

BUFFALO CITY METROPOLITAN MUNICIPALITY WETLAND REPORT | 2017

LOCAL ACTION FOR BIODIVERSITY (LAB): WETLANDS SOUTH AFRICA



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FOREWORD



Wetlands are one of the most valuable and diverse ecosystems on this planet and are essential for human existence. Wetlands clean the water we drink as well as provide nutritious food in the form of plants and fish. Wetlands also provide organic materials, which can be used for medicinal purposes. They help protect us from flooding and storm surges and also have the ability to store water which is then released in times of drought. Wetlands also provide key habitat for a significant array of critically endangered flora and fauna.

Furthermore, wetlands play a key role in the mitigation of climate change, which is predicted to have a major impact on human livelihoods. They can store large amounts of carbon and thus can help with the regulation of greenhouse gases, thus playing a very important part in climate change mitigation. These ecosystems also have the ability to protect against the effects of climate change by reducing flooding risk, stabilizing shorelines and controlling erosion.

Despite the essential role wetlands play in maintaining the delicate balance of life on Earth, they are being lost and degraded at an unprecedented rate, faster than any other ecosystem in the world. Since the 1900s, it is estimated that 64% of the world's wetlands have been destroyed. Within South Africa, 50% of the country's wetlands have been lost and 48% of the remaining wetlands are critically endangered. The astounding loss of the wetland systems

worldwide is largely as a result of wetland areas being 'reclaimed' for expanding urban development or agricultural expansion as well as encroachment of invasive alien vegetation. As a result, species which once populated these areas in vast numbers are seeing a rapid decline and countless animals and plants have been brought to the verge of extinction. Wetlands are also increasingly unable to perform the ecosystem services so vital for human life.

In the 21st century we need wetlands more than ever before. The conservation and the management of wetlands in a holistic, collaborative and effective manner is therefore essential to sustain human livelihoods and local economies, protect our valuable biodiversity and buffer the impacts of climate change.

CLLR PAKATI
Executive Mayor: BCMM
Buffalo City Metropolitan
Municipality



ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

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ICLEI – Local Governments for Sustainability is the leading global network of over 1,500 cities, towns and regions committed to building a sustainable future. By helping the ICLEI Network to become sustainable, low-carbon, ecomobile, resilient, biodiverse, resource-efficient, healthy and happy, with a green economy and smart infrastructure, we impact over 25% of the global urban population.

ICLEI Africa’s work is conducted by a dynamic and passionate team of professionals that seek to work with cities to ensure a more sustainable future, with a specific focus on urban biodiversity matters.

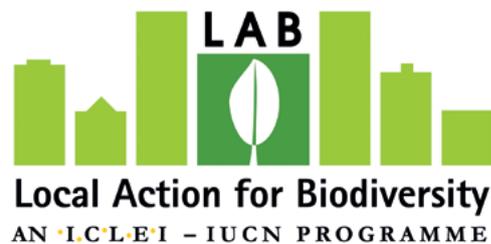
In order to strengthen the role cities and local governments play in the pursuit of greater sustainability through the collaborative design and implementation of integrated urban development and effective biodiversity management, the ICLEI Cities Biodiversity Center (ICLEI CBC) was created in 2009. The ICLEI CBC is located in Cape Town, South Africa, embedded in the Africa Regional Office of ICLEI. We offer cities a broad portfolio of supportive services through our dedicated team of passionate, skilled and dynamic biodiversity and urban development experts.



ICLEI CITIES BIODIVERSITY CENTER

LOCAL ACTION FOR BIODIVERSITY PROGRAMME

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The ICLEI Cities Biodiversity Center aims to create BiodiverCities, which promote urban biodiversity for the many benefits they offer, including human well-being, poverty alleviation, habitat conservation, air and water quality, climate change adaptation and mitigation, food provision, fortified infrastructure resilience, and happiness of citizens.

BiodiverCities are aware that ecosystem services contribute towards many essential municipal services, as well as towards the local economy, sustainability and social well-being of their cities. Biodiversity in cities provides a critical contribution towards achieving the global biodiversity targets. It

buffers further biodiversity loss, improves the urban standard of living, and provides local opportunities for global education and awareness.

ICLEI's Local Action for Biodiversity (LAB) programme is a unique global biodiversity programme run by The ICLEI Cities Biodiversity Center. The LAB Program is aimed at improving and enhancing ecosystem management at the local level, and is recognized globally as the leading results-driven local government biodiversity initiative. Currently, LAB is working on wetland restoration in South Africa under the Local Action for Biodiversity: Wetlands South Africa (LAB Wetlands SA) project.



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LIST OF ACRONYMS AND ABBREVIATIONS

| | | | |
|--------------|--|---------------|--|
| ABLMC | Aquatic Biodiversity Land Management Classes | MTSF | Medium Term Strategic Framework |
| AS | Africa Secretariat | MOSS | Municipal Open Space System |
| BLMC | Biodiversity Land Management Classes | NEMA | National Environmental Management Act 108 of 1998 |
| BCMM | Buffalo City Metropolitan Municipality | NEMBA | National Environmental Management Biodiversity Act 10 of 2004 |
| BGIS | Biological Geographic Information System | NEMPAA | National Environmental Management Protected Areas Act 57 of 2003 |
| CBA | Critical Biodiversity Areas | NFEPA | National Freshwater Ecosystems Priority Areas |
| CBC | Cities Biodiversity Centre | NGO | Non-Governmental Organisation |
| CIP | Climate Information Platform | NWA | National Water Act 36 of 1998 |
| CSAG | Climate Systems Analysis Group | NWI | National Wetland Inventory |
| DEA | Department of Environmental Affairs | SANBI | South African National Biodiversity Institute |
| DEDEA | Department of Economic Development and Environment Affairs | SALGA | South African Local Government Association |
| DWAF | Department of Water Affairs and Forestry | SDF | Strategic Development Framework |
| ECBCP | Eastern Cape Biodiversity Conservation Plan | SoER | State of the Environment Report |
| EMAPs | Environmental Management Action Plans | SPLUMA | Spatial Planning and Land Use Management Act 16 of 2013 |
| ESAs | Ecological Support Areas | STEP | Subtropical Thicket Ecosystem Project |
| FEPAs | Freshwater Ecosystem Priority Areas | SWSA | Strategic Water Source Area |
| IAPs | Invasive Alien Plants | UCT | University of Cape Town |
| ICLEI | ICLEI – Local Governments for Sustainability | UNFCCC | United Nations Framework Convention on Climate Change |
| IDP | Integrated Development Plan | WfW | Working for Wetlands |
| IEMP | Integrated Environmental Management Plan | WSAs | Water Source Areas |
| LAB | Local Action for Biodiversity | | |

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EXECUTIVE SUMMARY

Buffalo City Metropolitan Municipality (BCMM) lies within the Eastern Cape Province in South Africa and it covers an area of 2 536 km². The Municipality plays a vital role in addressing the Metro's social, economic and environmental needs. All South African municipalities, including Buffalo City Metropolitan Municipality, are tasked with the provision of services in a sustainable and equitable manner, the facilitation of social and economic development and the promotion of a safe and healthy environment for all people living within its domain. Biodiversity offers an immense opportunity to support the country's development path by providing many free goods and services which contribute to municipal service delivery, water and food security, and quality of life. Wetland ecosystems have many benefits to society, such as purifying water, controlling erosion and providing habitat for wetland dependent species. Wetlands remain South Africa's most threatened ecosystem, they continue to be destroyed and poorly managed. This is largely due to their benefits being poorly understood, resulting in an urgent need to increase awareness of wetland importance and to incorporate natural wetland resource considerations into municipal governance mechanisms and planning.

The wetland ecosystems cover an area of approximately 3 338 ha which make up to 1.3% of the Buffalo City Metropolitan Municipality. At least 79.6% of wetland ecosystems are critically endangered, 19.7% are endangered and 0.7% are least threatened. This means most of the wetland ecosystems have been severely or moderately modified from their natural condition. Freshwater is our most limiting natural resource. Industrialization and urbanization as well as rapid population growth have since become the largest water users and thus heavily affecting water management activities. It is imperative that South Africa develops both a water-efficient economy together with a social ethic of water conservation and ultimately a culture of sustainability of water resource use.

Despite wetlands being of high value in the Buffalo City Metropolitan Municipality due to the ecosystem service that they provide, a large number of the wetlands in the municipality have already been lost. Loss of wetlands can be attributed to the deliberate draining of wetlands, development and expansion (both urban and agricultural) and pollution. Damage to wetlands results in increasingly limited functionality and subsequently a decrease in the ability to provide valuable ecosystem services.

Currently there is no specific department within the Buffalo City Metropolitan Municipality that directly deals with the management of wetlands. Instead, separate municipal departments including Environmental Management, Disaster Management, Municipal Health Services, Urban Planning and Water and Sanitation all manage wetlands as per their own legislative requirements. Due to capacity constraints and the tendency of these separate municipal departments to work "in silos", there is currently very little communication or cohesion across the separate departments dealing with issues related to wetlands, making the holistic management of wetlands within the Metro a difficult task and also increasing the risk of wetland degradation.

To streamline and improve the management of wetlands, the Buffalo City Metropolitan Municipality is implementing the Local Action for Biodiversity: Wetlands South Africa (LAB: Wetlands SA) programme with support from ICLEI Africa Secretariat (ICLEI AS). The LAB: Wetlands SA project aims to ensure the protection of priority natural wetland resources, thus enabling the supply of ecosystem services, and promoting resilient communities and sustainable local economies under a changing climate within South African local governments. Through the development of this Wetland Report, ICLEI AS will assist the Buffalo City Metropolitan Municipality in identifying the gaps in management and assist with devising new and better wetlands management strategies going forward.

INTRODUCTION

South Africa is endowed with a rich wealth of biodiversity, which offers an immense opportunity to support the country's development path by providing many goods and services which contribute to municipal service delivery, water and food security, and quality of life, especially under a changing climate. Wetlands in particular, are high-value 'ecological infrastructure', providing critical ecosystem services such as clean water, clean air, food, medicines, water storage and habitat for biodiversity. Wetlands also play a role in disaster management, and could lessen the negative effects of climate change through flood attenuation, temperature regulation and water and food security.

Wetlands however are South Africa's most threatened ecosystems, with 48% of wetland ecosystems critically endangered,¹ resulting in an urgent need to increase awareness of wetland importance to incorporate natural wetland resource considerations into municipal governance mechanisms and planning.

Buffalo City Metropolitan Municipality (BCMM) is located in the Eastern Cape Province of South Africa (refer to **Figure 1**). Numerous wetlands of high ecological value and exceptional beauty, occur within the region and provide crucial habitat for a variety of critically endangered flora and fauna species, as well as provide key ecosystem services for local communities living in the area. A large number of the wetlands in the region however are under threat due to mining, afforestation, historical unsustainable development as well as encroachment of invasive alien plants (IAPs).

This report draws together the range of knowledge about wetlands in the Buffalo City Metropolitan Municipality, and provides a detailed overview of the stakeholders and programmes working towards improved wetland management in this region.

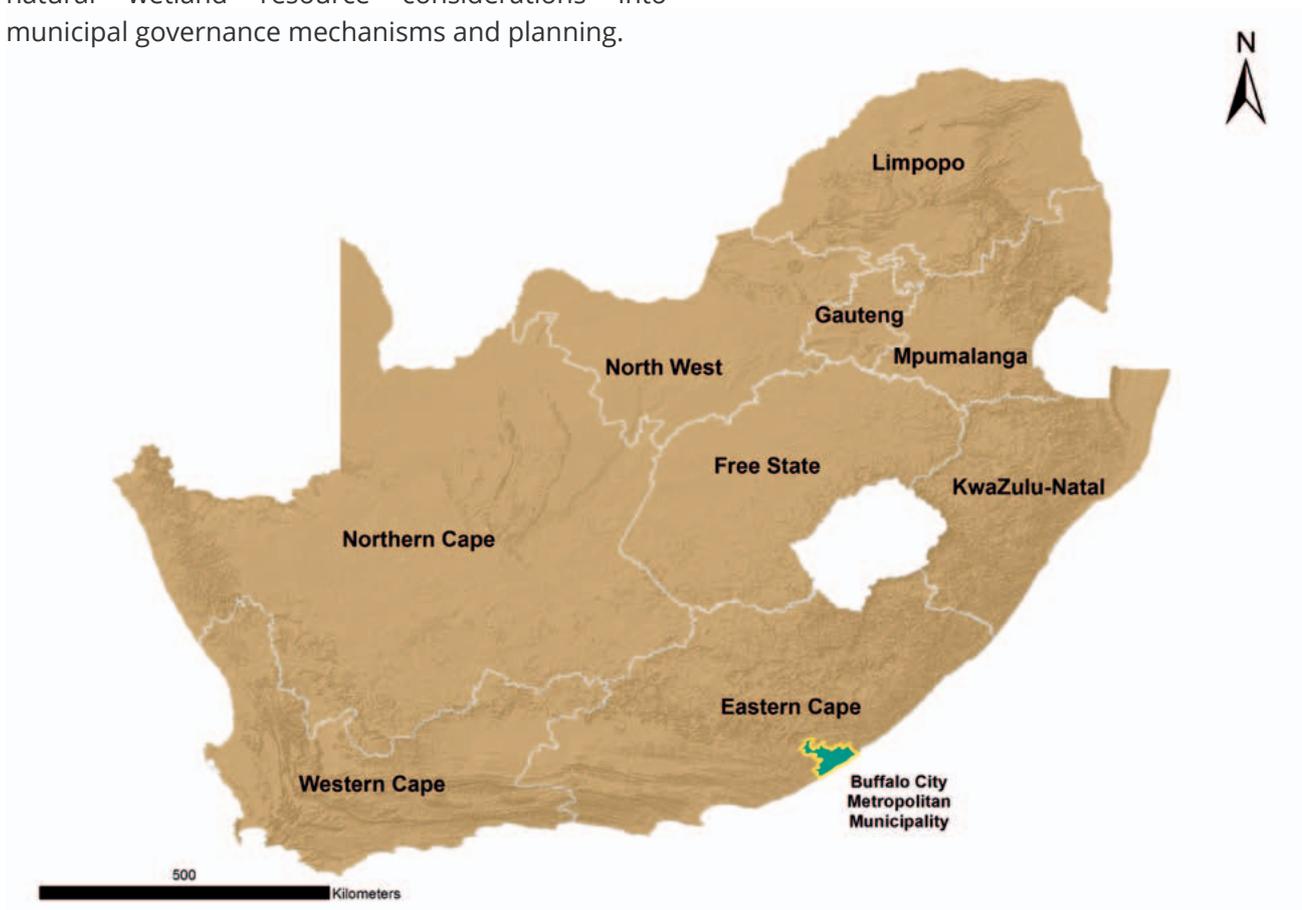


FIGURE 1: Buffalo City Metropolitan Municipality in relation to the rest of South Africa.

INTRODUCTION

SCOPE

This Wetland Report is compiled by Buffalo City Metropolitan Municipality and ICLEI Africa and covers the Buffalo City Municipal Region, which is located in the Eastern Cape Province and is one of 8

metropolitan municipalities in South Africa (refer to **Figure 1**). It is surrounded by the Amathole District Municipality, and its Great Kei, Amahlathi, Nkonkobe and Ngqushwa Local Municipalities.

PURPOSE OF THE REPORT

The Wetland Report captures information about wetlands in the Buffalo City Metropolitan Municipal area by merging existing wetland information so that the municipality can identify knowledge gaps and priority areas regarding wetlands moving forward. This report considers and promotes cross sectorial and ecosystem based approaches to wetland management on a city wide basin, encourage stakeholder participation and increase transparency and accountability for a greener better Buffalo City by:

- Consolidating available wetland information in Buffalo City
- Documenting the wetland resources in Buffalo City
- Geographical and geospatial information
- Biological aspects (general biological health status quo)
- Identifying knowledge gaps on wetlands
- Identifying key stakeholders that impact on or are impacted by wetlands
- Identifying municipal departments that impact or benefit from wetlands, discuss those impacts or benefits, and responsibilities and roles of each department with regards to wetland management
- Identifying risks and opportunities in relation to wetland and service delivery



1 | WHAT IS A WETLAND?

“Wetlands are land which is transitional between terrestrial and aquatic systems, where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.”

National Water Act No. 36 of 1998

In simpler terms, a wetland is a feature in the landscape which is saturated with water for a long enough period that the soil conditions change (mottling as a result of the low oxygen conditions) and the vegetation shifts to respond to these changes.²

Six different types of wetlands occur across the country. These vary based on the underlying geology and include seeps, depressions, wetland flats, floodplain wetlands, channelled valley bottom wetlands and unchannelled valley bottom wetlands.⁴ SANBI has compiled a detailed hydro-geomorphic classification system to assist with wetland identification. An illustrative overview from this guide on the different types of wetlands is included in **Figure 4**.

Wetlands also vary on a temporal scale based on the climate and season. As such, once a wetland type has been established, it can then be categorised into either a temporary, seasonal or permanent wetland. A temporary wetland is saturated for a very short period (approximately one month) during the rainy season only. Vegetation types associated with this type of wetland are predominantly grass species, as well as a mixture of species that occur in non-wetland areas and hydrophytic plants that are largely restricted to wetland areas. A seasonal wetland is saturated for most of the growing season. Vegetation types associated with this type of wetland are predominantly sedges and grasses that are restricted to wetland areas, usually < 1m tall. Lastly, a permanent wetland is saturated all year round. This type of wetland is dominated by highly specialised aquatic plants adapted to permanently wet conditions.⁵



FIGURE 2 & 3: Mottled soils indicative of a wetland (left) and specially adapted wetland vegetation (right).³

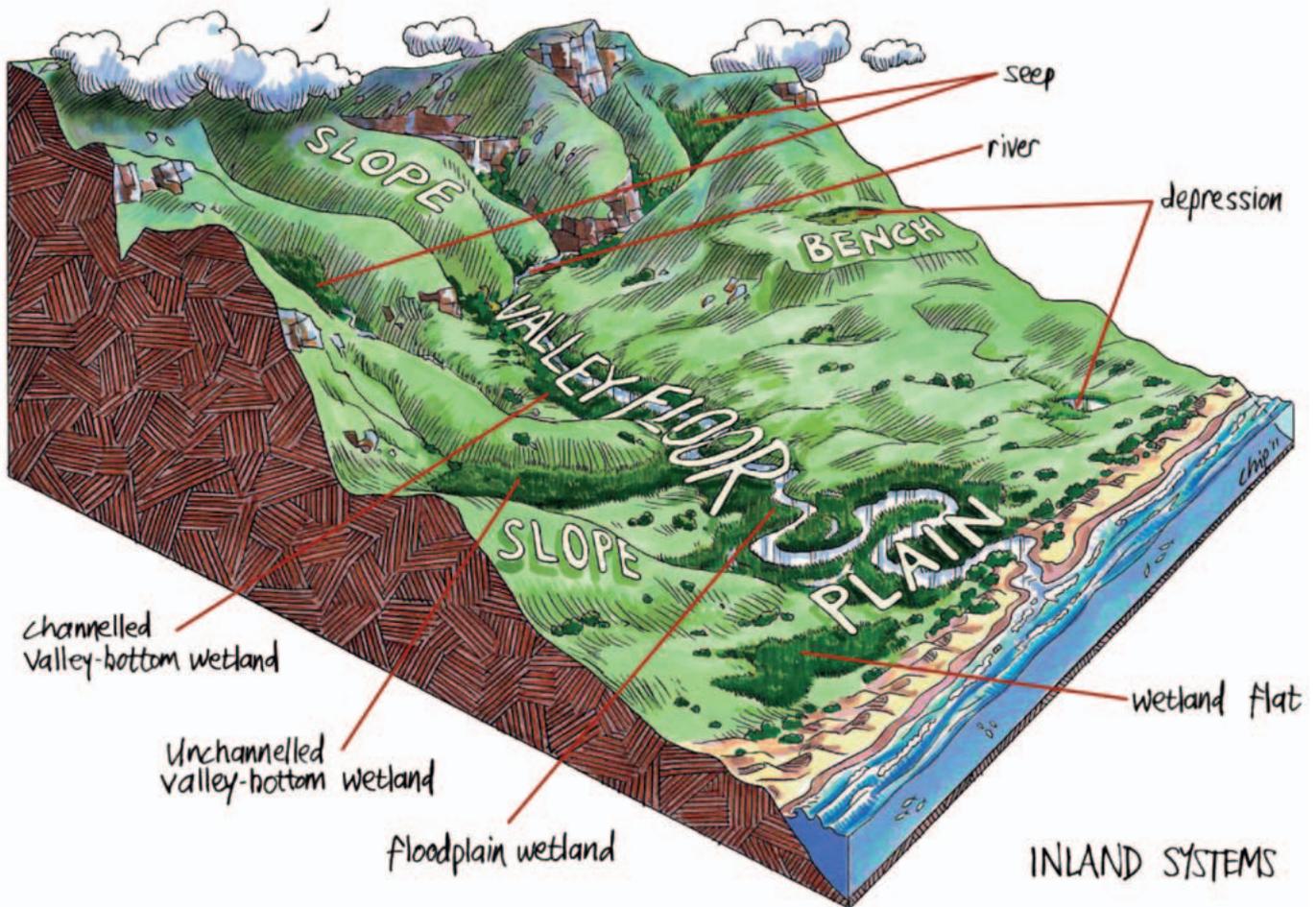


FIGURE 4: Wetland systems within South Africa.⁶

All wetland types can be classified as high value ecological infrastructure due to the large number of ecosystem services that they provide. Wetland ecosystem services can be classified into four separate categories, namely provisioning services, regulating services, cultural services and supporting services.⁷ Provisioning services can be described as the products one can physically obtain from wetlands such as fresh water, food and natural medicines. Regulatory services can be described as the benefits one receives from the wetland such as stream flow regulation, erosion control, water filtration and flood attenuation. Cultural services are the nonmaterial benefits that one can obtain from wetlands such as spiritual enrichment, sense of place and aesthetic experience. Lastly, supporting services

are the services provided that are necessary for the production of all other ecosystem services namely, nutrient cycling and water cycling.⁷

It should be noted that ecosystem services provided by wetlands come at no cost to the municipality and as such, all that needs to be done to ensure continued provision of these services is to protect and maintain local wetlands. However, the inappropriate management of wetlands can cause a loss of wetland area and subsequent loss of ecosystem services. This results in the municipalities having to invest in expensive infrastructure (e.g. water filtration plants or flood barriers) to ensure the same level of service delivery.

2 | WHAT IS BIODIVERSITY?

“The variability among living organisms from all sources, including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.”

National Environmental Management: Biodiversity Act No. 10 of 2004

To expand on this, biological diversity or the shorter more commonly used term biodiversity, is the variety of genes, species and ecosystems on Earth, and the processes that maintain this diversity. It is the living species and natural processes that constitute nature. Rather than simply considering plant and animal populations (i.e. total numbers), biodiversity reflects the variability of plants and animals and importantly, the processes by which they are supported, and the functions that they deliver.

Essentially, as biodiversity includes natural processes, it describes the health and functioning of a given area. For example, if a wetland becomes polluted and its ecological condition deteriorates, it is no longer able to function correctly and natural processes such as providing food (e.g. fish), materials (e.g. reeds) and water purification no longer take place. The real value in the term biodiversity is that by describing the variety of life forms rather than total numbers, biodiversity can be used at any scale (e.g. for landscapes such

as grasslands or a habitat such as a woodland or koppie) to reflect the health of any area – not just wild landscapes, but pockets of biodiversity such as wetlands, too.

To illustrate the concept of biodiversity, compare two areas of the same size. Both areas have 100 animals living in the area. In the first area, there are 20 birds, 70 insects and 10 mice. The insects pollinate the flowers, the birds disperse seeds and the mice provide soil nutrients in the form of droppings so that more seed-producing plants grow. In the second area, all the animals are mice. Over time, these mice eat more seeds than are being replaced, no birds disperse seeds and no flowers are pollinated by the insect, hence the area becomes degraded. Hence, even though both areas have the same total number of animals, the first has greater variety, hence greater biodiversity, and is a healthier, better functioning ecosystem.



FIGURE 5: The Blue Duiker (*Philantomba monticola*).⁸



FIGURE 6: The White-backed Night Heron (*Gorsachius leuconotus*).⁹

3 | WETLANDS AND BIODIVERSITY WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

The Eastern Cape Province has the highest number of biomes and vegetation types out of the nine provinces in South Africa. Seven biomes and twenty-nine Acocks veld types are present, as well as a number of species: namely Plants (6164 species), Mammals (156 species), Birds (384 species), Amphibians (51 species) and Reptiles (57 species). The Province has many sensitive and conservation worthy areas within its region, such as the subtropical thicket, wetlands, river systems, cultural sites, rare and endangered species and its coastal areas.¹⁰

Buffalo City Metropolitan Municipality (BCMM) is located in the Eastern Cape Province and is one of 8 metropolitan municipalities in South Africa. The metropolitan area is approximately 2 515 km² in size and includes some 82 km of coastline and is surrounded by the Amathole District Municipality, and

its Great Kei, Amahlathi, Nkonkobe and Ngqushwa Local Municipalities. It includes the towns of East London, Bisho and King William's Town, as well as the large townships of Mdantsane and Zwelitsha (refer to Figure 7).¹¹

The majority (64.5%) of the municipal area falls within the Albany Thicket Biome, followed by the Savanna Biome (29.5%). Buffalo City Metropolitan Municipality also contains areas of indigenous forest, grasslands, wetlands and estuaries. There are 22 estuaries within the boundaries of the Buffalo City Metropolitan Municipality ranging from large open to small closed systems. This does not include Kwelera and Keiskamma estuaries that form the municipal boundaries with the Great Kei and Ngqushwa Municipalities respectively.

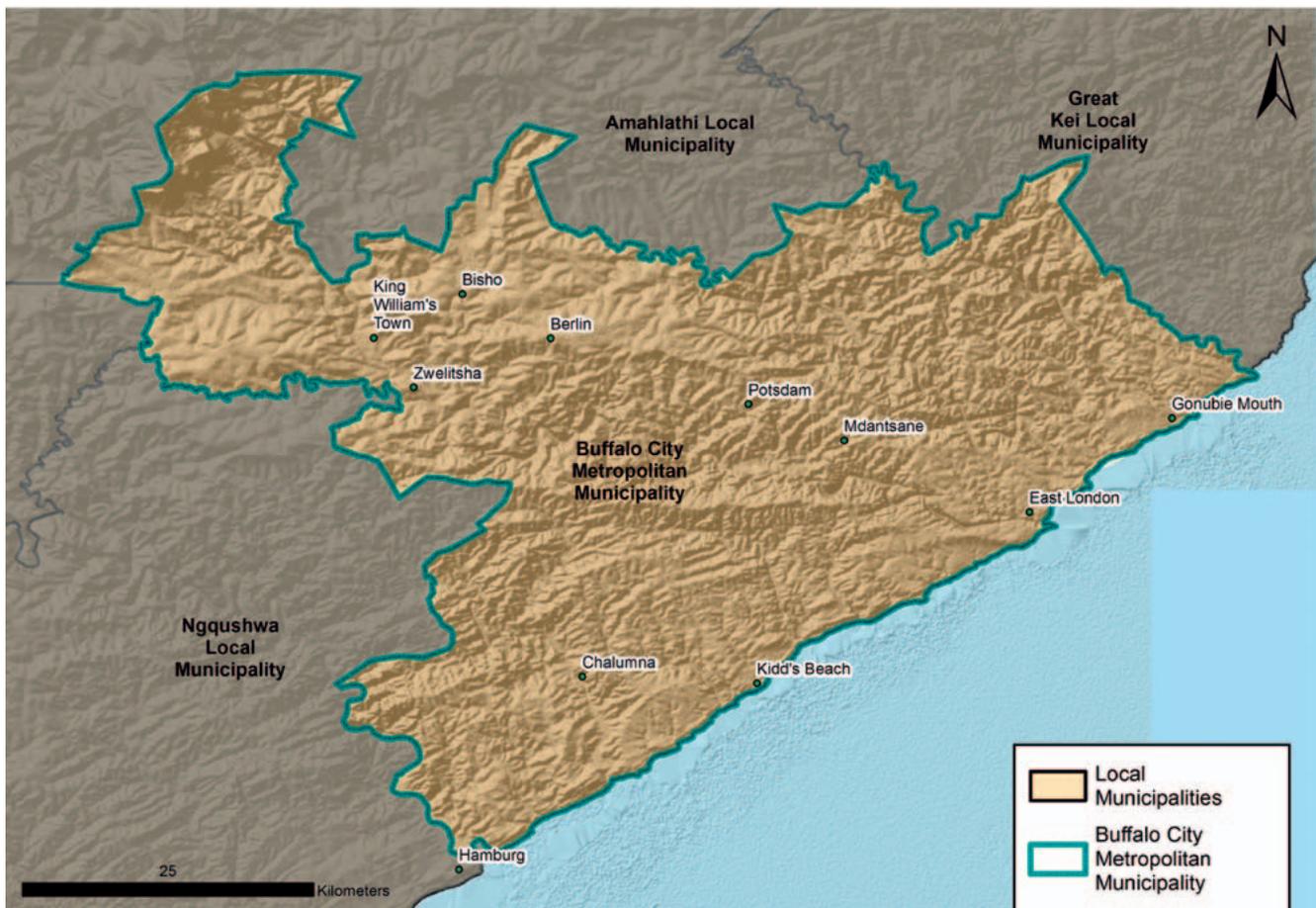


FIGURE 7: Buffalo City Metropolitan Municipality in relation to its surrounding municipalities.

3 WETLANDS AND BIODIVERSITY WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

This section will provide information on existing maps, information on the known key wetlands in the Metro as well as information on their health and status and key flora and fauna species associated with wetlands in Buffalo City Metropolitan Municipality.

It provides detail on the value of wetlands to the Metro and highlights the key threats. Also included is information on the Buffalo City Metropolitan Municipality's Strategic Water Source Areas (SWSAs).

3.1 MAPPING WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

Currently there is no specific ground-truthed/verified wetland map available covering the Buffalo City Metropolitan Municipality in its entirety. SANBI's National Freshwater Ecosystem Priority Area (NFEPA) provides a broad national-level overview of where wetlands are located within the landscape, including individual wetlands and clusters of wetlands that are considered to be of regional or national importance. As such, the SANBI NFEPA data can be used as a first-level or preliminary assessment of wetland occurrence within the municipality (refer to **Figure 8**).

Freshwater Ecosystem Priority Areas (FEPAs) are rivers and wetlands that are required to meet biodiversity targets for freshwater ecosystems. They are not formally protected in terms of law but are areas considered to provide strategic spatial priorities for conserving freshwater ecosystems. These areas should be maintained in good ecological conditions to support the sustainable yield and use of water resources. The FEPA wetland ecosystems present 6.8%, which is a small proportion of priority wetlands requiring urgent sustainable management intervention.

FEPA wetlands need management plans that identifies the key wetland and river habitats for which it was selected, delineates management buffers around these, and addresses specific pressures that may impact on its conservation. In some instances it may be sensible to develop management plans for groups of FEPAs, Fish Support Areas and Upstream Management Areas.

It should be noted however, that the NFEPA wetland map is based predominantly on remote-sensing imagery (which does not always detect features on the ground) and at this stage is largely not ground-truthed. As such the data should be treated with caution and for initial planning only as some wetlands may not be reflected (e.g. a number of known seeps occurring within the municipality are not reflected in the NFEPA wetland map, whilst a number of farm dams are). Despite these limitations, the NFEPA wetland map is thought to provide the best available indication of true wetland distribution data across the country and although the spatial representation of wetlands cannot be considered as definitive, it does provide an indication of relative wetland occurrence, size and density across the municipality.

Based on the information available at the time of writing this report, it is clear that there are significant gaps in wetland mapping within the municipality and that there is a real need for comprehensive ground-truthed mapping to be undertaken within the municipality to assist with accurate and holistic planning going forward. This could be achieved by incorporating a GIS specialist into the existing municipal structure to undertake the required mapping or by employing a wetland specialist to ground-truth wetlands within Buffalo City Metropolitan Municipality and developing a wetland map accordingly.

Recognising the need to ensure that these important natural resources are conserved, the Department of Economic Development and Environment Affairs (DEDEA) together with the Department of Water

3.1 MAPPING WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

Affairs and Forestry (DWAFF) prepared the Eastern Cape Biodiversity Conservation Plan (ECBCP).¹² The ECBCP identifies and maps critical biodiversity areas, and provides land use planning guidelines that recommend biodiversity-friendly activities in priority areas.

The ECBCP identifies Critical Biodiversity Areas (CBA) based on the systematic biodiversity planning analysis undertaken in 2007, as well as, biodiversity priority areas identified by other systematic biodiversity planning projects, such as the Subtropical Thicket Ecosystem Project (STEP). The ECBCP developed two

maps, one showing the terrestrial CBAs and the other, the aquatic CBAs.

To facilitate the integration of these CBAs into spatial development planning, the ECBCP has identified Biodiversity Land Management Classes (BLMC) which relate to the terrestrial CBAs and Aquatic Biodiversity Land Management Classes (ABLMC) which relate to the aquatic CBAs. The terrestrial BLMCs set out the desired ecological state of a parcel of land, as well as, the allowable land use types that are compatible with maintaining this desired state.

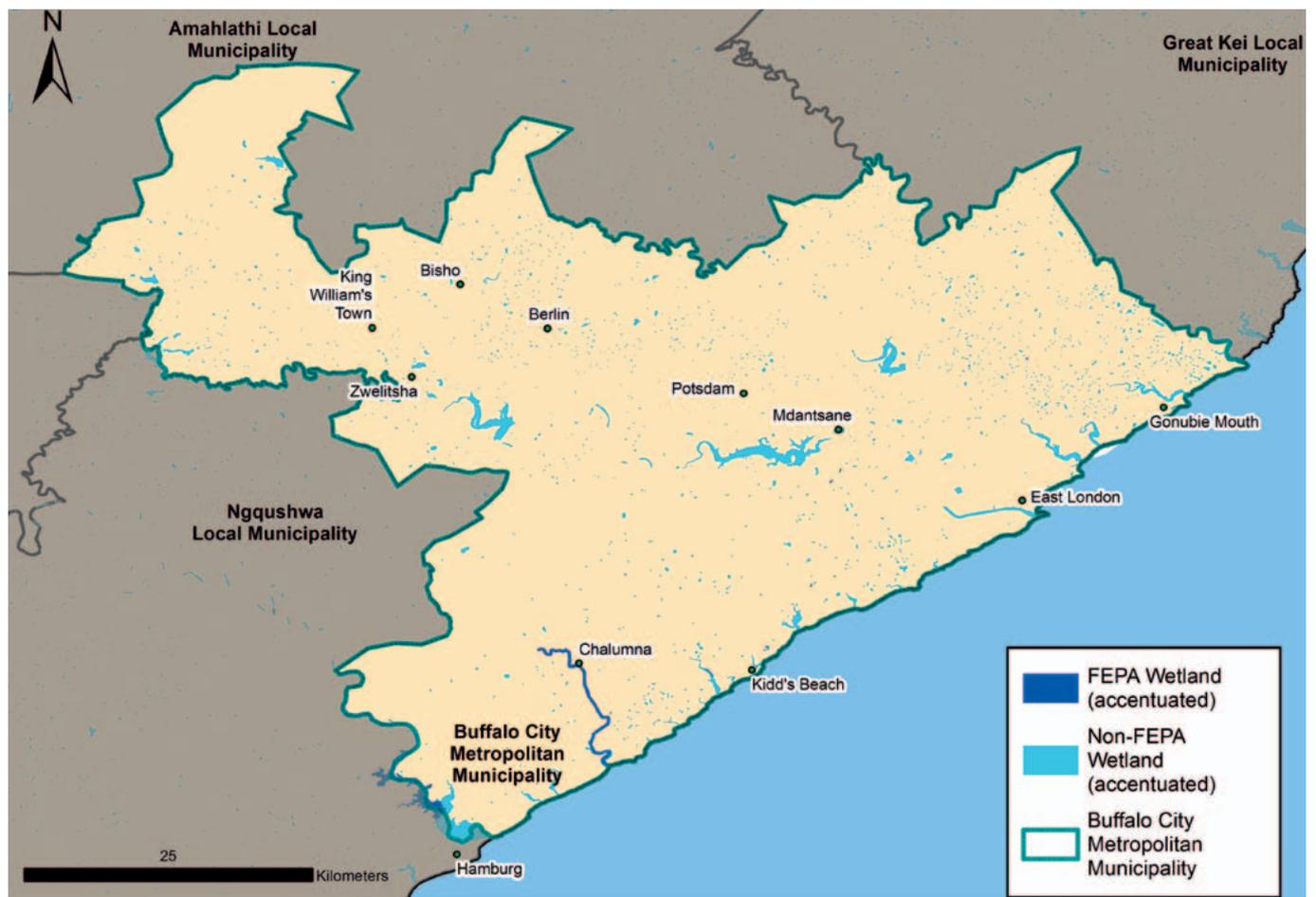


FIGURE 8: Map indicating the spatial distribution of the NFEPA wetlands in the Buffalo City Metropolitan Municipality.

3.2 KEY WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY



FIGURE 9: The Nagoon and Buffalo Estuaries.

Buffalo City has approximately 22 estuaries within its boundaries. According to RAMSAR's classification for wetlands, estuaries are classified as wetland ecosystems even though they are usually situated at the lower end of the River basin network. Most of Buffalo City's seep, mountain side or foothill wetlands occur outside the municipal boundary as part of the Amathole District Municipality which includes the Amathole mountains priority watershed. Coordination between these two municipalities on wetland management is therefore very important for sustainability. In Buffalo City Metropolitan Municipality, the estuary wetlands are of highest conservation importance.

3.2.1 The Nagoon Estuary

The Nagoon Estuary is considered to have the highest conservation significance in the municipal area (refer to **Figure 9**). The Nagoon Estuary is the only estuary that has been afforded formal protection through the proclamation of the East London Coast

Nature Reserve, which extends from the coast inland and incorporates most of the estuary. An Estuary Management Plan has been prepared for this estuary. None of the other estuaries in the municipal area are protected, with the exception of the extreme coastal extents of some, which may fall within coastal Nature Reserves.

3.2.2 The Buffalo Estuary

East London's harbour, situated on the Buffalo Estuary (refer to **Figure 9**) offers a strategic competitive advantage to economic development within the municipality. The harbour area is severely polluted by elevated levels of heavy metals, bacteria (faecal and total coliforms) and contaminated run-off. The Buffalo River and its pollutants are the primary source of contamination. Other sources include residential and industrial wastewater, storm water runoff from the city centre, landfill leachate and pollution associated with port activities such as spillages, repairs and waste disposal.¹³

3.3 KEY FLORA AND FAUNA OF THE BUFFALO CITY METROPOLITAN WETLANDS

The Eastern Cape is globally recognised for its high biodiversity value and scenic beauty. It has the highest biome diversity of any province, with no less than six biomes: Forest, Fynbos, Nama Karoo, Savanna, Succulent Karoo and Thicket. The Province contains three centres of biological endemism: the Albany Centre, the Drakensberg Centre and the Pondoland Centre. Buffalo City Metropolitan Municipality has a rich floral and faunal biodiversity, particularly with respect to coastal ecosystems (including coastal forests and grasslands), thicket vegetation of the south-eastern Cape (which is one of the eight distinct biomes seen in South Africa), and indigenous afro-mountain forest of the Amathole mountain region. An additional issue of concern in Buffalo City Metropolitan Municipality is the conservation of the Albany Centre of Endemism,¹⁴ which centres on the former Albany magisterial district of the Eastern Cape and stretches to East London in the East and Humansdorp in the west, as well as inland to include the mountainous areas.

3.3.1 Flora

As indicated in the Buffalo City Metropolitan Municipality State of Environment Report (2005)¹⁵ in terms of plants, the thicket vegetation of the south-eastern Cape has been acclaimed as unique and deserving of urgent conservation attention, especially because of its plant diversity, including many succulents and bulbs. Since much of the Thicket Biome falls within Buffalo City Metropolitan Municipality, the Municipality has a particularly important role to play in its conservation.

3.3.2 Fauna

An area east of King William's Town and close to Dimbaza in Buffalo City Metropolitan Municipality is home to the world's longest a-segmented worms (*Annelida*), the African giant earthworm (*Microchaetus rappi*). This huge worm can reach a length of as much as 6.7 m and can weigh over 1.5 kg (refer to **Figure 10**).

A number of rare butterflies occur in the Buffalo City Metropolitan Municipality including: Forest and thick bush species (*Aslauga australis*, *Bowkeria phosphor*, *Abantis bicolor*) and Grassland species (*Poecilimitis penningtoni*, *Metilsella syrinx*).



FIGURE 10: Showing the African giant earthworm (*Microchaetus rappi*).¹⁶

The Eastern Cape Rocky (*Sandelia bainsii*) is a rare and endangered freshwater fish species found only in several Eastern Cape river systems in South Africa including Kowie, Great Fish, Buffalo, Keiskamma, Igoda and Nahoon River systems. Named after the great Xhosa chief Sandile (*Sandelia*) from the area during the 19th Century and explorer geologist Thomas Bain (*bainsii*), the greatest threat to the fish is a loss of habitat. Other pressures, such as alien fish and vegetation, excessive salt deposition and water flow obstruction are usually man-induced and also pose dangers to the survival of this rare fish species.

Amphibians seen in the Buffalo City Metropolitan Municipality area includes the near threatened Hogsback Frog (*Anhydrophryne rattrayi*) which inhabits moist microhabitats in forest patches of the Amathole Escarpment including Evelyn Valley and Pirie areas in the Buffalo City Metropolitan Municipality. Other interesting species include: Dwarf Puddle Frog (*Phrynobatrachus mababiensis*), Sharp-nosed Grass Frog (*Ptychadena oxyrhynchus*), Striped Grass Frog (*Ptychadena porosissima*) all found in East London.

3.3 KEY FLORA AND FAUNA OF THE BUFFALO CITY METROPOLITAN WETLANDS *(continued)*

Although a number of venomous snakes occur in Buffalo City Metropolitan Municipality, including the Boomslang (*Dispholidus typus*), Rinkhals (*Hemachatus haemachatus*), Cape Cobra (*Naja nivea*), Common Night Adder (*Causus rhombeatus*) and Puff Adder (*Bitis arietans*), not many bites to humans or livestock are recorded.

The Buffalo City Metropolitan Municipal area has a rich bird diversity with nearly 500 species recorded. A significant number of threatened or vulnerable species occur in the area, including:

- Cape Parrot (*Poicephalus robustus*) classified as Critically Endangered
- White-backed Night Heron (*Gorsachius leuconotus*) classified as Vulnerable
- African Finfoot (*Podica senegalensis*) classified as Vulnerable
- African Black Oyster Catcher (*Haematopus moquini*) classified as Near Threatened

Amongst the mammals, the only species endemic to the area is the Giant Golden Mole (*Chrysospalax trevelyani*) that inhabits the indigenous forests of the Eastern Cape. There are numerous other threatened mammals in the Buffalo City Metropolitan Municipality, including Vulnerable and Rare species. While a number of the Rare species may best be considered Nationally Vulnerable (e.g. South African Hedgehog, Leopard, Blue Duiker and Tree Dassie), other rare taxa such as the Samango Monkey (*Cercopithecus mitis*), is restricted to forests in the Amathole Escarpment and coastal region (Umtiza Nature Reserve), may be considered Near Threatened.

Three interesting bat species can be found in the Buffalo City Metropolitan Municipality. The Lesser Woolly Bat (*Kerivoula lanosa*) is classified as Near Threatened, the African Pipistrella (*Kuhl's Bat*, *Pipistrellus kuhli*) is classified as Least Concern while Swinny's Horseshoe Bat (*Rhinolophus swinnyi*) is classified as Endangered and has been recorded from Pirie in the Buffalo City Metropolitan Municipality.

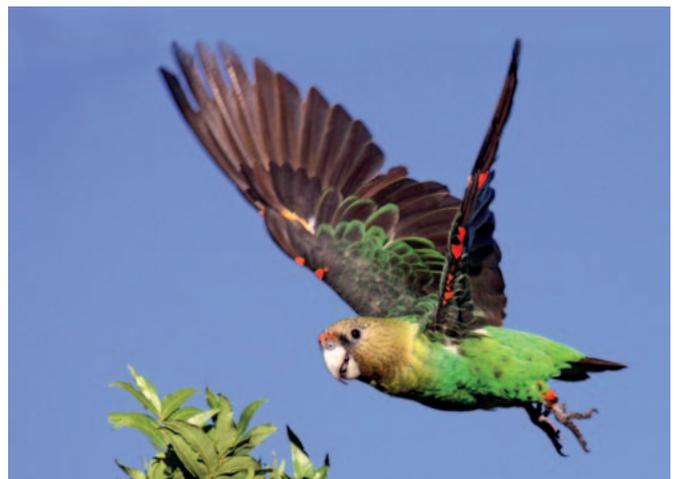


FIGURE 11, 12 & 13: From top to bottom – Sharp-nosed frog (*Ptychadena oxyrynchus*),¹⁷ the Striped Grass Frog (*Ptychadena porosissima*)¹⁸ and the Critically Endangered Cape Parrot (*Poicephalus robustus*).¹⁹

3.4 STRATEGIC WATER SOURCE AREAS AND CATCHMENT MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

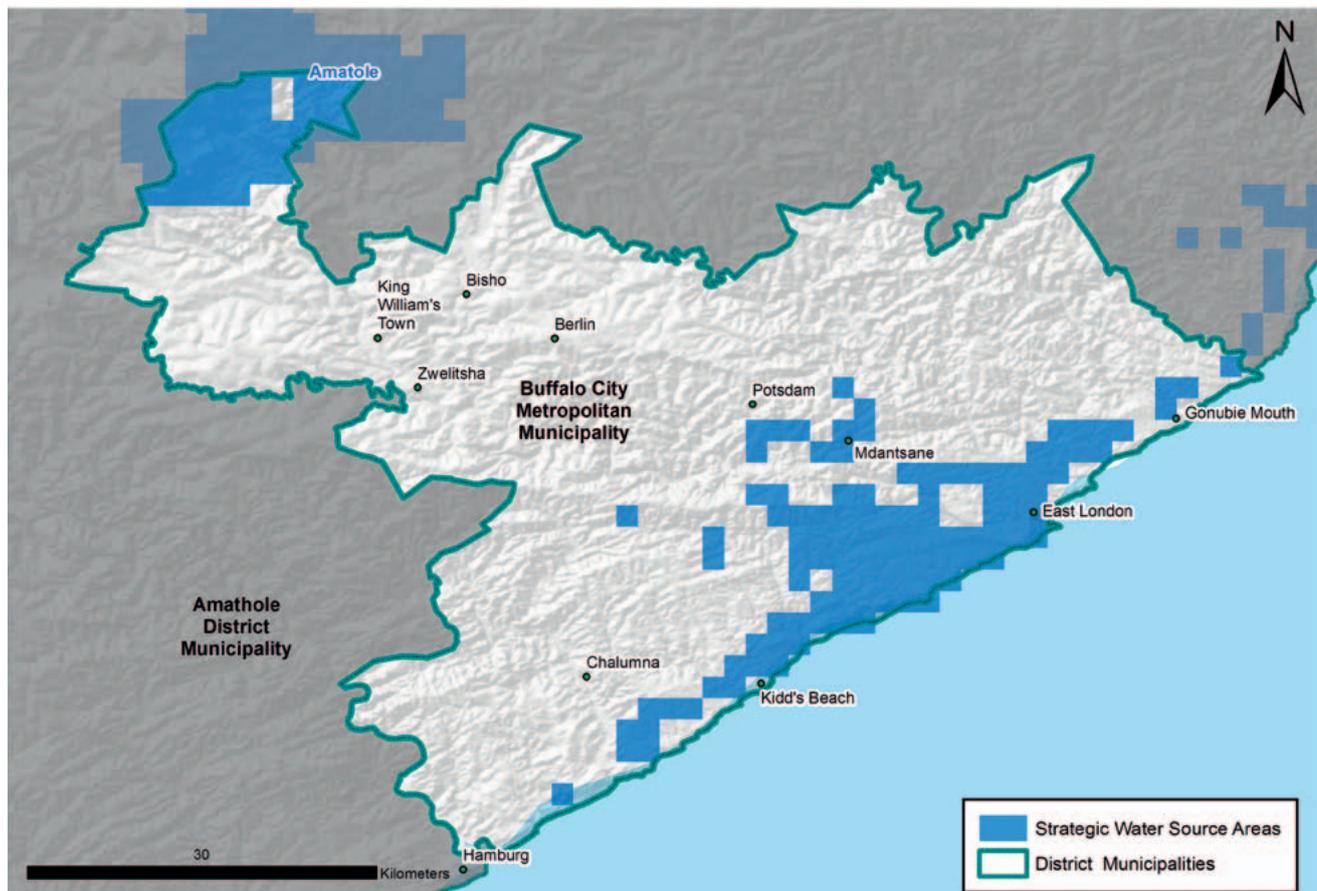


FIGURE 14: Strategic Water Source Area (SWSA) identified in the Eastern Cape that is of relevance to the Buffalo City Metropolitan Municipality.²³

Water Source Areas (WSAs) are sections of the landscape that provide a disproportionate amount of run-off compared to the rest of a given catchment area. South Africa's WSAs are largely spread across the country, however they are generally found in the highest parts of the landscape, receiving high amounts of rainfall. Downstream users and ecosystems are highly dependent on the healthy functioning of WSAs in order to sustain good quality water supplies for human consumption as well as agriculture. Disrupting the water supply from the WSAs therefore has the potential to have a hugely negative impact on national water and food security.²⁰

Twenty one separate WSAs have been identified in South Africa and can be divided into those of local importance (5) and those of strategic national importance (Strategic Water Source Areas or SWSAs, 16).²¹ Water managers are faced with finding new and

innovative ways of improving both water quality and quantity to meet the increasing water demands of the country. Yet, appropriate management of these water source areas, which occupy only 8% of the land surface area, can greatly support downstream sustainability of water quality and quantity. Prioritising their protection, and responsible use, will be of critical importance if we are to grow a sustainable economy that meets the needs and aspirations of all South Africans.²²

From the map (refer to **Figure 14**) it is clear that Buffalo City's main strategic water source area is situated to the North-West in the Amathole Mountains. Cooperative water management strategies between Buffalo City and Amathole District Municipality will therefore be key in securing water quality and quantity for a sustainable future for all in Buffalo City.

3.5 THE VALUE OF WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

The primary supply of water for the Buffalo City Metropolitan Municipality comes from the Gubu and Wiggleswade dams located on the Kubusi River, the Rooikrantz, Laing and Bridledrift dams on the Buffalo River and the Nahoon Dam on the Nahoon River. Water level of six major dams are showing decreasing levels. This could be as the results of decreasing water supply from wetlands to the tributary rivers that supply water to the main rivers that form part of

the dams. Gubu and Wiggleswade dams are located outside the Buffalo City Metropolitan Municipality, meaning that collaborative efforts should be made to better manage wetlands and rivers that supply these dams with water. Besides water security, wetlands also provide many other ecosystem service. **Table 1** below is an outline of services provided by wetlands in the Buffalo City Metropolitan Municipality.

TABLE 1 ECOSYSTEM SERVICES IDENTIFIED WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

| ECOSYSTEM SERVICE TYPE | ECOSYSTEM SERVICE | DESCRIPTION/ CASE STUDY |
|------------------------|--|--|
| Provisioning | Food | Wetlands provide food in the form of plants and fish. |
| | Fresh Water | Wetlands retain water. They also filter water which can be used for water for drinking and irrigation. |
| | Fibre and Fuel | Wetlands provide raw materials such as wood, reeds and peat. |
| | Medicinal products | Many plants within wetlands can be used for medicinal purposes. |
| | Habitat | Habitat wild life and nesting sites for birds. |
| Regulatory | Climate regulation | Wetlands store carbon and other greenhouse gasses preventing them from being released into the atmosphere. |
| | Water regulation (hydrological flows) | Wetlands absorb and store storm water much like a sponge and slowly release it over time. This reduces sediment loss and reduces flooding of areas down-stream. Wetlands also help with ground water recharge and discharge. |
| | Water purification and waste treatment | Wetlands have the ability to retain and remove excess nutrients and pollutants from the water. Wetlands also remove bacteria and pesticides which can contribute to ill-health in humans and animals if ingested. |
| | Erosion control | Wetland plants retain sediment that would otherwise be carried downstream and deposited in dams and floodplains. |
| | Natural hazard regulation | Wetlands control floods and also offer storm protection by slowing water runoff thus reducing the potential for severe flooding incidents downstream. |
| | Pollination | Wetlands provide habitat and breeding ground for pollinators (both insects and birds). |
| Cultural | Spiritual | Wetlands are seen as places of worship as well as areas where baptisms can take place in a natural setting. |

continued

3.5 THE VALUE OF WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

TABLE 1 ECOSYSTEM SERVICES IDENTIFIED WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

| ECOSYSTEM SERVICE TYPE | ECOSYSTEM SERVICE | DESCRIPTION/ CASE STUDY |
|------------------------|-------------------|---|
| Cultural | Recreational | Wetlands provide opportunities for recreational activities (e.g. boating and fishing) and ecotourism (e.g. birding and hiking trails). Wetlands improve the quality of life in communities. |
| | Aesthetic | Natural wetlands systems are beautiful and have high aesthetic value. |
| | Educational | Wetlands provide opportunity for learning at a primary, high school and university level. |
| Supporting | Soil formation | Wetlands retain sediment and organic matter providing perfect conditions for soil formation. |
| | Nutrient cycling | Storage and recycling, processing and acquisition of nutrients. |
| | Biodiversity | Wetlands provide critical habitat for a variety of flora and fauna; in particular, wetlands provide breeding ground for frogs, insects, fish and birds. |



FIGURE 15: Image depicting a small tributary where the water filtration capabilities of wetlands higher up in the catchment is illustrated. The brown water on the left has moved through a wetland that has been compromised by land use change whilst the clear water on the right has moved through a pristine wetland that has not been impacted by human activities.²⁴

3.6 THREATS TO WETLANDS

Despite the huge benefits that wetlands provide in terms of ecosystem services, 50% of wetlands in South Africa have already been lost and 48% of the remaining wetlands are critically endangered and/or degraded. This loss is a direct result of deliberate draining of wetlands, development and expansion (both urban and agricultural) and pollution. Damage to wetlands results in increasingly limited functionality and subsequently a decrease in the ability to provide valuable ecosystem services. The rate of loss of wetland ecosystem types are often associated with highly productive land, and are often the ones that are overgrazed, cultivated, dammed, drained or bulldozed for agricultural purposes.

The key threats to the wetlands located within Buffalo City Metropolitan Municipality are:²⁵

- Invasive alien plants (IAPs)
- Erosion
- Development within and around wetlands
- Pollution and excess nutrients
- Draining of water
- Over grazing/tramping
- Lack of buffer zones next to wetlands

3.6.1 Wetland Ecosystem Threat Status

Wetland ecosystem threat status shows the degree to which a wetland is still intact, or alternatively losing vital aspects of its structure, function and composition, on which its ability to provide ecosystem services ultimately depends. The wetland ecosystems in Buffalo City cover an area of approximately 3 338 ha which make up to 1.3% of the Buffalo City Metropolitan Municipality. At least 79.6% of these wetland ecosystems are critically endangered, 19.7% are endangered and 0.7% are least threatened (refer to **Figure 17**).

Wetlands ecosystem types in the Albany thicket are most threatened, especially the unchannelled valley bottom wetlands (53.4%) have the highest proportion of critically endangered wetlands, followed by flat (11%) and floodplain (9%) wetlands (**Figure 17**). Approximately 85% of the remaining wetlands in the Buffalo City Metropolitan Municipality are heavily or critically modified, while 12% are moderately modified with only 3% in a natural or good condition (**Figure 16**).

This means most of the wetland ecosystems have been severely or moderately modified from their natural condition. Any further transformation on wetlands must be avoided, and the focus should be made on urgent wetland ecosystems rehabilitation initiatives.

3.6.2 Impact of Land-use and Wetlands

The Buffalo City Metropolitan Municipality is characterised by three distinct land use patterns, namely urban areas (residential and industrial), rural settlement areas and commercial farmland. There is a distinct east-west urban corridor running along the R102 from East London in the east, to King Williams Town and Dimbaza in the west. According to the Land Cover maps available for the area, some 61% of the municipal area is “natural” – or undeveloped. Nearly 20% of the municipal area is under agriculture and plantations, 14% is built up, and 8% is “degraded”.

3.6.3 Rehabilitation of Wetlands in the Buffalo City Metropolitan Municipality

The value of wetlands and the ecosystem services they provide have been recognised by the multiple stakeholders working within the municipality and as such, efforts are being made to halt the loss of wetlands and rehabilitate those that have been damaged or degraded with the purpose of restoring functionality and the subsequent provision of ecosystem services.

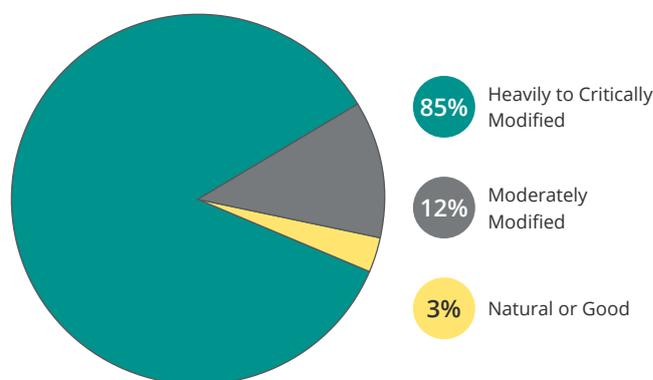


FIGURE 16: Wetland ecosystem condition in the Buffalo City metropolitan Municipality.²⁶

3.6 THREATS TO WETLANDS *(continued)*

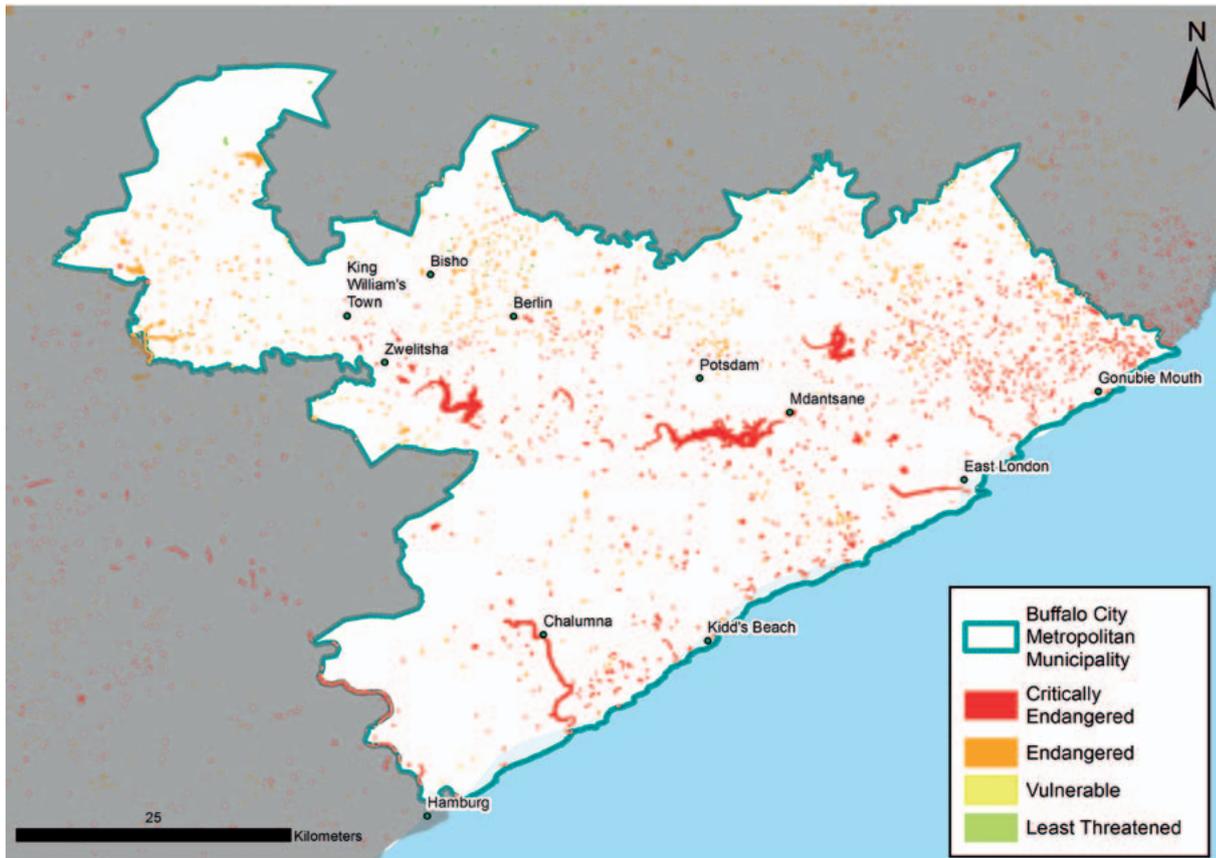


FIGURE 17: Map of wetland ecosystem threat status in the Buffalo City Metropolitan Municipality.²⁷

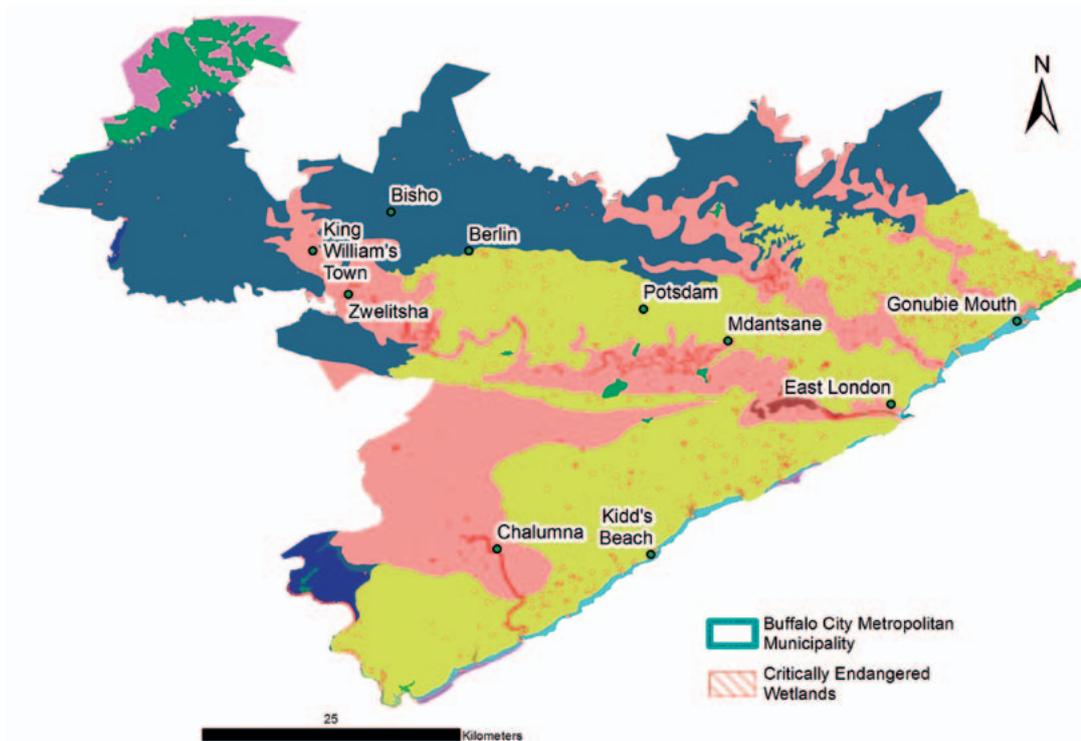


FIGURE 18: Map showing wetland ecosystem threat status and vegetation groups highlighting the Albany thicket where wetlands are most threatened.²⁸

4 | DISASTER MANAGEMENT AND CLIMATE CHANGE

“Disaster means a progressive or sudden, widespread or localised, natural or human-caused occurrence which is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.”

Disaster Management Act No. 57 of 2002

4.1 DISASTER RISK MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

The Disaster Management Act (Act No. 57 of 2002) stipulates that every Metropolitan and District Municipality within South Africa must establish and implement a framework for disaster management within the municipality. This is to ensure that each municipality takes responsibility for hazard monitoring and risk mapping (“disaster risk assessment”), takes the necessary remedial steps to prevent and/or mitigate the occurrence or re-occurrence of disasters in their area of jurisdiction and that there is an integrated and uniform approach to disaster management.

4.1.1 Role of Wetlands in Disaster Risk Mitigation

As noted earlier, wetlands are considered to be high-value ecological infrastructure as they provide a substantial number of ecosystem services to the surrounding local area as well as downstream. Wetlands also have the ability to buffer and reduce the impacts of a substantial array of disasters including flooding, drought, inconsistent water supply, soil erosion, loss of biodiversity and groundwater pollution. Wetlands can play a key role in disaster risk mitigation within the Metro. This is summarised in Table 2 below:

TABLE 2 ROLE OF WETLANDS IN DISASTER RISK MITIGATION WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY ²⁹

| DISASTER | ROLE OF WETLANDS IS DISASTER RISK MITIGATION |
|--|---|
| Flooding | Wetlands have the ability to reduce the velocity of flowing water and absorb some of the water into the wetland system. As such, rather than the flood water moving through the system at once, water is retained and released at a slower rate. This means that not only is the intensity of the flood reduced or prevented all together, thereby reducing the potential impact on infrastructure and housing downstream, but there is sustained water flow long after the rainfall event. |
| Inconsistent Water Flow & Drought | Wetlands have the ability to act like sponges in that throughout the rainy season they absorb water. During the dry season, and even in times of drought, this water is slowly released thereby ensuring that rivers and streams maintain sustainable flows and supply continuous water despite lack of rainfall. |
| Groundwater Pollution | Wetlands have the ability to purify water by trapping pollutants, sediments, excess nutrients (especially nitrogen and phosphorus), heavy metals, disease-causing bacteria and viruses, and synthesized organic pollutants such as pesticides, thereby ensuring that the water leaving the wetland is cleaner than the water that entered it. |

continued

4.1 DISASTER RISK MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

TABLE 2 ROLE OF WETLANDS IN DISASTER RISK MITIGATION WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY ²⁹

| DISASTER | ROLE OF WETLANDS IS DISASTER RISK MITIGATION |
|----------------------|---|
| Loss of Biodiversity | Wetlands can be considered as biodiversity hotspots in themselves as they provide key habitat to a number of plant and animal species. Often these species are considered to be unique and are completely dependent on the system. Maintaining healthy wetlands can therefore contribute to halting loss of biodiversity within the municipality. |
| Soil Erosion | Due to the fact that wetlands are covered by specially adapted vegetation, little to no erosion occurs in wetland areas as the wetland plants have the ability to stabilise and bind the soil, reducing the risk of top soil loss downstream. |

4.2 CLIMATE CHANGE AND WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

‘Climate change’ means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. 9

United Nations Framework Convention on Climate Change (UNFCCC) ³⁰

Climate change resilient development refers to all interventions that contribute to a fair and effective global solution to the climate change challenge while simultaneously building and maintaining South Africa’s international competitiveness, its social, environmental and economic resilience to the adverse effects of global climate change, and any unintended consequences of global climate change response measures. 9

National Climate Change Response White Paper (RSA, 2011:12)

Climate change is possibly the most serious environmental challenge currently facing the planet. It is a global problem that will impact everyone, but especially the urban poor.

In simpler terms, climate change can best be described as a long term change in the Earth’s global climate patterns including shifts in historical seasonality, rainfall patterns and average temperature ranges. These shifts are caused by an increase in global temperatures which are caused by increasing greenhouse gases (e.g. carbon dioxide) being emitted into the atmosphere. The raising of greenhouse gas levels in the atmosphere is caused by large scale human activities including, but not limited to

industry, agriculture, transport and land use change. As a result, the long term historical climate trend is shifting towards unstable and unpredictable future climate conditions.

In 2011 the Department of Environmental Affairs (DEA) published the National Climate Change Response White Paper, which documents the vision and policy of the South African government to developing an effective response to climate change and moving towards a low carbon economy.

4.2 CLIMATE CHANGE AND WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

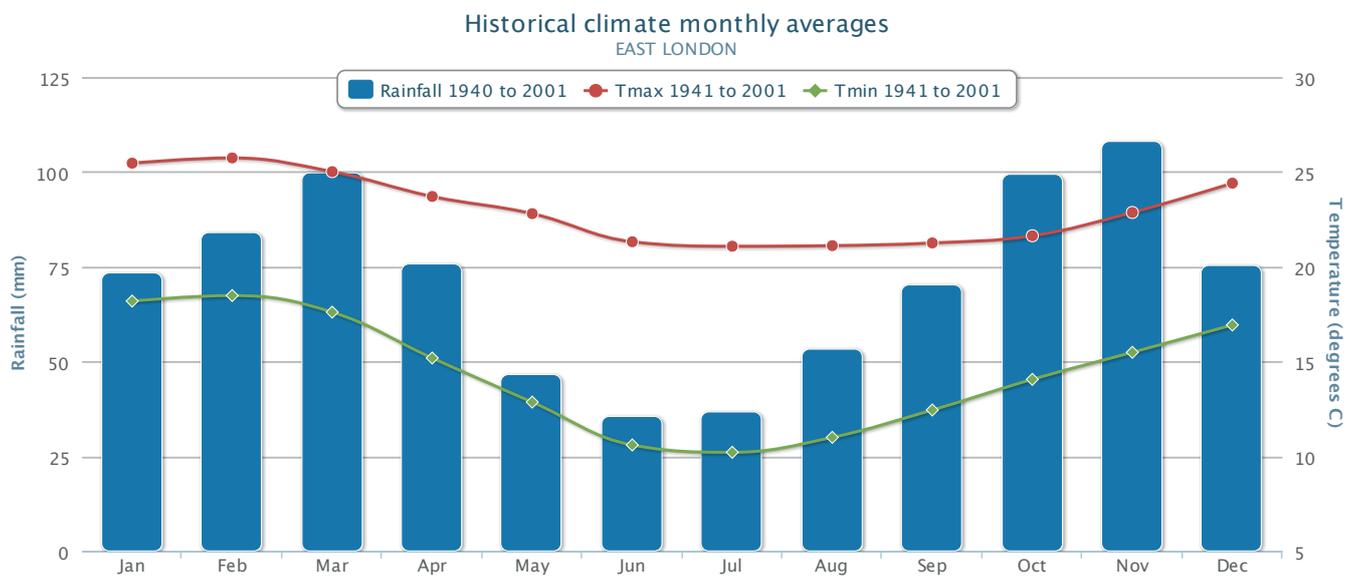


FIGURE 19: Graph depicting the typical climate of the Buffalo City Metropolitan Municipality.³²

4.2.1 Historical Climate in the Buffalo City Metropolitan Municipality

The Buffalo City Metropolitan Municipality has a borderline humid subtropical climate, with the warm temperatures and moderation typical of the South African coastline. Although it has no true dry season, there is a drying trend in the winter, with the wettest times of year being “spring” and “autumn”. There is also a shorter and lesser dry period in December and January. Summer months are warm to hot and are from December to March. Winter months are moderate to cool and are from June to September. Average maximum temperatures occur during the late summer months (Jan and Feb). Moderate temperature variations occur between winter and summer months.

Winters are usually mild with some rain. Annual rainfall in the municipal area varies from 400 mm to more than 1 000 mm, with an annual average of around 700 mm. The highest precipitation occurs in the Amathole Mountains and in the coastal region of the Municipality. Most of the rainfall occurs during summer, except in the coastal area west of East London, where rainfall occurs year-round.³¹ Extreme weather events are extremely rare, however may

start to increase due to climate change.

4.2.2 Projected Climate Change in the Buffalo City Metropolitan Municipality

The Climate Systems Analysis Group (CSAG) from the University of Cape Town (UCT) has developed the Climate Information Platform (CIP) which seeks to provide climate related information at downscaled levels. The CIP runs a series of climate models which collectively provide a database of historical climate patterns as well as future projections for regions and districts throughout the world.

Temperature:

Models all agree that a general warming will definitely occur in the Buffalo City Metropolitan Municipality. There will be an increase (red in **Figure 20** below) in average monthly temperatures throughout the year. Overall increase in monthly average temperatures will most likely be between 1.5–2.5 degrees Celsius. Late summer/early autumn temperatures will increase more than the winter temperatures. Maximum temperatures will experience an overall moderate increase, whilst minimum temperatures will increase more steeply resulting in an ‘evening out’ of

4.2 CLIMATE CHANGE AND WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

temperatures in the late summer (refer to **Figure 20**). An increased risk of heat waves in the late summer period is also predicted for Buffalo City Metropolitan Municipality.

Rainfall:

Change in the overall rainfall patterns will definitely occur. There is no consistent indication on the direction of the expected change. Despite uncertainty however, models generally indicate that there will be a shift to generally drier conditions overall, particularly in the winter months. Models also indicate that there will be a shift in timing of high rainfall events to late summer as well as a shift in the rainfall patterns. Rainfall quantity is likely to remain the same or decrease overall however there could be a decrease in winter rainfall and an increase in the frequency and intensity of rainfall events during the late summer months. It is anticipated that there will be an exacerbation of the existing climate conditions.

4.2.3 Impacts of Climate Change in the Buffalo City Metropolitan Municipality

A shifting climate means that the historical seasonality and rainfall and temperature patterns no longer apply. Increasing monthly temperatures and increasingly uncertain rainfall patterns combined with the increased duration of hot and dry spells between rainy seasons results in an increased risk of drier winter and early summer periods and risk of periodic drought. Increasing uncertainty of rainfall patterns, shifts in the known heavy rainfall months and changes in the number of the associated wet days could result in either general drying and increasingly periodic drought conditions or could result in an increase in the magnitude and frequency of rainfall events resulting in an increased risk of more severe flooding in the late summer months.

4.2.4 Role of Wetlands in Mitigating the Impacts of Climate Change

The projected changes in climate will impact wetlands. The most prominent effect of climate change on wetlands will be through the alteration in changes in flow patterns and decrease in wetland size. A loss in wetlands will cause a reduction in ecosystem services as well as loss of habitat important to a variety of animal and plant species, particularly migratory birds. Healthy wetlands have a high resilience to climate change impacts, which means that they are able to maintain their capabilities to supply ecosystem services. Wetlands which are in poor condition are more vulnerable because their ability to respond and adapt to the change in climate is reduced (i.e. if wetlands are in poor condition then they cannot provide the ecosystem services that are required).

Maintaining and or rehabilitating wetland systems is therefore vitally important to reduce risk to climate change impacts. Ecosystem-based adaptation options, which could be used to reduce the impact of climate change on wetlands and enhance their ecosystem service delivery, include:

- Improved management strategies and cooperative approaches to innovative solutions
- Removal and or control of polluting agents and sources
- Proactive wetland rehabilitation

Wetlands occur extensively across Buffalo City Metropolitan Municipality. Investing in the maintenance of healthy wetlands and the rehabilitation and restoration of damaged or degraded wetlands can ensure that wetlands perform their ecosystem services to the maximum of their capabilities. This will assist Buffalo City Metropolitan Municipality with reducing climate change impacts in the Metro and increase the Metro's resilience to climate change impacts.

4.2 CLIMATE CHANGE AND WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

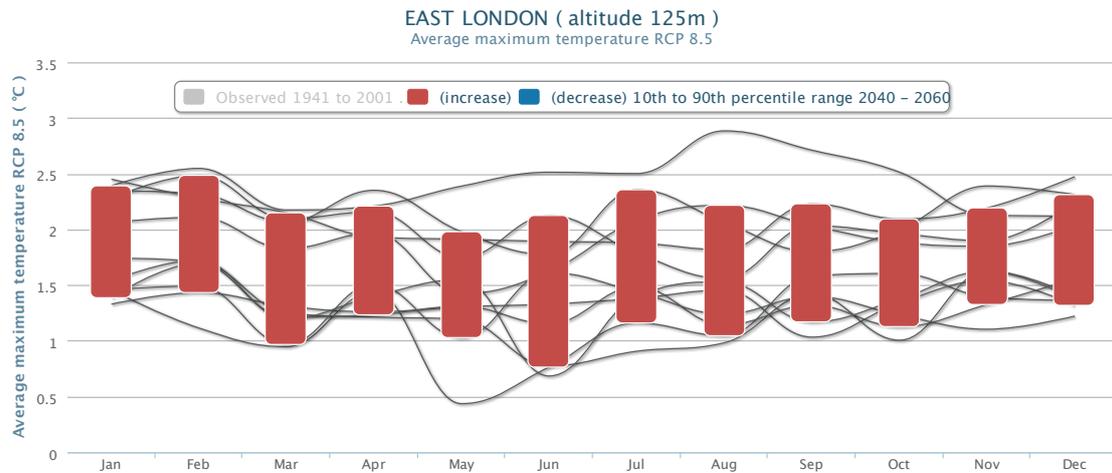


FIGURE 20: Graph depicting the anticipated changes in average maximum temperature patterns for the Buffalo City Metropolitan Municipality.³³

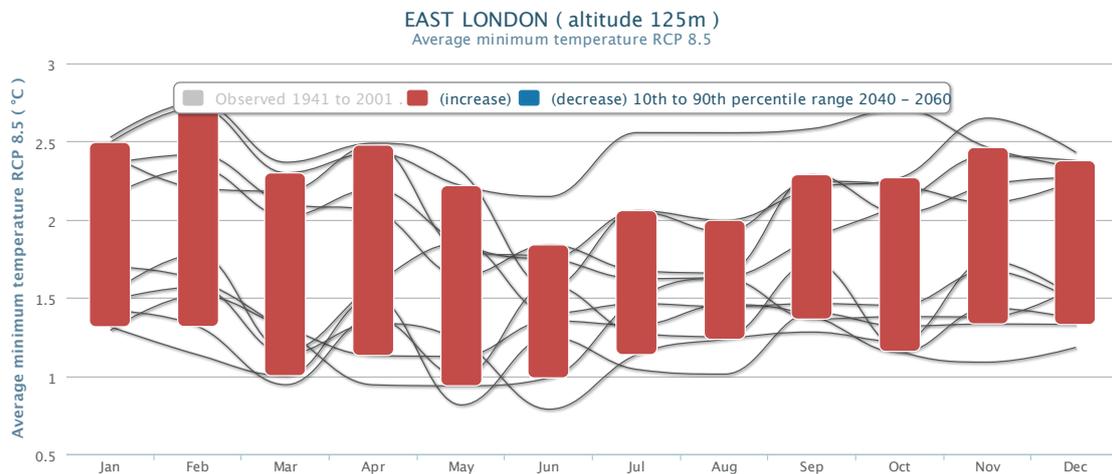


FIGURE 21: Graph depicting the anticipated changes in average minimum temperature patterns for the Buffalo City Metropolitan Municipality.³⁴

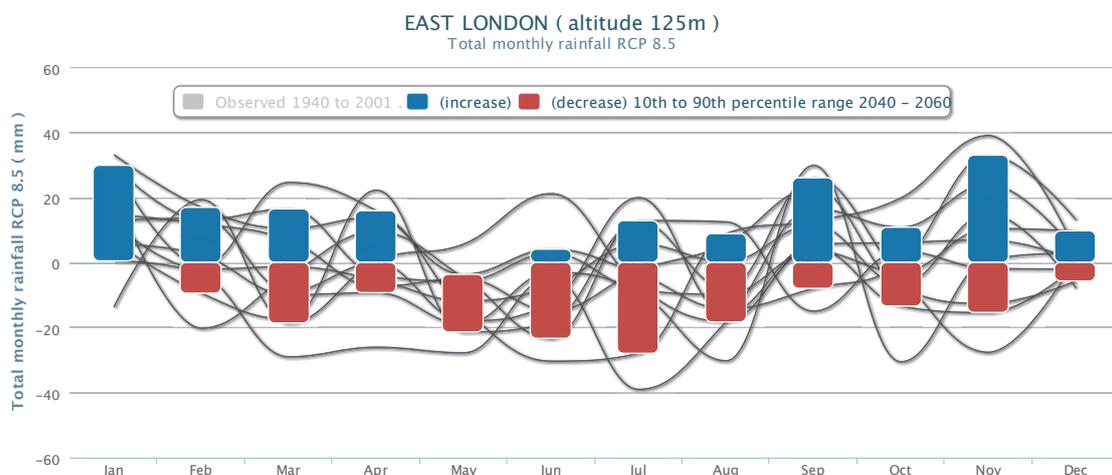


FIGURE 22: Graph depicting the anticipated changes in total monthly rainfall patterns in the Buffalo City Metropolitan Municipality.³⁵

4.2 CLIMATE CHANGE AND WETLANDS WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

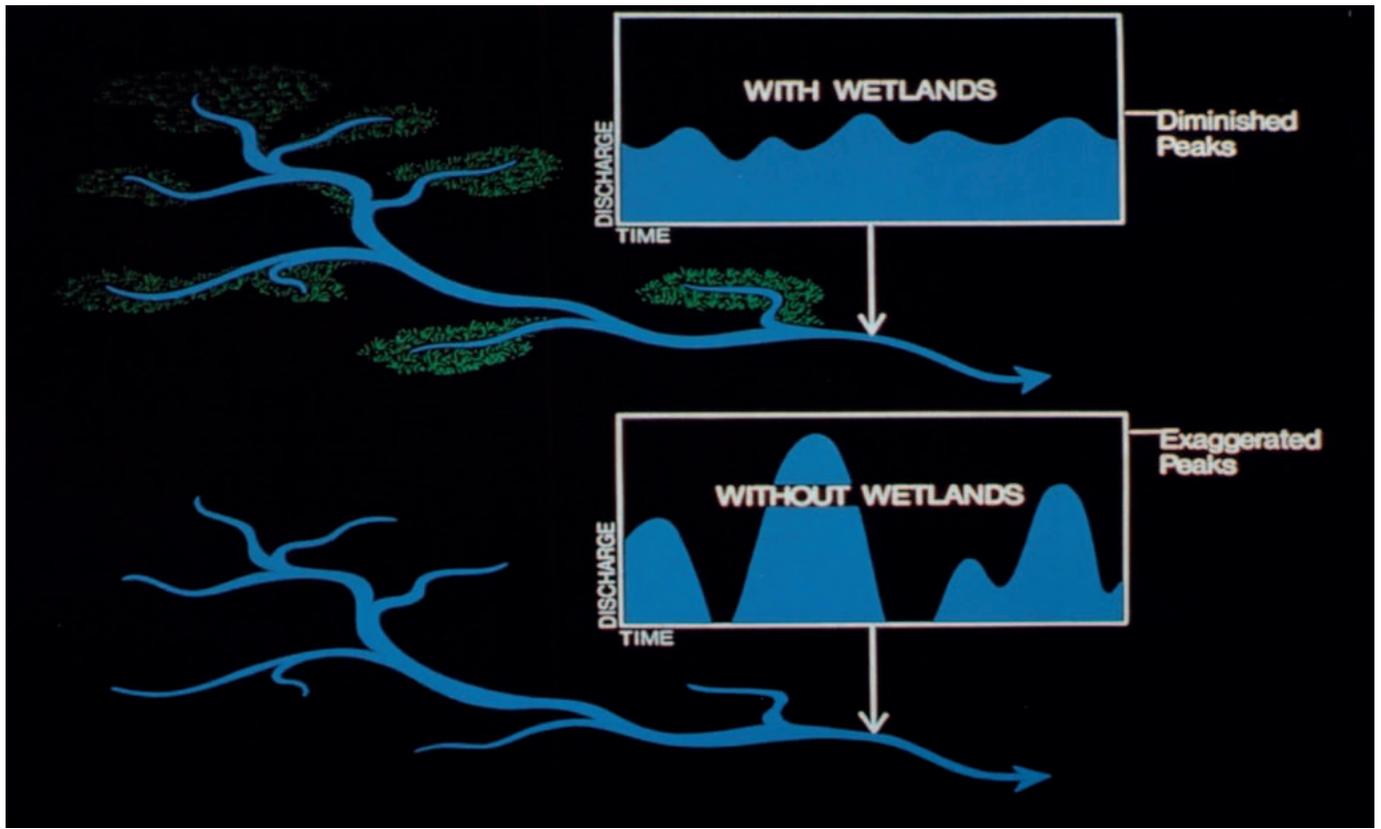


FIGURE 23: Schematic representation on the hydrological buffering capability of wetlands.



South Africa has an extensive legislative framework concerning the environment and biodiversity, which are considered in both development planning as well as national government priorities. This section

outlines key legislation and policies as well as the governance structure within the Buffalo City Metropolitan Municipality.

5.1 POLICY FRAMEWORK

The table below provides a comprehensive summary of South African legislation, policies and strategies pertinent for the management of wetlands in the Buffalo City Metropolitan Municipality. It is important to note that some of the legislation such as the National

Environmental Management Act provides specific instructions regarding wetland management whilst other legislation indirectly supports management of wetlands such as the National Environmental Management: Waste Act (NEM:WA).

TABLE 3 SUMMARY OF LEGISLATION GOVERNING WETLAND MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

| LEGISLATION/ POLICY/STRATEGY | HOW IT RELATES TO WETLANDS |
|--|---|
| Legislation | |
| South African Constitution | Overarching principles of care for the environment. |
| National Water Act | Water use control, including extraction and construction within the vicinity of a watercourse or wetland. |
| National Environmental Management Act | Environmental impact assessments (EIAs) for the development of a new or disturbed site within the vicinity of a watercourse or wetland. |
| National Environmental Management: Biodiversity Act | Protection of biodiversity and the formulation of a number of tools (e.g. bioregional plans and threatened ecosystem lists) that feed into land use planning and EIA procedures. |
| National Environmental Management: Biodiversity Act – Alien and Invasive Species Regulations | All matters related to invasive species management (fauna and flora). |
| National Environmental Management: Integrated Coastal Management Act | Integrated landscape protection from catchment to the coast. |
| National Environmental Management: Protected Areas Act | Protection of national parks, protected areas and conservation sites. This includes the protection of wetland site. |
| National Environmental Management: Waste Act | Regulation of illegal dumping. |
| Conservation of Agricultural Resources Act | Protect the utilization of the natural agricultural resources to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invasive plants. |
| Municipal Systems Act | Role of local governments and the requirements for IDPs, SDFs and Disaster Management Plans. |

continued

5.1 POLICY FRAMEWORK *(continued)*

TABLE 3 SUMMARY OF LEGISLATION GOVERNING WETLAND MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY

| LEGISLATION/ POLICY/STRATEGY | HOW IT RELATES TO WETLANDS |
|--|---|
| Municipal Structures Act | Promotion of regional planning and spatial planning categories. |
| Municipal Health Act | Monitoring of WWTW discharge. |
| Policies | |
| National Development Plan, and associated Medium Term Strategic Framework. | The NDP sets out measures to protect natural resources in South Africa. Through the creation of the MTSF and associated 'Delivery Agreements', required outputs and targets are set. |
| Local and Provincial Development Policies | Is the green economy or the role of biodiversity considered? |
| Municipal Planning | |
| Integrated Development Plan (IDP) | Overall strategy document for the municipality. |
| Strategic Development Framework (SDF) | Spatial translation (i.e. a map) of the IDP. |
| Open Space Framework | Demarcation of Open Space Areas. |
| Environmental Management Framework | Map and land use guidelines for areas of environmental importance. |
| Sector Plans | Disaster Management Plan. |
| Strategies | |
| The National Biodiversity Framework | Provides biodiversity targets for South Africa. |
| National Water Resource Strategy | Speaks to protection and rehabilitation of wetlands. |
| Other | |
| Bioregional plans (draft or gazetted) | Maps Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). |
| Spatial Planning and Land Use Management Act | Provides a framework for spatial planning and land use management in South Africa. It sets out in its definitions that municipal planning is primarily the executive function of the local sphere of government and requires that biodiversity is adequately considered in spatial planning. |
| Disaster Management Amendment Bill | Outlines how ecosystems should be considered in the updated Disaster Management Act. |

5.2 WETLAND MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY



FIGURE 24: Stakeholders of the Buffalo City Metropolitan Municipality Wetland Strategy and Action Plan Workshop, developing a joint vision for the wetlands of Buffalo City.

Currently there is no specific designated wetland management authority or wetland management capacity within Buffalo City Metropolitan Municipality. Instead, the management of wetlands is a collective effort between the Environmental Management, Disaster Management, Municipal Health Services, Urban Planning and Water and Sanitation, each of which manage wetlands through their own key mandates and legislative requirements.

5.2.1 Integrated Environmental Management Plan (IEMP)

The Buffalo City Metro's Integrated Environmental Management Plan provides a response to the various issues identified in the State of the Environment Report (SoER).³⁶ These take the form of Environmental Management Action Plans (EMAPs).

5.2.2 Integrated Development Plan (IDP)

The Buffalo City Metropolitan Municipality IDP embraces the principles of sustainable development and Agenda 21 Principles, which by implication

demonstrates a commitment toward the mainstreaming of sustainable development and environmental management as a central pillar of the IDP process. The following sustainable development and environmental management principles are reflected in the Buffalo City Metropolitan Municipality IDP Report:

- Human beings are at the centre of concern, and are entitled to a healthy and productive life in harmony with nature.
- Equitably meet developmental and environmental needs of present and future generations.
- Environmental protection shall constitute an integral part of development and cannot be considered in isolation.

Environmental issues are best handled with the participation of all concerned citizens, at the relevant level.

- Peace, development and environmental protection are interdependent and indivisible.

5.2 WETLAND MANAGEMENT WITHIN BUFFALO CITY METROPOLITAN MUNICIPALITY *(continued)*

The Buffalo City Metropolitan Municipality IDP report also identifies a number of issues, objectives and strategies relating specifically to environmental management in Buffalo City Metropolitan Municipality. The more important strategies that have a direct relevance to conservation planning and open space management include:

- Manage land use sustainability in urban, peri-urban and rural areas.
- Implement the principles of Integrated Environmental Management (IEM) in spatial planning.

5.2.3 Buffalo City Metropolitan Municipality Environmental Policy

A healthy and sustainable environment is a Constitutional Right of all the citizens of Buffalo City, and is important to the economy and the future of the City. Buffalo City Metropolitan Municipality is therefore committed to promoting a healthy and sustainable environment consistent with National Policy and Legislation and LA 21 principles, as reflected in the Integrated Development Plan for the Municipality.

Within its legislated or delegated roles and responsibilities, and with respect to its own activities and operations and the activities of others operating within its geographical area of jurisdiction, Buffalo City Metropolitan Municipality's commitments with respect to environmental management are:

- To strive to continually improve the environmental performance.
- At a minimum, to meet, if not exceed, the environmental standards set by applicable policy, laws, regulations and best practice.
- To promote and practice sustainable development in line with LA 21 and other principles.
- To prevent environmental degradation and pollution or explore, create, implement and communicate ways of preventing or minimising environmental degradation and pollution
- To rehabilitate environmental damage and pollution.
- To conserve renewable and non-renewable

resources and to promote the conservation of biodiversity and other environmentally sensitive and conservation-worthy areas.

- To set environmental performance targets and objectives in line with National standards, and to monitor compliance on an ongoing basis, to respond to non-compliances, and to report and communicate performance to BCM employees and the public.
- To maintain an appropriate system for documenting and reporting the environmental objectives, targets and performance.
- To communicate in a transparent manner, details concerning the environmental performance of Buffalo City Metropolitan Municipality and the State of the Buffalo City Metropolitan Environment on at least an annual basis.

5.2.4 Buffalo City Conservation Plan and Municipal Open Space System (MOSS)

The Buffalo City Metropolitan Municipality Environmental Unit commissioned a comprehensive Municipal Open Space System (MOSS)³⁷ study in 2007. The 2007 study focused on open Space within the city. This was later expanded to include areas falling under the Mdantsane Urban Renewal Programme (MURP). The full Buffalo City Metropolitan MOSS represents a comprehensive synthesis of recent spatial environmental planning policy and tools affecting Buffalo City including:

- EIA regulations with spatial ramifications
- The Coastal Environmental Management Framework from Cannon-Rocks to the Great Kei River
- The Eastern Cape Biodiversity Conservation Plan (ECBCP)
- The Coastal Management Act
- Climate Change Considerations

The overall Buffalo City Metropolitan MOSS is divided into two components:

- A Conservation Plan for the entire Buffalo City Metropolitan Municipality area
- A Municipal Open Space System (MOSS) confined to the urban edges

6 | COMMUNICATION AND PUBLIC AWARENESS

Communication, education and public awareness play an essential role in gaining the cooperation and collaboration of individuals and organizations in the public, political and economic sectors to act to reduce

wetland loss and degradation. This section details the current activities that the municipality engages in for raising awareness and educating the community at large.

6.1 COMMUNICATION AND EDUCATION

At this stage, the Buffalo City Metropolitan Municipality does not have any Metro specific environmental awareness campaigns being implemented with either

officials or the public. There are also no municipal environmental tools available for educational purposes at this stage.³⁸



FIGURE 25: Anton Listrom undertaking municipal level awareness raising on the value of wetlands for local communities living in rural areas.

6.2 PUBLIC PARTICIPATION AND AWARENESS

Strategic documents such as the IDP, SDF and EMF are reviewed and updated regularly. Formal public participation processes are followed whenever these

documents are updated to ensure that the public has ample opportunity to submit comments and engage with the municipality.

CONCLUSION

The aim of the Buffalo City Wetland Report was to bring together all the available wetland related information for the Buffalo City Metropolitan Municipality, as well as highlight gaps in knowledge and where wetland management within the municipality could be strengthened going forward.

Through an extensive desktop study, as well as multiple bi-lateral meetings with stakeholders working within the Buffalo City Metropolitan Municipality, it was found that the Metro has a wealth of biodiversity in the Thicket biome and especially wetlands, including, particularly important systems such as the Buffalo River system and the Key Strategic Water Source Area upstream in the Amathole Mountain range. The wetlands within the municipality not only provide a wide range of ecosystem services, such as flood attenuation, water storage, water filtration and food provision, but also provide key habitat for a number of rare and critically endangered flora and fauna. The wetlands within the municipality play a pivotal role in reducing the impacts of climate change as well as disaster risk management within the Metro.

The wetlands within the Buffalo City Metropolitan Municipality however, are currently under threat from encroachment, flow system modifications as well as chemical, stormwater and polluted waste water treatment discharge into the wetlands. This puts the municipality at risk from losing the valuable ecosystem services its wetlands provide.

In terms of wetland management, it was found that other than the SANBI BGIS NFEPA data, there is currently no formal ground-truthed wetland spatial data for the Metro, clearly depicting where the wetlands are located within the landscape. This makes development planning around wetlands extremely challenging. As such, it would be useful to develop a ground-truthed wetland map which not only highlights where wetlands are on the ground but also indicates their status (i.e. pristine condition or degraded) as this would assist town planners, developers and farmers with future planning of developments, expansion and or redevelopment.

Additionally, at the time of reporting there was no specific department within the Buffalo City Metropolitan Municipality which directly deals with the management of wetlands within the landscape. Instead separate municipal departments including Environmental Management, Disaster Management, Municipal Health Services, Urban Planning and Water and Sanitation all manage wetlands as per their own legislative requirements. Due to capacity constraints and the tendency of these separate municipal departments to work “in silos”, there is currently very little communication or cohesion across the separate departments dealing with issues or concerns pertaining to the wetlands, making the holistic management of wetlands within the Metro a difficult task and also increasing the risk of wetland degradation.

Thus, to strengthen wetland management, prevent further loss of and/damage to wetlands and ensure the continued provision of valuable ecosystem services to the municipality, a holistic management approach is recommended where wetlands are addressed specifically by one department. Alternatively, a platform could be developed where information can be easily shared and maintenance/rehabilitation actions are allocated and taken forward. It would also be useful to work with key external stakeholders such as developers, public and private sectors and scientists to ensure cohesion between projects and information available on wetlands across the Metro.

Finally, it was found that the Buffalo City Metropolitan Municipality currently does not have any environmental or education strategies surrounding wetlands and as such, at this stage, no wetland education is currently being implemented into schools or within the local municipalities. Developing a wetland awareness education tool for the municipality would be useful to ensure ongoing wetland education and awareness raising is implemented throughout the municipality.

A Summary of challenges and possible solutions is listed in **Table 4** on page 38.

CONCLUSION

TABLE 4 SUMMARY OF IDENTIFIED CHALLENGES WITH POSSIBLE SOLUTIONS AND WAY FORWARD

| CURRENT CHALLENGES | POSSIBLE SOLUTIONS |
|--|--|
| There is no 'Wetland Map' available | SANBI is currently updating the NFEPA Map. Once the SANBI NFEPA BCMM Wetland Map is complete, BCMM can obtain a free copy of the map from the SANBI BGIS Website. The SANBI NFEPA Wetland Map can then be integrated into key municipal processes (including the IDP and land-use planning legislature such as the SDF, etc.) The Map can also be ground-truthed either by BCMM staff or by a hired consulting team. This will assist BCMM with more effective land use planning on the ground. |
| There is no 'Wetland Information Database' available to access wetland information | BCMM can develop an 'in-house' database which includes all key available wetland information and make it freely available to key stakeholders. BCMM can also commission research as required to address any gaps in required information. As new information becomes available, this can be added to the database by BCMM. This will assist BCMM with knowledge sharing around wetlands. |
| There is no 'Wetland Management Plan' to guide the management of wetlands | BCMM can either gather the required information and draw up a management plan themselves or hire a consultant to develop a Wetland Management Plan. The Management Plan should also have an associated budget. This will assist BCMM with managing key wetland areas in Buffalo City. |
| Pollution levels are high within wetlands within BCMM | Determine the source of pollution and develop strategies and projects to address these. |
| Mainstream wetlands into land use planning legislature | Incorporate Wetland Maps into the SDF and Wetland Management activities into the IDP. This will streamline efforts across departments in planning around wetlands and allows budget to be allocated for key interventions. |
| Awareness raising initiatives to incorporate wetlands | Incorporate wetlands into Education Strategies across Buffalo City to raise awareness around the importance of wetlands. Increase awareness raising to communities around the importance of wetlands. |

DEFINITIONS

| | |
|--|--|
| Biodiversity ³⁹ | The variability among living organisms from all sources, including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems. |
| Climate Change ⁴⁰ | Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. |
| Critically Biodiversity Areas ⁴¹ | CBAs incorporate: (i) areas that need to be safeguarded in order to meet national biodiversity thresholds (ii) areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or (iii) important locations for biodiversity features or rare species. |
| Disaster ⁴² | Disaster means a progressive or sudden, widespread or localised, natural or human-caused occurrence which is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. |
| Ecological Support Areas ⁴³ | ESAs are supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature, e.g. the riparian habitat surrounding and supporting aquatic Critical Biodiversity Areas. |
| Ecosystem services ⁴⁴ | This is the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth. |
| Estuary ⁴⁵ | Means a body of surface water - (a) that is part of a water course that is permanently or periodically open to the sea; (b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the water course is open to the sea; or (c) in respect of which the salinity is measurably higher as a result of the influence of the sea. |
| Invasive Species ⁴⁶ | Species that have been introduced into an area, and are able to outcompete and displace indigenous or useful alien species. |

DEFINITIONS

Ramsar Site⁴⁷

Ramsar Sites are designated because they meet the Criteria for identifying Wetlands of International Importance. The first criterion refers to Sites containing representative, rare or unique wetland types, and the other eight cover Sites of international importance for conserving biological diversity. These criteria emphasize the importance the Convention places on sustaining biodiversity.

Wetland⁴⁸

Land which is transitional between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

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