

AMATHOLE DISTRICT MUNICIPALITY WETLAND REPORT | 2017

LOCAL ACTION FOR BIODIVERSITY (LAB): WETLANDS SOUTH AFRICA



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FOREWORD



Amathole District Municipality is situated within the central part of the Eastern Cape Province, which lies in the southeast of South Africa and borders the Indian Ocean. Amathole District Municipality has a land area of 21 595 km² with approximately 200 km of coastline stretching along the Sunshine Coast from the Fish River to just south of Hole in the Wall along the Wild Coast. Amathole District Municipality coastline spans two bio-geographical regions, namely the warm temperate south coast and the sub-tropical east coast.

Amathole District Municipality is generally in a good natural state; 83.3% of land comprises of natural areas, whilst only 16.7% are areas where no natural habitat remains. The biodiversity of the Amathole District Municipality is represented in 5 major biomes that describe the different biotic communities. These biomes are Savanna (34.5%), Grasslands (31.5%), Albany Thicket (29.6% of the area), Indian Ocean Coastal Belt (3.7%) and Forests (0.7%).

Amathole District Municipality is a water service authority and provider. As such, two major catchment areas, i.e., Amathole Catchment (north) and Great Fish River Catchment (west), provide essential water resources. More than 70% of wetlands are located within these catchment areas. Amathole District Municipality views wetlands as an essential resource for the fulfilment of its constitutional mandate of providing sustainable basic services to communities.

Amathole District Municipality is also prone to climate change and disaster risk such as wild fires, drought and floods. Wetland systems however can be viewed as risk reduction ecological infrastructure. Wetlands also form part of the Amathole Mountain Biosphere Reserve, which is viewed as a conservation and sustainable development flagship initiative.

Amathole District Municipality Integrated Development Plan (IDP) recognises the importance of wetlands within the critical biodiversity areas of the Spatial Development Framework (SDF). Sustainable development principles are an integral part of Amathole District Municipality's developmental approach as they are captured in the vision: "Commitment towards selfless, excellent and sustainable service to all our communities".

Cllr. N. W. Nxawe
Executive Mayor
Amathole District
Municipality



ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

@ ICLEI-Africa@iclei.org +27 21 202 0381 www.africa.iclei.org www.twitter.com/ICLEIAfrica



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

@ ICLEI-Africa@iclei.org +27 21 202 0381 www.africa.iclei.org www.twitter.com/ICLEIAfrica



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

ADM	Amathole District Municipality	LAB	Local Action for Biodiversity
AFC	Amathole Forestry Company	MTSF	Medium Term Strategic Framework
AS	Africa Secretariat	NEMA	National Environmental Management Act 108 of 1998
BGIS	Biodiversity Geographic Information System	NEMBA	National Environmental Management Biodiversity Act 10 of 2004
BSP	Biodiversity Sector Plan	NEMPAA	National Environmental Management Protected Areas Act 57 of 2003
CARA	Conservation of Agricultural Resources Act 43 of 1983	NFEPA	National Freshwater Ecosystem Priority Areas
CBA	Critical Biodiversity Areas	NDP	National Development Plan
CBC	Cities Biodiversity Center	NGO	Non-Governmental Organisation
CEPA	Communication, Education and Public Awareness	NWA	National Water Act 36 of 1998
CIP	Climate Information Portal	NWI	National Wetland Inventory
CMF	Coastal Management Framework	RDP	Reconstruction and Development Programme
CSAG	Climate Systems Analysis Group	SAIAB	South African Institute for Aquatic Biodiversity
CSIR	Council for Scientific and Industrial Research	SALGA	South African Local Government Association
DEA	Department of Environmental Affairs	SANBI	South Africa National Biodiversity Institute
DEDEA	Department of Economic Development and Environment Affairs	SDF	Spatial Development Framework
DWAF	Department of Water Affairs and Forestry	SPLUMA	Spatial Planning and Land Use Management Act 16 of 2013
DWS	Department of Water and Sanitation	STEP	Subtropical Thicket Ecosystem Project
ECBCP	Eastern Cape Biodiversity Conservation Plan	SWSA	Strategic Water Source Area
EIA	Environmental Impact Assessment	UCT	University of Cape Town
EMF	Environmental Management Framework	UNFCCC	United National Framework Convention on Climate Change
EMP	Environmental Management Plan	WFW	Working for Wetlands
EMS	Environmental Management System	WSA	Water Source Area
ESAs	Ecological Support Areas	WULA	Water Use License Application
GIS	Geographical Information System	WWTW	Waste Water Treatment Works
IAP	Invasive Alien Plant		
ICLEI	ICLEI – Local Governments for Sustainability		
IDP	Integrated Development Plan		

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EXECUTIVE SUMMARY

Amathole District Municipality lies within the Eastern Cape Province with jurisdiction over a diverse range of ecosystems, ranging from coastal dunes to forested hills in the hinterland. There are many sensitive and conservation worthy areas within Amathole District Municipality, such as subtropical thicket, wetlands, river systems and cultural sites, all of which have associated rare and endangered species. While rich in natural, cultural and historical resources, Amathole District Municipality is faced with a number of challenges including addressing inequality and the legacy of apartheid, unemployment, housing shortages, poverty and pollution of natural resources. The growing needs of the increasing population in Amathole District Municipality have also resulted in a growing demand for development. Amathole District Municipality recognises that, although development must be economically and socially acceptable, it is imperative that development challenges facing Amathole District Municipality be addressed in an environmentally sustainable manner.

Biodiversity offers an immense opportunity to support the municipality'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 however remain South Africa's most threatened ecosystems and continue to be poorly managed and destroyed. 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 number of type of wetlands across Amathole District Municipality varies as a result of the climate, topography and

vegetation types across the landscape. The highest concentration and largest wetlands are found in the wet Amathole and Tsomo Grassland areas of Amahlathi and Nkonkobe Local Municipalities, and include important valley-bottom wetlands and wetland seeps. A smaller concentration of depression wetlands and wetland flats can be found within the thicket areas. Most of the wetland ecosystems have been severely or moderately modified from their natural condition.

Freshwater is South Africa's most limiting natural resource. Industrialization and urbanization as well as rapid population growth are the largest water users and are 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.

Currently there is no specific designated wetland management authority or capacity for management within Amathole District Municipality. To streamline and improve the management of wetlands, Amathole District Municipality is implementing the Local Action for Biodiversity: Wetlands South Africa (LAB: Wetlands SA) Project 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 Amathole District Municipality in identifying the gaps in management and assist with devising new and better wetland 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 and to incorporate natural wetland resource considerations into municipal governance mechanisms and planning.

The Local Action for Biodiversity: Wetlands South Africa Project (LAB: Wetlands SA) is working with 11 municipalities throughout the country to build institutional capacity and develop local policies for integrating biodiversity and specifically wetlands across local government departments. The project is implemented by ICLEI – Local Governments for Sustainability Africa Secretariat (ICLEI AS) through the Cities Biodiversity Center (CBC) with key partners such as SANBI, SALGA, Working for Wetlands and DEA. The project is based on the globally-renowned LAB Pioneer Programme methodology.

This report draws together the range of knowledge about wetlands within Amathole District Municipality (Figure 1), and provides a detailed overview of the stakeholders and programmes working towards improved wetland management in this region.



FIGURE 1: Amathole District Municipality in the Eastern Cape, South Africa.

SCOPE AND PURPOSE OF THE REPORT

This Wetland Report is compiled by Amathole District Municipality and ICLEI AS on behalf of Amathole District Municipality. The report includes information pertaining to Amathole District Municipality, which is one of the 7 districts in the Eastern Cape Province of South Africa. The Municipality is situated in the central part of the Eastern Cape stretching along the Sunshine Coast from the Fish River Mouth, along the Eastern Seaboard to just south of Hole in the Wall along the Wild Coast.

The Wetland Report captures information about wetlands within Amathole District Municipality. By merging existing wetland information, the municipality can identify knowledge gaps and priority areas for wetland management going forward. This report considers and promotes cross sectorial and ecosystem based approaches to wetland management on a region wide basis, encourages stakeholder participation and increases transparency

and accountability for a greener, better Amathole District Municipality by:

- Consolidating available wetland information in Amathole District Municipality;
- Documenting the wetland resources within Amathole District Municipality including:
 - Geographical information
 - 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.



FIGURE 2: Kwelera River located within Amathole District Municipality.²

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



FIGURE 3 & 4: Mottled soils indicative of a wetland (left) and specially adapted wetland vegetation (right).³

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 anaerobic conditions) and the vegetation shifts to respond to these changes.⁴

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.⁵ SANBI has compiled a detailed hydrogeomorphic classification system to assist with wetland identification. An illustrative overview from this document of the different types of wetlands is included in Figure 5.

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 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 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.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

1 WHAT IS A WETLAND? (continued)

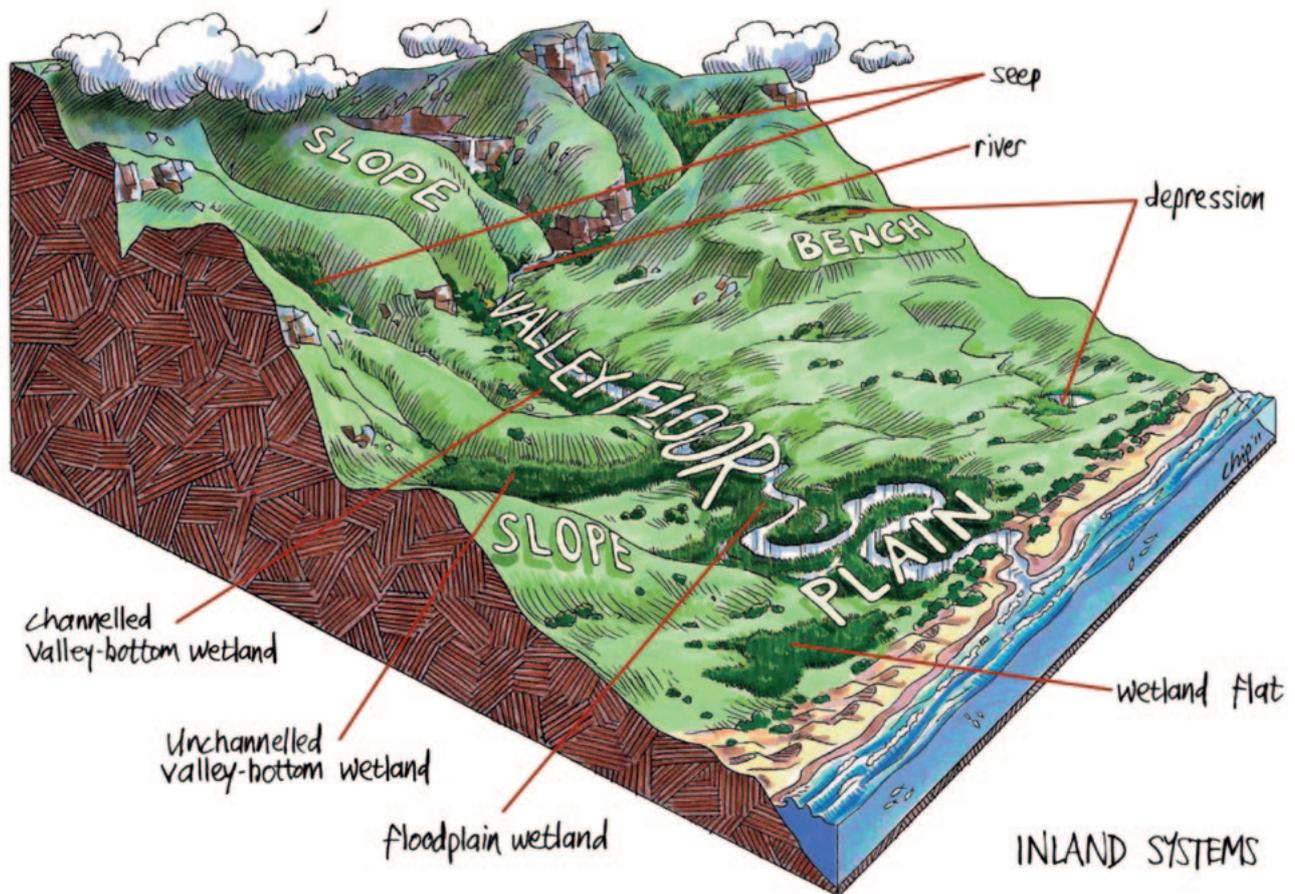


FIGURE 5: Wetland systems within South Africa.⁸

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. Please refer to **Section 3.7** of this report for a detailed description of the ecosystem services that wetlands within Amathole District Municipality provide.

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 crucially, 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.



FIGURE 6: The critically endangered Cape parrot (*Poicephalus robustus*) is a large, temperate forest dwelling parrot of the genus *Poicephalus* endemic to South Africa.⁹

3 | WETLANDS AND BIODIVERSITY WITHIN AMATHOLE DISTRICT MUNICIPALITY

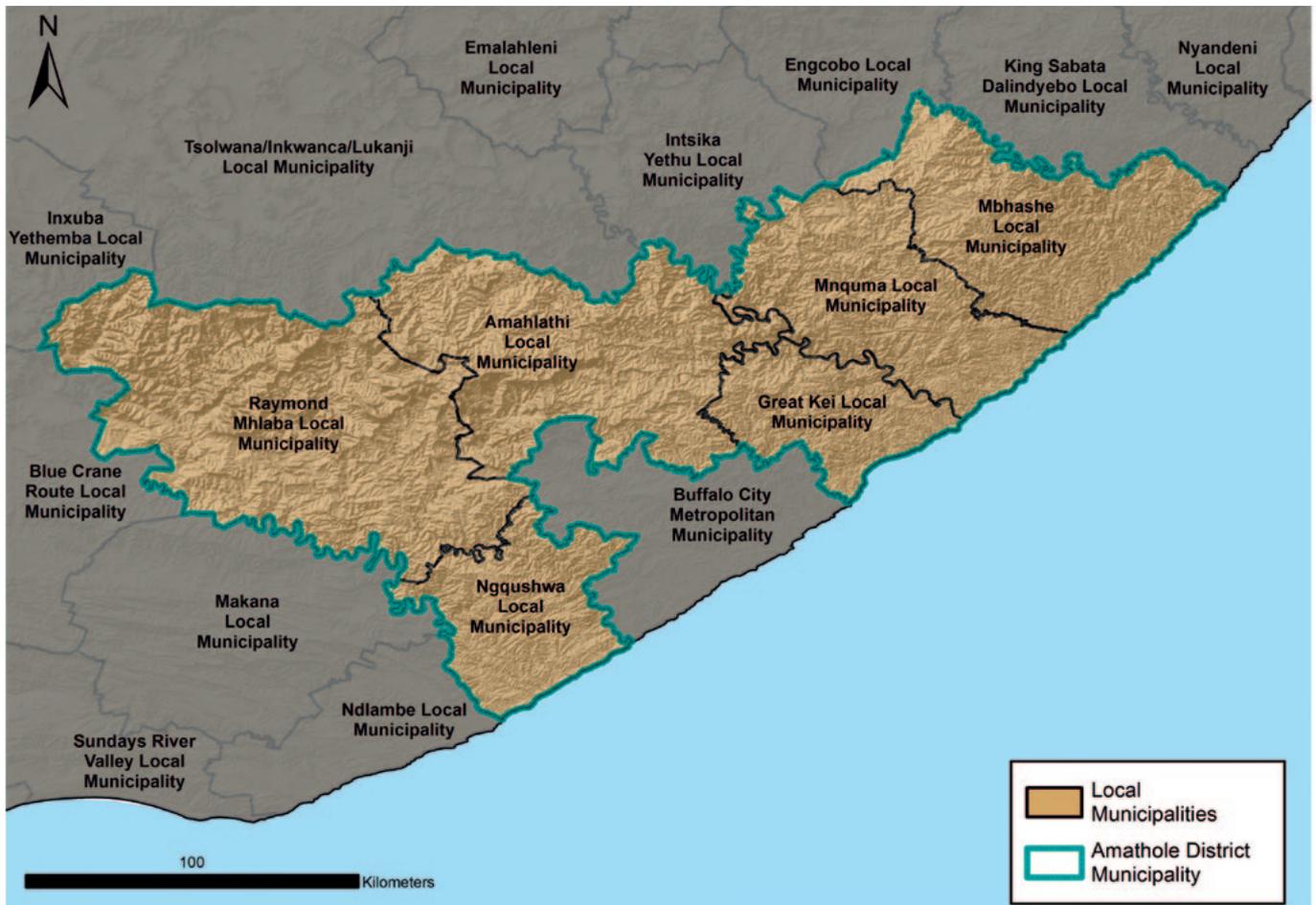


FIGURE 7: Local Municipalities located within Amathole District Municipality.

Amathole District Municipality occupies the central coastal portion of the Eastern Cape Province and is bordered by Sarah Baartman District Municipality to the west, Chris Hani District Municipality to the north and OR Tambo District Municipality to the east. Buffalo City Metropolitan Municipality lies within Amathole District Municipality along the Indian Ocean border. The Amathole Mountain range borders the northern part of Amathole District Municipality whilst the southern part of the district runs some 269 km along the Indian Ocean, which accounts for 19.58% of the districts' jurisdictional boundary and roughly 34% of the Eastern Cape coastline. In total the district covers a geographical area of 23 577 km².

This section will provide information on existing maps, information on the known key wetlands in the district as well as information on their health and status and key flora and fauna species associated with wetlands in Amathole District Municipality. It provides detail on the value of wetlands to the district and highlights the key threats. Also included is information on the Amathole District Municipality's Strategic Water Source Areas.

3.1 MAPPING WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY

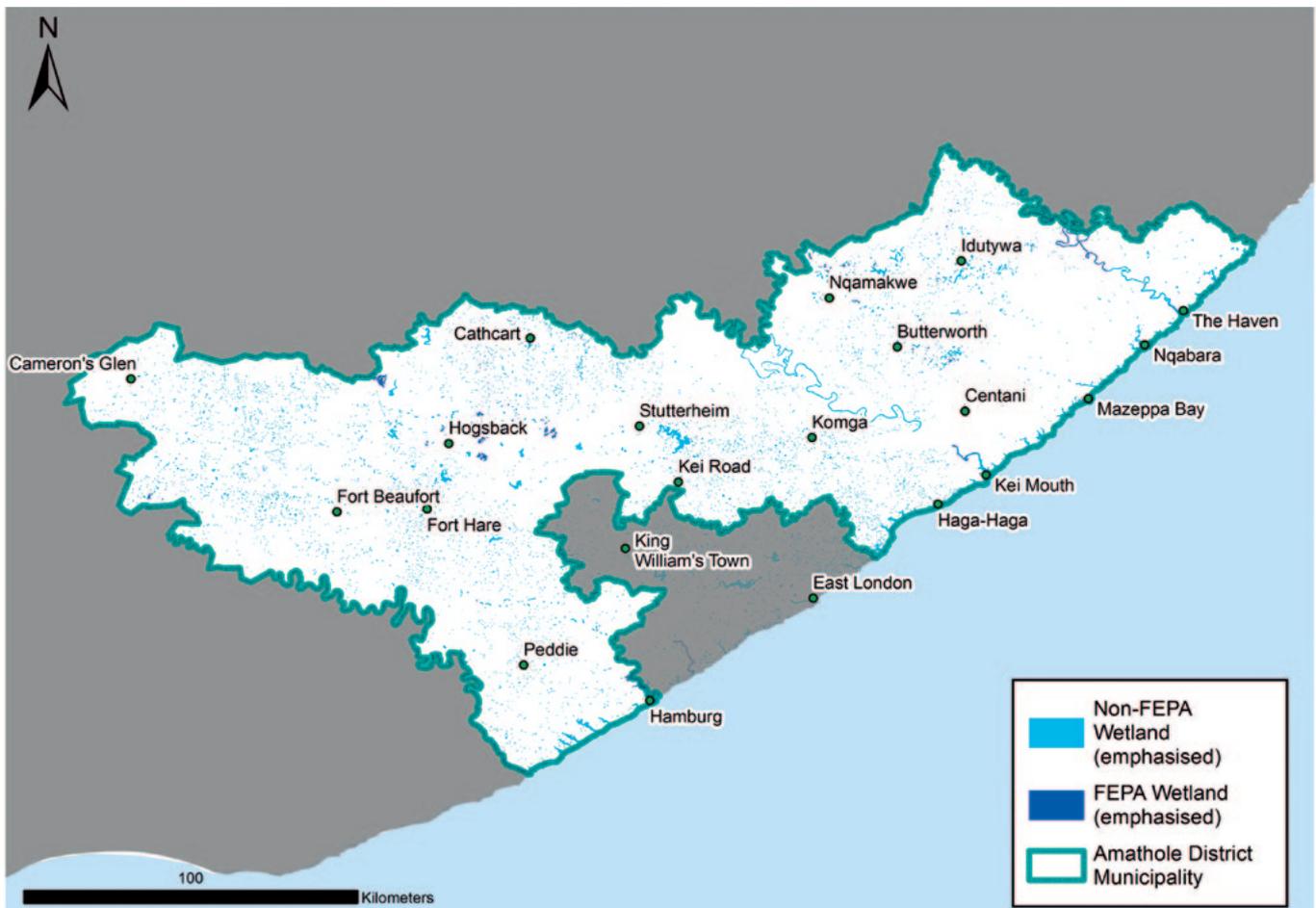


FIGURE 8: Map showing the NFEPA and non-NFEPA wetlands within Amathole District Municipality.

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 Affairs and Forestry (DWAF) prepared the Eastern Cape Biodiversity Conservation Plan (ECBCP). The ECBCP identified and mapped Critical Biodiversity Areas (CBAs), and provided land use planning guidelines that recommend biodiversity-friendly activities in priority areas.

The CBAs were identified through systematic biodiversity analysis undertaken for the ECBCP in 2007 as well as through other projects such as the Sub-Tropical Thicket Ecosystem Project (STEP). The ECBCP developed two maps, one showing the terrestrial CBAs and the other the aquatic CBAs.

These can be found in the ECBCP handbook (2007) available here: <http://www.nda.agric.za/doaDev/sideMenu/ForestryWeb/webapp/Documents/PF/ECBCPHandbookAug07.pdf>.

The Amathole District Municipality's Integrated Development Plan (IDP) Review 2016–2017 includes the area of land that is covered by wetlands in particular (Amahlathi: 4285.2 ha, Great Kei: 928.7 ha, Mbhashe: 2609.6 ha, Mnquma: 1612.4 ha, Raymond Mhlaba: 4479.6 ha). However, these reflect very low percentages of the total area (between 0.5–1%). Given that the coverage of wetlands across South Africa is an average of 2.4%,¹⁰ it is likely that the area has not been sufficiently mapped and that more detailed mapping and analysis is required for Amathole District Municipality.

3.1 MAPPING WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY

(continued)

Although CBA maps are included in the ECBCP and wetlands are included in the Amathole District Municipality IDP, there are currently no ground-truthed maps of wetlands within the district. At this stage, wetland maps for Amathole District Municipality can be derived from the SANBI Biodiversity Geographical Information System (SANBI BGIS) National Wetlands Inventory (NWI). The NWI aimed to identify a national network of national freshwater ecosystem priority areas (NFEPA) including rivers and wetlands, and map the extent, location and state of these systems across the country.

The NWI acts as a good starting point for understanding where wetlands are located within the landscape. This NWI was however developed at a national scale from aerial imagery and as a result the resolution (accuracy) is not always detailed or accurate enough for inclusion in ground level decision making processes around land use planning. The SANBI NFEPA maps however are among the best tools currently available to inform land-use planning. These can be accessed here: <http://bgis.sanbi.org/MapViewer>.



FIGURE 9: The Hogsback in the Amathole Mountains.¹¹

3.2 WETLAND ECOSYSTEM HEALTH AND CONDITION

The term 'Wetland Ecosystem Threat Status' indicates the state of a wetland (i.e. the degree to which it is still intact or alternatively the degree to which it has been impacted with resultant loss of structure, function and subsequent ability to provide ecosystem services). Most of the wetlands within

Amathole District Municipality have been severely or moderately modified from their natural condition. Any further transformation of wetlands must be avoided, and the focus should be made on urgent wetland ecosystem rehabilitation initiatives.

TABLE 1 THE CONDITION OF WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY

LOCAL MUNICIPALITY	CONDITIONS	AREA (HA)	% WETLANDS AREAS
Amahlathi	Natural/Good condition	92.6	8.0
	Moderately Modified condition	136.1	11.8
	Heavily/Critically Modified condition	924.5	80.2
Greate Kei	Natural/Good condition	17.1	3.2
	Moderately Modified condition	28.0	5.2
	Heavily/Critically Modified condition	492.4	91.6
Mbhashe	Natural/Good condition	60.6	15.2
	Moderately Modified condition	100.3	25.2
	Heavily/Critically Modified condition	237.2	59.6
Mnquma	Natural/Good condition	99.9	18.7
	Moderately Modified condition	136.2	25.5
	Heavily/Critically Modified condition	297.1	55.7
Ngqushwa	Natural/Good condition	74.8	15.0
	Moderately Modified condition	103.4	20.8
	Heavily/Critically Modified condition	319.9	64.2
Raymond Mhlaba	Natural/Good condition	95.0	10.2
	Moderately Modified condition	64.0	6.7
	Heavily/Critically Modified condition	1650.1	183.1

3.3 KEY WETLANDS WITHIN THE AMATHOLE DISTRICT MUNICIPALITY

The number of type of wetlands across Amathole District Municipality varies as a result of the climate, topography and vegetation types across the landscape. The highest concentration and largest wetlands are found in the wet Amathole and Tsomo Grassland areas of Amahlathi and Nkonkobe Local Municipalities, and include important valley-bottom wetlands and wetland seeps. A smaller concentration of depression wetlands and wetland flats can be

found within the thicketed areas of the municipality. The driest areas of Amathole District Municipality, which comprise predominantly of Bushveld and Thornveld (in Mnquma and Mbhashe Local Municipalities as well as parts of Amahlathi Local Municipality), have the least number of wetlands. However, some seep wetlands are found in the Umtata Moist Grassland of northern Mnquma and Mbhashe Local Municipalities.

3.3 KEY WETLANDS WITHIN THE AMATHOLE DISTRICT MUNICIPALITY

(continued)

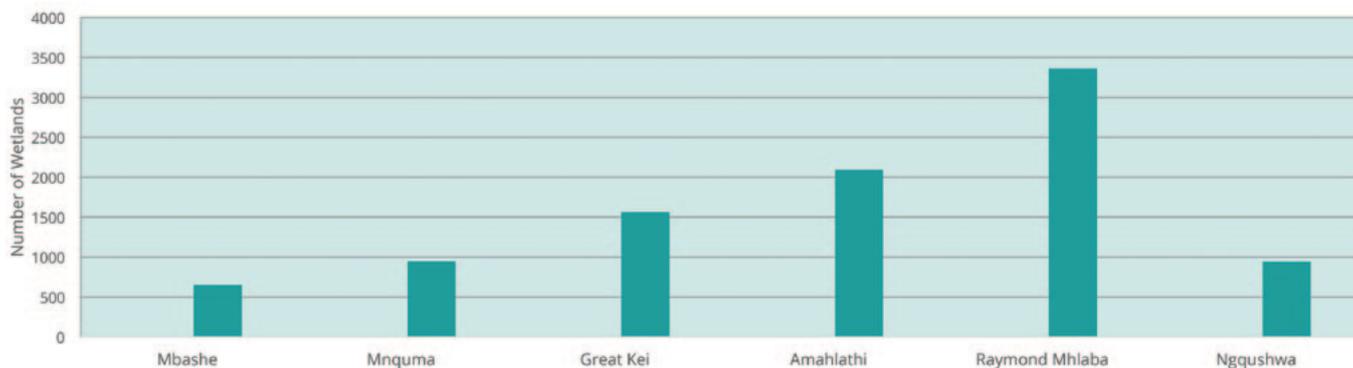


FIGURE 10: Number of known wetlands in the local municipalities within Amathole District Municipality.¹²

3.3.1 The Great Fish Estuary

The Great Fish Estuary is of great importance as it forms the southern boundary between Amathole District Municipality and Cacadu District Municipality. This is the 13th most important estuary in South Africa due to its large size, significant habitat and biological diversity. It is imperative that the system be effectively managed by both district municipalities to ensure that the system is protected and ecosystem services continue to be provided to both municipalities.

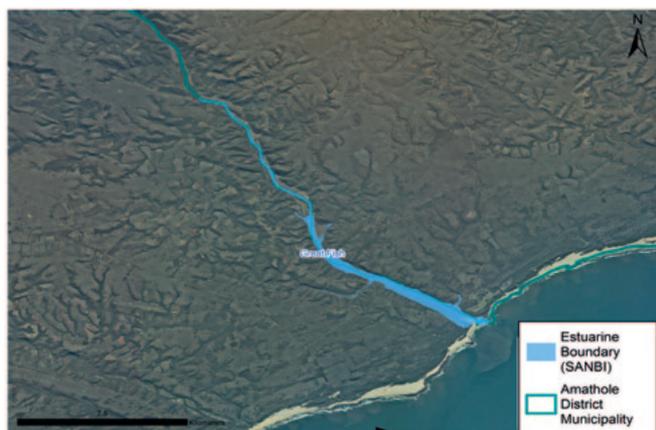


FIGURE 11: The Great Fish Estuary.

3.3.2 The Great Kei System

The Great Kei Catchment (20 485 km²) drains the northern slopes of the Amathole Mountain range and the southern slopes of the Stormberg/Drakensberg range at an altitude of 2400 masl. The Kei Catchment ranges from Queenstown to the Indian Ocean within Amathole District Municipality. The upper Great Kei River is centered around Queenstown, whilst the middle and lower reaches of the Great Kei River are characterised by a deeply incised valley, which meets the Indian Ocean at the Kei Mouth north of East London.¹³



FIGURE 12: Map of the Great Kei System located within Amathole District Municipality.

3.4 KEY FLORA AND FAUNA OF THE AMATHOLE DISTRICT MUNICIPAL WETLANDS

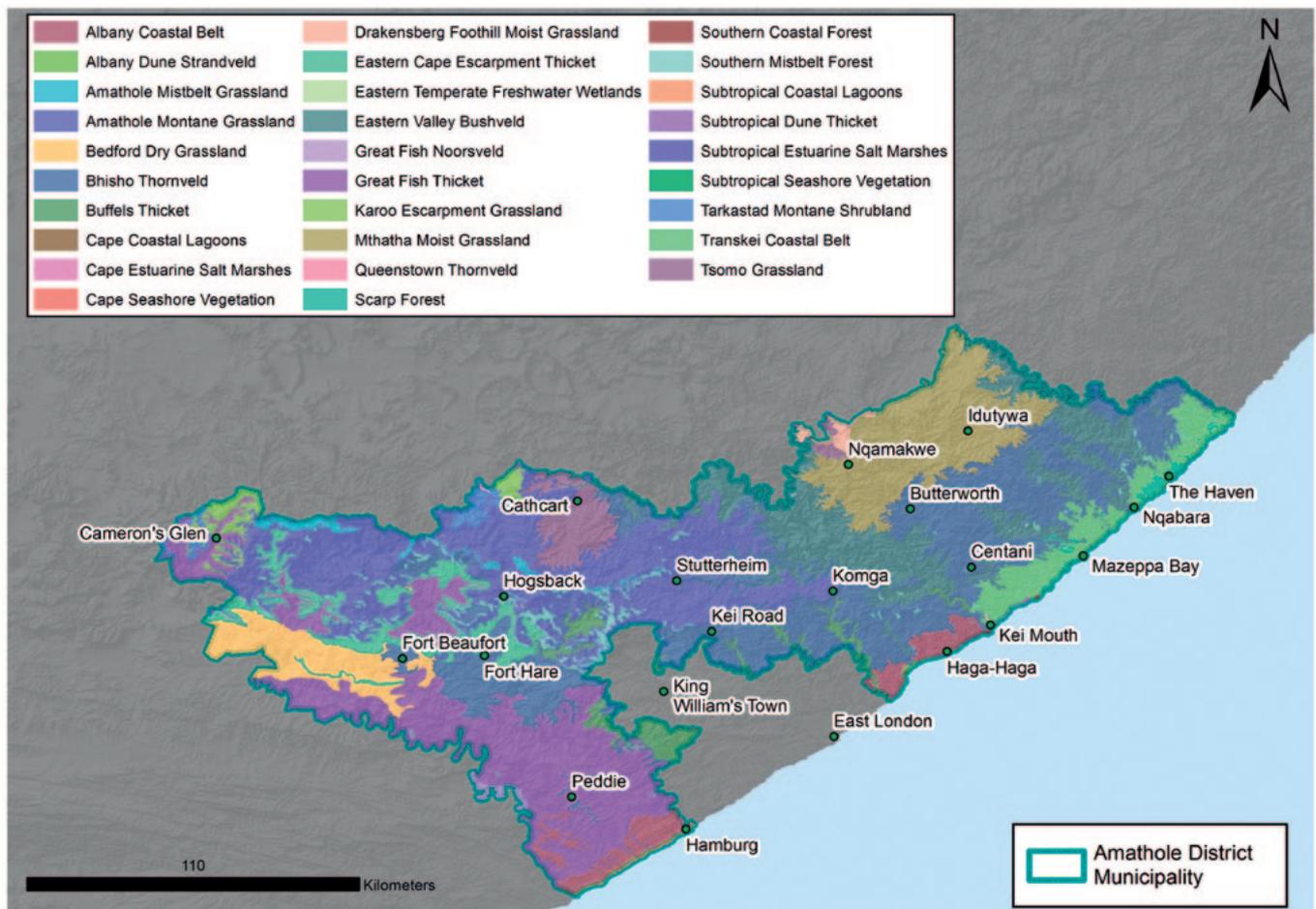


FIGURE 13: Different vegetation types present in Amathole District Municipality.¹⁴

The Eastern Cape Province is globally recognised for its high biodiversity value and scenic beauty. It has the highest biodiversity of any of the Provinces within South Africa and includes no less than six biomes: Forest, Fynbos, Nama Karoo, Savanna, Succulent Karoo and Thicket. In addition, three centres of biological endemism can also be found within the Eastern Cape: Albany Thicket, the Drakensberg Centre and the Pondoland Centre. As a result, many sensitive and conservation worthy areas can be found throughout the Eastern Cape including subtropical thicket, wetlands, river systems, cultural sites as well as coastal areas, all of which have associated rare and endangered species. This includes 6164 plant species, 156 mammal species, 384 bird species, 51 amphibian species and 57 reptile species.

3.4.1 Flora

Amathole District Municipality encompasses an extremely diverse geographical area ranging from the Amathole Mountain Range down to the Wild Coast. The associated diverse landscape and climate results in a variety of habitats. Amathole District Municipality itself contains five biomes that describe the biotic communities in the area. These are Savanna (34.5%), Grasslands (31.5%), Albany Thicket (29.6%), Indian Ocean Coastal Belt (3.7%) and Forests (0.6%). The biomes are further separated into different vegetation types that describe the types of communities present.¹⁴

3.4 KEY FLORA AND FAUNA OF THE AMATHOLE DISTRICT MUNICIPAL WETLANDS *(continued)*

3.4.2. Fauna

A number of rare butterflies occur within Amathole District Municipality including several types of forest and thick bush species (*Aslauga australis*, *Bowkeria phosphor* and *Abantis bicolor*) as well as grassland species (*Poecilimitis penningtoni* and *Metilsella syrinx*).

Five threatened freshwater dependent species occur within the district. Two of these are fish species; namely the Border Barb (*Barbustrevelyani*) and the Eastern Cape Rocky Fish (*Sandelia bainsii*). One is a damselfly species, namely the Amathole Malachite (*Chlorolestes apricans*), and two are amphibian species, namely the Amathole Toad (*Vandijkophrynus amatolicus*) and the Hogsback Chirping Frog (*Anhydrophryne rattrayi*).

The Eastern Cape Rocky Fish (*Sandelia bainsii*) is listed as a rare and endangered freshwater fish species found only in a small portion of the Eastern Cape river systems in South Africa. The greatest threat to this fish species is a loss of habitat however other pressures, such as invasive fish and vegetation, excessive salt deposition and water flow obstruction (usually man-induced) also pose dangers to the survival of this rare fish species.

Other interesting species endemic to the areas include the Dwarf Puddle Frog (*Phrynobatrachus mababiensis*), the Sharp-nosed Grass Frog (*Ptychadena oxyrhynchus*), Striped Grass Frog (*Ptychadena porosissima*) and the Amatola Flat Gecko (*Afroedura amatolica*).



FIGURE 14, 15, 16 AND 17: Dwarf Puddle Frog (*Phrynobatrachus mababiensis*)¹⁵ (top left), Sharp-nosed Frog (*Ptychadena oxyrhynchus*)¹⁶ (top right), Striped Grass Frog (*Ptychadena porosissima*)¹⁷ (bottom left), and Amatola Flat Gecko (*Afroedura amatolica*)¹⁸ (bottom right).

3.4 KEY FLORA AND FAUNA OF THE AMATHOLE DISTRICT MUNICIPAL WETLANDS *(continued)*

The Amathole District Municipal area has rich bird diversity. A significant number of threatened or vulnerable species occur in the area, including:

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

Amongst the mammal species found within Amathole District Municipality, the only species endemic to the area is the Giant Golden Mole (*Chrysospalax trevelyani*)

which inhabits the indigenous forests of the Eastern Cape. Other mammals found within Amathole District Municipality include the Samango Monkey (*Cercopithecus albogularis*), which can only be found in forests along the Amathole Mountain Escarpment and within the coastal forests; as well as the the South African Hedgehog (*Atelerix frontalis*), Leopard (*Panthera pardis*), Blue Duiker (*Philantomba monticola*) and the Tree Dassie (*Dendrohyrax arboreus*).

The Samnago Monkey is classified as Near Threatened whilst the South African Hedgehog, Leopard, Blue Duiker and Tree Daissie are all classified as Nationally Vulnerable.

3.5 STRATEGIC WATER SOURCE AREAS AND WATER MANAGEMENT AREAS WITHIN AMATHOLE DISTRICT MUNICIPALITY

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.¹⁹

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/ SWSAs, 16). Three SWSAs are located within and just outside of Amathole District Municipality; namely the Amathole Mountain SWSA (within the district) and the Pondoland Coast and Eastern Cape Drakensberg (just outside the district). These are illustrated in **Figure 18**.

The Amathole Mountain SWSA includes the Great Kei, Keiskamma, Great Fish, Tyume and Amatele Rivers and is the main water source for Bisho, Fort Beaufort, Grahamstown and Queenstown. The Pondoland Coast SWSA includes the Mzimvubu, Mngazi, Mntafufu and Msikaba Rivers and is the main water source for OR Tambo District Municipality. The Eastern Cape Drakensberg SWSA includes the Mzimvubu, Orange, Bokspruit, Thina, Klein Mooi and Mthatha Rivers and is the main water source for Umtata.

The main threats to all the SWSAs within and near Amathole District Municipality include land degradation and fire. The Amathole SWSA is however also threatened by invasive alien vegetation whilst the Pondoland Coast SWSA is also threatened by coal mining.

3.5 STRATEGIC WATER SOURCE AREAS AND WATER MANAGEMENT AREAS WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

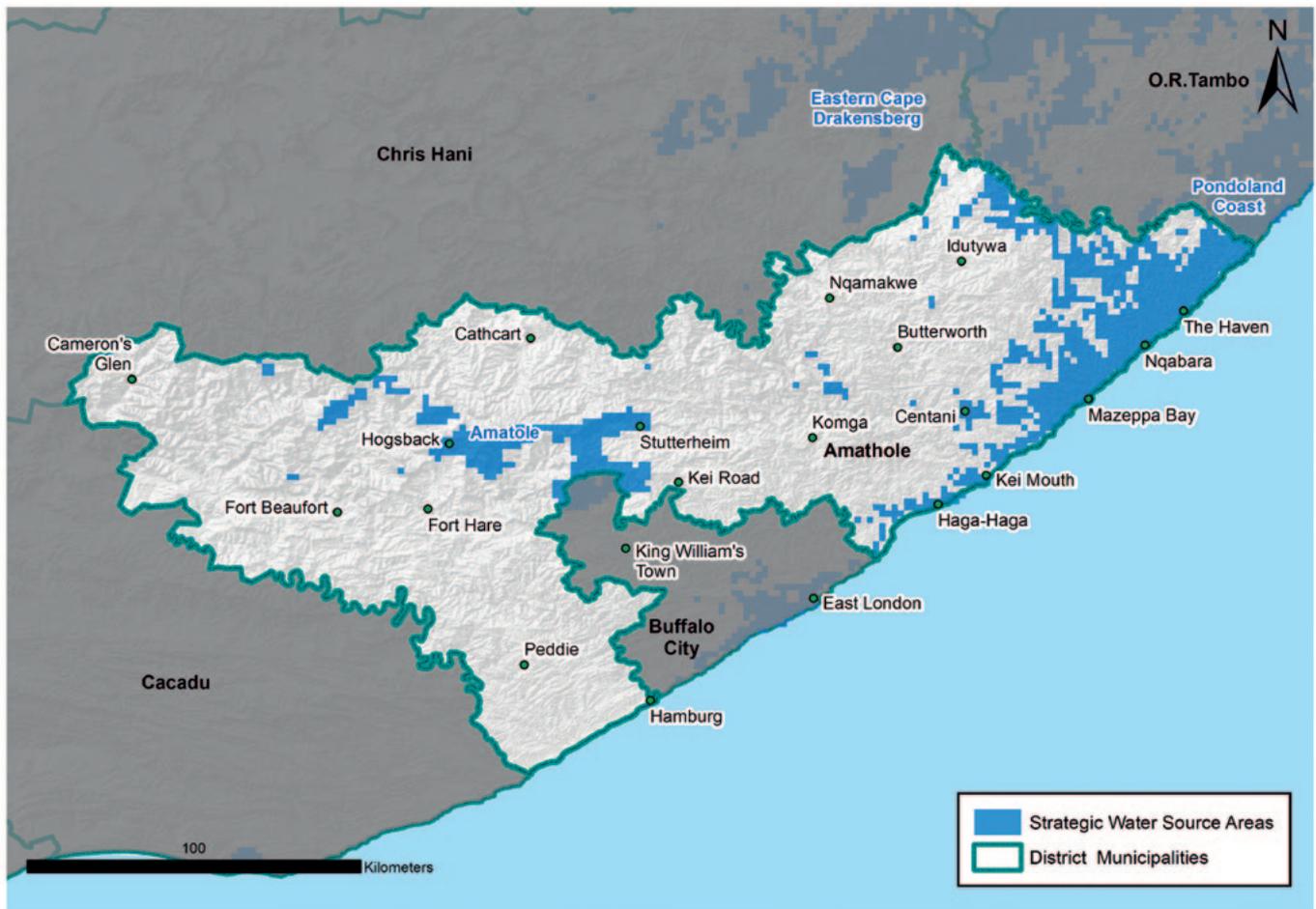


FIGURE 18: Strategic Water Source Areas located within Amathole District Municipality.²⁰

3.6 CATCHMENT MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY

3.6.1 Inter-basin water transfer schemes

The Fish and Sundays Rivers are augmented by inter-basin water transfers from the Gariiep Dam (Orange River Basin). As with all Water Management Areas (WMAs) in South Africa, over-abstraction is a major issue in terms of water resource management as it threatens ecological stream flow requirements. Whilst most water from rivers located within the Fish and Tsitsikamma WSAs is fully allocated for municipal use, the Mzimvubu to Keiskamma WMAs remain two

of the only WMAs within the district where water resources are not 100% allocated for municipal use.

Water resource management issues in the Eastern Cape include:

- Over-abstraction of existing resources for irrigation, manufacturing and urban requirements, resulting in deterioration of downstream water quality, quantity and ecological integrity;

3.6 CATCHMENT MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

- Threats to water quality, quantity and aquatic ecosystem integrity due to basin degradation; land-use change in basins;
- Threats to water quality from sub-standard effluent releases as a result of poorly managed and poorly maintained waste-water treatment works and sewage reticulations;
- Threats to ecological integrity of fresh-water resources due to invasive species and damming of existing resources.

The Eastern Cape Province is strongly dependent on the quality and quantity of the water resources in the relevant Water Management Areas. It is therefore critical that those responsible for water services infrastructure manage these resources effectively. They should also take into account the future climate change scenarios related to water resources as the impacts of climate change are likely to have secondary and tertiary impacts on the technical and operational integrity of installed water and services infrastructure.

3.7 THE VALUE OF WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY

The Amathole District Municipality 2016–2017 Integrated Development Plan (IDP) notes that wetlands contribute to the local economy by producing resources, enabling recreational activities and providing other benefits, such as pollution control and flood protection. The availability of water at the appropriate time, in the appropriate quantity and with the appropriate quality is a fundamental requirement for the sustainable development of local municipalities. Water security is widely regarded as the key natural resource challenge facing humanity.

Wetlands are crucial for maintaining the water cycle. 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’. Provisioning services can be described as the products one can physically obtain from wetlands. Regulatory services can be described as the benefits one receives from the wetland. Cultural services are the nonmaterial benefits that one can obtain from wetlands. Lastly supporting services are the services provided that are necessary for the production of all other ecosystem services.

Please refer to **Table 2** below for a detailed description of the ecosystem services that wetlands within Amathole District Municipality provide.

TABLE 2 ECOSYSTEM SERVICES PROVIDED BY WETLANDS WITHIN AMATHOLE DISTRICT 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.

continued

3.7 THE VALUE OF WETLANDS IN THE AMATHOLE DISTRICT MUNICIPALITY

(continued)

TABLE 2 ECOSYSTEM SERVICES PROVIDED BY WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY

ECOSYSTEM SERVICE TYPE	ECOSYSTEM SERVICE	DESCRIPTION/ CASE STUDY
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.
	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.

It should be noted that the numerous 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.

3.8 THREATS TO WETLANDS

Despite the significant 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 Amathole District Municipality IDP notes that wetlands are currently utilised in an unsustainable manner throughout the municipality.

Following verbal communications with active stakeholders working within Amathole District Municipality, it became clear that wetlands face a significant number of threats all of which have the ability to either destroy the wetland entirely or severely compromise function and provision of ecosystem services. The most significant threats to the wetlands located within Amathole District Municipality include:

- Invasive alien plants;
- Erosion;
- Development within & around wetlands;
- Pollution and excess nutrients seeping into wetland areas;
- Draining of water;
- Over grazing/trampling particularly by cattle; and
- Lack of buffer zones next to wetlands.



FIGURE 19: Nguni cattle grazing on the foothills of the rural areas in Amathole District Municipality.²¹



FIGURE 20: Example of the water filtration capabilities of wetlands.²²

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 AMATHOLE DISTRICT 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.

A Level 2 Disaster Risk Management Plan (DRMP) has been developed for Amathole District Municipality. A Level 2 DRMP applies to national, provincial and municipal organs of state that have established the

foundation institutional arrangements for disaster risk management, and are building the essential supportive capabilities needed to carry out more comprehensive disaster risk management activities.

The Amathole District Municipality DRMP is highly detailed and aims to achieve the following objectives:

- Serve as the foundation and guide for local municipal disaster risk management planning and risk reduction;
- Prevent and reduce of disasters;
- Mitigate impacts of disasters;
- Ensure preparedness for effective response to disasters; and
- Minimize loss and property damage and ensure quick recovery from the impacts related to disaster.

The Amathole District Municipality DRMP includes actions to prevent and mitigate disasters and outlines how risk reduction measures can be dealt with in the long-term. The DRMP also outlines a plan for managing emergencies in the shorter term, including aspects of preparedness, response and recovery. Also included in the Amathole District Municipality DRMP are specific roles and responsibilities of stakeholders in the case of emergency. Provision is also made for the periodic reviews and updates of the DRMP.

The DRMP establishes the arrangements for disaster risk management within Amathole District Municipality in accordance with the requirements of the Disaster Management Act, 57 of 2002 (the Act).



FIGURE 21: Example of a residential development in a wetland in Stutterheim. During wet periods, the water table is at surface level and creates poor living conditions and negatively impacts the residents.

4.1 DISASTER RISK MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

4.1.1 Risk Identification and Mapping

The Amathole District Municipality DRMP includes prioritised risks which are likely to affect the municipality and therefore should be planned for. Out of the 54 risks that were identified, drought, flooding (river, urban and dam failure), fire (both formal and informal), severe storms (including heavy rain, hail and lightning) and environmental degradation ranked among the top 10 risk factors that could lead to disasters.

Whilst the loss of biodiversity is noted in the Amathole District DRMP as a risk that may lead to disasters,

the role of the natural environment in assisting with the prevention and attenuation of disasters is not considered in the DRMP.

Given that drought and floods are listed within the top 10 disaster priorities for the district, and the fact that they are also included in the main priorities for all of the local municipalities within Amathole District Municipalities, the contribution of wetlands to attenuating and mitigating these disasters should be considered, including the impact that the loss of wetlands will have to increasing the vulnerability to these disasters.

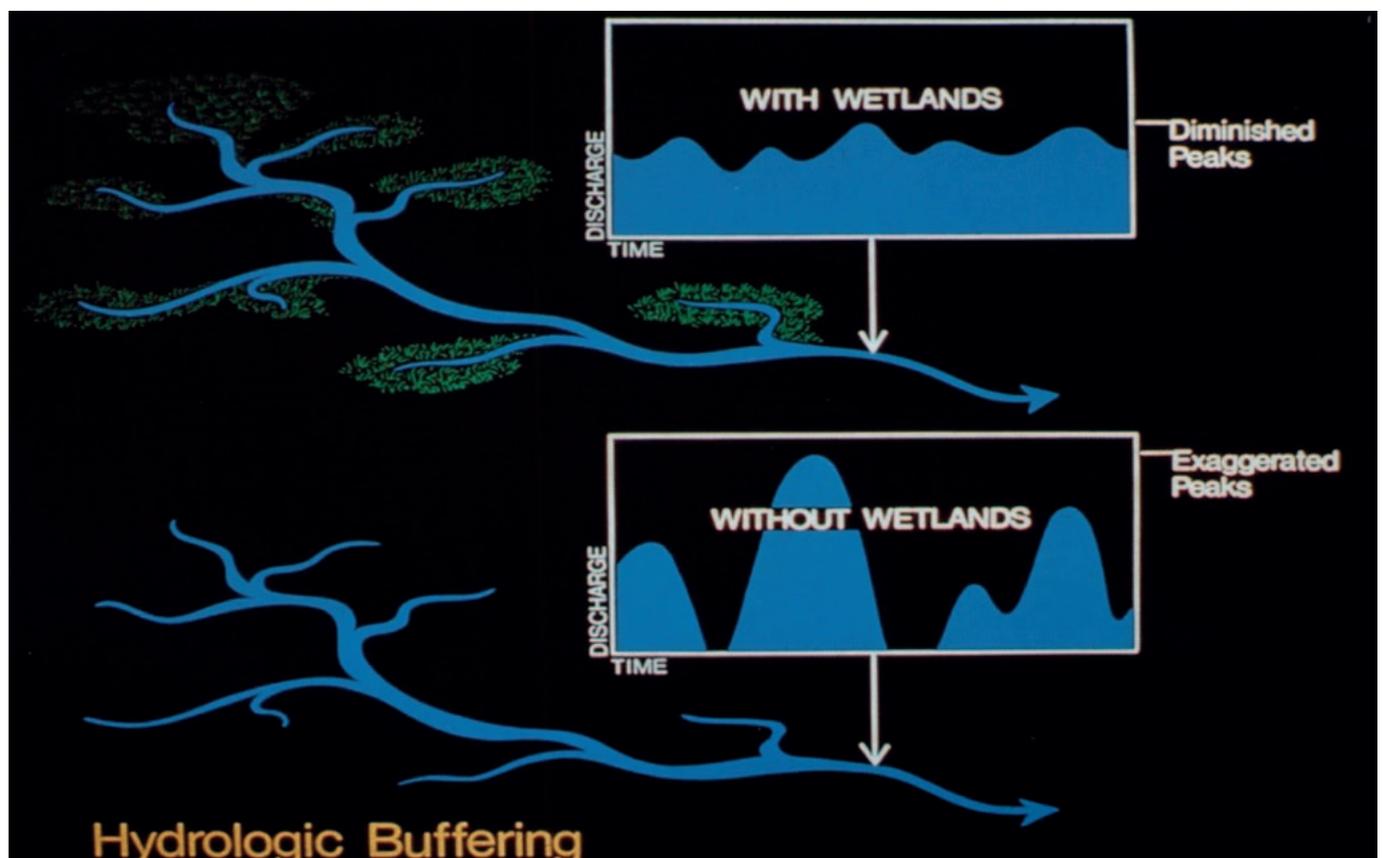


FIGURE 22: A schematic representation of the hydrological buffer function of wetlands.

4.1 DISASTER RISK MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

4.1.2 Role of Wetlands in Disaster Risk Mitigation

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. Given that these are among the main risks to Amathole District Municipality, wetlands can play a key role in disaster risk mitigation within the district. This is summarised in **Table 3**.

TABLE 3 ROLE OF WETLANDS IN DISASTER RISK MITIGATION WITHIN AMATHOLE DISTRICT MUNICIPALITY²³

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 (Figure 22).
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 (Figure 22).
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 (Figure 20).
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 AMATHOLE DISTRICT 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)

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)

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 rising 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 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.

The Eastern Cape Climate Change Response Strategy²⁴ outlines the risk and vulnerability of sectors and resources to climate change across the Eastern Cape, and anticipates impacts on the water sector and associated water resources, the agricultural and forestry sectors, health and transport infrastructure

as well as biodiversity, air quality and soil resources. In terms of water resources, some of the secondary impacts of climate change on water resources include:

- Changes to base-flows and storm-flows and their associated variability;
- Changes to annual stream-flows and their associated variability;
- Changes to sediment yield and its variability;
- Changes to irrigation water requirements and associated losses.

Storm-flow, base-flow and sediment yield regimes and their associated variability have strong and direct influences on water quality and quantity, as well as the integrity of aquatic ecosystems.

The Amathole Water Supply System Reconciliation Strategy includes a water balance study up to 2030, however, the impact of climate change is not adequately considered, and the contribution of land degradation and loss of natural resources is not included. At present, Amathole Water is reliant on partnerships with external stakeholders such as Working for Water and the Department of Environmental Affairs for natural resource management at the basin level, as there currently is no landscape focus when considering the availability of water for the future.²⁵

4.2 CLIMATE CHANGE AND WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

4.2.1 Historical Climate in Amathole District Municipality

The topography of Amathole District Municipality has been heavily influenced by the underlying geography of the region, specifically the formation of the Great Escarpment. As a result, the southern portion of the district is defined by a series of rivers and wetlands, whilst the northern areas of the district are associated more with the altitudinous plains of the Escarpment and the drier conditions of the Great Karoo.

Amathole District Municipality enjoys a moderate climate, with moderate to warm temperatures throughout the year associated with sub-tropical climate conditions. Spring and summer months are warm to hot and are from October to April. Winter

months are moderate to cool and are from May to September. Average maximum temperatures occur during the late summer months (Jan and Feb). Moderate temperature variation occurs between winter and summer months.

Winters are usually mild with some rain. Annual rainfall in the municipal area varies from 400mm to more than 1000mm, with an annual average of around 700mm. 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.²⁶ Extreme weather events are extremely rare, however may start to increase due to climate change.

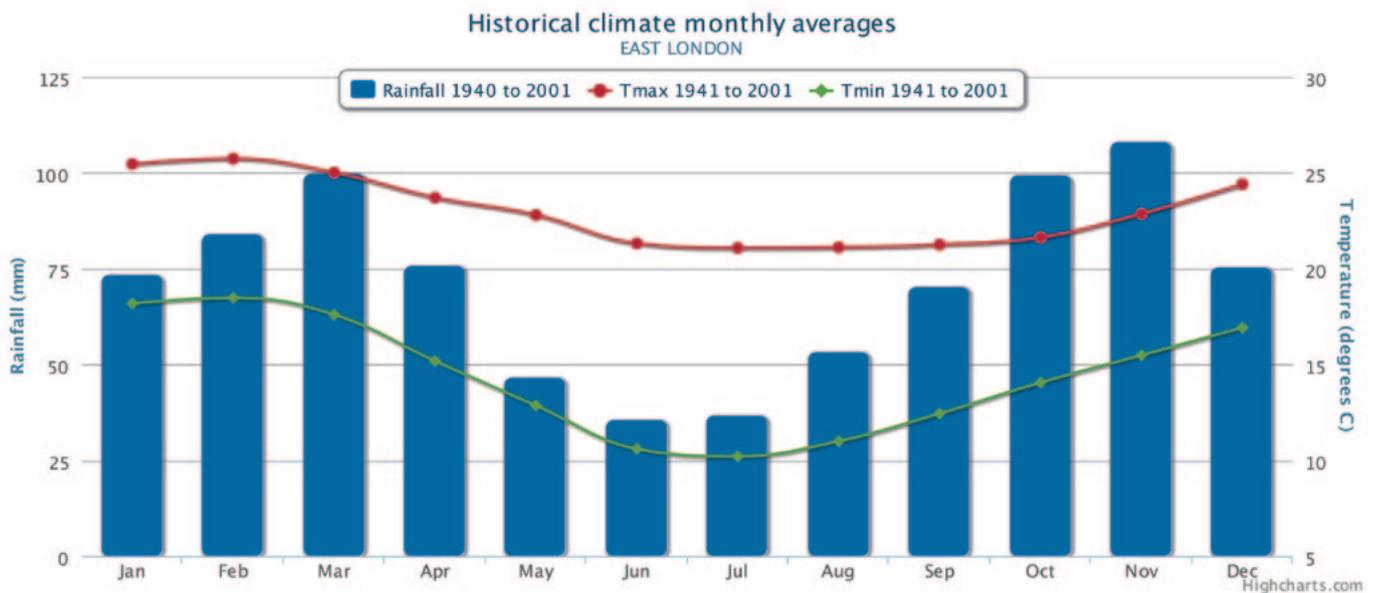


FIGURE 23: Graph depicting the typical climate of the Amathole District Municipality.²⁷

4.2 CLIMATE CHANGE AND WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

4.2.2 Projected Climate Change within Amathole District 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 general warming will definitely occur in Amathole District Municipality, in that there will be an increase in average monthly temperatures throughout the year. The 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 temperatures in the late summer. An increased risk of heat waves in late summer period is also predicted for Amathole District Municipality.

Rainfall:

Change in the overall rainfall patterns will definitely occur. Overall 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 overall there will be an exacerbation of the existing climate conditions.

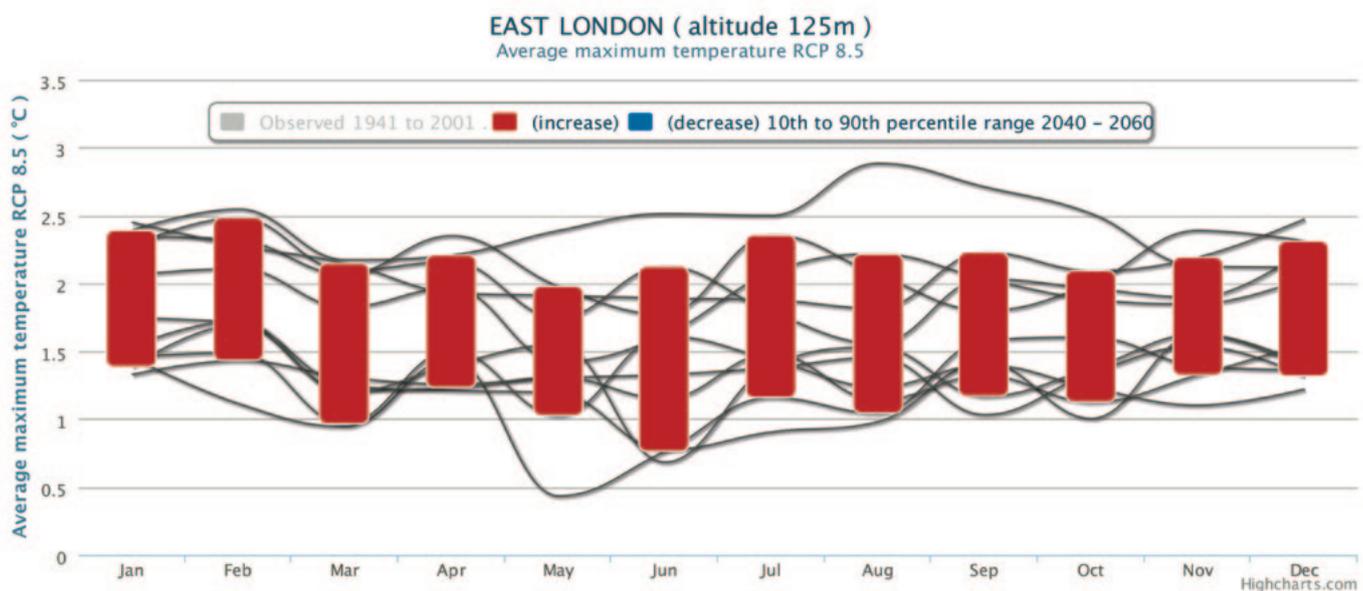


FIGURE 24: Graph depicting the anticipated changes in average maximum temperature patterns for Amathole District Municipality.²⁸

4.2 CLIMATE CHANGE AND WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

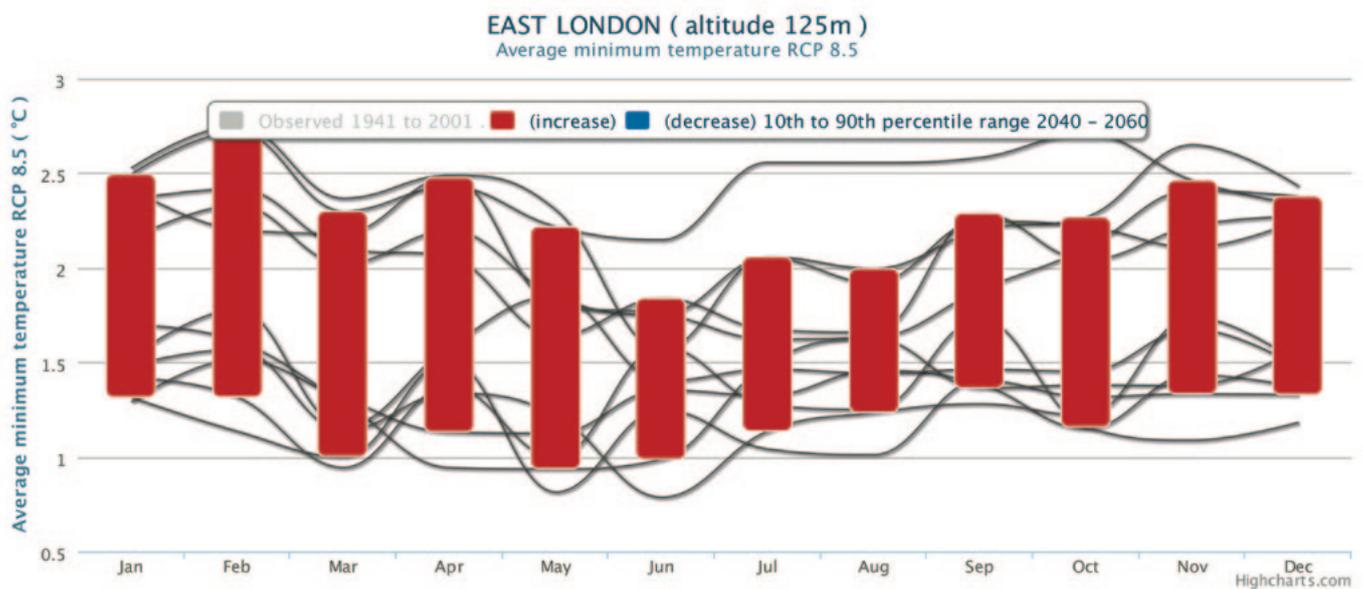


FIGURE 25: Graph depicting the anticipated changes in average minimum temperature patterns for Amathole District Municipality.

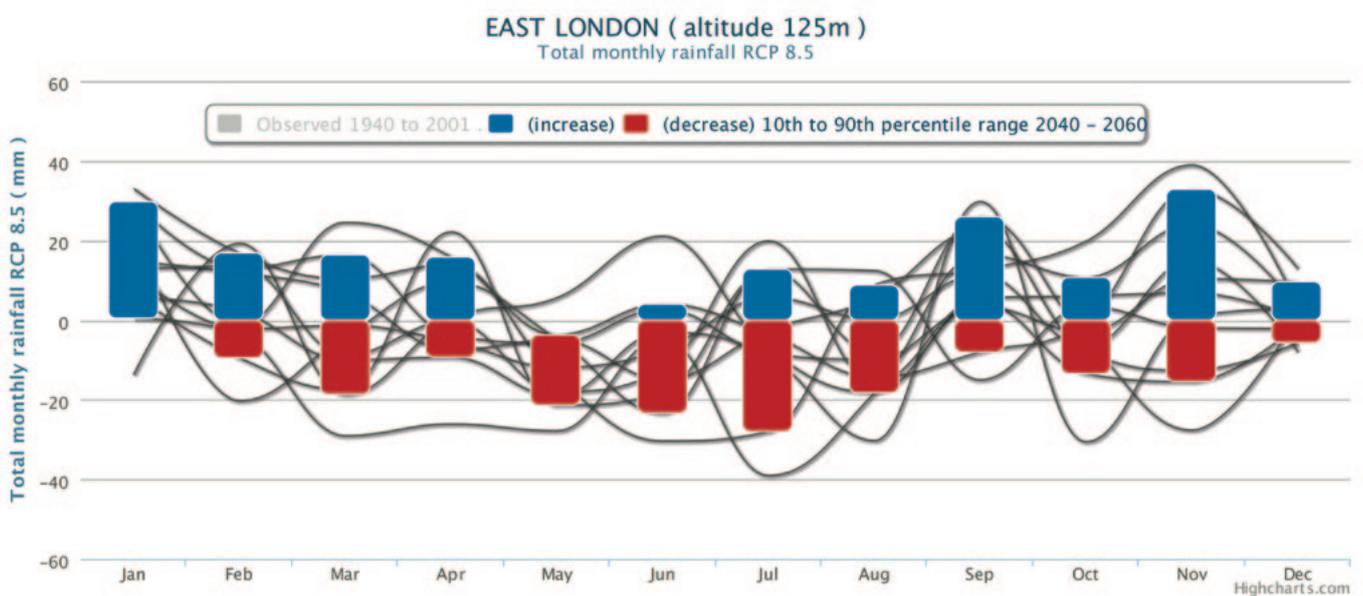


FIGURE 26: Graph depicting the anticipated changes in total monthly rainfall patterns within Amathole District Municipality.²⁹

4.2 CLIMATE CHANGE AND WETLANDS WITHIN AMATHOLE DISTRICT MUNICIPALITY *(continued)*

4.2.3 Impacts of Climate Change in Amathole District Municipality

A shifting climate means that the historical seasonality as well as 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 season 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.

Climate impacts in Amathole District Municipality have been considered in the Amathole District Municipality Climate Change Vulnerability Assessment and Response Framework. The Assessment outlines the key sectors that should be considered in terms of planning for climate change and adapting for the consequences. Based on the outcomes of the risk and vulnerability assessment the following response themes are highlighted:

- Water scarcity risks;
- Coastal Erosion and Inundation;
- Storm water and flooding;
- Human Health;
- Food Security and subsistence agriculture;
- Disaster Management and Municipal Infrastructure.

4.2.4 Role of Wetlands in Mitigating the Impacts of Climate Change

Climate change is also likely to have an impact on wetlands. The most pronounced effect will be through alteration in flow patterns and decrease in wetland size. Wetlands which are in poor condition have a reduced ability to respond and adapt to a shift in climate which means climate impacts (e.g. flooding) are more likely to damage or destroy the wetland. Subsequently the wetland is compromised in its ability to perform vital ecosystem services (including most importantly flood attenuation, water storage and flow regulation).

Healthy wetlands however have a high resilience to climate change impacts, meaning that they are able to maintain their capabilities to supply ecosystem services despite significant shifts in climate. As such, healthy wetlands are able to maintain the ecosystem services which means they are able to play a highly significant role in reducing the impacts of climate change within the municipality.

Investment in the maintenance of healthy wetlands and the rehabilitation and restoration of damaged or degraded wetlands will not only ensure wetland resilience to climate change but will ensure increased resilience of the municipality to the impacts of climate change.

South Africa has an extensive legislative framework concerning the environment and biodiversity is 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 Amathole District Municipality, which leads to the current wetland management strategy with the district.

5.1 POLICY FRAMEWORK

Table 4 provides a comprehensive summary of South African legislation, policies and strategies pertinent for the management of wetlands within Amathole District 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.

TABLE 4 LEGISLATION GOVERNING WETLAND MANAGEMENT WITHIN AMATHOLE DISTRICT 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.

continued

5.1 POLICY FRAMEWORK *(continued)*

TABLE 4 LEGISLATION GOVERNING WETLAND MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY

LEGISLATION/POLICY/STRATEGY	HOW IT RELATES TO WETLANDS
Municipal Systems Act	Role of local governments and the requirements for IDPs, SDFs and Disaster Management Plans.
Municipal Structures Act	Promotion of regional planning and spatial planning categories.
Municipal Health Act	Monitoring of Water Waste Treatment Works (WWTW) discharge.
Policies	
National Development Plan (NDP) and associated Medium Term Strategic Framework (MTSF)	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.
Municipal Planning	
Integrated Development Plan (IDP)	Overall strategy document for the municipality.
Provincial Strategic Development Framework (SDF)	Overarching spatial planning guidelines for the province.
District SDF	Broad spatial planning guidelines for the district (including a map of land use within the district).
Local Municipal SDFs	Strategic plans to manage municipal land at the local level.
Open Space Framework	Demarcation of Open Space Areas.
Environmental Management Framework (EMF)	Map and land use guidelines for areas of environmental importance.
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 (SPLUMA)	Provides a framework for spatial planning and land use management in South Africa. It also 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 AMATHOLE DISTRICT MUNICIPALITY

Since the effective management and conservation of wetlands cannot be undertaken without engaging with a range of municipal departments, the mainstreaming of wetland management across line functions is imperative. Mainstreaming does not create parallel processes and systems, but ensures that plans are integrated into existing structures, processes and systems.

5.2.1 Environmental Management Plan (EMP)

Currently there is no specific designated wetland management authority or wetland management capacity within Amathole District Municipality as capacity, human resources and funding within the municipality is an ongoing issue.

Specific challenges include:

- Lack of mainstreaming of environmental issues;
- Environment is regarded as an unfunded mandate;
- Lack of clear roles and responsibilities with regards to wetland management.

Amathole District Municipality developed an Environmental Management System (EMS) in 2004 to govern all of Amathole District Municipality's functions to ensure environmental compliance and sustainability, as well as form the basis for environmental management within Amathole District Municipality.

5.2.2 Integrated Development Plan (IDP)

The Vision and Mission included in the Amathole District Municipal IDP, as adopted by Council in May 2012 are as follows:

Vision – Commitment towards selfless, excellent and sustainable service to all our communities.

Mission – is dedicated in contributing to:

- Ensuring equal access to socio-economic opportunities;
- Building the capacity of local municipalities within Amathole District Municipality's area of jurisdiction;
- Ascribe to a culture of accountability and clean governance;
- Sound financial management;
- Political and administrative interface to enhance good service delivery;
- Contributing to the betterment of our communities through a participatory development process.

5.2.3 Spatial Development Framework (SDF)

The Amathole District Municipality Spatial Development Framework (SDF) as well as the local municipal SDFs, each contain environmental sections which relate to biodiversity, land-use and agriculture. Wetlands however do not appear in either the district or the local municipal SDFs.

5.2 WETLAND MANAGEMENT WITHIN AMATHOLE DISTRICT MUNICIPALITY (continued)

5.2.4 Amathole District Municipality Coastal Management Framework (CMF)

Wetlands are noted within the Amathole District Municipal Coastal Management Framework (CMF) as coastal resources and are defined as being sensitive, vulnerable and highly dynamic ecosystems along with estuaries and coastal shores.

The CMF notes that these particular systems require specific attention with regards to management and planning procedures as these systems are particularly affected by human and developmental pressures. Wetlands are in urgent need of protection from further development to prevent further degradation to the aquatic environments.



FIGURE 27: Amathole District Municipality developing a Wetland Strategy and Action Plan, with the aim of incorporating it into the IDP.

6 | LOCAL AND REGIONAL PARTNERSHIPS AND PROGRAMMES

In addition to the collective municipal work that is being undertaken at both the district and local level to monitor and manage wetlands within Amathole District Municipality, there are numerous projects and activities currently being implemented within

and around wetlands by the public and private sector as well as several NGOs. The projects currently underway within Amathole District Municipality are summarised in **Table 5**:

TABLE 5 LOCAL AND REGIONAL WETLAND RELATED PARTNERSHIPS AND PROGRAMMES WITHIN AMATHOLE DISTRICT MUNICIPALITY

PROJECT NAME	PROJECT DESCRIPTION	PROJECT IMPLEMENTING ENTITY	ADDITIONAL STAKEHOLDERS
Hogsback wetland project	The Hogsback wetland project started in August 2009. Work during the first 2 to 3 years took place on the Amathole Forestry Company's (AFC) land (State land). Additional work on adjacent private land was identified and part of the wetland rehabilitation plan (2010/2011 Plan).	Amathole Forestry Company Aurecon, appointed by Working for Wetlands	SANBI, Working for Wetlands, DEA, landowners (Amathole Forestry Company and Richard Bowker)
The Amathole Toad Conservation Project³⁰	This project will provide the essential information required to understand the true status of the Amathole toad (<i>Vandijkophrynus amatolicus</i>), once thought to be lost. The results of this project, working in coordination with local stakeholders and community champions, will help to lay the foundation for a long-term management strategy and initiate suitable conservation actions. The development and stakeholder buy-in of the management strategy will be seen as the primary output.	Endangered Wildlife Trust	
Amatola Freshwater Species Conservation Project³¹	To address water security and poverty challenges this project aims to establish natural resource conservation through the generation of a water-linked green-economy in the Amathole region of the Eastern Cape. A large focus of the project is the removal of alien vegetation from sensitive water source areas which are the lifeblood of numerous river systems within the province. This project serves to secure the valuable water resources of the Amathole while also providing green jobs in the former Ciskei homeland, which suffers from high rates of unemployment.	Endangered Wildlife Trust	South African Institute for Aquatic Biodiversity (SAIAB), Conservation South Africa (CSA), the Wildlife and Environment Society of South Africa (WESSA), Environmental and Rural Solutions (ERS)

Communication, education and public awareness (CEPA) 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.

7.1 COMMUNICATION AND EDUCATION

Municipalities present a unique opportunity to reach a large audience and spread the message about their critical reliance on wetlands and biodiversity. Amathole District Municipality has both the Environmental Management Forum and the Waste Management Forum which are used as platforms to share environmental projects, programs and strategies. The Eastern Cape Wetlands Forum is also a very well established platform for wetland related discussions and sharing of information. This forum promotes collaboration, cooperation and capacity building through shared information and opportunities.

At this stage, the Amathole District Municipality does not have any district 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.

The following environmental awareness campaigns however are held annually by the District:

- World Wetlands Day in February;
- Water Week in March;

- Wetlands Month in April;
- Environmental week in June;
- Arbour week in September;
- Marine Week in November;
- Weed buster week in December.



FIGURE 28: Anton Listrom undertaking municipal level awareness raising on the value of wetlands for local communities living in rural areas.

7.2 PUBLIC PARTICIPATION AND AWARENESS

Strategic documents such as the IDP, SDF and EMF are reviewed and updated regularly by Amathole District Municipality. 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.

In addition, Amathole District Municipality is responsible for commenting on all Environmental Impact Assessment (EIA) applications, the process of which requires two rounds of public participation before a decision is made by either the DEDEA or the National DEA.

CONCLUSION

The aim of the Amathole District Municipality Wetland Report was to bring together all the available wetland related information for the Amathole District 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 Amathole District Municipality, it was found that the district has a wealth of biodiversity and wetland systems as well as three key SWSA which support the district's functioning. It was also found that wetlands within the municipality not only provide a wide range of ecosystem services including 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 district.

Despite the wetlands within Amathole District Municipality being of high value to the municipality in terms of ecosystem service provision, a large number of the wetlands in the region are under threat or have already been lost. This is largely due to historical degradation, deliberate draining of wetlands to make way for development and agriculture, inappropriate development within close proximity to the wetlands, poorly regulated agricultural practices, contamination through chemical, sewage, effluent and stormwater seeps, water abstraction and the spread of invasive alien plants. Degraded wetlands are unable to function to the same degree as healthy wetlands and as such ecosystem service provision is severely hindered or even lost altogether. As such, careful management as well as the investment in the maintenance of healthy wetlands and the rehabilitation and restoration of damaged or degraded wetlands is required. This will ensure the continued provision of these vital ecosystem services to the municipality.

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 district, clearly depicting where the wetlands are located within the landscape, at a scale or accuracy level useful to planners and developers for

decision-making purposes. 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, it was found that, there was no specific department within the Amathole District Municipality which directly deals with the management of wetlands within the landscape. Due to capacity constraints and the tendency of 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 district a difficult task and also increasing the risk of wetland degradation.

Thus, in order 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, one of the existing platforms/forums could be utilised or a new 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 district.

Finally, it was found that Amathole District 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.

DEFINITIONS

Biodiversity³²

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 Change³³

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.

Critical Biodiversity Areas³⁴

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.

Disaster³⁵

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 Management³⁶

Disaster Management means a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures to prevent or reduce the risk of disasters; mitigate the severity or consequences of disasters; emergency preparedness; a rapid and effective response to disasters; and post-disaster recovery and rehabilitation. It is the systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. Disaster Management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

Ecosystem services³⁷

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.

Wetland³⁸

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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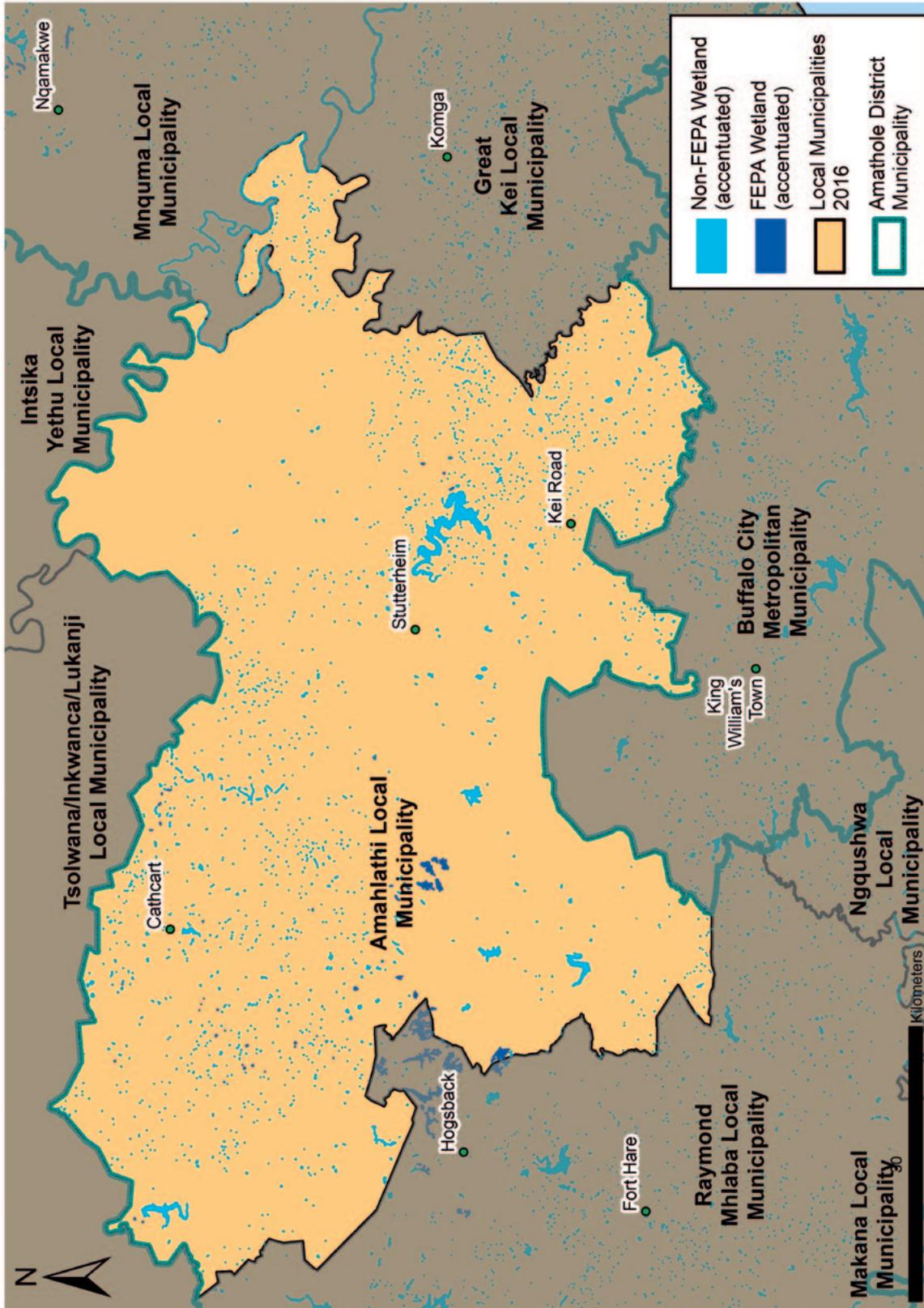
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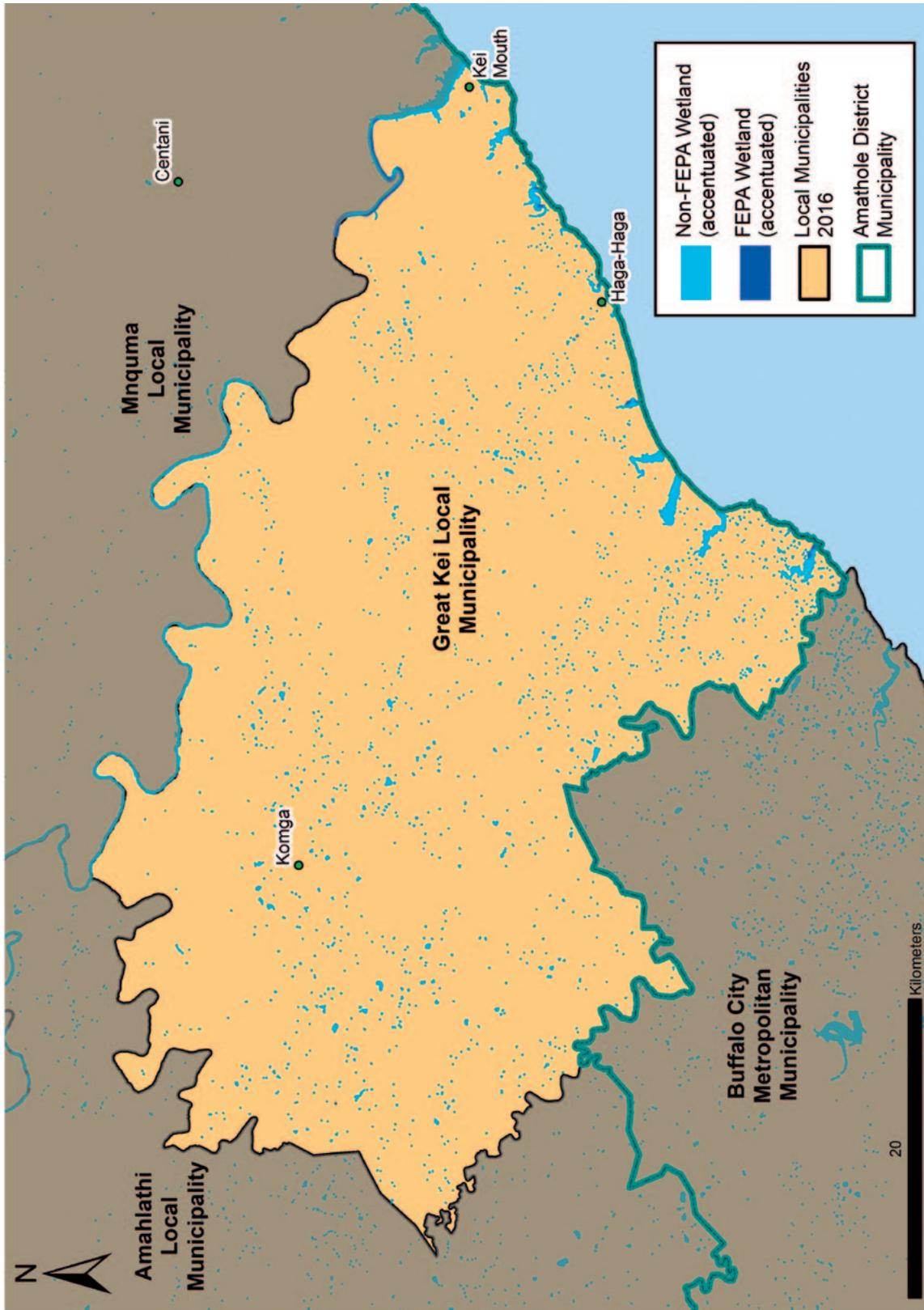
ANNEXURES

ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN AMATHOLE DISTRICT MUNICIPALITY



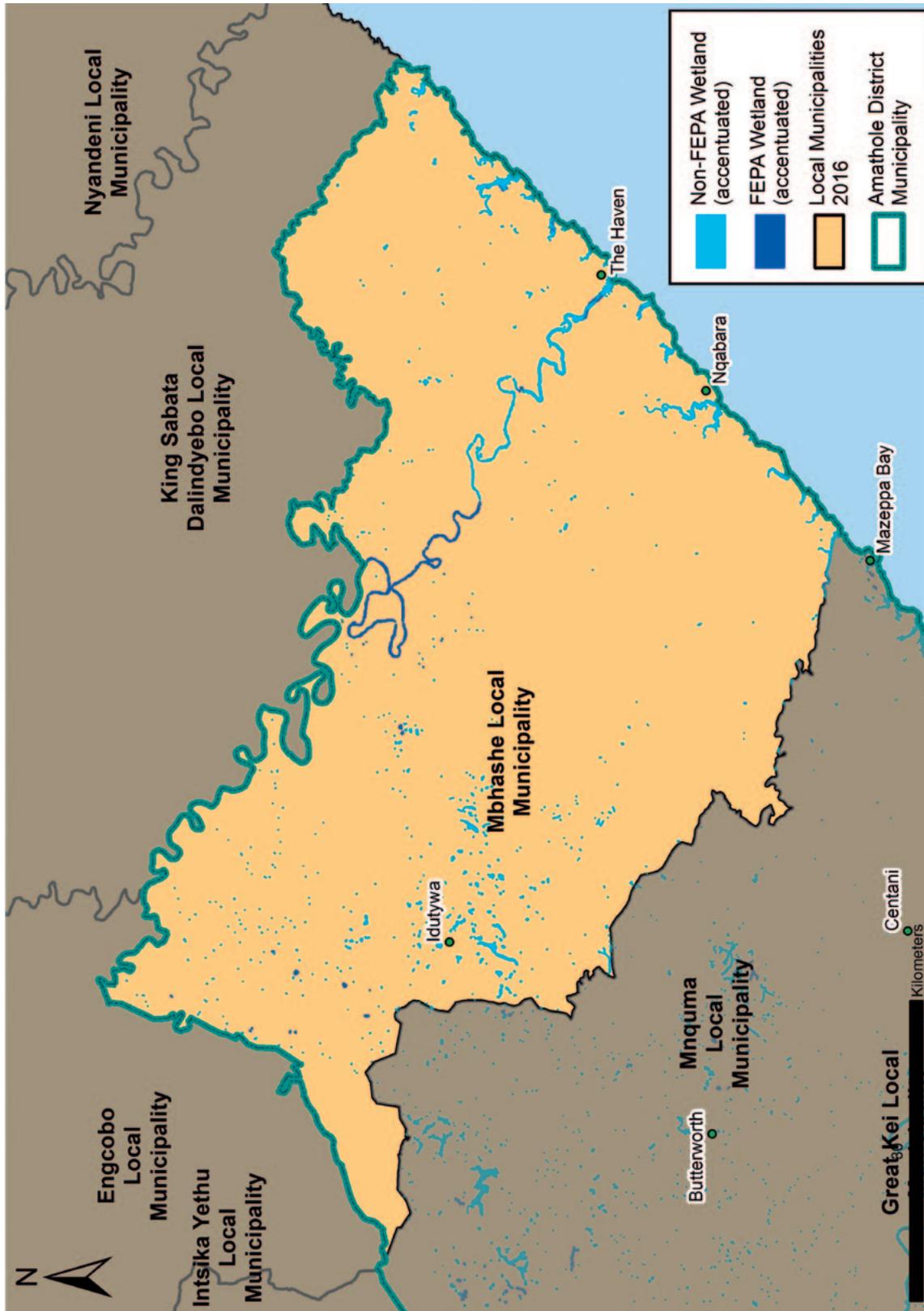
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ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN AMATHOLE DISTRICT MUNICIPALITY *continued*



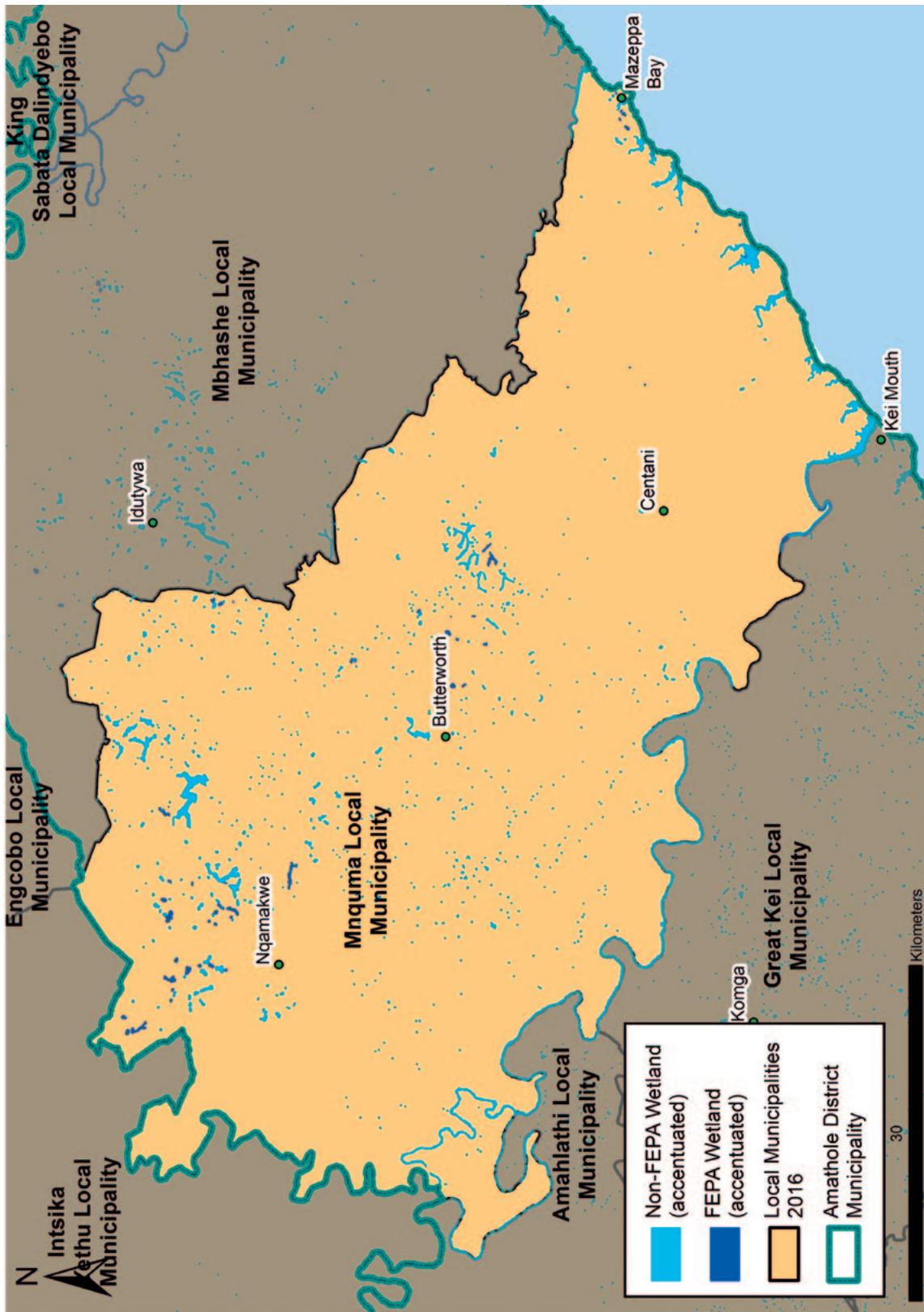
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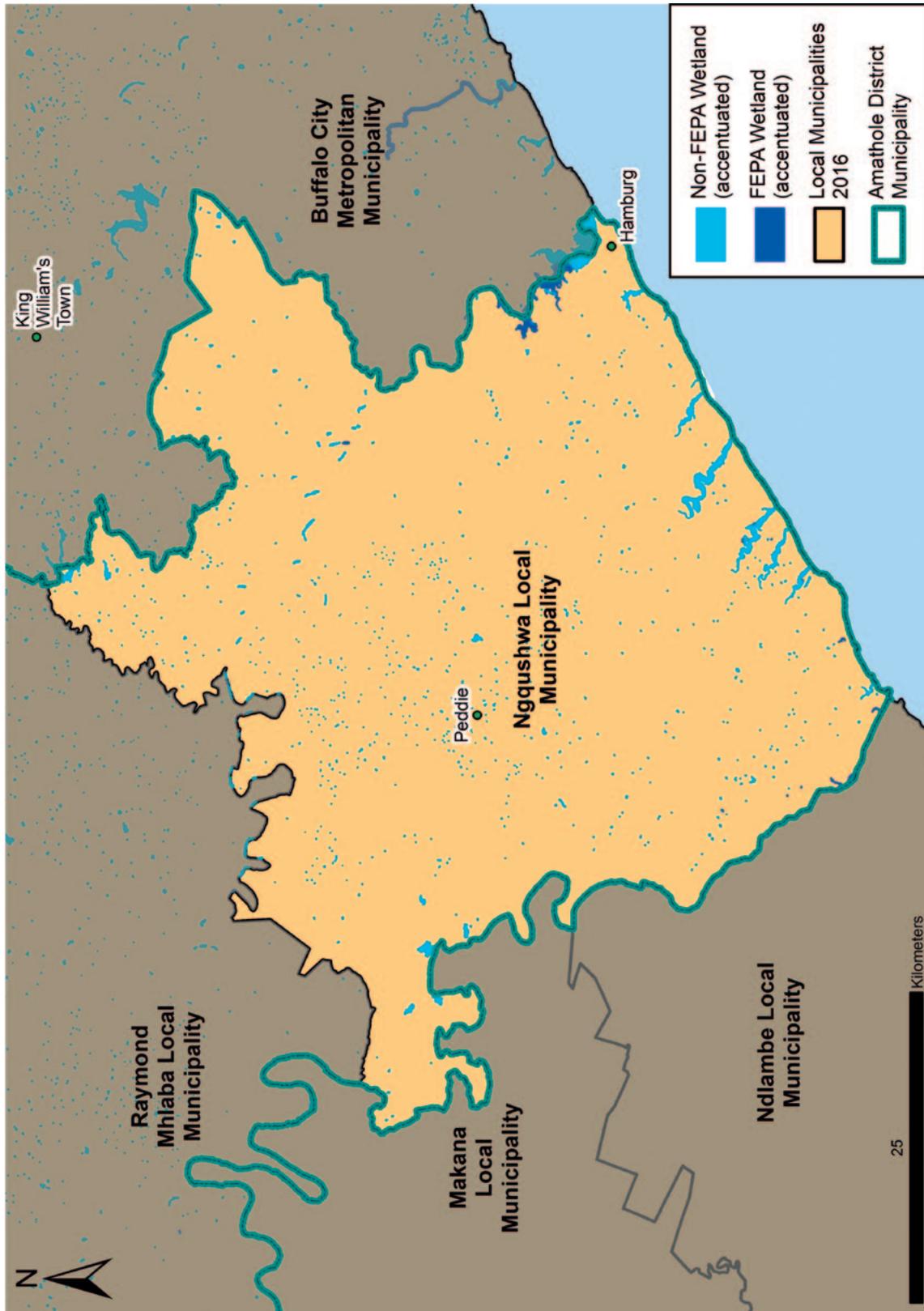
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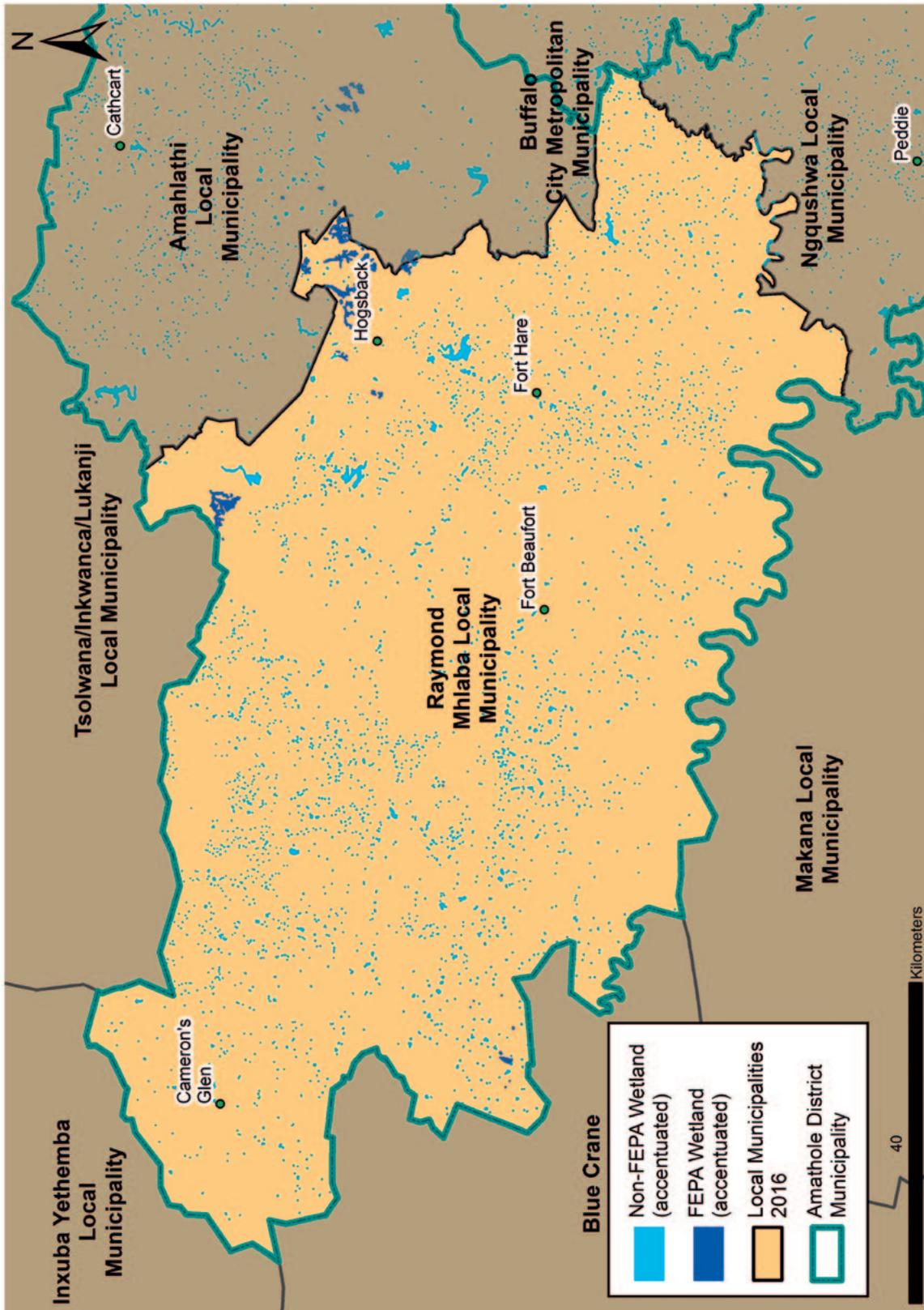
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ANNEXURES

ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN AMATHOLE DISTRICT MUNICIPALITY *continued*







environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

