




# Our Nature, Our City, Our Future


Local Biodiversity Strategy and Action Plan 2019



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The original development of this report emanates from the City of Johannesburg's participation in ICLEI's Local Action for Biodiversity (LAB) Project. Based on the original Local Biodiversity Strategy and Action Plan (LBSAP) developed for the City of Johannesburg by Bohlweki SSI (SSI Engineers and Environmental consultants (Pty) Ltd) in 2009, this report presents a revised LBSAP for the COJ to guide the approach to urban nature conservation, protection, and enhancement in the COJ for the next five years (2020-2025), in line with the timeframe of South Africa's current National Biodiversity Strategy and Action Plan (NBSAP). Thereafter, it is recommended that the LBSAP be reviewed again, and consistently on a five-year basis, to ensure it is relevant, accurate, and aligned with evolving city planning and development processes.

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## Executive Summary

This strategic report presents the Local Biodiversity Strategy and Action Plan (LBSAP) for the City of Johannesburg (CoJ) and articulates detailed action plans through which the LBSAP's vision and strategic objectives will be implemented for the conservation, protection, use and development of nature and biodiversity in and around the city, within the jurisdictional boundaries of the COJ over the next five years.

The strategy is a tool by which the CoJ, its departments, municipal owned entities, partners and the local community can work together, through a whole-of-society approach, to deliver sustained action towards a greener, healthier, and more sustainable city. More specifically, the Action Plans seek to guide the COJ Environment and Infrastructure Services Department's approach to effective biodiversity management in order to safeguard and enhance the natural assets that provide essential ecosystem services for urban populations.

Part 1 describes the current state of biodiversity within the City. Part 2 provides an overview of the local, provincial, national and international policy and legislative context for biodiversity. Part 3 sets out the vision, mission, strategic objectives and guiding principles for biodiversity within the City. Part 4 provides details on the specific action plans under each strategic objective. Part 5 illustrates how a monitoring and evaluation framework should be developed to measure progress towards achieving the COJ's biodiversity vision. Finally, a way forward is identified for the CoJ.

The CoJ is a major metropolitan area and economic growth node for the region as well as Southern Africa. The state of the natural environment in the COJ is shaped by a number of drivers and forces which ultimately shape the city's growth and development.

The CoJ's LBSAP, titled the *Our Nature, Our City, Our Future* strategy, sets out a framework and a plan of action for the conservation, restoration, and sustainable use of biological diversity and the equitable sharing of benefits derived from this use. It provides an overview of the current state of biodiversity and key issues identified in the stock-taking and assessment phase, before presenting a policy and legislative framework and a series of action plans to guide implementation over the next five years.

The term 'urban biodiversity' refers to the biological diversity located within urban areas. The character and quality of urban ecosystems is reflected by the plant and animal species that are present in the urban ecosystem, their interactions with one another and with their surrounding environment. Urban biodiversity is constantly influenced by human activity and our social, economic and cultural dynamics. Healthy ecosystems provide essential services that are the foundation for human health and well-being. These services are referred to as ecosystem goods and services and are the benefits people obtain from the natural environment. The city's strategy is underpinned by the acknowledgement that urban development and its associated land use change are major drivers of biodiversity loss worldwide. Development pressures, as a result of growing urban populations have seen nature diminish in and around cities. However, healthy ecosystems, biodiversity, and nature more broadly are essential for the sustainability of urban areas and the health and wellbeing of urban populations. As such, the use of the term "Nature" is preferred over "Biodiversity" throughout this document in order to capture the complexity of the social, economic, and

development systems that drive the growth of urban areas but depend on nature for their long-term sustainability.

The overall biodiversity vision for the City is to **“conserve and manage the City’s natural assets and the City’s environmental heritage to ensure the delivery of sustainable and equitable ecosystem goods and services to the citizens of Johannesburg, now and in the future.”**

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## Acronyms

<b>CBD</b>	Convention on Biological Diversity
<b>CBO</b>	Community Based Organisation
<b>CoJ</b>	City of Johannesburg
<b>C-Plan</b>	Conservation Plan
<b>DEA</b>	Department of Environmental Affairs
<b>EISD</b>	Environmental and Infrastructure Services Department
<b>GDARD</b>	Gauteng Department of Agriculture and Rural Development
<b>GDP</b>	Gross Domestic Product
<b>GDS</b>	Growth and Development Strategy
<b>GIS</b>	Geographic Information System
<b>IAPs</b>	Invasive alien plant species
<b>IDP</b>	Integrated Development Plan
<b>JMOSS</b>	Johannesburg Metropolitan Open Space System
<b>JCP</b>	Johannesburg City Parks
<b>JPC</b>	Johannesburg Property Company
<b>JRA</b>	Johannesburg Roads Agency
<b>LAB</b>	Local Action for Biodiversity
<b>LBSAP</b>	Local Biodiversity Strategy and Action Plan
<b>MOE</b>	Municipal Owned Entity
<b>NBSAP</b>	National Biodiversity Strategy and Action Plans
<b>NEMA</b>	National Environmental Management Act
<b>NEMA: BA</b>	National Environmental Management Act: Biodiversity Act
<b>NGO</b>	Non-governmental organisation
<b>NSBA</b>	National Spatial Biodiversity Assessment
<b>NWRS</b>	National Water Resource Strategy
<b>RDL</b>	Red data listed
<b>SANBI</b>	South African National Biodiversity Institute
<b>SDF</b>	Spatial Development Framework

## Glossary

<b>Biodiversity</b>	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.
<b>Biome</b>	A biome is a regional-scale ecosystem characterized by distinct types of vegetation, animals, and microbes that have developed under specific soil and climatic conditions.
<b>Critical Biodiversity Areas</b>	Areas that are required to meet biodiversity targets for species, ecosystems or ecological processes. Such areas need to be kept in a natural or near-natural state, with no further loss of habitat or species.
<b>Ecological Support Areas</b>	Areas not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of Protected Areas or CBAs and for delivering ecosystem services. These areas usually consist of natural or near natural, but also degraded areas that can support CBAs by maintaining ecological processes.
<b>Ecosystem</b>	A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functioning unit.
<b>Ecosystem Services</b>	The benefits that people obtain from ecosystems, including provisioning services (such as food and water), regulating services (such as flood control), cultural services (such as recreational benefits), and supporting services (such as nutrient cycling, carbon storage) that maintain the conditions for life on Earth. Ecosystem services are the flows of value to human society that result from a healthy stock of ecological infrastructure. If ecological infrastructure is degraded or lost, the flow of ecosystem services will diminish.
<b>Ecosystem Status</b>	The classification of vegetation types based on the extent of remaining area (currently not transformed) of each vegetation type in relation to their biodiversity target.
<b>Natural Assets</b>	Elements or features of nature (for example, forests, parks, rivers and mangroves) that represent stocks of natural capital from which goods and services flow. By valuing urban natural assets and the associated goods and services, cities can recognise opportunities to enhance and unlock social, economic and spiritual benefits.
<b>Nature</b>	The broad term used to encompass and describe all elements of the natural environment and the biodiversity that is housed, or dependent on these elements. In many cases, this term will be used either alongside, or interchangeably with, the term “biodiversity.”



## INTRODUCTION

### PURPOSE OF THIS DOCUMENT

The purpose of this document is to outline the current state of biodiversity and the policy and legislative framework and present the vision, guiding principles, strategic objectives, goals and action plans for the protection, use and conservation of natural assets within the CoJ.

### LAB PROJECT

This document first originated from a set of biodiversity reports produced by participant cities of the Local Action for Biodiversity (LAB) project, which has since ended. LAB was an ICLEI – Local Governments for Sustainability initiative for the protection of biodiversity at the local level. The goal of the LAB project was to bring together cities from a range of global contexts, to explore the best ways for local governments to engage in effective biodiversity management, and to profile their efforts. Johannesburg is one of the cities with a track record of involvement and interest in biodiversity initiatives and was involved in the LAB project. Since the close out of LAB, the COJ has now embarked on a review of its LBSAP, to guide decision making around natural asset management within its area of jurisdiction.

### URBAN BIODIVERSITY

Biodiversity includes the diversity within and among species and ecosystems or more simply, the variety of living things in a specific habitat or region. The term ‘urban biodiversity’ refers to the biodiversity located within urban areas. The character and quality of urban ecosystems is reflected by the plant and animal species that are present in the urban ecosystem, their interactions with one another and with their surrounding environment. Urban biodiversity is constantly influenced by human activity and our social, economic and cultural dynamics (ICLEI, 2008).

The type and diversity of species found within urban ecosystems depends upon the density of the urban environment. The species found in densely populated urban areas are usually those that have been able to adapt to and sometimes even benefit from the urban environment (ICLEI, 2008). Understanding the context of urban biodiversity is very important for cities and the human populations within them play crucial roles beyond their borders. Urban biodiversity is not only important both visually and spiritually for the urban population, but it also represents our dependency upon nature and the earth’s natural resources (ICLEI, 2008). For purposes of this LBSAP, the term “nature” will be used to encompass the range of urban biodiversity and natural assets in and around the city. These assets include all natural elements that provide ecosystem services for urban populations and contribute to the health and resilience of the city.

### BENEFITS OF NATURE

Ecosystems are living elements which interact with each other and their non-living environments. A safe, healthy and sustainably managed environmental and natural resource base provides critical ecosystem goods and services that are a foundation for economic and social development (Department of Environmental Affairs, 2019). Ecosystem goods and services can be direct or

indirect in their nature. Direct goods are physically taken directly from the ecosystem and an example of this would be the timber and fishery industry. Indirect goods are benefits that are received due to the functioning of an ecosystem. A good example of this would be the water purification function that a wetland provides. The concept of the ecosystem goods and services is well-known, and much data is available on the subject. How to actually quantify ecosystem goods and services, especially over time has however been a stumbling block. More research and case studies are thus required, worldwide to assist decision making authorities in conserving their ecosystems while still utilizing the services they have to offer.

The pressure for urban development and land use conversion within the CoJ is one of the major drivers of biodiversity loss and has put, and is likely to continue to put, considerable pressure on the remaining natural habitat. Nature is vital to sustain the healthy functioning of urban systems, such as air quality and mitigation of the urban heat island effect. Nature, through its ecological and evolutionary processes, sustains the quality of the air, fresh water and soils on which humanity depends, distributes fresh water, regulates the climate, provides pollination and pest control services and reduces the impact of natural hazards. Furthermore, nature is our most sustainable asset in the fight against climate change. Nature-based solutions provide us with the most effective ways to ensure effective infrastructure provision and the safeguarding of environmental processes that are essential for our health and wellbeing in urban areas. Diaz (2006), states that human societies are threatening the biodiversity of the environments that they inhabit. It is important to note that biodiversity and the ecological framework in which biodiversity effectively functions, is important in providing multiple services and a range of benefits to the societies living there.

As humans we are heavily dependent on the services that the environment provides to us for our survival, which include (The Economics of Ecosystems and Biodiversity, n.d):

**Table 1: Different categories of ecosystem services that ecosystems provide and examples.**

Categories of Ecosystem Services	Examples
<b>Provisioning services</b> which are the products obtained from ecosystems such as food, fresh water, wood, fibre, genetic resources and medicines.	Nature plays a vital role in the global water cycle, as it regulates the flow and purification of water through the filtration of particles, pathogens, excess nutrients, and other chemicals.
<b>Regulating services</b> defined as the benefits obtained from the regulation of ecosystem processes such as climate regulation, local climate and air quality, natural hazard regulation, water purification and waste management, pollination or pest control;	Local climate and air quality: Trees provide shade whilst forests influence rainfall and water availability both locally and regionally. Trees and other plants also play an important role in regulating air quality by removing pollutants from the atmosphere.
<b>Supporting/Habitat services</b> which highlight the importance of ecosystems to provide habitat for migratory species and to maintain the viability of gene-pools; and	Habitats for species: Ecosystems provide different habitats that can be essential for a species' lifecycle. Habitats provide the necessary ecological conditions that an individual plant or animal needs to survive, including food, water, and shelter.

Categories of Ecosystem Services	Examples
<p><b>Cultural services</b> which are the non-material benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation and aesthetic values.</p>	<p>Recreation and mental and physical health: Exposure to the natural environment can have a range of physical, psychological and social benefits that can contribute to improved physical and mental well-being. Walking and playing sports in green spaces is not only a good form of physical exercise but also helps people relax.</p>

Many ecosystem services and their use in the City, are not strictly regulated or controlled by the municipality or other agencies. When benefits from ecosystem services are not governed by rules and norms, it leads to the degradation of natural habitats and ecosystems, over-exploitation of natural resources and biodiversity loss, which in turn diminishes the health and functioning of ecosystems and their ability to provide benefits to the city and its people. Many of these goods and services and the value of nature in urban areas are however, often undervalued and therefore overlooked in development planning, land use, and implementation processes. To provide certain services to its citizens and perform its functions relating to biodiversity, it is important to understand the goods and services that the natural environment offers us. We further need to understand the role that the biodiversity within the CoJ plays in the sustainable development of the City. These aspects subsequently need to be integrated into land-use planning and decision making in the City.

Diaz (2006) also proposes that the most significant impacts on the ecosystem services are related to the altered functional composition of communities through loss within the same trophic level of locally abundant species rather than from the loss of species that are already recognized as rare. This stresses the importance of conserving landscapes, rather than species alone. Conservation at the landscape level promotes the methodology of Systematic Conservation Planning (SCP) which has been successfully applied in many strategic planning efforts in South Africa (Driver et al., 2003, Margules and Pressey, 2003). Much of the effort that has gone into the Conservation Plan (C-Plan), which was developed by the Gauteng Department of Agriculture and Rural Development (GDARD), has applied many of these methodologies. As such, this LBSAP should be used in conjunction with the CoJ Bioregional Plan, which is the local output of the Gauteng C-Plan's SCP process.



**Figure 1 : The Klipriviersberg Ridge system is an important ecological area which has grasslands, ridges and drainage systems, all providing important ecosystem goods and services.**

## THE CITY OF JOHANNESBURG LOCAL AUTHORITY

The City of Johannesburg Metropolitan Municipality is the authority responsible for the management of the City. The Metropolitan Municipality is responsible for implementing sustainable environmental practices while promoting the socio-economic development in the city.

The Integrated Development Plan (IDP) for the CoJ states the vision for the City as: "A Johannesburg that works, is a South Africa that works", while its mission is to create an enabling economic environment by making Johannesburg more responsive in the delivery of quality services. This will require economic decoupling and the acknowledgement of the value of nature in achieving socio-economic outcomes.

In order to achieve this vision, the City has several strategic interventions and sector strategies in place. In addition, one of the CoJ's nine priorities is to preserve our resources for future generations. The City therefore undertakes the following initiatives:

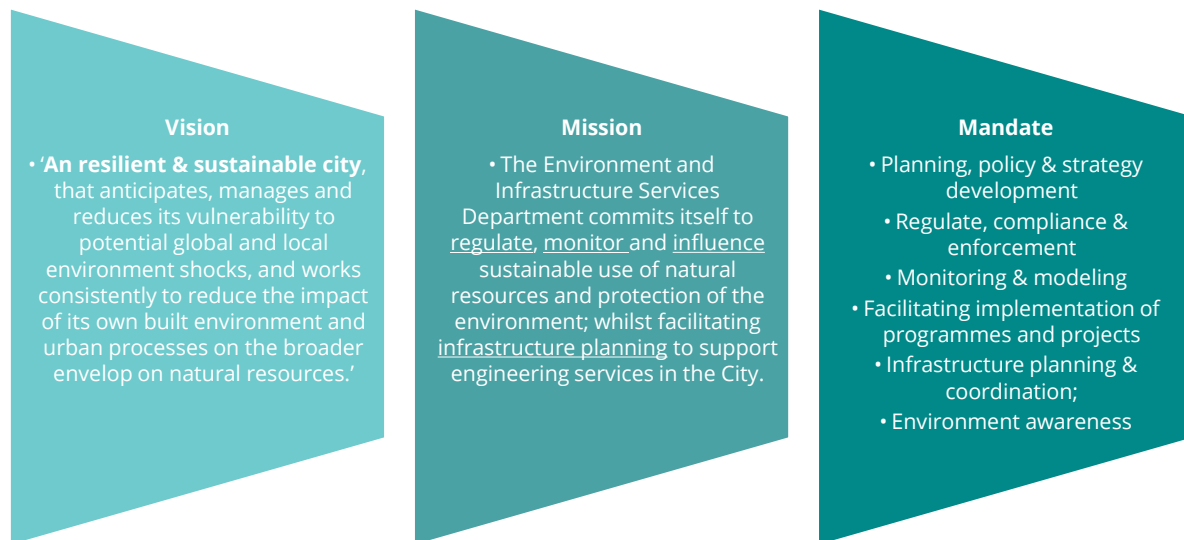
- Biodiversity conservation
- Open space planning
- Water Resource Management
- Air quality management
- Waste management
- Challenges to water and energy demand management
- Climate change management

The CoJ's GDS 2040 also focuses on maintaining the sustainability of the city's future development trajectory, whilst also maximising liveability for urban populations. This implies that the functionality of remaining natural environment in the city, which not only harbours some species of conservation concern, but also provides a multitude of ecosystem services, needs to be retained and improved. The City's long- and medium-term strategies (GDS and IDP) therefore recognizes the importance of conserving natural resources.

## THE COJ ENVIRONMENT AND INFRASTRUCTURE SERVICES DEPARTMENT

The CoJ's Environment and Infrastructure Services Department (EISD) is responsible for the protection and conservation of the natural assets within the City and is consequently responsible for the implementation of this strategy. The department's main function is policy development, regulatory and monitoring. The EISD recognizes the fact that economic growth is strongly connected with the demand for natural resources i.e. water, electricity generated from coal, liquid fuel and minerals and the subsequent generation of waste which impacts on the environment in the process of disposal. The management of natural resources either as pristine resources or as valuable economic commodities is the prime objective of the Department with a focus on the potential consequences of not sustainably utilizing these natural resources for urban inhabitants. It cannot be ignored that human actions, if not managed appropriately, can deplete the earth's natural assets that the detriment of future generations. The strain that unsustainable human actions and consumption patterns put on the natural environment, resulting in the incapability of the planet's ecosystems to sustain future generations, can no longer be taken for granted.

The EISD’s strategic agenda on Environmental Sustainability can be linked to Outcome 2 of the revised Growth and Development Strategy (GDS) 2040 which is to “Enhance quality of life by improving services and taking care of the environment”. The EISD has defined its vision (figure 2) in line with the existing GDS of service delivery through sustainable services.



**Figure 2: The Vision, mission and mandate of the EISD in the City of Johannesburg**

The mandate of the department can be further understood in that EISD strives to:

- **Anticipate:** Data management, trend analysis to inform decision making;
- **Manage vulnerability:** Policy development and implementation, implementation of key programmes;
- **Reduce impact:** Regulation and compliance monitoring.

EISD’s mandate is embedded in two strategic functions of the Department as is reflected below:

- Infrastructure planning and coordination is one of the integral areas of focus as it is meant to ensure adequate and resilient infrastructure to support the City’s spatial vision.
- Preserving our natural resources is aimed at adequately managing the use of these resources to avoid serious scarcity in future.

The table below illustrates how the Department’s mandate in relation to its Key Performance Areas (KPAs) links to the desired outcomes of the COJ’s 2040 GDS.

**Table 2: Relationship of KPA's to EISD's Mandate**

<b>Key Performance Area of Department</b>	<b>Desired GDS2040 Outcome</b>
<b>Climate Change &amp; Energy</b>	<ul style="list-style-type: none"> <li>• Reduce impacts of climate change</li> <li>• Implementation of CC Strategic Framework</li> <li>• Diversification of energy mix</li> </ul>
<b>Water Resources &amp; Water Demand</b>	<ul style="list-style-type: none"> <li>• Improved &amp; protected water courses</li> <li>• Water conservation</li> <li>• Demand reduction/ Alternative sources</li> <li>• Building a water sensitive city</li> </ul>
<b>Air Quality Management</b>	<ul style="list-style-type: none"> <li>• Acceptable ambient air quality</li> </ul>
<b>Biodiversity Conservation &amp; Open Spaces</b>	<ul style="list-style-type: none"> <li>• Adequately Protected and Secured Biological Diversity</li> <li>• Alien &amp; invasive species controlled</li> <li>• Ecological functioning ecosystem</li> <li>• Equitable provision of recreational open spaces</li> <li>• Integrated Open Space Systems</li> <li>• Sustainable management of urban drainage to reduce damage to receiving environment</li> </ul>
<b>Waste Management</b>	<ul style="list-style-type: none"> <li>• Reduce waste to landfill</li> <li>• Increased recycling initiatives</li> </ul>
<b>Infrastructure Planning &amp; Coordination</b>	<ul style="list-style-type: none"> <li>• Resilient infrastructure</li> <li>• Asset management</li> <li>• Integrated infrastructure development</li> </ul>
<b>Environmental Awareness &amp; Education</b>	<ul style="list-style-type: none"> <li>• Behavioral change</li> </ul>

## PART 1: CURRENT STATE OF JOHANNESBURG'S NATURAL ASSETS

### THE CITY OF JOHANNESBURG

Johannesburg (also known as Joburg or Egoli) is located within the Gauteng Province (Figure 3), in the heart of south eastern South Africa. The City area is approximately 1 645 km<sup>2</sup>, or just under 10% of the total land of the province.

Johannesburg like many other highly urbanised cities is densely populated and the natural land cover has therefore experienced significant transformation into urban activities. Johannesburg is founded on the mineral resources found underground. The economic activities that characterise Johannesburg have been responsible for the rapid urban growth within the city, both in terms of physical development and the number of urban dwellers, which drives the transformation of large areas of natural land cover to more 'urban' uses. Uncontrolled transformation leads to problems such as urban sprawl, inefficient transportation, environmental pollution, loss of ecosystem functioning, food insecurity and a general decay in perceived urban quality.

The development paradigm of cities, with Johannesburg not being an exception, has changed vastly due to the ever-increasing complexity of challenges faced as a result of uncertainty and unpredictability within urban planning and development processes. Cities therefore need to develop integrated and holistic strategies that lay out a framework for the strategic choices that are necessary to guide future developments. The City's GDS (2040) was developed with this in mind as Johannesburg experiences many challenges in relation to migration, globalisation, climate change, natural resource scarcity, technological innovation and inequality, to name a few.

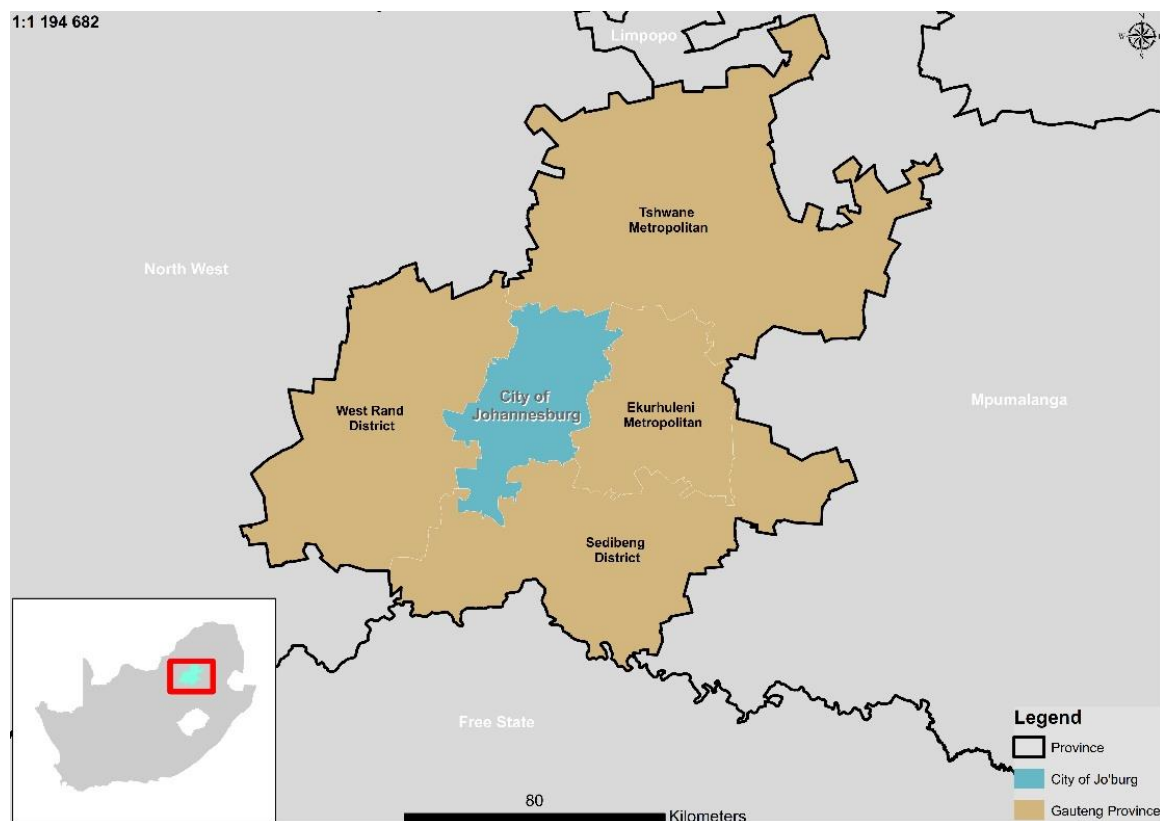


Figure 3: City of Johannesburg, regional context

The CoJ is the city with the highest number of human inhabitants in South Africa, with a population of 4 763 168 according to the latest District Health Barometer (DHB, 2015). There are at least 3000 people migrating into the city every month (City of Johannesburg IDP, 2019). It is estimated that Johannesburg's population could reach 5.3 million by 2021 (City of Johannesburg IDP, 2019). The population density of the City is approximately 2896 persons per km<sup>2</sup>. The CoJ is one of the densely populated Metropolitan areas in the world. The City's development was influenced by mining and industry which led to escalating population figures and attracted more people from neighbouring countries migrating for job opportunities.

The topography of the CoJ is fairly uniform and is characterised by rolling grasslands and rocky outcrops and ridges. The central regions of Johannesburg are densely covered by the built form and are mostly transformed. These regions are characterized by commercial, industrial, mining and residential land uses. To the north and south of the central region, the land cover is dominated by residential land use and its associated activities. City suburbs are predominantly vegetated with trees and bushes, many of which are not indigenous, and which even consist of invasive alien species. The residential areas gradually decrease in density as one nears the northern and southern boundaries of the city. The most northern portion of Johannesburg is characterised by smallholdings, parks and open spaces, although the area is fast expanding into the remaining undeveloped spaces. The vegetation in this area is dominated by irrigated and natural grassland. Small areas of scattered residential and commercial land uses are also present.

According to the most recent South African land cover data (Geoterraimage, 2014), land cover patterns in the CoJ are characterised by very high levels of transformation and urbanisation with only 35% of the extent in a natural state and 61% transformed. Agriculture covers 8% of the CoJ, and mining and urbanisation cover 2% and 51% respectively (figure 4).



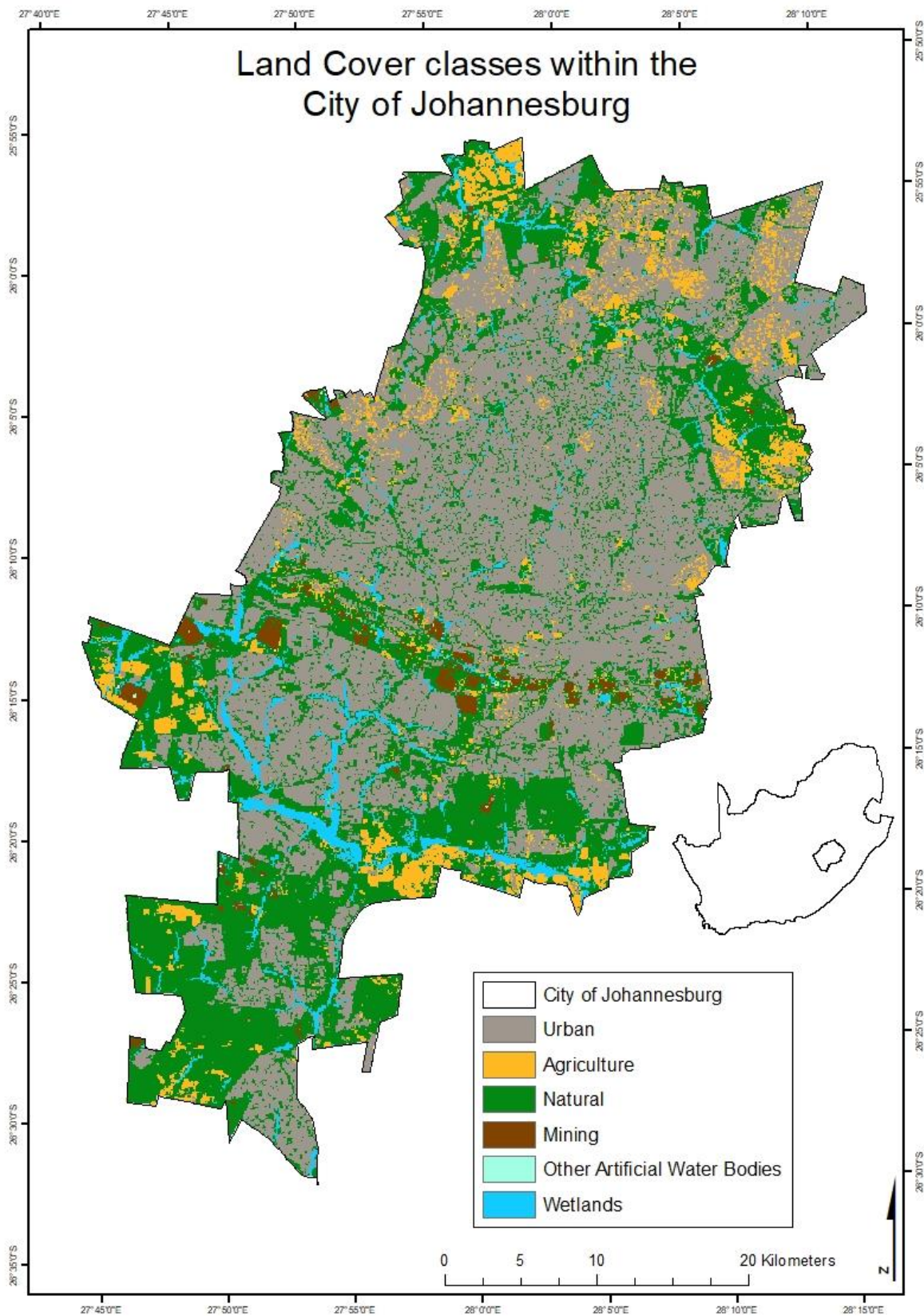


Figure 4: Land cover in the City of Johannesburg (Geoterrimage, 2014)

## SOCIAL AND ECONOMIC ACTIVITIES

Johannesburg is generally perceived as the 'economic hub' of South Africa, and the sub-Saharan region more broadly. Johannesburg is South Africa's largest metropolitan municipality in terms of population, size and diversity of its economy (contributing around 15% of national Gross Domestic Product (GDP) in 2016), as well as the number of jobs its economy provides (2.04 million employed people which is 41.64% of the total employment in Gauteng) (City of Johannesburg IDP, 2019).

Population growth and rapid and unregulated development are major driving forces behind the degradation of ecosystems and natural resources in the City. There are large pressures for land for new developments and increasing pressure to provide infrastructure for the growing population. There are still high levels of unemployment and the resultant high levels of poverty evident in the Province (CoJ SoER, 2009).

The provision of housing is one of the foremost drivers of the current state of the environment of the city (SoER, 2009). Much of the low-cost housing has been built in low-density developments on the outskirts of the city. This has increased the loss of natural land cover and increased the impact of infrastructure systems on the city.

## NATURAL ASSETS

Natural Assets are elements or features of nature (for example, forests, parks, rivers and mangroves) that represent stocks of natural capital from which goods and services flow. By valuing urban natural assets and the associated goods and services, cities can recognise opportunities to enhance and unlock social, economic and spiritual benefits. Natural assets in cities are increasingly regarded as providing opportunities for nature-based solutions to urban problems. For example, the provision of urban green infrastructure to reduce high temperatures and reduce air pollution and wetlands that function as wastewater filters and reduce exposure to hazards. Natural areas in cities are not always thought of as having biodiversity conservation as a primary goal, but they have the potential to provide additional co-benefits when biodiversity is enhanced. Cities can play a role in creating such co-benefits. Incorporating biodiversity aspects when designing for and enhancing urban nature is therefore important because biodiversity improves the stability and resilience of ecosystems on which humans depend. The sections below will detail the natural assets and the current state of these resources in the CoJ.

## THE BIODIVERSITY ASSESSMENT

The CoJ completed a Biodiversity Assessment as the first part of the LAB process during 2009. The aim of this assessment was to establish a sound understanding of the status quo of biodiversity in the municipal area. In some cases, the data collected in 2009 is the most recent data available to guide strategic planning. In other cases, there is updated data that has since been reported. For purposes of this LBSAP, the most up-to-date data in each instance was given preference, although a significant portion of this LBSAP is informed by data emanating from the 2009 Biodiversity Assessment.

The Biodiversity Assessment found that despite its ever-increasing urban expansion, Johannesburg is still home to a variety of natural assets and biodiversity, such as the Melville Koppies, which remain intact. It is also one of the few remaining cities with river systems that are still connected. Johannesburg's streams are also the source of two of southern Africa's mightiest rivers – the Limpopo and the Orange. The City has an array of well-maintained parks, urban trees, residential gardens and resources such as its nature reserves, a zoo and a botanical garden.

## FLORA

The natural historical vegetation covering the CoJ consisted mainly of grasslands, with a small element of savannah, interspersed by riparian and wetland vegetation. From a biodiversity point of view, the flora in CoJ is highly compromised. A large proportion of the habitats in the CoJ have been transformed and, for some vegetation types, only small proportions may remain of the original extent.



**Figure 5: Grassland vegetation in Glen Austin**

The CoJ contains 8 vegetation types, 1 of which is critically endangered, 1 endangered, 2 vulnerable and 4 are classified as least concern (NEMBA list, SANBI 2018) (figure 8). Of those vegetation types occurring within the CoJ, Egoli Granite Grassland, classified as a critically endangered vegetation type, is considered to be the highest conservation priority. The CoJ has a significant responsibility with respect to conservation of this vegetation type due to the fact that a large proportion of this vegetation type occurs within the municipal area (Driver et al, 2005). This LBSAP highlights the urgency of protecting the remaining intact areas of grasslands, as well as many other irreplaceable natural areas. The types of vegetation within the CoJ are listed below and are illustrated in figure 9:

- Soweto Highveld Grassland
- Rand Highveld Grassland
- Andesite Mountain Bushveld
- Carleton Dolomite Grassland
- Egoli Granite Grassland
- Gauteng Shale Mountain Bushveld
- Tsakane Clay Grassland
- Gold Reef Mountain Bushveld



Johannesburg has what is considered one of the world's largest urban forests (JUFA, 2019). According to the Johannesburg City Parks, there are about ten million trees in Johannesburg, most of which are in private gardens (JUFA, 2019). The CoJ further contains a disproportionately high percentage of rare and threatened species and threatened ecosystem compared both to the rest of the Gauteng Province and to South Africa as a whole. This is a consequence of the combination of its topographic and geological diversity resulting in a diversity of habitats (which will in turn support a diversity of species) and the high level of habitat transformation that characterises the bioregion. The City contains two of South Africa's nine biomes, namely the Grassland and Savanna biomes



**Figure 6: Johannesburg has one of the world's largest urban forests.**

A total of 1 374 plant species have been previously recorded within the CoJ. The City contains 12 out of 41 threatened plant species recorded in Gauteng, 3 threatened and special concern mammal species and 3 threatened invertebrate species. Eight vulnerable bird species and four 4 near threatened species are particularly reliant on the Gauteng region, and a number of others also occur occasionally. Seven of these bird species are found in the CoJ (EISD, 2018). This is relatively high species richness and indicates high habitat diversity and geographical variation in species composition. Factors that promote high species richness include geological and topographical variation (different slopes, aspects, and surface rockiness).

There are twenty-seven Red List or Orange List plant species that occur in the general geographic area, of which nine have a high chance of occurring there or have been previously there and twelve species for which there is a moderate chance of them occurring there. A preliminary qualitative assessment of which habitats are important for the conservation of threatened plant species indicates that the most important habitats are the koppies and ridge habitats and wetland habitats. Habitats for threatened plant species should be carefully managed to ensure that none of these species become extinct or are categorised into higher threat categories.



**Figure 7: Grassland vegetation and ridges in Kloofendal**

Ridges and hydrological systems are considered to be important for the maintenance of ecological processes. Ridges are characterised by high spatial heterogeneity (various different habitats) due to the differing aspects (north, south, etc), differing altitudes, differing soils, different lighting conditions and different hydrological conditions. This spatial and topographical heterogeneity results in a high biodiversity in these areas as compared to surrounding flat areas. These areas should be carefully managed in order to maintain linkages between ecosystems and to limit habitat loss within this most diverse part of the landscape.

Areas underlain by dolomite tend to have high local species richness. There are few threatened plant species restricted to this vegetation type in the CoJ and Carletonville Dolomite Grassland is not considered to be threatened, but it is important for biodiversity conservation within the CoJ that conservation of these areas takes place.

It is essential that remaining indigenous riparian zones are protected within the Municipality to ensure that the essential functions that this vegetation provides can continue. In areas where vegetation has been cleared in a riparian zone, rehabilitation measures will be required to reinstate the functioning of the riparian zone. Alien vegetation needs to be cleared along riverbanks and replaced with indigenous species.

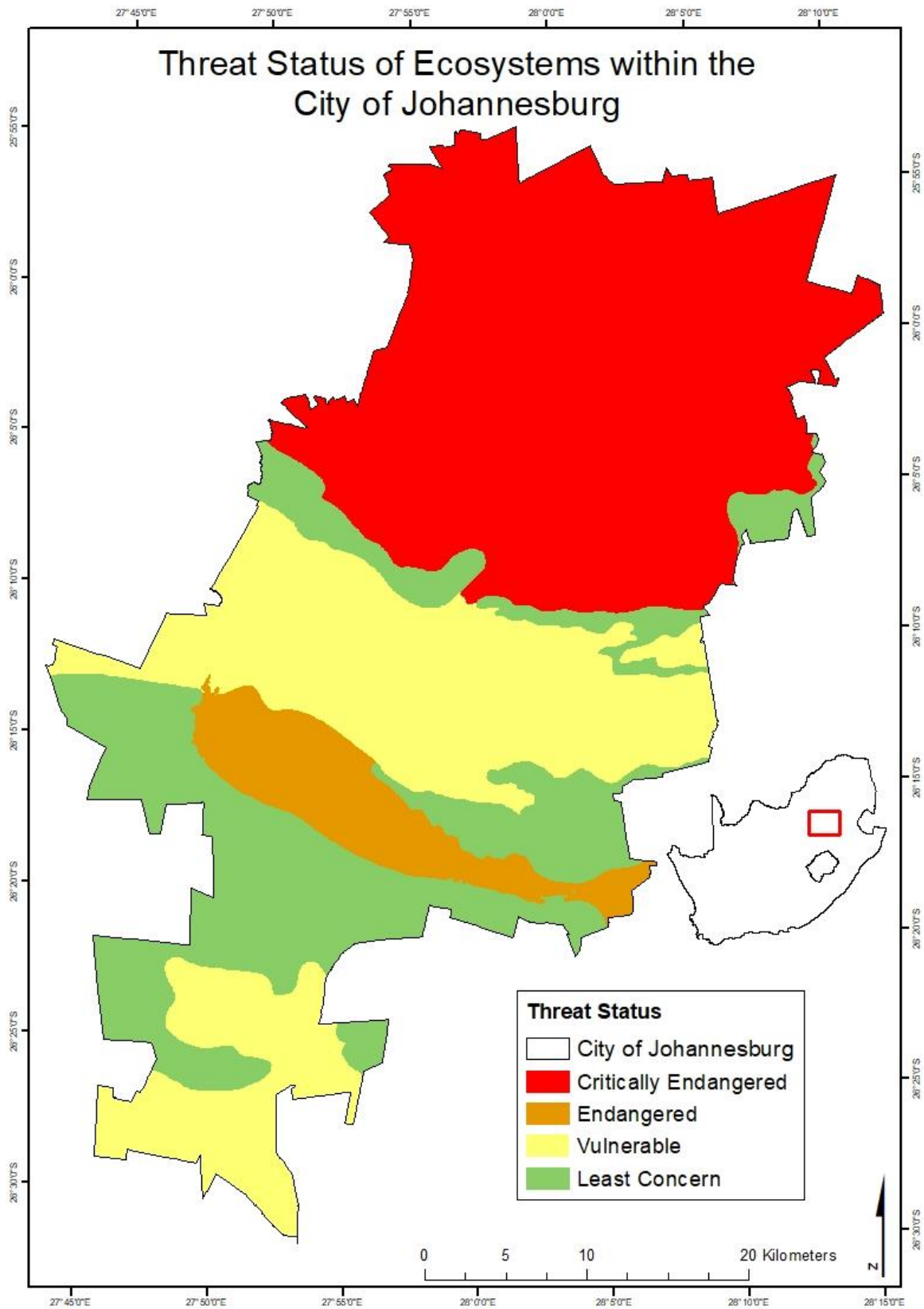


Figure 8: Threatened Ecosystems in the City of Johannesburg (NEMBA list, SANBI 2018)

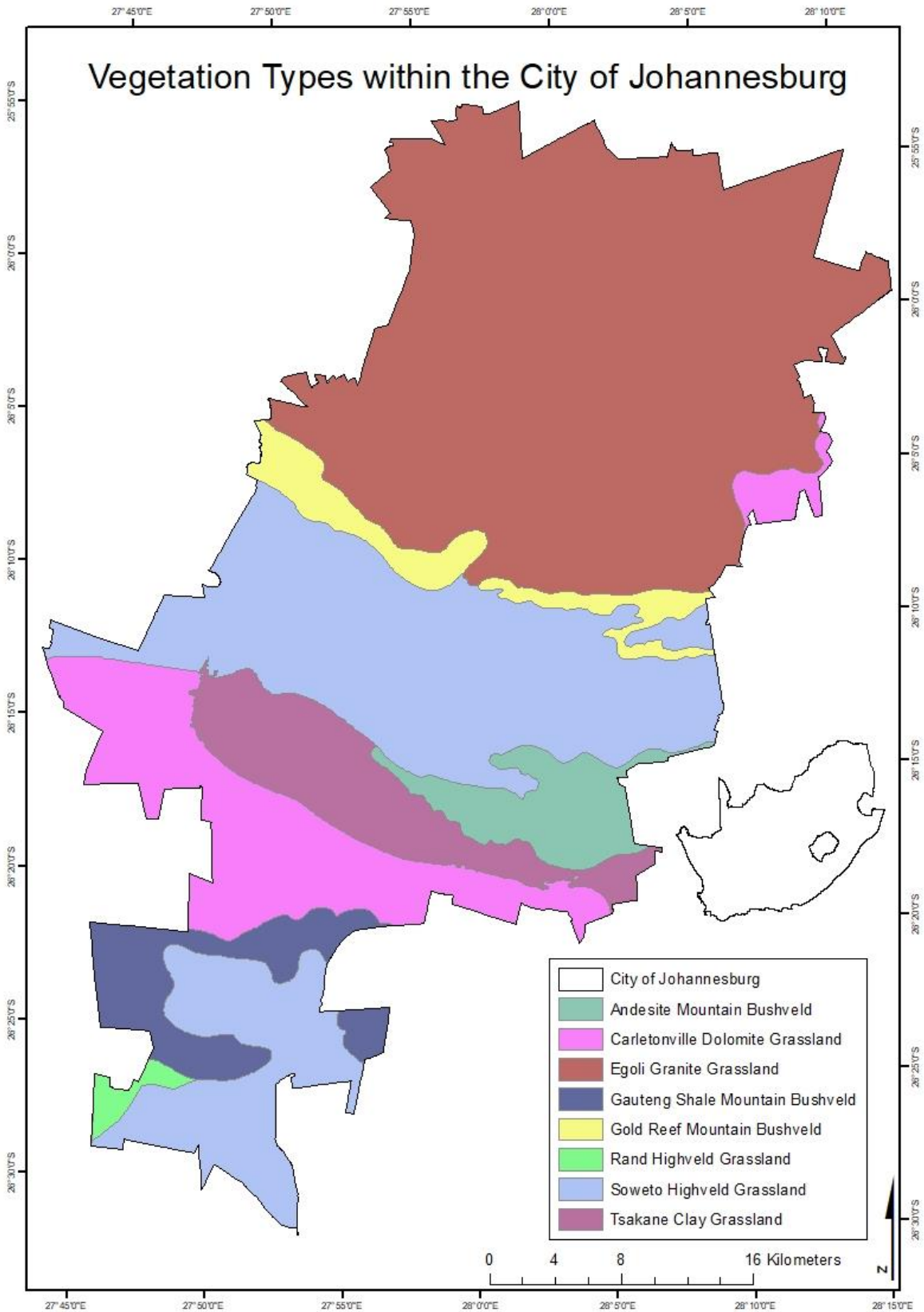


Figure 9: Vegetation types in the City of Johannesburg (SANBI, 2018)

## SURFACE WATERS

The CoJ incorporates the border of the two watersheds between the Atlantic and the Indian Oceans. There are a number of key rivers and wetlands in the CoJ municipality, which make up its hydrological system (figure 10). The major river systems represented within the CoJ boundary include the Jukskei River and the main tributaries of the Klein Jukskei, Modderfonteinspruit, Braamfonteinspruit and Sandspruit. The occurrence of wetlands in the CoJ is related to the drainage systems. Overall, the occurrence of wetlands has been significantly affected by transformation associated with urban development, with many wetlands in the City having been destroyed (especially in the case of hillslope seepage wetlands) or significantly transformed to the degree that they are no longer effective-functioning wetlands.

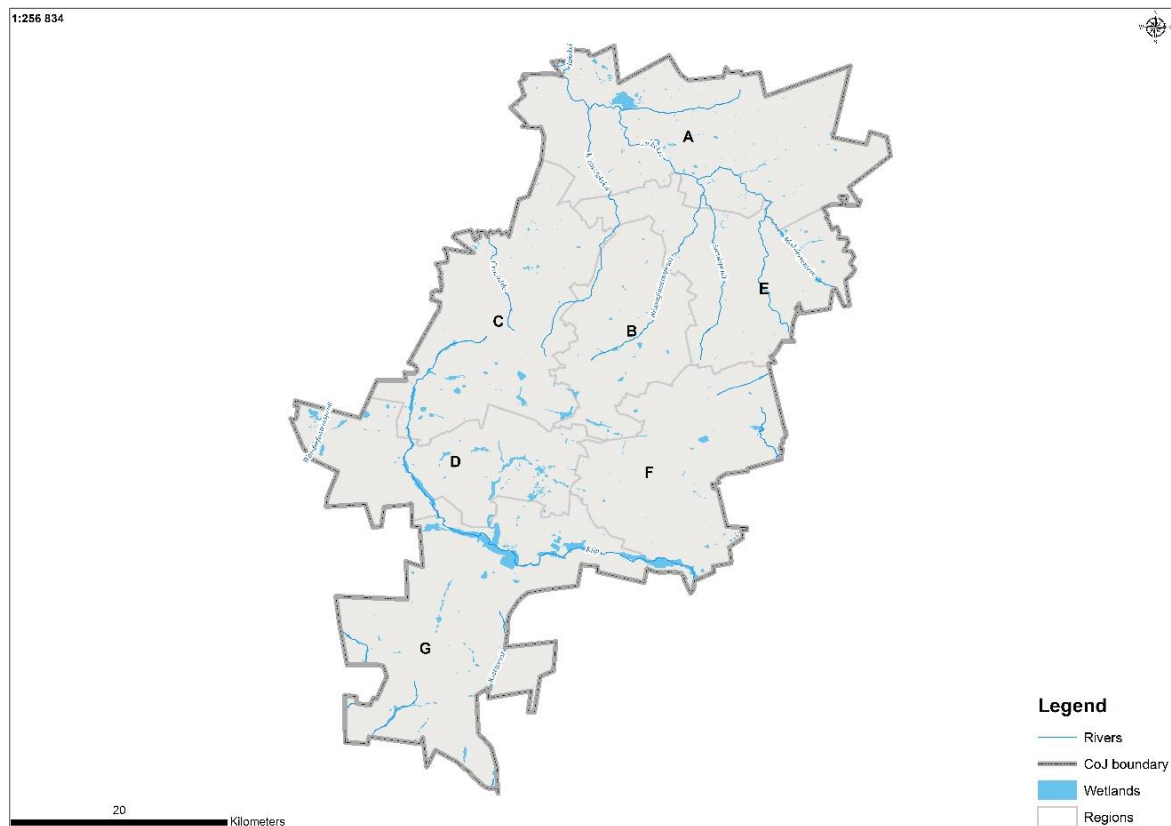
The metropolitan area of the CoJ does not represent a significant proportion of any water supply catchment. It covers a very small proportion of the catchment of the Crocodile River that feeds the Hartbeespoort Dam, and even a smaller proportion of the catchment that contributes to the Vaal River Barrage. Effluent from the metropolis does, however, represent a major contributor to the water quality problems experienced by these suppliers.

The CoJ suffers a high degree of negative ecological impacts and environmental pressures through an ever-increasing population density. Service delivery in terms of supplying potable water and water-borne sewerage disposal systems that can adequately cater for the needs of this influx of people remains a significant challenge to the CoJ. Poverty of many of the rural communities has led to the establishment of informal settlements and overloaded (and often failing) present infrastructure means that rural people are ever reliant on natural resources to satisfy their basic every day service needs for consumption as well as waste disposal. This situation has placed large pressures on surface waters throughout the region and has ultimately lead to a situation whereby none of the surface waters within the CoJ are fit for consumption, with many of them being regarded as having either chemical or bacterial contents that constitute a serious human health risk. Contamination of the surface waters from large industries has also further degraded aquatic ecosystems throughout the CoJ. As such, the water bodies in the CoJ are only just able to support only the most tolerant of aquatic biota, thereby posing an increasing threat to the quality of the natural environment. It is therefore imperative that sewerage infrastructure be upgraded and failing infrastructure be repaired and adequately maintained to protect the surface water resource throughout the CoJ, and that surface waters be safeguarded against harmful pollutants and the effects of unsustainable production and consumption patterns. There is an urgent need to upgrade the wastewater treatment works in the municipality so that they can be managed well within their capacity loads to ensure that negative ecological impacts are minimized by reducing the overall bacterial and chemical contamination of the receiving waters.

The majority of the riparian zones of river systems within the Municipality have been transformed for several reasons. Riverine habitats in the COJ were found to be readily subjected to physical alterations in the form of impoundment structures that effectively act as migratory barriers to aquatic biota. These impoundments are in the form of low-level bridges, weirs or culverts. The isolation of fish communities and the fact that fish cannot exploit suitable upstream habitats for breeding purposes is regarded as one of the greatest long-term threats to fish conservation.



Ensuring that riparian zones and their surrounding habitats are restored should be an urgent priority, in order to sustain the biodiversity that these assets are home to.



**Figure 10: Wetlands and rivers in the City of Johannesburg**

## TERRESTRIAL HABITATS

As stated, the CoJ (the high central plateau/Highveld) is mainly made up of grasslands, and thus falls within the grassland biome. The highly urbanised character of the CoJ however, means that the encroachment into otherwise natural habitats for the purpose of urban expansion has placed great pressure on the terrestrial habitats that potentially support Red Data Listed (RDL) biota within the region. Natural grasslands do, however, still exist, albeit scarcely and fragmented, that remain important areas for biodiversity conservation and these areas should be preserved to conserve the RDL species that occur within the region. Rocky ridge habitat found throughout the CoJ was also found to retain the ecological processes capable of supporting a high biodiversity, especially RDL species. These areas should also be conserved to preserve this ecological functionality.

## OPEN SPACES

The Joburg Metropolitan Open Space System (JMOSS) is a system which addresses the management of the natural open space resources in the municipality. JMOSS is regarded as a tool to conserve and protect biodiversity in development planning and implementation processes.

Open spaces provide environmental, social and economic benefits to society. On the one hand, open space resources have intrinsic value and support ecological functions such as providing habitats for biodiversity, helping to improve the microclimate and air and water quality, recharging groundwater, managing urban drainage, preventing flooding and mitigating the impact of disasters, supporting food security, and climate change mitigation and adaptation. On the other hand, open spaces also contribute to human development by providing for the socio-economic needs of communities in the form of recreational parks, and the preservation of areas of natural scenic beauty or cultural value. Open spaces further underpin and promote other sustainable initiatives, such as non-motorized transport, eco-tourism, and the promotion of investment through enhancing the visual amenity and image of the city, to name a few. Hence, the conservation and management of open spaces and integrated landscape planning is necessary to secure the natural capital and ecosystem goods and services provided by the City's open spaces and underpins a range of GDS outcomes and outputs such as sustainable human settlements, improved environmental protection and climate change resilience, and infrastructure supportive of a low carbon economy.

## AREAS REQUIRING ATTENTION

It should be said upfront that the quality and extent of the remaining nature in the CoJ presents a significantly unique case. The CoJ's Critical Biodiversity Area (CBA) map 2019 (figure 11) which is based on the Gauteng C-Plan version 3.3 (2011), highlights areas which contain important biodiversity assets which require protection. The Gauteng C-Plan 3.3 has been crucial to the determination of important areas within the COJ. The C-Plan utilises data gathered for various areas within Gauteng to determine which areas are important or irreplaceable. These areas have been identified due to important ecological services that they provide as well as the presence of Red Data fauna or flora. However, since the 2011 C-Plan does not reflect the rapid land use changes that have taken place in recent years and the true current extent of the CBA network, an update to the CoJ's C-Plan has been long overdue. The revision of the 2019 CoJ bioregional plan occurred in parallel to the development of this LBSAP. Through the Bioregional Plan review process, the South African National Biodiversity Institute (SANBI) undertook extensive technical updates to many of the datasets that informed the maps in the 2019 Bioregional Plan and updated the CBA and its supporting maps through a systematic biodiversity planning process. The rationale for undertaking this exercise was the fact that in order to maximise the CoJ's potential to meet biodiversity targets, a reconfiguration of the remaining natural areas was necessary. The updated CBA map for the City of Johannesburg can be seen in Figure 11 below.

Johannesburg is unique in that the remaining extent of its natural areas are almost all required to meet biodiversity targets. The COJ has reported a concerning reality in that it is often the case that CBAs and Ecological Support Areas (ESAs) are lost as a result of development at the land use application level. This is concerning, given that there are very little natural assets left to replace them with. On the current trajectory, with losses occurring through development applications, the City is headed for a situation whereby they will begin to lose critical natural assets that are, in many cases, irreplaceable. It is therefore the intention that the City's bioregional plan be a tool to guide decision-making to reverse the current trajectory for the benefit of all species in the COJ, with this LBSAP being an integral tool for the EISD to implement actions that protect these natural assets.

Another major concern is the number of ridges that are located in areas which are becoming more and more isolated regardless of their sensitivity. In addition, a large portion of the areas which are important for ecological processes are located in heavily transformed stretches of the CoJ. Special attention needs to be placed on these areas in order to ensure that these processes are retained. Several of the municipal parks within the CoJ are located within areas which are considered to have a high conservation priority. Improved landscaping (i.e. plant choices and maintenance practices) and improved ecological functioning of these areas is thus important to maintain linkages and improve functionality.

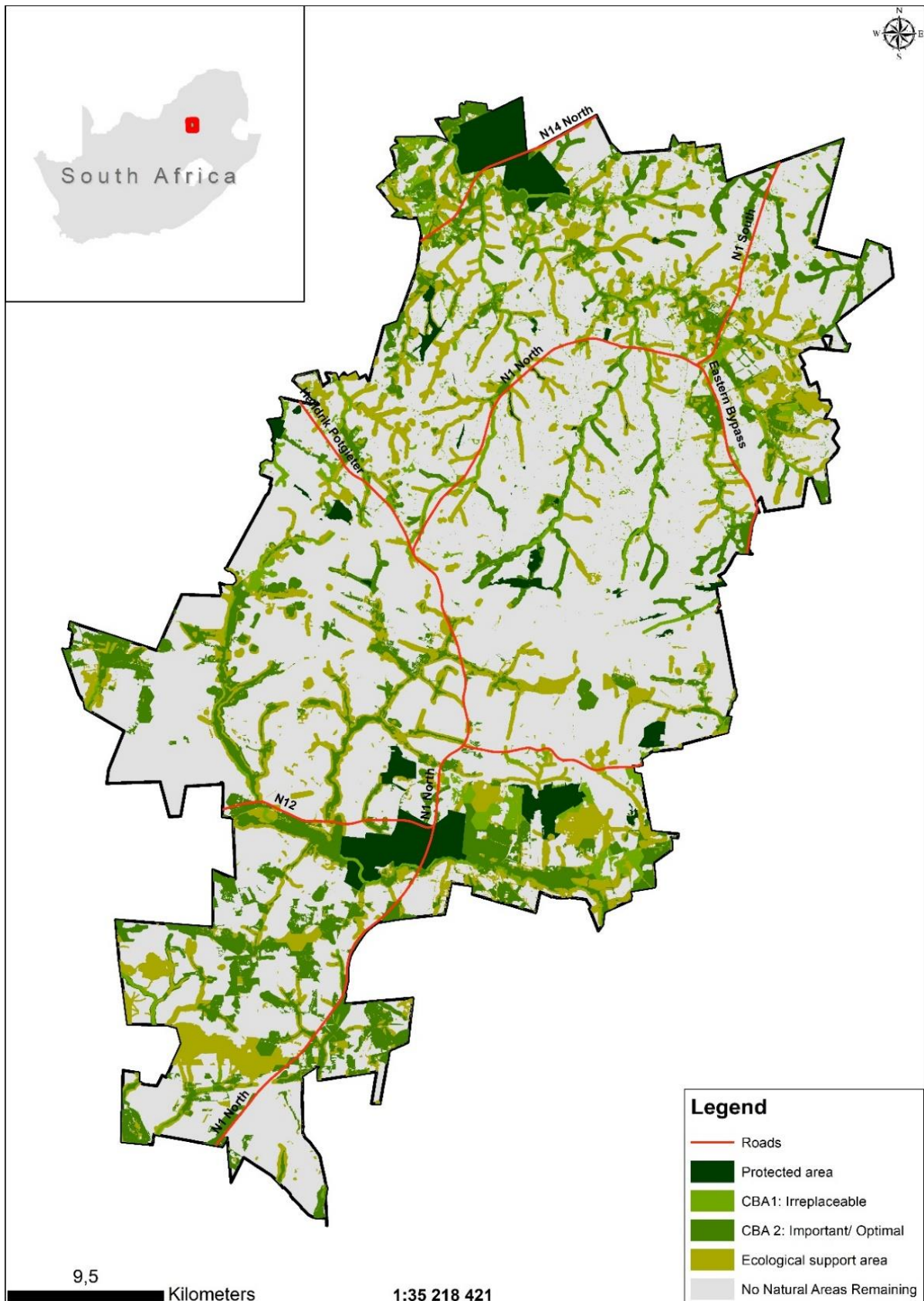


Figure 11: Critical Biodiversity Area Map for the City of Johannesburg

## KEY THREATS TO NATURAL ASSETS IN JOHANNESBURG

Like many other cities, the CoJ is densely populated and the natural land cover continues to experience significant transformation. The threats to biodiversity in the CoJ are arguably stronger than any other municipality in the Gauteng province, due to land use development pressures that seek to position the CoJ as the leading metropolitan municipality in the country and the “gateway to Africa” as a city of global significance. As such, biodiversity in the CoJ has often taken a backseat in favour of development and has left very few tracts of vegetation intact, and even where they are intact, they are often fragmented and not coherently connected or linked. However, this argument does not meaningfully acknowledge the fact that biodiversity and its associated ecosystem services are the very foundation on which all development and land uses depend, thereby indicating that the current trajectory is self-destructive. There are many key threats to biodiversity, that are driving the loss of natural assets within the CoJ, including urban development, infrastructure, informal settlements, climate change, invasive species and pollution.

### *Urban Growth and Development*

Increasing urban growth currently being experienced within the City is posing a major threat to the remaining biodiversity as intact habitats and the quality of the natural environment continue to rapidly diminish and deteriorate. High migration and urbanisation rates and inappropriate development, in the form of urban sprawl, to accommodate a rapidly growing urban population constitute the greatest threats to remaining biodiversity in the City. However, this is ironic in the sense that growing populations require more nature to secure the health of their urban futures. The Metropolitan Municipalities of the Gauteng Province are home to a high proportion of South Africa’s mining activity, heavy industry, commercial enterprise and urban population. The pressures placed on the natural environment and the remaining natural ecosystems are particularly high, and the loss of natural habitat and ecological processes has been seemingly unavoidable. Urbanisation further causes fragmentation of natural habitats, exposing flora and fauna to greater negative impacts, including higher prevalence rates of invasive alien species, pollution and other disturbances. In turn, these impacts lead to declines in urban biodiversity species populations and increased extinction risks. Loss of key species, such as insect pollinators for example, can then lead to lack of seed production in plants, and decreased food security.

### *Infrastructure*

As urbanisation rates increase across the world, cities will have to invest heavily in social and economic infrastructure, services, logistics and mass transit in order to cater for this demand. The CoJ still has to meet its current infrastructure development and service delivery demands and provide services to the less privileged in the communities. Key focus areas will be on proving the quality of infrastructure through increased repairs and maintenance of basic infrastructure; provision of housing and in investing in improving the circumstances in informal settlements (City of Johannesburg IDP, 2019). For a number of years, development has enjoyed priority over conservation in the City. Inappropriate siting of roads and railways has partly led to loss of riparian and in stream wetlands as well as degradation of natural areas (COJ SOER 2003).

Increased infrastructure places significant pressure on the natural environment. While the City can no longer manage its natural environment as a pristine resource, due to existing and planned demand for development, the City has an obligation to ensure the impact on its built and natural environment is minimised, both from the City's own operations, private developments and from communities at large. Furthermore, nature-based solutions and green infrastructure systems have the potential for meeting both socio-economic and environmental targets.

### *Informal Settlements*

A key challenge faced by the City is the limited availability of low-cost housing. As Johannesburg continues to attract migrants, with an estimated 25% from outside Gauteng and 10% from outside South Africa, the housing backlog is conservatively estimated at 300 000 units with an average delivery of only 3 500 housing units per year. This shortage has in part led to the development of over 180 informal settlements, which further complicates the City's infrastructural challenge. Coupled with unequal development of the past, the result is that the residents of informal settlements do not enjoy the same service standards received by more affluent communities. Uneven service delivery can, in part, be attributed to the rapid growth of these communities due to increasing inward migration, rapid urbanisation, and the associated growth in the number of households which require services (City of Johannesburg IDP, 2019). The increasing prevalence of informal settlements is having a disastrous effect on the natural assets of the city, the quality of the natural environment, and the ability for nature to deliver the services that these informal populations so desperately need. Infrastructural challenges in these communities increases the pressure on nature and significantly diminishes its ability to absorb the effects of insufficient services and infrastructure provision, such as increased pollution.

### *Climate Change*

Climate change itself is not a direct driver of biodiversity loss. Rather, the loss of nature and biodiversity in and around urban areas is a contributing factor to climate change and is exacerbating its negative impacts on people and cities. Nature is our most effective tool in the fight against climate change, as it holds the greatest potential for delivering both mitigation and adaptation outcomes. In essence, the global biodiversity and climate change crises are two sides of the same coin, with complex back and forth linkages between them. The CoJ is amongst the biggest emitters of greenhouse gases in South Africa mainly from industrial activity, transport and residential areas. Anticipated future minimum and maximum daily surface temperatures are expected to be higher than they are at present. Climate risks such as heat wave-related deaths; heavy downpours and flood risks; water and energy demands; and disease vectors are becoming more prevalent. In addition, natural resources scarcity including water shortages projections by 2019 and acid mine drainage also poses further risks to already polluted resources, infrastructure and the health of citizens.

The CoJ has an important role for supporting a range of ecological processes which are critical for ensuring long term persistence of biodiversity and the delivery of ecosystem services, especially in the context of climate change. Protection of intact natural habitat in an ecologically



viable configuration (as would be achieved by implementing the Bioregional Plan) should be the primary climate change adaptation approach taken by local authorities, with the potential to deliver multiple benefits to ensure the resilience of urban areas and human populations.

### *Invasive Species*

Invasive Alien Plants (IAPs) have major economic, environmental and social impacts. In South Africa, invasive alien plants are the greatest threat to biodiversity after habitat destruction. Once invasive species dominate an area, most natural vegetation is displaced or out shaded. This is because they spread rapidly and become abundant in their non-native habitats. Invasive Alien Plants largely threaten native biodiversity; water security; the ecological functioning of natural systems as well as the productive use of land (Henderson, 2001).



**Figure 12: Lantana's are one of the common alien plants found in South Africa (JCP, 2019).**

Common alien plants found in South Africa are bugweed, lantana and wattle trees. The Johannesburg City Parks (JCP) has encountered these resilient plants consistently over the years, and has run many programmes and initiatives, often in association with national and provincial departments, in an attempt to eradicate these plants.

Effective invasive alien species management is an essential part of the sustainable management of natural resources and the CoJ is currently in the process of revising its alien invasive strategy to strengthen the analytical and prioritisation aspects of the plan and also to place greater emphasis on implementation planning.

More recently, an alien invasive species known as the polyphagous shot hole borer beetle, a native of Southeast Asia, has found its way to South Africa and is infesting and killing trees around the country at an alarming rate. The beetle, which is smaller in size, is a major threat to Johannesburg's trees and urban forest (JUFA, 2019).

### *Pollution*

All forms of pollution pose a serious threat to biodiversity. The main forms of pollution in the CoJ are air, water and waste. Industrial activity, veld fires, coal-fired stoves in residential areas and vehicular emissions are major contributors to deteriorating air quality in the City. Pollution from burning fossil fuels such as oil, coal and gas can remain in the air as particle pollutants or fall to the ground as acid rain. Acid rain, which is primarily composed of sulfuric and nitric acid, causes the acidification of lakes, streams and sensitive forest soils, and contributes to slower forest growth and tree damage at high elevations. In addition, fertilisers and other chemical pollutants such as pesticides and herbicides leach into soils and waterbodies and can also lead to eutrophication. Eutrophication is a serious environmental problem since it results in a deterioration of water quality. Furthermore, illegal dumping of waste in the CoJ's open spaces

is one problem that calls for serious intervention. The City produces approximately 1.8 million tons of waste each year, the bulk of which ends up in landfills, yet the City is running out of landfill sites. Development, consumerism and population growth are the key contributory factors to ever increasing waste generation in the City. This requires strategic interventions that preserve natural resources for use by future generations (City of Johannesburg IDP, 2019). This also presents opportunities for the development of closed-loop systems and points to the need for more sustainable consumption and production patterns. The natural environment has the potential to clean our air, water, and even absorb our waste, but its capacity to provide these services is largely determined by the prevalence, quality, and ecological limits and tipping-points of the natural environments that support urban areas and the degree to which urban populations live and consume responsibly.



## PART 2: POLICY AND LEGISLATIVE CONTEXT AT A VARIETY OF SCALES

There is an extensive set of local, regional, national and international policies, commitments, treaties, guidelines, and legislation that exists with which this LBSAP for Johannesburg should align. Many of these have either a direct or indirect effect on this LBSAP and its implementation. The CoJ is, in many instances, legally or morally bound to align, integrate, and/or consider the policy and legislative framework within which the EISD, and other CoJ departments, operate in implementing this LBSAP.

In addition to the range of national legislation that aim to protect biodiversity and regulate planning, there is an impressive range of corporate, biodiversity and sector policy frameworks, at policy local and provincial level, include the Biodiversity Assessment (2009), State of Environment Report, CoJ Wetland Audit and Wetland and Riparian Protection and Management Plan (2009), CoJ Catchment Management Policy (2009), Gauteng Conservation Plan (2001), CoJ Growth and Development Strategy 2040, Integrated Development Plan (2017 – 2022), Municipal Spatial Development Framework, Bioregional Plan (currently being finalized), State of Rivers Reports (2017), CoJ Critical Biodiversity Area Network Management Recommendations (2017), Environment and Infrastructure Services Department Business Plan 2018/2019, Gauteng Protected Area Expansion Strategy (2013), Gauteng Environmental Implementation 2015, Climate and Adaptation Plan 2009 (currently being reviewed) and the Invasive Alien Species Strategy (currently being reviewed).

Appendix A (the policy and legislative framework) will highlight and provide an overview of existing CoJ, Gauteng, national, and international policies, legislation, and guidelines that are related to nature, influence this LBSAP, and guide natural asset management in the City, for the purposes of understanding the context in which this LBSAP is situated.

## PART 3: VISION AND GUIDING PRINCIPLES FOR THE STRATEGY

This section articulates the overarching vision, mission, as well as guiding principles and objectives to achieve the vision.

The CoJ envisages “An environmentally sustainable city, that anticipates, manages and reduces its vulnerability to potential global and local environmental shocks, and works consistently to reduce the impact of its own built environment and urban processes on the broader envelope of natural resources.”

### OVERALL VISION AND MISSION FOR THE CITY

**Vision:** A Johannesburg where people and nature are connected and valued.

**Mission:** Our mission is to: Protect and mainstream nature, promote its benefits, and deliver nature-based solutions for the benefit of current and future generations, as the foundation of our city’s sustainability, resilience and liveability.

### STRATEGIC OBJECTIVES

**Strategic Objective 1:** An enabling policy and legislative environment that integrates all aspects of nature and biodiversity into the City’s planning & policy frameworks.

**Strategic Objective 2:** Enhanced institutional effectiveness and efficiency, ensures good governance of all aspects of nature and biodiversity in the City.

**Strategic Objective 3:** Reduced impacts of threatening processes on all aspects of nature and biodiversity, enhanced ecosystem service provision and improved social as well as economic security through an integrated management approach.

**Strategic Objective 4:** Human development and well-being is enhanced through sustainable use of nature and biodiversity, as well as the equitable sharing of their benefits.

**Strategic Objective 5:** Local conservation targets are met through a network of protected areas and key ecosystems in the City and contribute to provincial and national targets.

**Strategic Objective 6:** Raise awareness & build capacity about the value of nature & biodiversity to city functioning across all departments, regions & municipal entities, as well as other sectors of society.

## **GUIDING PRINCIPLES**

1. The remaining natural ecological spaces should be kept in their natural condition, remain intact and functioning optimally. These spaces provide valuable ecological goods and services to the City and intervention can reduce their value.
2. Build institutional capacity and develop partnerships with society (community structures, Community Based Organisations (CBOs) and Non-governmental organisations (NGOs)). Develop and encourage networks and learning within the city departments. All departments and entities can play a role in enhancing and maintaining biodiversity, no matter how small or seemingly unrelated (e.g. Pickup, JRA, Johannesburg Property Company (JPC)). Partnerships are essential to successfully implement conservation goals.
3. Biodiversity is a common, shared good (or public asset) and the City should take collective responsibility for the ecological goods and services provided by biodiversity.
4. Engage local communities for the conservation and management of the remaining natural areas in order to harness existing local knowledge and raise awareness of biodiversity issues.
5. Think globally and act locally. Ecological processes are not confined to city administrative boundaries and wards and are connected throughout the city (for example, rivers systems and ridges). Various policies and strategies support this interconnected and integrative approach such as the C-Plan, Bioregional plan, Catchment Management Policy, Wetlands audit, and so forth.
6. Align with other plans and initiatives being undertaken by the city, NGOs or communities. It is better to contribute to and complement other policies and plans, add to existing initiatives and recognize existing projects, rather than creating new initiatives. (for example, owl boxes, bat boxes at schools)
7. Use best available science and knowledge. Biodiversity science is a relatively new science that is continually developing and evolving, use the best available knowledge for urban biodiversity and principles of sustainable development.
8. Balance public interest and private interests of property owners. Successful biodiversity management and use requires a balance between the public interest and the rights and responsibilities of individual property owners.
9. Promote the city's open space framework (OSS) and ecological network (including ecosystem goods and services) as the context to which urban development must be tailored.
10. Use innovative approaches to protect and integrate biodiversity into city management.

## PART 4: THE ACTION PLANS

This section provides details of the various action plans that's the CoJ will undertake to meet the vision and strategic objectives set out in Part 3 over the next five years. These action plans include considerations around the broader strategic issues relating to the nature and biodiversity in the CoJ; mainstreaming of biodiversity into the City's plans and processes; issues of governance and institutional arrangements that would enable the biodiversity strategy and action plans; action plans related to environmental education and awareness to raise the profile and understanding of the role of urban biodiversity within the City; and specific implementation considerations for biodiversity within Johannesburg. Finally, there are a specific set of actions that relate to the control and removal of invasive alien plants within the City.

The following is a table which contains the set of action plans for each strategic objective above. The action plans provide detail on specific actions, the responsibility and timeframes for each action, the resource needs in relation to each action, and the indicator to measure progress and success for purposes of monitoring and evaluation. In essence, the action plans lay out the work plan for the EISD in terms of its strategic priorities over the next five years. These action plans were co-developed through an extensive collaborative and participatory process with a range of stakeholders from EISD and other key departments in the CoJ.

### Timeframes for Action Plans

<b>Short</b>	1 – 2 years: Actions are to be planned or completion from 2019-2020
<b>Medium</b>	2 – 3 years: Actions are to be planned for completion from 2020-2021
<b>Long</b>	3 – 5 years: Actions are to be planned for completion from 2021-2023
<b>Onward</b>	Actions that underpin the implementation process and are incorporated into annual planning and budget processes

**Table 3: Table of Action Plans with Priorities, timeframes and responsible departments**

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
<b>Strategic Objective 1: An enabling policy and legislative environment that integrates all aspects of nature and biodiversity into the City's planning &amp; policy frameworks</b>				
1. Identify & develop appropriate tools to protect priority areas of natural & biodiversity value	Water and Biodiversity Unit	Short term	Staff and financial	These tools are identified in a consolidated list  These tools are developed (e.g. BRP)
2. Mainstream these tools across all City planning processes & policy frameworks	Water and Biodiversity Unit, Strategic Coordination, Impact Management	Short term onward	Staff Time	Up-to-date tools incorporated in LUMS, SDF and IDP maps  Number of development applications where the outcome favoured the protection of nature and biodiversity assets (represented spatially)
3. Keep track of new tools and developments in the sector	Water and Biodiversity Unit	Short term onward	Staff Time	New information e.g. post 2020 biodiversity targets are incorporated in new tools (qualitative reporting)
4. Integrate nature and biodiversity in the city's budgeting processes	Water and Biodiversity Unit	Short term onward	Staff and financial	Biodiversity priorities reflected on the city budget
5. Develop, promote, and implement sound environmental protection	Water and Biodiversity Unit	Medium term	Staff Time and Financial	Identify priority areas for management plan development

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
and enhancement policies (management plans? Where?)				Number of management plans developed for priority areas
<b>Strategic Objective 2: Enhanced institutional effectiveness and efficiency, ensures good governance of all aspects of nature and biodiversity in the City</b>				
1. Use existing, and where necessary establish appropriate, transversal structures / forums within the City (e.g. s79 & Cluster committees etc.) to ensure coordinated & integrated action	Water and Biodiversity Unit	Short term onward	Staff Time	Nature and biodiversity are prioritised in inter-departmental discussions and decision making in existing transversal structures New structures are created to support transversal considerations for nature and biodiversity (eg bilaterals with land user departments and entities)  Number of annual transversal meetings/workshops where nature and biodiversity are prioritised on the agenda
2. Use existing inter-governmental structures to ensure coordinated & integrated action (IGR)	Water and Biodiversity Unit, Strategic Coordination	Short term onward	Staff Time	Coordinated and integrated action is proven through strengthened IGR relating to nature and biodiversity

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
				Number of annual IGR meetings/workshops where nature and biodiversity are prioritised on the agenda
3. Use existing, and where necessary establish, appropriate forums for citizen (including CBOs & NGOs) and private sector participation; and set out rules of engagement	Water and Biodiversity Unit	Short term onward	Staff Time and Financial	Forums are identified and/or established and citizens and the private sector are engaged  Rules of engagement are developed and shared with citizens and the private sector  Number of annual forum meetings/workshops held with external role players
4. Review and redefine the SDA between the custodian (EISD) and implementing agent (Relevant Municipal Owned Entity (MOEs))	Water and Biodiversity Unit (Governance, Relevant MOEs)	Medium term onward	Staff Time	SDA is reviewed and updated
5. Ensure coordination between abutting municipalities to align efforts to protect nature and biodiversity	Water and Biodiversity Unit	Medium term onward	Staff Time	Agreements are signed with all neighbouring municipalities to align efforts to protect nature and biodiversity

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
<b>Strategic Objective 3: Reduced impacts of threatening processes on all aspects of nature and biodiversity, enhanced ecosystem service provision and improved social as well as economic security through an integrated management approach</b>				
1. Develop, implement & review plans to reduce threats to nature and biodiversity and to enhance ecosystem service provisioning in the City (e.g. rehabilitation plans, IAS plans, catchment plans etc.)	Water and Biodiversity Unit	Short term onward	Staff Time and funding	New plans are developed and implemented (e.g regularisation of unauthorised ESS)  Existing plans are reviewed and implemented
2. Ensure ongoing protection and conservation of ecologically sensitive areas through appropriate mechanisms	Water and Biodiversity Unit	Short term onward	Staff Time and Financial	Relevant stewardship agreements planned, initiated, and implemented New areas are identified for various protection and conservation status (e.g. proclamation)  Ecological assets are appropriately zoned and desirable and non-desirable land uses identified for each ecological category
3. Develop business cases for ensuring adequate resources and capacity for service	Water and Biodiversity Unit	Short term onward	Staff Time	Business cases are developed



KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
delivery through alternative funding sources				
4. Ensure adequate service delivery interventions to ensure protection and maintenance of nature and biodiversity areas	Water and Biodiversity Unit (Relevant MOEs)	Short term onward	Staff time and funding	All nature and biodiversity areas are serviced and well maintained
5. Manage, and rehabilitate priority areas to near-natural states	Water and Biodiversity Unit	Medium term	Staff time and Financial	Invasive species are controlled  Priority areas are managed and rehabilitated
6. Identify, plan for, and manage specific species of concern and develop conservation and management plans to do so (eg. red data fauna and flora)	Water and Biodiversity Unit	Medium term	Staff time and Financial	Conservation and management plans developed for priority areas
<b>Strategic Objective 4: Human development and well-being is enhanced through sustainable use of nature and biodiversity, as well as the equitable sharing of their benefits.</b>				
1. Educate all citizens and city decision makers on the benefits of nature and biodiversity	Water and Biodiversity Unit, Strategic Coordination	Short term onward	Staff Time and Financial	Education and awareness programme is designed and implemented  Surveys show improved citizen awareness of the benefits and use of nature and biodiversity

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
				Quality of life survey includes nature and biodiversity aspects
2. Ensure equitable access and use of nature and biodiversity across the City	Water and Biodiversity Unit	Short term onward	Staff Time and Financial	Access to nature and biodiversity is within acceptable national and international standards across the city
3. Review existing protected area management agreements to ensure equitable access and use of nature and open areas across the City	Water and Biodiversity Unit (JCPZ)	Short -Medium Term onward (repeated reviews where necessary)	Staff Time	Agreements are reviewed and proven to improve equitable access
<b>Strategic Objective 5: Local conservation targets are met through a network of protected areas and key ecosystems in the City and contribute to provincial and national targets</b>				
1. Set realistic targets for the protection of nature and biodiversity	Water and Biodiversity Unit	Short term onward (reviewed after each review of BRP)	Staff Time	Natural assets are identified, mapped, defined, and categorised  Targets and indicators for protection, conservation, expansion, rehabilitation, activation, equitable access and sustainable use, and enhancement are set for

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
				each natural asset category
2. Develop a M&E framework for nature and biodiversity planning, conservation, protection, and management	Water and Biodiversity Unit, Strategic Coordination	Short - medium term	Staff time	M&E Framework developed and utilised
3. Investigate other mechanisms in terms of SPLUMA to protect and enhance priority natural assets	Water and Biodiversity Unit	Short term	Staff Time	Investigation is undertaken  All mechanisms are identified and documented for different natural asset categories
4. Identify, map, and collect data on the extent, status, quality, and value of all natural assets and the threats thereto in the municipality to set a baseline and gain an updated understanding of the current status quo at the local scale and set local targets (review and update the 2009 Biodiversity Assessment)	Water and Biodiversity Unit	Short term	Staff Time and Financial	Assets are identified, mapped (spatial GIS), and understood holistically at a local level and a baseline assessment is established  Conservation, targets for the COJ as related to the updated baseline assessment, are clearly defined  Biodiversity Assessment is reviewed to provide up-to-date baseline information
5. Develop an information system and database for continuous monitoring of	Water and Biodiversity Unit, Strategic Coordination	Medium-long term	Staff Time	Information system and database are developed and used

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
nature and biodiversity and establish mechanisms for the collection, use, and dissemination of up-to-date data on nature and biodiversity				Data on natural assets and changes in status, use, and extent are maintained, tracked, and reported on
<b>Strategic Objective 6: Raise awareness &amp; build capacity about the value of nature &amp; biodiversity to city functioning across all departments, regions &amp; municipal entities, as well as other sectors of society</b>				
1. Develop messaging to inform promotional materials for internal & external target audiences	Water and Biodiversity Unit, Strategic Coordination	Short term onward	Staff Time and Financial	Messaging is developed and planned  Promotional materials are developed  Material is disseminated to internal and external audiences
2. Identify suitable programmes to compliment thematic environmental days	Water and Biodiversity Unit, Strategic Coordination	Short term onward	Staff Time and Financial	Thematic environmental days are identified and diarised  Suitable programmes are identified and linked to environmental days  Programmes are implemented in line with thematic environmental days

KEY ACTIONS	RESPONSIBILITY	TIME FRAME	RESOURCES	INDICATOR
3. Design and implement capacity building workshops for internal & external stakeholders	Water and Biodiversity Unit, Strategic Coordination	Short term onward	Staff Time and financial	<p>Capacity building needs are identified and analysed</p> <p>Capacity building workshops are designed</p> <p>Capacity building workshops are implemented and facilitated for internal and external stakeholders (based on identified needs/gaps)</p>

## PART 5: MONITORING AND EVALUATION FRAMEWORK

The identified immediate first step in the implementation of the Johannesburg *Our Nature, Our City, Our Future* LBSAP is to develop an effective monitoring and evaluation framework for nature and biodiversity. The monitoring and evaluation (M&E) framework will ensure two things:

- That the state, extent, and trends relating to biodiversity gains and losses are monitored, recorded, and used as evidence in decision making on an ongoing basis; and
- That implementation of the LBSAP is successfully measured and aligned to its vision and objectives and that the LBSAP is adapted according to changing circumstances within the City.

Tools for the monitoring and evaluation system should ideally be linked to quantitative outputs from the biodiversity assessment and the LBSAP to ensure an ongoing M&E system that can be continually updated according to fast-changing trends and development pressures. To ensure the relevance of these tools, it is proposed that the biodiversity assessment (and its linked LBSAP) be reviewed and updated every 5 years. The review should focus on changes to the extent, quality, and presence of nature and biodiversity that occurred during that period, the ongoing monitoring of trends relating to losses and gains, and how project implementation should be adapted to cope with those changes. Furthermore, a regular review process would ensure that the LBSAP is kept relevant in a changing policy and legislative environment and aligned strongly to priorities emerging at all scales. This adaptive management cycle will allow the City to respond timeously to changes in the environment as they occur, thereby maintaining the relevance of the LBSAP.

The EISD should take overall responsibility for this strategy and it should be reflected within its line functions, performance management mechanisms, business planning processes and budgeting processes, as well as in the budgets of relevant role players. This will ensure that the conservation of biodiversity receives due attention and acknowledgement of its importance. However, to ensure the effective implementation of this strategy occurs in an integrated manner, and that the LBSAP is mainstreamed in relevant planning and development processes, all stakeholders whose plans, actions, and decisions either have an impact on, or are impacted by nature and biodiversity, take ownership of its contents.

Conservation planning and biodiversity management occur in a complex environment where the levels of uncertainty are often high and decision making is often characterised by disagreement (Roux et al, 2006). Having a robust biodiversity assessment, a clear set of goals, and a vision for biodiversity can go a long way to reducing some of this uncertainty.

Specific recommendations for the development of a robust monitoring and evaluation system:

- The Biodiversity Assessment and subsequently the *Our Nature, Our City, Our Future* LBSAP should be reviewed on a 5-yearly basis (in line with the national review process), starting with an urgent review as the baseline for the 2019/20-2025 implementation period
- A tool needs to be established to monitor biodiversity losses and gains and the changes in extent and quality of nature in the CoJ over time to ensure that an up-to-date snapshot of the current state is available when needed as the basis for robust decision making

- Clear responsibilities and time frames should be set and adhered to for the implementation of the action plans
- Responsible line departments and MOEs should ensure that the action plans are reflected in their planning and development processes, business plans, performance management systems and have the budget allocated to achieve the goals
- Gaps in the biodiversity assessment and the LBSAP should be identified and appropriate interventions developed to address them, thereby ensuring that this document is a living one
- A detailed monitoring and evaluation framework needs to be developed and this should be linked to quantitative and qualitative indicators. This framework would measure progress on both the conservation, restoration, and enhancement of nature and biodiversity and the implementation of this LBSAP, in line with the indicators identified in the action plans. The State of Environment reporting process can provide guidance on nationally acceptable indicators to monitor progress.



## PART 6: CONCLUDING REMARKS

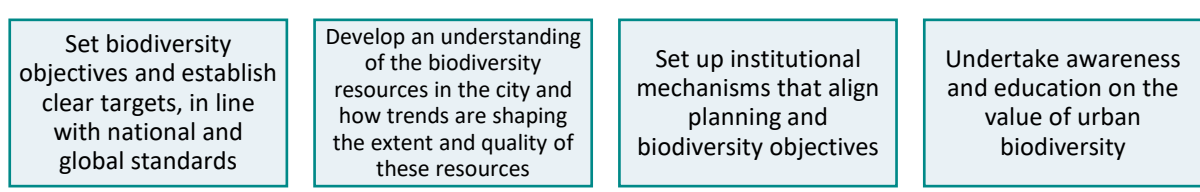
The protection of the City's natural assets is essential to preserving the quality of life for future generations. If Johannesburg is able to preserve its resources for future generations, it will build economic growth, promote social and human development, ensure good governance and conserve the environment.

Managing and protecting biodiversity within an urban area is an issue that requires a collaborative and integrative approach. It requires acknowledging the particular value associated with urban biodiversity features, many of which may be man-made and part of the built environment.

The natural environment is an essential element in the structuring of the future City. It is the environment around which all planning, development and land use decisions should be made. The natural structure should be seen as an irreplaceable city asset that provides valuable ecosystem services and not merely as unused land available for development. Protecting these areas is not done for the sake of conservation alone, but to make surrounding developed parts of the city more sustainable, liveable and valuable (socially, financially and in terms of green infrastructure). As such, the protection of the city's natural assets must be a starting point for all development.

### BROAD CONSIDERATIONS FOR A WAY FORWARD

The following presents 4 key priorities regarding the CoJ's approach to preserving the natural assets within their boundaries, to ensure that ecosystem goods and services are safeguarded for human populations, both now and in the future.



#### 1. Set biodiversity objectives

The CoJ is expected to come under ever increasing development pressures in the coming years. As a consequence, biodiversity management has to confront a reality where general and conventional conservation principles no longer offer practical answers, and where critical and strategic conservation decisions have to be made. The most important conservation decision facing the City, and one that will radically determine the success of any biodiversity management strategy, is a determination of a set of conservation objectives and a strong understanding of the targets and goals that will guide and steer conservation and restoration efforts. Traditional generalist approaches that attempt to conserve biodiversity elements in the City using broad principles must be replaced with specific decisions on which species or habitats are considered to be of value to the City, along with associated conservation strategies that create the enabling frameworks for these features to persist in the urban landscape.

## **2. Develop an understanding of the biodiversity resources in the City**

A tool or protocol for the systematic collection, recording and dissemination of biodiversity data is critical to ensure informed decision making is based on credible evidence. The high levels of uncertainty on biodiversity values and contributions to development, along with conflicting decision making for biodiversity and development priorities can be reduced by having a systematic, ongoing, and scientifically robust database of the biological resources within the city. This database should have a strong spatial component to ensure that biodiversity, key natural areas, and the land use management guidelines on and around them are easily integrated into other strategic planning processes. This also implies that biodiversity management should be communicated in a manner that other decision makers within the city are capacitated enough to understand the implications of their decisions for biodiversity and nature, and how they will benefit from conserving, protecting, restoring, and using it sustainably. This will ensure that trade-offs are responsibly negotiated through well-established relationships among key stakeholders. Ultimately this would provide for an integrated approach to biodiversity that is strategically embedded in all CoJ departments that deal with development planning and implementation decisions. In addition, the CoJ should build on the strategic assessment and valuation of ecosystem goods and services undertaken by the EISD by investigating ways and options for improving the management and regulation of ecosystem services in the City. Such an investigation should include identifying and recommending appropriate measures and mechanisms to be introduced.

## **3. Set up an institutional system that aligns planning and biodiversity**

For effective biodiversity management it is extremely important to ensure that the different sets of management tools and policies within Johannesburg are aligned with one another. If these policies are not coherent and provide a level of overlap and congruence then confusion can result, giving conflicting objectives or contradictory approaches to city management. The implications of a fragmented approach for biodiversity are further degradation, habitat and species loss, ultimately resulting in a loss of ecosystem goods and services. Many of the actions plans have policy and institutional implications. In essence, effective biodiversity management and ensuring long term provision of ecological goods and services in Johannesburg is dependent on an institutional system that acknowledges and enables the valuable role of biodiversity within the city. This will require an adaptive management approach where coordination, flexibility, and strong relationships are enabled and deployed.

## **4. Awareness and education on the value of urban biodiversity**

It is in the interest of the City of Johannesburg that a strategy to pursue education and awareness regarding the conservation of natural assets be undertaken in order to make sure that key ecological processes are sustained, despite population and development pressure experienced within the CoJ's area jurisdiction. The harmonious co-existence of both nature and human development can be realized only if education and awareness becomes a core element embedded in the planning and development processes at the local and community scales. Issues of environmental awareness and a community that responds responsibly to biodiversity concerns is a central theme to all the action plans within the LBSAP. A "whole of society approach" is the only feasible way to ensure that the CoJ is able to realise a sustainable future for its urban populations.

## CONCLUSION

In conclusion, the CoJ's EISD is mandated to operate and function in line with this LBSAP. In a context where nature and biodiversity are diminishing at increasingly alarming rates, this LBSAP will form the broad foundation for natural resource planning, use, and development in the CoJ's municipal area. It is intended that this strategy be owned by a range of stakeholders whose visions are aligned with the need to urgently protect, enhance, restore, and conserve nature. Without nature and biodiversity, our collective urban future is not secure. As such, the health and wellbeing of the CoJ's urban population, as well as the ability of its natural environment to sustain its life-giving goods and services flows is dependent on the realisation of collective effort to rigorously safeguard the nature and biodiversity that remains in the municipality.

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## APPENDIX A: POLICY AND LEGISLATIVE FRAMEWORK

### LOCAL AND REGIONAL POLICY AND LEGISLATIVE CONTEXT

There are a range of policies, strategies and guidelines that the CoJ and the Gauteng province have developed and implemented that have a bearing on nature in Johannesburg. Below is an overview of these policies and guidelines.

#### COJ Biodiversity Assessment 2009

**Purpose:** In 2009, the CoJ completed a Biodiversity Assessment as the first part of the LAB process. The assessment sought to present the extent and quality of the CoJ's natural assets and identify those areas that were critical for the conservation of nature and habitats for species, especially those that are threatened or endangered. The Biodiversity Assessment provided the status quo baseline that informed the development of the 2015 LBSAP.

**Relevance to this Strategy:** The Biodiversity Assessment informed the COJ's 2015 LBSAP and provided information on the state of the City's biodiversity at the time. Some of this information is used to inform the 2019 reviewed LBSAP, since an updated Biodiversity Assessment was not undertaken for purposes of its development. In many instances, the 2009 assessment provides the most recent data on biodiversity. However, in so far as possible, more recent data has been sources and used. It is thus recommended that in order for the city to source relevant and recent data to inform strategic actions, a review and update be undertaken of this Assessment in any subsequent LBSAP reviews to identify the trends that have persisted over the last decade and understand how the 2009 status quo has changed over the last decade as informants to any future interventions. However, one of the strengths of this LBSAP lies in the fact that a review of the COJ Bioregional Plan, based on a SANBI-led systematic biodiversity review process of most-relevant data was undertaken in 2019, and provides an accurate and recent assessment of the quality, significance, and extent of key biodiversity priority areas.

#### State of Environment Report

**Purpose:** The purpose of The State of Environment Report (SoER) for the CoJ is to provide information in a user-friendly format on the state of the environment and to show trends against a number of predetermined environmental parameters. The report reviews whether environmental conditions within the city have improved, worsened or remained the same over the review period, as well as identifies what the drivers of change are. Recommendations are made to assist in the management of key environmental issues and reverse negative trends. The report is updated on a five-yearly basis.

**Relevance to this Strategy:** The SoER provides up to date information in a user-friendly format on the state of the environment in the CoJ, to guide decision making in line with the action plans in this LBSAP. This information can also be used to raise awareness on the importance of natural assets in CoJ.

### **COJ Wetland Audit and Wetland and Riparian Protection and Management Plan 2009**

Purpose: The Wetland Audit undertaken for the CoJ indicated that as a result of the rapid rate of urban development, valuable wetlands are increasingly lost. Furthermore, deterioration and destruction of wetland areas have resulted from urban infilling and drainage, the poor location of buildings, roads and other hard surfaces in, around, and through wetlands. The purpose of the Wetland and Riparian Protection and Management Plan is to inform spatial planning, development decisions and management strategies for priority wetlands within the City in order to promote the protection and sustainability of wetlands and associated water resources, and an integrated approach to development and the protection of the environment.

Relevance to this Strategy: Wetlands and riparian zones are important for maintaining ecological functioning and for habitat quality. As such, they are critical natural assets for a city and its biodiversity. Furthermore, the quality and extent of wetlands and riparian areas has an impact on the services a river provides for urban populations. The Plan provides all relevant information on the status of wetlands and the threats imposed on them in the municipal area, as vital components of the natural environment, and thus provide data needed to improve decision-making capacity in this regard.

### **COJ Catchment Management Policy 2009**

Purpose: The catchment management policy has been prepared to meet the City's obligations to protect and manage its water catchments by using an integrated approach in line with legislative requirements and best management practices and in the interests of environmental and economic sustainability and the amenity and safety of all the City's residents.

Relevance to this Strategy: Provides all relevant information on water catchments in the CoJ, as critical components of the natural environment. As such, the policy is a useful tool for improved integrated decision-making.

### **Gauteng Conservation Plan 2011**

Purpose: The C-Plan, developed through a Systematic Biodiversity Planning process, was initiated as a guideline for conservation and development planning and presents priority areas for biodiversity conservation in the Gauteng province. Conservation planning started in Gauteng in the year 2000 and the aim was to revise the Conservation Plan at least every 5 years. GDARD produced the Gauteng Conservation Plan Version 3.3 (C-Plan 3.3) in October 2011.

Relevance to this Strategy: The 2011 C-Plan was used as the basis for developing the CBA map for the CoJ's Bioregional Plan (also presented in this Strategy in figure 11) which is recommended to be integrated with all sector planning and development processes in the future, such as the CoJ Spatial Development Framework (SDF) and Integrated Development Plan (IDP) as the environmental informant to be used in development decision-making processes.



### **Gauteng Ridges Policy 2001**

Purpose: According to the Gauteng development guidelines for ridges, a ridge is defined as including hills, koppies, mountains, kloofs and gorges or a landscape type or topographic feature that is characterized by two or more of the following features: crest, plateau, cliff or footslopes; while Biodiversity is defined as the variation of life forms within a given ecosystem, biome, or for the entire Earth. Biodiversity is often used as a measure of the health of ecological systems. Ridges play a vital role in ecosystem sustenance and subsequent biodiversity as they provide habitats for certain fauna and flora. Valid topography is recognized as one of the most powerful influences contributing to the high biodiversity of southern Africa. The diversity of plants on ridges can easily be observed, with grassland communities associated with the crests of hills and the southern slopes, while woody species grow on warmer northern aspect as well as on protected areas on southern slopes band on rocky outcrops.

Relevance to this Strategy: Provides information on ridges in the wider Gauteng province, as features of interest for biodiversity and natural asset management.

### **COJ Growth and Development Strategy 2040**

Purpose: The GDS sets the framework for economic and social development of the City up to 2040, and clearly recognises the need to have the natural environment, society, economy and governance structures aligned in order to ensure an integrated and positive outcome from present-day interventions. The GDS is a tool which will be used to enable the City to develop a coordinated, institutional framework in order to harness the potential of urbanisation and make the most of opportunities to yield economic, social, and environmental benefits. The GDS, based on the research and analysis of trends, is a path breaking attempt, which points to some basic requirements for Johannesburg to achieve economic competitiveness, improved quality of life and environmental sustainability.

Relevance to this Strategy: The GDS's Strategic Outcome 2: "enhance quality of life by improving services and taking care of the environment" is closely aligned to the objectives of the LBSAP.

### **Integrated Development Plan 2017-2022**

Purpose: An IDP acts as the main strategic planning instrument for municipalities. An IDP is a 'super plan' for the municipality that gives an overall framework for development, detailing how land should be used, what infrastructure and services are needed and how the environment should be protected. It integrates the long-term strategic planning processes of various sectors and departments into a single pipeline of short-term priorities and considers trade-offs to maximise multi-pronged benefits for a local municipality.

Relevance to this Strategy: The City's long- and medium-term strategies (GDS and IDP) recognize and acknowledge the importance of conserving natural resources, and make

provisions for environmental management projects, all of which need to be linked to the LBSAP.

### **Municipal Spatial Development Framework 2016**

**Purpose:** The Local Government Municipal Systems Act requires all municipalities to compile a SDF as a core component of the IDP. The SDF maps the vision, goals and objectives of the municipal IDP, and is the legally enforceable spatial component of the IDP, indicating to the municipality and the public where certain types of land use and associated developments are permissible, and where certain activities are unlikely to be permitted. A SDF should be based on the IDP planning principles, promoting equality and sustainability – and therefore should be aligned with bioregional plans and the EMF.

**Relevance to this Strategy:** The Municipal Systems Act places certain environmental management responsibilities on the municipality which the Nature Strategy needs to take into account. In this case, it is also recommended that the CoJ LBSAP be aligned to the SDF in its next review cycle.

### **Bioregional Plan 2019**

**Purpose:** A bioregional plan is a legislated planning tool, introduced by the NEM: Biodiversity Act, 2004, to assist with the management and conservation of biological diversity to provide the conditions for integrated and co-ordinated biodiversity planning. A bioregional plan aims to facilitate conservation and management of biodiversity priority areas that fall outside of the formal protected areas network, but that are critically important due to their distinct environmental characteristics. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas and Ecological Support Areas, with accompanying land-use planning and decision-making guidelines.

**Relevance to this Strategy:** The Bioregional Plan provides information on biodiversity priority areas within the CoJ, and land use guidelines for these areas, which feed into the SDF and other municipal decision-making processes. The LBSAP links to the Bioregional Plan by providing action plans for conservation objectives in these priority areas. The two documents are also linked in the sense that the LBSAP provides actions that are relevant to the mainstreaming and future use of the Bioregional Plan by the CoJ.

### **State of Rivers Reports (Summer and Winter) 2017**

**Purpose:** The State of Rivers Reports provides a river health assessment within selected catchments of the CoJ with the goal of determining the ecological status of selected rivers. As already mentioned, all rivers in the CoJ are significantly compromised in terms of their

quality, and therefore their ability to provide ecosystem services for humans and support key habitats for biodiversity.

Relevance to this Strategy: Rivers and their surrounding areas are core components of the CoJ's natural environment. The State of Rivers Reports provide a recent overview of the ecological status of 16 rivers within the CoJ which provides information on water resources which are relevant to this strategy.

### **COJ Critical Biodiversity Area Network Management Recommendations 2017**

Purpose: The Critical Biodiversity Area Network Management Recommendations document complements the Bioregional Plan by providing information on a first attempt at setting overarching management objectives and recommendations aimed at maintaining an optimal CoJ conservation network, in addition to the management options set for each Bioregional Plan Map Category as set out in the Bioregional Plan.

Relevance to this Strategy: The Critical Biodiversity Area Network Management Recommendations were used in developing the Bioregional Plan's measures for effective environmental management. This information also informed the development of the action plans in this strategy and as such is a complementary tool for the CoJ.

### **Environment & Infrastructure Services Department: Business Plan 2018/2019**

Purpose: On an annual basis, the IDP is reviewed and business plans are developed by Departments and Municipal Entities, detailing short term operational plans. These are linked to annual budgets and the City's annual Service Delivery and Budget Implementation Plan. The EISD recognizes the fact that economic growth is strongly connected with the demand for natural resources i.e. water, electricity generated from coal, liquid fuel and minerals and the subsequent generation of waste which impacts on the environment in the process of disposal. The management of natural resources, either as pristine resources or as valuable economic commodities, is the prime objective of the Department with a focus on the potential consequences of over-utilizing these natural resources for human activity.

Relevance to this Strategy: The Business Plan outlines the City's strategic agenda, the roles and responsibilities of the department, the number of environmental sensitive features in the CoJ and key performance areas of the department – all of which will guide the implementation of this LBSAP.

### **Gauteng Protected Area Expansion Strategy 2013**

Purpose: The purpose of the Gauteng Protected Area Expansion Strategy (GPAES) is to provide the framework for protected area expansion in Gauteng over the next 20 years, setting out key strategies for protected area expansion and identifying spatial priorities

and protected area targets. For Gauteng, the national targets translate to a 20-year target of 1,668km<sup>2</sup> (or 166,800ha) and a five-year target of 380km<sup>2</sup> (or 30,800ha), which constitutes 9.2% and 1.7% of the province respectively. Within this plan, the 20-year targets have been translated for individual vegetation types, based on the proportion of the vegetation type within Gauteng and the corresponding pro rata proportion that must be protected within the province to meet the national protected area target.

Relevance to this Strategy: The CoJ can use information from this strategy in determining where protected area expansion should occur, based on specific vegetation types that are either at risk of loss or for safeguarding of species and habitats.

### **Gauteng Environmental Implementation Plan 2015**

Purpose: The purpose of the EIP is to describe the policies, plans and programmes of an organ of state that performs functions that may impact on the environment, and how the organ of state's policies, plans and programmes that may significantly affect the environment will comply with NEMA principles and National environmental Norms and Standards. The EIP seeks to ensure that the numerous governance controls or mechanisms, which set the targets and oversee the performance of the national and provincial Departments and Municipalities, are monitored and measured effectively.

Relevance to this Strategy: Provides information on the policies, plans and programmes of an organ of state that performs functions that may impact on the environment.

### **Climate and Adaptation Plan 2009 (In the process of being reviewed)**

Purpose: The CoJ's Climate Change Adaptation Plan (CoJ CCAP), includes an assessment of climate model projections for the CoJ region, a risk assessment based upon that analysis and an integrated adaptation plan cutting across all the major sectors of the CoJ. The plan primarily seeks to provide an indication of the scale and nature of the climate change vulnerabilities facing key sectors, to prioritise the associated risks, to propose adaptive actions including identifying where further studies are required, and to provide a preliminary indication of the scale of potential costs and benefits associated climate change adaptation for the CoJ.

Relevance to this Strategy: The Plan provides all relevant information on climate change and adaptation in the CoJ. This is useful in biodiversity planning and management, given the inextricable linkages between the nature and climate crises, and in understanding the potential for effective biodiversity conservation, protection, enhancement, and management to contribute significantly to improved climate change mitigation and adaptation.

### **Invasive Alien Species Strategy 2018 (In the process of being reviewed)**

**Purpose:** With the promulgation of the NEM:BA regulations in 2015, the requirement for invasive species reporting expanded to include other taxa, not only plants. In response to the new policy requirement, a draft Alien Invasive Species Monitoring, Control and Eradication Plan was prepared for the COJ in 2018. The strategies focused on managing Invasive Alien Plants in an effort to conserve the municipality's biodiversity in a sustainable manner. The COJ however, is in the process of revising its alien invasive strategy to strengthen the analytical and prioritisation aspects of the plan and also to place greater emphasis on implementation planning.

**Relevance to this Strategy:** Provides information on managing Invasive Alien Plants in the CoJ in an effort to conserve the municipality's indigenous biodiversity, which should be a priority for the CoJ if the state of the natural environment in and around the city is to be enhanced, protected, and restored.

## **NATIONAL POLICY AND LEGISLATIVE FRAMEWORK AND APPLICABLE GUIDELINES**

South Africa has a range of national legislation, policies and guidelines which aim to protect the natural assets in the country and which are relevant to biodiversity and nature. Below is an overview of these policies and guidelines, which have specific relevance to Johannesburg's development of an LBSAP.

### **The Constitution of South Africa 1996**

**Purpose:** The Constitution of South Africa has a number of Sections that are relevant to the environment. Section 24 guarantees everyone an environment that is not harmful to their health or wellbeing. The Constitution further commits all levels of government to sustainable development so as to ensure that the environment is protected for present and future generations. It further places a duty on all spheres of government to take reasonable steps, including making laws, to prevent pollution, promote conservation and ensure sustainable development.

**Relevance to this Strategy:** The constitution provides the legal foundation for the existence of South Africa and sets out the rights and duties of its citizens in terms of the environment. Furthermore, the LBSAP is a strategy developed under the imperative given in the Constitution for local governments to take reasonable steps to ensure effective environmental management.

### **National Environmental Management Act - NEMA 1998**

**Purpose:** NEMA is a pivotal piece of environmental legislation in South Africa on which subsequent environmental legislation in South Africa is built. The main objective of this Act is to provide for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote

cooperative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

Relevance to this Strategy: The CoJ should comply with this act in developing its environmental plans, and all of its interrelated sub-components as it is the overarching framework for environmental governance in South Africa.

### **National Water Act 1998**

Purpose: The NWA gives effect to the constitutional right of access to water. The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account, amongst other factors, issues relating to protecting aquatic and associated ecosystems and their biological diversity.

Relevance to this Strategy: The CoJ should comply with this act and all compliance and management requirements in relation to safeguarding its water resources, as core components of the natural asset base of the municipality.

### **Municipal Systems Act 2000**

Purpose: The Municipal Systems Act is part of a series of legislation which aims to empower local government to fulfil its Constitutional objectives. It also defines the roles and responsibilities of both district and local governments. According to the Municipal System Act, all municipalities have to undertake an integrated development planning process to produce IDPs.

Relevance to this Strategy: The Municipal Systems Act provides information relating to local government and their roles and responsibilities which give effect to the preparation of this, and similar plans and the undertaking of environmental planning and implementation processes.

### **National Environmental Management: Protected Areas Act – NEM:PA 2003**

Purpose: The Protected Areas Act provides a framework for the declaration, cooperative governance and management of South African protected areas on state, private and communal land. This forms part of a strategy to manage and conserve biodiversity while preserving the ecological character of these areas. The Act promotes the sustainable utilisation of protected areas for the benefit of people and supports participation of local communities in the management of protected areas. The Protected Areas Act also establishes the South African National Parks as a statutory board.

Relevance to this Strategy: Protected areas are seen as an extremely important tool for achieving biodiversity objectives, since these often provide greater security for

conservation worthy land and the safeguarding of habitat for species, especially those who are threatened and/or endangered.

#### **National Environmental Management: Biodiversity Act – NEM:BA 2004**

**Purpose:** The Biodiversity Act is perhaps the most relevant national legislation for this LBSAP as it provides for the Minister to publish a notice in the Government Gazette that issues norms and standards, and indicators for monitoring progress for the achievement of any of the objectives of the Act. The Act provides for the development of a National Biodiversity Framework to guide all strategic development planning process regarding the integration of biodiversity planning and monitoring in South Africa and these binds all organs of the state, at national, provincials and local levels.

**Relevance to this Strategy:** The CoJ needs to comply with the Biodiversity Act in providing the cooperative governance needed for biodiversity management and conservation. The act is the overarching legislation governing biodiversity and its conservation and mainstreaming in the country. The Biodiversity Act provides for the management and conservation of South Africa's biodiversity and as such the LBSAP needs to align with these principles.

#### **National Water Resource Strategy: Second Edition 2013**

**Purpose:** The major focus of the National Water Resource Strategy (NWRS) is equitable and sustainable access and use of water by all South Africans while sustaining our collective water resources. The purpose of the NWRS is to ensure that national water resources are protected, used, developed, conserved, managed and controlled in an efficient and sustainable manner towards achieving South Africa's development priorities in an equitable manner over the next five to 10 years.

**Relevance to this Strategy:** Provides an analysis of the role of water in the economy and identifies the specific challenges, development opportunities and actions that inform an agreed framework for priority areas of focus for the country. Recognizing that water is a critical element of all ecological systems and processes, it forms the foundation for nature, biodiversity, people, and cities.

#### **National Biodiversity Assessment 2011**

**Purpose:** The purpose of the National Biodiversity Assessment is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. It involves mapping information about biodiversity features such as species, habitats and ecological processes, protected areas and current and future patterns of land and resource use. It provides a national contextual framework for assessments at the



subnational scale and points to broad priority areas where further investigation, planning and action are warranted.

Relevance to this Strategy: The NBA links closely with the National Biodiversity Monitoring Framework, which establishes a set of core biodiversity indicators for the country. Together, these policies enable the monitoring of biodiversity targets and evaluation of actions aimed at conserving and mainstreaming biodiversity.

### **National Biodiversity Strategy and Action Plan 2015 – 2025**

Purpose: The National Biodiversity Strategy and Action Plan (NSBAP) aims to conserve and manage terrestrial and aquatic biodiversity to ensure sustainable and equitable benefits to the people of South Africa, now and in the future. The NBSAP is a requirement of contracting parties to the Convention on Biological Diversity (CBD), to which South Africa is a Party. The NBSAP set out a strategy and plan for South Africa to fulfil the objectives of the Convention. With the adoption of the CBD's Strategic Plan for Biodiversity for 2011-2020, parties agreed to revise and align their NBSAPs to the Strategic Plan and the Aichi Targets. However, 2020 is a critical year as the Parties to the CBD will negotiate and adopt the Post 2020 Global Biodiversity Framework that will guide efforts over the next decade.

Relevance to this Strategy: The NBSAP identifies the priorities for biodiversity management in South Africa, as they are aligned with the priorities and targets in the global agenda, as well as other national development imperatives. The LBSAP is essentially the local expression of the NBSAP and should therefore demonstrate strong alignment with the NSAPs strategic objectives. In the post 2020 Global Biodiversity Framework negotiations and implementation, Local Governments, such as the CoJ, will play a critical role. This LBSAP will thus set out the local priorities which will contribute to achieving the framework in the first half of its decade of implementation.

## **INTERNATIONAL OBLIGATIONS AND AGREEMENTS**

South Africa is a signatory to various international obligations and agreements regarding natural assets. This section provides an overview of these obligations and agreements which will in turn, influence the practices at the provincial and local scale.

### **Ramsar Convention 1971**

Purpose: The Convention on Wetlands, called the Ramsar Convention, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. The mission of the Ramsar Convention is "the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world". The Convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Since then, almost 90% of UN member states, from all the world's geographic regions, have acceded to become "Contracting Parties".

### **Bruntland Report 1987**

Purpose: In 1987 the Brundtland Report, also known as Our Common Future, alerted the world to the urgency of making progress toward economic development that could be sustained without depleting natural resources or harming the environment. The report provided a key statement on sustainable development, defining it as: development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Brundtland Report was primarily concerned with securing a global equity and redistributing resources towards poorer nations, while also encouraging their economic growth. The report also suggested that equity, growth and environmental maintenance are simultaneously possible and that each country is capable of achieving its full economic potential whilst at the same time enhancing its resource base. The report also recognised that achieving this equity and sustainable growth would require technological and social change.

### **Earth Summit and Agenda 21 1992**

Purpose: Agenda 21, established at the 1992 United Nations Conference on Environment and Development, or "Earth Summit", in Rio de Janeiro, Brazil, is the blueprint for sustainability in the 21st century. Agenda 21 is a commitment to sustainable development, which was agreed to by many of the world's national governments. Nations that have pledged to take part in Agenda 21 are monitored by the International Commission on Sustainable Development and are encouraged to promote Agenda 21 at the local and regional levels within their own countries. Agenda 21 addresses the development of societies and economies by focusing on the conservation and preservation of our environments and natural resources. Agenda 21 is a blueprint on how to make development socially, economically and environmentally sustainable in the 21st century.

### **Convention on Biological Diversity 1994**

Purpose: The Convention on Biological Diversity (CBD) is an international legally binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; and fair and equitable sharing of the benefits arising from the use of genetic resources. The aim of the CBD is to effect international cooperation in the conservation of biological diversity and to promote the sustainable use of living natural resources worldwide. It also aims to bring about the sharing of the benefits arising from the utilisation of natural resources. South Africa is a Party to the Convention on Biological Diversity, which is an international attempt to conserve plant and animal species and the natural resources which sustain their existence into the future. The role of local and subnational governments is increasingly being recognised by the CBD, as the levels of government most closely and appropriately positioned to deal with biodiversity conservation and restoration and the sustainable management of drivers of biodiversity loss and the natural environment, while ensuring that the services nature provides urban populations are equitably shared.

### **World Summit on Sustainable Development 2002**

Purpose: During the World Summit on Sustainable development that was held in Johannesburg from 26 August to 4 September 2002, the ex officio Vice-President of the Summit opened the 3rd plenary meeting on 26 August 2002, with the theme of biodiversity and ecosystem management. At the meeting, statements were made by the High-level Adviser for the United Nations Environment Programme and the Executive Secretary of the Convention on Biodiversity, acting as presenters, and by the Special Envoy of the Secretary-General, acting as moderator.

### **Cartagena Protocol on Biosafety 2003**

Purpose: On 11 September 2003, the Cartagena Protocol on Biosafety (the "Protocol") entered into force - the first legally binding international agreement governing the movement of living modified organisms (LMOs) across national borders. Following entry into force, those countries that ratified the Protocol, including South Africa, became Parties to the Protocol and are required to comply with and implement all of its provisions.

### **Rio Declaration on Biodiversity 2005**

Purpose: The International Conference "Biodiversity: Science and Governance" (Paris Conference) met from 24-28 January 2005 at the headquarters of the United Nations Educational, Scientific and Cultural Organization (UNESCO), in Paris, France. The Conference was part of the ongoing global effort to reverse the current rate of biodiversity loss by 2010, and ensure the long-term conservation and sustainable use of biodiversity, as well as the fair and equitable sharing of the benefits arising from genetic resources. The Conference was convened to assess the current knowledge in, and needs for, research and scientific expertise in biodiversity, as well as examine public and private approaches to biodiversity conservation and management, and the interactions between science and governance.

### **Durban Agreement 2001**

Purpose: The representatives of local, national and international non-governmental organisations (NGOs) and other civil society groups from around the world gathered in Durban/South Africa during the week of 28 August - 3 September 2001 for the World Conference against Racism, Racial Discrimination, Xenophobia and Related Intolerance (WCAR), guided by their commitment in the struggle against racism and racial discrimination and inspired by the recommendations of the NGO Forums held in Strasbourg/France, Santiago de Chile/Chile, Dakar/Senegal and Tehran/Iran and the related sub-regional NGO meetings held in Warsaw/Poland, Kathmandu/Nepal, Cairo/Egypt and Quito/Ecuador, in preparation for the World Conference, made declaration in terms of the environment that: Recognizing environmental racism as a form of racial discrimination which refers to exploitation and depletion of natural resources and

any environmental policy, practice, action or inaction that intentionally or unintentionally, disproportionately harms the health, ecosystems, and livelihood of nations, communities, groups, or individuals, and in particular the poor.

### **UN Agenda 2030 and the Sustainable Development Goals 2015**

Purpose: The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Biodiversity is also at the heart of Agenda 2030. The conservation, restoration, and sustainable use of biodiversity is essential if we are to achieve and realise sustainable development by 2030.

### **Preparations for the Post-2020 Biodiversity Framework**

Purpose: In 2020 the Convention on Biological Diversity will adopt a post-2020 global biodiversity framework as a stepping stone towards the UN's 2050 Vision of “Living in harmony with nature”. In its decision 14/34 the Conference of the Parties to the Convention on Biological Diversity adopted a comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework.