NORTH WEST PROVINCE

# BIODIVERSITY SECTOR PLAN

# 2025


**dedect**

Department:
Economic Development, Environment,
Conservation and Tourism
North West Provincial Government
**REPUBLIC OF SOUTH AFRICA**

# ACKNOWLEDGEMENTS

**The development of the North West Biodiversity Sector Plan (2025) is a provincial plan that has been collaboratively developed with the inputs of multiple stakeholders from national, provincial and local government, together with members of civil society and the private sector. The inputs made by these stakeholders provides the sound strategic basis and a broadly supported approach to biodiversity sector planning in North West Province. Inputs and comments have been received from the Magaliesberg Biosphere, Marico Biosphere Reserve, BirdLife South Africa and North West University.**

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NORTH WEST PROVINCE

# BIODIVERSITY SECTOR PLAN 2025

# MEC FOREWORD

The North West Biodiversity Sector Plan 2025 (NWBSP 2025) represents a significant milestone in the province's ongoing commitment to sustainable development and environmental stewardship. As we face the growing challenges of biodiversity loss, climate change, and environmental degradation, it has become increasingly clear that healthy and functioning ecosystems are not a luxury, but a necessity.

Biodiversity underpins the ecological infrastructure that supports essential services such as clean water provision, food security, climate regulation, and disaster risk reduction. It is the foundation upon which many of our province's key economic sectors such as agriculture, tourism, and the wildlife economy are built. This plan recognises that the protection and sustainable use of biodiversity is crucial not only for ecological resilience but also for long-term economic and social development, particularly in our rural communities.

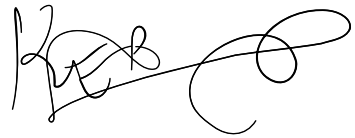
The NWBSP 2025 is grounded in the strategic direction provided by national frameworks, including the National Development Plan 2030 and the Medium-Term Development Plan (MTDP-2025-2030), that focuses on three key strategic priorities namely driving inclusive growth and job creation; reducing poverty and high cost of living; and building a capable, ethical and developmental state. In alignment with these priorities, healthy provincial ecosystems are recognised as central to realise sustainable development.

This updated Biodiversity Sector Plan builds on the 2015 version, incorporating the most current and accurate data available. It is fully aligned with national standards for bioregional plans and provides detailed spatial and management guidelines to help retain and maintain critical biodiversity and ecosystem services.

Importantly, the NWBSP 2025 serves as the biodiversity sector's formal input into broader government planning processes, including the Provincial Growth and Development Strategy, municipal Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs). It is a tool that enables government departments, municipalities, planners, and other stakeholders to integrate biodiversity considerations into their decision-making and resource allocation.

We call upon all spheres of government, relevant entities, and development partners to fully integrate the outputs of the NWBSP 2025 into their planning and operational frameworks. Only through collective action and coordinated planning can we safeguard our natural heritage and secure a healthy and prosperous future for the people of the North West Province.

**Let this plan serve as a guideline for the advancement of biodiversity conservation and for the benefit of growth of the provincial economy, communities and future generations.**



**Ms Bitsa Lenkopane**

MEC for Economic Development, Environment, Conservation and Tourism, North West Province

# HOD FOREWORD

The North West Province stands at a critical juncture where the choices we make today will shape the quality of life for future generations. In a time of accelerating environmental change and growing development pressures, it is vital to recognise that a healthy and functioning natural environment forms the foundation of a resilient society and a sustainable economy. This is not merely a matter of conservation, it is about securing the life-support systems upon which we all depend.

The North West Biodiversity Sector Plan 2025 (NWBSP 2025) represents a bold and scientifically grounded step toward safeguarding the province's rich biodiversity and ecological infrastructure. It is a product of rigorous analysis, applying national systematic biodiversity planning principles and drawing on the latest spatial and ecological data. The result is a province-wide map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)—landscapes that are essential for maintaining ecosystem services, conserving natural resources and supporting climate resilience.

This plan is the strategic tool that will guide planners, municipalities, landowners, developers and all stakeholders in making decisions that are informed, balanced, and sustainable. It provides clear land use guidelines and technical support for aligning with legislative frameworks such as the National Environmental Management: Biodiversity Act (NEMBA) and the Spatial Planning and Land Use Management Act (SPLUMA).

The NWBSP 2025 also renews our commitment to a collaborative, landscape-level approach to biodiversity conservation. By identifying priority areas and enabling proactive protection and restoration, the plan serves as a vital reference for Protected Area expansion, environmental assessments, and local spatial development frameworks.

As we move forward, let this plan be a living document that evolves with new knowledge, responds to emerging challenges and remains at the heart of integrated planning and development in the province. We call on all stakeholders to use the NWBSP 2025 to its full potential and to work together in securing a sustainable and prosperous future for all the people of North West.

**Together, we can ensure that our natural heritage is not only protected, but thrives for the benefit of current and future generations.**

**Mr Relebohile Mofokane**

Head of Department: North West Department of Economic Development, Environment, Conservation and Tourism

# EXECUTIVE SUMMARY

The North West Biodiversity Sector Plan 2025 (NWBSP 2025) emerges as a pivotal instrument in South Africa's North West Province, an area of roughly 105,000 km$^2$ that stretches south of the Botswana border and abuts Limpopo, Gauteng, Free State and Northern Cape Provinces. Although extensive portions of the province have been transformed by mining, agriculture and urban expansion, significant tracts of natural vegetation persist—supporting ecosystem services vital for clean water, climate regulation, food security and cultural values.

At its core, the NWBSP 2025 is a systematic biodiversity planning tool designed to integrate the latest spatial data, refine Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), and provide clear land-use guidelines underpinned by national legislative frameworks such as the National Environmental Management: Biodiversity Act (NEMBA) and the Spatial Planning and Land-Use Management Act (SPLUMA).

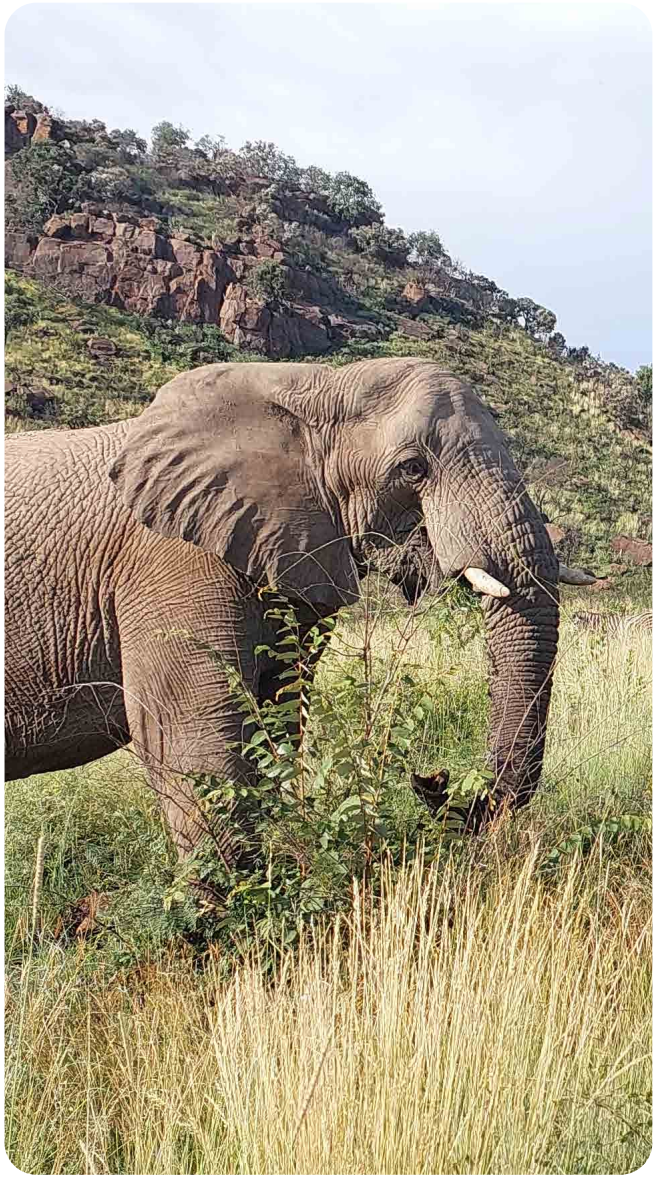
Building on the NWP BSP 2015 iteration, this revision incorporates updated vegetation and wetland maps, evolving land-cover assessments, and the *Technical Guidelines for CBA mapping* (SANBI, 2017). Its primary objectives are threefold: to delineate the spatial requirements necessary to maintain a resilient, functioning landscape; to serve as the authoritative source of biodiversity data for Environmental Impact Assessments, Integrated Development Plans, and Water-Use Licence applications; and to guide both conservation and restoration initiatives in priority areas.

Biodiversity in the North West Province is both rich and distinctive. Nearly 2,300 indigenous plant species and 120 mammal species have been recorded, alongside myriad threatened birds, reptiles and freshwater fish. There are unique habitats in the North West province, ranging from the quartzite koppies that shelter endemic flora such as *Gladiolus filiformis*, to the karstic "eyes" and peat wetlands of the Malmani Subgroup that supply groundwater to major towns. These habitats are irreplaceable for both ecological processes and climate resilience, and also support the protected area network and conservation areas in the province.

However, this biodiversity is increasingly under threat. The province is losing its natural or near natural areas to human land uses at an annual rate of 0.34%, leading to ecosystem degradation and fragmented landscapes. Freshwater systems face degradation through excessive abstraction, flow modification, pollution and invasive species. Climate change further amplifies these threats, with rising temperatures, altered rainfall patterns and increased wildfire risk, which are projected to shift ecosystem boundaries and exacerbate bush encroachment.

In response, the NWBSP 2025 offers a conservation framework for a living landscape - A map of CBAs/ESAs; targeted land use guidelines for CBA/ESA categories that can be readily incorporated into Spatial Development Frameworks and municipal zoning schemes; and strategic recommendations for Protected Area expansion, ecological restoration, and biodiversity offsets. By mobilising stakeholders—from government departments and environmental practitioners to landowners and community groups—it seeks to embed biodiversity considerations at every stage of planning and development.

**Ultimately, the North West Biodiversity Sector Plan 2025 is more than a conservation framework: it is an actionable, science-driven blueprint that empowers decision-makers to balance sustainable growth with the imperative of conserving the province's irreplaceable natural heritage. Its success will be measured not only by adherence to its guidelines, but by the enduring health and connectivity of ecosystems that support the well-being of both nature and people.**



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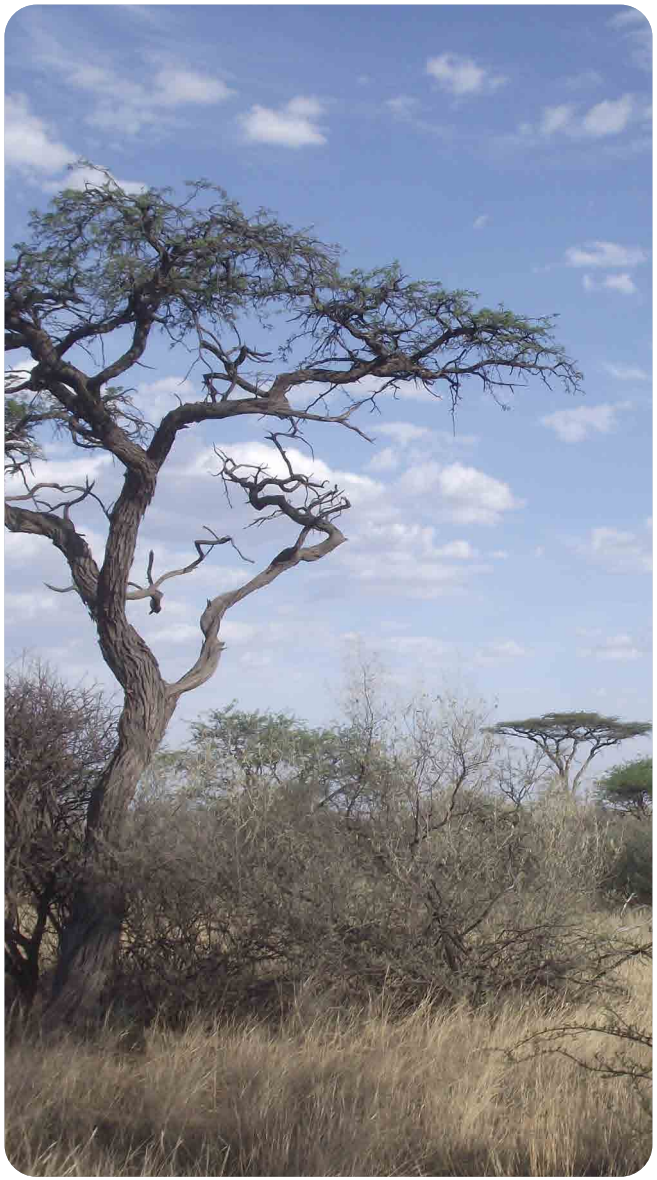

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# ACRONYMS & ABBREVIATIONS

| ACRONYM | MEANING |
|---|---|
| **BSP** | Biodiversity Sector Plan |
| **CALC** | Computer Automated Land Cover |
| **CBA** | Critical Biodiversity Area |
| **COGTA** | Department of Cooperative Governance and Traditional Affairs |
| **CR/CE** | Critically Endangered (threat status) |
| **DARD** | North West Department of Agriculture and Rural Development |
| **DEA** | Department of Environmental Affairs, now DFFE |
| **DEDECT** | North West Department of Economic Development, Environment, Conservation and Tourism |
| **DFFE** | Department of Forestry, Fisheries and Environment |
| **DLRRD** | National Department of Land Reform and Rural Development ( former Department of Agriculture, Land Reform and Rural Development) |
| **DMRE** | Department of Mineral Resources and Energy |
| **DWA** | Department of Water and Sanitation |
| **EAP** | Environmental Assessment Practitioner |
| **EBA** | Ecosystem-based Adaptation |
| **EIA** | Environmental Impact Assessment |
| **EMF** | Environmental Management Framework |
| **EN** | Endangered (threat status) |
| **ESA** | Ecological Support Area |
| **ESG** | Environmental, Social and Governance |
| **GIS** | Geographical Information Systems |
| **HA** | Hectare |
| **ICLEI** | International Council for Local Environmental Initiatives |
| **IDP** | Integrated Development Plan |
| **KBA** | Key Biodiversity Areas |
| **NBA** | National Biodiversity Assessment |
| **NBF** | National Biodiversity Framework |
| **NDP** | National Development Plan |
| **NEMA** | National Environmental Management Act (No. 107 of 1998 as amended) |
| **NEMBA** | National Environmental Management: Biodiversity Act (No. 10 of 2001) |

| ACRONYM | MEANING |
|---|---|
| **NEMPAA** | National Environmental Management: Protected Areas Act (No. 57 of 2003) |
| **(N)FEPA** | (National) Freshwater Ecological Priority Area |
| **NNR** | No Natural Habitat Remaining |
| **NWBSF** | North West Biodiversity Spatial Framework |
| **NWBSP** | North West Biodiversity Spatial Plan |
| **NWP** | North West Province |
| **NWPAES** | North West Protected Area Expansion Strategy |
| **NWPTB** | North West Parks and Tourism Board |
| **NWWI** | North West Wetland Inventory |
| **ONA** | Other Natural Area |
| **PA** | Protected Area |
| **PAES** | Protected Area Expansion Strategy |
| **PE** | Protected Environment |
| **PES** | Present Ecological State |
| **READ** | Former North West Department of Rural, Environment, and Agricultural Development (now DEDECT) |
| **SANBI** | South African National Biodiversity Institute |
| **SDF** | Spatial Development Framework |
| **SEA** | Strategic Environmental Assessment |
| **SPLUMA** | Spatial Planning and Land Use Management Act (Act 16 of 2013) |
| **SWSA** | Strategic Water Source Area |
| **VU** | Vulnerable (threat status) |
| **WHS** | World Heritage Site |
| **WULA** | Water Use Licence Application |

# DEFINITION OF TERMS

| DEFINITION | MEANING |
|---|---|
| **Biodiversity:** | The variability among living organisms from all sources including, terrestrial and aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems (as per the National Environmental Management: Biodiversity Act, 2004 [Act No. 10 of 2004]). |
| **Biodiversity Act or NEMBA (Act 10 of 2004):** | The Biodiversity Act usually refers to South Africa's National Environmental Management: Biodiversity Act (NEMBA), Act 10 of 2004. It is national legislation that gives effect to the biodiversity-related objectives of the Constitution and the Convention on Biological Diversity (CBD). |
| **Biodiversity corridor:** | See ecological corridor. |
| **Biodiversity economy:** | The biodiversity economy refers to the economic activities and sectors that either directly rely on biodiversity for their core business or contribute to its conservation through their activities. This includes industries like wildlife tourism, game ranching, bioprospecting, and sustainable use of wild species. |
| **Biodiversity Offset:** | Measurable conservation actions designed to counterbalance the residual adverse effects of any activity, or of the implementation of any plan, on biodiversity or ecological infrastructure after every effort has been made sequentially to avoid and minimise such effects, and to rehabilitate or restore damage, and includes the outcome of such measures. |
| **Biodiversity Sector Plan:** | A map of Critical Biodiversity Areas and Ecological Support Areas accompanied by contextual information, land and resource-use guidelines and supporting GIS data. The map must be produced using the principles and methods of systematic biodiversity planning. A biodiversity sector plan is the precursor to a bioregional plan (see below). |
| **Biodiversity target (threshold):** | The minimum proportion of each ecosystem type that needs to be kept in a natural or near-natural state in the long term in order to maintain viable representative samples of all ecosystem types and the majority of species associated with those ecosystem types. |
| **Biogeographical region:** | A geographic region that is determined by the distribution of flora and fauna. |
| **Biome:** | An ecological unit of wide extent, characterised by complexes of plant communities and associated animal communities and ecosystems, and determined mainly by climatic factors and soil types. A biome may extend over large, more or less continuous expanses or land surface, or may exist in small discontinuous patches. |
| **Bioregion:** | A land and water territory, the limits of which are not politically bound, but which are defined by the geographical boundaries of human communities and ecological systems. Also, a geographical space that contains one whole, or several nested, ecosystems characterised by landforms, vegetative cover, human culture, and history (as identified by local communities, governments and scientists) |

| DEFINITION | MEANING |
|---|---|
| **Bioregional plan (published in terms of the Biodiversity Act):** | A map of Critical Biodiversity Areas and Ecological Support Areas, for a municipality or group of municipalities, accompanied by contextual information, land and resource-use guidelines and supporting GIS data. The map must be produced using the principles and methods of systematic biodiversity planning, in accordance with the Guideline for Bioregional Plans. Bioregional plans represent the biodiversity sector's input into planning and decision-making in a range of other sectors. The development of the plan is usually led by the relevant provincial conservation authority or provincial environmental affairs department. A bioregional plan that has not yet been published in the Government Gazette in terms of the Biodiversity Act is referred to as a biodiversity sector plan. |
| **Biosphere Reserve:** | An ecosystem with plants and animals of unusual scientific and natural interest. It is a title given by UNESCO to help protect these ecosystems and associated species etc. The plan is to promote management, research and education in ecosystem conservation. This includes the 'sustainable use of natural resources'. |
| **Bush encroachment:** | The process by which woody plants (shrubs and trees) invade and dominate grassland, savanna, or rangeland ecosystems, often reducing grass cover and altering ecosystem structure and function. |
| **Centre of Endemism:** | A Centre of Endemism is an area in which the ranges of restricted-range species overlap, or a localised area which has a high occurrence of endemics. |
| **Climate Change:** | A change in climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. |
| **Climate resilience:** | The ability of ecosystems, communities, or systems to withstand, adapt to, and recover from climate change impacts while maintaining their essential functions. |
| **Compatible Land Use Activities:** | Compatible Land Uses are types of land use or development that can occur in a specific area without compromising its ecological integrity, biodiversity, or conservation objectives. They are defined within biodiversity planning frameworks to guide sustainable development in areas like Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Other Natural Areas (ONAs). |
| **Conservation Areas:** | An area of land or sea that is not formally protected in terms of NEMPAA, but is nevertheless managed, at least partly, for biodiversity conservation. Because there is no long-term security associated with conservation areas, they are not considered a strong form of protection. Conservation areas contribute towards the conservation estate, but not the protected area estate. Conservation areas have largely been superseded by OECMs. |
| **Critical Biodiversity Areas (CBAs):** | Terrestrial and aquatic areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan. |
| **Critical linkages:** | Critical linkages or pinch points in the provincial ecological network are areas where ecological linkages are spatially constrained by other land uses and at high risk of being lost. Cutting or loosing ecological whole-ecosystem level impacts by reducing the overall connectedness of the corridor network and impeding species ability to respond and adapt to changes in the environment, such as moving in response to climate change impacts. |

| DEFINITION | MEANING |
|---|---|
| **Critically Endangered ecosystem:** | An ecosystem type that has very little of its original extent (measured as area, length or volume) left in a natural or near-natural condition. Most of this ecosystem type has been severely or moderately modified from its natural state. This ecosystem type is likely to have lost much of its natural structure and functioning; and the species associated with the ecosystem may have been lost. |
| **Desired State:** | In ecological and biodiversity planning, the Desired State refers to the target condition or ideal outcome for an ecosystem, landscape, or area in terms of its ecological integrity, biodiversity, and functionality. It represents what the ecosystem should look like and how it should function if conservation, management, or restoration goals are successfully achieved. |
| **Ecological integrity:** | The sum of the biological, physical and chemical components of an ecosystem and its products, functions and attributes (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]). |
| **Ecological processes:** | Ecological processes are the natural interactions and functions that occur within ecosystems, driving the flow of energy, cycling of nutrients, and maintenance of biodiversity and ecosystem health. They describe how living organisms (plants, animals, microorganisms) interact with each other and with their physical environment (soil, water, air, climate). |
| **Ecological restoration:** | Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed so that it can once again support biodiversity and provide ecosystem services |
| **Ecological Support Areas (ESAs):** | Terrestrial and aquatic areas that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas; or in delivering ecosystem services. |
| **Ecosystem:** | A dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit (as per the National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]). |
| **Ecosystem fragmentation:** | Ecosystem fragmentation is the process by which large, continuous ecosystems are broken into smaller, isolated patches, often due to human activities. It is a major driver of biodiversity loss because it disrupts ecological processes and species movement. |
| **Ecosystem protection level:** | Indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as well protected, moderately protected, poorly protected, or not protected, based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Unprotected, poorly protected or moderately protected ecosystem types are collectively referred to as under-protected ecosystems. |

| DEFINITION | MEANING |
|---|---|
| **Ecosystem services:** | 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 and spiritual 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. |
| **Ecosystem targets:** | Ecosystem targets are specific, measurable goals set to conserve or maintain ecosystems and their components within a landscape. They define how much of each ecosystem type needs to be protected, restored, or sustainably used to ensure long-term ecological integrity and biodiversity |
| **Ecosystem-based adaptation (EbA) strategies:** | Ecosystem-based Adaptation (EbA) strategies are approaches that use biodiversity and ecosystem services to help communities and ecosystems adapt to the impacts of climate change. Rather than relying solely on engineered solutions, EbA emphasizes working with nature to increase resilience and reduce vulnerability. |
| **Endemic:** | A vegetation type, plant or animal species, which is naturally restricted to a particular defined region (not to be confused with indigenous). For example, a plant may be endemic to a certain region, such as the North West, which means it is restricted to this area and does not grow naturally anywhere else in the country or world. |
| **Environmental degradation:** | The deterioration of the environment through depletion of resources such as air, water and soil; the destruction of ecosystems and the loss of species or undesirable reduction of species population numbers from a specific area from an environmental health perspective |
| **Extinction Risk:** | The likelihood that a species will disappear completely, used to assess conservation priorities. |
| **Fish sanctuaries:** | A river reach that is essential for protecting threatened or nearthreatened freshwater fish that are indigenous to South Africa. Fish sanctuaries that are in good ecological condition are FEPAs, and the associated sub-quaternary catchment is marked with a red or black fish symbol on FEPA maps. Fish sanctuaries that are not in good ecological condition are Fish Support Areas. |
| **Fish Support Area:** | A river reach that is essential for protecting threatened or near-threatened freshwater fish that are indigenous to South Africa, but that is not in good ecological condition (i.e. a fish sanctuary that is not in good ecological condition) OR a river reach that is important for migration of threatened or near-threatened fish species. Sub-quaternary catchments associated with Fish Support Areas that are fish sanctuaries are marked with a fish symbol on FEPA maps; those that are important for migration are not marked with a fish symbol. |
| **Free-flowing River:** | A long stretch of river that has not been dammed, flowing undisturbed from its source to the confluence with another large river or to the sea. |
| **Freshwater Ecosystem Priority Area (FEPA):** | A river or wetland that is required to meet biodiversity targets for freshwater ecosystems. |

| DEFINITION | MEANING |
|---|---|
| **Habitat loss:** | The destruction, degradation, or conversion of natural environments so that they can no longer support the species that depend on them. |
| **Heritage:** | Refers to the legacy of physical, cultural, and natural assets inherited from the past that are valued and preserved for present and future generations. |
| **Incompatible Land Use Activities:** | Are activities or developments that negatively impact an area's ecological integrity, biodiversity, or conservation objectives. They are essentially the opposite of compatible land uses and are typically restricted or prohibited in areas of ecological importance, such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). |
| **Invasive Alien Species (IAS):** | Any species whose establishment and spread outside of its natural distribution range —<br>(a) threaten ecosystems, habitats, ecological infrastructure, or other species or have the potential to threaten eco-systems, habitats, ecological infrastructure, or other species.<br>(b) may result in economic or environmental harm or harm to human health<br>Invasive species: any species whose establishment and spread outside of its natural distribution range —<br>(a) threaten ecosystems, habitats, ecological infrastructure, or other species or have the potential to threaten eco-systems, habitats, ecological infrastructure, or other species.<br>(b) may result in economic or environmental harm or harm to human health |
| **Irreplaceability:** | A concept in conservation biology and systematic biodiversity planning that refers to how essential a site or area is for achieving conservation goals. In other words, it measures how unique or indispensable a particular site is for protecting biodiversity—if it were lost, there would be no or few alternative sites that could achieve the same conservation outcome. |
| **Karst system:** | A karst landscape is a landscape formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterised by underground drainage systems with sinkholes, dolines, and caves (Wikipedia). |
| **Key Biodiversity Area (KBA):** | A site that contributes significantly to the global persistence of biodiversity. The concept was formalised by the IUCN (International Union for Conservation of Nature) to provide a globally standardised framework for identifying the most important sites for nature. |
| **Land cover:** | The class of substance which covers the land, e.g., natural vegetation, roads, factory, or bare ground. In the context of this document, land cover gives an indication of the level of modification of natural ecosystems and can range from natural through to irreversibly modified. Land cover cannot always be equated to land-use, e.g., bare land can either be borrow pits (where the land-use is mining) or natural bare soil (where the land-use may be conservation). |

| DEFINITION | MEANING |
|---|---|
| **Land Management Objectives:** | Land Management Objectives (LMOs) are specific goals set for the management and use of a particular piece of land to ensure that its ecological, social, and economic values are maintained or enhanced. |
| **Landscape connectivity:** | Refers to the degree to which the landscape allows or hinders the movement of species, genes, water, nutrients, and ecological processes across space. |
| **Land use guidelines:** | Land-use guidelines are planning and management tools that provide rules, recommendations, or conditions for how land can be used or developed in a way that balances economic, social, and environmental needs. They are especially important in biodiversity and environmental planning because they help ensure that activities like farming, mining, housing, or infrastructure development do not compromise critical ecosystems, ecological processes, or protected areas. |
| **Mega-living landscapes:** | A landscape-level initiative, comprising a mosaic of conservation and production systems and different elements including land and water, biodiversity, livelihoods and heritage, under different legal and management arrangements that is centred on the needs of people and provides a basis for sustainable rural development. |
| **Mitigation measure:** | A measure or sequence of measures aimed at avoiding, minimising, rehabilitating, restoring, or remedying, including by means of biodiversity offsets, an adverse effect. |
| **No Natural Habitat Remaining:** | In the context of South African biodiversity planning (e.g., Biodiversity Sector Plans), No Natural Habitat Remaining (NNHR) refers to areas where the original natural vegetation or ecosystem has been completely transformed by human activities, so that no functioning natural habitat remains. |
| **Peat wetlands:** | Wetlands with a thick water-logged organic soil layer (peat) made up of dead and decaying plant material (www. Wetlands.org). |
| **Production landscapes:** | Landscapes that have been shaped through long-term harmonious interactions between humans and nature in a manner that fosters well-being while maintaining biodiversity and ecosystem services. |
| **Protected Area Expansion Strategy geographic focus areas:** | In South Africa, the Protected Area Expansion Strategy (NPAES) identifies Geographic Focus Areas (GFAs) as priority regions for expanding the national protected area network. |
| **Protected Area Network:** | A Protected Area Network is the system of protected areas in a country or region that are linked together to conserve biodiversity, maintain ecological processes, and provide ecosystem services at a landscape scale. |
| **Zoning schemes:** | Zoning schemes are legal and spatial tools used by municipalities to regulate land use and development within a defined area. They are designed to organize land uses in a way that balances development, environmental protection, and public interest. |

# 1

# INTRODUCTION & OBJECTIVES

# INTRODUCTION & OBJECTIVES

## 1.1. DESCRIPTION OF THE NORTH WEST PROVINCE

South Africa's North West Province (NWP) is located south of Botswana, and shares boundaries with Limpopo, Gauteng, Free State and Northern Cape Provinces. The province covers approximately 105,000 km$^2$ and includes four District Municipalities and 17 Local Municipalities. Higher altitudes support Highveld Grasslands, while lower regions in the north west and north east represent the arid Kalahari Basin and Bushveld Basin, respectively. Other noteworthy higher-lying regions include Vredefort Dome in the east and Ghaap Plateau in the south-west.

While large areas have been modified by urban, mining and agricultural development, the NWP supports sufficient tracts of natural vegetation to harbour threatened species and ecosystems. It delivers vital ecosystem services that support human livelihoods, health and well-being.

## 1.2. MAKING THE CASE FOR BIODIVERSITY

Biodiversity is defined as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; which includes diversity within species, between species and of ecosystems." SANBI (2023).

So why should biodiversity be conserved? People are essentially dependent on the natural environment and its variability for their survival and livelihoods. People derive benefits from the biodiversity in our natural environment, which we call ecosystem services.

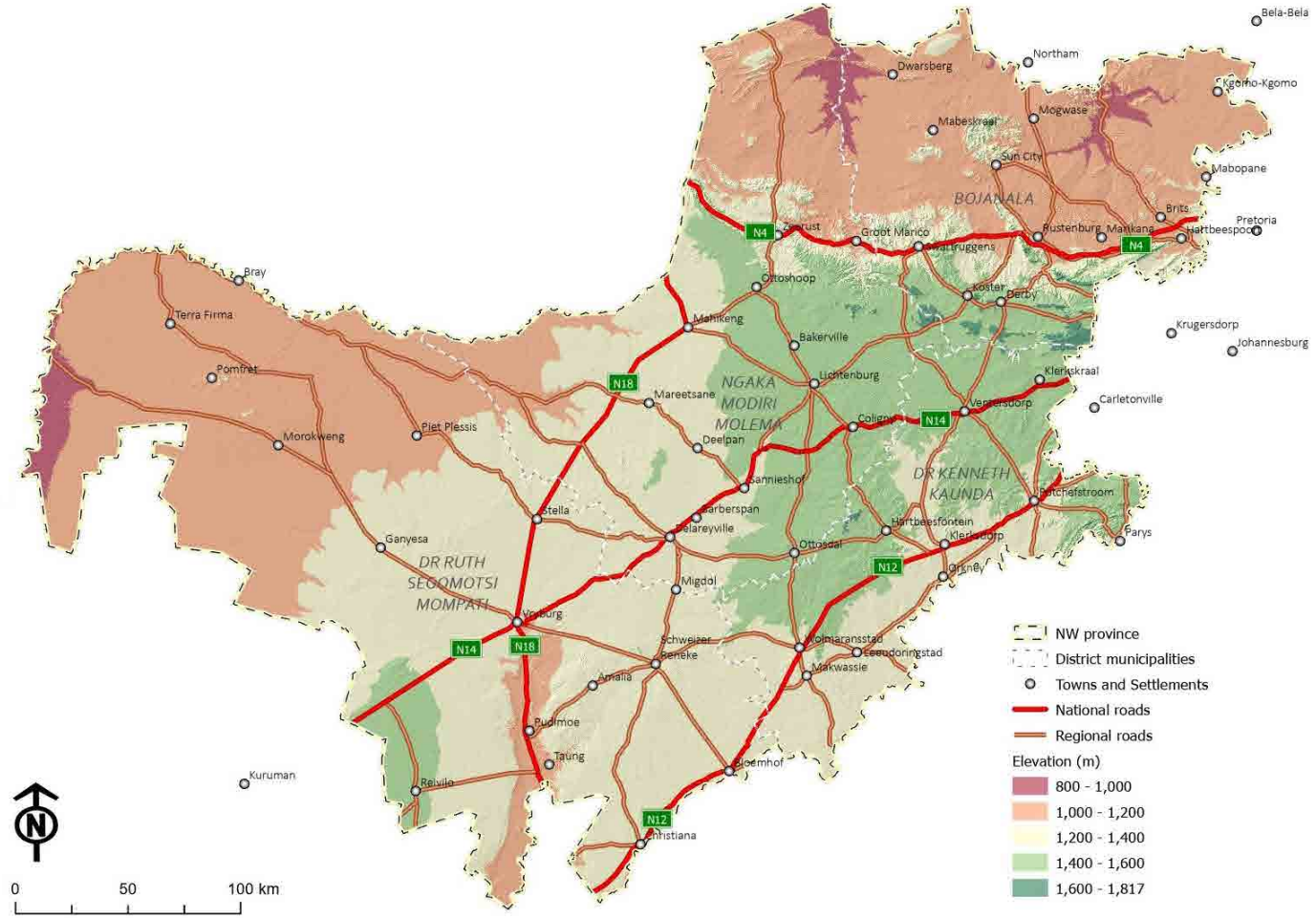



**Figure 1. North West Province extent and elevation.**

**Examples of ecosystem services include:**

- Provisioning services, which are tangible benefits such as food, water, building material, medicine and fuel (i.e wood).
- Regulating services, which include flood attenuation and climate regulation.
- Cultural services, which include the use of natural resources to fulfil spiritual and religious needs, as well as recreation and wellness.

The healthier an ecosystem is, the more benefits we derive from the system, therefore it is necessary to conserve the diversity in an ecosystem in order to ensure that ecosystems continue to function properly and to ensure that ecological processes (such as nutrient cycles) are supported.

## 1.3. WHAT IS A BIODIVERSITY SECTOR PLAN?

A Biodiversity Sector Plan (BSP) is a tool that guides and informs land use and resource-use planning and decision-making by a full range of sectors whose policies, programmes and decisions impact on biodiversity, to preserve long-term functioning and health of National or regional priority areas known as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). It is therefore the official reference document for biodiversity priorities that need to be considered in all land-use planning and decision-making processes.

A BSP is developed by applying systematic biodiversity planning methods. The process is clearly outlined in the national guidelines for bioregional planning *NEMBA Guideline regarding the determination of bioregions and the preparation of and publication of Bioregional Plans* No 291 of 2009) and the *Technical Guidelines for CBA maps* (SANBI, 2017).

In summary, a BSP produces a map of important biodiversity areas, outside of the Protected Area network, that requires management intervention through land use guidelines, to retain biodiversity patterns and ecological processes. The types of information used to inform this map may include distribution mapping of biodiversity features, mapping land cover and land use, which is optimised to support the Protected Area network. The process followed to "build" the revised CBA map is explained in more detail in Section 7.

**The components of a BSP include the following:**

1. Map of CBAs and ESAs, also known as a CBA map, for both terrestrial and freshwater ecosystems
2. BSP handbook which includes a biodiversity profile and land use guidelines
3. GIS files and metadata
4. Technical report describing the analyses and processes undertaken to develop the CBA map.

**Definitions of CBAs and ESAs SANBI (2017)**

*A CBA is an area that is currently in good ecological condition that*, together with the network of Protected Areas, *must remain so in order to meet biodiversity targets for ecosystem types, species of special concern or ecological processes.*

*An ESA is an area that must retain its ecological processes in order to: meet biodiversity targets for ecological processes that have not been met in CBAs or protected areas; meet biodiversity targets for representation of ecosystem types or species of special concern when it is not possible to meet them in CBAs; support ecological functioning of a protected area or CBA (e.g. protected area buffers); or a combination of these.*

## 1.4. PURPOSE, AIM AND OBJECTIVES OF THE NORTH WEST BIODIVERSITY SECTOR PLAN 2025

The primary intention of NEMBA Chapter 3 is to facilitate conservation and management of biodiversity in "biodiversity priority areas" or priority areas for conservation, outside of the Protected Area network, at a landscape level. Therefore, the purpose of the Biodiversity Sector Plan is to provide a map of the priority biodiversity areas and develop associated land use management guidelines in order to reduce further loss or degradation to biodiversity priority areas and ecological support areas.

**The overarching objectives of a Biodiversity Sector Plan are therefore to:**

1. Identify the minimum spatial requirements, based on set targets, needed to maintain a living landscape that continues to support all aspects of biodiversity and retain essential ecological infrastructure.

2. Serve as the primary source of biodiversity information for land use planning and decision-making, such as Environmental Impact Assessment and Authorisations.
3. Inform conservation and restoration action in key biodiversity areas.

**For the NW BSP 2025, more specifically, it is aimed to:**

- Integrate up-to-date spatial biodiversity data.
- Re-assess Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).
- Incorporate climate resilience, ecosystem services, and landscape connectivity.
- Identify new or modified biodiversity priorities.
- Support municipalities and land use planners with revised BSP guidelines that more closely align with NEMA and SPLUMA.
- Identify priority sites for Protected Area Expansion

**Note:** A Biodiversity Sector Plan is produced to meet a specific objective, and is designed for a particular set of uses and users. Other management tools that are also designed to achieve biodiversity conservation goals include:

- North West Biodiversity Strategy and Action Plan 2025-2030
- North West Protected Area Expansion Strategy
- Biodiversity Management Plans (for ecosystems or species)
- Strategic Environmental Assessments
- Environmental Management Frameworks.

## 1.5. REVISION OF THE NW BSP 2015

Since the publication of the NW BSP 2015, the following key informants of a CBA map, were updated:

- Land Use (LU) and Land Cover (LC) changes: Changes in urban, agricultural, and mining land uses.
- Updated vegetation mapping: Review and update of the NW Vegetation Map to improve the accuracy of ecosystem classification.
- Wetland and freshwater mapping updates: better delineation and classification through tools like the National Wetland Map (version 6+) and the NW Wetland Inventory.
- Biodiversity threats and climate change pressures: Increased pressures on key habitats and corridors.
- Policy and legal framework changes: Updates to SPLUMA planning tools such as SDFs, NEMA Environmental Management instruments such as EMFs, and provincial policy instruments such as the NW BSAP 2030.
- *Technical Guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas and Ecological Support Areas using systematic biodiversity planning (SANBI, 2017).*

The BSP needs to integrate the new information, re-assess priorities, and review management interventions that need to be implemented to ensure the persistence of biodiversity and ecological processes in the NWP.

The revision process of the NW BSP will also ensure consistency with the *Technical Guidelines for CBA mapping* (SANBI, 2017), which aims to standardise the approaches to developing CBA maps in South Africa.

The revised NW BSP 2025 will replace the previous 2015 version in its entirety.

## 1.6. INTENDED USES AND USERS

The NW BSP 2025 should be used by all sectors involved with land use planning and decision-making in the NWP. This extends to entities that need to use the NW BSP 2025-2030 to meet legislative requirements, as well as planners, programmes and developers who would find it useful to inform planning processes. The main users of the NW BSP 2025 should include:

- All National and NW departments and municipalities who undertake planning and decision-making functions
- National and Provincial Extended Public Works Programmes
- Environmental Assessment Practitioners
- Developers or landowners considering development applications or changes in land use
- Environmental NGOs.

The consequence of not implementing the Biodiversity Sector Plan effectively is the continued loss of critical habitat. This critical habitat is not only essential to account for the province's share of national targets, but also to sustain biodiversity and ecosystems which, in turn, supports its citizens.

## HOW IS THE BIODIVERSITY SECTOR PLAN USED?

**Planning ahead:**

- Provincial and Municipal planning departments must integrate CBAs, ESAs and the land use guidelines into:
  - Spatial Development Frameworks (SDFs), Integrated Development Plans (IDPs) and other relevant sector plans
  - Strategic Environmental Assessments (SEA) or Environmental Management Frameworks (EMF)
  - Land use zoning schemes or other planning processes under SPLUMA.
- Environmental Impact Assessment (EIA) processes currently require practitioners to pull down a report from the National Screening Tool prior to initiating an EIA. The CBA map produced as part of the NW BSP is served on the National Screening Tool, and triggers the gazetted Protocol for specialist assessment and minimum report content requirements for environmental impacts on Terrestrial Biodiversity (NEMA EIA regulations: GN 320 of 2020).
- Identification of appropriate sites for the Protected Areas Expansion Strategy should be informed by the Biodiversity Sector Plan.
- Restoration and rehabilitation programmes should use the Biodiversity Sector Plan to identify sites of high biodiversity importance, or that are considered as critical for ecosystem functioning, as priority areas for programme implementation.

**Making decisions**

- Decision-making on applications for Environmental Authorisations
- Relevant agricultural applications
- Water-use licence applications (WULAs)
- Authorisation for prospecting and mining.

**TABLE 1. SUMMARY OF WHO SHOULD USE THE NW BSP (2025) AND HOW.**

| USER | APPLICATION | SPECIFIC USES |
|---|---|---|
| District and Local Municipalities | Proactive planning | Informing spatial and development planning through integration, as a sectoral plan, into SDFs, IDPs and other relevant municipal sector plans |
| National and Provincial development sectors (e.g. DFFE, DEDECT, COGTA, etc.) | Proactive planning | Informing environmental and development planning |
| National and Provincial Expanded Public Works Programmes | Proactive planning | Assisting planning and prioritisation of areas for restoration and conservation |
| Public and private developers, landowners and community organisations contemplating changes in land use (e.g. agriculture, mining or urban development). | Proactive planning | Informing appropriate development, layout and design of proposed land use changes by considering sensitive biodiversity and habitat |
| Conservation authorities, organisations and agencies | Proactive planning | Informing conservation priorities and protected area expansion. |
| Environmental Assessment Practitioners | Reactive assessment and decision-making | Informing the scope of work for EIAs and biodiversity specialist impact assessments |
| Competent Authorities (DFFE, DEDECT, DMRE, DWS) | Reactive assessment and decision-making | Informing decision-making/permitting/ authorisations |

## 1.7. SYSTEMATIC BIODIVERSITY PLANNING APPROACH AND LIMITATIONS

In South Africa, the approach to biodiversity planning is target-based modelling to select mapping areas that are irreplaceable for achieving species and ecosystem targets (Critical Biodiversity Areas - CBAs) as well as mapping areas that support ecological processes such as dispersal and migration (Ecological Support Areas - ESAs). Biodiversity targets for ecosystem types in the NWP range between 16 - 31% of the original extent (*National Spatial Biodiversity Assessment*, *2004*). The challenge is that the available land for achieving the target for some ecosystem types in the North West is not available, or is only just met (See NW BSP Technical Report, 2025 for further details).

**In addition to achieving biodiversity targets, two other considerations need to be noted:**

1. Mining and agriculture are important economic contributors in the province;
2. Natural areas are not all alike. Some are natural or near-natural, but have been degraded by factors such as soil erosion, bush encroachment or the presence of alien invasive species. Other areas that appear natural are, in fact, previously cultivated secondary natural vegetation that supports lower levels of biodiversity. However, they are important for maintaining some ecological processes, such as foraging areas for bird species, buffering of natural areas, and maintaining connectivity (ecological corridors). Game farmers for instance value secondary grasslands for enhanced habitat for plains dwelling antelope. While some semi-natural areas are important, natural or near-natural uncultivated grasslands are a much higher priority for conservation.

**In view of the above, significant emphasis has been placed on identifying secondary vegetation.**

A network of ecological corridors has been designed to connect biodiversity nodes and Protected Areas. Edge-matching with surrounding provinces was undertaken to ensure alignment across provincial boundaries. A detailed account of how the CBA map was developed is available in the NW BSP (2025) Technical Report, published as part of this project. The technical report provides the method and techniques employed to generate the map.

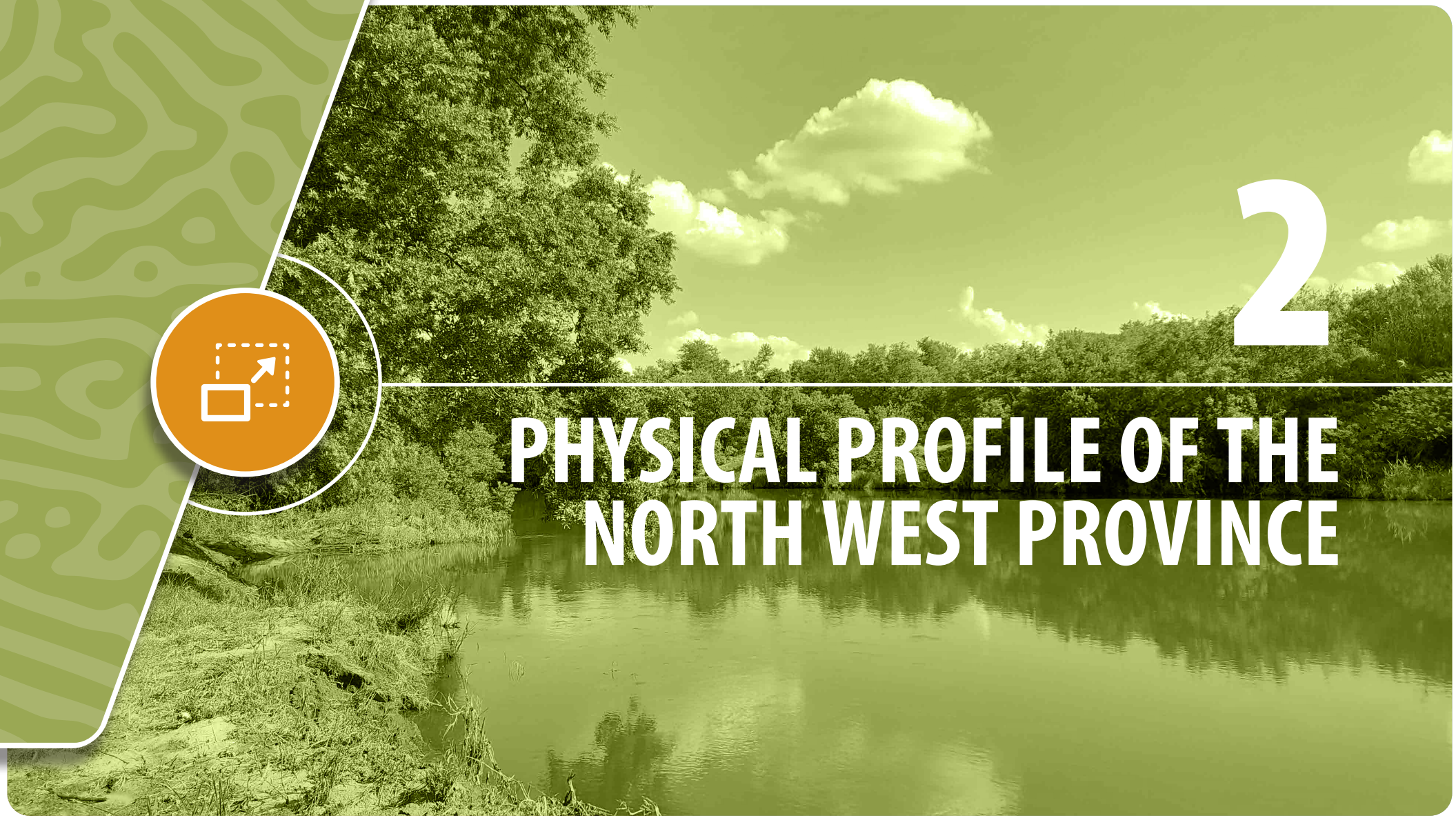
The land-use guidelines have been developed by collating SPLUMA Land Use Schemes from across a number of municipalities to identify the main land-use categories in the NWP. The land-use categories have then been aggregated or disaggregated, depending on their anticipated impact on the surrounding natural environment. The convergent language of the land-use guidelines and the municipal land-use scheme categories will facilitate the integration of the CBA map into the other spatial planning processes, such as the Spatial Development Frameworks (SDFs).

Management actions and interventions emanating from the plan should be incorporated into future municipal Integrated Development Plans for NWP. This may include projects for securing biodiversity offset areas, ecosystem restoration projects, environmental education and data gathering, all of which need to be resourced.

Stakeholder engagement is a key component in the development of the Biodiversity Sector Plan. A diverse range of stakeholders have been involved in the process, including representatives from national and provincial government departments, municipalities and conservation agencies. To facilitate meaningful input, a stakeholder workshop was held on 19 November 2024, followed by a presentation to the Provincial Spatial Land Use Forum on 19 March 2025. These engagements were instrumental in gathering information and feedback to guide the development of the CBA map and the associated land use guidelines. Furthermore, stakeholders were given the opportunity to review and comment on the Draft revised North West Biodiversity Sector Plan (2025), ensuring that the final product is informed by a broad spectrum of perspectives and expertise.

**Although the revised NW BSP (2025) is based on the most accurate, recent and available science, due to gaps in biodiversity knowledge, the following must be taken into account:**

- The NW BSP (2025) cannot be used to the exclusion of other environmental or biodiversity planning initiatives.
- The NW BSP (2025) cannot replace or supersede onsite, fine-scaled surveys and assessments for land use or development applications in terms of NEMA EIA Regulations.



# 2

# PHYSICAL PROFILE OF THE NORTH WEST PROVINCE

# PHYSICAL PROFILE OF THE NORTH WEST PROVINCE

## 2.1 BIOREGIONS OF THE NORTH WEST PROVINCE

The terrestrial ecosystems can be broadly divided into bioregions based on geology, climate, elevation and hydrology, which drive species and ecosystems found in these areas (Figure 2). These include the Kalahari Basin in the north-west, the Bushveld basin in the north-east, and Bankenveld range which separates the Bushveld Basin from the higher-lying Western Grasslands. The Kalahari, south of the Botswana border, is characterised by lower-lying, arid conditions and flatter topography. A small portion of the Vredefort Dome is found in the central east portion of the NWP, while the Lower-Vaal Valley follows the south-west boundary of the province. The Ghaap Plateau is a high-lying plateau in the south-west of the NWP.

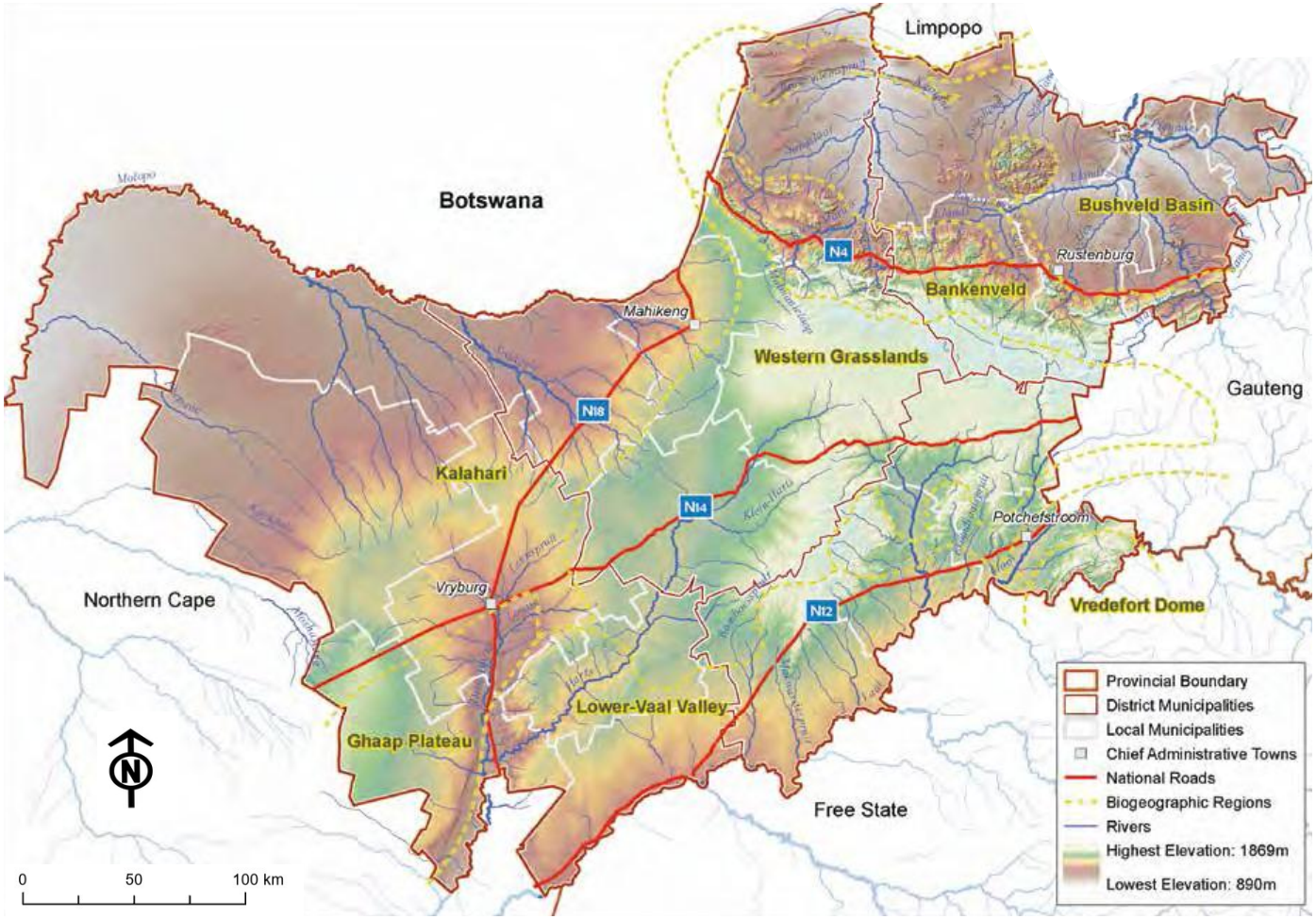



**Figure 2. Bioregions of the North West Province.**

## 2.2 PHYSICAL CHARACTERISTICS

### 2.2.1. RAINFALL AND TEMPERATURE

Rainfall ranges from near 800 mm per annum in the Western Grasslands, Bankenveld and Bushveld Basin in the north-east of the province and decreases to 250 mm in the Kalahari region in the extreme west of the province. There is a single summer-rainfall season from October through to April.

Temperatures are coolest with higher incidence of frost in the Western Grasslands and Bankenveld, while the northern savannas are warmest. The Kalahari region has the warmest summer temperatures and the Bushveld region the mildest winters.

**Figure 3. Mean average precipitation (mm) of the North West Province (Schulze, 1997).**

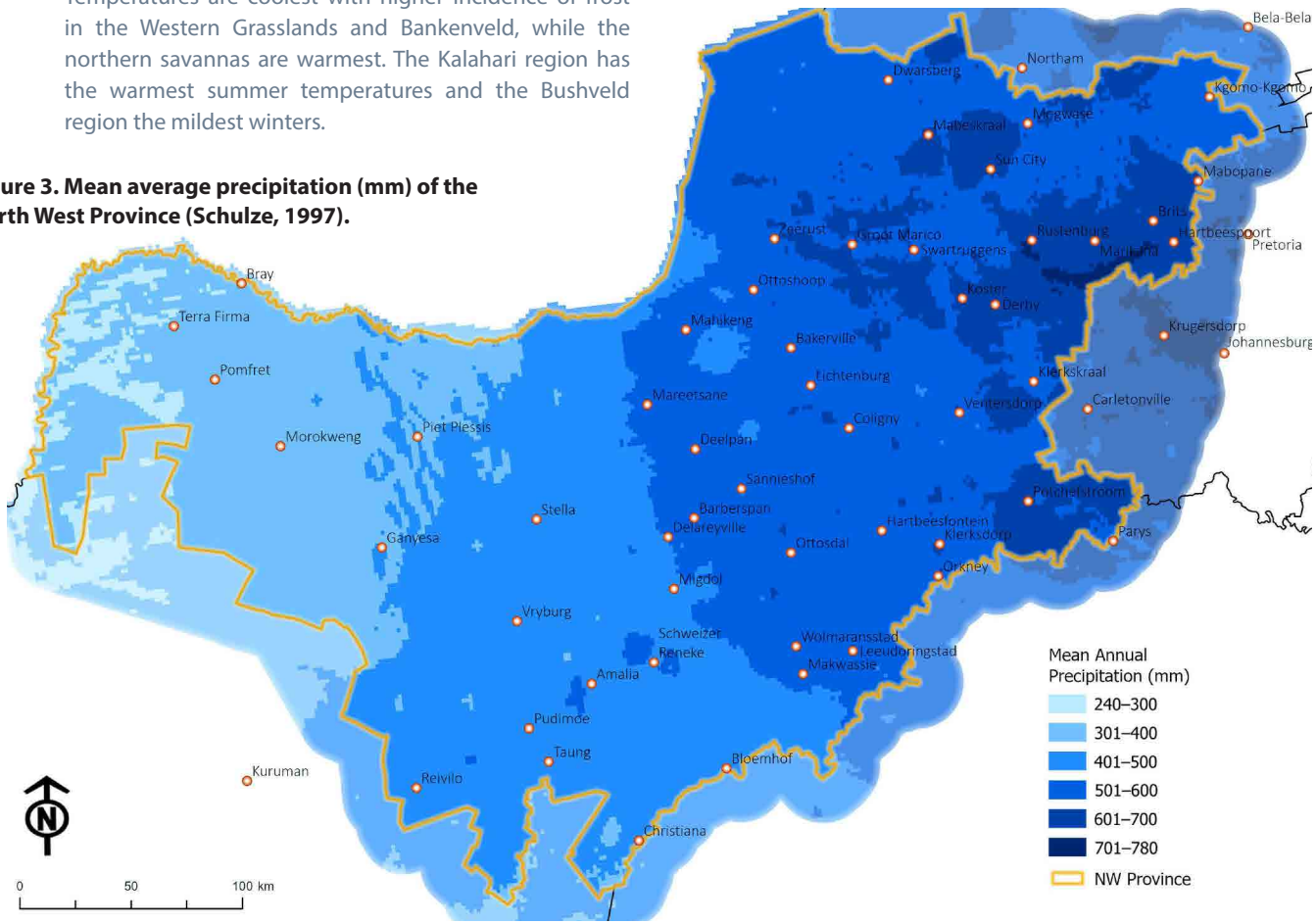
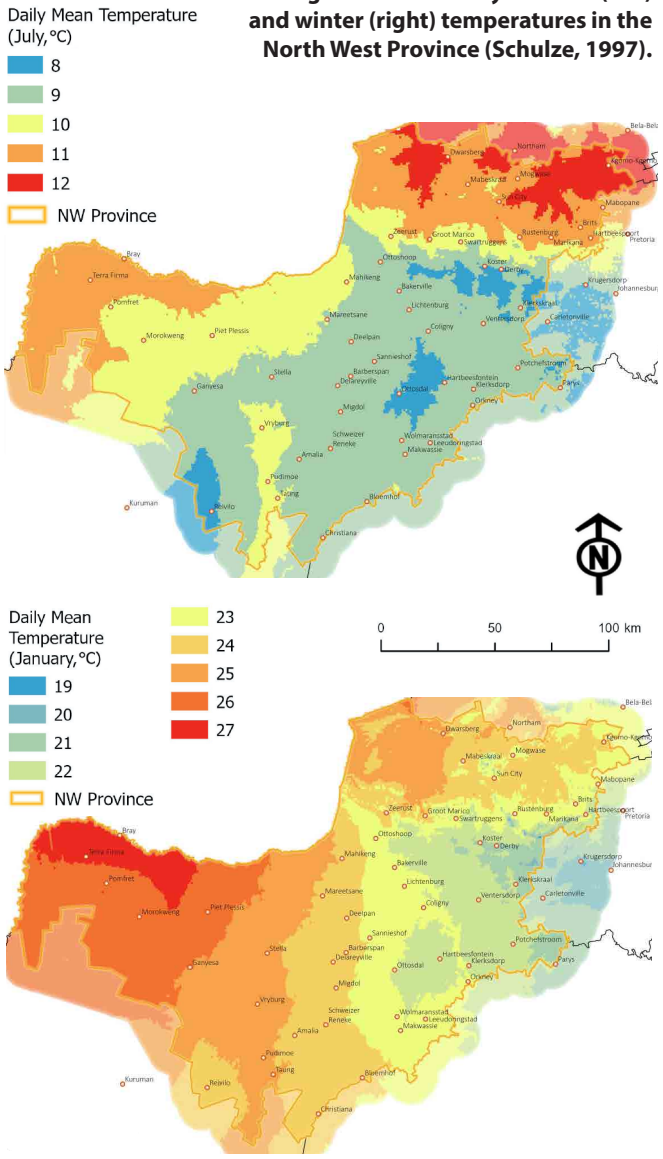


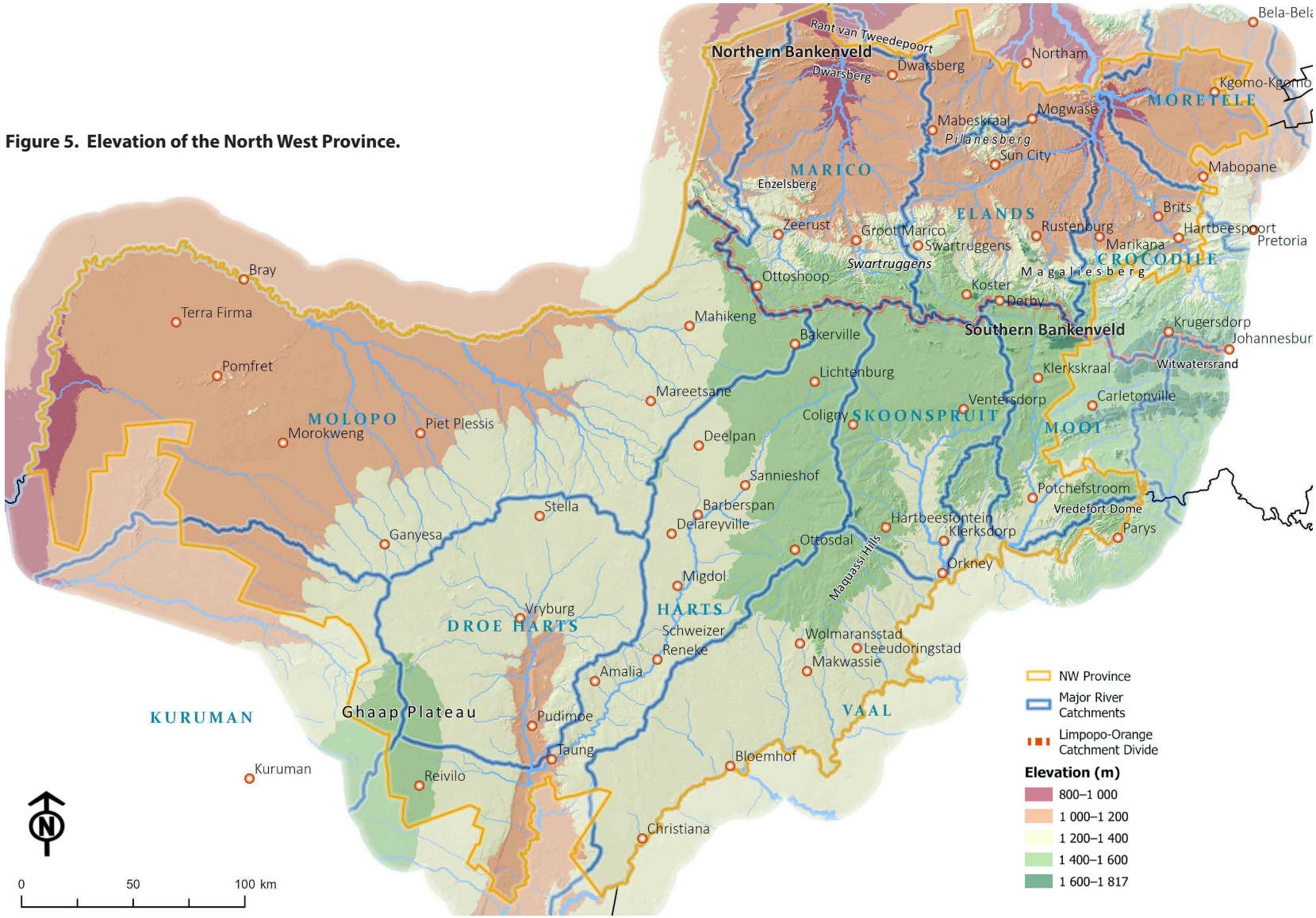

**Figure 4. Mean daily summer (left) and winter (right) temperatures in the North West Province (Schulze, 1997).**



### 2.2.2. TOPOGRAPHY AND ALTITUDE

The NWP is a relatively flat to gently undulating landscape punctuated with hills or mountains. The major mountain ranges of the province are in the Northern Bankenveld (including the Dwarsberg and Rant van Tweedepoort), the Southern Bankenveld (including the Magaliesberg, Witwatersrand, Enzelsberg and Swartruggens (Partridge et al., 2010), the Pilanesberg, the hilly landscape spanning between Wolmaransstad to Hartbeesfontein known as the Maquassi Hills, the predominantly east-facing low cliffs of the Ghaap Plateau forming a west dipping cuesta on the border between the NWP and Northern Cape, and the Vredefort Dome in the southeast bordering Gauteng and Free State provinces (Desmet et al., 2024).

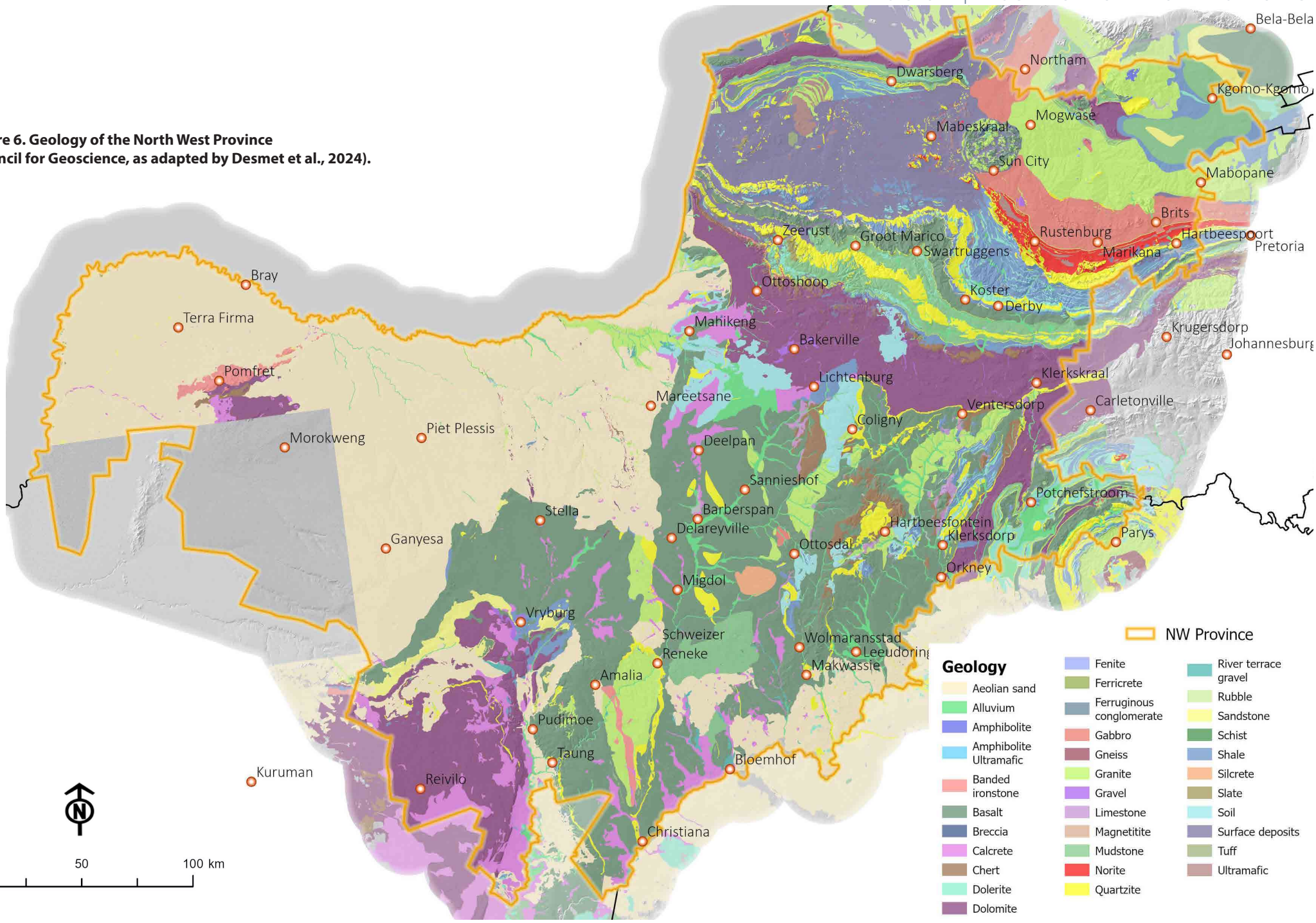
**Figure 5. Elevation of the North West Province.**

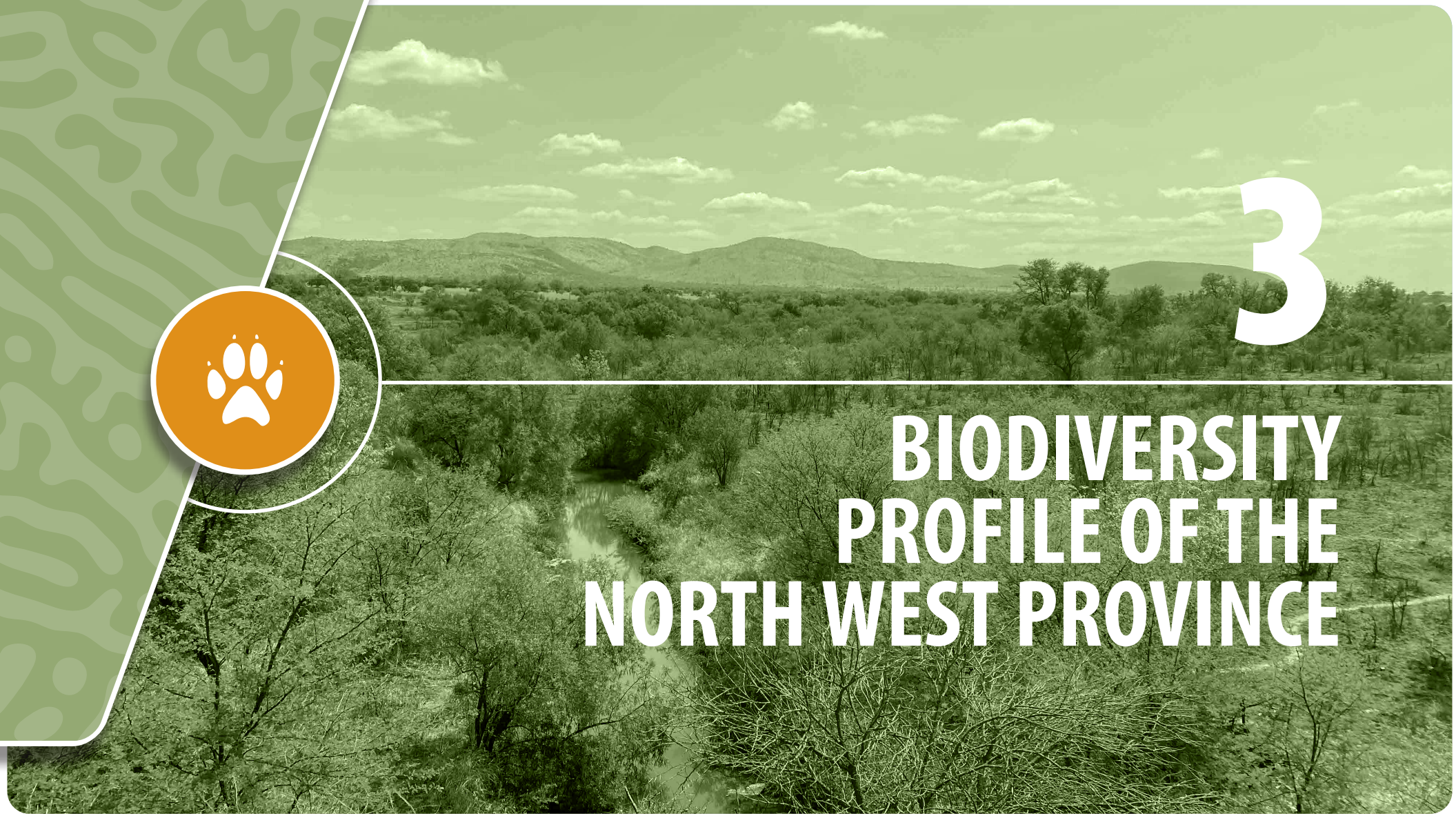


### 2.2.3. GEOLOGY AND SOILS

Geology and soils play a key role in species composition and structure and therefore the make up and function of terrestrial and aquatic ecosystems. This is reflected in the recent update of the vegetation map of the NWP, where geology and soils are one of the criteria defining spatial extents of vegetation types (Desmet et al., 2024). The geology and soils in NWP are highly variable (Figure 6), influencing landscape level biodiversity patterns and micro-scale habitat niches. The NWP can be broadly characterised into aeolian, quartzite and sandstone, shale and mudstone, dolomite, igneous mafic and igneous felsic geologies.

**Figure 6. Geology of the North West Province (Council for Geoscience, as adapted by Desmet et al., 2024).**





# 3

# BIODIVERSITY PROFILE OF THE NORTH WEST PROVINCE

# BIODIVERSITY PROFILE OF THE NORTH WEST PROVINCE

## 3.1. THREATENED AND ENDEMIC SPECIES

Within the South African context, the North West is not characterised by a large diversity of endemic or rare species. However, with nearly 2,300 indigenous plants (Hahn, 2013), and 120 mammal species recorded for the province (Power et al., 2019), the province can be considered as having a rich biodiversity.

**THREATENED AND/OR ENDEMIC PLANTS, MAMMALS, BIRDS, FISH, REPTILES FOUND IN THE NORTH WEST PROVINCE.**

**PLANTS**

**Important endemic plant species that are supported in the province and which show a broad association to geology and/or geomorphology include (also refer to the NW BSP Technical Report (2025):**

- *Aloe peglerae, Frithia pulchra, Ledebouria atrobrunnea, L. confusa, Lobelia cuneifolia var. ananda, Gladiolus filiformis* and *Nuxia glomerulata* are Southern Bankenveld endemic species, and are restricted predominately to soils derived from the Transvaal supergroup quartzites. Areas of the province with quartzite geology are considered important areas for biodiversity because they are associated with the majority of endemic species in the NW. Rocky habitats in these areas also produce poor soils that are resistant to bush thickening, and thus are viewed as an important climate change refuge habitat.
- *Euphorbia knobelii* is restricted to the western extremities of the Northern and Southern Bankenveld.
- *Gladiolus filiformis* is endemic to the extreme western section of Southern Bankenveld growing most prolifically in chert/dolomite areas.
- The grasses *Cynodon polevansii and Sporobolus oxyphyllus* are both saline pan specialists, highlighting the possibility that similar species can still be discovered. The Highveld Salt Pans are important habitats for these species.
- *Rennera stellata,* a **Vulnerable** aquatic plant, is restricted to calcrete pans, dolines (depressions) and seasonal rivulets in dolomite and calcrete areas, from Vryburg southwards into the Northern Cape, with its main distribution occurring on the Ghaap Plateau.
- Endemic plants from Griqualand West Centre of Endemism include *Amphiglossa tecta, Antimima lawsonii, Brachiaria dura Stapf var. pilosa, Barleria media, Cineraria exilis, Dicoma kurumanii, Hereroa wilmaniae, Justicia puberula, Maytenus ilicina, Prepodesma orpenii* and *Putterlickia saxatilis.*
- *Blepharis angusta* is another important species endemic to the North West, known from Leeuwfontein in the west to Klerkskraal in the east (Hahn, 2013).
- Several rivers in the province support threatened species, such as the **Vulnerable plant**, *Rennera stellata*, in the Blue Pools River.

## MAMMALS

Black Rhinoceros (*Diceros bicornis minor*), Roan Antelope (*Hippotragus equinus*), African Wild Dog (*Lycan pictus)*, Mountain Reedbuck (*Redunca fulvorufula*) and Short-eared Trident Bat (*Cloeotis percivali*) are nationally **Endangered** species that occur in the North West Province. **Vulnerable** species include the Temminck's Ground Pangolin (*Smutsia temminckii*), Black-footed cat (*Felis nigripes*), Leopard (*Panthera pardus*), Spotted-necked Otter (*Hydrictis maculicollis*), Sable Antelope (*Hippotragus niger*), White-tailed rat (*Mystromys albicaudatus*) Robert's Marsh Rat (*Dasymus rebertsii)*, Tsessebe (*Damaliscus lunatus*), Maquassie Musk Shrew (*Crocidura maquassiensis*) and Cheetah (*Acinonyx jubatus)*. The Oribi (*Ourebia ourebi*) is the only one known to have gone extinct since the last BSP. The current status of the White-tailed rat is uncertain.

## REPTILE SPECIES

A comprehensive inventory of North West Province herpetofauna (from surveys during 2019–2020) recorded 102 reptile species in total, but only one was classified as IUCN-threatened within the province—Crocodylus niloticus which is classified as which **Vulnerable**. The only reptile species classified as Near Threatened (NT) that has a confirmed occurrence in North West Province, South Africa is Transvaal Grass Lizard (*Chamaesaura aenea*).

## FRESHWATER FISH SPECIES

Three **Vulnerable** fish species occur in the Groot Marico system, a designated Freshwater Ecosystem Priority Area (NFEPA): the Marico Barb (*Enteromius motebensis*), the Mountain Catfish (*Amphilius uranoscopus*), and the Suckermouth Catlet (*Chiloglanis pretoriae*). The status of the **Vulnerable** Goldie barb (*Barbus* sp.'*pallidus* cf. north') is under review. The Near -Threatened Orange-Vaal largemouth yellowfish (*Labeobarbus kimberleyensis*) is endemic to the Orange-Vaal Rivers systems. The rivers and associated catchments that support threatened fish species are Fish Sanctuary Areas, which are designated as Freshwater Ecosystems Priority Areas (FEPAs) if in a good ecological condition (A or B ecological category) or Fish Support Areas (lower than A or B ecological category) (Nel et al., 2011).

**BIRDS**

The North West Province contains habitat that supports numerous threatened bird species, most notably the Critically **Endangered** White-backed Griffon/Vulture (*Gyps africanus*), Lappet-faced Vulture (*Torgos tracheliotos*) and possibly the White-headed Vulture *(Trigonoceps occipitalis*), which is considered extinct from the region.

**Endangered** bird species include: Tawny Eagle (*Aquila rapax*), Steppe Eagle (*Aquila nipalensis*), Martial Eagle (Polemaetus bellicosus) and Bateleur (*Terathopius ecaudatus*), the Black and African Marsh Harriers (*Circus maurus* and *Circus ranivorus*), the Saddle-billed and Black Stork (*Ephippiorhynchus senegalensis* and *Ciconia nigra*), the Cape Vulture (*Gyps coprotheres*), the Grey Crowned Crane (*Balearica regulorum*), Blue Crane (*Grus paradisea*) and Southern Ground Hornbill (*Bucorvus leadbeateri*).

Regional endemic species found in the Province include Cape Shoveler (*Spatula smithii*), South African Shelduck (*Tadorna cana*), Cape Vulture, Black Harrier, Jackal Buzzard (*Buteo rufofuscus*), Blue Korhaan (*Eupodotis caerulescens*), Northern Black Korhaan (*Afrotis afraoides*), Blue Crane, White-backed Mousebird (*Colius colius*), Southern Boubou (*Laniarius ferrugineus*), Fairy Flycatcher (*Stenostira scita*), Short-clawed Lark (*Certhilauda chuana*), Eastern Long-billed Lark (*Certhilauda semitorquata*), Melodious Lark (*Mirafra cheniana*), Cape Grassbird (*Sphenoeacus afer*), Southern Pied Babbler (*Turdoides bicolor*), Cape White-eye (*Zosterops virens*), Orange River White-eye (*Zosterops pallidus*), Pied Starling (*Lamprotornis bicolor)*, Karoo Thrush (*Turdus smithi*), Karoo Scrub Robin (*Tychaedon coryphoeus*), Fiscal Flycatcher (*Sigelus silens*), White-throated Robin-chat (*Dessonornis humeralis*), Sentinel Rock Thrush (*Monticola explorator*), Ant-eating Chat (*Myrmecocichla formicivora*), Greater Double-collared Sunbird (*Cinnyris afer*), Sociable Weaver (*Philetairus socius*), Cape Weaver (*Ploceus capensis*), Swee Waxbill (*Coccopygia melanotis*), Cape Longclaw (*Macronyx capensis*) and Cape Canary (*Serinus canicollis*).

## 3.2. IMPORTANT TERRESTRIAL AND AQUATIC HABITATS IN THE NORTH WEST PROVINCE

**Marico Biosphere Reserve** at the edge of the Highveld and Bushveld, is characterised by diverse topography, geology and hydrology, which results in a unique set of ecosystems supporting a wide range of species across taxonomic groups. Examples of unique features include the Bankenveld, Highveld Salt Pans and Malmani Dolomites. In addition, the Marico River and tributaries, are a priority river due to the clean, free-flowing nature of the Marico River and the presence of the Vulnerable Marico barb (*Barbus motebensis*) and the Near Threatened Barbus sp. 'Waterberg'.

**Magaliesberg Biosphere Reserve** conserves multiple threatened ecosystems and species. The quartzite cliffs of the Magaliesberg support two breeding colonies of Cape Vulture. Furthermore, studying the movements of leopard (*Panthera pardus*) in the Magaliesberg are ongoing projects. The Magaliesberg Mountain Range, one of the oldest mountain ranges in the world; is an extensive mountainous area that stretches 120 km across the North West and Gauteng provinces, delivering the most important ecosystem service in the province – clean, fresh water. The Kgaswane wetland (also a peat wetland system), located in the Magaliesberg, is of critical importance, as it serves as a sponge for water feeding the Rustenburg area.

The Magaliesberg, and associated aquatic resources, is therefore invaluable ecological infrastructure that supports all the settlements, agricultural-, mining- and industrial development in the north-east of the province. The mountain range is also an important area for visitors to enjoy solitude and appreciate the

wilderness within a short distance from the large cities. The mountain is both a refuge and important habitat to various large vertebrates, such as the Cape vulture, leopard and brown hyena.

**The Kgaswane Wetland,** located within the Kgaswane Mountain Reserve, is a designated Ramsar site of international importance. It lies within the Waterberg–Magaliesberg Summit Sourveld vegetation unit and represents a unique wetland system in the Magaliesberg region. Unlike many peat wetlands in South Africa, the Kgaswane Wetland is not associated with dolomitic geology, yet it supports peat accumulation and functions as a significant carbon sink. Due to its ecological importance and degradation pressures, it has been identified as a priority wetland for rehabilitation. The site plays a crucial role in regional hydrology, biodiversity conservation, and climate regulation through carbon sequestration.

**Barberspan Bird Sanctuary**, a designated Ramsar Wetland of International Importance, serves as a critical wintering site for waterfowl and migratory birds. It functions as both a dry-season refuge and an important stopover along migratory routes, supporting a wide diversity of resident and seasonal bird species. Due to its rich avifaunal assemblage and ecological significance, Barberspan has long been a focal point for ornithological research and monitoring. The site continues to contribute valuable data to long-term studies on waterbird populations, migration patterns, and wetland ecology in South Africa.

**The upper Groot Marico River and tributaries** are also important for species evolutionary processes, as the different catchments support three genetically distinct populations of the Vulnerable Marico barb (*Barbus motebensis*) (Roux, 2015). Diversification of fish and other aquatic organisms is likely to be a phenomenon common to all upper catchments of rivers arising in the Swartruggens and Magaliesberg mountains.

**Unique karst landscapes** have formed in the North West from the chemical weathering of dolomite, which has created underground drainage systems with sinkholes, dolines (depressions) and caves. A typical karst landscape, characterised by its dolines, poljes and dry valleys, occurs between Klerksdorp and Mahikeng. These karst landscapes have also given rise to unique aquatic features, known as dolomitic eyes (springs) and tufa ecosystems.

- **Caves**, such as the Rand Van Tweedepoort (Madikwe) are known to be key habitats for bats and other species. Caves are also important heritage and archaeological sites, and some, like the Weltevreden Caves in the Derby area, are locally well-known attractions.
- **Dolomitic eyes (springs)** are associated with the perimeter of all the dolomite rock formations in the province. There are 46 mapped dolomitic springs in the province. Springs that are still in a relatively natural state are supported in the Blue Pools, Molopo, Molemane, Marico, Mooi, Ngotwane and Schoonspruit Rivers. These ecosystems are often associated with unique biodiversity. The geographic isolation of dolomitic eyes results in high levels of speciation and thus results in high endemism of both invertebrates and fish species. Some eyes are very large features; for example, the Groot Marico Eye is 17 m deep and 40 m wide. Therefore, the local and international importance of these unique ecosystems and landscape features cannot be underestimated. Locally, the water derived from these features for agricultural and domestic use is important. Within the NWP, all rivers that originate from the Malmani karst system (e.g. Ngotwane, Schoonspruit, Marico, Molopo, Mooi, Harts) have a dolomitic eye as their source. Many major towns have eyes as their sole source of water (e.g. Morokweng, Zeerust, Mahikeng). Consequently, these ecosystems must be regarded as critically important ecological infrastructure within the province.
- **Tufa waterfalls** are a unique habitat associated with dolomite areas in the province. There are eight (8) known Tufa waterfalls in the province. Tufa is a type of limestone rock, which forms due to

the precipitation of carbonate minerals from low-temperature freshwater springs, rapids, cascades and waterfalls. Tufa deposits support the growth of wetland plants, unique biota and potentially new species not yet discovered.

- **The Malmani karst system** located between Molemane and Ventersdorp is the recharge area for all the major eyes in the province, and is thus a watershed in this context. This area is possibly the single most important ecosystem service area in the NW given that it is responsible for regulating and maintaining the fresh water resources for a significant proportion of the province's population. **Large peat wetlands** are associated with all the dolomitic eyes of the Malmani karst system. These are nationally unique ecosystems that provide an immeasurable ecosystem service. Apart from being massive carbon sinks, these wetland systems filter, clean and regulate the flow of fresh water from the dolomitic eyes. These wetlands have significant ecosystem service value and make a disproportionately large contribution to human well-being in the province.

**Important floodplain wetland** systems are also associated with the Harts Rivers system (downstream of the Taung Dam), and in the north-east of the province, the Tolwane and Moretele Rivers (Roux, 2015). The Moretele River floodplain near Kgomo-Kgomo rivals that of the Nyl River near the Waterberg, however, urgent restoration is required in this system. This wetland is popular amongst birdwatchers from Gauteng.

Areas of **serpentine soils** occur in the province, principally in (a) the Vredefort Dome and (b) the norite hills of the Rustenburg Layered Suite in the Bushveld Basin. Serpentine soils are derived from ultramafic rocks and are characterised by low calcium to magnesium ratios; low availability of essential nutrients (e.g. nitrogen, potassium, and phosphorus); and, high concentrations of nickel and chromium. Globally, serpentine areas are associated with unique plants, specifically adapted to the extreme toxic soil conditions of these areas. In the NW, the biodiversity of these areas is known to be important. The North West University (Potchefstroom Campus) is investigating these two areas to determine whether a relationship between geology and plant species distribution (biodiversity pattern) exists. As a precautionary measure, rocky habitats (e.g. koppies) within these regions are considered as important sites for biodiversity (Siebert, pers comm).

The **Griqualand West Centre of Endemism** falls partially within the North West, centred on the Ghaap Plateau (Taung and Revillo) and stretching to Morokweng and Vryburg.

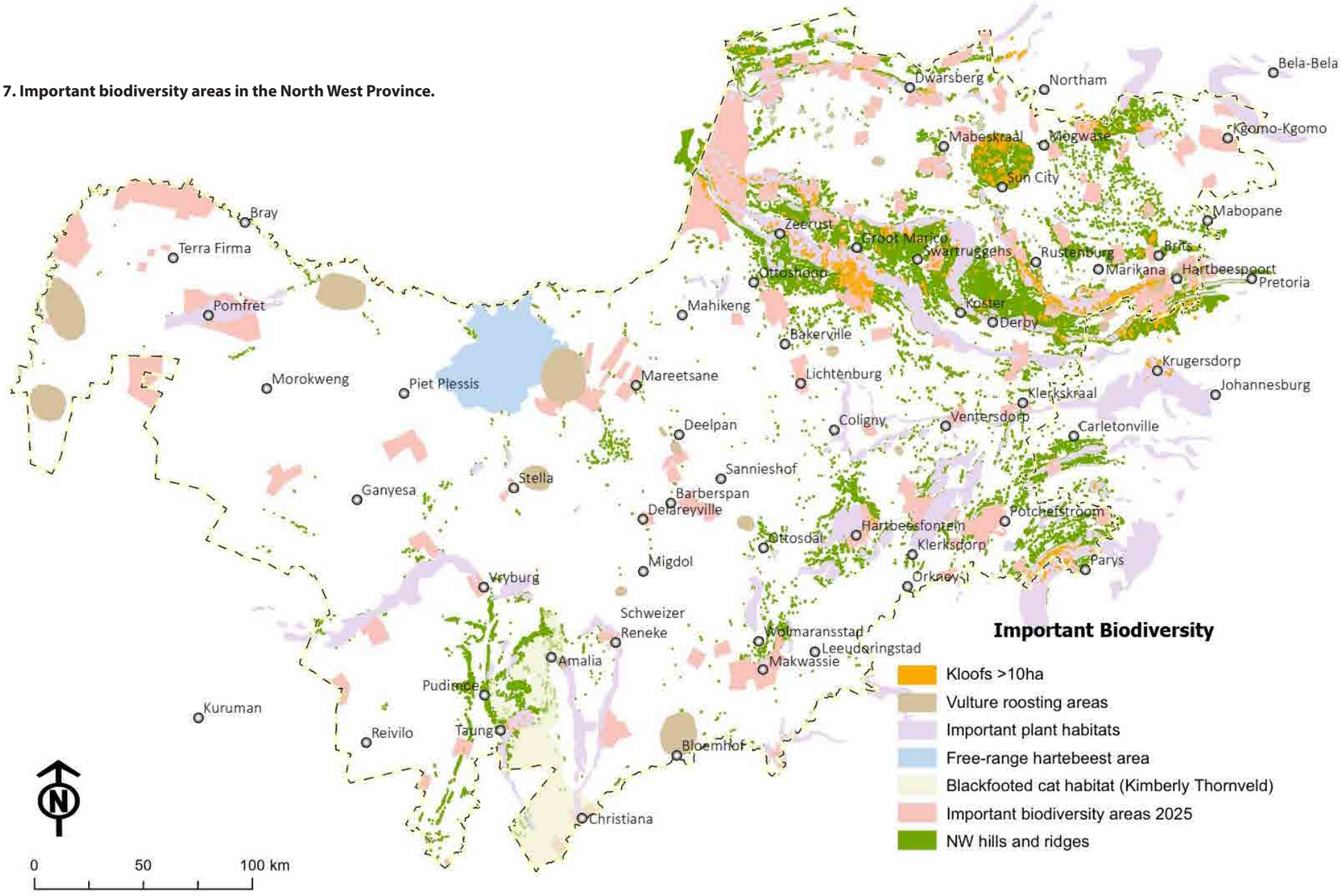
**Key Biodiversity Areas** (KBAs) are international areas of importance for the persistence of biodiversity and are defined in terms of globally standardised IUCN criteria. In the North West Province, three KBAs have been mapped namely the Madikwe-Atherstone, Magaliesberg and Pilanesberg Nature Reserve KBA. A small portion of the Cradle of Humankind KBA also falls within the province.

- **Madikwe - Atherstone** is a large terrestrial KBA. The site qualifies as a KBA as it meets the thresholds for three (3) threatened mammal species, and potentially meets the thresholds for another five (5) species which cannot be confirmed due to a lack of species information.
- **Magaliesberg** site qualifies as a KBA as it meets the thresholds for 4 criteria based on 8 species, which include birds, mammals, plants, and reptiles and the site holds significant proportions of the global extent of two (2) geographically restricted ecosystems.
- **Pilanesberg Nature Reserve** site qualifies as a KBA as it meets the thresholds for 2 threatened mammal species and also holds a significant proportion of the global extent of 1 geographically restricted ecosystem.

Further to the above, other biodiversity features of importance identified by biodiversity specialists in the 2015 and 2024 are included (Figure 7):

- Kloofs as important climate change adaptation habitat features;
- Hills and ridges as important habitat for biodiversity and climate change adaptation habitat features;
- Known White-Backed and Cape Vulture nesting sites;
- Important plants habitats for species of conservation concern;
- Known remaining extent of free-range red hartebeest;
- Blackfooted Cat habitat (Kimberly Thornveld); and,
- Expert-mapped important areas for biodiversity.

**Figure 7. Important biodiversity areas in the North West Province.**



## 3.3. TERRESTRIAL ECOSYSTEMS (VEGETATION TYPES) OF THE NORTH WEST PROVINCE

The recently updated vegetation map for the North West Province (Desmet et al., 2024) classifies and describes 39 different vegetation types, which are representatives of the Savanna and Grassland Biomes.

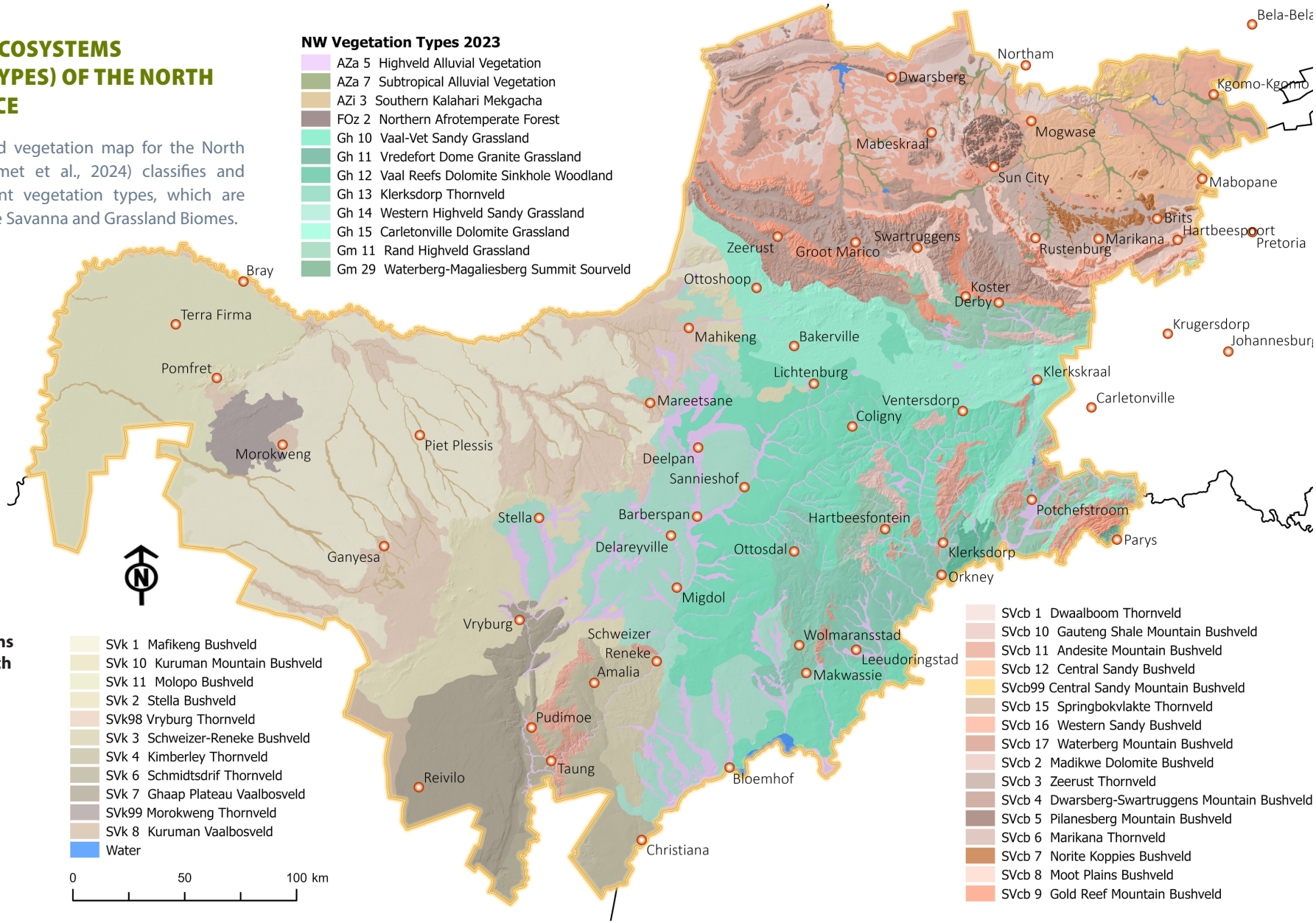



**Figure 8. Terrestrial Ecosystems (vegetation types) of the North West Province (Desmet et al., 2024).**

## 3.4. TERRESTRIAL ECOSYSTEMS- THREAT STATUS AND LEVELS OF PROTECTION

The Provincial threat status of terrestrial ecosystems (vegetation types) is determined by calculating how much of each ecosystem is still in a natural state (remaining extent) compared to the national conservation target set for the ecosystem. The provincial vegetation map, land cover and national biodiversity conservation target for vegetation types are used to calculate threat status.

The current analysis shows that two (2) ecosystems are **Critically Endangered**, four (4) are **Endangered** and six (6) are **Vulnerable**, in the NWP (Table 2 and Figure 9).

The method for calculating ecosystem threat status is the same as the method used for the 2015 NW BSP to ensure a level of comparison between the two assessments. The national method for calculating threatened ecosystems has changed to align with international trends (see *National Biodiversity Assessment, 2018*), however, this method is not applied here.

It should be noted that the changes in threat status can partly be ascribed to differences in the provincial vegetation map, which was recently updated (Desmet et al., 2024).

Out of 39 ecosystem types, only five (5) are well protected, while 14 are not afforded any level of protection (Figure 10 and Table 2).

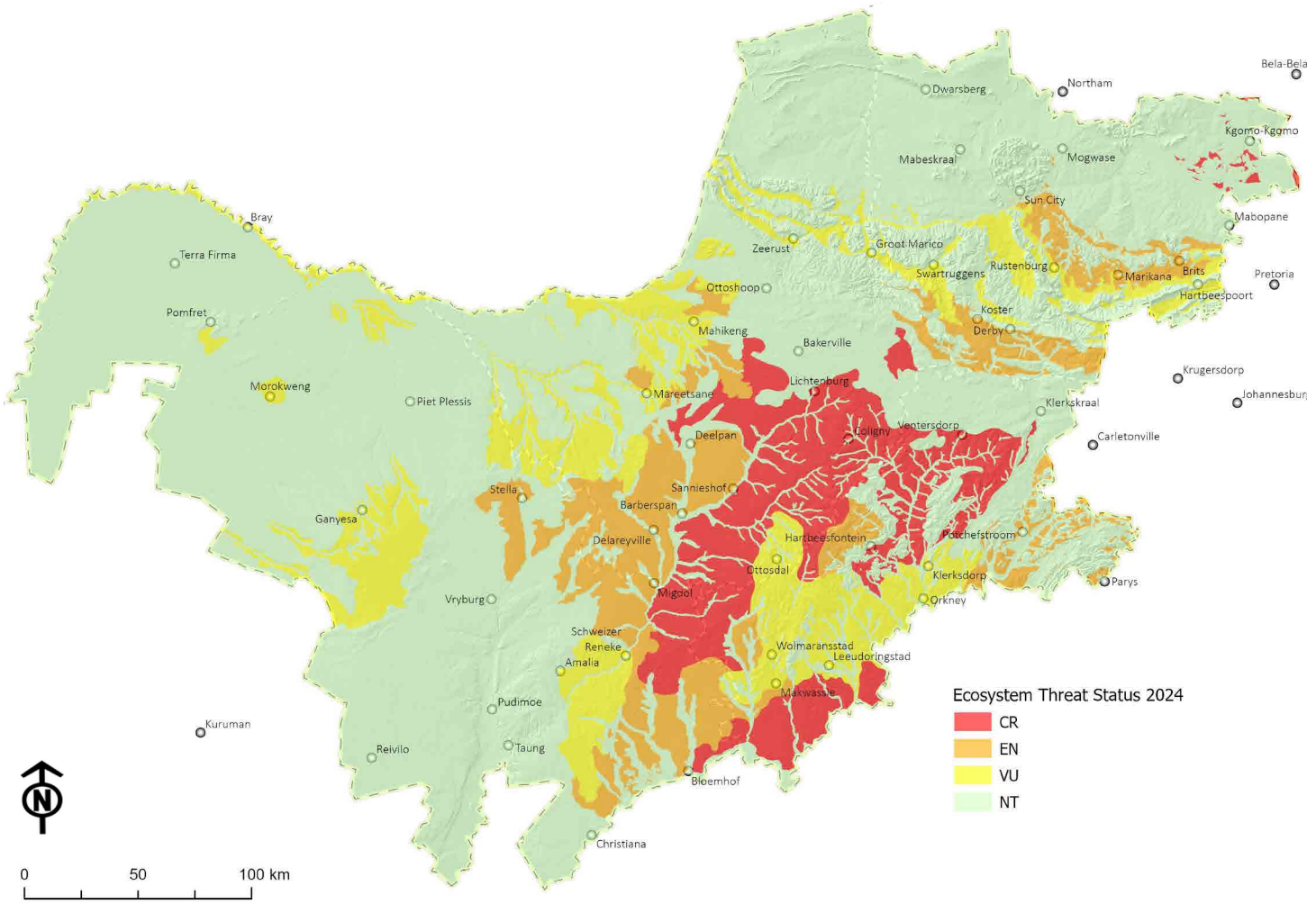



**Figure 9. Threat status of the terrestrial ecosystems of the North West Province (also see NW BSP Technical Report, 2025).**

**Figure 10. Level of Protection of the terrestrial ecosystems of the North West Province.**

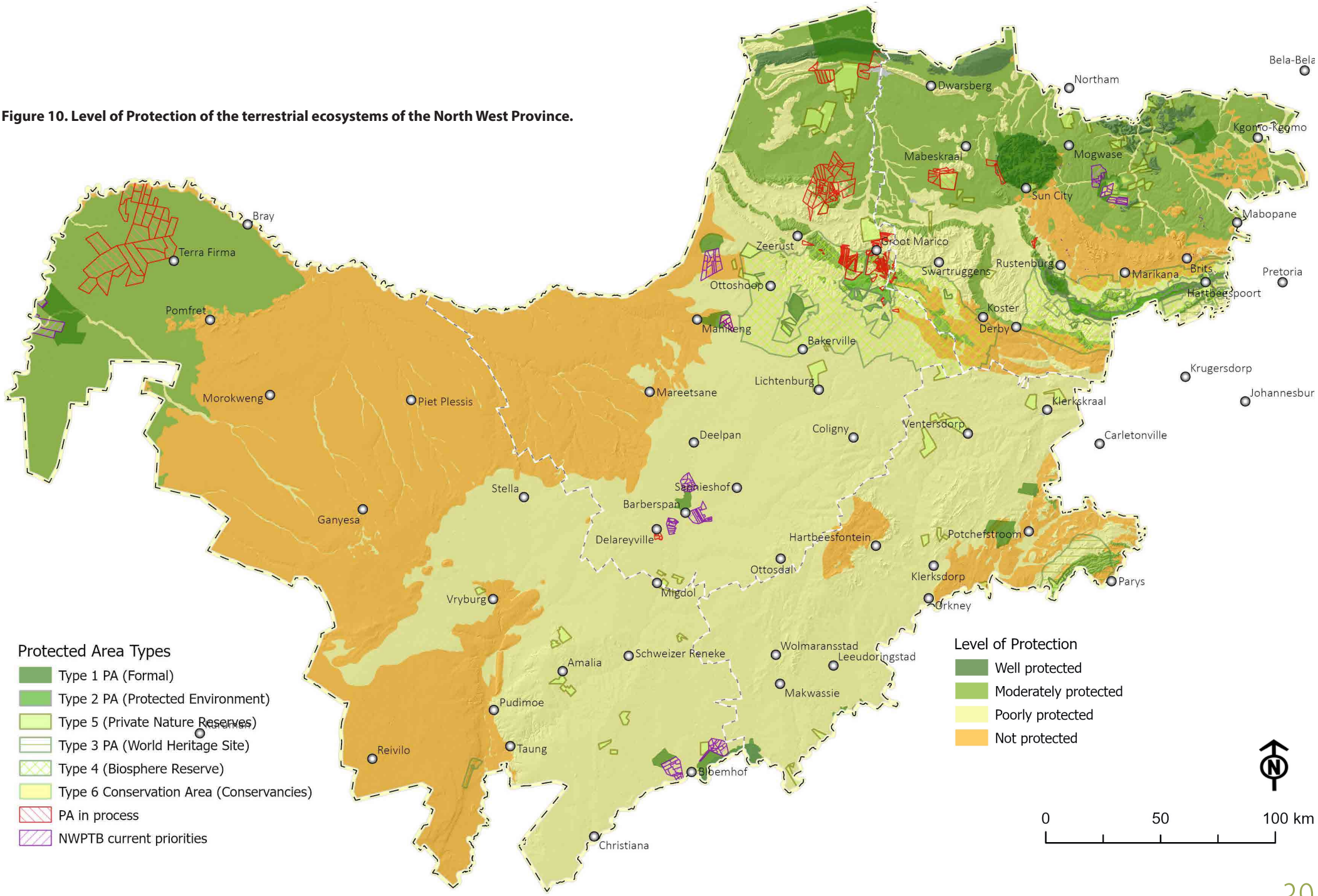


**TABLE 2. SUMMARY OF ECOSYSTEM THREAT STATUS AND LEVEL OF PROTECTION FOR THE NORTH WEST PROVINCE. (CR - CRITICALLY ENDANGERED, EN - ENDANGERED, VU - VULNERABLE).**

| VEGETATION TYPE NAME | ORIGINAL EXTENT (HA) | ENDEMICITY | % REMAINING | THREATENED 2024 | THREATENED 2015 | CHANGE 2015-2025 | CONSERVATION TARGET (%) | LEVEL OF PROTECTION |
|---|---|---|---|---|---|---|---|---|
| Springbokvlakte Thornveld | 22,491 | 3.4 | 20.3 | CR | EN | UP | 19 | Not protected |
| Vaal-Vet Sandy Grassland | 1,033,728 | 43.2 | 16.8 | CR | CR | No change | 24 | Poorly protected |
| Marikana Thornveld | 127,055 | 57.1 | 25.8 | EN | VU | UP | 19 | Not protected |
| Rand Highveld Grassland | 265,022 | 29 | 30.9 | EN | EN | No change | 24 | Not protected |
| Vredefort Dome Granite Grassland | 4,450 | 6 | 36.3 | EN | CR | DOWN | 24 | Not protected |
| Western Highveld Sandy Grassland | 734,949 | 100 | 29.6 | EN | CR | DOWN | 24 | Poorly protected |
| Klerksdorp Thornveld | 343,903 | 100 | 50.7 | VU | VU | No change | 24 | Poorly protected |
| Moot Plains Bushveld | 139,695 | 77.7 | 40.5 | VU | VU | No change | 19 | Poorly protected |
| Schweizer-Reneke Bushveld | 133,543 | 100 | 38.4 | VU | VU | No change | 16 | Poorly protected |
| Vaal Reefs Dolomite Sinkhole Woodland | 26,543 | 85.2 | 60.1 | VU | VU | No change | 24 | Not protected |
| Vryburg Thornveld | 646,260 | 96.7 | 45.3 | VU | | New | 16 | Not protected |
| Zeerust Thornveld | 131,324 | 99.7 | 61.3 | VU | VU | No change | 19 | Poorly protected |
| Andesite Mountain Bushveld | 179,525 | 55.7 | 80.6 | | | | 24 | Poorly protected |
| Carletonville Dolomite Grassland | 570,807 | 67.8 | 73.9 | | | | 24 | Poorly protected |
| Central Sandy Bushveld | 265,078 | 16 | 76.8 | | | | 19 | Moderately protected |
| Central Sandy Mountain Bushveld | 29,248 | 76.8 | 96.4 | | | | 19 | Well protected |
| Dwaalboom Thornveld | 259,363 | 39.8 | 71.1 | | VU | DOWN | 19 | Moderately protected |
| Dwarsberg-Swartruggens Mountain Bushveld | 409,060 | 98.6 | 85.7 | | | | 24 | Poorly protected |
| Gauteng Shale Mountain Bushveld | 64,632 | 45.1 | 64.3 | | | | 24 | Poorly protected |
| Ghaap Plateau Vaalbosveld | 422,244 | 31.9 | 95.1 | | | | 16 | Not protected |
| Gold Reef Mountain Bushveld | 229,925 | 74.5 | 85 | | | | 24 | Moderately protected |
| Highveld Alluvial Vegetation | 426,331 | 10 | 65.1 | | EN | DOWN | 31 | Poorly protected |
| Kimberley Thornveld | 190,396 | 11.4 | 84.6 | | VU | DOWN | 16 | Poorly protected |
| Kuruman Mountain Bushveld | 123,199 | 21.2 | 83.3 | | | | 16 | Not protected |
| Kuruman Vaalbosveld | 45,690 | 13.5 | 95.4 | | | | 16 | Not protected |
| Madikwe Dolomite Bushveld | 83,567 | 76.3 | 96.1 | | | | 19 | Well protected |
| Mafikeng Bushveld | 1,353,193 | 90.8 | 73.8 | | VU | DOWN | 16 | Not protected |
| Molopo Bushveld | 784,370 | 57.6 | 96.8 | | | | 16 | Moderately protected |
| Morokweng Thornveld | 100,159 | 100 | 93.9 | | | | 16 | Not protected |
| Norite Koppies Bushveld | 41,913 | 85.4 | 72 | | | | 24 | Not protected |
| Northern Afrotemperate Forest | 2,333 | 10.9 | 96.6 | | | | 22 | Well protected |
| Pilanesberg Mountain Bushveld | 36,687 | 100 | 97.2 | | | | 24 | Well protected |
| Schmidtsdrif Thornveld | 66,077 | 13.4 | 69.7 | | VU | DOWN | 16 | Not protected |
| Southern Kalahari Mekgacha | 126,029 | 0 | 69.7 | | VU | DOWN | 24 | Poorly protected |
| Stella Bushveld | 402,108 | 100 | 73.8 | | | | 16 | Poorly protected |
| Subtropical Alluvial Vegetation | 69,526 | 10 | 63.3 | | | | 31 | Poorly protected |
| Waterberg Mountain Bushveld | 524 | 0.1 | 64.7 | | | | 24 | Not protected |
| Waterberg-Magaliesberg Summit Sourveld | 2,159 | 4.2 | 98.7 | | | | 24 | Well protected |
| Western Sandy Bushveld | 579,918 | 51.5 | 70.6 | | VU | DOWN | 19 | Moderately protected |

## 3.5. AQUATIC ECOSYSTEMS (RIVERS AND WETLANDS) OF THE NORTH WEST PROVINCE

The aquatic ecosystems of the North West Province, encompassing rivers, wetlands, dolomitic springs, and groundwater-fed systems, represent a crucial component of the region's biodiversity and ecological infrastructure. These ecosystems provide essential services including water provisioning, groundwater recharge, flood regulation, and habitat support for endemic and threatened species. In the context of a predominantly semi-arid climate, their conservation and sustainable management are of strategic importance.

The aquatic environment of the province is shaped by a dynamic interplay between perennial and ephemeral rivers, seasonal floodplains, valley-bottom wetlands, and dolomitic aquifer-fed springs. These systems sustain both ecological integrity and socio-economic development, particularly in rural and agricultural communities.

**The 2018 National Biodiversity Assessment classifies:**

- 80% of river ecosystem types as threatened
  - 37% Critically Endangered.
  - 37% Endangered.
- 52% of wetland ecosystem types as threatened.
- These figures highlight the urgent need for targeted interventions to secure ecosystem services and protect biodiversity hotspots.

### 3.5.1 RIVER SYSTEMS OF THE NORTH WEST PROVINCE

The primary rivers include the Crocodile, Vaal, Marico, Groot Marico, Ngotwane, Molopo, Mooi, and Harts Rivers, along with their tributaries. These systems span six ecoregions and vary significantly in permanence and flow regimes.

**Notable river systems include the:**

- Vaal River: Defines the southern provincial boundary; critical for interprovincial water supply.
- Crocodile River: Originates in the Highveld; supports irrigation, mining, and urban demands through Hartbeespoort Dam.
- Marico River: Dolomitic origin; contributes to the formation of the Limpopo River.
- Upper Marico Catchment: Includes Groot Marico, Klein Marico, and Ngotwane Rivers; features perennial flows from dolomitic springs, offering ecological refugia.

A special area of interest is the Blue Pools River (Taung). The river, which traverses the Taung Skull World Heritage Site, hosts dolomitic headwaters, endemic species, and active tufa formation. Rennera stellata, a Vulnerable species, is abundant along this river within the Ghaap Plateau, its primary distribution range.

### 3.5.2 FRESHWATER ECOSYSTEM PRIORITY AREAS (NFEPA)

The NFEPA project (Nel et al., 2011) delineated 35 river ecosystem types in the province, of which 28 are threatened. Priority areas for conservation and restoration include Freshwater Ecosystem Priority Areas (FEPAs), Fish Support Areas and upstream Management Areas.

**Key Priority Rivers**

- **Groot Marico River** – the only free-flowing river in the province and a designated FEPA.
- **Molopo and Upper Marico Rivers** – FEPAs in good ecological condition.
- **Crocodile, Mooi, and Harts Rivers** – Fish Support Areas critical for fish migration and habitat.
- **Koedoespruit and Tolwane Rivers** – Upstream Management Areas.
- **Sterkstroom and Harts Rivers** – Phase 2 FEPAs requiring further investigation.

### 3.5.3 STRATEGIC WATER SOURCE AREAS (SWSAS)

Although the North West Province is not a major surface water contributor nationally, its dolomitic aquifer systems, particularly the Malmani Subgroup, function as Strategic Groundwater Source Areas (SGWSAs).

**These areas:**

- Maintain baseflow in rivers
- Ensure water security for surrounding communities
- Supply water trans-nationally via the Tswasa Agreement with Botswana

### 3.5.4 FISH SANCTUARIES AND CONSERVATION AREAS

The upper reaches of the Marico, Groot Marico, and Molopo Rivers have been identified as priority fish sanctuaries. These support rare and endemic species including:

- *Opsaridium peringueyi* (Southern Barred Minnow)
- *Pseudocrenilabrus philander* (Southern Mouthbrooder)

These sanctuaries align with national fish conservation goals and form part of the province's freshwater biodiversity assets.

### 3.5.5 WETLAND ECOSYSTEMS

A total of 98 wetland ecosystem types occur within the following four major ecoregions:

- Eastern Kalahari Bushveld
- Dry Highveld Grassland
- Central Bushveld
- Mesic Highveld Grassland

These include diverse hydro-geomorphic classes such as depressions, seeps, floodplains, and valley-bottom wetlands. The semi-arid nature of the province means that many wetlands are sustained by dolomitic aquifers. Springs such as the Molopo Eye and Molemane Eye support wetland systems essential for towns like Mahikeng and Dinokana.

### 3.5.6 UPDATED WETLAND INVENTORY (2024)

Recent advances in satellite imagery and wetland classification have enabled a refined inventory of aquatic habitats. According to the NW Wetland Inventory (Figure 11, DEDECT, 2024):

- 29,837 wetlands have been identified across the province:
  - 26,943 classified as depressions
  - 2,894 as other wetland types

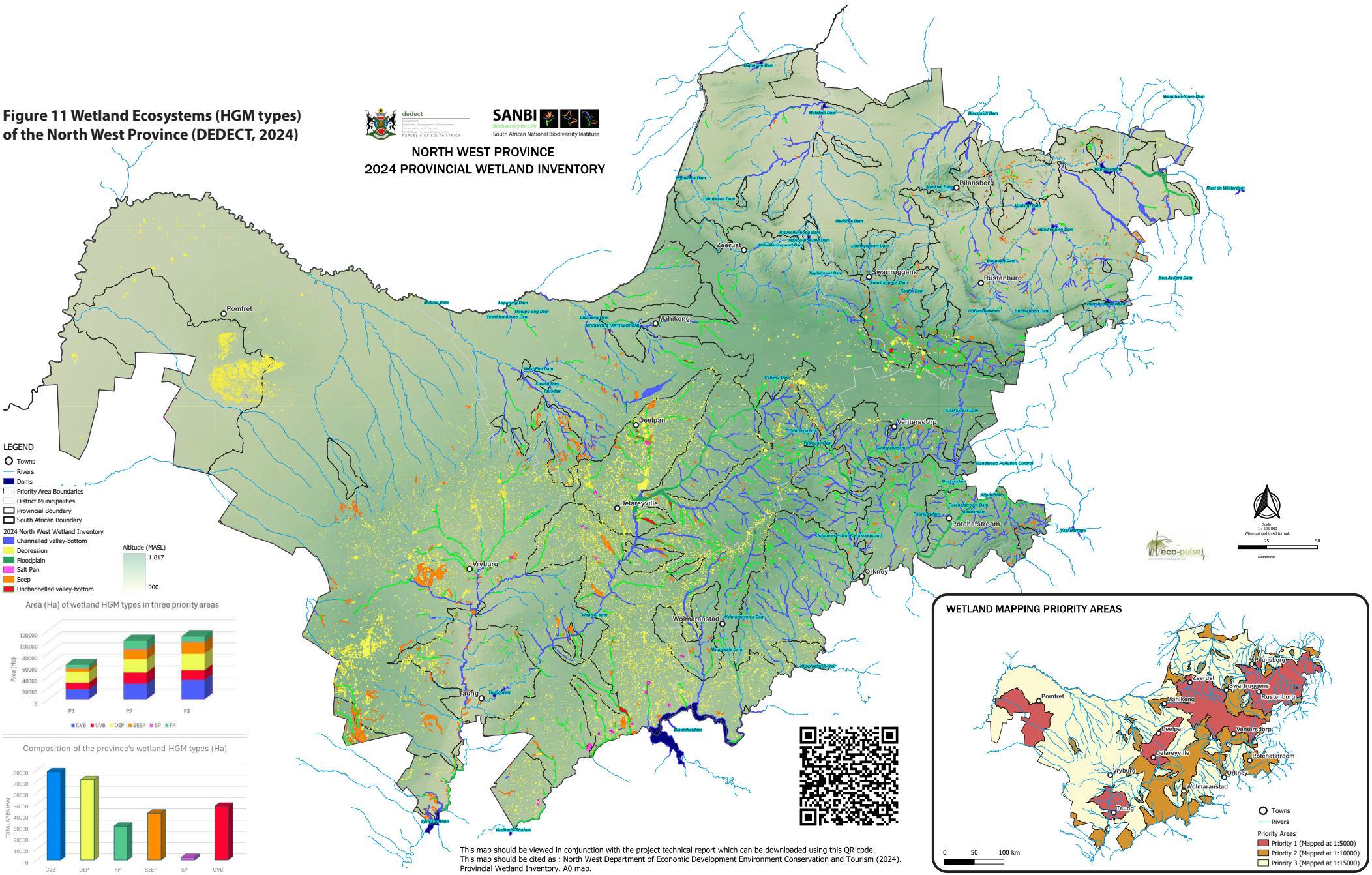
Channelled valley-bottom wetlands dominate in areal extent, particularly along the Vaal, Harts, and Marico Rivers.

**These wetlands:**

- Support dynamic seasonal floodplains
- Function as biodiversity hotspots
- Require protection to maintain lateral connectivity and natural sediment flows

**In conclusion,** the rivers and wetlands of the North West Province underpin both ecological resilience and socio-economic sustainability in a water-scarce environment. With over 80% of river types and 52% of wetland types under threat, urgent attention is required to enhance conservation, safeguard water resources, and manage development responsibly. Protecting Strategic Groundwater Source Areas and fish sanctuaries, along with implementing NFEPA guidelines are key actions for sustaining this vital ecological infrastructure into the future.

**Figure 11 Wetland Ecosystems (HGM types) of the North West Province (DEDECT, 2024)**




This map should be viewed in conjunction with the project technical report which can be downloaded using this QR code.
This map should be cited as : North West Department of Economic Development Environment Conservation and Tourism (2024). Provincial Wetland Inventory. A0 map.

## 3.6. ECOLOGICAL DRIVERS AND ECOLOGICAL PROCESSES

### 3.6.1 KEY ECOLOGICAL DRIVERS OF THE SAVANNA AND GRASSLAND BIOMES

The NWP is characterised by vegetation types representative of the Savanna Biome and Grassland Biome. The key ecological drivers of these biomes are briefly discussed. For detailed information refer to the *Ecosystem Guidelines for the Savanna Biome* (SANBI, 2021) and the *Grassland Ecosystem Guidelines* (SANBI, 2013).

#### SAVANNA BIOME

According to the *Ecosystem Guidelines for the Savanna Biome* (SANBI, 2021) the savanna vegetation types have been grouped into the Kalahari Bushveld and Central Bushveld. The key ecological drivers for savanna are climate and fire. Grazing/browsing and veld management also play a role, and form complex systems when considered in conjunction with climate and fire.

**Climate** (both rainfall and temperate) is one of the primary drivers of species composition in the Savanna Biome. The Kalahari Bushveld Savanna, which occurs in the north-west of the NWP is characterised by low rainfall (300-550mm per annum), and hot, dry arid-to-semi-arid conditions, with cold winters. The Central Bushveld Savanna in the north-east of the NWP experiences slightly more rain (350-650mm) over a west-east gradient, with warm summers and warm-dry winters.

**Fire** is not common in the Kalahari Bushveld Savanna due to the lack of fuel load, and is considered rare in the Bushveld Savanna mountains.

#### GRASSLAND BIOME

According to the *Grassland Ecosystem Guidelines* (SANBI, 2013) the grasslands in the NWP fall into the Dry Highveld Grasslands south of the Bankenveld and Mesic Highveld Grasslands north of the Bankenveld. The key ecological drivers of grasslands are climate, elevation, fire and grazing.

### 3.6.2 SUPPORTING ECOLOGICAL PROCESSES IN DEGRADED LANDSCAPES

In a landscape that is modified by agriculture and human settlement, pockets of natural habitat play a critical role in maintaining ecological function and ecological processes. A patchwork of remaining natural areas must be prioritised, based on patch size. Larger patches of natural habitat can support a wider range of ecological processes and therefore greater biodiversity. Consequently, they play a major role in metapopulation dynamics as sources areas (areas that have positive population growth) that contribute individuals, *via* dispersal or emigration, to sink areas (areas that have declining populations). Connectivity of patches to other patches of natural habitat is also a crucial factor. Larger patches of intact natural vegetation, when connected to other large patches, help reduce the edge effects associated with numerous smaller patches.

Therefore, a connected network of large intact vegetation patches is needed to support migration and dispersal of mobile mammal, bird and even plant species between patches. Intact vegetation is uncommon across some of the heavily modified and highly fragmented North West landscapes, and maintaining connectivity between them is important if species are to respond to a changing environment and climate.

## 3.7. SACRED NATURAL SITES OF THE NORTH WEST PROVINCE

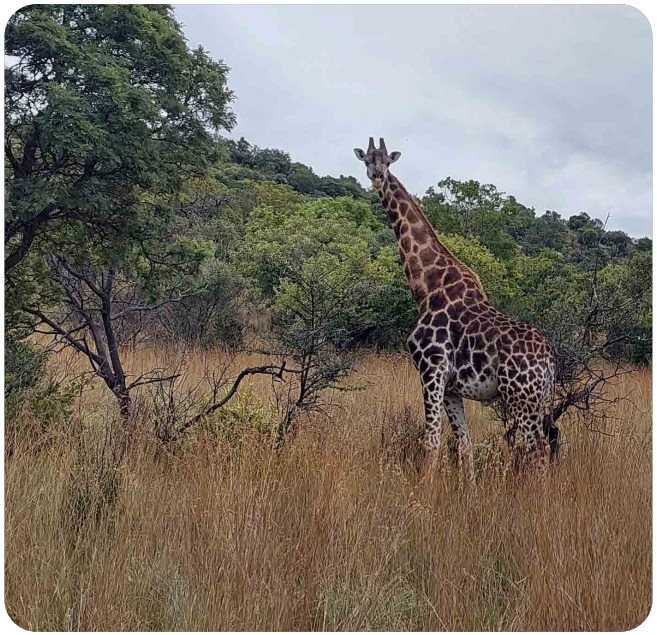
**The Rustenburg Kloof**, characterised by its prominent sandstone pillars, was famously depicted in several artworks by Jacob Hendrik Pierneef. It remains a visually and culturally significant landmark within the Magaliesberg mountain range, particularly for those approaching Rustenburg from the western platinum belt. The site holds spiritual importance for numerous African-initiated churches, serving as both a pilgrimage destination and a sacred landscape. Worshippers ascend the mountain for prayer and to collect holy water from springs that feed a waterfall within the Rustenburg resort area - an ecologically sensitive zone where invasive plant species are displacing remnants of Afrotemperate forest.

**Kgaswane Mountain Reserve** is not only a core conservation area within the Magaliesberg Biosphere Reserve and a designated RAMSAR site, but it is also recognised as a sacred natural space. The plateau forms a natural basin where spring water and dew collects and drains into the largest wetland in the North West Province. Ritual practices, such as leaving behind burning candles have unfortunately been associated with wildfires in the surrounding natural grasslands. Fire, however, plays an important ecological role by promoting the perseverance of fire-resistant woody plants, such as Protea, wild seringa (*Burkea africana)* and boekenhout (*Faurea saligna*), while preventing encroachment by less fire-tolerant species like *Searsia lancea* (karee). These fires also help to revitalize grazing areas for wildlife, such as eland, sable antelope, waterbuck, and zebra. Below the Tierkloof Waterfall, the Waterkloofspruit valley is rich in woodland associated species, and serves as both a site for water collection and spiritual cleansing rituals (though under some degree of supervision from management). This area is also home to a variety of medicinal plants, including African Wormwood/uMhlonyane (*Artemisia afr*a) and Daisy-tea (*Athrixia elata*).

**Norite koppies** are rocky hills and outcrops typically seen around Marikana. They are characteristic of the Bushveld Igneous Complex and stand as enduring reminders of the region's ancient volcanic history and the resilience of life in a rugged landscape. These koppies rise prominently above the surrounding grasslands and savannas (specifically the Marikana Thornveld), forming steep, weathered outcrops with rocky summits. It is therefore not surprising that Oorsaak Koppie has, for generations, served as a sacred site for Tswana rainmaking ceremonies (go apeela pula). These ceremonies were typically led by community elders and rain doctors (baloi ba pula), who performed rituals to petition the ancestors and natural spirits for rain during times of drought. Although these ceremonies have never been formally documented at Oorsaak, a local landowner has kept records of annual requests to overnight at the site, and archaeological artefacts provide further evidence of its cultural use. The koppie also serves as a refugium for biodiversity, supporting important plant species, succulents and small animals such as rock hyrax, reptiles, and various birds of prey. Trees like *Obetia tenax* and *Ficus abutilifolia* might anchor themselves in rocky crevices, while grasses, geophytes, and wildflowers thrive in more sheltered microhabitats.

**Barnardsvlei** lies in the foothills of the Magaliesberg mountain range and is fed by springs and the Sterkstroom river. Its thick reeds provide privacy for numerous overnight cleansing rituals involving steaming and full immersion in the water. The site is in constant use by churches and traditional healers, unfortunately, raising concerns from the surrounding agricultural sector regarding water quality.

**Enzelsberg** was known as Tshwenyane, a name derived from the word for "small or young baboon." It is located within Ramotshere Moiloa Local Municipality, and is notable for a large rock overhang and a cave, housing bats beneath the mountain behind a waterfall. It serves as a site for cultural activities. Evidence of these cultural practices includes burnt candles, sweets, wood ash and gin bottles. The landowner manages access and charges an access fee, which is used to regularly remove rubbish from the site, helping to maintain the area's cleanliness. In this sense, one has to reconcile culture and the environment.



# 4

# KEY THREATS TO BIODIVERSITY

SECTION 4

# KEY THREATS TO BIODIVERSITY

**There are a number of threats facing biodiversity in the province. All threats impact biodiversity and ecosystem process in some way or another. Different threats impact biodiversity in different ways and at different rates. This can range from outright loss of habitat or species, through to degradation of ecosystems where there is a decline in biodiversity present and ecosystem function over a period of time. It is important to understand what these threats are and how they impact biodiversity in order to develop effective biodiversity conservation and management strategies in the province.**

## 4.1 HABITAT LOSS

Habitat Loss is possibly the most important threat to biodiversity in the province. Clearing of land for agriculture and urban development not only directly leads to a catastrophic loss of biodiversity, but it also results in the fragmentation of the remaining natural habitat that over time degrades ecological functioning through loss of landscape connectivity. Managing habitat loss is possibly the single most important biodiversity conservation strategy in the province and a key purpose of the bioregional plan. Historically, cropping agriculture has been the largest driver of biodiversity loss in the province through habitat loss. Currently, urban development, mining and especially renewable energy are the largest drivers of habitat loss.

## 4.2 ALIEN INVASIVE SPECIES

Alien invasive species are regarded as the second most important agent of biodiversity loss after habitat loss. Alien invasive species lead to biodiversity loss by directly displacing species and indirectly by changing ecological processes (e.g. changed fire regimes).

## 4.3 ECOSYSTEM FRAGMENTATION

Loss of habitat and the erection of barriers (e.g. game fences) leads to ecosystem fragmentation which reduces the functioning of ecosystems by limiting species ability to negotiate and move through anthropogenic landscapes. Landscape ecological connectivity is a key ecological process allowing species to respond to changing environments, including climate change. The CBA map identifies critical corridor linkages which are parts of the landscape where ecological connectivity is severely constrained by other land uses, and where ecological connectivity is at risk of being completely lost if further habitat is lost. It is imperative that these linkages are retained if we are to meet our biodiversity conservation goals.

In addition to the drivers of habitat loss mentioned above, the erection of game fencing is possibly the single largest contributor to ecological fragmentation in the NW. Game fences create impermeable barriers that severely constrain the ability of wildlife to move through landscapes. Whilst the regulations stipulating the minimum requirements of fencing wildlife (*North West Wildlife Fencing Policy*, *393 of 2009*) are intended to promote conservation, these regulations are causing significant un-intended ecological impacts on ecosystems. This is an example of where well-intentioned government policy is actually driving the loss of biodiversity in the province. indirectly.

## 4.4 SUPPRESSION OF FIRE

Many human activities can lead to changes in ecological processes that ultimately lead to changes in ecosystem functioning and biodiversity conservation. Foremost amongst these changes is use of fire as an ecosystem management tool. The suppression of fire in ecosystems where fire is one of the most important ecological drivers is resulting in the loss of species from ecosystems and encroachment of alien invasive species (e.g. invasion of Flax-leaf fleabane (*Erigeron bonariensis*) and bankrupt bush (*Seriphium plumosum*) is directly linked to the suppression of fire in grassland ecosystems). The suppression of veld fires through government legislation is another example of where well-intentioned regulatory legislation is acting as a driver of biodiversity loss.

## 4.5 UNSUSTAINABLE HARVESTING OF BIODIVERSITY

Unsustainable, and often illegal, harvesting of biodiversity includes a range of activities involving collection, harvesting or hunting of biodiversity for both personal and trade purposes. The scale of harvest is very significant and is extensive throughout the province.

**These include:**

- The harvesting of plants and animals for the Muthi trade;

- Harvesting of trees for fire wood
- Hunting and particularly snaring of wildlife for personal, but mostly illegal bushmeat trade; and,
- Organised criminal poaching of high value plants and animals (e.g. rhinos and pangolin) (DFFE, 2024).

## 4.6 CLIMATE CHANGE

Climate change will impact biodiversity both directly and indirectly. The biodiversity sector plan considers the impacts of climate change in the design of the CBA map. For example, CBA designation criteria such as buffers to protected areas; ecological corridors that span major ecological gradients; and, retaining larger patches of habitat and larger populations of species, are all partly in response to climate change. Whilst climate change will impact biodiversity, short term threats to biodiversity such as loss of habitat and alien invasive species are considered much more important and immediate threats to manage from a biodiversity conservation perspective. Whilst it is necessary to have a climate change perspective in management plans, it is very important not to be distracted by the climate change debate whilst neglecting the present and most serious drivers of biodiversity loss (e.g. loss of habitat, etc.).

In terms of the Climate Change and Biodiversity Factsheet Series (7 of 7, 2013), the Grassland biome is considered the most threatened under all climate scenarios with a predicted shift to Savanna or Forest biomes, and therefore has the highest priority for action.

Existing impacts of climate change on biodiversity have been described in the *Ecosystem Guidelines for the Savanna Biome* (SANBI, 2021).

**These include:**

- Altered hydrological systems which impact on water quantity and quality.
- Shifts in distribution ranges, species interactions, species abundance, migration and changes in seasonal activities.
- Species extinctions.
- Extreme weather and climate events such as prolonged periods of drought or heavy rainfall and flooding.
- General increases in temperature and milder winters with fewer frost days.
- Changes in frequency and intensity of ecosystem disturbance such as fires, pest outbreaks and wind storms.

In addition to the direct impacts of climate change, indirect impacts include exacerbation of other threats to biodiversity such as bush encroachment, alien species invasion and altered fire regimes. Bush encroachment will increase biomass fuel loads and increase the intensity of fires, which will alter productivity of the ecosystem and therefore the ecosystem services that we derive (i.e. livestock productivity and tourism potential). Climate change also acts as a multiplier to threats due to land uses such as crop cultivation, plantations, commercial livestock farming, urban development and mining (SANBI, 2021).

The loss or change of biodiversity, combined with the disruptive effect of changes in temperature and rainfall will affect the level of integrity of ecosystems. This will in turn determine the ability of ecological infrastructure to deliver ecological and social services. Also, pressures currently exerted on the biodiversity and ecological processes are likely to intensify with the progression of climate change manifestations. Maintaining healthy, functioning ecosystems is an important adaptation strategy that enhances the ability of natural systems to build resilience against climate change impacts. Wetlands are a good example of ecological infrastructure that provide effective flood attenuation, which need to be prioritised. To increase natural resilience, it is imperative to develop an integrated approach to biodiversity conservation, poverty alleviation and development.

According to the North West Climate Risk and Vulnerability Assessment (2021) climate change is anticipated to manifest in the following ways:

- Temperature increases (increased transpiration and evaporation, fewer frost days)
- Unpredictable (when) and variable (amount) rainfall, locally and across the NW
- Periods of drought
- Periods of high rainfall, associated with storms and consequent flooding
- Increased risk of wildfires
- Bush encroachment due to elevated $CO_2$ levels

The highest risk of all these modelled changes, North West Province will be affected the most by temperature changes with average temperatures in the Kalahari and Bushveld Basin increasing by 3-4˚C (Figure 12), while temperatures in the western grasslands and lower Vaal valley regions are expected to get between 2.5-3˚C hotter.

While the annual rainfall is predicted to remain stable, or may slightly increase, over most of the North West Province, areas in the south-west and west associated with the Kalahari and Ghaap Plateau may experience slightly reduced annual rainfall (Figure 13). Also, increased evaporation due to elevated temperatures may negate the benefits of increased rainfall and result in overall drier conditions.

Ultimately, the impact of Climate Change on ecosystems in the NWP has been assessed as a HIGH risk (North West Climate Risk and Vulnerability Assessment, 2021). Some of the anticipated impacts on species and ecosystems include:

- Encroachment of woody species into grasslands due to increased $CO_2$: .
- The increase in temperatures could result in localised extinction of plants and animals that are not able to move from or adapt to Increased temperatures. This effect could also affect animal behaviour and life-cycles, which may in turn affect breeding and foraging, and affect plants by changing flowering times and seed-set of plants.
- Increased temperatures will increase evaporation rates and drier conditions will increase the risk of wildfires.
- Fewer frost days due to increased winter temperatures will mean that plant and animal diseases are not kept under control and will affect both wildlife, natural plants as well as livestock and crops.
- Unpredictable rainfall, drought, storms and flooding may leave soils vulnerable to erosion, result in localised species extinctions and therefore impact on overall ecosystem function.

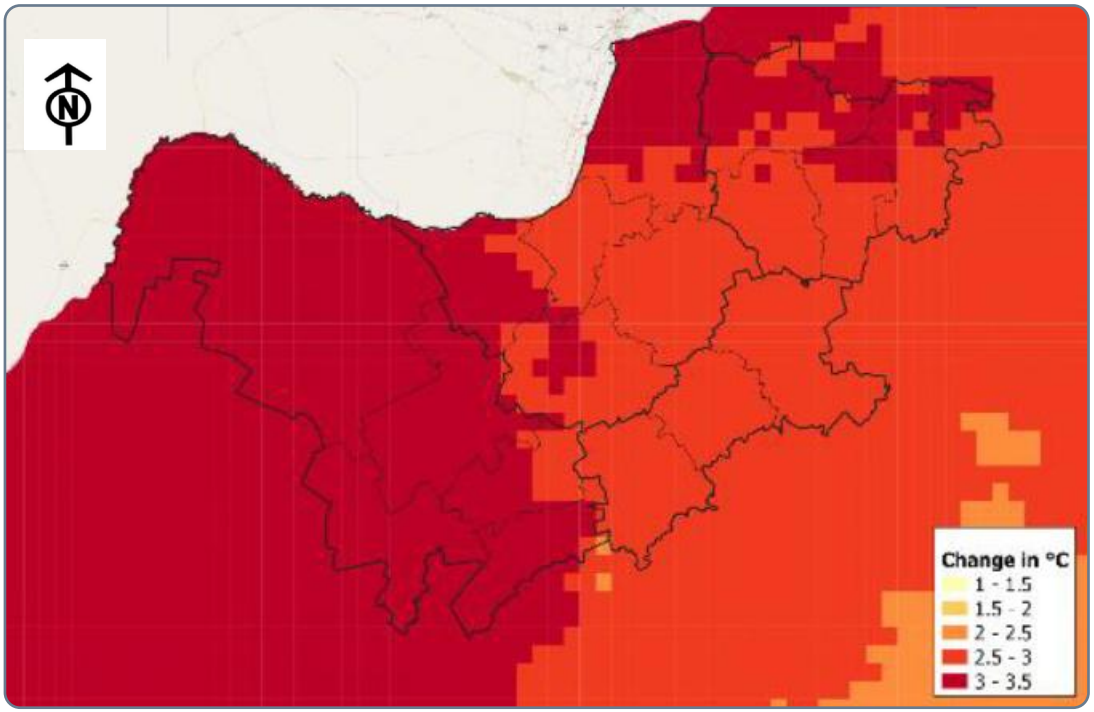



**Figure 12. Modelled temperatures increases - extract from NW Climate Risk and Vulnerability Assessment (DEDECT, 2021).**

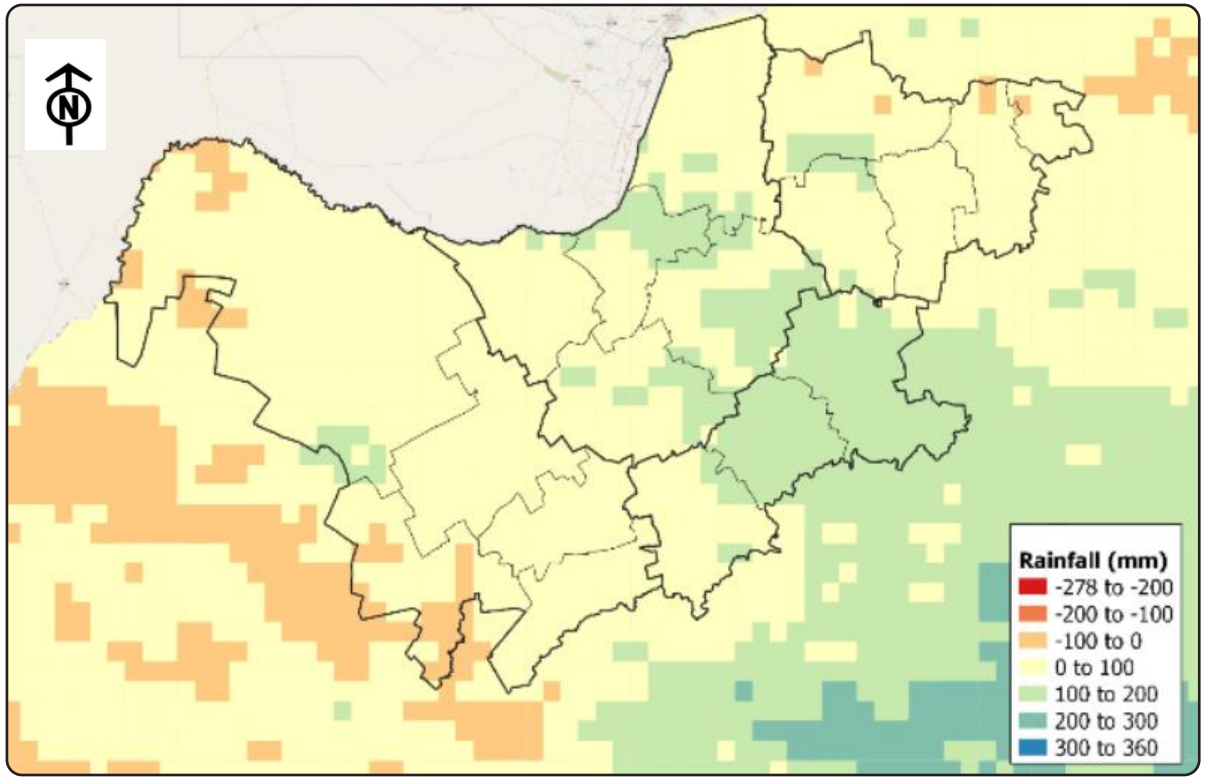



**Figure 13. Modelled changes in annual rainfall - extract from NWP Climate Risk and Vulnerability Assessment (DEDECT, 2021).**

Climate change is an emerging threat, intensifying existing pressures. Rising temperatures, changing rainfall patterns, and more frequent droughts are expected to reduce water availability, particularly in non-perennial systems. Impacts on freshwater resources are compounded by poor enforcement of environmental regulations, limited capacity for monitoring, and inadequate protection of Strategic Water Source Areas and priority freshwater ecosystems.

The loss of habitat in CBAs and ESAs, which are designed to maintain ecological corridors and build climate change resilience reduces or eliminates the ability of biodiversity to move through the landscape. A key climate change adaptation strategy is maintaining landscape ecological connectivity to allow biodiversity to move in response to climate change. Loss of habitat that reduces land connectivity will have significant impacts on biodiversity that will only manifest long after the habitat/ecological connectivity is lost, only to be amplified by climate change.

## 4.7 THREATS TO FRESHWATER AQUATIC ECOSYSTEMS

Aquatic ecosystems in the North West Province face a range of threats that compromise their ecological integrity, functioning, and ability to provide essential services such as water purification, flow regulation, and habitat for biodiversity. Chief among these threats is land degradation caused by unsustainable agricultural practices, including overgrazing, poor ploughing techniques, and wetland cultivation, which lead to increased sedimentation, erosion, and loss of wetland functionality.

Water abstraction and flow modification pose additional significant pressures. The construction of dams, canalisation of rivers, and groundwater over-extraction, particularly from dolomitic aquifers, disrupt natural flow regimes, reduce base flows, and degrade downstream ecosystems. In many catchments, perennial rivers have become increasingly ephemeral, losing their capacity to sustain aquatic life year-round.

Pollution from mining, agriculture, and poorly managed wastewater treatment works is also widespread. Elevated nutrient levels and heavy metal contamination reduce water quality and lead to eutrophication in rivers and wetlands. Mining in particular is a growing threat, with expansion into sensitive headwaters, dolomitic recharge zones, and wetland clusters, often in contravention of water legislation.

Invasive alien species, including both plants (e.g., *Eichhornia crassipes* and *Salix babylonica*) and fish (e.g., *Micropterus* spp.), alter habitat structure, compete with native species, and disrupt ecological processes. The spread of invasive plants also exacerbates siltation and changes flow patterns in wetlands and river systems.

# 5

# PATTERNS OF LAND USE & CONDITION

SECTION 5

# PATTERNS OF LAND USE & CONDITION

Land use activities impact on the extent and ecological status of natural habitats. Land use is measured at the landscape level by mapping land cover. Land cover describes the present physical make-up of a site based on interpretation of satellite imagery. Land cover can range from various natural states (e.g. grassland, shrubland, woodland, etc.) through to altered states (e.g. crop fields, urban settlements, mining and industrial structures). Several detailed land cover maps have been developed for the North West at different time periods, with the latest provincial land cover using the National Computer Automated Land Cover (CALC) products for 2022. This means that the current extent or status of ecosystems in the province can be assessed, as well as the rate of change over the past 30 years. The rate of change or loss of ecosystems tells us where biodiversity is being lost most rapidly, and can be used to focus activities and policies to avoid, mitigate and reduce this loss.

The land cover map that was developed for the revision of the NWP BSP has undertaken an analysis of previous mapping events and identified fallow lands that may appear to be natural in the 2022 South African National Land Cover map (DFFE, 2022). These areas are considered 'secondary' natural areas, and while they may still function on an ecological level, the level of species richness and overall biodiversity would be lost in these systems. They have therefore been classified separately and treated differently in the development of the CBA map.

According to the NWP land cover assessment (Table 3, Table 4 and Figure 14), a large portion of the NWP is under cultivation. This is primarily concentrated in the high potential soils in the central and south-west regions of the province. Under the current assessment it appears as though crop cultivation has reduced by 9%, while activities involved with built development, plantations have remained stable. The areas that are no longer being cultivated may erroneously be mapped in land cover assessments as 'natural', but as mentioned above, a distinction between pristine and secondary natural areas needs to be made.

A more detailed analysis of land use land cover patterns and trends in the NW is available in the NW BSP Technical Report.

**TABLE 3. PERCENTAGE OF EACH LAND COVER CLASSES IN THE NORTH WEST PROVINCE, FROM 1990 – 2025 (BASED ON 2023 LANDCOVER DATASET).**

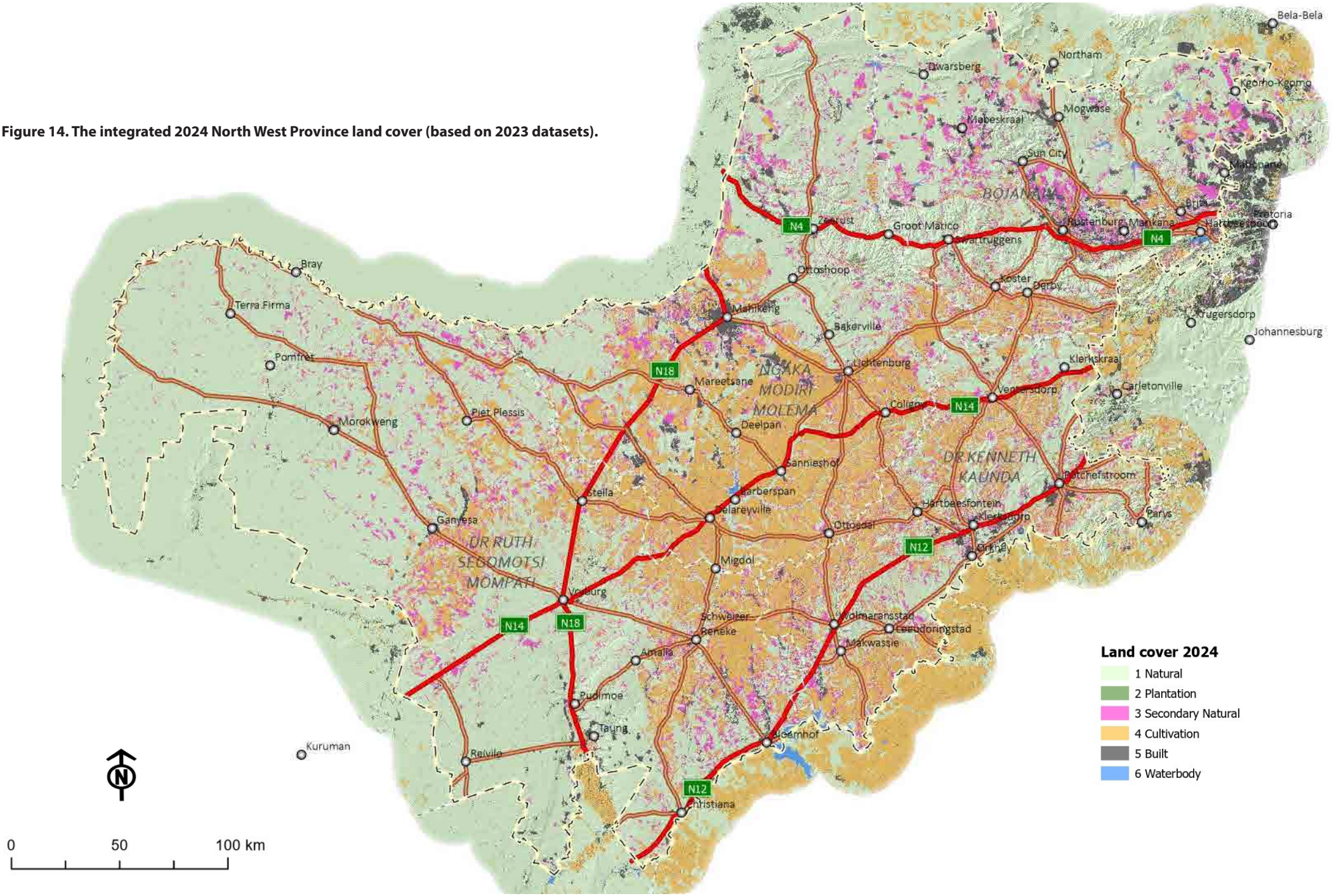
| LAND COVER | % IN 2025 * | % IN 2018 * | % IN 1990 | % CHANGE (1990 TO 2014) | % CHANGE (2014 - 2023) | % CHANGE (1990 TO 2023) | RATE OF CHANGE (% PER YEAR) |
|---|---|---|---|---|---|---|---|
| Unmodified terrestrial and aquatic | 62,38 | 63,96 | 69,74 | -8,29 | -2,47 | -10,56 | -0,34 |
| Modified | 37,62 | 36,04 | 30,26 | 19,11 | 4,38 | 24,33 | 0,66 |
| Cultivated | 26,55 | 26,59 | 22,67 | 17,32 | -0,17 | 17,12 | 0,48 |
| Secondary Natural (Old croplands etc.) | 2,77 | 2,59 | 3,96 | -34,39 | 6,93 | -29,84 | -1,07 |
| Plantations | 0,39 | 0,26 | 0,13 | 103,19 | 51,99 | 208,82 | 3,48 |
| Built (Urban, Mining and Roads) | 7,16 | 5,75 | 3,14 | 82,95 | 24,57 | 127,89 | 2,53 |
| Waterbodies | 0,75 | 0,85 | 0,37 | 129,61 | -11,89 | 102,32 | 2,16 |

***The North West 2025 Integrated land cover results are derived from the 2022 National Land cover (DFFE, 2015), that has been updated with the 2023 Google Buildings Data. Th e 2015 totals are from the BSP 2015 (and are based on the 2013/2014 National Land Cover (DFFE, 2014)**

**TABLE 4. PERCENTAGE OF LAND COVER CLASSES IN THE NORTH WEST PROVINCE, BY DISTRICT MUNICIPALITY.**

| DISTRICT MUNICIPALITY | LAND COVER CATEGORY (% OF DM) | | | | | | % OF DM NATURAL LOST TO OTHER LAND USES SINCE 1994 |
|---|---|---|---|---|---|---|---|
| DISTRICT MUNICIPALITY | NATURAL | PLANTATIONS | CULTIVATED | SECONDARY NATURAL | BUILT | WATER BODY | % OF DM MODIFIED SINCE 1990 |
| Bojanala | 63,56 | 0,68 | 16,44 | 5,02 | 13,05 | 1,25 | -9,78 |
| Dr Kenneth Kaunda | 46,43 | 0,70 | 40,00 | 3,93 | 7,69 | 1,25 | -9,90 |
| Dr Ruth Segomotsi Mompati | 75,48 | 0,10 | 18,12 | 1,63 | 4,28 | 0,38 | -5,02 |
| Ngaka Moiri Molema | 49,52 | 0,50 | 39,24 | 2,49 | 7,51 | 0,74 | -8,12 |

**Figure 14. The integrated 2024 North West Province land cover (based on 2023 datasets).**



# 6

# PROTECTED AREAS & CONSERVATION AREAS

SECTION 6

# PROTECTED AREAS & CONSERVATION AREAS

## 6.1. IMPORTANCE OF PROTECTED AREAS AND CONSERVATION AREAS

The purpose of Protected Areas and Conservation Areas is to conserve biodiversity, safeguard ecosystems, and provide a space for wildlife and natural habitats to thrive. In South Africa, ***Protected Areas*** are defined as an area of land, freshwater, or sea that are managed primarily for biodiversity conservation and are formally protected by law. Areas that are managed for biodiversity conservation, but which are not formally protected by law are classified as ***Conservation Areas.*** and may include Other Effective Conservation Measures (OECMs). DFFE are in the process of developing norms and standards for OECMs, which will form the basis of South Africa's conservation area network and will be formally reported to the Convention on Biological Diversity in the coming years. The network of Protected Areas and Conservation Areas in South Africa preserve unique and valuable biodiversity that is essential for ecological function and human health and livelihoods, and should be effectively managed and supported by development buffers to prevent edge effects within the area itself.

## 6.2 NORTH WEST PROVINCE PROTECTED AREAS

The NWP protected area database classifies protected area types (Table 5, Table 6 and Figure 15). These include formally protected areas, protected environments and private nature reserves (proclaimed in terms of NEMPAA), world heritage sites and biosphere reserves, and conservation areas (conservancies). For planning purposes, the NW adopts an inclusive definition of what is considered a protected area. This includes areas declared in terms of the protected areas act (approximately 3% of the province) as well as areas not declared in terms of the act (approximately 8% of the province) that are considered *de facto* protected areas, and which may or may not be effectively managed as a protected area. Further information on the current status of each protected area type is listed below:

- **Type 1 (Formal, statutory reserves):** The North West Parks and Tourism Board (NWPTB) manages 15 type 1 protected areas. These reserves are cover 207,170 ha which is 2% of the province.
- **Types 2 (Protected Environments):** Two Protected Environments (PE) have been declared in the NWP, namely Magaliesberg Protected Environment and Marico Protected Environment that represent core conservation areas within larger biosphere reserves. Combined these sites cover 41,593ha (0.4%) of the province. There is an initiative currently underway to expand the Marico Protected Environment to manage NFEPAs in the region, which could result in 2,680 ha added to the PE.
- **Type 3 (UNESCO World Heritage Sites):** NWP has three World Heritage Sites (WHS). Approximately 8,834 ha of the Cradle of Humankind WHS, which straddles Gauteng and NWP, and 47,368 ha of the Vredefort Dome WHS, which straddles the Free State and NWP, falls with the province. Together with the Taung Skull WHS, the three sites cover 59,828 ha (0.6%) of the province.
- **Type 4 (UNESCO's Man and the Biosphere (MAB) Programme - Biosphere Reserves):** two biosphere reserves are listed within the NWP, namely the Magaliesberg Biosphere Reserve and the Marico Biodiversity Reserve. Combined these reserves cover 666,957 ha (6.4%) of the province.
- **Type 5 (Municipal and Private Nature Reserves):** Faan Meintjies Nature Reserve and Leon Taljaard Nature Reserve are managed by Naledi Local Municipality and City of Matlosana Local Municipality, respectively. The province currently has 72 Private Nature Reserves). Combined type 5 protected areas cover 145,512 ha (1.4%) of the province.
- **Type 6 (Proclaimed conservancies):** a number of conservancies fall within WHS and biosphere reserves. Conservancies cover 31,877 ha (0.3%) of the province.

## 6.3 CONTRIBUTION OF THE PROTECTED AREA NETWORK TO NATIONAL AND ECOSYSTEM TARGETS

Currently, the North West Protected Area Network (NW PAN) meets only around 18% of vegetation type conservation targets. As shown in Figure 10 and Table 2, five (5) of the province's 39 ecosystems are well conserved, while 14 ecosystems have no representation in the PA network. The ecosystems for which targets are not met, and which are not well represented in the Protected Area Network, present clear priorities for expansion. The NW PAES (2025-2030) has identified 29 PAs focus areas as strategic priorities for future inclusion into the provincial conservation estate.

In line with the norms and standards of the national register of protected areas, Private Nature Reserves need to be verified/validated. An initial analysis of the condition of 72 Private Nature Reserves has been

undertaken using land cover change, which indicates that in 9 (12.5%) reserves more than 60% of the reserve has been modified and is no longer natural (Table 6), while in another 7 (9.7%) and in 18 (25%) reserves, 41-60% and 20-40% of the reserve is no longer in a natural state, respectively. The condition of the sites provides an indication of the ecological function of the site and therefore its contribution towards achieving biodiversity targets.

Some of the formally protected areas that are no longer being managed for biodiversity conservation and are largely modified should be considered for de-proclamation, as required by the Norms and Standards for the Inclusion of Private Nature Reserves in the Register of Protected Areas of South Africa.

## 6.4 EFFECTIVENESS OF PROTECTED AREA MANAGEMENT

Annual Management Effectiveness Tracking Tool (METT) assessments have been consistently carried out for 15 Type 1 protected areas in the NWP. Over the last six years, the NWPTB achieved an average METT score of 60%, falling below the national sound management benchmark of 67%, indicating that these protected areas are allocated basic management with significant deficiencies. It is important to include other protected areas not managed by the North West Parks and Tourism Board in the annual METT assessments. This would provide the competent authority with a more comprehensive understanding of the effectiveness of management across the entire North West protected area network.

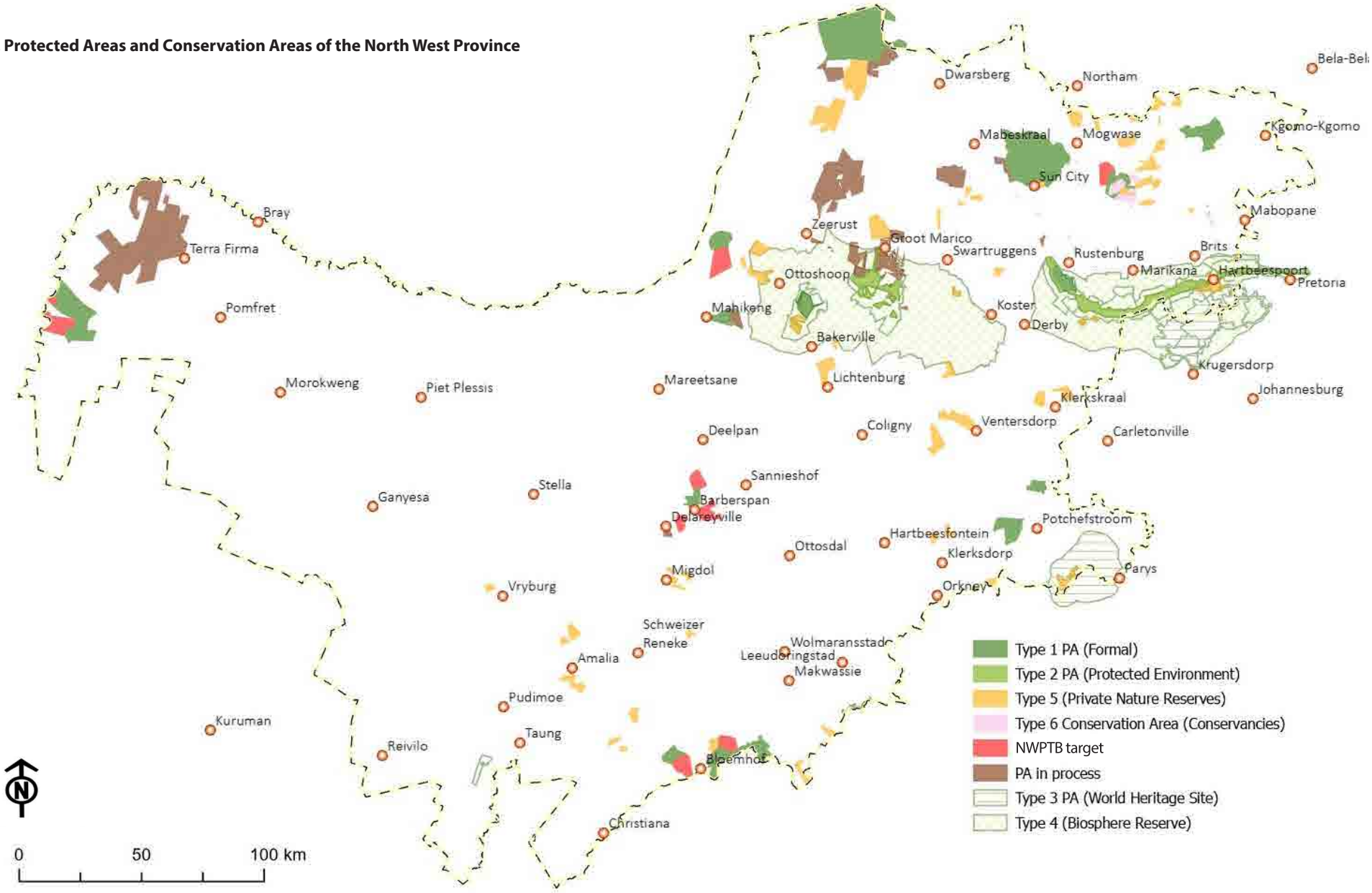
**TABLE 5. PROTECTED AREAS AND CONSERVATION AREAS IN THE NORTH WEST PROVINCE.**

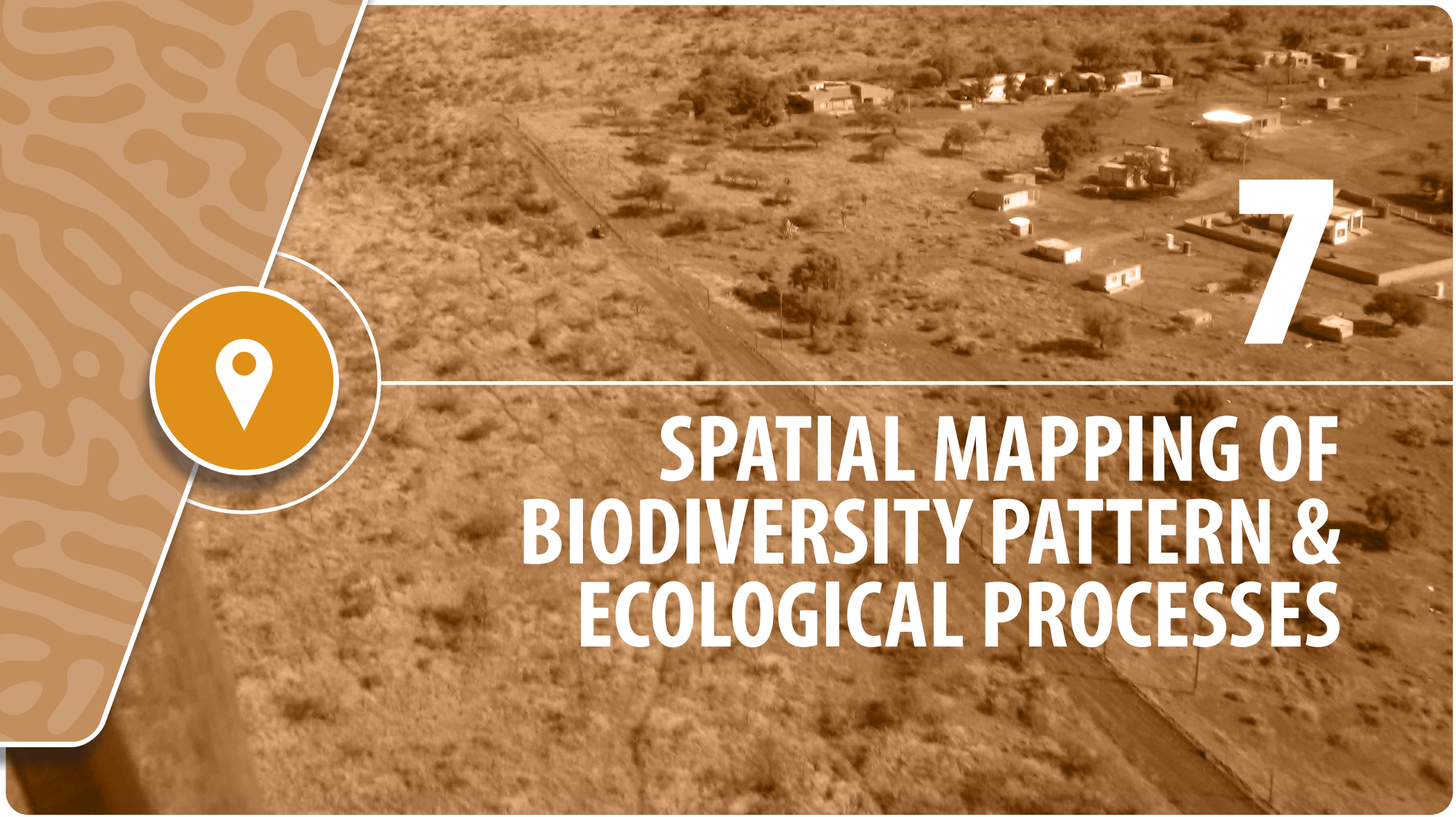
| PROTECTED AREAS AND CONSERVATION AREAS | AREA IN NW (HA.) | MANAGEMENT AUTHORITY |
|---|---|---|
| **Type 1 Protected Areas (Statutory or Formal)** | **207,170** | NWPTB |
| Barberspan Nature Reserve | 3,156 | NWPTB |
| Bloemhof Dam Nature Reserve | 14,942 | NWPTB |
| Borakalalo Nature Reserve | 11,974 | NWPTB |
| Boskopdam Nature Reserve | 3,070 | NWPTB |
| Botsalano Nature Reserve | 5,673 | NWPTB |
| Highveld Nature Reserve | 8,616 | NWPTB |
| Kgaswane Mountain Reserve | 5,497 | NWPTB |
| Madikwe Nature Reserve | 60,732 | NWPTB |
| Mafikeng Nature Reserve | 4,613 | NWPTB |
| Molemane Nature Reserve | 5,256 | NWPTB |
| Molopo Nature Reserve | 24,020 | NWPTB |
| Pilanesberg Nature Reserve | 49,583 | NWPTB |
| S.A. Lombard Nature Reserve | 3,637 | NWPTB |
| Vaalkopdam Nature Reserve | 4,658 | NWPTB |
| Wolwespruit Nature Reserve | 1,743 | NWPTB |
| | | |
| **Type 2: Protected Environments** | **41,593** | |
| Magaliesberg Protected Environment | 27,080 | DEDECT and GDARDE |
| Marico Protected Environment | 14,513 | Marico River Conservation Association |
| | | |
| **Type 3: World Heritage Sites** | **59,828** | |
| Fossil Hominid Sites of SA: Cradle of Humankind World Heritage Site | 8,834 | GDARDE |
| Taung Skull World Heritage Site | 3,627 | DEDECT |
| Taung Skull Site (Core) (Protected Area Estate) | 159 | DEDECT |
| Taung Skull Site (Buffer) | 3,468 | DEDECT |
| Vredefort Dome World Heritage Site | 47,368 | DEDECT |
| | | |
| **Type 4: Biosphere Reserves** | **666,957** | |
| Magaliesberg Biosphere Reserve | 219,462 | Magaliesberg Biosphere Reserve Non-Profit Company |
| Marico Biosphere Reserve | 447,495 | Marico River Conservation Association |
| | | |
| **Type 5: Private and Municipal Nature Reserves** | | |
| ***Municipal Reserves*** | **2,065** | |
| Faan Meintjies Nature Reserve | 1,189 | City of Matlosana Local Municipality |
| Leon Taljaard Nature Reserve | 876 | Naledi Local Municipality |
| ***Private Nature Reserves in Type 1 Reserves (Need to be de-proclaimed)*** | **14,029** | |
| Weldere Private Nature Reserve (Madikwe) | 10,975 | |
| McGregor Private Nature Reserve (2083 Ha. in Pilanesberg) | 3054 | |
| ***See Table 6 for other Private Nature Reserves*** | | |
| | | |
| **Types 6: Conservancies** | | |
| Conservancies (Total Area in WHS) Type 3/4/6 | 6,479 | |
| Conservancies (Total Area Outside MPE & WHS + PNR) Type 4/6 | 31,877 | |

**TABLE 6. PRIVATE NATURE RESERVES S IN THE NORTH WEST PROVINCE (TYPE 5) AND PERCENTAGE MODIFICATION >60% - RED SHADED CELLS, 41-60% – ORANGE SHADED CELLS, 20-40% - YELLOW SHADED CELLS**

| PRIVATE NATURE RESERVE | TOTAL AREA (HA) | MODIFIED 2023 (%) |
|---|---|---|
| Arabos Private Nature Reserve | 586 | 6 |
| Atorus Private Nature Reserve | 1,043 | 53 |
| Bettie Private Nature Reserve | 966 | 7.1 |
| Bochco Private Nature Reserve | 810 | 7.0 |
| Bosworth Private Nature Reserve | 1,212 | 32 |
| Burger Private Nature Reserve | 1,102 | 3.9 |
| Bushybend Private Nature Reserve | 1,131 | 5.4 |
| Dawie Pieterse Private Nature Reserve | 830 | 5.0 |
| Deon Private Nature Reserve | 3,139 | 13 |
| Drie Annies Private Nature Reserve | 5,746 | 20 |
| Druprenella Private Nature Reserve | 3,549 | 32 |
| Eerstbegin Private Nature Reserve | 1,576 | 73 |
| Elma Private Nature Reserve | 157 | 33 |
| Faan Meintjies Private Nature Reserve | 1,188 | 29 |
| Flintbeck Private Nature Reserve | 405 | 33 |
| Flovin Mauken Private Nature Reserve | 1,257 | 1 |
| Franko Private Nature Reserve | 1,640 | 4 |
| Fred Coetzee Private Nature Reserve | 2,397 | 0.6 |
| Goedgevonden Private Nature Reserve | 894 | 65 |
| Hans Engelbrecht Private Nature Reserve | 952 | 8 |
| Hartbeespoort Dam Nature Reserve | 3,627 | 80 |
| Hillendale Private Nature Reserve | 1,305 | 8 |
| Hillhoff Private Nature Reserve | 1,060 | 3 |
| Hoffman Private Nature Reserve | 2,246 | 72 |
| Honingspruit Private Nature Reserve | 2,228 | 4.8 |
| J. H. Klopper Private Nature Reserve | 639 | 70 |
| Kareesloot Private Nature Reserve | 1,898 | 6.7 |
| King Fisher's Kingdom Private Nature Reserve | 1,038 | 48 |
| Klipfontein Private Nature Reserve | 906 | 30 |
| Klipkuil Private Nature Reserve | 1,484 | 24 |
| Klipplaat Private Nature Reserve | 543 | 6 |
| Klipstraat Private Nature Reserve | 2,105 | 2 |
| Koos Meintjies Private Nature Reserve | 1,719 | 35 |
| Koos Meyer Private Nature Reserve | 1,701 | 42 |
| Koos Swart Private Nature Reserve | 5,405 | 9 |
| Kosmo Private Nature Reserve | 1,854 | 25 |
| Krokodil Private Nature Reserve | 957 | 19 |
| Leon Taljaard Nature Reserve | 876 | 11 |
| Lichtenburg Game Breeding Centre | 5,142 | 13 |
| M. D. Viljoen Private Nature Reserve | 703 | 93 |
| M. J. Hermann Private Nature Reserve | 1,382 | 5 |
| Makokskraal Private Nature Reserve | 4,522 | 33 |
| Marico-Bosveld Nature Reserve | 6,688 | 22 |
| Marokane Private Nature Reserve | 745 | 1 |
| Matlapeng Private Nature Reserve | 4,838 | 41 |
| McGregor Private Nature Reserve | 3,051 | 15 |
| M'Nandi Private Nature Reserve | 285 | 48 |
| Molopo Oog Private Nature Reserve | 1,497 | 7 |
| Nellie Private Nature Reserve | 784 | 0.2 |
| Nooitgedacht Private Nature Reserve | 2,576 | 24 |
| Olyvenbult Private Nature Reserve | 3,225 | 3 |
| Quarry Private Nature Reserve | 682 | 44 |
| Rall Broers Private Nature Reserve | 416 | 2 |
| Rietspruit Rusoord Nature Reserve | 289 | 4 |
| Rustig No 1 Private Nature Reserve | 662 | 7 |
| Rustig No 2 Private Nature Reserve | 1,432 | 45 |
| Schoonspruit Nature Reserve | 4,341 | 36 |
| Somerville Private Nature Reserve | 2,724 | 2 |
| Sterkfontein Private Nature Reserve | 854 | 0.7 |
| Stroomdrift Private Nature Reserve | 1,417 | 73 |
| Thabaphiri Private Nature Reserve | 237 | 38 |
| Thys Snyman Private Nature Reserve | 768 | 31 |
| Tiekie Private Nature Reserve | 533 | 19 |
| Tweekoppiesfontein Private Nature Reserve | 13,864 | 8.4 |
| Uitspan Private Nature Reserve | 454 | 76 |
| Vaalbosch Private Nature Reserve | 517 | 19 |
| Venterskroon Private Nature Reserve | 630 | 5 |
| Voorbrand Private Nature Reserve | 860 | 17 |
| Voorspoed Private Nature Reserve | 653 | 71 |
| Vuurfontein Private Nature Reserve | 1,695 | 28 |
| Weldere Private Nature Reserve | 10,876 | 15 |
| Witkrans Private Nature Reserve | 1,936 | 20 |
| Total area | 143,447 | |

**Figure 15. Protected Areas and Conservation Areas of the North West Province**





# 7

# SPATIAL MAPPING OF BIODIVERSITY PATTERN & ECOLOGICAL PROCESSES

SECTION 7

# SPATIAL MAPPING OF BIODIVERSITY PATTERN & ECOLOGICAL PROCESSES

Important and unique biodiversity are not distributed uniformly throughout the landscape. A spatial biodiversity planning exercise prioritises and maps information about biodiversity patterns and ecological processes, current and future land use, and the protected area network in the context of achieving biodiversity targets set for species and ecosystems.

## 7.1. NW SPATIAL BIODIVERSITY FRAMEWORK

The NW Spatial Biodiversity Framework (NWBSF) is a spatial vision for a living landscape that achieves our biodiversity conservation goals whilst avoiding, where possible, competing land uses and development pressures. The biodiversity spatial framework gives expression to the Living Landscape concept articulated in Figure 10.3. The NW biodiversity spatial framework provides a generalised representation of the location of core biodiversity conservation landscapes connected via a network of ecological corridors aligned with the major climatic and environmental gradients in the province.

The NWSBF is a high-level spatial expression of the key biodiversity conservation and climate change adaptation goals embodied in the NW Biodiversity Sector Plan CBA Map. The NW BSP (2025) can be used to inform the provincial and national protected area expansion strategies as well as high-level spatial planning tools such as SDFs.

Ideally protected area expansion and the development of the biodiversity economy in the NWP should be aligned with this landscape vision. This in turn enables the development of a conceptual living-landscape framework, with a system of protected areas that conserve biodiversity and ecosystem services, embedded within it (Figure 20 and Figure 21).

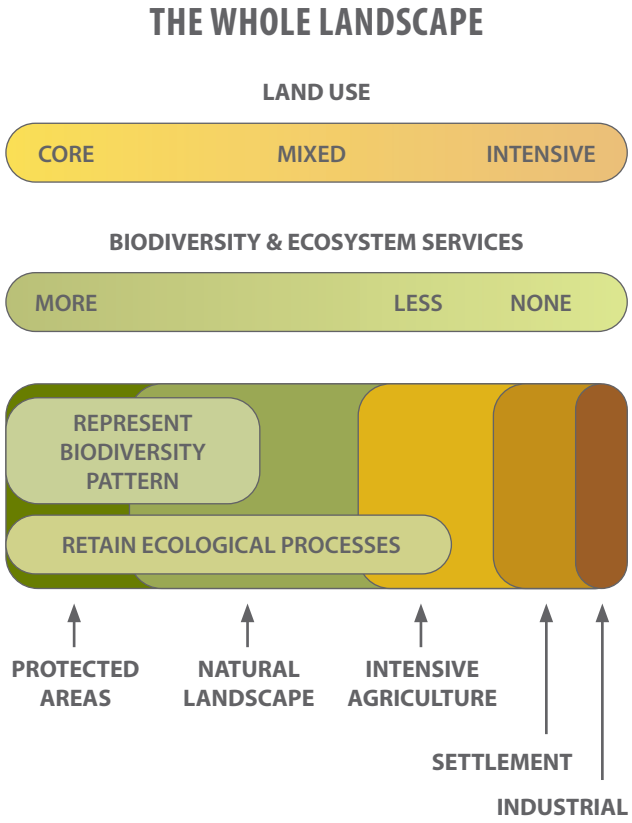
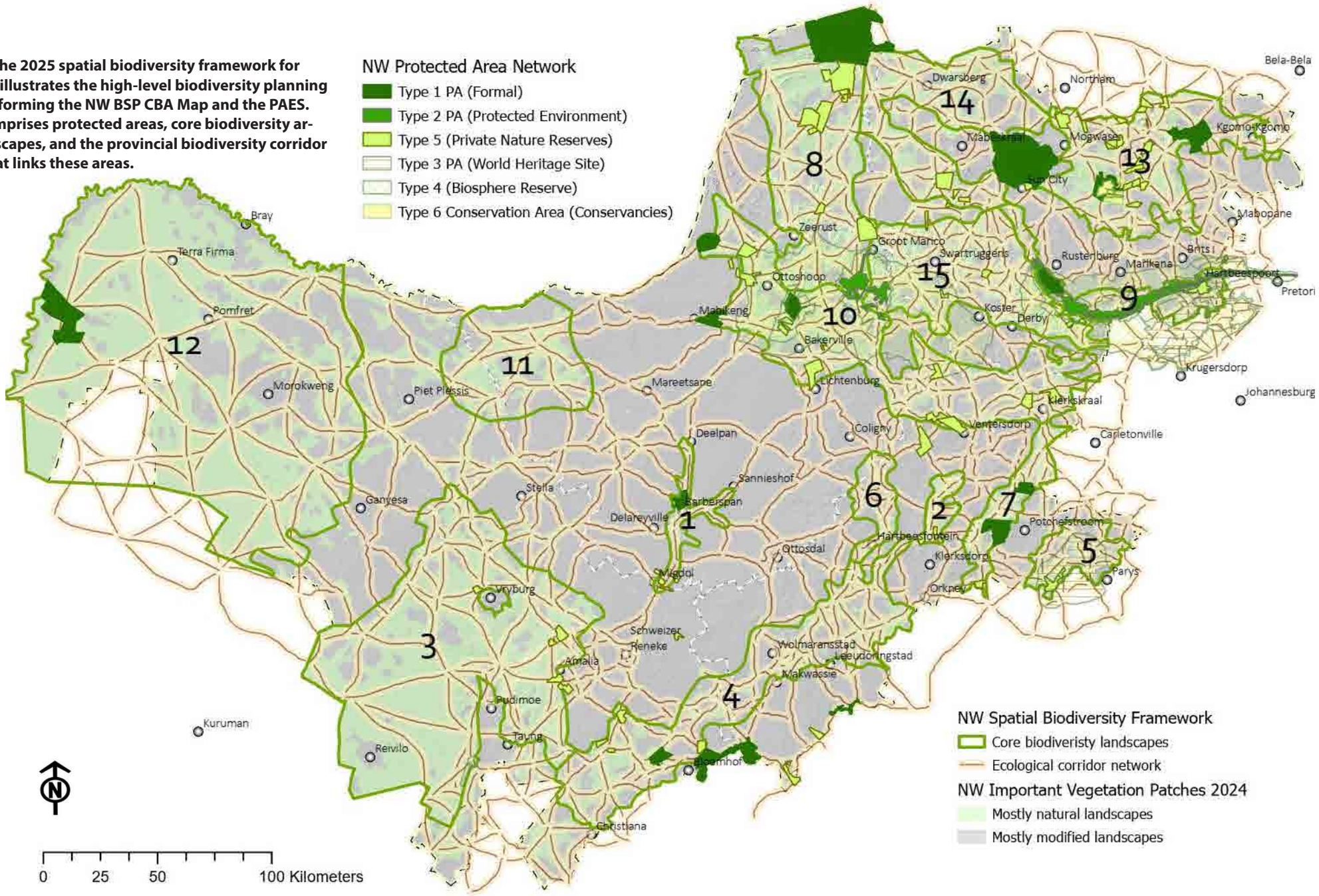



**Figure 16. The living-landscape conceptual framework that informs the development of the NW biodiversity spatial framework and ultimately the provincial CBA map and PAES.**

**Figure 17. The 2025 spatial biodiversity framework for North West illustrates the high-level biodiversity planning concepts informing the NW BSP CBA Map and the PAES. The SBF comprises protected areas, core biodiversity areas or landscapes, and the provincial biodiversity corridor network that links these areas.**



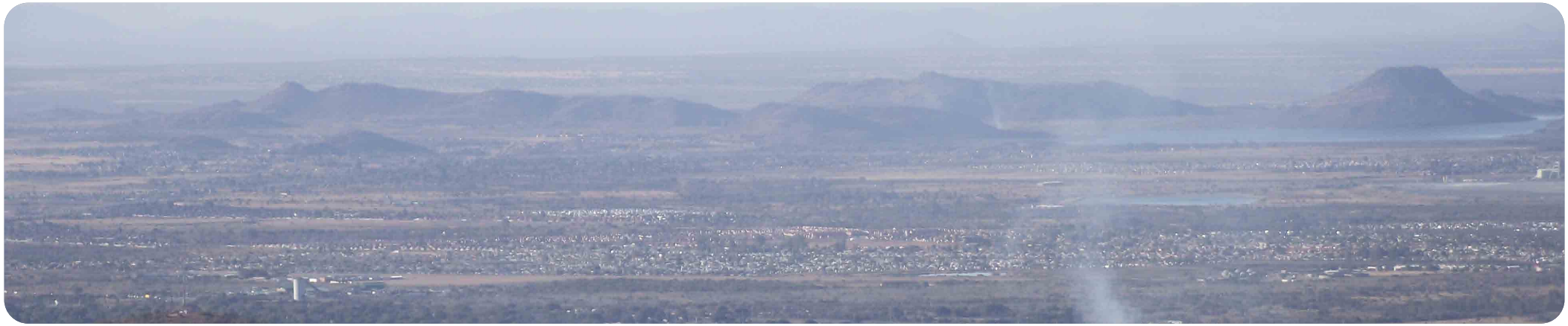
## 7.2. TECHNICAL GUIDELINES FOR MAPPING CRITICAL BIODIVERSITY AREAS (SANBI 2017)

In 2017 SANBI published the first edition of the *Technical Guidelines for Mapping Critical Biodiversity Areas* to ensure a consistent approach to spatial biodiversity planning in South Africa. The technical guidelines provide clear guidance on the definition of CBAs and ESAs, what biodiversity features qualify and do not qualify for consideration, as well as guidance on irreplaceability as a measure of relative importance of sites. When undertaking priority planning for biodiversity steps or processes to answer key questions in the systematic biodiversity planning process as set out in Table 7 are undertaken.

**TABLE 7. KEY INFORMANTS OF THE SYSTEMATIC BIODIVERSITY PLANNING PROCESS**

| QUESTION | SYSTEMATIC BIODIVERSITY PLANNING PROCESS: INFORMANTS OF NW BSP REVISION |
|---|---|
| **Where in the landscape does biodiversity occur?** | Biodiversity information, considered the best available science at the time of the analysis, is collected and collated (See NW BSP Technical Report, 2025). Specialist and expert stakeholders are invited to provide spatial inputs. |
| **How much conservation or protection is required to ensure the persistence of that biodiversity?** | South Africa has developed biodiversity targets for ecosystems (e.g. vegetation types, rivers). Achieving these biodiversity targets will ensure the persistence of biodiversity and ecological processes. Targets are divided into two groups: targets for representing biodiversity patterns, and targets for maintaining ecological processes. The targets for vegetation types are used as a proxy for biodiversity pattern targets. These give a quantitative indicator of how much we would like to include in our protected area network to represent the variety of biodiversity in the NW. Ecological process targets represent the amount of the NW that we would like to keep in a natural or near-natural state in order to accommodate the ecological processes necessary for the biodiversity to persist into the future (e.g. the natural landscape space necessary for feeding, breeding and movement). An ecological process target of 60% of the NW is used as a guide for how much of the province needs to be earmarked in the network of CBAs and ESAs. About 5% of the NW has been secured in the provincial protected area (PA) network. However much of the target is still located outside of PAs and it is in this space that systematic biodiversity planning takes place. |
| **How is Climate Change being integrated into the design of the CBA map?** | Climate change considerations are integrated into the CBA map through multiple mechanisms:<br>1. Biodiversity Features: Inclusion of features that support climate change resilience, such as habitats associated with microclimatic refugia (e.g. kloofs, ridges).<br>2. Target Setting: Use of ecological process targets that reflect the need to maintain ecosystem functionality under changing climatic conditions.<br>3. Ecological Corridor Design: A provincial ecological corridor network that promotes landscape connectivity and encompasses ecological gradients, aiding species migration and adaptation.<br>4. Spatial Biodiversity Planning: Integration of climate resilience objectives into the provincial spatial biodiversity framework and the protected area expansion strategy.<br><br>Climate change adaptation and resilience objectives are captured in the CBA map through the application of landscape ecological design principles informing the design of the CBA. These include:<br>▶ A strong focus on the design of the provincial ecological corridor network and reflecting this in the CBA map especially critical ecological linkages that are earmarked as CBA1 in the map<br>▶ A focus on identifying and maintaining large, connected patches of natural vegetation and avoiding the fragmentation of these patches through further land use change<br>▶ The design of the provincial protected area network (captured in the NW PAES) to increase the spatial representation and size of PAs, and ecological connectivity between them to support core areas for species persistence. The design framework of the NW protected area network (based on the provincial spatial biodiversity framework and national 2040 mega living landscape vision) embodies key climate change adaptation elements, particularly the concept of ecological gradients. |

| QUESTION | SYSTEMATIC BIODIVERSITY PLANNING PROCESS: STEPS TAKEN FOR NW BSP REVISION |
|---|---|
| **Where are the best places to achieve the conservation/ protection of biodiversity and ecological processes?** | 1. Firstly, the ecological condition of the North West Province was mapped to determine what areas are still in a natural (or near natural) state. For the purposes of the revision of the NW BSP a detailed land cover, which included the mapping of secondary natural areas, was developed.<br>2. Secondly, a target-based modelling approach was used to identify irreplaceable sites that are required to achieve biodiversity targets for ecosystems. The biodiversity features that were used and the targets that were set are found in the Technical Report. As far as possible, the modelling took into consideration current and future land use activities to avoid selecting sites that may conflict with future planned development.<br>3. Lastly, additional information layers were developed to assist with planning and decision-making. These include important biodiversity areas, critical linkages and ecological process areas, such as wetland buffers. |
| **How should the areas be managed?** | A set of land and water use guidelines have been developed. The land use categories represent the categories as they appear in most of the Municipal Land Use Schemes. For each land use activity, a corresponding score of anticipated environmental impact is assigned and compared to the condition required of each CBA/ESA category. The land use guidelines identify:<br>► Compatible (C) land use activities<br>► Incompatible (I) land use activities, which are not compatible with desire management outcomes. Activities located in these areas will require detailed specialist impact assessment (in line with applicable protocols) and permitting/authorisations are likely to be associated with stringent legally binding conditions.<br>► Restricted (R) land use activities - are those activities that will require further specialist impact assessment as well as legally binding conditions through the process of permitting/authorisation. |
| **How should this information be communicated and used?** | Uptake and implementation of the NW BSP (2025) is crucial for the necessary conservation of the remaining biodiversity in the province. The CBA maps and the associated land and water use guidelines have been developed to guide users (see Table 15) and should be freely accessible. |



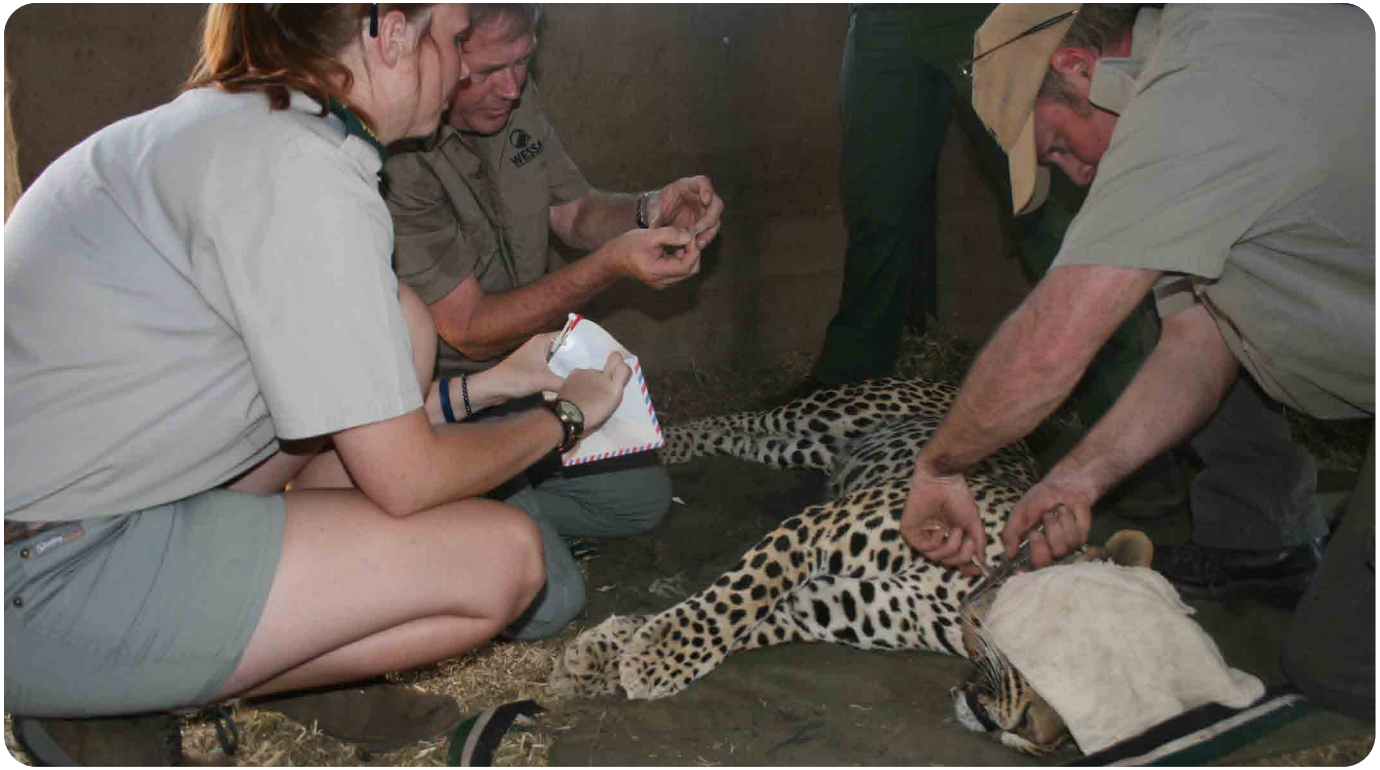
In consideration of the key informants in Table 7 above, a systematic conservation planning approach to developing the CBA map was used. This approach is based on explicitly identifying and mapping biodiversity features, collating information of the condition of this biodiversity (i.e. land cover), and then selecting sites or areas to include in the CBA map based on biodiversity conservation targets set for these features. The final CBA map incorporates a variety of criteria to determine the CBA status of a site (see Table 10 and Table 11).

An equally important biodiversity conservation issue in the cultivated landscapes of the NWP is that of landscape connectivity. Despite cultivated fields retaining some ecological function and permeability, the highly fragmented nature of natural vegetation means that opportunities for creating or retaining landscape ecological linkages are very limited, especially for biodiversity that is reliant on natural habitats. Therefore, the network of secondary natural sites (ESA1) and croplands (ESA2) support the CBA1 sites by providing important buffers to natural areas and most importantly link up all remaining natural areas into a provincial landscape ecological corridor network. Landscape ecological connectivity is achieved in the CBA map by explicitly incorporating the designated provincial ecological corridor network into the selection of sites in the CBA map. Most importantly, critical ecological linkages or pinch points are designated as CBA1 irrespective of their ecological condition. For example, cultivated fields can be earmarked as CBA1 where these are deemed to be critical ecological linkages.

When assessing sites during a development application process, it is important to consider both the biodiversity present (especially for natural sites), as well as the landscape ecological context of sites and the role sites play in the larger landscape. ESA sites that do not have natural vegetation, and in some cases can be highly modified, are identified for their role in supporting ecological processes (e.g. movement corridors/landscape connectivity, ecological buffers around natural areas or foraging sites for species) and ecological infrastructure (e.g. wetland buffers and flood mitigation areas). Therefore, in highly modified landscape, just because there is no apparent biodiversity at a site, it does not mean that a site is not important ecologically in the wider landscape ecological context, specifically with regards to ecological connectivity.

The way that ESAs have been identified and the information contained in the CBA Map attribute table will assist planners and assessors in better understanding and quantifying the wider landscape ecological significance of sites. ESA sites are important and need to be retained in order to meet our ecological process target.

**Where degraded or in a cultivated state, these sites could be priorities for ecosystem restoration or conservation agriculture. Equally, they can remain under their current land use, especially for croplands or green open spaces in built-up areas.**



## 7.3. BIODIVERSITY FEATURES AND TARGETS USED FOR THE IRREPLACEABILITY ANALYSIS.

Biodiversity features and set conservation targets for these features were used during the systematic biodiversity modelling process to drive the selection of planning units, and derive the level of irreplaceability of sites. These features are summarised in Table 8 below. Further information can be found in the NW BSP (2025) Technical Document.

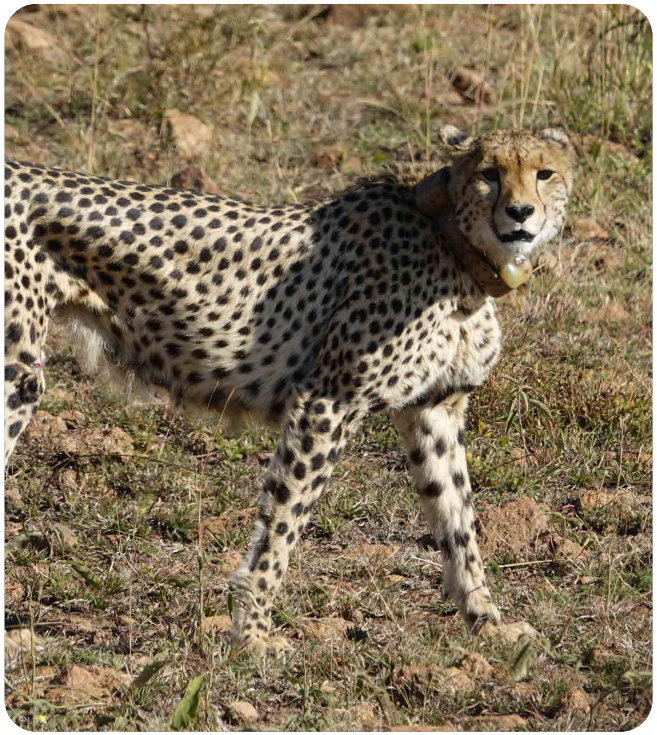


**TABLE 8. BIODIVERSITY FEATURES, SET TARGETS AND PORTION OF TARGET ACHIEVED IN THE MARXAN ANALYSIS.**

| | BIODIVERSITY FEATURES | ORIGINAL | REMAINING | DIFFERENCE | TARGET % | TARGET (HA) |
|---|---|---|---|---|---|---|
| 1 | Andesite Mountain Bushveld | 178 515 | 168 104 | 10 411 | 24 | 42 844 |
| 2 | Carletonville Dolomite Grassland | 570 345 | 514 882 | 55 462 | 24 | 136 883 |
| 3 | Central Sandy Bushveld | 265 034 | 237 553 | 27 481 | 19 | 50 357 |
| 4 | Central Sandy Mountain Bushveld | 29 638 | 29 395 | 244 | 19 | 5 631 |
| 5 | Dwaalboom Thornveld | 258 715 | 241 690 | 17 025 | 19 | 49 156 |
| 6 | Dwarsberg-Swartruggens Mountain Bushveld | 409 445 | 398 095 | 11 350 | 24 | 98 267 |
| 7 | Gauteng Shale Mountain Bushveld | 64 459 | 57 115 | 7 344 | 24 | 15 470 |
| 8 | Ghaap Plateau Vaalbosveld | 407 662 | 402 052 | 5 610 | 16 | 65 226 |
| 9 | Gold Reef Mountain Bushveld | 230 802 | 225 247 | 5 555 | 24 | 55 393 |
| 10 | Highveld Alluvial Vegetation | 342 692 | 294 921 | 47 771 | 31 | 106 234 |
| 11 | Kimberley Thornveld | 189 251 | 177 830 | 11 421 | 16 | 30 280 |
| 12 | Klerksdorp Thornveld | 337 120 | 254 673 | 82 448 | 24 | 80 909 |
| 13 | Kuruman Mountain Bushveld | 121 916 | 114 819 | 7 097 | 16 | 19 506 |
| 14 | Kuruman Vaalbosveld | 45 333 | 45 162 | 172 | 16 | 7 253 |
| 15 | Madikwe Dolomite Bushveld | 85 068 | 83 859 | 1 210 | 19 | 16 163 |
| 16 | Mafikeng Bushveld | 1 355 938 | 1 184 443 | 171 495 | 16 | 216 950 |
| 17 | Marikana Thornveld | 124 578 | 86 782 | 37 796 | 19 | 23 670 |
| 18 | Molopo Bushveld | 789 435 | 788 376 | 1 059 | 16 | 126 310 |
| 19 | Moot Plains Bushveld | 139 546 | 106 348 | 33 199 | 19 | 26 514 |
| 20 | Morokweng Thornveld | 95 551 | 94 474 | 1 077 | 16 | 15 288 |
| 21 | Norite Koppies Bushveld | 42 397 | 37 807 | 4 590 | 24 | 10 175 |
| 22 | Northern Afrotemperate Forest | 2 484 | 2 481 | 3 | 22 | 546 |
| 23 | Pilanesberg Mountain Bushveld | 36 717 | 36 491 | 226 | 24 | 8 812 |
| 24 | Rand Highveld Grassland | 259 495 | 153 033 | 106 462 | 24 | 62 279 |
| 25 | Schmidtsdrif Thornveld | 63 931 | 51 463 | 12 469 | 16 | 10 229 |
| 26 | Schweizer-Reneke Bushveld | 129 966 | 81 182 | 48 784 | 16 | 20 795 |
| 27 | Southern Kalahari Mekgacha | 137 497 | 126 053 | 11 443 | 24 | 32 999 |
| 28 | Springbokvlakte Thornveld | 23 448 | 18 852 | 4 596 | 19 | 4 455 |
| 29 | Stella Bushveld | 389 088 | 343 451 | 45 637 | 16 | 62 254 |
| 30 | Subtropical Alluvial Vegetation | 56 409 | 51 185 | 5 225 | 31 | 17 487 |
| 31 | Vaal Reefs Dolomite Sinkhole Woodland | 26 420 | 21 317 | 5 103 | 24 | 6 341 |
| 32 | Vaal-Vet Sandy Grassland | 1 005 372 | 355 076 | 650 296 | 24 | 241 289 |
| 33 | Vredefort Dome Granite Grassland | 4 216 | 3 361 | 855 | 24 | 1 012 |
| 34 | Vryburg Thornveld | 639 532 | 429 974 | 209 558 | 16 | 102 325 |
| 35 | Water | 17 730 | 17 649 | 81 | 0 | 0 |
| 36 | Waterberg Mountain Bushveld | 593 | 581 | 12 | 24 | 142 |
| 37 | Waterberg-Magaliesberg Summit Sourveld | 2 128 | 2 128 | 0 | 24 | 511 |
| 38 | Western Highveld Sandy Grassland | 715 091 | 343 184 | 371 906 | 24 | 171 622 |
| 39 | Western Sandy Bushveld | 586 291 | 524 793 | 61 499 | 19 | 111 395 |
| 40 | Zeerust Thornveld | 131 131 | 115 760 | 15 371 | 19 | 24 915 |
| 50 | Kloofs | 54 591 | 47 717 | 6 873 | 80 | 43 672 |
| 51 | Important areas less 2000 ha | 14 716 | 12 905 | 1 811 | 60 | 8 829 |
| 52 | Important areas 2000 - 4000 ha | 113 946 | 96 521 | 17 425 | 40 | 45 578 |
| 53 | Important areas greater 4000 ha | 921 512 | 784 920 | 136 592 | 20 | 184 302 |
| 54 | Plant Habitats | 1 010 961 | 620 760 | 390 201 | 40 | 404 385 |
| 55 | Vulture roosts | 207 545 | 174 868 | 32 677 | 80 | 166 036 |
| 56 | Free-range hartebeest | 203 085 | 188 071 | 15 014 | 40 | 81 234 |

## 7.4. DESCRIPTION OF MAPPING CATEGORIES

**The CBA maps categories include:**

- Protected Areas
- Critical Biodiversity Areas
- Ecological Support Areas
- Other Natural Areas
- No Natural Habitat Remaining.

Further descriptions of each category are provided in Table 9 below.

**TABLE 9. DETAILED DESCRIPTIONS OF EACH MAP CATEGORY.**

### PROTECTED AREAS

Protected Areas are areas formally declared or recognised in terms of NEMPAA, therefore Protected Areas refer to "State owned" reserves. It includes Provincial PAs managed by North West Parks and Tourism Board (NWPTB), municipal reserves, Private Nature Reserves, and Protected Environments.

Since these areas have been legally secured for conservation purposes, Protected Areas contribute towards meeting biodiversity conservation targets, and together with CBAs, ensure that viable representative samples of all species and ecosystems can persist. Several municipal reserves, though not formally proclaimed under any legislation, are zoned accordingly within relevant Spatial Development Frameworks and recognised as de facto Protected Areas.

Some Protected Areas listed in the South African Protected Area Database (DFFE) are either not in a natural state or are not being actively managed for conservation.

DEDECT is currently evaluating the conservation value of these Nature Reserves to determine if de-proclamation is necessary.

While these non-functioning areas may still appear on the CBA map, their specific treatment remains an open question. Other Effective Conservation Mechanisms are excluded from the modeling analysis.

## CRITICAL BIODIVERSITY AREAS LEVEL 1

### TERRESTRIAL

Terrestrial CBAs are selected to meet biodiversity targets for species, ecosystems and ecological processes. CBAs must be in good ecological condition, and only in exceptional cases, which are strongly motivated, will fair or poor condition sites be selected as CBAs. A number of targets for multiple biodiversity features may be achieved in a CBA. **CBAs are areas of high irreplaceable biodiversity importance and should therefore be maintained in a natural state, with no further loss of habitat and no deterioration in ecological condition.**

### AQUATIC

Freshwater CBAs encompass all freshwater ecosystems necessary to achieve biodiversity targets for freshwater ecosystems and certain species. These areas must be preserved in a natural or near-natural state and maintained in good ecological condition. Freshwater CBAs are sensitive to land-based activities occurring within the broader sub-catchment or anywhere within the freshwater ecosystem, whether upstream or downstream. Consequently, when assessing the potential impacts of land-use changes on a freshwater CBA, it is essential to consider activities within the entire sub-catchment.

## CRITICAL BIODIVERSITY AREAS LEVEL 2

### TERRESTRIAL

These areas are not necessarily irreplaceable, but have been selected as the best option for meeting biodiversity targets, based on complementarity, efficiency, connectivity and/or avoidance of conflict with other land or resources uses.

### AQUATIC

These areas are not necessarily irreplaceable, but have been selected as the best option for meeting biodiversity targets, based on complementarity, efficiency, connectivity and/or avoidance of conflict with other land or resources uses

## ECOLOGICAL SUPPORT AREAS LEVEL 1

### TERRESTRIAL

Terrestrial ESAs are areas that are not essential for meeting biodiversity targets, but are essential for ensuring targets for ecological processes, landscape connectivity between CBAs, maintaining ecological function of CBAs and PAs, strengthening climate change resilience, and proper functioning of ecosystem infrastructure for the delivery of ecosystem services. ESAs may include wetland buffers, riparian areas, ridges, climate change refugia, etc.

### AQUATIC

Aquatic ESAs are not directly required to meet freshwater biodiversity targets but are crucial for sustaining the ecological functioning of freshwater Critical Biodiversity Areas (CBAs). It is essential to maintain freshwater ESAs in at least a functional ecological state to fulfill their support role. Activities in the upstream catchment must be mitigated or minimized by adhering to the land-use guidelines provided with the CBA map.

**ESAs need to be maintained in at least a semi-natural, if not natural, state.**

## ECOLOGICAL SUPPORT AREAS LEVEL 2

### TERRESTRIAL

As per ESA1 described above, the sites have been modified and are in a non-natural state. These areas are generally only included as critical linkages in the landscape. Examples include cultivated land, golf courses and small holdings.

### AQUATIC

Aquatic ESA 2 areas are not in a natural state, however they retain a support role in sustaining the ecological functioning of downstream freshwater ecosystem.

## OTHER NATURAL AREAS

Other Natural Areas are sites that are in a natural state, in varying conditions, that have not been identified as CBAs or ESAs.

## NO NATURAL HABITAT REMAINING

NNR areas that are intensively or permanently modified and are in a poor ecological condition. Although some biodiversity and ecological function may be retained,

## 7.5. CRITERIA USED FOR TERRESTRIAL BIODIVERSITY PLANNING IN NORTH WEST PROVINCE

**The criteria in Table 10 were applied in order to revise the terrestrial CBA map for the NW BSP:**

**TABLE 10. CBA MAPPING CRITERIA USED TO REVISE THE NW BSP CBA MAP.**

| CBA MAP CATEGORY AND CRITERION NAME | DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY | MAP CODES |
|---|---|---|
| **PROTECTED AREAS** | | |
| **Protected Areas** | Protected areas recognised in the Protected Areas Act, including South African National Parks and North West Provincial Parks. In terms of the NW PA database these include Type 1 (protected area) and Type 2 (PA protected environment).<br><br>Note that the following PA types are included as an overlay category and are not indicated in the CBA map as a CBA category: Type 5 (private nature reserves), Type 6 (conservancies), Type 3 (world heritage sites) and Type 4 (biosphere reserves). | PA (6) |
| **CRITICAL BIODIVERSITY AREA LEVEL 1** | | |
| **Critical Patches: Ecosystem Status - Critically Endangered** | Polygons from the Important Patches dataset larger than 3 ha of provincially threatened (CR) ecosystems (vegetation types), i.e. the amount of vegetation remaining intact (of these ecosystems) in ecologically viable patches is less than the biodiversity conservation target. Therefore all remaining patches of these vegetation units are of the highest conservation priority and further impacts on natural habitat should be avoided. | CBA1 (5) |
| **Irreplaceable Sites** | Planning units with high irreplaceability values (SSLN>80%) based on the provincial MARXAN analysis, i.e. areas or sites that are mandatory if biodiversity targets are to be achieved. | |
| **Critical Biodiversity Corridors Linkages** | Critical linkages in the provincial biodiversity corridor network where existing conversion of natural landscapes to other land uses has severely restricted options for maintaining connectivity in the natural landscape. Critical linkages that are not in a natural state are categorised as ESA 2. | |
| **Important Terrestrial Habitats: Kloofs** | All medium to large kloofs identified as an important habitat for climate change adaptation. | |

| CBA MAP CATEGORY AND CRITERION NAME | DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY | MAP CODES |
|---|---|---|
| **CRITICAL BIODIVERSITY AREAS LEVEL 2** | | |
| **Critical Patches: Ecosystem Status - Endangered and Vulnerable Ecosystems** | Polygons from the Important Patches dataset larger than 5 ha of provincially threatened (EN and VU) ecosystems (vegetation types), i.e. the amount vegetation remaining intact (of these ecosystems) is less than 60% of original extent. Any further modification of these vegetation types should be limited to existing irreversibly modified or heavily degraded areas. | CBA2 (4) |
| **Best Design Sites** | Planning units with MARXAN summed solution >60 and <80m irreplaceability, i.e. areas or sites that are the optimal location (lowest cost and highest adjacency) for achieving biodiversity conservation targets for all features considered in the MARXAN analysis. | |
| **Important Habitats: Focus Wildlife Areas** | Areas identified as being important for maintaining species of conservation concern (free-ranging red hartebeest (*Alcelaphus buselaphus*), black-footed cat (Felis nigripes) and vulture nesting areas). | |
| **Important Terrestrial Habitats: Expert Areas** | Areas in the terrestrial environments less than 10 000 ha in extent identified by experts as being important for biodiversity conservation. (Hahn, 2013; Power, 2013; Power et. al., 2014; Power 2014 and 2025; Roux 2015; Tye, 2012) | |
| **ECOLOGICAL SUPPORT AREAS LEVEL 1** | | |
| **Important Habitats: Hills and Ridges** | Hills and ridges are identified as sensitive habitats in the provincial SDF dataset and are important for supporting a range of ecological processes associated with species survival, movement and climate change adaptation. The hill and ridges layer was developed to address the special biodiversity significance of these topographic features in the province. | ESA1 if natural (3) |
| **Biodiversity Corridors** | Provincial-level biodiversity corridor network aimed at retaining connectivity between all geographic areas in the province.<br>The corridor network was identified following a least cost path analysis.<br>The corridor network was designed as a product of the systematic biodiversity assessment and was based on the following set of design criteria or principles agreed to by the stakeholders and experts involved in the assessment:<br>▶ The corridor network needs to incorporate all existing identified landscape or biodiversity corridors. These include the | ESA2 if not natural (2) |
| **ECOLOGICAL SUPPORT AREAS LEVEL 2 (IF NOT NATURAL)** | | |

| CBA MAP CATEGORY AND CRITERION NAME | DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY | MAP CODES |
|---|---|---|
| **ECOLOGICAL SUPPORT AREAS LEVEL 1** | **ECOLOGICAL SUPPORT AREAS LEVEL 2 (IF NOT NATURAL)** | |
| | ▶ Platinum Heritage Park, Magaliesberg Protected Environment, and Biosphere Reserve, etc.<br>▶ The corridor network needs to link core conservation landscapes through a province-wide network that covers the complete range of altitudinal and latitudinal zones, and thus favouring effective beta-diversity (i.e. ratio between gamma (regional) and alpha (local) diversities) incorporation.<br>▶ The corridor network should, where possible, incorporate most terrestrial and freshwater priority areas.<br>▶ The corridor network should not focus on one component of biodiversity (e.g. grassland) in the design, but rather consider all components of biodiversity patterns and ecological processes.<br>▶ Give effect to the principles and axes of landscape corridor design embodied in the National Spatial Biodiversity Assessment and other national PA planning informants e.g. Mega Living Landscapes / Vision 2040.<br>▶ Align with the corridor network of bordering provinces (i.e. edge-matching). | |
| **Existing or Proposed Protected Area Development Corridors** | Existing protected area development corridors identified in previous studies and the provincial protected area expansion strategy. Expansion of land uses not compatible with protected areas or beneficial green economy activities can severely degrade the economic potential of this valuable resource, if allowed to expand into these zones.<br>1. Platinum Heritage Park<br>2. Highveld Grassland<br>3. Vredefort Dome World Heritage Site<br>4. Kgalagadi / Molopo Bushveld<br>5. Magaliesberg Protected Environment<br>6. Lower Vaal - SA Lombard/Bloemhof | |
| **Protected Area Buffers** | The 5 km radius buffer around all Protected Areas.[1]<br>Buffers around protected areas as defined in "Listing Notice 3" are included (National Environmental Management Act, 1998 (Act No. 107 of 1998) Listing Notice 3: List of Activities and Competent Authorities Identified in Terms of Sections 24(2) and 24d No. R. 546 [As Corrected By "Correction Notice 2" (Gn No. R. 1159 of 10 December 2010)]. Government Gazette, 18 June 2010, No. 33306.). Buffers of 5km have been created around provincial nature reserves and are included as at least Ecological Support Areas. The generic buffers, as determined in "Listing notice 3", serve to protect the biodiversity and economic asset values of the provinces PA's by reducing the impacts of development adjacent to PA's. There are impacts on biodiversity (e.g. edge effects or introduction of alien species) and economic value (e.g. degradation of viewshed and sense of place). | |

| CBA MAP CATEGORY AND CRITERION NAME | DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY | MAP CODES |
|---|---|---|
| **OTHER NATURAL AREAS** | | |
| **Other Natural Areas** | All remaining natural areas not included in the above CBA or ESA categories. | Natural (1) |
| **NO NATURAL HABITAT REMAINING** | | |
| **No Natural Habitat Remaining** | These are areas that have been irreversibly modified and do not contribute to maintaining biodiversity patterns or ecological processes. These include urban and rural settlements; croplands; mining areas; and, forest plantations. The coverage of these areas was derived from the NWP 2024 integrated land cover map. | Irreversibly Modified |

## 7.6. CRITERIA USED FOR AQUATIC BIODIVERSITY PLANNING IN NORTH WEST PROVINCE

**The criteria in Table 11 were applied in order to revise the aquatic CBA map for the NW BSP:**

**TABLE 11. CRITERIA USED TO MAP AQUATIC CBA MAP.**

| AQUATIC CBA/ESA | WETLAND/RIVER | DESCRIPTION OF BIODIVERSITY FEATURES USED TO DEFINE CBA MAP CATEGORY | LAYER CODE |
|---|---|---|---|
| CBA 1 | Wetland | 2024 NWWI – All Depression / Pans | W1 |
| | | 2024 North West Wetland Inventory (NWWI) Wetland Condition (PES) – A & B PES | W2 |
| | | Peat Wetlands – Peat wetlands from the 2024 NWWI, which were identified using existing 2022 peatland data points. Additional peatlands were further identified and mapped through expert input. | W5 |
| | | Dolomitic Features - Tufas and Eyes (500m buffer) (if Natural) | W7 |
| | River | NBA SQ River reaches based on 2024 Condition (PES) - A & B PES (relevant river lines extracted from 1:50k river lines and with variable buffer representing different order river segments). | AQ_1 |
| | | FEPA Status: River FEPA's, Fish FEPA's, Fish Support Areas, Fish corridors | AQ_3 |
| | | Free flowing rivers | AQ_4 |
| CBA 2 | Wetland | 2024 North West Wetland Inventory (NWWI) Wetland Condition (PES) – C PES | W2 |
| | River | NBA SQ River reaches based on 2024 Condition (PES) - C PES (relevant river lines extracted from 1:50k river lines and with variable buffer representing different order river segments). | AQ_1 |
| | | Phase 2 FEPA's | AQ_3 |
| ESA 1 | Wetland | 2024 North West Wetland Inventory (NWWI) Wetland Condition (PES) – D - F PES | W2 |
| | | Wetland Clusters (if Natural) | W3 |
| | | Dolomite Recharge Areas (if Natural) | W4 |
| | | Peat Wetlands Buffer Zone – 500m (if Natural) | W6 |
| | | FEPA Catchments (if Natural) | W8 |
| | | Wetland 100m buffers (if Natural) | W9 |
| | River | NBA SQ River reaches based on 2024 Condition (PES) – D - F PES (relevant river lines extracted from 1:50k river lines and with variable buffer representing different order river segments). | AQ_1 |
| | | Other/ remaining rivers (1:50k) – No PES available | AQ_2 |
| | | River ecosystem inventory 100m Buffers (if Natural) | AQ_5 |
| | | Freshwater vegetation types from provincial vegetation map (if Natural) | AQ_6 |
| | | Modelled Wetlands (Collins, 2015) (if Natural) | AQ_7 |
| ESA 2 | Wetland | Wetland Clusters (if Not Natural) | W3 |
| | | Dolomite Recharge Areas (if Not Natural) | W4 |
| | | Peat Wetlands Buffer Zone – 500m (if Not Natural) | W6 |
| | | Dolomitic Features - Tufas and Eyes (500m buffer) (if Not Natural) | W7 |
| | | FEPA Catchments (if Not Natural) | W8 |
| | | Wetland 100m buffers (if Not Natural) | W9 |
| | River | River ecosystem inventory 100m Buffers (if Not Natural) | AQ_5 |
| | | Freshwater vegetation types from provincial vegetation map (if Not Natural) | AQ_6 |
| | | Modelled Wetlands (Collins, 2015) (if Not Natural) | AQ_7 |

## 7.7. HOW TO USE/INTERPRET THE CBA MAP

The interpretation and use of the map is an important component of the NW BSP. Users should be able to interrogate the CBA map to ensure that it is used appropriately. For this reason, a simple decision-support tool (decision tree) has been developed to assist users of the CBA map.

**TABLE 12. CBA MAP - DECISION SUPPORT TOOL.**

| CBA MAPPING CATEGORY | | | | | |
|---|---|---|---|---|---|
| **OTHER NATURAL AREA** | | **ECOLOGICAL SUPPORT AREA** | | **CRITICAL BIODIVERSITY AREA** | |
| VERIFY | | VERIFY | | VERIFY | |
| ▶ Threatened species/ecosystem present?<br>▶ Is the site critical for the delivery of ecosystem services? | | ▶ Threatened species/ecosystem present?<br>▶ Is the site a critical pin-point corridor?<br>▶ Is the site critical for the delivery of ecosystem services?<br>▶ If degraded, is the site still functional? | | ▶ Threatened species/ecosystem present?<br>▶ Is the site still in a pristine ecological condition (i.e. not previously cultivated or degraded)? | |
| **NO** | **YES** | **NO** | **YES** | **NO** | **YES** |
| Proceed with development planning and assessment | Treat the site as CBA or ESA, respectively. | Proceed with development planning and assessment | Treat the site as a CBA | Not a CBA, unless threatened species recovery is possible at the site. May consider development. | **Specialist inputs required:**<br>• Is the site classified as irreplaceable (CBA1) or optimal (CBA2)<br>• What species are driving the CBA classification (Reasons layer)<br>• Is the threatened species/ ecosystem present? |

| | | | | | |
|---|---|---|---|---|---|
| Minimise/Reduce impacts. | Minimise/Reduce impacts. | Minimise/Reduce impact mitigation | Avoidance mitigation.<br>Development must be designed for maintained ecological function, and retain landscape connectivity.<br>Ecosystem/species assessments must determine the Site Ecological Importance and if/how the proposed development can avoid or mitigate impacts.<br>Residual impacts of Moderate/ Medium significance or higher need to be offset in terms of the *National Biodiversity Offset Guideline* (GN 3569 of 2023). | Minimise/Reduce impact mitigation. | Avoidance mitigation.<br>Development must be designed for maintaining biodiversity pattern and ecological function.<br>Ecosystem/species assessments must determine the Site Ecological Importance and if/how the proposed development will impact on biodiversity features that are being conserved in the CBA.<br>Residual impacts of Moderate/ Medium significance or higher need to be offset in terms of the *National Biodiversity Offset Guideline* (GN 3569 of 2023). |

## 7.8. THE MAP OF CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS

The development of the terrestrial and aquatic CBA map for the NW BSP 2025 is consistent with the *Guidelines for Bioregional Plans* (NEMBA, 2009) and the Technical Guidelines (SANBI, 2017). The Terrestrial and Aquatic CBA map (Figure 16 and Figure 17) developed in the current assessment, replaces, in their entirety, the maps developed for the NW BSP (2015).

The extent of 2025 CBA map categories is summarised in Table 13 and compared to the 2015 CBA map. There is a notable increase in the extent of CBA1 areas. This reflects the significant loss of natural areas in the province since 2015 and increase in the fragmentation of ecosystems due to this land use change leading to more CBA2 and ESA1 areas now being classified as CBA1.

There is an increase in the extent of Other Natural Area (ONA) and conversely a decrease in the extent "No Natural habitat Remaining (NNR)". This is partly due to the reduction in the cultivated area, which is now mapped as being in a secondary natural condition and included in the Other Natural Area category.

The change in category extents is also partly due to the way in which planning units are classified as a single land cover category (natural or not natural) with the classification favouring the natural component of planning units. Thus, a "natural" planning unit can contain up to 60% coverage of not natural land cover which partly contributes to the observed reduction in planning units classified as No Natural Remaining (i.e. planning units with NNR>60%).

**TABLE 13. TERRESTRIAL CBA MAP CATEGORIES COMPARED BETWEEN 2025 AND 2015**

| CBA CATEGORY | % OF NW 2025 | % OF NW 2015 |
|---|---|---|
| PA | 3.8 | 2.3 |
| CBA1 | **17.0** | **8.4** |
| CBA2 | 19.6 | 20.7 |
| ESA1 | 15.0 | 22.4 |
| ESA2 | 2.6 | 5.2 |
| ONA | 28.3 | 18 |
| NNR | 13.7 | 23 |

A key feature of the 2025 CBA map is the polygon unit used for the spatial representation of the CBA map. In the 2015 CBA map a "natural" planning unit was used that represented remaining natural areas subdivided by water catchments and cadastral boundaries. In the 2025 CBA map a standardised 400mx400m (16ha) planning unit is used. There is therefore, a very significant change in the "look and feel" of the 2025 CBA map compared to its predecessor. One key reason for changing the unit relates to the quality of the input data informing the plan.

Not all informants are at the spatial resolution applicable to the site assessment for land use decision making. The CBA map is a guide to decision making that represents a spatial vision for sustainable development where our biodiversity and environmental goals are achieved. The spatial unit is a deliberate attempt to convey the inherent scale limitations of the informants. So, whilst it conveys the intent of the CBA map it is deliberately spatially vague.

It is therefore necessary for the environmental practitioner or appropriate specialist to "finescale" the vision embodied in the CBA map to a scale and accuracy relevant to the development being assessed. It is critically important that the environmental practitioner or appropriate specialist understand the criteria informing the CBA status of a site and the landscape ecological context of the site, and use these to interpret observed ecological conditions on the ground when completing the site assessment.

**Figure 18. Terrestrial CBA map for the North West Province (2025).**

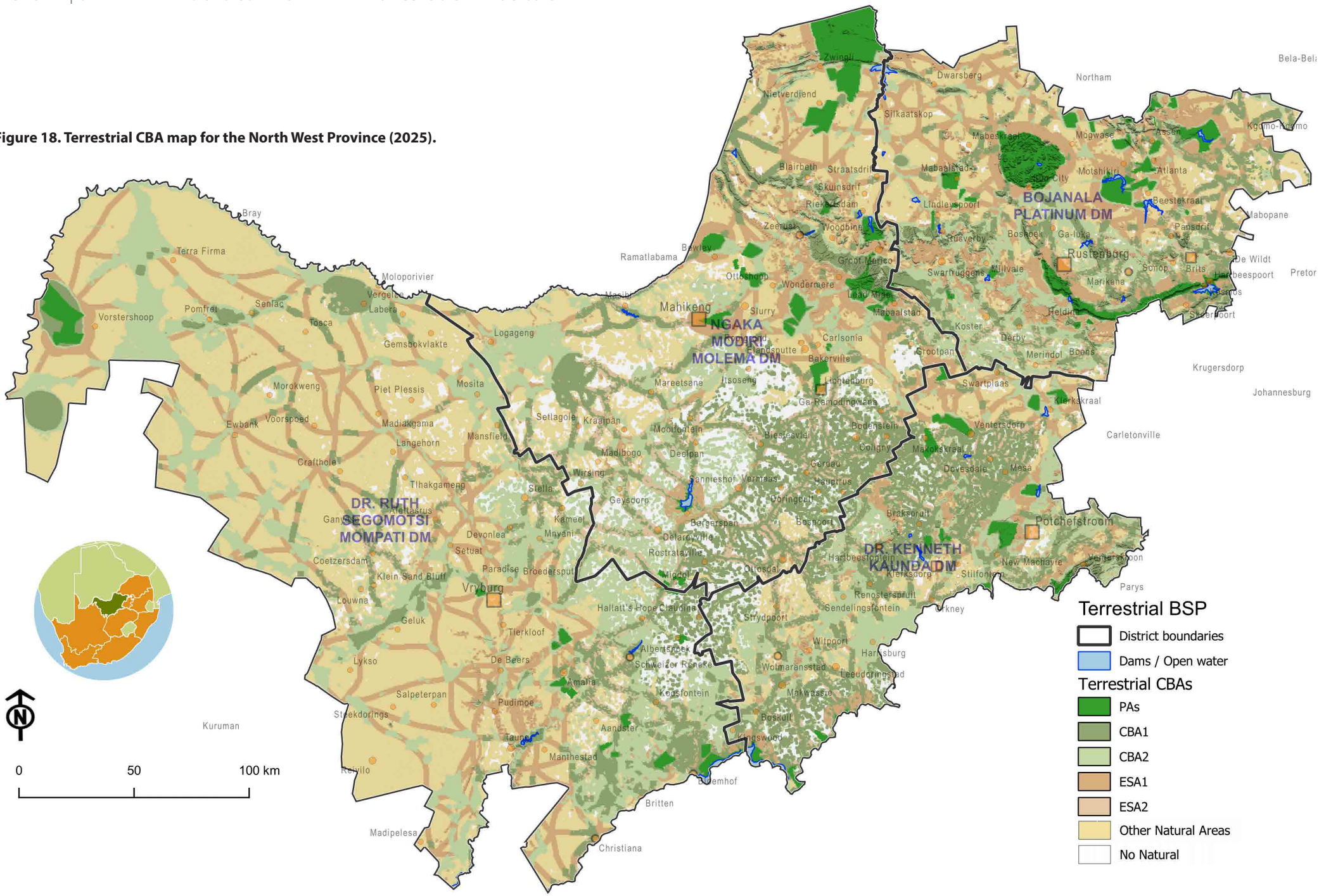
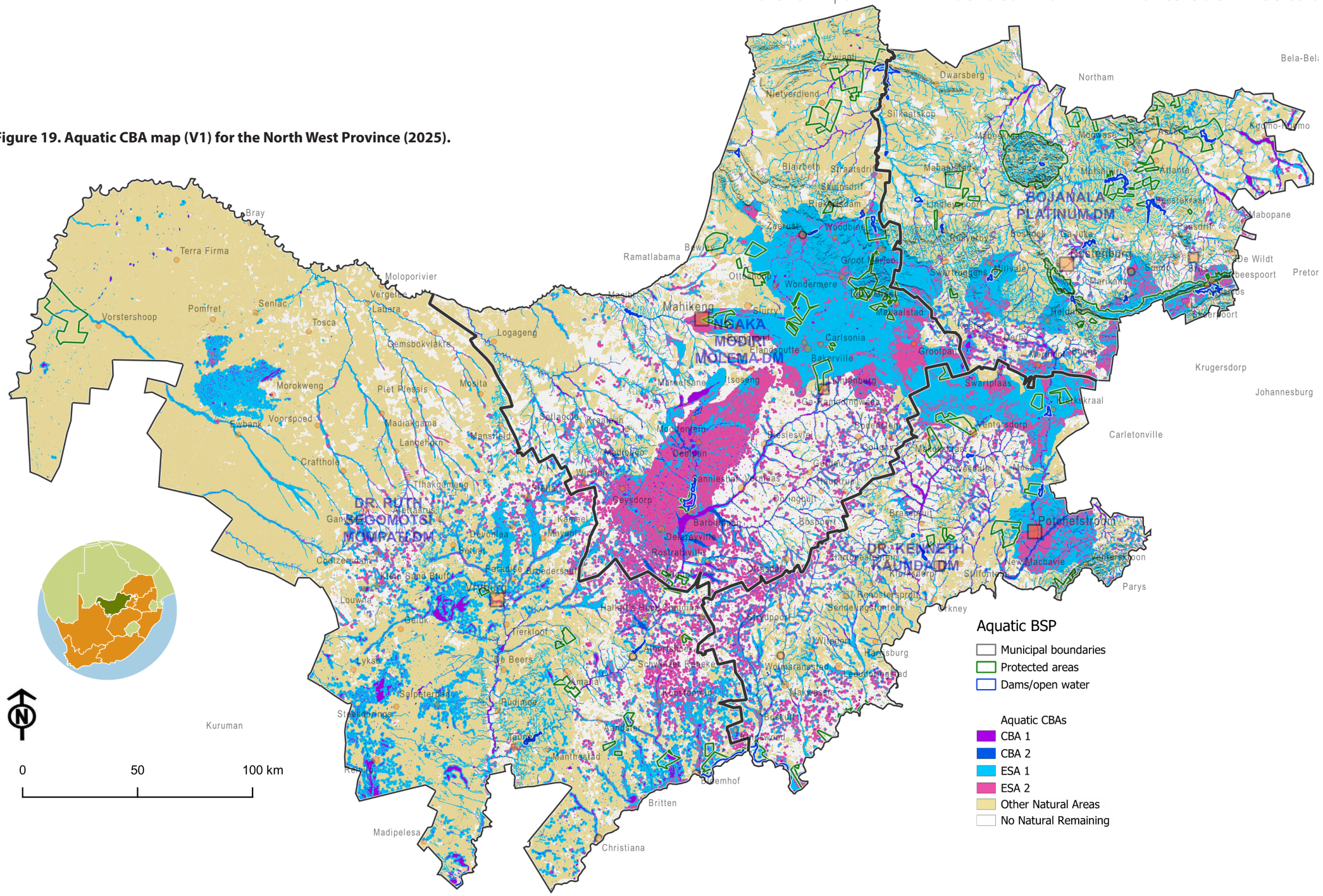
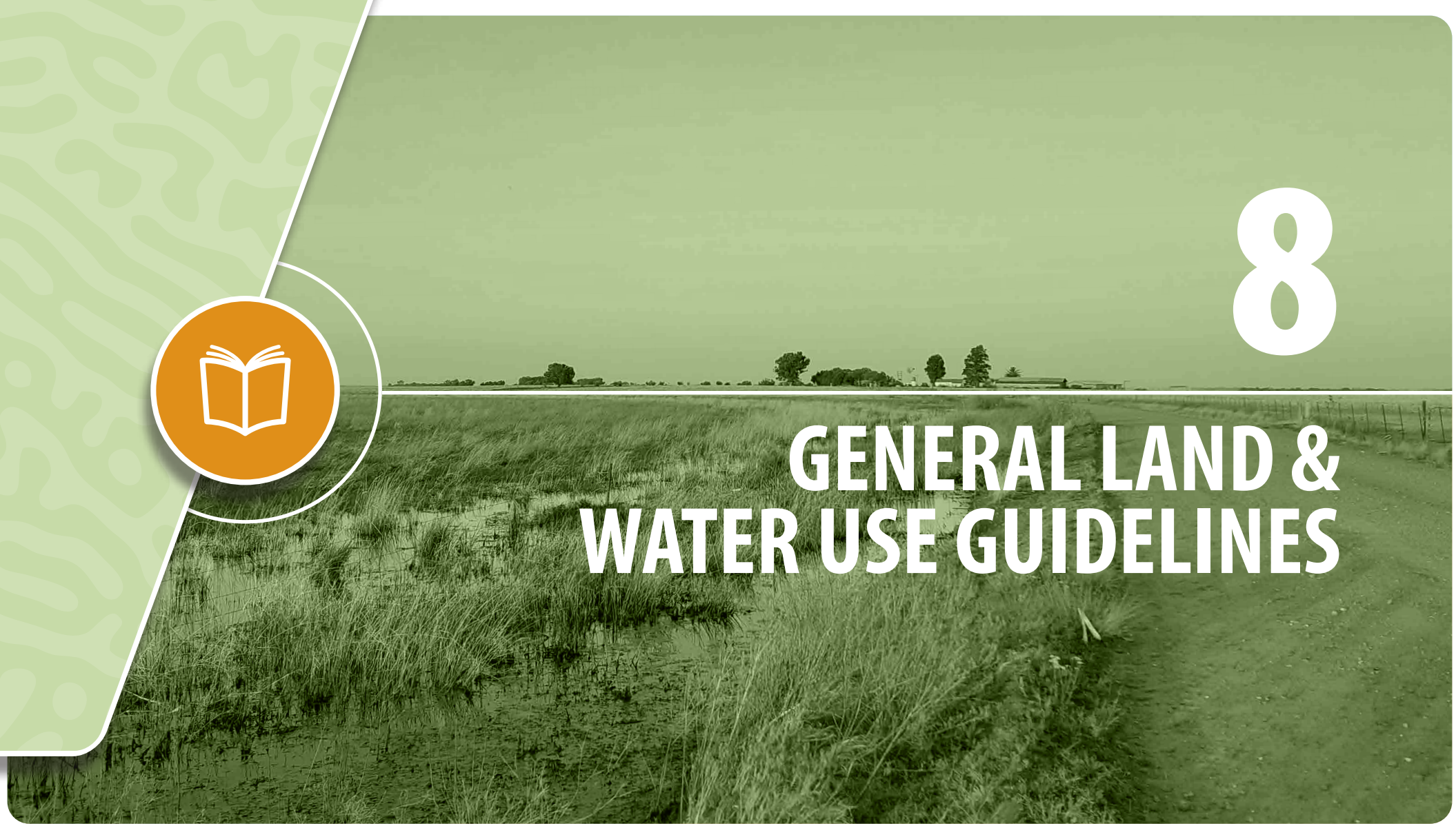


**Figure 19. Aquatic CBA map (V1) for the North West Province (2025).**





# 8

# GENERAL LAND & WATER USE GUIDELINES

SECTION 8

# GENERAL LAND & WATER USE GUIDELINES

**After using the decision support tool provided in Section 7.6, and the CBA mapping category has been assessed and verified by the environmental practitioner or appropriate specialist, the next step is to explicitly outline what this means in terms of managing land uses in these CBA/ESA areas.**

The following land use guidelines are developed to inform land use planning (specifically the spatial planning of land use categories and subsequent zoning schemes of Municipal SDFs) and decision-making involving authorities, decision-makers and Environmental Assessment Practitioners (EAPs) who must consider these guidelines when assessing development applications.

**The land use guidelines for the CBA map categories have there been informed by:**

- Land management objectives of CBA and ESA categories (Table 14)
- Anticipated impacts associated with activities linked directly to land use categories in municipal zoning schemes (Table 15).

In order to inform the management of CBAs/ESAs, the desired state, or land management objectives, for these areas needs to be determined. Table 14 describes the desired state that each CBA mapping category needs in order to fulfil its biodiversity function. For example the desired state and land use management objective of CBAs is to be 'maintained in a natural state to support biodiversity patterns and ecological processes'.

Land use activities (Table 15), as defined in municipal land use schemes, that do not compromise the land management objectives are **Compatible**, and conversely land use activities that impact on the respective land management objectives are **Incompatible**. There are instances where a land use, under certain restrictions or careful management and mitigation, may be compatible, and these have been termed Restricted land uses.

**TABLE 14. THE DESIRED STATE OF CBA MAP CATEGORIES LINKED TO LAND MANAGEMENT OBJECTIVES.**

| | CBA MAP CATEGORY | DESIRED STATE | LAND MANAGEMENT OBJECTIVE |
|---|---|---|---|
| TERRESTRIAL AND AQUATIC CBA MAP CATEGORIES | **Protected Areas** | **Natural** | **Protected Areas are management through Protected Area Management Plans** |
| | **Critical Biodiversity Areas 1 and 2 (CBA 1 & CBA 2)** | Natural | Maintain in natural or near-natural state that secures the retention of biodiversity pattern and ecological processes.<br><br>**For terrestrial areas classified as CBA, the following applies:**<br>▶ Ecosystems and species habitats are to remain intact and undisturbed.<br>▶ Since these areas demonstrate high irreplaceability, if disturbed, biodiversity targets will not be met.<br>▶ Critically Endangered and Endangered species and ecosystems: these biodiversity features are at, or beyond their limits of acceptable change.<br><br>If intensive land use activities, that impact on ecological condition, are unavoidable and there is strong motivation for the desirability of the activity, then the feasibility of a Biodiversity Offset must be assessed, and if deemed appropriate, it should be designed and implemented as a legally binding condition of development. |
| | **Ecological Support Area 1 (ESA 1)** | At least semi-natural | Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in at least a semi-natural state such that ecological function and ecosystem services are maintained.<br><br>**For areas classified as ESA1, the following applies:**<br>▶ These areas are not required to meet biodiversity targets, but they perform essential roles in terms of landscape connectivity, ecosystem service delivery and climate change resilience.<br>▶ These systems may vary in condition and maintaining function is the main objective, therefore:<br>  ▶ Ecosystems still in natural or near-natural state should preferably be maintained as such;<br>  ▶ Ecosystems that are moderately disturbed/degraded should not be further modified or disturbed. |

| | CBA MAP CATEGORY | DESIRED STATE | LAND MANAGEMENT OBJECTIVE |
|---|---|---|---|
| TERRESTRIAL AND AQUATIC CBA MAP CATEGORIES | **Ecological Support Area 2 (ESA 2)** | No further intensification of land use | Terrestrial ESA2 - Maintain current land use with no intensification.<br><br>**For areas classified as ESA2, the following considerations apply:**<br>▶ These areas have already been subjected to varying degrees of intensive modification and are no longer considered natural.<br>▶ These areas are not required to meet biodiversity targets, but they may still perform an important function with respect to connectivity, ecosystem service delivery and climate change resilience.<br>▶ Objective is to maintain remaining as much ecological function as possible, therefore:<br>  ▶ Areas should not undergo any further deterioration in ecological function;<br>  ▶ Opportunities to change land use practices to improve ecological function (i.e. conversion of cultivation agriculture to livestock grazing agriculture) are desirable in ESA2 areas.<br><br>Aquatic ESA 2 - Management in these areas should focus on minimising further ecological degradation, improving land-use practices, and reducing negative impacts on hydrology, water quality, and sedimentation. Rehabilitation and best-practice land management interventions may be necessary to enhance their capacity to support aquatic ecosystem functioning. |
| | **Other Natural Areas (ONA)** | NONE | |
| | **No Natural habitat Remaining (NNR)** | Production | No desired state or management objective is provided for NNR. |

## TABLE 15. LAND AND WATER USES AS PER MUNICIPAL LAND USE SCHEMES - AND CORRESPONDING COMPATIBILITY WITH DESIRED STATE OF CBA MAPPING CATEGORIES.

**Compatibility with this land use: compare code for impact with the code needed for CBAs and ESAs. Compatible (C), Incompatible (I) and Restricted (R) as per authority permit/authorisation.**

***The Lexicon of spatial biodiversity assessment, prioritisation and planning in South Africa (SANBI, 2023) can be referenced for explicit definitions of land uses such as 'agriculture', ' conservation', etc.**

| SPLUMA LAND USE ZONE | DESCRIPTION OF ACTIVITIES: | CBA 1&2 | ESA1 | ESA2 |
|---|---|---|---|---|
| Conservation | Conservation and Protected Areas | C | C | C |
| Commonage | Agriculture, Subsistence Farming, Grazing, and Open Space. | R | C | C |
| Private and Public Open Space | Recreational purposes and activities for local and wider communities. Set aside areas of land for the provision of parks, botanical gardens. | R | C | C |
| Recreational | Recreational purposes and activities for local and wider communities. | R | C | C |
| Agriculture and high potential or unique agriculture | Agriculture: Extensive livestock grazing | R | C | C |
| | Agriculture: Cultivation (grains, groves, orchards, etc) | I | R | C |
| | Agriculture: Intensive rearing e.g. feedlots, piggeries, etc) | I | R | R |
| | Agriculture: Agri-industrial activities | I | I | R |
| Aerodrome | Built Environment | I | C | C |
| Authority Use | Built Environment | I | I | I |
| Business (1-2) | Built Environment | I | I | I |
| Cemetery | Built Environment | R | C | C |
| Commercial | Built Environment | I | I | I |
| Educational | Built Environment | I | I | I |
| Government | Built Environment | I | I | I |
| Industrial (1-2) | Built Environment | I | I | I |
| Institutional | Built Environment | I | I | I |
| Mining and Quarrying | Built Environment | I | I | I |
| Municipal | Built Environment | I | I | I |

| SPLUMA LAND USE ZONE | DESCRIPTION OF ACTIVITIES: | CBA 1&2 | ESA1 | ESA2 |
|---|---|---|---|---|
| Offices | Built Environment | I | I | I |
| Infrastructure (1-6), Transportation services and roads | Built Environment: Communication facilities, masts, towers | R | C | C |
| | Built Environment: Energy facilities, electricity, renewable energy, substations | I | R | R |
| | Built Environment: Sanitation facilities, Sewer treatment plants, sewage farms | I | R | R |
| | Built Environment: Water facilities, water treatment plant, oxidation points, reservoir | I | R | R |
| | Built Environment: Public and Private Roads | I | R | R |
| | Built Environment: Solid waste facilities, disposal sites, landfill | I | I | I |
| | Built Environment: Transportation facilities, roads, taxi rank, railway lines | I | I | I |
| | Built Environment: Transportation services | I | I | I |
| Residential (1-4, rural) | Built Environment - Residential: Lowest density of 1 in 10 ha (areas zoned for agriculture) | R | C | C |
| | Built Environment - Residential: The density of LOW - HIGH residential in the land use schemes would effectively result in complete modification of the natural landscape | I | I | I |
| Resort | Low impact eco-resort (footprint <1 ha, as contemplated in EIA Listing Notice 3) | R | C | C |
| | Hotels, lodges, etc | I | R | R |

# 9

# SPECIFIC GUIDELINES FOR ACTIVITIES & AREAS

SECTION 9

# SPECIFIC GUIDELINES FOR ACTIVITIES & AREAS

In addition to the general guidelines that may be applied, specific land use activities and specific areas may require additional consideration when planning and implementing activities in an area. These activities/areas are listed in Table 16. In the case where an area-specific guideline should be considered, these are provided as overlays in the CBA map, which will trigger the consideration of the relevant documents and management requirements.

**TABLE 16. LIST OF SPECIAL LAND USE GUIDELINES, THAT REFERS EITHER TO THE MANAGEMENT OF A SPECIFIC ACTIVITY OR A SPECIFIC AREA, THAT WILL BE DEVELOPED OR ARE AVAILABLE FOR USE.**

| THEME | DESCRIPTION OF AREA/ACTIVITY | MANAGEMENT RESPONSE AND AVAILABLE MANAGEMENT TOOLS |
|---|---|---|
| **Important Biodiversity and Ecological corridors** | Focus on activities that are not compatible, including impermeable, electric fencing. | There is a tendency to underestimate the importance of maintaining ecological corridors. The types of barriers and the landscape-level fragmentation resulting from these barriers are seldom assessed properly at project level.<br><br>An example of an emerging threat in this regard is non-permeable fencing associated with game reserves, wildlife estates, etc. The gazetted North West Wildlife Fencing Policy (2008, as amended) stipulates specific fencing requirements for listed species.<br><br>The North West Wildlife Fencing Policy (No 393 of 2009) is currently being revised and should include guidelines for improved fencing design that allows for movement of biodiversity in conservation areas. |
| **Grassland and Savanna Ecosystem Guidelines (SANBI, 2013 and SANBI, 2021)** | The Ecosystem Guidelines developed for the Grassland and Savanna Biomes provide an overview of key distinguishing features of the biomes, unique threats and pressures that they are facing, and recommendations for management of threats, and assessment when considering development options. | *Ecosystem Guidelines for the Savanna Biome*<br>http://hdl.handle.net/20.500.12143/7500.<br><br>*Ecosystem Guidelines for the Grassland Biome*<br>https://bgis.sanbi.org/Projects/Detail/193 |
| **Wetlands and buffers** | See Section 9.1 below | |

| THEME | DESCRIPTION OF AREA/ACTIVITY | MANAGEMENT RESPONSE AND AVAILABLE MANAGEMENT TOOLS |
|---|---|---|
| **Strategic Ground Water Source Areas** | Groundwater is a vital component of the NWP water supply, which plays a critical role in maintaining water security for sustaining communities, agriculture, and biodiversity & ecosystems, particularly in arid and semi-arid regions in the western half of the NWP. Managing these areas are crucial for ensuring the resilience of water supply infrastructure, which is a priority for Climate Change adaptation. | Managing SWSAs requires an integrated approach focusing on water conservation, sustainable land use, and ecosystem restoration, across governance spheres, communities and economic sectors, as key stakeholders that have a vested interest in maintaining the quality and quantity of water supply in these areas. |
| **Renewable (Solar) Energy Facilities** | Renewable Energy is a growing sector in the NWP. The activities, mainly in the form of Solar PV facilities, are extensive and often require complete landscaping of large areas for PV installation. In areas that are already modified by crop cultivation the conflict between utilisation of agricultural versus biodiversity priority areas will need to be carefully managed. | Conflict resolution of the land use conflict can be managed by proactive planning in the form of an SEA for the NWP. Alternatively, the conflict will have to be managed by reactive response to individual development application processes (land use applications) and through review of EIAs. |
| **Biospheres Reserves** | The Magaliesberg and Marico Biosphere Reserves have adopted management plans and zonation criteria, specifically developed to achieve the objectives of these sites. These need to be taken into account when planning or developing in these reserves. | Biospheres are included as an overlay in the CBA map for information purposes.<br><br>Magaliesberg Biosphere Reserve: https://magaliesbergbiosphere.org.za/<br>Marico Biosphere Reserve: https://www.maricobiosreserve.org/ |
| **Biodiversity Offsets** | The *National Biodiversity Offset Guidelines* provide the framework for determining when a biodiversity offset is necessary, when it is not appropriate and general guidelines on the minimum requirements for the development of a Biodiversity Offset. See Section 9.3 below for detailed information. | https://www.dffe.gov.za/sites/default/files/legislation/2023-09/nema_nationalbiodiversityoffsetguideline_g48841gon3569.pdf |

| THEME | DESCRIPTION OF AREA/ACTIVITY | MANAGEMENT RESPONSE AND AVAILABLE MANAGEMENT TOOLS |
|---|---|---|
| **Protected Area buffers** | Buffer areas around Protected Areas are important zones that ensure the core biodiversity within the Protected Area is not impacted by edge-effects from human activities and safe-guards the ecological processes and functional integrity of the Protected Area. Activities in Protected Area buffer zones must consider its impact on biodiversity, linkage corridors, sense of place and groundwater resources. | The EIA regulations use a 10 km buffer around National Parks or World Heritage Sites and a 5km buffer around all other Protected Areas proclaimed in terms of NEMPAA as areas in which certain activities trigger the need for environmental authorisation.<br><br>These buffer zones will be included as an overlay in the CBA map for information purposes. |
| **Protected Area Expansion Strategy geographic focus areas** | Viewshed and heritage considerations | NWP has updated the provincial PAES at the same time as updating the BSP. Expanding conservation and the biodiversity economy into areas may require that viewsheds are not degraded. Refer to the NW PAES 2025-2030 for further information. |
| **Mega-living landscapes (formally known as Bio Economy Nodes)** | Compatible land uses that contribute towards maintaining linkages in the CBA map have been listed in the land and water use guidelines. | Include Biodiversity Spatial Framework, which includes mega-living landscapes, as an overlay into the spatial dataset. |

## 9.1 WETLAND MANAGEMENT

Wetlands are the most threatened and least protected ecosystems in South Africa (SANBI, 2019). While this highlights the urgent need for conservation action, wetlands are also recognised as "high-value" ecosystems that, despite covering a small proportion of the landscape, deliver disproportionately high ecological and social benefits (SANBI, 2019). In modified or urban landscapes especially, the value of healthy, functioning wetlands in reducing climate change impacts, such as flooding and drought, is increasingly understood and appreciated.

**Wetland ecosystems provide a broad range of ecosystem services that support multiple national and local agendas, including:**

- biodiversity conservation,
- water resource protection and management,
- disaster risk reduction and climate change adaptation, and
- provision of direct-use goods and cultural/amenity values to people.

In urban and peri-urban contexts, wetlands are particularly important for improving water quality, attenuating floods, and supporting public health, while also contributing to recreational and aesthetic values. In response, a suite of national and local wetland management guidelines has been developed, with more recent resources tailored to municipal planning and land use decision-making (e.g. ICLEI, 2018; SANBI & DWS, 2020).

Further modification or degradation of wetland systems is inappropriate and unsustainable, especially given their ecological sensitivity and functional value. Land use planning and decision-making processes must fully integrate the critical services wetlands provide to the citizens of the North West Province, many of whom depend directly on natural water systems for their livelihoods and basic needs. This includes prioritising land uses that are compatible with the ecological and hydrological objectives of maintaining or enhancing the condition of wetlands and rivers.

One key consideration in this regard is the application of appropriate wetland buffers, which are essential to maintaining the ecological integrity and functioning of wetland ecosystems. Buffers help reduce edge effects, filter pollutants, manage floodwaters, and provide transitional habitat. The *Guidelines for the delineation of wetland buffer zones* (WRC, 2017) provide a scientifically grounded approach to determining site-specific buffer widths, based on wetland type, sensitivity, surrounding land use, and risk of impact. The *National Wetland Offset Guidelines* (SANBI, 2023) further reinforce the need for buffers and no-go areas, particularly for wetlands with high ecological importance or functionality. These tools should be routinely applied in spatial planning, development control, and environmental impact assessment processes.

## 9.2 SITES CRITICAL FOR LANDSCAPE CONNECTIVITY

Critical sites for landscape connectivity are essential for maintaining ecological health and resilience through the maintenance of ecological processes associated with these sites, specifically:

- Habitat Corridors: Paths or areas that connect different habitats and natural areas, allowing species to migrate freely.
- Refuge Areas: Protecting ecosystems from degradation as refuges for species facing threats.
- Nodes: Points where multiple corridors intersect, enhancing overall connectivity.

**In the context of land use planning and conservation, these sites are crucial because:**

- They support biodiversity by providing habitats for various species.
- They protect sensitive areas, ensuring they remain accessible or undamaged despite development.
- They enhance ecological functions such as pollination and water regulation.
- They buffer core biodiversity areas from human impacts.
- They provide safe paths for species to move through anthropogenic landscapes.
- They offer opportunities for community involvement in environmental management and cultural heritage preservation.
- Ensuring landscape ecological connectivity helps maintain ecosystem functionality and resilience against landscape changes.

Critical linkages or pinch points in the provincial ecological network are areas where ecological linkages are spatially constrained by other land uses and at high risk of being lost. Cutting or loosing ecological connectivity in these pinch points can have significant whole-ecosystem level impacts by reducing the overall connectedness of the corridor network and impeding species ability to respond and adapt to changes in the environment, such as moving in response to climate change impacts.

Protecting landscape ecological connectivity in critical linkages is a very high priority land use management objective.

## 9.3 BIODIVERSITY OFFSETS

South Africa's National Development Plan (NDP) 2030 acknowledges that market and policy failures have led to an "ecological deficit," where natural capital such as groundwater, marine life, terrestrial biodiversity, cropland, and grazing areas is being degraded, destroyed, or depleted faster than it can be replenished. This recognition underscores the urgent need to protect the natural environment comprehensively, ensuring that future generations inherit an endowment of at least equal value.

To address this ecological deficit, biodiversity offsets have emerged as a mechanism to counterbalance the negative impacts of development on biodiversity. These offsets aim to achieve no net loss, or preferably a net gain, in biodiversity by compensating for significant residual impacts through conservation actions elsewhere. This approach is particularly pertinent when development affects Critical Biodiversity Areas (CBAs) or ecosystems of high ecological importance.

**The environmental impact mitigation hierarchy serves as the foundational framework guiding sustainable development (Figure 18). This hierarchy prioritises:**

- **Avoidance:** Preventing impacts before they occur.
- **Minimization:** Reducing the duration, intensity, and extent of impacts.
- **Rehabilitation/Restoration:** Repairing affected ecosystems.
- **Offsetting:** Compensating for residual impacts that cannot be mitigated on-site.

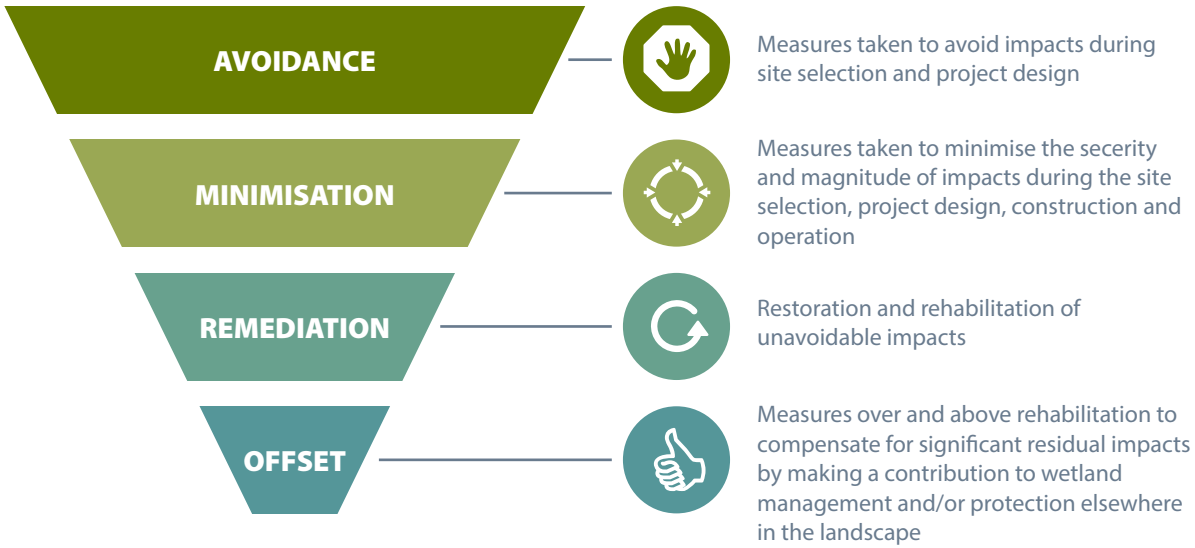
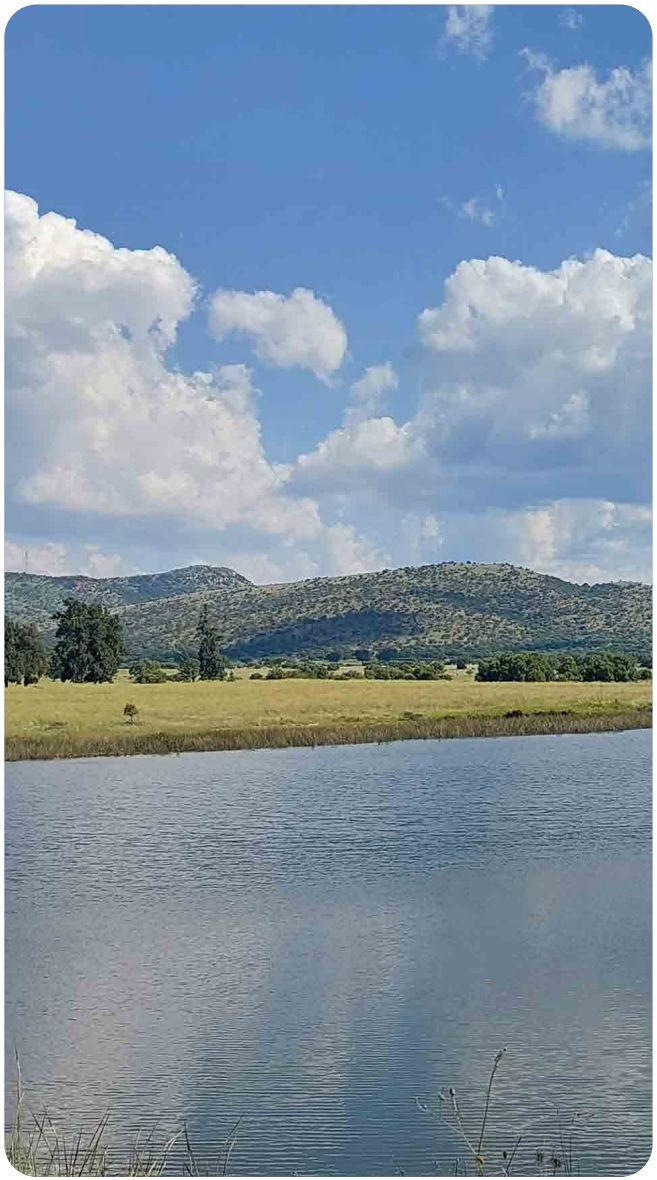



**Figure 20. Diagram illustrating the mitigation hierarchy (taken from ICLEI, 2018).**



In instances where significant (MODERATE) residual impacts on biodiversity remain after applying the first three steps, biodiversity offsets become a necessary consideration.

To standardise and guide the implementation of biodiversity offsets, the Department of Forestry, Fisheries and the Environment (DFFE) published the *National Biodiversity Offset Guideline* in June 2023 under section 24J of the National Environmental Management Act (NEMA). This guideline provides a legal and scientific basis for applying offsets, ensuring that such impacts are counterbalanced by conservation gains elsewhere.

For wetland-specific offsets, the South African National Biodiversity Institute (SANBI) and the Department of Water and Sanitation (DWS) developed a guideline in 2016. This document offers practical guidance for determining the size and characteristics of a wetland offset and outlines the requirements for its implementation, particularly through the water use authorization process.

It is imperative that the best available science and the latest publications inform offset planning and implementation. This ensures that offsets are effective, enforceable, and contribute meaningfully to the conservation of South Africa's rich biodiversity.

# 10

# OTHER PLANS THAT NEED TO BE CONSIDERED

SECTION 10

# OTHER PLANS THAT NEED TO BE CONSIDERED

## 10.1. ENVIRONMENTAL MANAGEMENT FRAMEWORKS

Role of the North West Biodiversity Sector Plan in Environmental Management Frameworks (EMFs)

The North West Biodiversity Sector Plan (NW BSP) serves as a critical informant in the development of Environmental Management Frameworks (EMFs), which are recognised as strategic and planning instruments under sections 24(3) and 24(5) of the National Environmental Management Act, Act 107 of 1998 (as amended) (NEMA) and the EMF Regulations, 2010.

**The NW BSP plays a valuable role in addressing and managing environmental impacts by:**

- Supporting project-level decision-making and informing higher-level development planning and sector programmes;
- Ensuring that EMFs are integrated into project planning and regulatory decisions where developments occur in or impact on areas covered by such frameworks (see listed EMFs below);
- Promoting alignment between various sector planning initiatives, particularly between Spatial Development Frameworks (SDFs) and EMFs, thereby facilitating cooperative governance;
- Providing applicants, developers, and planners with clear guidance on which areas are considered environmentally suitable, conditionally compatible, or incompatible with proposed developments; and
- Offering reliable, up-to-date biodiversity and environmental data to support informed decision-making.

### INTEGRATION OF NW BSP INTO EMFS

The NW BSP has been utilised in several Environmental Management Frameworks within the province, namely the:

- Tlokwe Local Municipality EMF (2010)
- Vredefort Dome World Heritage Site EMF (2014)
- Greater Taung Local Municipality EMF (2017)
- Bojanala Platinum District Municipality (BPDM) EMF (2018)
- Mahikeng Local Municipality EMF (not gazetted at time of publication)

A practical example of the NW BSP's influence is seen in the development of Environmental Management Zones (EMZs) within the BPDM EMF (2018). The creation of EMZ 'Zone F – Biodiversity Zone' was directly informed by the 2015 version of the NW BSP, illustrating the alignment and value of the BSP in guiding strategic spatial planning and environmental management.

## 10.2. NW PROTECTED AREAS EXPANSION STRATEGY (2025-2030)

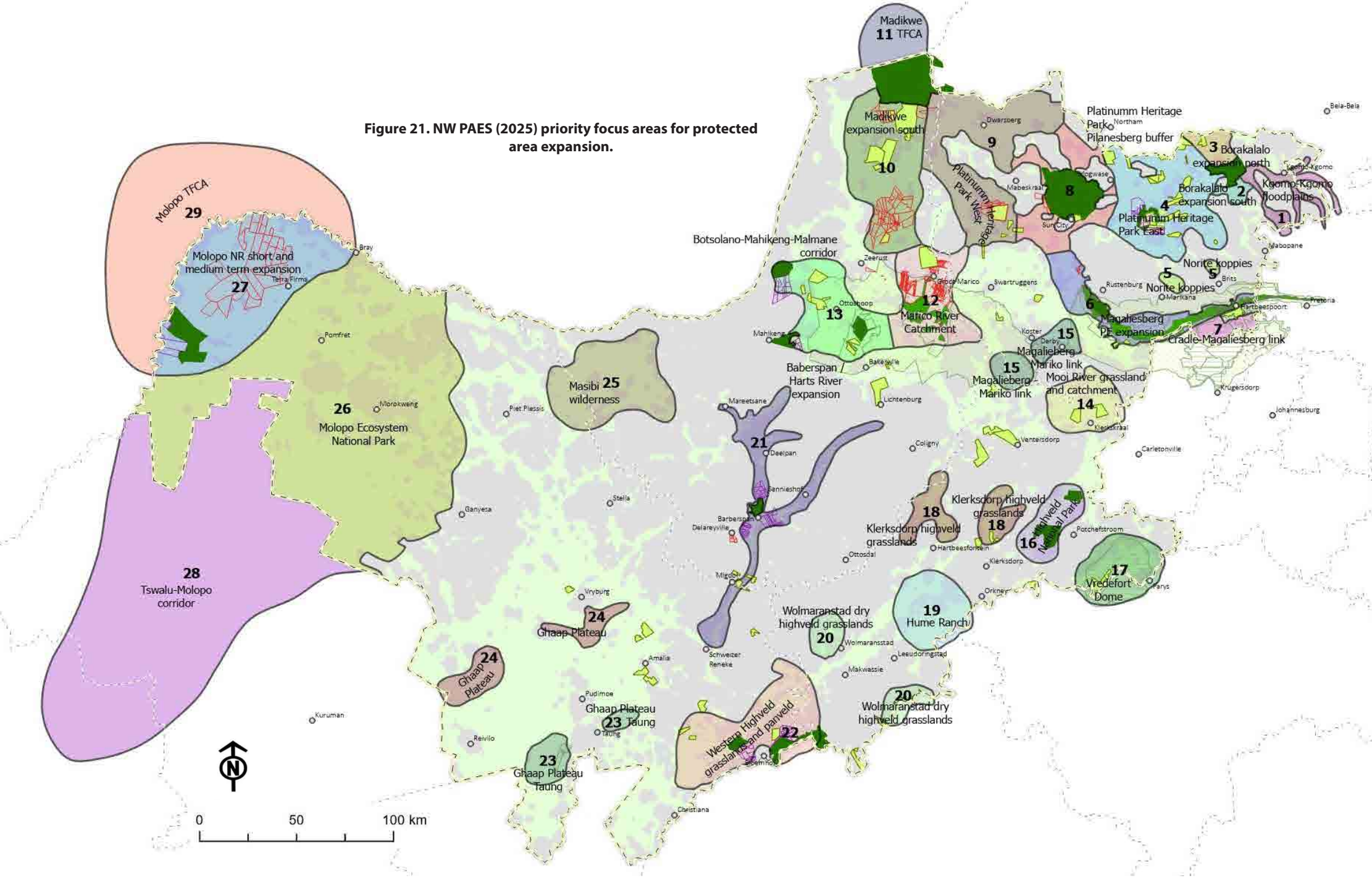
The North West Province updated the Provincial Protected Area Expansion Strategy (NW PAES) concurrently with updating the NW BSP. The two initiatives are therefore integrated. The process of updating the NW PAES involved integrating biodiversity priorities and ecological sustainability, with socio-economic needs and human-well-being, while factoring in the need to adapt to climate change. Spatial priorities for protected area expansion in the North West are based on the areas necessary to achieve conservation targets for biodiversity pattern and ecological processes

as identified through the systematic conservation assessment used to inform the provincial CBA map. In addition, they are informed by areas identified based on context specific opportunities or risks such as areas with low conflict with competing land uses or high landowner willingness and biodiversity risk such as areas at high risk of being lost if no conservation action is taken. Finally spatial priorities have been informed by expert inputs in which areas important for inclusion in the protected area system have been identified. Through these expert inputs, 52 areas were mapped as priorities for protected area expansion.

The vision for the NW PAES is to "Expand the protected area system in North West Province in a strategic, targeted fashion to ensure the persistence of key biodiversity features and ecological processes, while fostering inclusive community participation, promoting sustainable livelihoods, and enhancing environmental stewardship for the benefit of present and future generations." In addition it sets strategic goals, outcomes and targets for protected area expansion, which have been co-developed with key stakeholders. The NW PAES (2025-2030) mapped priority focus areas (Figure 19) that align with provincial and national planning, as well as the updated NW BSP CBA map (2025).

The NW PAES includes a detailed description of mechanisms for protected area expansion. Because land acquisition is generally not financially feasible, the primary means for protected area expansion is based on the biodiversity stewardship model with a focus on the declaration of state-owned communal land and private land.

**Figure 21. NW PAES (2025) priority focus areas for protected area expansion.**



# 11

# MANAGING COMPETING LAND USES & FUTURE THREATS TO BIODIVERSITY

# MANAGING COMPETING LAND USES & FUTURE THREATS TO BIODIVERSITY

## 11.1. LOSS OF HABITAT AND LANDSCAPE CONNECTIVITY

In the NWP, future loss of natural habitat and resources will likely be due to the expansion of mining, expansion of formal and informal human settlements, solar PV renewable energy projects. Decisions regarding the use of land, particularly high biodiversity value and important agricultural land is an emerging threat and while the loss of either of these natural resources is concerning, in landscapes that are constrained, decision makers may be required to trade-off between the loss of agricultural resources versus natural biodiversity resources. While the NW BSP (2025) is a guideline, these trade-offs must be carefully considered and monitored to track biodiversity losses in order to ensure that thresholds of acceptable change are not exceeded.

When contemplating activities that may result in the loss of natural or semi-natural areas, maintaining landscape connectivity, must also be prioritised. In highly modified landscapes in the North West Province, the corridor network that creates linkages plays a crucial role in maintaining ecological function, ecological processes and is a primary adaptation strategy for increased climate change resilience. Therefore, the Ecological Support Areas mapped for the NWP need to be elevated as high priorities in these landscapes. Fragmentation of corridor networks are not only limited to the loss of habitat through development activities but may include barriers to the movement of species through the landscape (e.g. non-permeable fencing).

## 11.2. CLIMATE CHANGE RISKS - ADAPTATION AND RESILIENCE

The integration of climate change mitigation and adaptation has become central to all sectoral planning. Climate change manifestations will affect biodiversity and ecological processes at the level of individuals, populations, communities, ecosystems and biomes through extinction events, loss of vulnerable and fragile ecosystems and changes in distribution ranges.

**Specifically, climate change can lead to:**

- Increased extinction risk for species unable to adapt or migrate in response to changing environmental conditions.
- Loss of vulnerable and fragile ecosystems which are particularly sensitive to temperature and precipitation shifts.
- Altered distribution ranges of species, often resulting in disruptions to ecological interactions and food webs, and contributing to the emergence or intensification of invasive species.

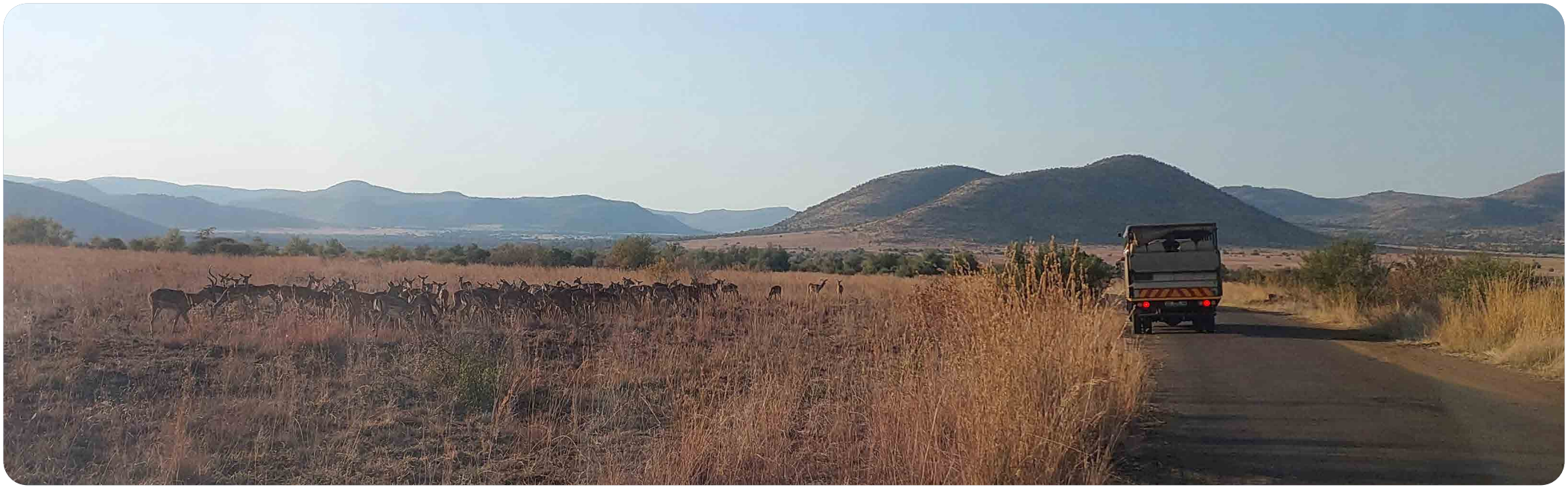
**Given these widespread implications, integrating climate-resilient approaches into biodiversity conservation and land-use planning is essential. This includes enhancing ecosystem-based adaptation (EbA) strategies, promoting habitat connectivity, and safeguarding genetic diversity to bolster ecosystem resilience in the face of ongoing and future climatic changes.**

# 12

# MONITORING, REVIEWING & UPDATING

SECTION 12

# MONITORING, REVIEWING & UPDATING



**The loss or modification of natural environments, ongoing changes in land use, as well as changes in distribution or knowledge of biodiversity, may impact on the identified network of Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA).**

**This highlights the importance of monitoring, evaluation and revision of the North West Biodiversity Sector Plan.**

The NW BSP (2025) should be reviewed and updated (where necessary) at least every five years by DEDECT in accordance with the published guidelines for Bioregional Planning (NEMBA 291 of 2009).

**The review process should examine:**

- Implementation and impact of the North West BSP 2025 (as measured by an assessment of the rate of development in CBA and ESA sites).
- The need (or lack thereof) for an update of the underlying systematic biodiversity plan. Although the update of a systematic biodiversity plan is a data intensive and time-consuming process, therefore an assessment of the degree of changes in the landscape and datasets, a revision may or may not be necessary.
- The need (or lack thereof) for an update of the other components of the Biodiversity Sector Plan (e.g. land use and water use guidelines).

**Notwithstanding the above, the following data improvements will be required as part of the update:**

- Detailed updated land cover mapping
- Protected area and conservation area map
- Inventories of all taxon groups with emphasis on threatened mammals, amphibians, invertebrates and plants.

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# A REPORT ON THE BIODIVERSITY SECTOR

The healthier an ecosystem is, the more benefits we derive from the system, therefore it is necessary to conserve the diversity in an ecosystem in order to ensure that ecosystems continue to function properly and to ensure that ecological processes (such as nutrient cycles) are supported.


**dedect**

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