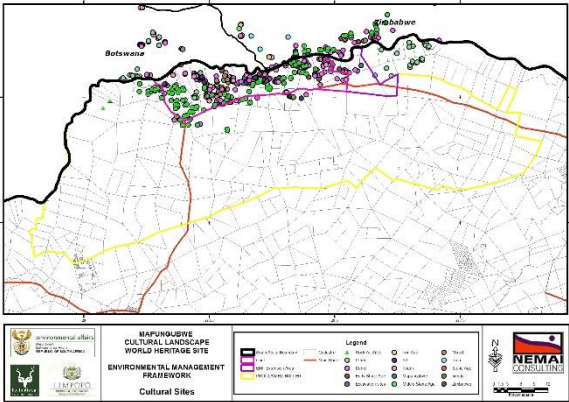
INFRASTRUCTURE & MUNICIPAL SERVICES

Management Priorities

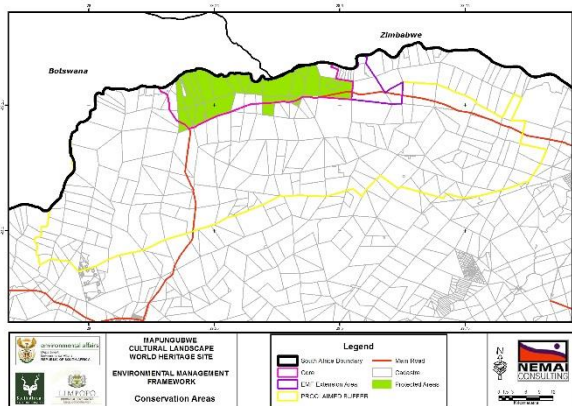


- Priority infrastructure development initiatives and intentions to be integrated into the EMF, where possible. Consideration to be given to the establishment of service corridors where applicable.
- Eradicate service backlogs.
- Vacancies in the local municipality need to be filled in order to run efficiently.
- The municipality to develop and review its policies and by-laws.
- Cooperative governance is central to the effective management of the MCLWHS.
- Compliance and enforcement of potential impacting land uses need to be stringently executed and effectively coordinated.
- Stakeholder engagement needs to be adequately pursued and promoted.
- Implementation of Integrated Waste Management Plan for the district.
- Creation and improvement of transport linkages to provide access to isolated areas, to support potential economic activity (increased tourism and movement of goods) and to improve social activities (recreation, access to health and education).
- The quality of the roads need to be restored to make the area accessible. The potholes on the R572, adjacent to MCLWHS, need to be fixed and the bridge that collapsed during the floods of 2013 must be repaired as soon as possible.
- Clearing of road verges to improve visibility of animals and vehicles to reduce road kill
- Action plan for promoting renewable energy within the MCLWHS.
- Waste disposal sites and WWTWs to be operated in accordance with legal requirements.
- Water conservation and demand management strategy.
- Enforcement of Local-, Regional- and National Legislation and Policies.
- Waste recycling to be encouraged.
- More energy-efficient forms of transport such as rail need to be upgraded and expanded

AGRICULTURE	Management Priorities
	<ul style="list-style-type: none"> • EMF to facilitate the harnessing of the agricultural potential in the district. • Invest in better agricultural education and land care programmes. Build capacity surrounding farming methods to local subsistence farming. • High potential agricultural land set aside for agricultural purposes outside core of MCLWHS • Sustainable and environmental friendly irrigation practices. • Sustainable grazing practises • Enforcement of livestock carrying capacity for the area. • Settling of land claims as expeditiously as possible • Providing the necessary support to emerging farmers. • Support development of game farms but ensure that game is not allowed to enter areas that will place cultural and environmental resources at risk. Conservation should take priority over game farming as the comparative advantage of the area lies in the cultural resources.

HERITAGE RESOURCES	Management Priorities
	<ul style="list-style-type: none"> • Preservation of MCLWHS. • <i>Heritage impact assessments to accompany all developments, where necessary.</i> • The Limpopo government should exploit the opportunities that the WHS offers. • Those who visit the GMTFCA will automatically enter MCLWHS. This should be viewed as an advantage when marketing Mapungubwe and it should be used to generate more interest in the area. • <i>Signage to be erected along roads that makes people aware that they are entering a WHS.</i> • The site must be efficiently managed and controlled in order to avoid trampling of deposits, graffiti, damage to paintings and other artefacts, and removal of archaeological material such as pottery and beads. • The area must be monitored and signage must be evident of where visitors will be allowed and where visitors will be restricted • If tourism development is uncontrolled it may result in a high risk for conservation and biodiversity. Development needs to take place in a sustainable manner so that the natural landscape is not altered. • Incorporate heritage considerations into development proposals. • Clear institutional responsibilities at a municipal level not only for heritage conservation but for interaction with MCLWHS management in terms of developments adjacent / close to the WHS so that negative impacts are limited as much as possible • <i>Compilation of Vhembe DM Heritage Management Plan that should tie in with that of the MCLWHS to ensure that there are no areas of conflict or uncertainty.</i>

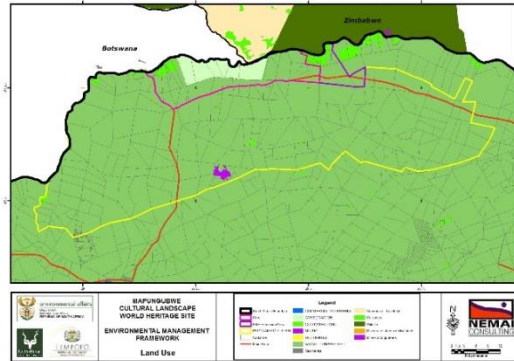
TOURISM	Management Priorities
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- Diversification of tourism opportunities and target markets especially in terms game farms and eco-tourism initiatives.
- Improve accessibility by improving signage and information boards throughout the destination.
- Manage tourism closely to prevent damage to heritage sites, through trampling of deposits, graffiti, damage to paintings and other artefacts, and removal of archaeological material such as pottery and beads.
- Management of WHS so that status is not threatened by uncontrolled tourism development.
- Business tourism should be explored in the area. Accommodation facilities should cater for business travel in order to attract more people to the area especially as there are two operational mines in the area and future mining activities are likely to occur.
- Game should not be allowed to enter areas which will place the cultural and environmental resources at risk. Conservation should take priority over game farming as the comparative advantage of the area lies in the cultural resources of the area.
- Have an environment conducive to the development of SMME's; capacitate SMMEs especially in the tourism field
- Tourism industry must be accessible to previously marginalised communities and particularly rural communities.
- Create a safe and crime free environment conducive for tourism development and appealing to visitors.
- Promote environmentally responsible tourism development that is sensitive to the natural environment and attractions.
- Improve the quality of the roads in the area including the repair of potholes and bridges along the R572 as well as the clearing of verges of vegetation growth to reduce road kill and accidents

PLANNING & DEVELOPMENT

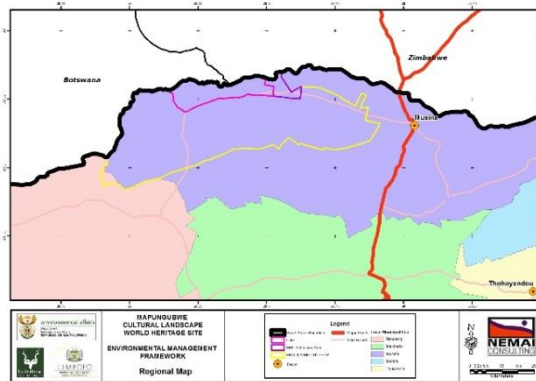
Management Priorities



- EMF to consider SDFs.
- EMF to be integrated into next generation SDFs of both the Local Municipality and District Municipality
- Maintain working relationships between the various spheres of government to ensure a collaborative effort to conserve MCLWHS protected areas and their adjoining buffer zones, through prudent planning.
- The spatial imbalance between the Western and Eastern areas in the Musina LM in terms of settlement and infrastructure development, will need to be addressed should tourism development around Mapungubwe/Dongola complex develop.

INSTITUTIONAL ENVIRONMENT

Management Priorities



- Provisions in the EMF to address institutional problems associated with environmental management in the local and district municipalities.
- Cooperative governance central to the effective management of the MCLWHS.
- Compliance and enforcement of potential impacting land uses need to be stringently executed and effectively coordinated.
- Stakeholder engagement needs to be adequately pursued and promoted.
- Environmental awareness and training required for municipal officials to create capacity.
- Address resource shortcomings to allow the Local and District Municipalities to fulfil their environmental management functions.
- Micro organisational restructuring to allow for the EMF roll-out.
- Improved cooperative governance for environmental and WHS matters

2.3 Future Pursuit of Management Priorities

In terms of the EMF development process, Management Priorities are not necessarily taken forward in the mapping component of the framework, where some of the objectives cannot be presented spatially. However, the Management Priorities promote attaining the desired state of the study area by playing an important role in setting Management Guidelines for the respective Environmental Management Zones (EMZs).

The Management Priorities serve as high-level objectives that facilitate the realisation of the desired state. Outside of the functions of the EMF, the Management Priorities need to be captured in future environmental management strategies for the study area, which need to be championed by the responsible government bodies.

Sensitivity Analysis



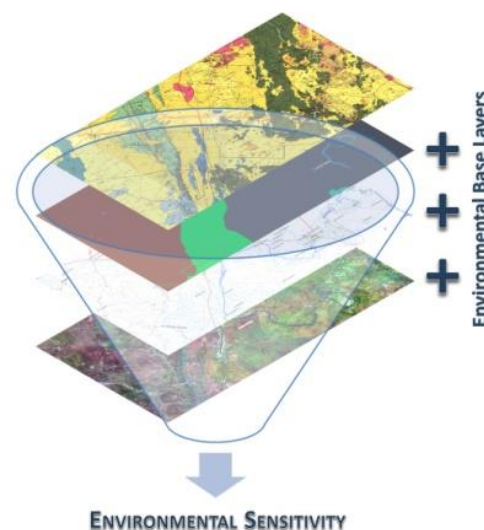
3 SENSITIVITY ANALYSIS

'Sensitivity' is regarded as the inherent quality of an environmental feature, which is derived from the following traits:

- ❖ Goods and services offered;
- ❖ Scientific importance (e.g. research purposes, uniqueness, biodiversity significance);
- ❖ Legal status / protection level; and
- ❖ Vulnerability / tolerance to change.

The process adopted in undertaking the sensitivity analysis for the EMF Desired State phase consisted of the following:

1. Integrate spatially represented baseline information from the the Status Quo assessment;
2. Identify the **environmental features and their associated attributes** that portray the environmental sensitivity of the MCLWHS based on the outcomes of the Status Quo phase;
3. Assign **sensitivity ratings**;
4. Mapping of sensitivity by –
 - a. Overlaying **base layers** in the Geographic Information System (GIS) to compile sensitivity maps for s environmental features; and
 - b. Combining separate sensitivity maps to prepare a composite map that reflects the **Environmental Control Zones**.



3.1 Determining Sensitivity per Environmental Feature

Groupings of homogenous environmental features and attributes in the MCLWHS that depict the sensitivity of the area were allocated weightings, based on their intrinsic qualities that render them as sensitive. In this way, baseline information was transformed into secondary information that attached values to different features.

These ratings were based on input received from the environmental specialists that aided in compiling the EMF Status Quo Report. The sensitivity scale that was employed ranged from low to very high (see **Table 2**), based on various criteria such as the sensitivity to development pressure or resilience to change. In order to retain a certain degree of objectivity the band or spectrum of weighting was kept narrow.

Table 2: Environmental Sensitivity Scale (*Note: sensitivity based on a single criterion / combination of criteria, where applicable to the feature*)

Sensitivity Rating	Description
Restricted	Constraints exist against the activities associated with the environmental feature (e.g. agriculture not supported in protected areas).
Low	The inherent feature status and sensitivity is already significantly degraded. Environmental goods and services depleted / compromised. Any <i>significant environmental – development*</i> change will not influence the current status.
Medium	The inherent feature status and sensitivity will be moderately influenced by a significant environmental – development change.
High	Environmental – development change may influence the current status of the feature, either negatively or positively. Feature offers intact environmental goods and services / supports environmental goods and services offered by other feature(s). Feature may be afforded legal protection status.
Very High	Environmental – development change will significantly influence the feature, either negatively or positively. Feature offers critical environmental goods and services. Feature afforded legal protection status.

The sensitivity of the key environmental features in the MCLWHS are portrayed in the sub-sections to follow. Please note the following:

- Where a rating is shown as “restricted” it implies that constraints exist against the activities associated with the environmental feature (e.g. mining not supported in the core area).
- Where difficulties in obtaining spatial data (groundwater information; proposed and current mining plans, etc.,) therefore the information presented may not necessarily provide a balanced view of the overall sensitivity of the study area.
- Although the sensitivity analysis does not prescribe the desired state, it is one of the key factors that are considered in the delineation of the EMZs (refer to **Section 1.7**).

3.1.1 Agriculture

According to the WHS nomination dossier (DEAT, 2002), farming within the core area is regarded as a conflicting land use therefore farming will be phased out of the core area over a period of time. Those farms will be acquired by SANParks, decommissioned and gradually rehabilitated thereby halting any further agricultural encroachment into the core.

However, high agricultural potential is regarded as a scarce non-renewable resource and accordingly a risk averse and cautious approach should be adopted in terms of phasing out farms in the core of the MCLWHS.

In addition, the labour intensive agricultural practices that take place along the Limpopo River provide employment to a high number of local people that service the citrus, vegetable and other crop industries.

Land capability for the area was compiled by the National Department of Agriculture, Forestry and Fisheries (DAFF) through the compilation of more than 300 models depicting the various aspects pertaining to soil capability (depth, clay %, structure, texture, water holding capacity etc.), climate capability (rainfall, frequency, intensity, temperature – max & min, heat units, chill units etc.) and terrain capability (slope, aspects, trafficability, erosion susceptibility etc.)

The table to follow reflects the sensitivity ratings according to the aspects mentioned above that apply to the study area.

Table 3: Sensitivity Ratings assigned to Category: Agriculture

Category	Sensitivity Criteria	Attributes	Rating
AGRICULTURE	Land Capability	Soil, climate & terrain - Moderate to High capability	M - H
	Land Capability	Soil, climate & terrain – Moderate capability	M
	Land Capability	Soil, climate & terrain – Low capability	L
	Existing agricultural activities (Primary Agricultural Land Use)	Commercial agriculture	M
	Rainfall Class	201mm – 400mm	L

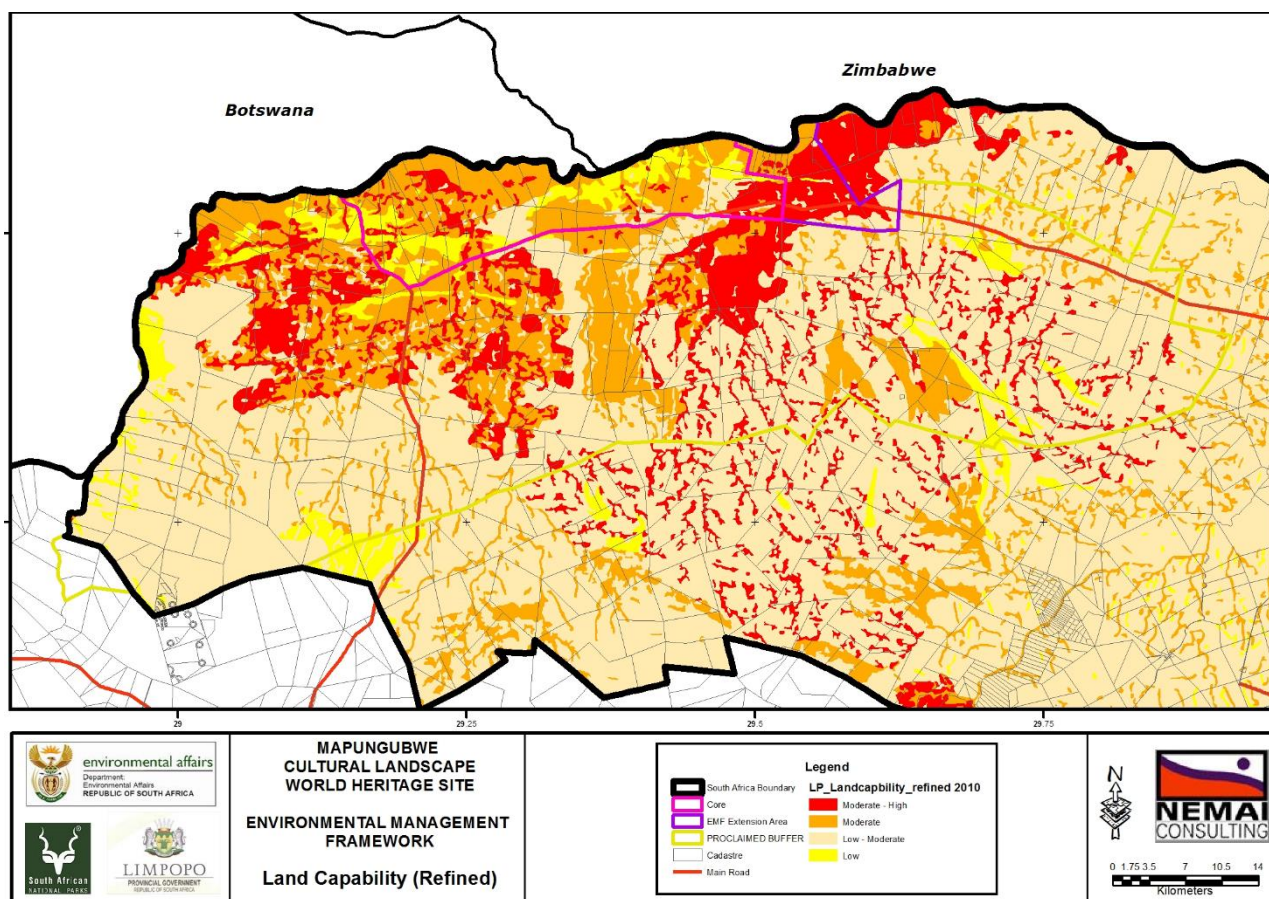


Figure 11: Land Capability - Agriculture

3.1.2 Heritage

The site of Mapungubwe was inscribed on the World Heritage List in July 2003, on the basis of criteria ii, iii, iv and v. In Government Notice No. 71 of 30 January 2009 (GN 31832) the Mapunbugwe Cultural Landscape (MCL) was declared as a World Heritage Site in terms of the World Heritage Convention Act (Act No. 49 of 1999) with specified powers of management delegated to SANParks.

This prestigious status needs to be maintained and supported and the Outstanding Universal Values of the MCLWHS require appropriate safeguarding. Some of the significant features include –

- ❖ Remains of palaces (Mapungubwe period);
- ❖ Archaeological remains testifying to Mapungubwe’s growth 900-1200 A.D.;
- ❖ Remains of early settlement - Stone Age & Iron Age & rock art;
- ❖ ‘Natural’ landscape surrounding the built remains;

- ❖ Intangible heritage - Mapungubwe Hill associated with sacredness, beliefs, customs and traditions of local communities;
- ❖ Living heritage - continuing traditions and associations such as rain making, and participation by local communities in reburial ceremonies; and
- ❖ Landscape sharing and interaction between farmers and hunter-gatherers.

The rich cultural heritage is reflected in the large number and diversity of heritage sites in the MCLWHS. The sensitivity rating of heritage sites in the MCLWHS is shown in Table 4.

Table 4: Sensitivity ratings allocated to Category: Heritage

Category	Sensitivity Criteria	Attributes	Rating
HERITAGE	Cultural Heritage Sites*	Capitals (Schroda, K2, Mapungubwe, Bambandyanalo) – 50m buffer zones	VH
		Heritage sites within MCLWHS core area – 25m buffer zone	H
		Heritage sites within proclaimed Buffer Zone: ❖ Iron Age sites; Stone Age deposits in rock shelters & Rock Art – 25m buffer zone	H
		❖ Scattered Stone Age artefacts – no buffer	L
		Outside Buffer Zone: ❖ Rock Art Sites – 25m buffer zone	H
		❖ Iron Age & <i>in situ</i> Stone Age sites – 25m buffer zone	M
		Stone-walled ruins of Zimbabwean culture – 50m buffer zone	VH
		Graves – 25m buffer zone	H
		Paleontological sites – very high fossil sensitivity (fossil sensitivity map) – 25m buffer zone	VH
		Paleontological sites – high fossil sensitivity (fossil sensitivity map) – 25m buffer zone	H

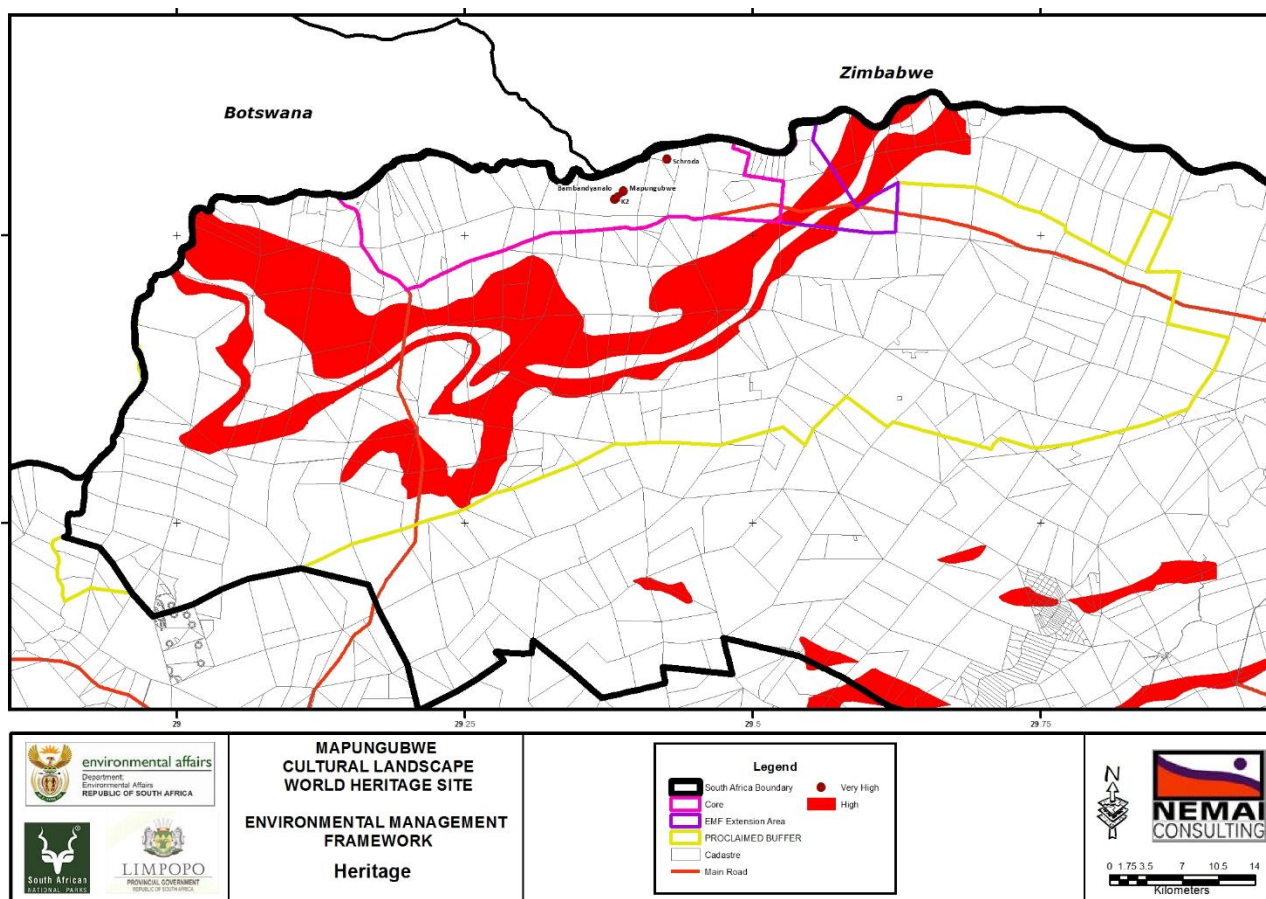


Figure 12: Heritage Sensitivity

3.1.3 Terrestrial Biodiversity

Apart from the strong legislative framework that protects terrestrial biodiversity, various mechanisms exist to manage terrestrial biodiversity in Limpopo Province hence in the MCLWHS. There include:

- ❖ Limpopo Conservation Plan: Critical Biodiversity Areas (CBAs) within the bioregion are the sites that are required to meet the region's biodiversity targets. Systematic conservation planning process resulted in 40% of the Province being identified as Critical Biodiversity Areas (CBA1 22% and CBA2 18%). Ecological Support Areas cover a further 22% of the province, of which 16% are intact natural areas (ESA1) and 7% are degraded or areas with no natural remaining which are nevertheless required as they potentially retain some value for supporting ecological processes (ESA2).

A map of CBAs for Limpopo was produced as part of this plan and sites were assigned to CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes. According to this data, there is one Endangered (EN) and one Vulnerable (Vu) ecosystem in the MCLWHS, namely Lowveld Riverine Forest and Mapungubwe/Greefswald Riverine Forest respectively.

- ❖ Protected areas: there are number of provincial nature reserves in the MCLWHS namely: Vhembe Nature Reserve and the Limpopo Valley Game Reserve. Protected areas are managed in accordance with their respective Integrated Management Plans (IMPs) and buffer zones (where applicable);
- ❖ The Greater Mapungubwe Transfrontier Conservation Area: is located at the confluence of the Limpopo and Shashe Rivers, incorporating areas in Botswana, South Africa and Zimbabwe. The selection of the Limpopo/Shashe area is based on the rich biodiversity of the area, its scenic beauty and the cultural importance of the archaeological treasures of Mapungubwe. There are three main vegetation communities recognised in the region: riparian fringe along the Limpopo and tributaries, the Acacia-Salvadora community of the Limpopo flats and the mixed western mopane veld on ridges and flats south of the riparian fringe and flood plains. Both the riparian forest and Acacia-Salvadora communities are regarded as being among the most endangered vegetation communities in the South African environment.
- ❖ Vhembe Biosphere Reserve (VBR): was named a biosphere reserve by UNESCO since 2009. The VBR covers the Vhembe District, the Blouberg Municipality and the Kruger National Park north of the Shingwedzi River, the Mapungubwe National Park, the Makgabeng Plateau, the Makuleke Wetlands and as well as part of two recognized centres of biodiversity endemism (the Soutpansberg and Blouberg). The aims of VBR is to conserve the areas' uniquely bio-diverse environment, while simultaneously supporting and promoting much needed sustainable development. The VBR include three biomes, namely savanna, grassland, and forest, four bioregions and twenty four different vegetation types.

- ❖ Musina Local Municipality (LM) has an Environmental Plan and the Municipality is performing the function through a service level agreement with Vhembe District Municipality according to the Draft 2012/13-2017 IDP for the LM. According to the IDP, the sensitive areas within and around the municipality are identified as its riverine areas, natural heritage sites and nature reserves. The rivers and landscapes within the municipality are subjected to pollution from human activities and air pollution from derelict mine dumps are viewed as leading to potential health problems. Litter and unsightly waste dumps create an image of a degraded environment with a concomitant negative impact on the aesthetics of the area.
- ❖ Land Management Classes for terrestrial ecosystems: are utilised to demarcate the land uses that can be undertaken in certain areas. Category 1 Protected Areas include core areas of World Heritage Sites, RAMSAR sites and proclaimed National and Provincial Parks for example. Therefore the core area of the MCLWHS can only be used for conservation and associated activities (ecotourism operations) in terms of land management hence the Very High rating attributed to the core.
- ❖ Venetia Limpopo Nature Reserve: is not a formally proclaimed nature reserve and consists of 22 farm title deeds that are managed as a conservation area by de Beers with the objective of becoming self-sustainable.

The rich biodiversity in the MCLWHS is revealed in terms of the various sensitive features that are rated in the table to follow.

Table 5: Sensitivity ratings allocated to Category: Terrestrial Biodiversity

Category	Sensitivity Criteria	Attributes	Rating	
TERRESTRIAL BIODIVERSITY	WHS Core		VH	
	Mapungubwe National Park		VH	
	Important Bird Areas		H	
	Critical Biodiversity Areas Categories (TSCP*)	CBA 1		VH
		CBA 2		VH
	Ecological Support Areas	ESA 1		H
		ESA 2		M
	Game Farms			M
Transfrontier Conservation Area	GMTFCA		H	

Category	Sensitivity Criteria	Attributes	Rating
	Vegetation types	Critically Endangered	VH
		Endangered	H
		Vulnerable	H
		Least Threatened	L
	RAMSAR Sites	UDP WHS	VH
	Ridges with slopes > 5°		VH
	Transformation	No natural areas remaining	Restricted
	Protected Areas – buffer zones	WHS & Nature Reserves - 10 km buffer	M
		MCLWHS Proclaimed Buffer	M
	Riparian forest and floodplain		H
Priority species	<ul style="list-style-type: none"> Blue Crane Habitat Grey Crowned Crane Wattled Crane Southern Ground-Hornbill Oribi 	VH	

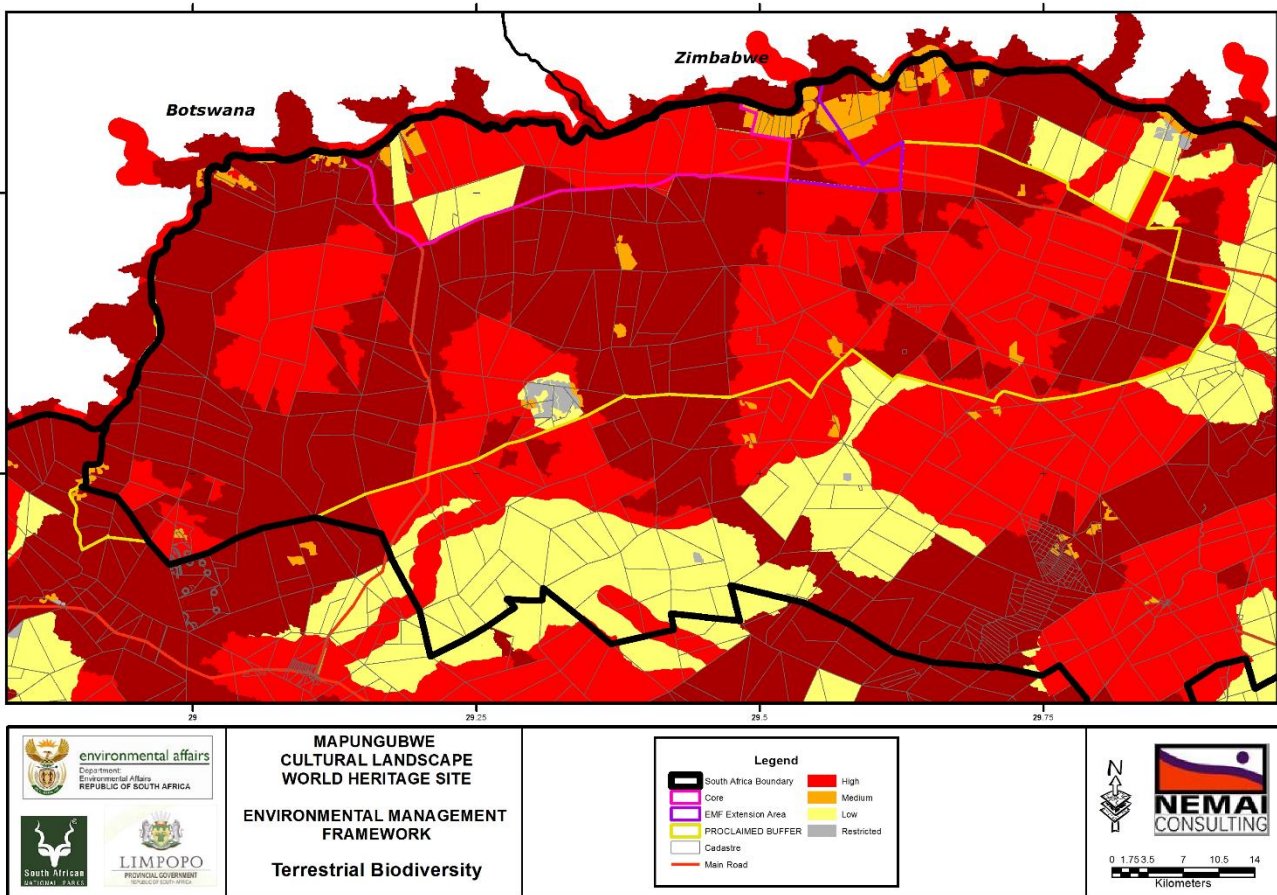


Figure 13: Terrestrial Biodiversity Sensitivity

3.1.4 Surface water

In accordance with the National Water Act (NWA) (Act No. 36 of 1998), a watercourse is regarded as a river or spring, a natural channel in which water flows regularly or intermittently, and a wetland, lake or dam into which, or from which, water flows.

A watercourse needs to be considered in terms of its “resource quality”, which is defined by the National Water Act (Act No. 36 of 1998) as the following:

- ❖ Quantity, pattern, timing, water level and assurance of in-stream flow;
- ❖ Water quality, including physical, chemical and biological characteristics of the water;
- ❖ Character and condition of the in-stream and riparian habitat; and
- ❖ Characteristics, condition and distribution of the aquatic biota.

The NWA promotes two complimentary approaches to achieve Integrated Water Resource Management, namely Resource Directed Measures (RDMs) and Source Directed Controls (SDCs). RDMs focus on the quality of the water resource itself, regarding it as an ecosystem rather than a commodity, and comprise the following components: Classification system, Reserve and Resource Quality Objectives (RQOs).

Giving effect to RDMs means regulating water use through SDCs. SDCs aim to control and minimise potential impacts on the water resource so that RQOs are achieved. SDCs include regulatory mechanisms such as water use authorisation.

The National Freshwater Ecosystem Priority Areas (NFEPA) project aims to identify a national network of freshwater conservation areas and to explore institutional mechanisms for their implementation. Freshwater ecosystems provide a valuable natural resource, with economic, aesthetic, spiritual, cultural and recreational value. NFEPA takes forward the implementation of the Cross-Sector Policy Objectives for Inland Water Conservation. It also builds on the river component of the National Spatial Biodiversity Assessment.

The MCLWHS falls within the Limpopo Water Management Area (WMA) that shares international boundaries with Botswana and Zimbabwe, with the Limpopo River demarcating the entire length of the international boundaries. The MCLWHS falls within quaternary catchments: A63D, A63E, A71K and A71L.

The dominant hydrological feature associated with the MCLWHS is the confluence of the seasonally-flowing Shashe and Limpopo Rivers and a large ephemeral Kolohe/Maloutswa wetland upstream of the confluence. The dolerite features close to the confluence with the Shashe are crucial in the functioning of the floodplain. The weathered sandstones, weathered contacts and fault zones are excellent aquifers.

FEPA rivers and wetlands need to stay in a good condition in order to conserve freshwater ecosystems and protect water resources for human use. The conservation status of the vast majority of rivers in the study area in terms of the river condition used by NFEPA fall within classes A (unmodified, natural) or B (largely natural). These categories are considered to be intact and able to contribute towards river ecosystem biodiversity targets. The Limpopo River falls within category C, which reflects that it is moderately modified.

Wetlands that are in a natural or good condition occur along the Limpopo River, as well as on tributaries of the Kolohe River. The riparian wetland along the Limpopo River is categorised as AB (natural or good condition). Two additional wetland clusters occur in the central part of the study area. Wetland clusters allow for important ecological processes such as migration of frogs and insects between wetlands.

However, wetlands in the MCLWHS have been impacted by a long history of agricultural practices, such as draining, damming, cultivation and grazing. Accelerated erosion and sedimentation are pertinent problems and recent impacts include exposure to high elephant concentrations and conservation interventions such as water transfers.

The implementation of management guidelines should take note of the distribution, type and current ecosystem health of wetlands. It is important to understand the hydro-geomorphic and biological drivers of these wetlands, the type of wetlands and their status (ecological condition) in order to make sound management decisions.

The surface water resources and associated habitat units within the MCLWHS need to be managed in a sustainable and responsible manner, whilst still allowing for socio-economic development in a way that is not detrimental to the overall quality of these resources.

Table 6: Sensitivity ratings allocated to Category: Surface Water

Category	Sensitivity Criteria	Rating
Surface Water	Main Stem Rivers & Rivers Network	VH
	FEPA - Wetlands	VH
	FEPA - Wetland Clusters	H
	FEPA - Rivers	M
	FEPA - Flagship Rivers & Priority Rivers	H
	FEPA - Phase 2 Rivers	H
	FEPA - Fish Sanctuaries	M
	FEPA - Water Yield Areas	H
	Rivers - 100m buffer zones	VH
	Rivers - 500m buffer zones	H
	CBA - Aquatic	H
	ESA - Aquatic	H
	100m buffer on CBA wetlands	M
	500m buffer on FEPA priority wetland clusters	M
	Freshwater Ecosystems - Floodplains	H

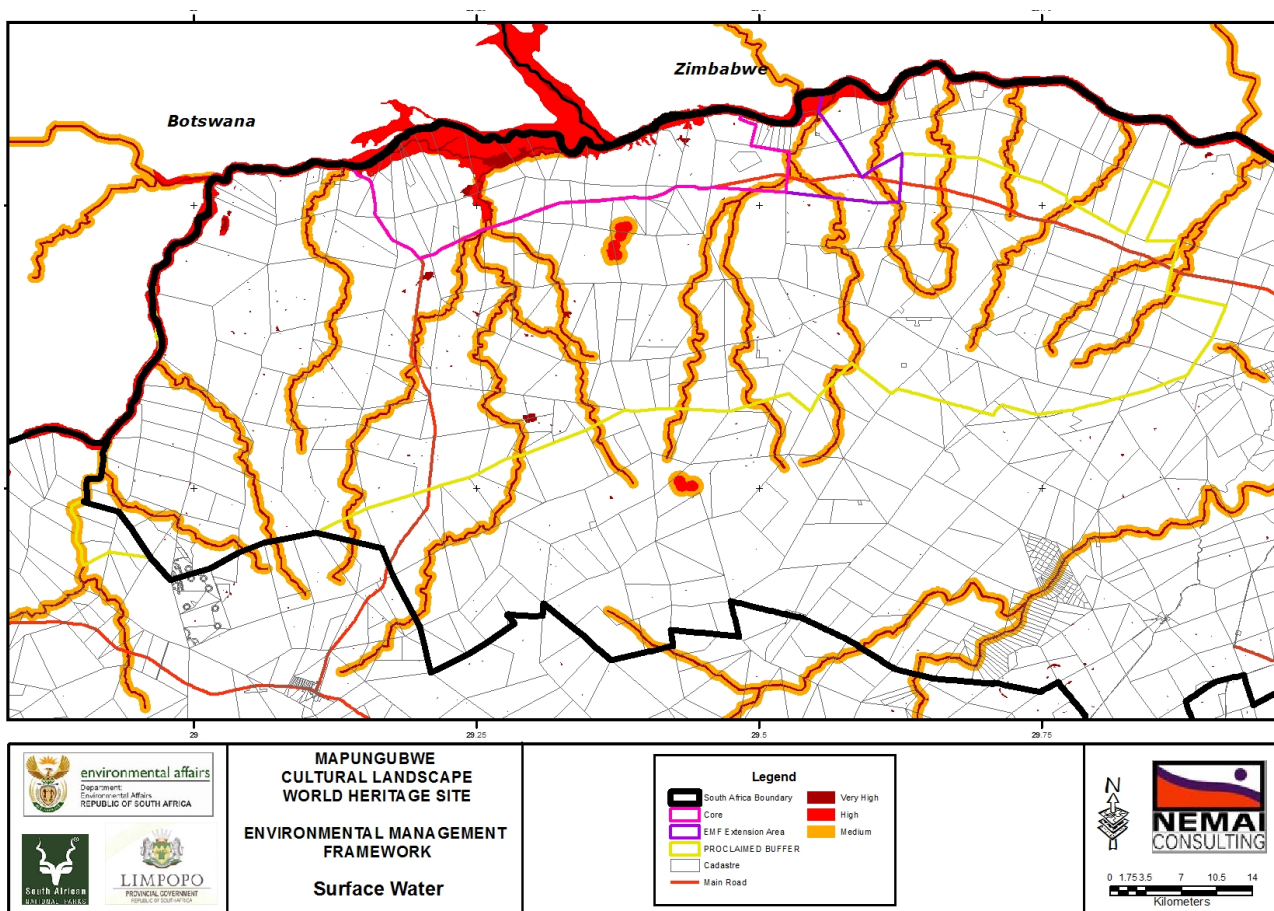


Figure 14: Surface Water Sensitivity

3.1.5 Groundwater

The study area has low and erratic rainfall, hence groundwater is the only dependable source of water for many users in this area away from the Limpopo River. The presence of groundwater depends upon the hydrological characteristics of the underlying aquifer.

The most prominent rocks in the area are the Beit Bridge Complex Archaean Gneiss, followed by the Karoo Supergroup. Aquifers are developed within the weathered overburden and fractured bedrock of these hard crystalline rocks of an Archaean Age. The Beit Bridge Complex is characterized by very low primary porosity and almost all groundwater movement and storage take place through fractures, faults, weathered zones and other secondary features that enhance the aquifer potential only locally.

The Tuli Karoo Sub Basin trans-boundary aquifer underlies the MCLWHS. The aquifer is shared by Botswana, South Africa and Zimbabwe. It appears that the Tuli Coal Seam is located on this trans-boundary aquifer. It is therefore important that transnational cooperation ensures that mining development does not pollute or deplete this very important aquifer.

The confluence of the seasonally flowing Shashe and Limpopo Rivers is the most prominent hydrological feature in the area. Occurrence of the dolerite dykes in the area indicates the presence of groundwater since dolerite dykes are generally known to control movement of groundwater. Swarms of dolerite dykes at the confluence with the Shashe River play an important role of supporting the functioning of the floodplain. Springs are common in the area and associated with dolerite dykes, fault zones as well as contact between different lithologies, and locally weathered sandstones are excellent aquifers.

Due to the importance of groundwater in the area, potentially negative impacts need to be well managed. Adverse impacts associated with mining in the context of the MCLWHS include groundwater contamination as well as high rates of groundwater extraction that will compete with everyday water extraction for household use and farming in the area.

Adequate source-directed controls to manage potential impacts to groundwater resources need to be instituted including authorisations, licences and permits and the implementation of on-site management practices to minimise waste at source and control diffuse pollution.

Table 7: Sensitivity ratings allocated to Category: Groundwater

Category	Sensitivity Criteria	Attributes	Rating
GROUNDWATER	Aquifers	Trans-boundary aquifers	H
		Alluvial aquifer at Vele Mine	H
		Alluvial aquifer at Venetia Mine	H

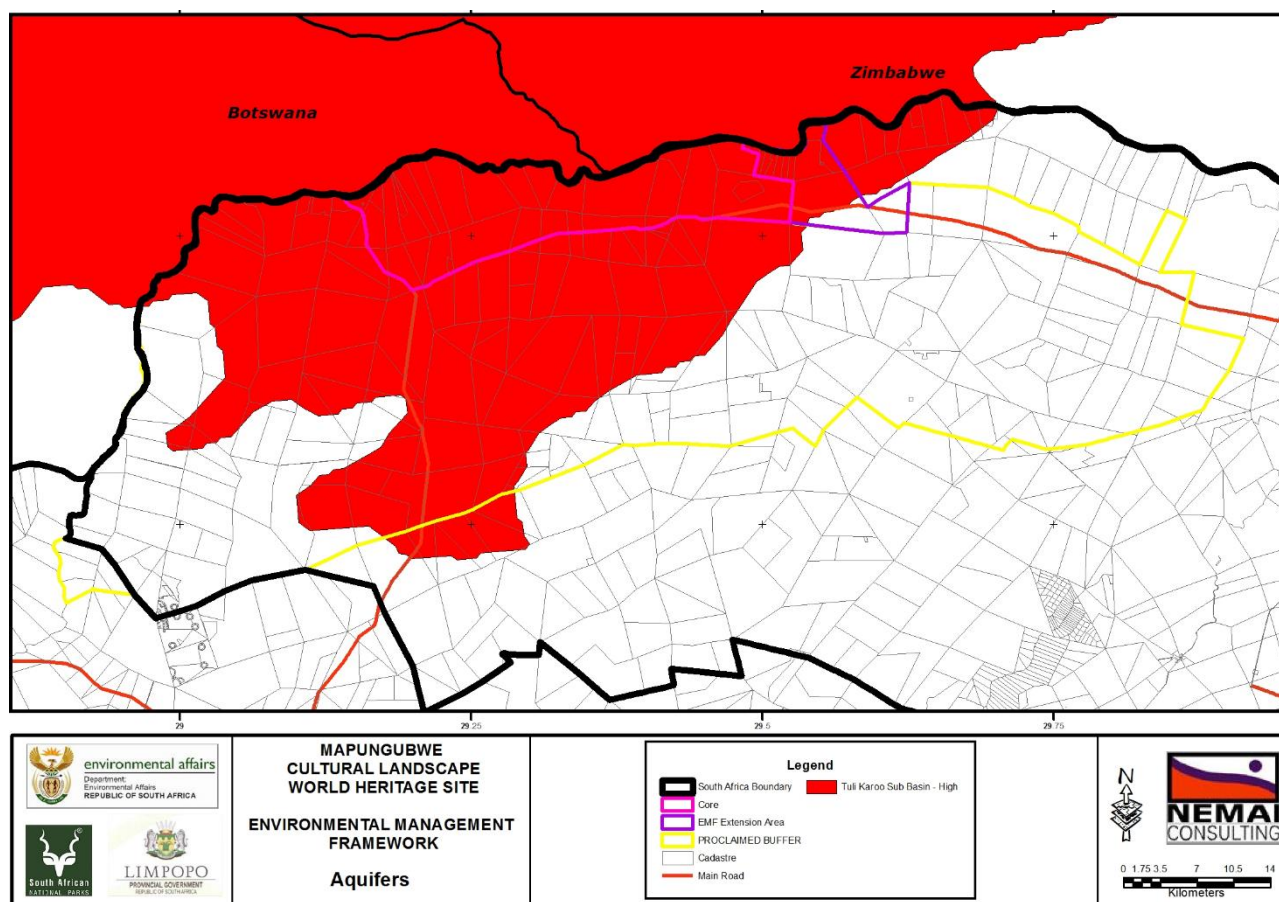


Figure 15: Groundwater Sensitivity

3.1.6 *Mining potential*

According to the 2012/13-2016/17 IDP for the Vhembe District Municipality, the mining sector is regarded as one of the three pillars of the Limpopo Province, hence its strategic importance to the development of the economy of the district.

Mining potential in the MCLWHS is high due to rich mineral deposits (primarily coal and to a lesser extent diamonds). The Department of Mineral Resources (DMR) has provided companies such as Anglo American Thermal Coal exploration rights as the quality of the coal found in the region had generated a lot of interest.

If mining increase in the area, it will significantly change the social and economic environment of the Mapungubwe region. An increase in mining will stimulate economic activity in the surrounding communities and generate wealth in the area. At the same time, the area could expect an influx of people and rapid development to take place. This will change the social structure of the area and be an additional burden on municipal services.

There are two mines in the greater Mapungubwe area, namely Vele Colliery and Venetia Mine. Vele Mine is currently not operational whilst the plant is modified in order to produce different coking and thermal coal products. Venetia mines diamonds and is operational.

Table 8: Sensitivity ratings allocated to Category: Mining Potential

Category	Sensitivity Criteria	Attributes	Rating
MINING POTENTIAL	Existing Mines	Venetia Mine	VH
		Vele Mine	VH
	Prospecting Right Permits	Issued Permits (16 prospecting rights)	H
	Mining Potential	Ranges (Coal to Diamond)	VH
	Biodiversity Priority Areas	Legally Protected (National Parks, Nature Reserves, WHS)	Restricted
		Highest Biodiversity Importance	Restricted

On 12 September 2014, the Minister of Mineral Resources issued a Government Notice No. 718 that prohibited or restricted prospecting or mining in term of section 49(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) in the buffer zone of the MCLWHS in order to protect the sensitive environment of the area. The Notice firstly restricts the granting of any mining right to the extent that the mining action, activity or process must be first modified in such a manner that there is physical impact whatsoever on the surface of the land, and secondly, that no further applications for prospecting rights or mining permits will be granted in respect of the farms (as listed) that fall within the buffer zone. This therefore does impose some restriction on the level and

extent of mining that in future will be allowed to take place within the buffer of the MCLWHS.

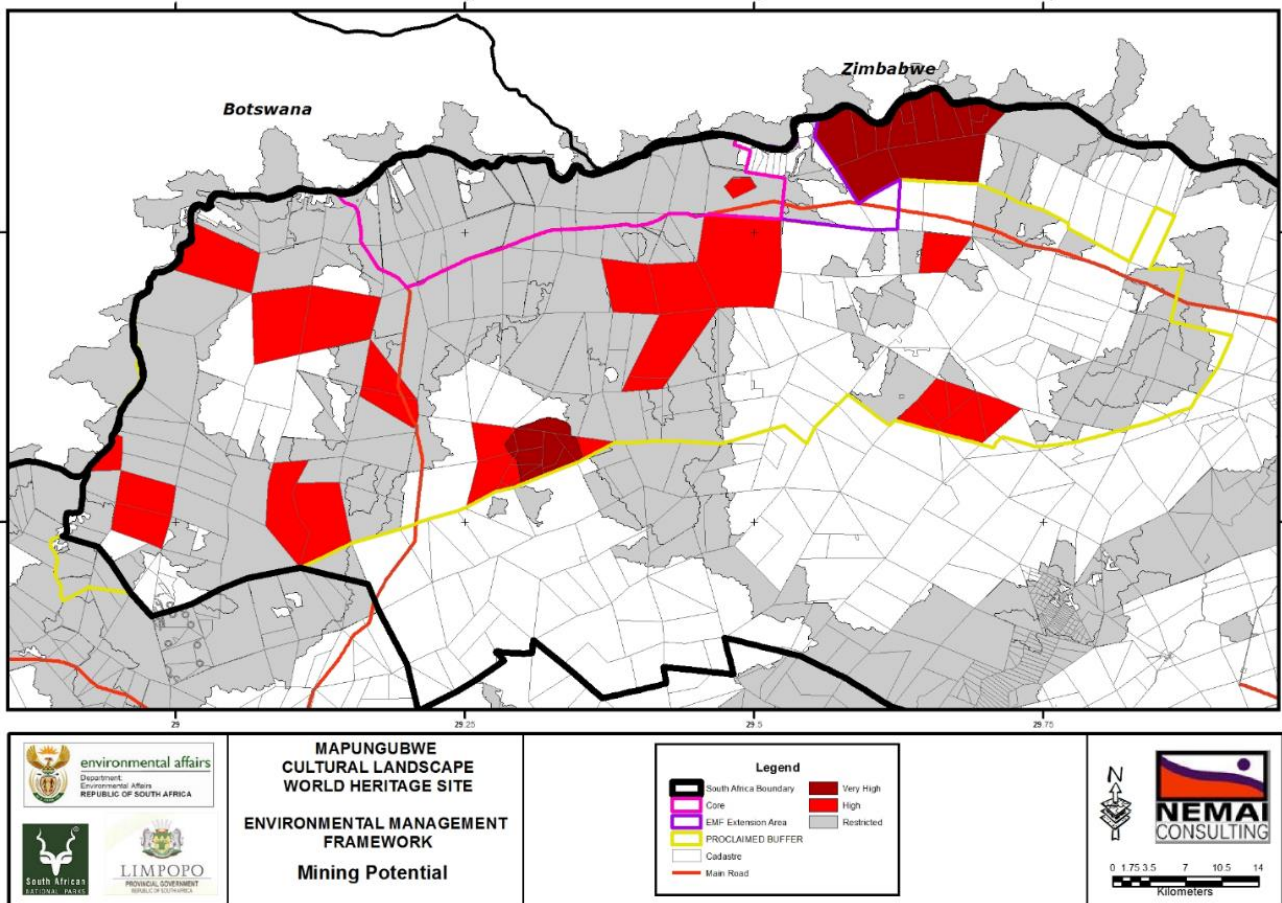


Figure 16: Mining Potential Sensitivity

3.1.7 Terrain

The terrain sensitivity in the study area is primarily based on an assessment of the slope gradients, as shown in **Figure 17**.

Table 9: Sensitivity ratings allocated to Category: Terrain & Geotechnical Conditions

Category	Sensitivity Criteria	Attributes	Rating
TERRAIN	Slope	Very steep slopes 18°	VH
		Steep slopes (12° - >18°)	VH
		Low to medium gradient slopes	H

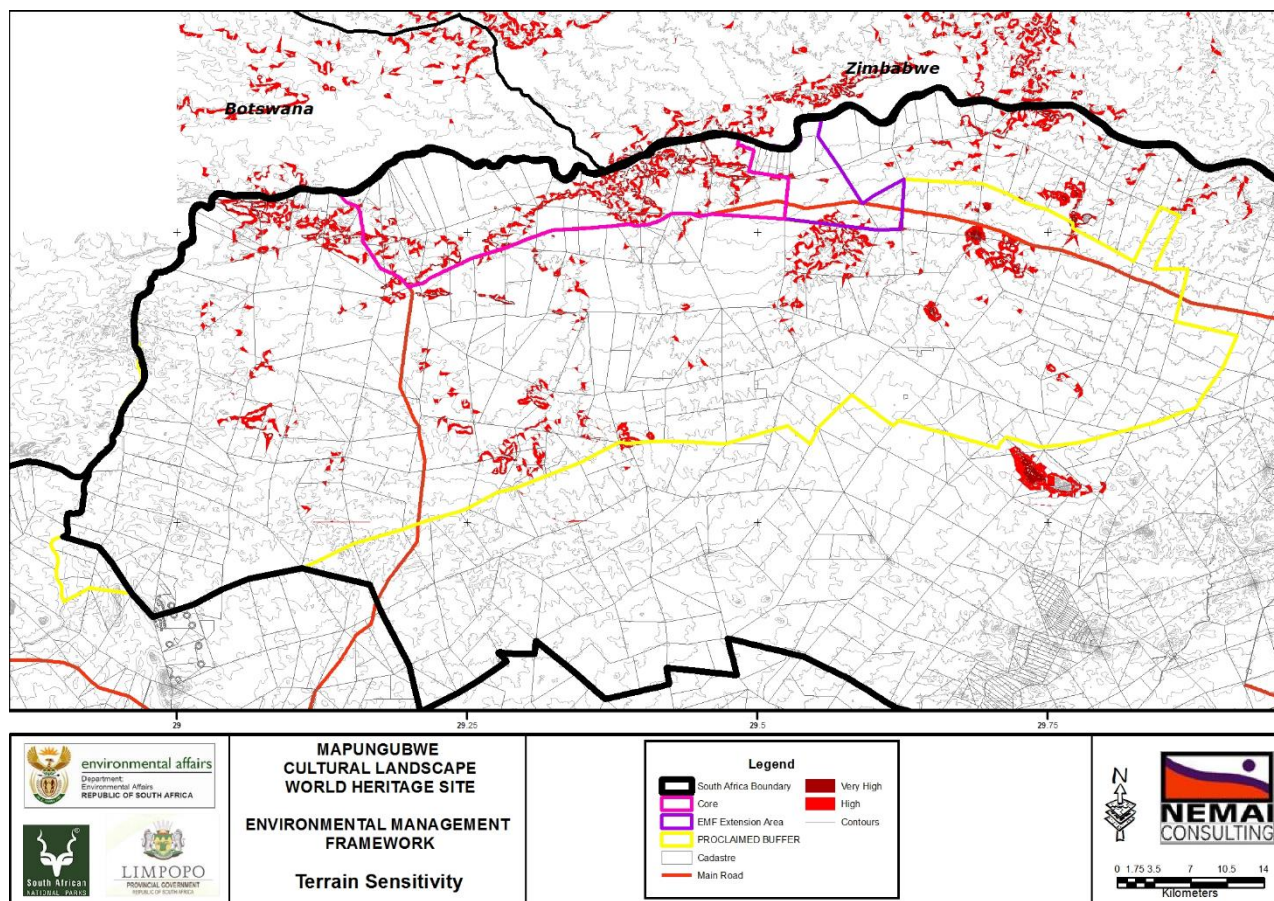


Figure 17: Terrain Sensitivity

3.2 Environmental Constraint Zones

By superimposing the various sensitivity maps in the GIS, Environmental Constraints Zones (ECZs) are produced (see **Figure 18**). These zones maintain the sensitivity ratings allocated to the environmental features and attributes as part of the sensitivity analysis, with priority to the mapped layers based on sensitivity (i.e. VH → H → M → L).

Due to their innate characteristics, the environmental feature categories (agriculture, terrestrial biodiversity, terrain, surface water, groundwater and heritage) highlight areas that pose limitations to development in the MCLWHS. Conversely, these characteristics promote certain types of development that harness the land potential and support the management objectives linked to the sensitive features and attributes.

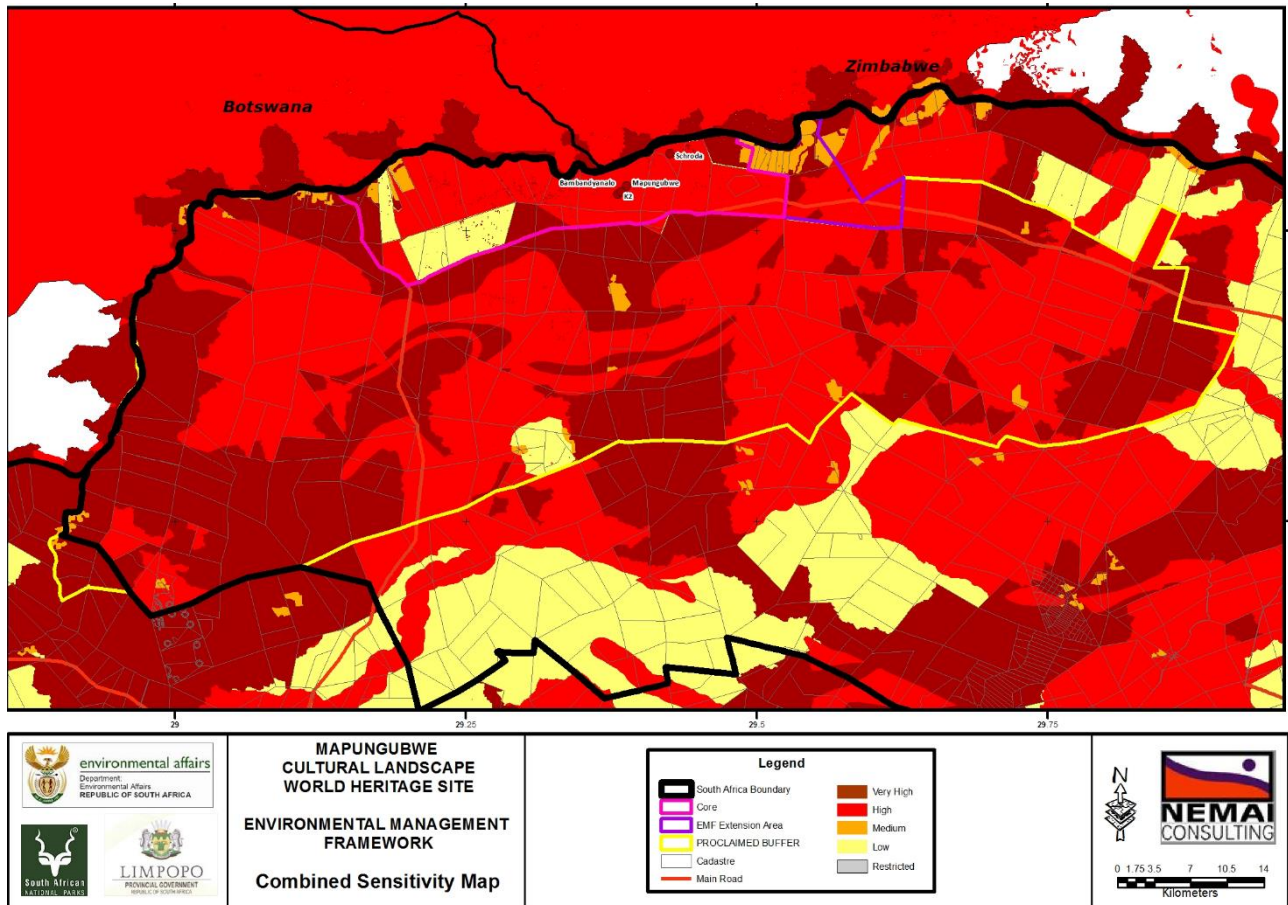


Figure 18: Combined Sensitivity Map

Figure 18, which is dominated by the 'Very High' and 'High' ECZs, reflects the remarkable abundance of sensitive environmental features and attributes in the study area. It shows the challenge faced in identifying suitable land that is available for development such as mining. On the other hand, it also highlights the MCLWHS's cultural and environmental wealth that can be exploited for commensurate development types, such as tourism.

The ECZs present a crucial component of the EMF's progression towards delineating Environmental Management Zones that present a balanced depiction of the MCLWHS desired state. These zones are the product of the interrogation and assessment of the Status Quo information and the realisation of the study area's possible restrictions to development pressures and opportunities.

Development Pressures and Trends



4 DEVELOPMENT PRESSURES AND TRENDS

Development is guided by various factors, including related policies and plans, population growth and distribution, income distribution, employment sectors, economic drivers, natural resource exploitation and growth sectors (amongst others). Development should strive to meet the societal needs while accommodating the receiving environment without compromising its goods and services

The EMF needs to take cognisance of future development pressures and trends in the study area. If possible, these developments should be accommodated as they contribute towards much needed socio-economic enhancement of the area. Conversely, areas of potential conflict between earmarked developments and sensitive environmental features need to be identified to determine a sustainable way forward.

In the sections to follow some of the key development pressures and trends in the MCLWHS are examined further.

4.1 Provincial Planning Framework

4.1.1 *Limpopo Provincial Growth and Development Strategy*

With its strong emphasis on improving the quality of life and sustainable development, the aim of the Limpopo Provincial Growth and Development Strategy (2004-2014) (PGDS) is to create a conducive environment for the people of the province to participate in the provincial economy. The PGDS is based on taking advantage of the province's competitive conditions in mining, agriculture and tourism to turn the economy of the province around.

The seven development clusters were adopted by the PGDS. Development clusters are critical masses, spatially concentrated and of unusual competitive success in a particular field. The seven clusters are:

- ❖ Platinum mining cluster on the Dilokong Corridor between Polokwane and Burgersfort (Sekhukhune district) and also in the Waterberg district;
- ❖ Coal mining and petrochemical cluster at Lephalale on the East-West Corridor (Waterberg district);

- ❖ Fruit and vegetable (horticulture) cluster in Vhembe, Mopani and Bohlabela districts;
- ❖ Logistics cluster in Polokwane (Capricorn district);
- ❖ Red and white meat cluster on all the corridors (all districts);
- ❖ Eight tourism sub-clusters at a number of high-potential destinations; and
- ❖ Forestry cluster in the Mopani and Vhembe districts.

Some of the strategic objectives that have particular implications for environmental planning in the MCLWHS include:

- ❖ Increased agricultural (fruit and vegetable) production in the area. There is already intensive farming within the MCLWHS that is regarded as been incompatible with the values of the MCLWHS
- ❖ Emphasis on tourism with Mapungubwe identified as one of the eight sub-clusters of the province. Transfronteir Parks are also included as one of the sub-clusters.
- ❖ Development of mining although the Mapungubwe area is not directly mentioned. Mining, especially open-cast mining, is also seen to be incompatible with the core values of the MCLWHS.
- ❖ Water resource development that could lead to additional pressures on the already limited surface and groundwater resources
- ❖ Development of road and rail networks

4.1.2 Local Planning Framework

The area around the MCLWHS is characterised by a sparse human population, and long distances for infrastructural lines of support. Land use and ownership within the MNP and the buffer is unusually diverse and includes contractual partners, land owners and land claimants, private tourism operations, game farms and local communities. The nearest larger populations of people are in the towns of Alldays and Musina.

The Vhembe District Municipality IDP Review (2012) has also focused on agriculture, tourism and mining as leading the District's growth potential and addressing poverty, unemployment, etc.

The IDP for the Musina Local Municipality (2012-2013) identified several high priority focus areas. These are

- ❖ Establish a manufacturing incubator in Musina town and undertake a poster campaign to entice business start-up projects;
- ❖ Investigate potential and promote opportunities for development of retail, industrial, storage & distribution and wholesale enterprises and transport hub;
- ❖ Establish local Business Support Centre in Nancefield ;
- ❖ Create rural community support cooperatives in Madimbo, Malale and Domboni Tshikhudini and Tanda;
- ❖ Provide land claims support;
- ❖ Undertake expansion of aquaculture production and extension of aquaculture value chain linkages;
- ❖ Establish vegetable processing plant in Musina town;
- ❖ Develop map and brochures of local tourism facilities and attractions and improve and increase road signage to villages, major attractions and facilities;
- ❖ Establish arts and crafts, jewellery and ornament incubator, exhibition and workshop stalls and curio shop linked to tourism information centre in Musina town; and
- ❖ Establish database of available land for mining development and encourage commencement of mining activities with existing mineral rights owners

4.1.3 Threats to Biodiversity

The development pressures linked to the MCLWHS stem primarily from the land use potential and incompatible land use practices. Threats to the area's biodiversity include mining, habitat loss through fragmentation, agriculture, alien species invasion, climate change, unsustainable harvesting of natural resources, unresolved land claims and poor land use practices in general.

If tourism development is uncontrolled it may result in a high risk for conservation and biodiversity. Development needs to take place in a sustainable manner so that the natural landscape is not altered.

Despite the large aquifers in the area, rates of groundwater extraction are very high as competing demands from agriculture, mining and normal day-to-day use depletes the resource. Concerns have been raised regarding the impact of these activities on the Ecological Reserve of the catchment of the MCLWHS.

Development Opportunities & Constraints



5 DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS

5.1 Development Opportunities

5.1.1 District and Municipal Competitive Advantages

The Vhembe District Municipality IDP Review (2012); Musina Local Municipality IDP (2012/2013-2017) and SDF (2011) have identified the area's competitive conditions and comparative advantages. These are discussed below in terms of their relevance to the MCLWHS.

❖ Mining advantages

Mining is currently the largest contributor to the local economy in terms of GVA. Mining has played an important role in the development of the area from the Mapungubwe civilization a thousand years ago until today as there is substantial mining and specifically coal mining potential in the area.

❖ Agriculture advantages

In terms of agricultural potential the whole area is suitable for grazing and wildlife farming. Although the area is not suitable for cultivation due to the absence of suitable arable land with the exception of small areas used for irrigation along some of the rivers, agriculture is responsible for employing more than half (54%) of the labour force in the Local Municipality (LM) and the agricultural jobs in the Musina LM contribute to approximately half of the employment created in the agricultural sector of the Vhembe district.

❖ Tourism and conservation advantages

Tourism and conservation plays an important role in the area and the number of nature reserves, conservancies and game farms in the LM is a comparative advantage over other municipalities. The Municipality plans to expand the tourism industry through initiatives such as the Golden Horse Shoe Initiative which refers to the arc of unspoiled natural countryside that runs from east to west sharing international borders with Botswana, Zimbabwe and Mozambique.

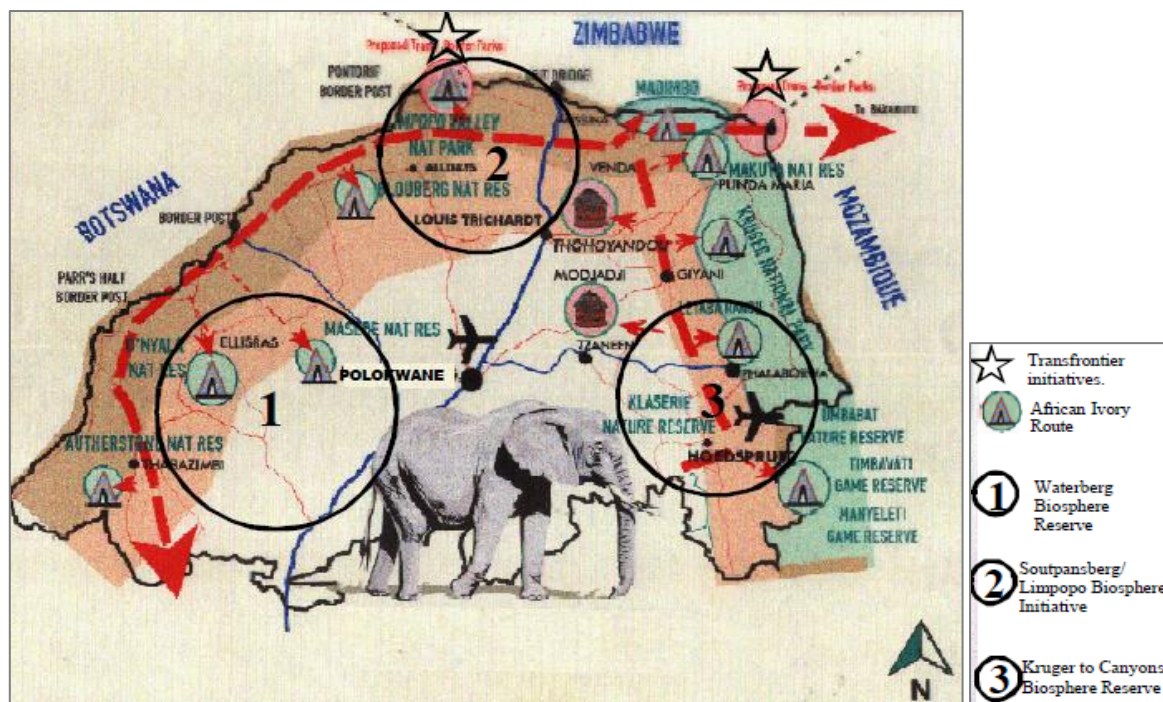


Figure 19: Illustration of Golden Horseshoe Tourism Initiative

5.1.2 MCLWHS Competitive Advantages

Heritage advantages

The MCL is significantly unique to the rest of South Africa's tourism destinations as it is the single largest area in the country to have such cultural heritage. The primary reason for the site being proclaimed as a World Heritage Site was because of the cultural and heritage value the site provides hence the cultural heritage of the landscape serves as a comparative advantage for the MCLWHS.

There are many different markets of tourism. These are dependent on the reason for people touring as well as the socio-economic profile of tourists and the length of the visit. The MCLWHS would attract tourism for culture, heritage, and eco-tourism and game watching.

Those who visit the GMTFCA will automatically enter MCLWHS which can be a competitive advantage for the MCLWHS to generate interest in the area.

Tourism and conservation advantages

At present, game farms in the Mapungubwe area are in talks to consolidate the farms to facilitate large-scale eco-tourism operations. This will allow for multiple consumptive (hunting and meat production) and non-consumptive (tourism activities) utilisation of these areas. The area will have the potential to become a top tourist destination.

The MCLWHS, together with several other protected areas, presents the district with good potential to grow in the tourism sector.

Transportation network

The MCLWHS is strategically located as it is located close to the two international border posts namely; Pontdrift linking South Africa to Botswana and Beit Bridge connecting South Africa to Zimbabwe and it is in close proximity to the town of Musina.

5.1.3 Environmental Opportunities for Development

The term 'opportunities' within the context of this section also refers to the manner in which the environment in the MCLWHS supports developments of a commensurate nature. Through the Status Quo assessment, the following opportunities were identified in the MCLWHS, some of which are also echoed in the preceding section.

- ❖ The area is afforded substantial visual quality through its topographic features. This also contributes to Mapungubwe's distinctive sense of place and eco-tourism potential;
- ❖ Occurrence of dolerite dykes at the confluence with the Shashe River play an important role in supporting the functioning of the floodplain and in sustaining the ecological functioning of important surface water systems, such as wetlands;
- ❖ The Limpopo River that forms the northern boundary of the MCLWHS is an important & strategic watercourse which South Africa shares with neighbouring countries;
- ❖ The vast majority of rivers in the MCLWHS fall within Class B (largely natural) and Class C (largely modified), with Limpopo River classified as Class A (unmodified natural) that indicates that the majority of rivers are in good health and should be retained as such;

- ❖ There is a possibility that the Golope/Maloutswa wetland could be designated as a wetland of international importance in terms of the Ramsar Convention thereby not only protecting the wetland but also adding to the attractions offered by the MCLWHS;
- ❖ Mineral resources that if developed can contribute to future economic growth;
- ❖ Certain areas along the Limpopo and Shashe Rivers provide arable soils for cultivation;
- ❖ Favourable conditions for livestock and game farming;
- ❖ Contains the GMTCA as well as centres of endemism- Blouberg and Soutpansberg;
- ❖ Pristine ecological environment with high levels of species diversity and ecosystems hold the potential for meeting biodiversity targets;
- ❖ TFCA offers potential for animals to occupy larger areas and opportunities to broaden the region's economies based on wildlife and ecotourism industries;
- ❖ The extensive wetlands and floodplains provide potential for sustainable harvesting of reeds and hygrophilous for weaving purposes;
- ❖ Employment opportunities in conservation areas as well as in developing ecotourism industries for local people;
- ❖ There is an opportunity in the tourism sector to support and encourage SMMEs;
- ❖ Development potential in sustainable harvesting of medicinal and flowering plant species;
- ❖ Protected areas provide opportunities for environmental education;
- ❖ Tourism is a key economic contributor in the local and district municipality which is reliant on the ecological and cultural features in Mapungubwe;
- ❖ Vast tourism potential of MCLWHS in terms of biodiversity, recreational opportunities, visual appeal, heritage and culture, etc., especially as it is strategically located in close proximity to two international border posts and the town of Musina making it easily accessible to visitors;
- ❖ Improved infrastructure and support services especially directed at tourism will generate high return rates and boost economic activity, create jobs and raise skill levels in the area as well as diversify the market;
- ❖ Possible consolidation of game farms in the Mapungubwe area in order to facilitate large-scale eco-tourism operations allowing for multiple consumptive (hunting and meat production) and non-consumptive (tourism activities) utilisation of these areas. Game farming will attract a large number of local and international visitors to the area; and
- ❖ Opportunity for the Province to use the MCLWHS to grow economic development.

5.2 Development Constraints

The ECZs, which represents the amalgamated sensitivity map for the MCLWHS, captures the development constraints that exist due to the inherent qualities of the MCLWHS' environmental features. Some of these constraints are highlighted hereunder:

- ❖ The MCLWHS is formally conserved and has core areas and a buffer zone which limits certain development types. In addition, sensitive biodiversity areas also occur outside of protected area, which also further restricts development;
- ❖ The cultural importance of the MCLWHS restricts most development activities in the core area;
- ❖ There is no policy for the buffer zone hence there is confusion whether certain activities such as mining and agriculture can take place within this zone;
- ❖ The proposed reduction in size of the buffer zone has led to speculation and uncertainty;
- ❖ Steep terrain in certain parts of the MCLWHS hamper development;
- ❖ Limited surface water availability and low rainfall limit development. Despite large aquifers in the area, rates of groundwater extraction are disturbingly high that will be exacerbated by increased mining and agricultural activities in the area;
- ❖ Unregulated water use by mines, farmers and to a lesser extent by local communities is placing more strain on an already over-burdened resource;
- ❖ Wetlands are essential for maintaining hydrological services, including flow regulation and water purification. These systems require suitable protection with associated restrictions to development;
- ❖ Land claims that have not been settled pose a threat to the socio-economic stability of the MCLWHS and surrounding area as development is hindered due to uncertainty around affected farms;
- ❖ Infestation of over 21 000 ha with alien invasive plants that affect the biodiversity of the MCLWHS;
- ❖ Dominant soils are Leptosols that can only support livestock and game farming (apart from the Limpopo River floodplains). The land capability class of most soils falls in the VII and VIII levels;

- ❖ Encroachment of disparate land uses and activities within buffer zones of protected areas, which are not sustainable and potentially jeopardise the integrity of sensitive habitat and species;
- ❖ Lack of capital funds for infrastructure development and maintenance of existing infrastructure inhibits growth and development.



DESIRED STATE EXPRESSED BY I&Ps



SECTION

6

6 PUBLIC PARTICIPATION

As a minimum, the Public Participation Process (PPP) for the MCLWHS EMF aims to comply with Regulation 3(2) of the EMF Regulations (2010).

The main purpose of the PPP includes:

1. To inform Interested and Affected Parties (I&APs) of the EMF process and its objectives;
2. To provide an opportunity for inputs from I&APs; and
3. To give feedback to I&APs with the opportunity for them to respond.

The PPP follows the phases of the overall EMF development process, and is executed to coincide with the outcomes associated with each milestone of the framework

The desired state for the study area from the perspective of Interested and Affected Parties (I&APs) was determined by means of the following:

- ❖ Public meetings; and
- ❖ Comments received from I&APs.

6.1 Meetings

A Public Meeting was held at the Golden Rhino Auditorium at the MCLWHS reception on 16 July 2014. Minutes of the meeting were circulated on 25 July 2014 to those who attended the meeting.

Input from I&Ps regarding the MCLWHS's desired state that were expressed during the meeting are captured hereunder:

- ❖ Use the fact that Mapungubwe is a special place to bring Africa together to form a United States of Africa;
- ❖ Aspirations of affected communities included in the TFCA IDP must be taken into account;
- ❖ Put up a more signboards that make people aware that they are entering a WHS thereby creating awareness and a sense of place;

- ❖ Fence the MCLWHS so that people know that they are in one park whether they are coming from Zimbabwe, Botswana or SA;
- ❖ Use the MCLWHS to meet conservation targets;
- ❖ Ecological Reserve for the catchment of the MCLWHS must be determined in order to identify water use constraints;
- ❖ A buffer zone policy for the MCLWHS buffer must be compiled by the custodian of the MCLWHS that provides clear guidance in terms of permissible activities in the buffer zone;
- ❖ The EMF should guide the buffer zone policy;
- ❖ DEA/SANParks undertake a roadshow that educates people and creates awareness not only about the buffer policy but also about Mapungubwe and its status as a WHS;
- ❖ More consultation with landowners and communities who fall within the buffer zone so that they are made aware that they live within a buffer zone and what the implications are of this in terms of the activities that can take place;
- ❖ Guiding principles should be included in the management zones as opposed to prescriptive instructions;
- ❖ Map conflicting land uses and provide action plans that will resolve conflicts and avoid a situation where there is a deadlock between conflicting parties;
- ❖ Address the implications and impacts of climate change; and
- ❖ Provide comprehensive reasons why the buffer area is to be decreased with the gazetting of a new buffer.
- ❖ Enforce speed limits, provide better roadside fencing and/or use of underpasses to allow wildlife connectivity to reduce road mortalities and increase human safety

6.2 EMF Implications

The aspirations expressed by I&APs for the desired state in the MCLWHS need to be examined in terms of the purpose of an EMF and its intended application in the environmental decision-making realm as part of a sphere of environmental assessment and management tools that are rooted in NEMA and the associated sectoral legislation.

Where appropriate, I&APs' comments were included as Management Priorities in the EMF. However, the EMF may not necessarily be the appropriate mechanism through

which some of the comments will be attended to. In some instances, further studies and assessments may be required to develop strategies and plans that deal with specific issues. This may also require the involvement of various government organisations and other relevant parties. The EMF is thus not the single panacea for sustainable environmental management in the MCLWHS and for addressing all of its environmental challenges.

During the development of the EMF, existing policies, strategies, plans and programmes of national, provincial and local government were considered. Where the issues raised by I&APs are in conflict with governmental objectives, the relevant structures and channels need to be pursued to find suitable solutions where the EMF is not necessarily the appropriate mechanism.



ENVIRONMENTAL MANAGEMENT ZONES



SECTION

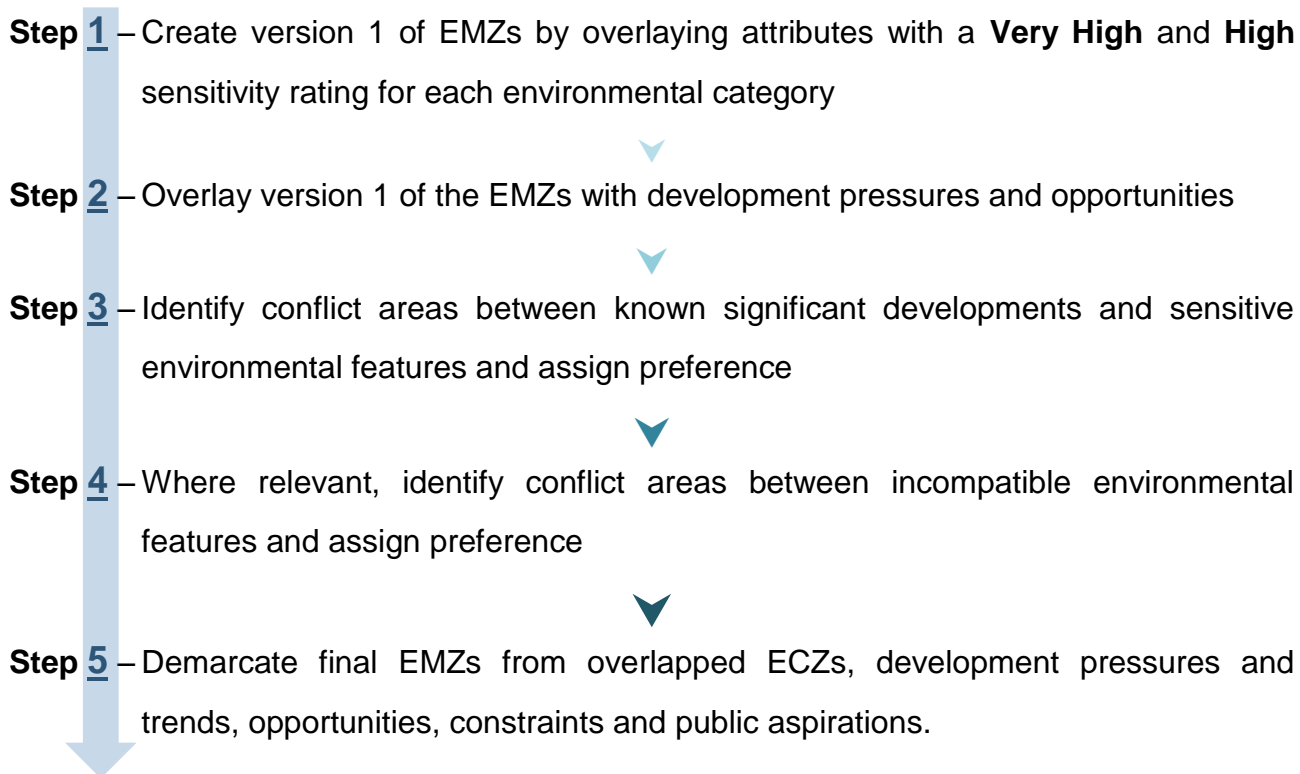
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7 ENVIRONMENTAL MANAGEMENT ZONES

7.1 Delineating Environmental Management Zones

An Environmental Management Zone (EMZ), which is also regarded as a ‘geographical area’ in terms of section 24 of NEMA, represents a specific demarcated area that requires active control to ensure that its potential is realised and sensitive features are safeguarded. The management zones focus the attention of the relevant authority on critical environmental areas in the MCLWHS and thus ultimately guide and inform decision-making within the environmental planning realm.

The EMZs in the study area were delineated as follows:



7.1.1 Managing Conflicts between Development and Environmental Features

Development pressures in the study area need to be screened and interpreted against the ECZs. Development and other growth demands can potentially be supported in areas where existing transformation exists or where detailed specialist studies confirm the receiving environment to be non-sensitive to the earmarked development. The last-mentioned would constitute ground-truthing of the EMF GIS information. Alternatively, the

development may be supported by the desired state of the EMZ, such as cultivation in the Agriculture EMZ or appropriate tourism activities in the Core or Buffer Zone EMZ.

Note that ultimately each development needs to be screened against the EMZs, and need to adhere to the Management Guidelines.

Conflict areas may arise where a proposed activity / development pressure or opportunity is disproportionate to the environmental sensitivity. In these instances, preference needs to be assigned based on the following considerations:

- ❖ Risks posed by planned development activities to the sensitive environmental attributes associated with the EMZ;
- ❖ Degree of acceptable change to the state of the environmental features affected by the proposed development;
- ❖ Application of principles underpinning sustainable development;
- ❖ Maximise the opportunities to the benefit of both the environment and development; and
- ❖ The likelihood of the development proceeding, in order to avoid compromising environmental sensitivity for unrealistic development proposals.

7.1.2 Mapping EMZs

EMZs depict the assimilated and refined ECZs that are integrated with the development pressures and trends, opportunities, constraints and public aspirations. The end product therefore determines the fitness and environmental suitability of a specific area for certain types of development based upon inherent characteristics and overall sensitivity.

From a sensitivity perspective (see **Section 3**), only those features and attributes with ratings of High – Very High, where there is a positive inclination towards the core focus of the zone, were included in the amalgamated map. Nonetheless, the other features that are considered to be of medium sensitivity should also be taken into consideration when reviewing development proposals against the respective sensitivity maps. In the next generation EMF, these medium or even low sensitivity areas may be enhanced through

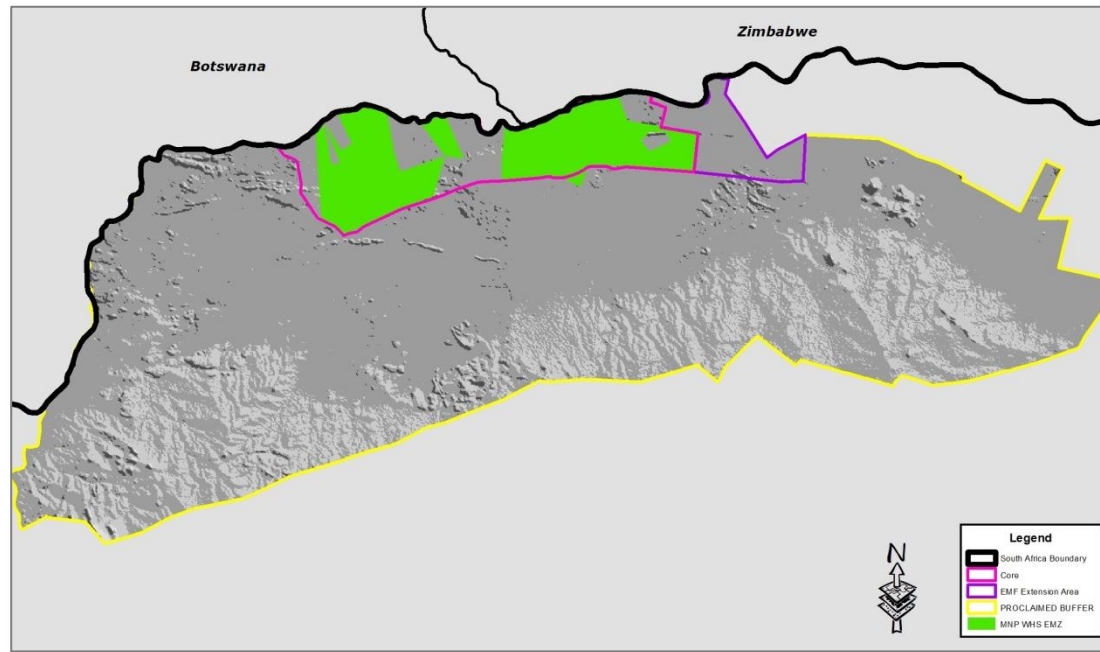
efforts such as environmental rehabilitation. Despite low sensitivity, it can also be recommended that an area or feature be managed to achieve an improved future state.

The EMZs take into account the current state of the environmental features and their attributes as well as the intended future use of the associated land parcels, and attempts to seek a sustainable compromise as to what features, attributes and areas should be included in which delineated areas that comprise the management zones.

An overview of each EMZ follows.

ENVIRONMENTAL MANAGEMENT ZONE:

Mapungubwe National Park & World Heritage Site



Zone Description:

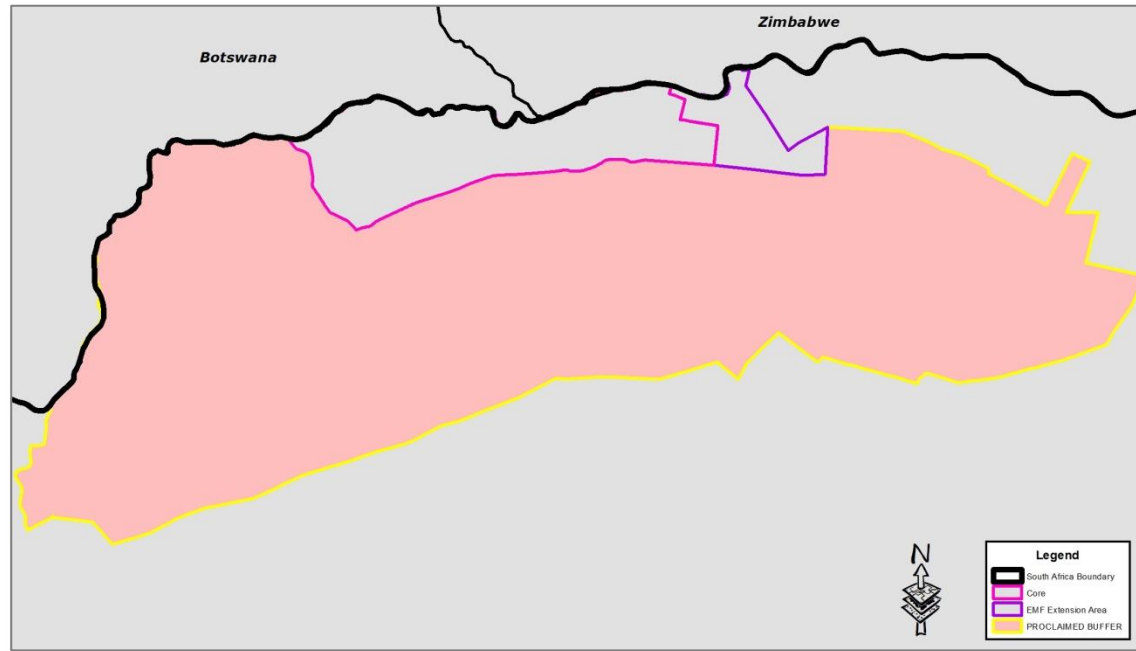
This zone encompasses the Mapungubwe National Park (MNP) and WHS.

Features & Attributes

- Core
- Current MNP and MCLWHS boundary
- Properties still to be consolidated as part of the Core

ENVIRONMENTAL MANAGEMENT ZONE:

Buffer Zone



Zone Description:

The buffer zone aims to reduce conflicts between external and internal management objectives, and to protect the core area that is afforded formal protection

A functional buffer zone can protect the WHS from external developments, especially incompatible land uses.

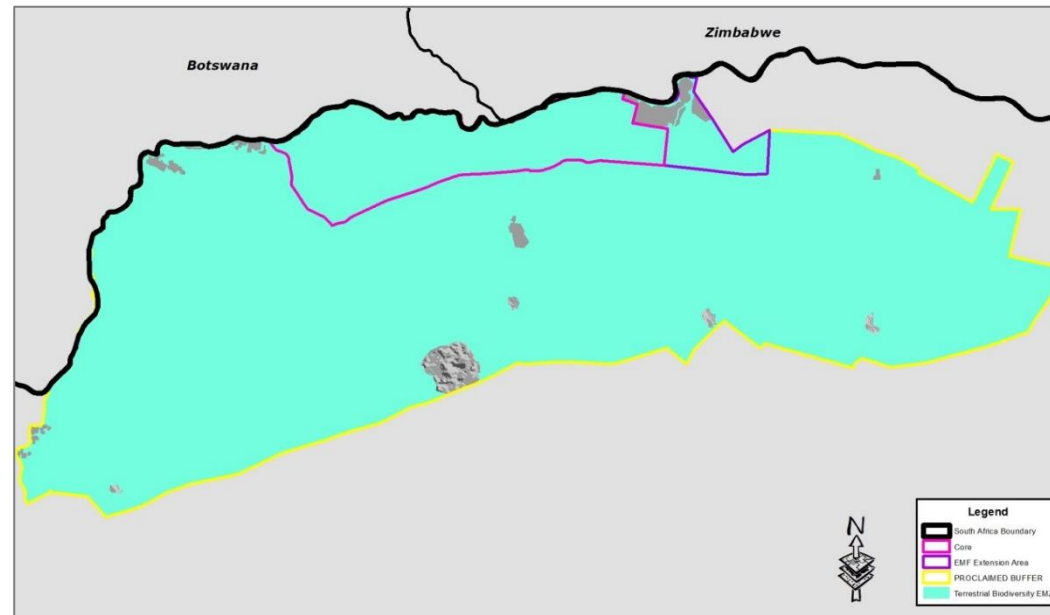
Note that the new buffer zone will be incorporated into the EMF once it has been gazetted, by following due process.

Features & Attributes

- Current MCLWHS 2009 proclaimed boundary
- Excludes core and extended area to the east

ENVIRONMENTAL MANAGEMENT ZONE:

Terrestrial Biodiversity



Zone Description:

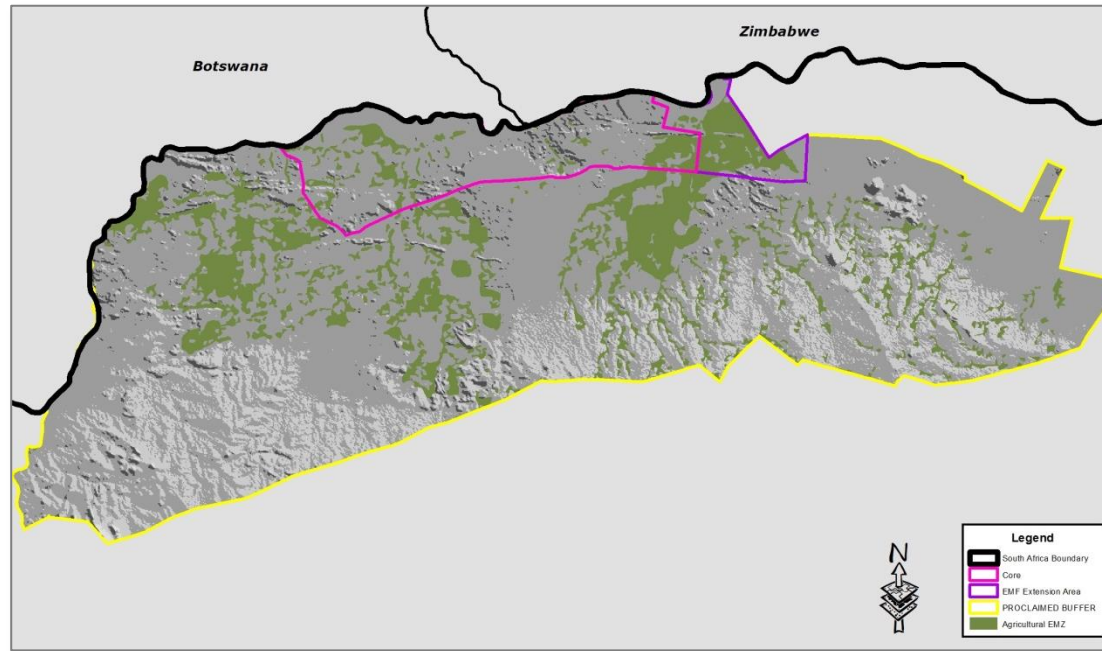
This areas that fall under this zone exhibit high biodiversity or supportive functions and include protected areas such as the MNP

Features & Attributes

- Critical Biodiversity Areas (CBA 1 & CBA 2)
- Important Bird Areas
- Ecological Support Areas (ESA 1)
- Vegetation types –
 - Critically Endangered
 - Endangered
 - Vulnerable
- RAMSAR sites
- Ridges with slopes > 5°

ENVIRONMENTAL MANAGEMENT ZONE:

Agriculture



Zone Description:

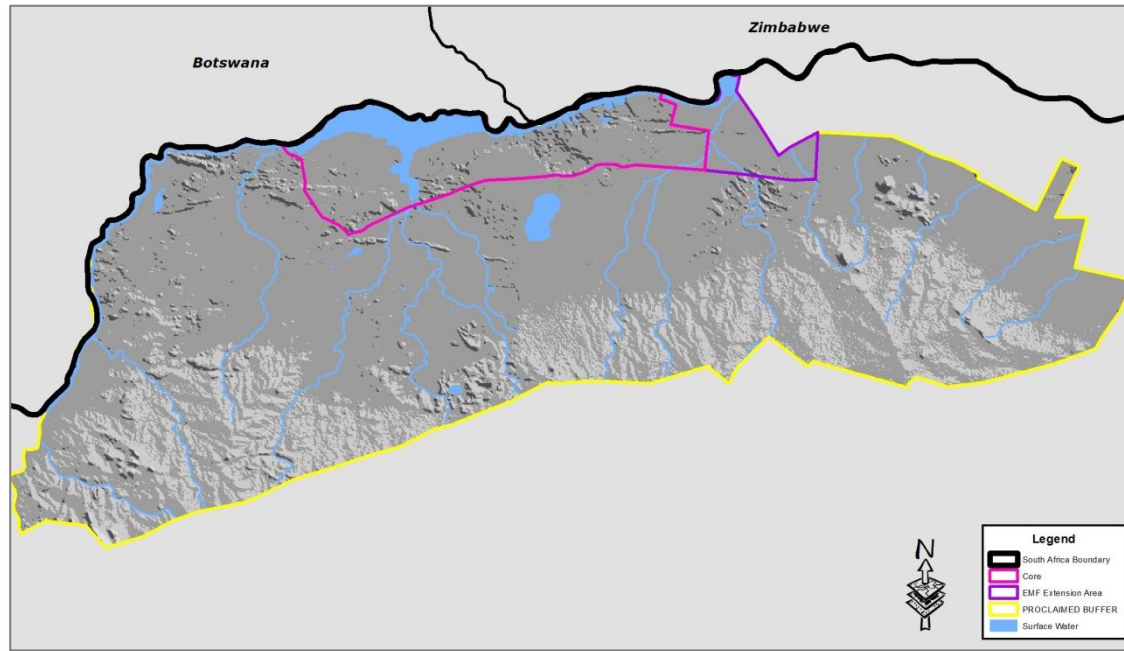
This zone reflects soil capability, climate capability and terrain capability

Features & Attributes

- Areas of Medium-High capability in terms of:
 - Soil
 - Climate
 - Terrain

ENVIRONMENTAL MANAGEMENT ZONE:

Surface Water



Zone Description:

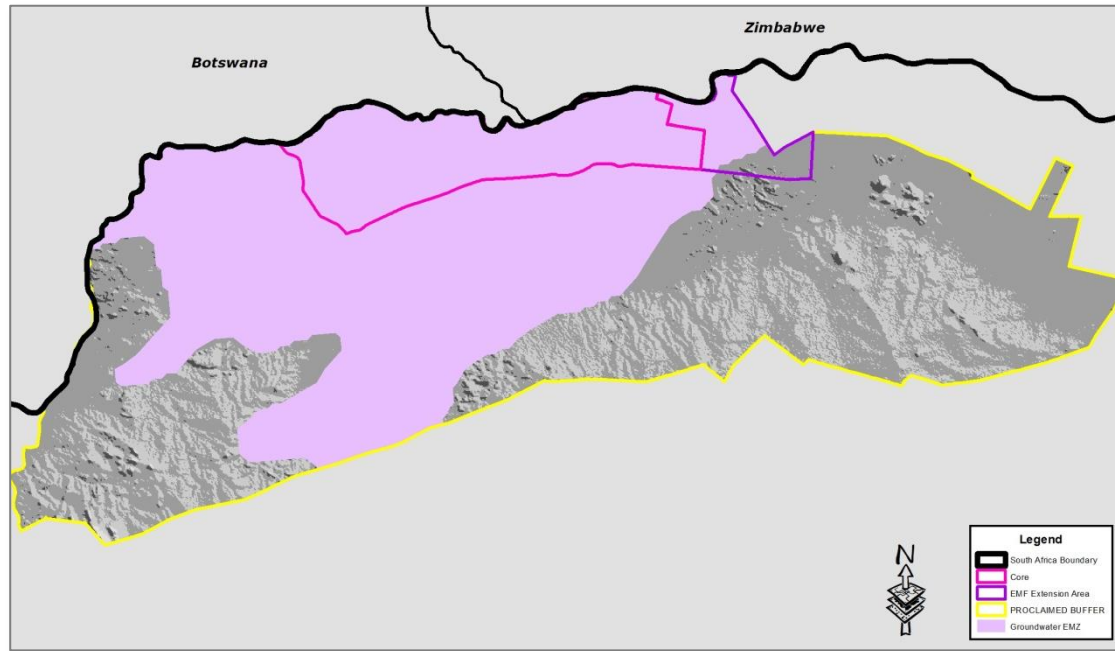
Surface water resources within this zone include the Limpopo and Shashe Rivers, wetlands and major watercourses

Features & Attributes

- Main stem rivers and river networks
- FEPA Wetlands and wetland clusters
- FEPA Flagship rivers and Priority rivers
- FEPA Phase 2 rivers
- FEPA Yield areas
- CBA – Aquatic
- ESA – Aquatic
- Freshwater ecosystems – Flood Plains

ENVIRONMENTAL MANAGEMENT ZONE:

Groundwater



Zone Description:

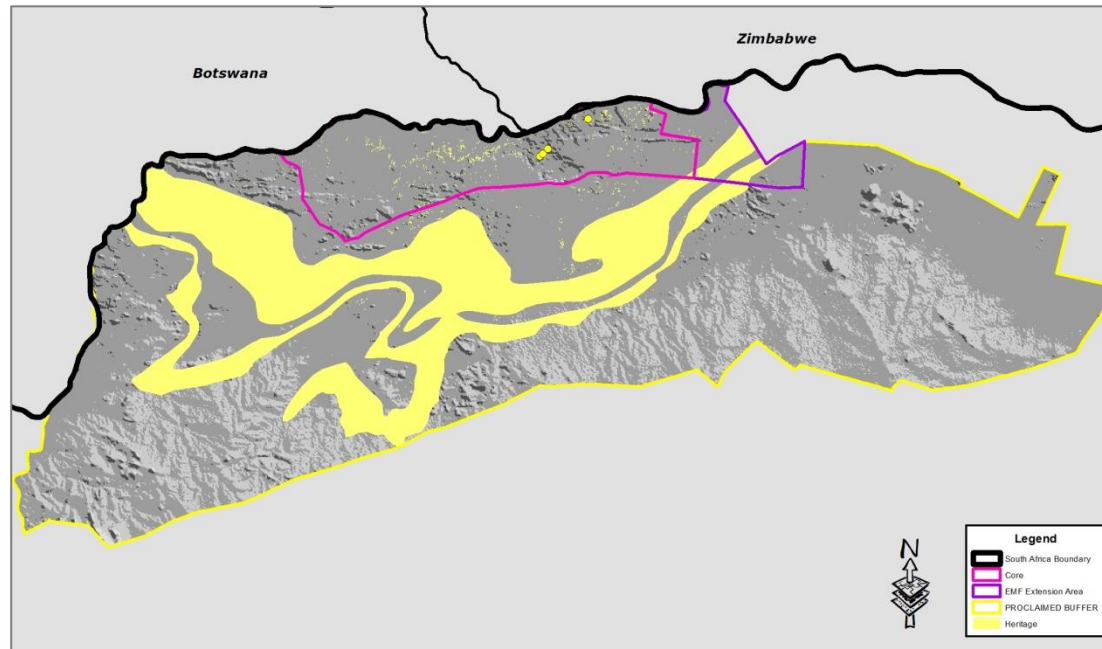
Groundwater resources in this zone include a transboundary aquifer as well as the alluvial aquifers at Venetia and Vele mines

Features & Attributes

- Transboundary aquifer
- Alluvial aquifer – Venetia Mine
- Alluvial aquifer – Vele Mine

ENVIRONMENTAL MANAGEMENT ZONE:

Heritage & Cultural Resources



Zone Description:

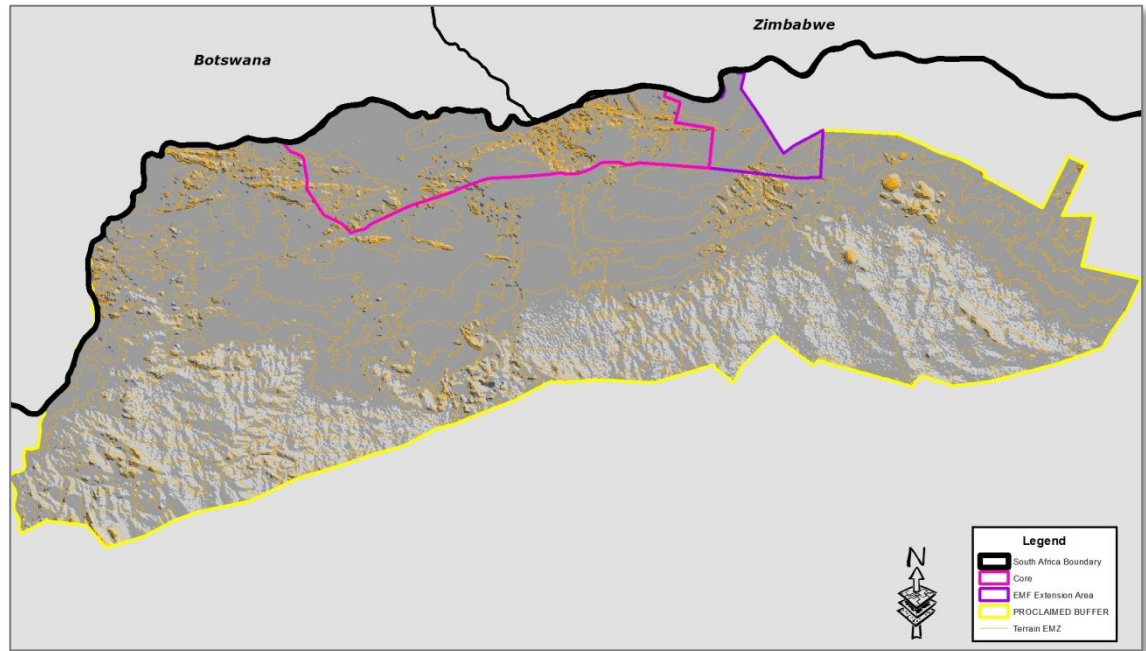
This zone incorporates all sites or areas of heritage significance. Note that buffer areas has been allocated to the heritage sites

Features & Attributes

- Remains of the Capitals (50 m buffer)
- Heritage sites within the core area of the MCLWHS (25 m)
 - Heritage sites within proclaimed Buffer Zone (25 m): Stone Age, Iron Age, Rock Art sites
- Rock art sites outside Buffer Zone (25 m)
- Stone walled ruins of Zimbabwe Culture (25 m)
- Graves (25 m)
- Palaeontological sites (25 m)

ENVIRONMENTAL MANAGEMENT ZONE:

Terrain



Zone Description:

This zone relates to the terrain features including steep slopes and low to medium gradient

Features & Attributes

- Very steep slopes >18°
- Steep slopes > 12° - 18°
- Low to medium gradient slopes

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