The Terrestrial Biodiversity and Wetland Assessment for the proposed Eskom DX Gamohaan-Seven Miles 22kV Powerline Project

Kuruman, Northern Cape

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CLIENT

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a terrestrial ecology (fauna and flora) and wetland baseline and impact assessment for the proposed Eskom DX Gamohaan-Seven Miles 22kV Powerline Project. The proposed project involves the construction of a 22 kV overhead powerline that will run for approximately 6 km from the existing Gamohaan substation into the township of Mamoratwe. The project is located nearby to the town of Kuruman in the Northern Cape province.

The powerline is divided into two sections, and section 1 is composed of two alternative routes. It is within the scope of this assessment to recommend the most appropriate route, from a terrestrial ecology and wetland sensitivity perspective. It is noted that the project falls within one of the Strategic Transmission Corridors (EGI) as identified in Government Notice No. 113 of *Government Gazette* No. 41445, published 16 February 2018.

In order to assess the baseline ecological state of the area and to present a detailed description of the receiving environment, both a desktop assessment as well as a field survey were conducted during August 2022. Furthermore, the desktop assessment and field survey both involved the detection, identification and description of any locally relevant sensitive receptors and habitats, and the manner in which these sensitive features may be affected by the proposed development was also investigated.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation”. The National Web based Environmental Screening Tool has characterised the terrestrial biodiversity theme for the area as ‘Very High’ sensitivity (National Environmental Screening Tool, 2022).

The purpose of conducting the specialist study is to provide relevant input into the overall Environmental Authorisation application process, with a focus on the proposed activities and their impacts associated with the projects. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

1.2 Project Area of Influence

A 500 m buffer was imposed on either side of all proposed powerline routes (considering both layout alternatives), and this was delineated to provide an overall 670 ha Project Area of influence (PAOI) within which the field survey was conducted. The PAOI is located adjacent to the Mamoratwe township and the R31 roadway, approximately 10 km north of the town of Kuruman in the Northern Cape. The region is composed of numerous relatively small township developments scattered across the landscape, and these are particularly dense eastward of the PAOI. The landscape towards the west of the PAOI is significantly less developed and a large mountain range runs north-south of the area.

A map of the PAOI in relation to the local region is presented in Figure 1-1, and a detailed map of the PAOI and associated proposed development footprint is presented in Figure 1-2.

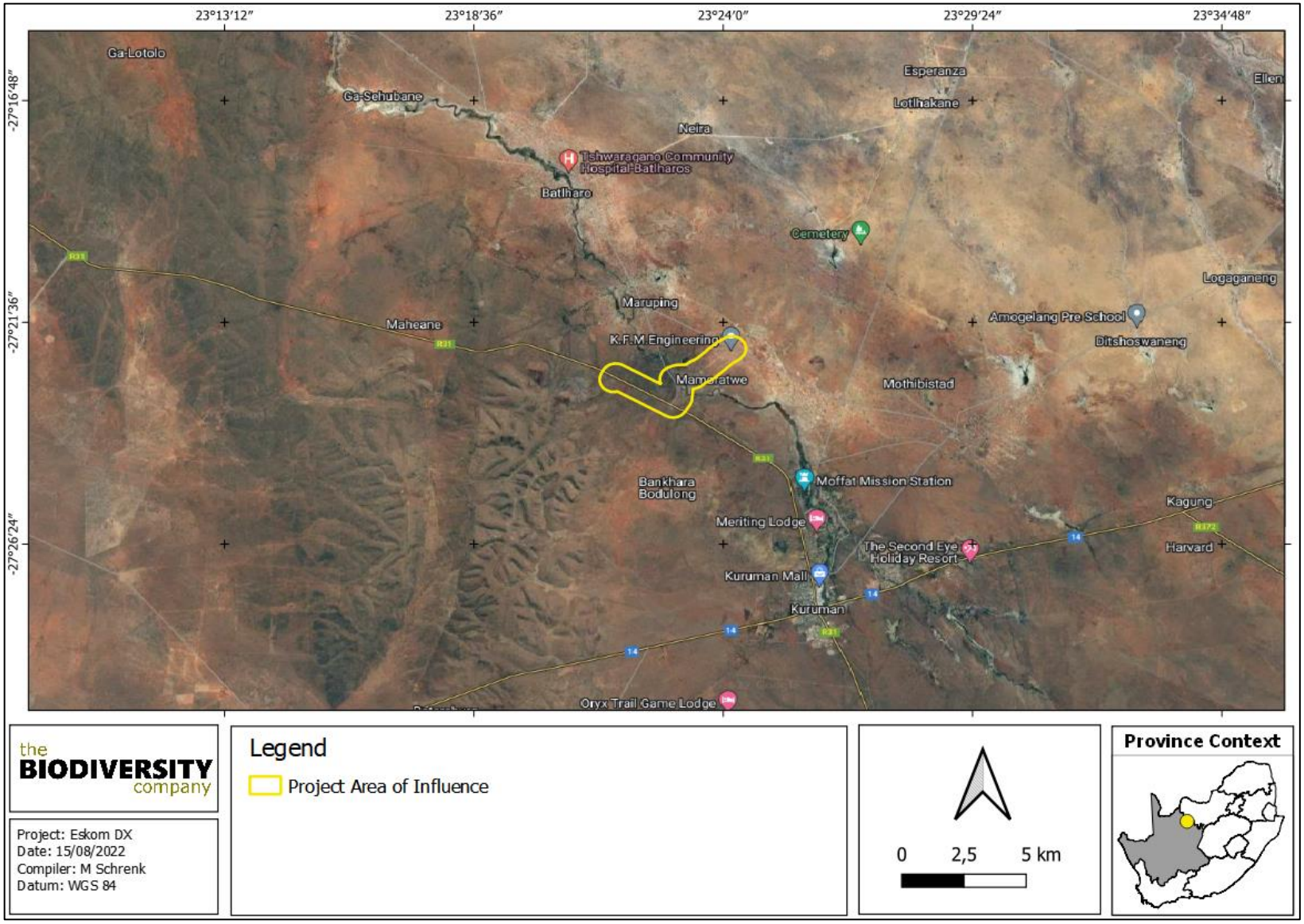

Figure 1-1 Map illustrating the regional context of the PAOI

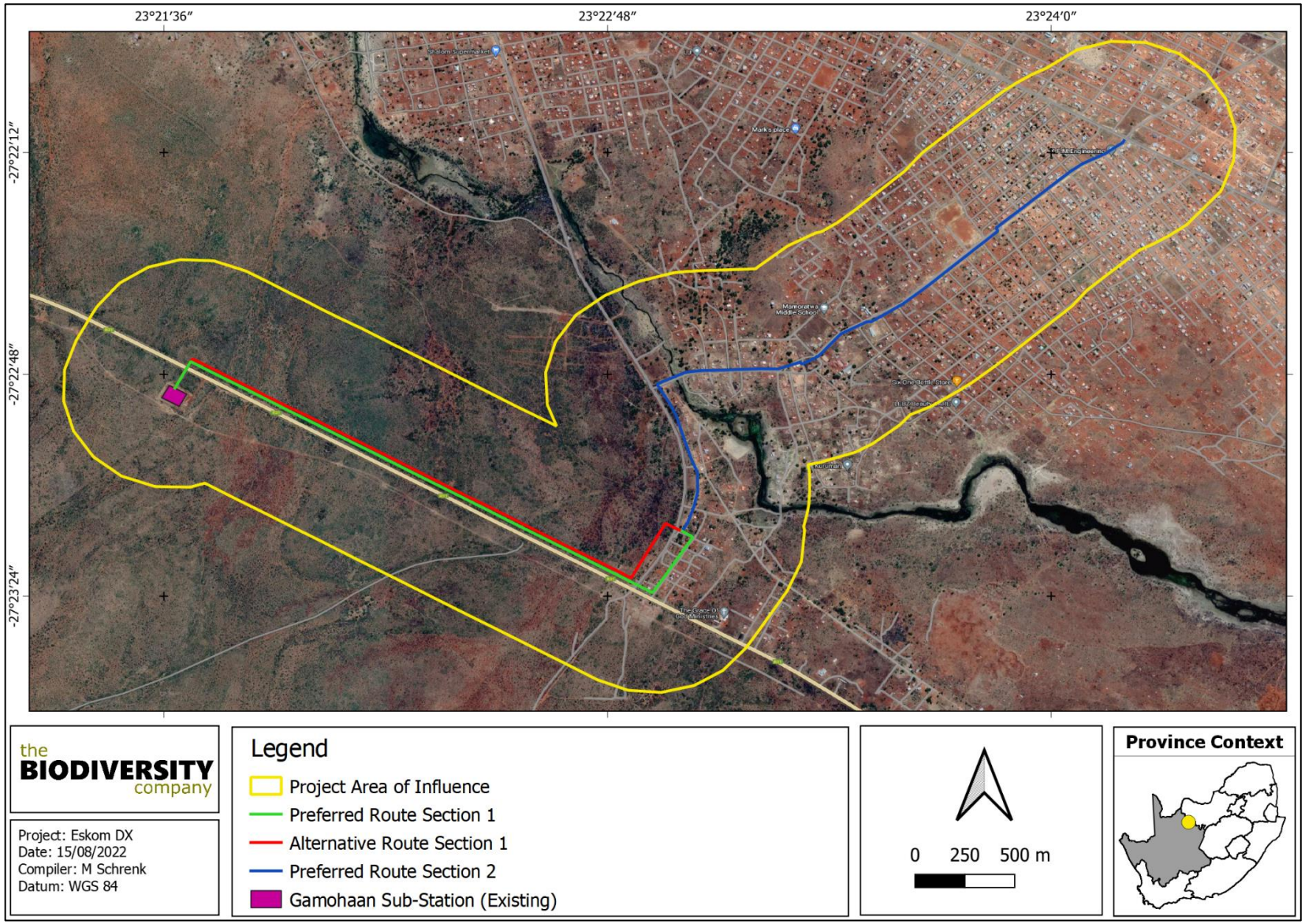

Figure 1-2 Map illustrating the details of the PAOI

1.3 Specialist Details

Report Name	**The Terrestrial Biodiversity and Wetland Assessment for the proposed Eskom DX Gamohaan-Seven Miles 22kV Powerline Project**
Reference	Eskom DX
Submitted to / Client	EIMS ENVIRONMENTAL IMPACT MANAGEMENT SERVICES
Fieldwork	Carami Burger 
	Carami Burger has completed her Bachelor of Science Honours degree in Ecological Interactions and Ecosystem Resilience. She is an ecologist and has completed various studies as part of Basic Assessments and Environmental Impact Assessments.
Fieldwork / Report Writer	Michael Schrenk 
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Report Writer / Reviewer	Andrew Husted 
	Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

1.4 Scope of Work

The principle aim of the assessment was to provide information to inform on the risk that the proposed activity has on the associated ecosystems within the PAOI. This was achieved through the following:

- Identification and description of any sensitive receptors that occur in the Project Area of Influence, and the manner in which these sensitive receptors may be affected by the proposed activity;
- Conducting of a desktop assessment to identify the relevant ecologically important geographical features within or nearby to the Project Area of Influence;
- Conducting of a desktop assessment to compile an expected species list and identify flora and fauna Species of Conservation Concern (SCC) that may occur within the Project Area of Influence;
- Conducting of a field survey to ascertain the baseline species composition of the present flora and fauna community within the Project Area of Influence;
- Delineation and mapping of the habitats and their respective sensitivities that occur within the Project Area of Influence;
- Identification of the manners in which the proposed project may impact the flora and fauna communities, and an evaluation of the level of risk that these potential impacts present;
- The prescription of mitigation measures and associated recommendations for the identified risks;
- The conducting of wetland risk assessments relevant to the proposed activity; and
- The conducting and prescription of wetland impact assessments, mitigations, and rehabilitation measures to prevent or reduce the significance of possible impacts.

2 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 2-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 2-1 A list of key legislative requirements relevant to biodiversity and conservation in the Northern Cape Province

Region	Legislation / Guideline
National	Constitution of the Republic of South Africa (Act No. 108 of 1996)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004)
	The National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
	Threatened or Protected Species Regulations and lists (No. R. 152 of Government Gazette No. 29657 of 23 February 2007, and No. R. 1187 of Government Gazette No. 30568 of 14 December 2007)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Forest Act (Act No. 84 of 1998), and National Veld and Forest Fire Act (101 of 1998)
	National Water Act (NWA) (Act No. 36 of 1998)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations and Alien and Invasive Species List 2014-2020, published under NEM:BA
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)

Provincial	Northern Cape Nature Conservation Act no. 9 of 2009
	Critical Biodiversity Areas of the Northern Cape Technical Report, 2016

3 Definitions

3.1 Species of Conservation Concern

In accordance with the National Red List of South African Plants website, managed and maintained by the South African National Biodiversity Institute (SANBI), a Species of Conservation Concern (SCC) is a species that has a high conservation importance in terms of preserving South Africa's rich biodiversity. This classification covers a range of red list categories as illustrated in Figure 3-1 below.

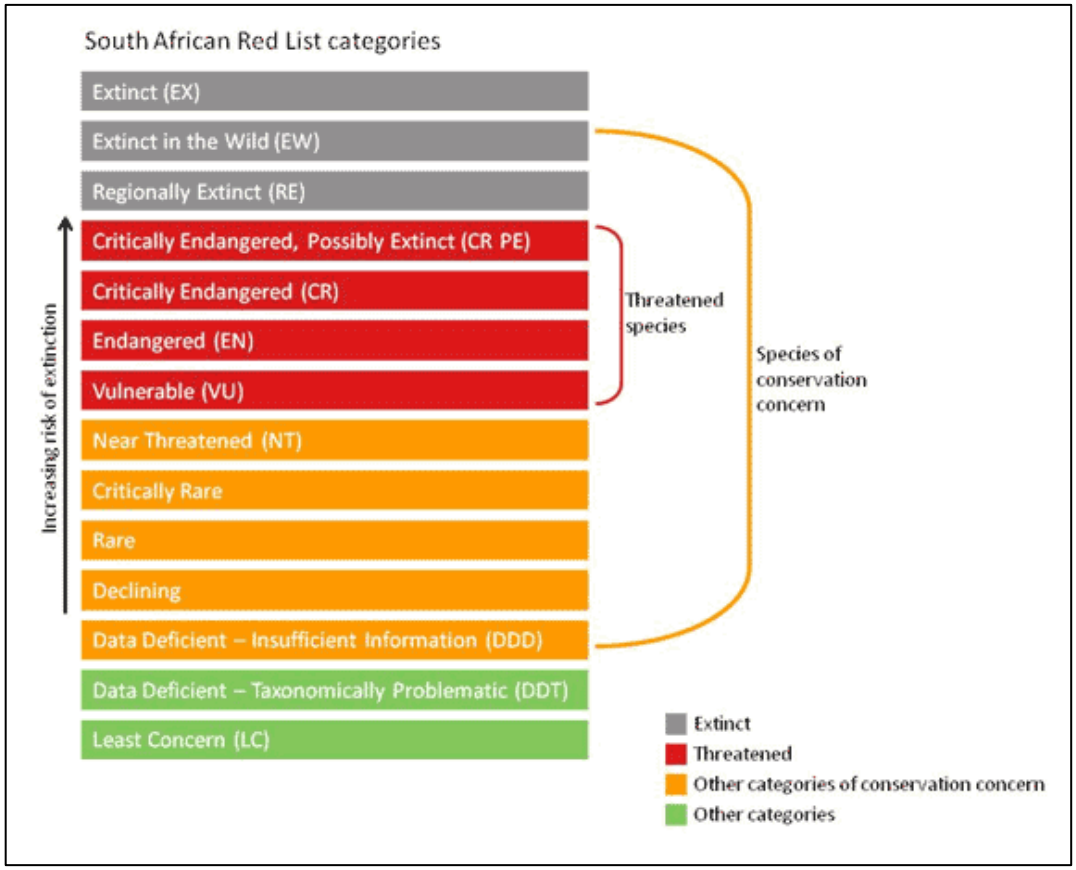


Figure 3-1 Threatened species and Species of Conservation Concern (SANBI, 2016)

South Africa uses the internationally endorsed International Union for Conservation of Nature (IUCN) Red List Categories and Criteria (IUCN, 2012). This scientific system is designed to measure species' risk of extinction and its purpose is to highlight those species that are in need of critical conservation action. As this system has been adopted from the IUCN, the definition of an SCC as described and categorised above is extended to all red list classifications relevant to fauna as well as the IUCN categories, for the purposes of this report.

3.2 Protected Species

Protected species include both floral and faunal species that are protected according to some form of relevant legislation, be it provincial, national, or international. Provincial legislation may include that published in the form of a provincial ordinance, bill, or act, and national legislation includes that which is published in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) or the National Forest Act (Act No. 84 of 1998). Relevant international legislation includes the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 2021).

4 Methods

4.1 Desktop Assessments

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to develop digital cartographs and species lists. These datasets and their respective dates of publishing are provided below.

4.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into GIS software to establish how the proposed project might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- Critical Biodiversity Areas of the Northern Cape, 2016 (Oosthuysen & Holness, 2016);
- 2018 National Biodiversity Assessment (NBA, 2018) (Skowno *et al.,* 2019);
- Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018);
- South Africa Protected and Conservation Areas Databases, 2022 (DFFE, 2022 & DFFE, 2022a);
- National Protected Areas Expansion Strategy, 2016 (DEA, 2016);
- Important Bird and Biodiversity Areas, 2015 (Marnewick *et al.,* 2015);
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Awuah, 2018 & Van Deventer et al., 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel, 2011); and
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021).

Descriptions of these datasets, and their associated relevance to terrestrial biodiversity, are provided below.

4.1.1.1 Provincial Conservation Plan

The Critical Biodiversity Areas of the Northern Cape database classifies areas within the province on the basis of their contributions to reaching the associated conservation targets within the province. These areas are primarily classified as either Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types & species, as well as the long-term ecological functioning of the landscape as a whole.

- **CBAs** are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).
- **ESAs** are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).

Provincial CBAs and ESAs are often further classified into sub-categories, such as CBA1 and CBA2 or ESA1 and ESA2. These present fine scale habitat and biodiversity area baseline requirements and associated land management objectives or outcomes. The highest categorisation level is often referred to as an ‘Irreplaceable CBA’ which usually represents pristine natural habitat very important for conservation.

4.1.1.2 National Biodiversity Assessment 2018

The National Biodiversity Assessment (NBA) was completed as a collaboration between the South African National Biodiversity Institute (SANBI), the then Department of Environmental Affairs (DEA), and other stakeholders including scientists and biodiversity management experts throughout the country over a three-year period (Skowno *et al.,* 2019).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The two headline indicators assessed in the NBA are Ecosystem Threat Status and Ecosystem Protection Level (Skowno et al., 2019).

- **Ecosystem Threat Status (ETS)** outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function, and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of each ecosystem type that remains in a good or healthy ecological condition (Skowno et al., 2019). CR, EN, or VU ecosystem types are collectively referred to as threatened ecosystems.
- **Ecosystem Protection level (EPL)** informs on whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected (NP), Poorly Protected (PP), Moderately Protected (MP) or Well Protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Skowno *et al.,* 2019). NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

4.1.1.3 South Africa Protected and Conservation Areas

The South African Protected Areas Database (SAPAD) and the South Africa Conservation Areas Database (SACAD) contains spatial data critical for the conservation of South Africa's natural resources. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection, such as conservation areas. These databases are updated regularly and form the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act (Act 57 of 2003).

Formally protected areas are categorised according to several different types, and each type is subject to specific legislative restrictions and management guidelines, many of which restrict development to some degree. Generally, these areas are assigned a buffer of influence of between 5 and 10 km (the latter pertaining to National Parks and World Heritage Sites), within which certain laws and management actions may apply. Many of the protected area types are further classified into sub-types as well. Formally protected area types include:

- National Parks;
- Nature Reserves;
- Special Nature Reserves;
- Mountain Catchment Areas;
- World Heritage Sites;
- Protected Environments;
- Forest Nature Reserves and Forest Wilderness Areas;
- Specially Protected Forest Areas; and
- Marine Protected Areas.

4.1.1.3.1 National Protected Areas Expansion Strategy

The Department of Environmental Affairs (now the Department of Forestry, Fisheries and the Environment) led the development of the National Protected Areas Expansion Strategy (NPAES) in consultation with the protected area agencies and other key private and public sector stakeholders. The need for the development of the NPAES was established in the National Biodiversity Framework in 2009. The NPAES is a 20-year strategy with 5-year implementation targets aligned with a 5-year revision cycle. (DEA, 2016).

South Africa's protected area network currently falls far short of representing all ecosystems and maintaining healthy functioning ecological processes. In this context, the goal of the NPAES is to achieve cost effective protected area expansion thus enabling better ecosystem representation, ecological sustainability, and resilience to climate change. A comprehensive set of priority areas was compiled based on the priorities identified by provincial and other agencies in their respective protected area expansion strategies. These focus areas are generally large, intact and unfragmented and are therefore of high importance for biodiversity, climate resilience and freshwater protection (DEA, 2016).

4.1.1.4 Important Bird and Biodiversity Areas

Important Bird & Biodiversity Areas (IBAs) are sites of international significance for the conservation of the world's birds, and other conservation significant species, as identified through multi-stakeholder processes using globally standardised, quantitative, and scientifically agreed criteria. These sites are also Key Biodiversity Areas; sites that contribute significantly to the global persistence and health of biodiversity (Birdlife, 2020).

The selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge on the sizes and trends of bird populations. The criteria ensures that sites selected as IBAs have true significance for the international conservation of bird populations, and it also ensures classification consistency among sites at all geographic levels.

IBAs constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. Approximately 60% of the IBA network is unprotected, leaving these sites vulnerable to habitat transformation and mismanagement. Additionally, habitats within many IBAs are poorly managed - which is leading to habitat degradation, especially in unprotected sites. (BirdLife SA, 2022)

4.1.1.5 Aquatic Habitats

Three inland aquatic habitat datasets are used to identify the ecological sensitivity of the project area with regards to local aquatic habitat, which is critical for the healthy functioning of both aquatic and terrestrial biodiversity. The presence of aquatic ecosystems is often a strong indicator for the presence of unique flora as well as the regular presence of fauna. Many national SCC are only found within or near to aquatic habitat.

- **The South African Inventory of Inland Aquatic Ecosystems (SAIIAE):** Established during the 2018 NBA, the SAIIAE is a collection of spatial data layers that represent the extent of river and inland wetland ecosystem types as well as the pressures on these systems. The same two headline indicators, and their associated categorisations, are applied as with the terrestrial ecosystem NBA, namely Ecosystem Threat Status and Ecosystem Protection Level. The Ecosystem Threat Status of river and wetland ecosystem types are based on the extent to which each ecosystem type had been altered from its natural condition.
- **National Freshwater Ecosystem Priority Areas, Rivers and Wetlands (NFEPA):** In an attempt to better conserve aquatic ecosystems, South Africa has categorised its inland aquatic systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs). The FEPAs are intended to be conservation support tools and it is envisioned that they will guide the effective implementation of measures to achieve the National Environment Management: Biodiversity Act's biodiversity conservation goals (Nel *et al.,* 2011).

- **Strategic Water Source Areas (SWSAs):** SWSAs are defined as areas of land that supply a disproportionate quantity of mean annual surface water runoff in relation to their size, and therefore contribute considerably to the overall water supply of the country, as well as national aquatic and terrestrial biodiversity resources. These are considered key ecological infrastructure assets and the effective protection of SWSAs is vital for national security because a lack of water security will compromise national security and human wellbeing on all levels.

4.1.2 Desktop Flora Assessment

The desktop flora assessment encompassed an assessment of all the vegetation units and habitat types within the PAOI as well as the identification of expected plant species and any locally occurring flora SCC.

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and the 2018 Terrestrial & Freshwater Assessment by SANBI (2018) was used to identify the vegetation types that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA, 2019) database was accessed to compile a list of expected flora species within the PAOI (Figure 4-1). The Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.

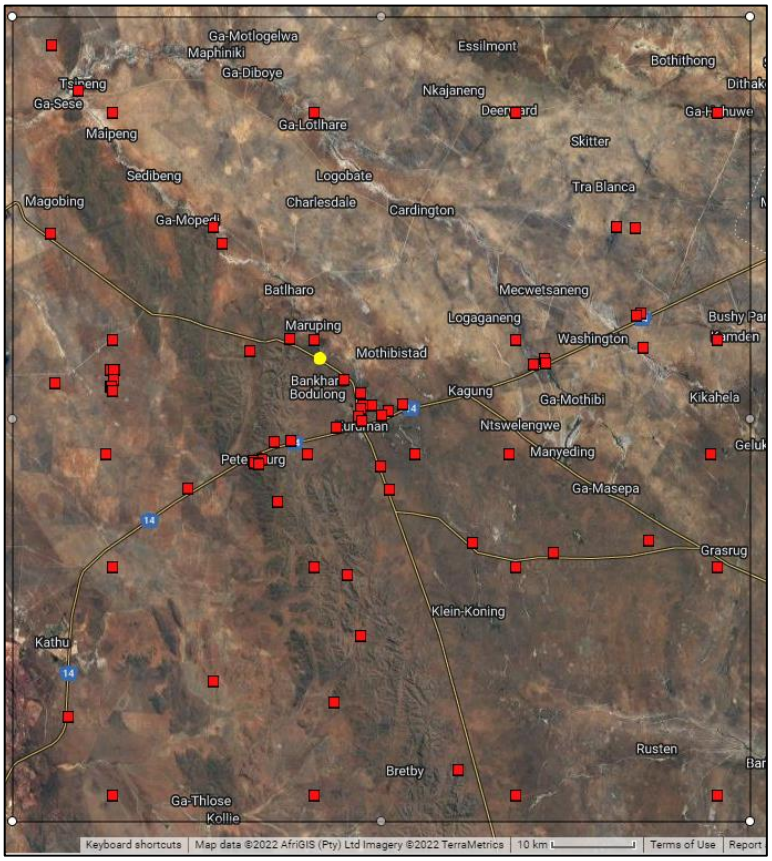


Figure 4-1 Map illustrating the extent of area used to obtain the expected flora species list from the Plants of South Africa (POSA) database. The yellow dot indicates the approximate location of the Project Area of Interest. The red squares are cluster markers of botanical records as per POSA data

The latest information regarding provincially, and nationally protected flora was obtained from the following published legislative sources:

- Provincially Protected Plant Species (Schedules 1 and 2 of the Northern Cape Nature Conservation Act No. 9 of 2009); and
- List of Nationally Protected Tree Species (DEFF, 2022).

4.1.3 Desktop Fauna Assessment

The faunal desktop assessment involved the compilation of expected species lists and the identification of any protected and/or SCC fauna potentially occurring in the area. The respective species lists, and international Red-List statuses, were obtained from the IUCN spatial dataset (2017), in addition to the following sources:

- Avifauna list: Generated from the Southern African Bird Atlas Project (SABAP2) dataset (SABAP, 2022) by considering numerous regional pentads;
- Mammal list: Generated from the ADU MammalMap database using the 2723 Degree Square (ADU, 2020);
- Reptile list: Generated from ADU ReptileMap database using the 2723 Degree Square (ADU, 2020a); and
- Amphibian list: Generated from ADU FrogMap database using the 2723 Degree Square (ADU, 2020b).

South Africa's official site for Species Information and National Red Lists (SANBI, 2022) was used to provide the most current national Red-List status of fauna.

The latest information regarding provincially, and nationally protected fauna was obtained from the following published legislative lists:

- Provincially Protected Wildlife Species (Schedules 1 and 2 of the Northern Cape Nature Conservation Act No. 9 of 2009); and
- Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the National Environmental Management: Biodiversity Act, No. 10 of 2004).

4.1.4 Desktop Wetland Baseline

The following spatial datasets were utilised:

- Aerial imagery (Google Earth Pro);
- Land Type Data (Land Type Survey Staff, 1972 - 2006);
- The National Freshwater Ecosystem Priority Areas (Nel et al., 2011);
- Strategic Water Source Areas 2021;
- Contour data (5m intervals);
- NASA Shuttle Radar Topography Mission Global 1 arc second digital elevation data; and
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer et al., 2019).

4.2 Biodiversity Field Survey

A field survey was undertaken on the 10th and 11th of August 2022, which constitutes a dry season survey, to determine the presence of any local SCC and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the PAOI, within the limits of time and access.

4.2.1 Flora Survey

The dry season fieldwork and sample sites were placed within targeted areas (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was therefore to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps (confirmed during the field survey). The floristic diversity and search for protected plants and flora SCC were conducted through timed meanders within representative habitat units. Emphasis was placed on sensitive habitats, especially those overlapping with the PAOI.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting protected plants and flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling observed flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff *et al*. (1982). Suitable habitat for SCC were identified according to Raimondo *et al.* (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g., roads, erosion etc.), and this included the subjective recording of dominant vegetation species and any sensitive features (e.g., wetlands, rock outcrops etc.). In addition, opportunistic observations were made while navigating through the area.

Relevant field guides and texts consulted for identification purposes included the following:

- A field guide to Wild flowers (Pooley, 1998);
- Field Guide to the Wild Flowers of the Highveld (van Wyk & Malan, 1998);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Medicinal Plants of South Africa (Van Wyk *et al*., 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016), and Aquatic and Wetland Plants of Southern Africa (van Ginkel & Cilliers, 2020);
- Identification guide to southern African grasses (Fish et al., 2015);
- Field guide to trees of Southern Africa, Struik Publishers (Van Wyk & Van Wyk, 1997); and
- Problem Plants and Alien Weeds of Southern Africa (Bromilow, 2018).

4.2.2 Fauna Survey

The faunal component of this report pertains only to avifauna, mammals, and herpetofauna (reptiles and amphibians). The faunal field survey utilised a variety of sampling techniques, including but not limited to:

- Visual and auditory searches: This involves strategic meandering and the use of binoculars and specialist camera equipment to view species from a distance without them being disturbed;
- Active hand-searches: Used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.);
- The identification of tracks and signs, and listening to species calls; and
- The utilization of local knowledge.

The relevant field guides and texts consulted for identification purposes included the following:

- Roberts Bird Guide, Second Edition (Chittenden *et al*., 2016);
- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Bats of Southern and Central Africa (Monadjem *et al*., 2010);
- Spiders of Southern Africa (Leroy & Leroy, 2003);
- A Guide to the Reptiles of Southern Africa (Alexander & Marais, 2007);
- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- Tortoises, Terrapins, and Turtles of Africa (Branch, 2008);
- A Complete Guide to the Frogs of Southern Africa (du Preez & Carruthers, 2009); and
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart & Stuart, 2000).

4.3 Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the project area) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 4-1 and Table 4-2 respectively.

Table 4-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km^2. Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 4-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitats. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehab potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 4-3.

Table 4-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance		Conservation Importance				
		Very high	**High**	**Medium**	**Low**	**Very low**
Functional Integrity	**Very high**	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 4-4.

Table 4-4 Summary of Receptor Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.

Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 4-5.

Table 4-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance				
		Very high	**High**	**Medium**	**Low**	**Very low**
Receptor Resilience	**Very Low**	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very High	Medium	Low	Very low	Very low	Very low

Interpretation of the SEI in the context of the proposed project is provided in Table 4-6.

Table 4-6 Guideline for interpreting Site Ecological Importance in the context of proposed activities

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

4.4 Wetland Baseline Assessment

4.4.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWAF (2005) guidelines, a cross section is presented in Figure 4-2. The outer edges of the wetland areas were identified by considering the following four specific indicators:

- The Terrain Unit Indicator helps to identify those parts of the landscape where wetlands are more likely to occur;
- The Soil Form Indicator identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation.

- The soil forms (types of soil) found in the landscape were identified using the South African soil classification system, namely, Soil Classification: A Taxonomic System for South Africa (Soil Classification Working Group, 1991);

- The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
- The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

Vegetation is used as the primary wetland indicator. However, in practise the soil wetness indicator tends to be the most important, and the other three indicators are used in a confirmatory role.

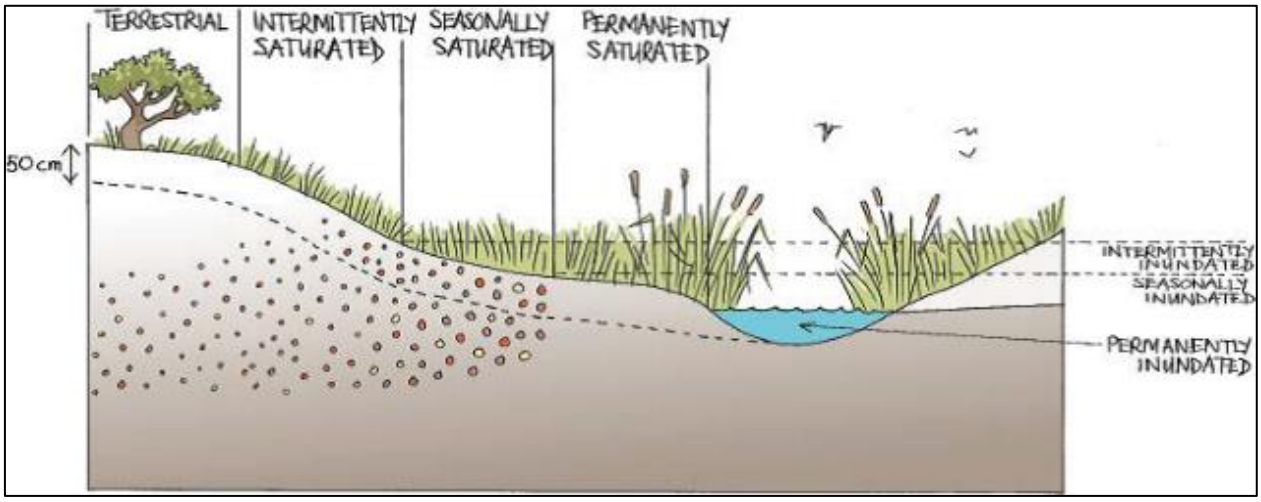


Figure 4-2 Cross section through a wetland, indicating how the soil wetness and vegetation indicators change (Ollis et al. 2013)

4.4.2 Delineation

The wetland indicators described above are used to determine the boundaries of the wetlands within the project area. These delineations are then illustrated by means of maps accompanied by descriptions.

4.4.3 Functional Assessment

Wetland Functionality refers to the ability of wetlands to provide healthy conditions for the wide variety of organisms found in wetlands, as well as humans. Eco Services serve as the main factor contributing to wetland functionality.

The assessment of the ecosystem services supplied by the identified wetlands was conducted as per the guidelines as described in WET-EcoServices (Kotze et al. 2008). An assessment was undertaken that examines and rates the services according to their degree of importance and the degree to which the services are provided (Table 4-7).

Table 4-7 Classes for determining the likely extent to which a benefit is being supplied

Score	Rating of likely extent to which a benefit is being supplied
< 0.5	Low
0.6 - 1.2	Moderately Low
1.3 - 2.0	Intermediate
2.1 - 3.0	Moderately High
> 3.0	High

4.4.4 Present Ecological Status

The overall approach is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (PES) score. This takes the form of assessing the spatial extent of the impact of individual activities/occurrences and then separately assessing the intensity of the impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact.

The Present Ecological State categories are provided in Table 4-8.

Table 4-8 The Present Ecological Status categories (Macfarlane, et al., 2008)

Impact Category	Description	Impact Score Range	PES
None	Unmodified, natural	0 to 0.9	A
Small	Largely Natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	1.0 to 1.9	B
Moderate	Moderately Modified. A moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.	2.0 to 3.9	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	D
Serious	Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable.	6.0 to 7.9	E
Critical	Critical Modification. The modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8.0 to 10	F

4.4.5 Importance and Sensitivity

The importance and sensitivity of water resources is determined in order to differentiate between resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts.

The mean of the determinants is used to assign the Importance and Sensitivity (IS) category, as listed in Table 4-9.

Table 4-9 Description of Importance and Sensitivity categories

IS Category	Range of Mean	Recommended Ecological Management Class
Very High	3.1 to 4.0	**A**
High	2.1 to 3.0	**B**
Moderate	1.1 to 2.0	**C**
Low Marginal	< 1.0	**D**

4.4.6 Ecological Classification and Description

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) will be considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels, and then also includes structural features at the lower levels of classification (Ollis *et al.,* 2013).

4.4.7 Buffer Requirements

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane *et al.,* 2014) was used to determine the appropriate buffer zone as applicable to the proposed activity/s.

4.5 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client is accurate and up-to-date;
- The specialist was not provided with an architectural plan or any engineering drawings with regards to the planned development activities and as such the potential impacts arising from these activities may only be assumed;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- Only a single season survey was conducted and thus this assessment does not consider temporal trends (note that the data collected is however considered sufficient to derive a meaningful baseline);
- The latest site visit was conducted during the dry season, and this means that certain flora and fauna would not have been present or observable due to seasonal constraints;
- A large number of protected flora species are confirmed to occur throughout the PAOI (>200 nationally protected trees and provincially protected plants). It was not within the scope of this survey to log the GPS location and numbers of all observed species, and as such only an approximate number of nationally protected trees is provided and the GPS locations of only the trees that occur along the proposed routes are provided. A follow up search and rescue survey would be required in order to obtain an accurate estimate of the numbers of all protected flora species that may be affected by the development, including their GPS locations;
- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling is completed and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

5 Results & Discussion

5.1 Desktop Assessments

5.1.1 Ecologically Important Landscape Features

Table 5-1 below has been produced as a result of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and SANBI). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI. Where a feature is regarded as relevant it is considered an ecologically important landscape feature and discussed further as part of the sub-sections that follow.

Table 5-1 Summary of the spatial relevance of the PAOI to local ecologically important landscape features

Desktop Information Considered	Relevant?	Reasoning	Section
Provincial Conservation Plan	Yes	Large parts of the PAOI intercept with both CBA and ESA areas	5.1.1.1
NBA 2018: Ecosystem Threat Status	Yes	The PAOI overlaps with a 'Least Concern' ecosystem	5.1.1.2
NBA 2018: Ecosystem Protection Level	Yes	The PAOI overlaps with a 'Not Protected' ecosystem	5.1.1.2
Protected and Conservation Areas (SAPAD & SACAD)	Yes	According to the latest datasets, one Nature Reserve occurs within 5 km of the PAOI	5.1.1.3
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Yes	A 'Critically Endangered' river and an 'Unclassified' wetland cross through the PAOI	5.1.1.4
National Freshwater Ecosystem Priority Areas	Yes	Both the river and wetland associated with the PAOI are listed as FEPA systems	5.1.1.4
National Protected Areas Expansion Strategy (NPAES)	No	No NPAES priority focus areas for expansion occur nearby	-
Important Bird and Biodiversity Areas (IBA)	No	No IBAs occur in the region	-
Strategic Water Source Areas	No	No Strategic Water Source Areas occur nearby according to the 2021 dataset	-

5.1.1.1 Provincial Conservation Plan

According to the Northern Cape CBA map dataset, extensive parts of the PAOI overlap with CBA1, CBA2, and ESA areas (Figure 5-1). CBA1 areas are typically regarded as irreplaceable and CBA2 areas as optimal, and CBA sites are generally in a good ecological condition and must remain in such a state in order to meet biodiversity targets (SANBI, 2017).

ESA areas are generally in a good or fair ecological condition, and they must remain in at least fair ecological condition in order to meet biodiversity targets, support ecological functioning, and/or deliver ecosystem services (SANBI, 2017).

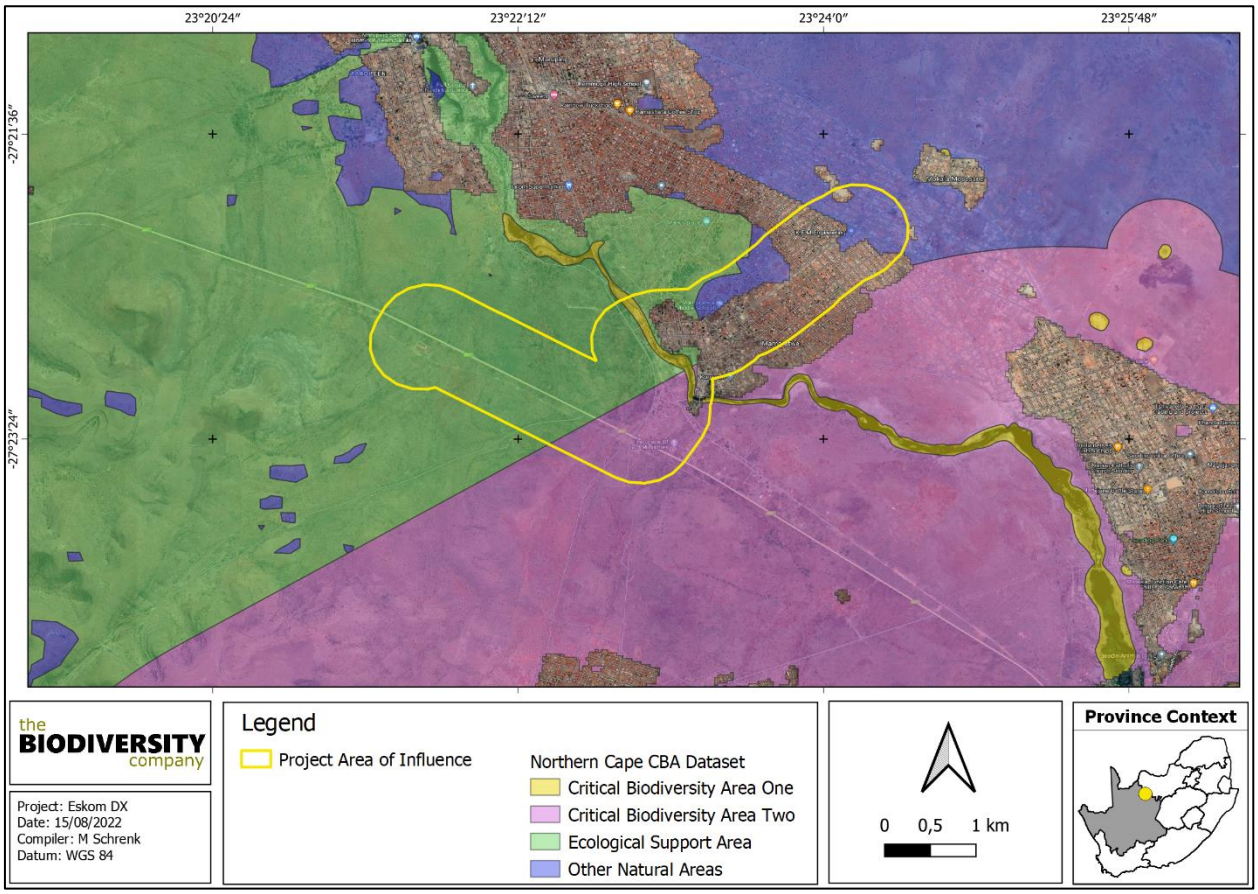


Figure 5-1 Map illustrating the Northern Cape CBA and ESA map dataset relevance

5.1.1.2 National Biodiversity Assessment

According to the 2018 NBA spatial dataset the PAOI overlaps with a 'Least Concern' ecosystem, which is regarded as a 'Not Protected' system (Figure 5-2 and Figure 5-3).

A 'Least Concern' ecosystem type is one which has experienced little or no loss of natural habitat or deterioration in condition, and 'Not Protected' ecosystem types have less than 5% of their biodiversity target included in one or more protected areas (SANBI, 2019).

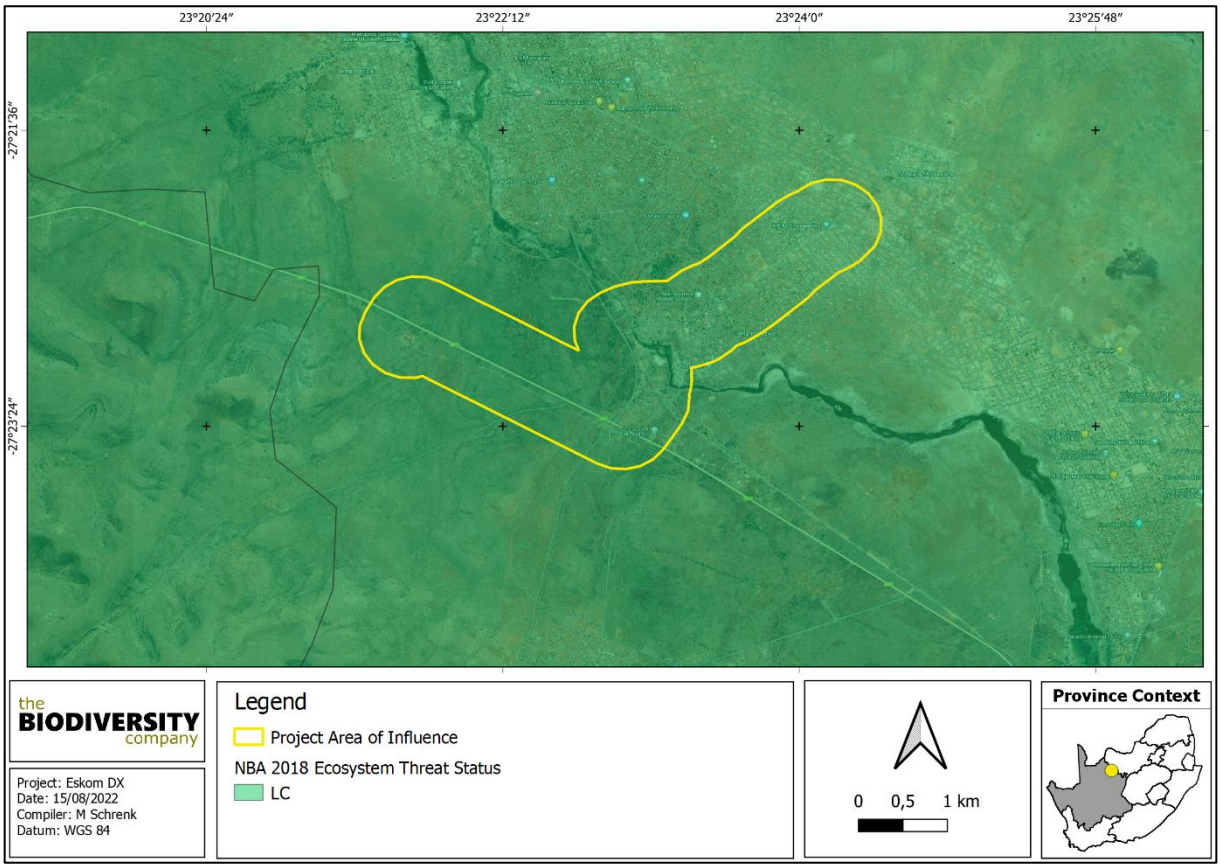


Figure 5-2 Map illustrating the Ecosystem Threat Status associated with the PAOI

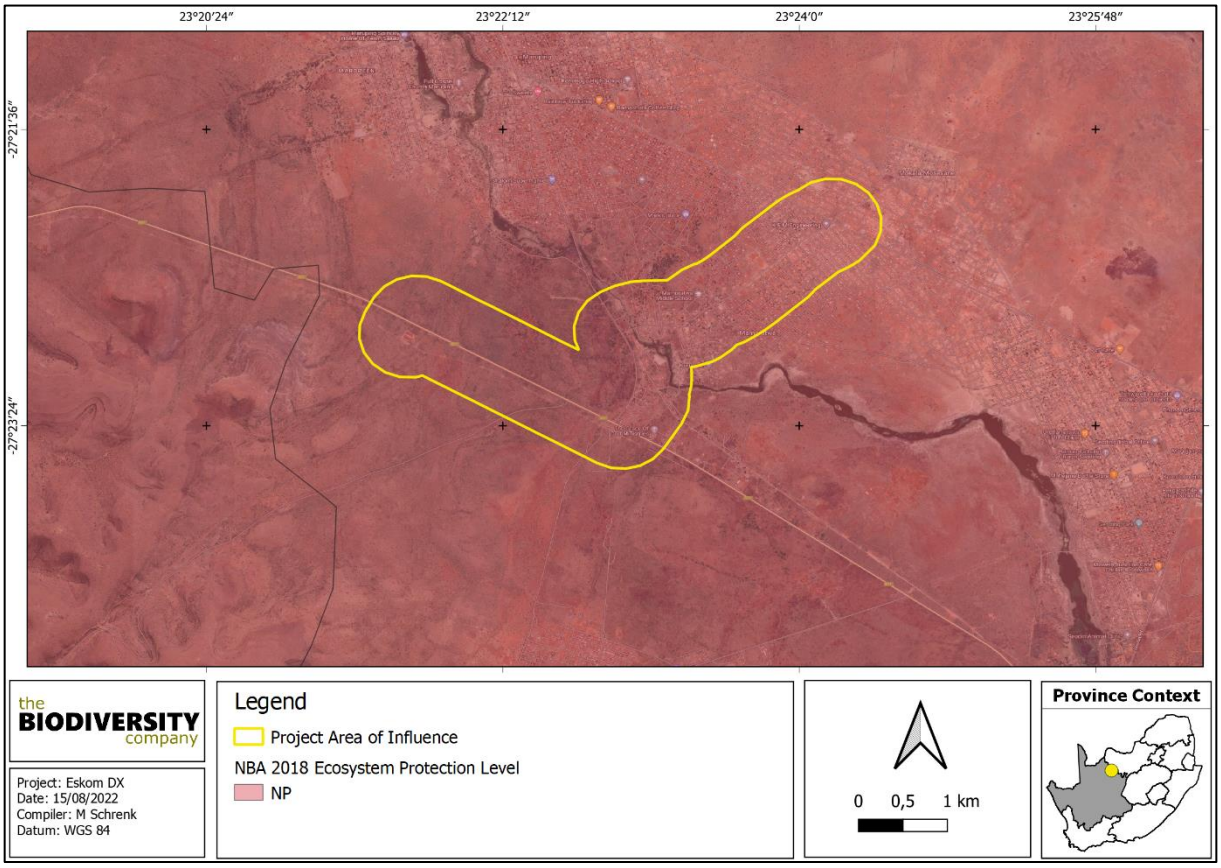


Figure 5-3 Map illustrating the Ecosystem Protection Level associated with the PAOI

5.1.1.3 Protected Areas

The latest SAPAD database lists one Nature Reserve within 5 km of the PAOI, the 2000 ha Billy Duvenhage Nature Reserve - which lies south of the PAOI (Figure 5-4). The proximity of the protected area means that certain fauna species utilising the reserve are likely to forage within the PAOI.

No SACAD areas exist nearby to the PAOI.

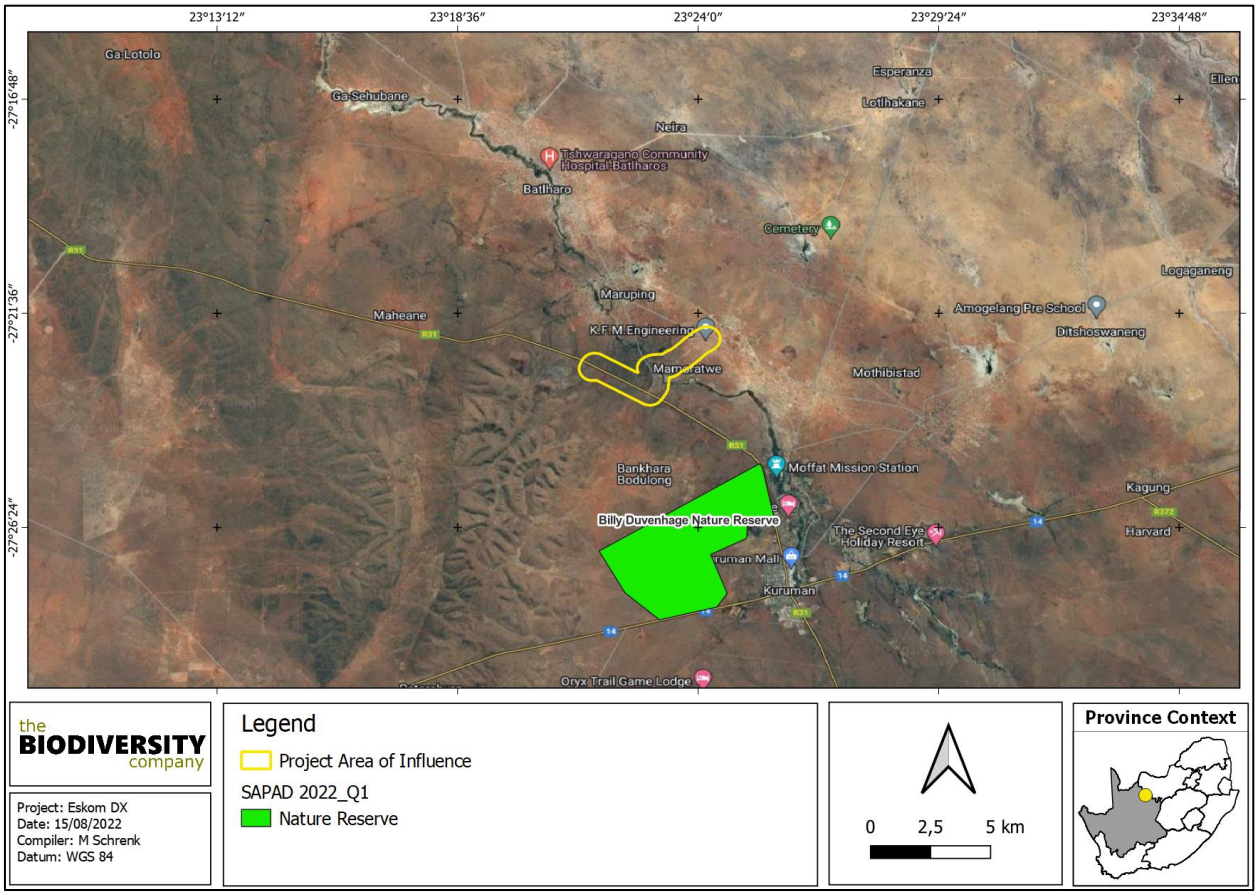


Figure 5-4 Map illustrating the PAOI location in relation to the latest SAPAD dataset

5.1.1.4 Aquatic Habitats

The SAIIAE dataset indicates that the 'Critically Endangered' Kuruman river crosses the PAOI, and this corresponds with an 'Unclassified' channelled valley-bottom wetland (Figure 5-5). According to SANBI (2019) 'Critically Endangered' systems are considered to be at an extremely high risk of collapse as most of the ecosystem type has been severely or moderately modified from its natural state. The ecosystem type is likely to have lost much of its natural structure and functioning, and species associated with the ecosystem may have been lost.

The NFEPA database indicates that both the river and its wetland system are considered Freshwater Ecosystem Priority Areas, whereby the Kuruman river is listed as an important upstream management area (Figure 5-6).

Note: The proximity of the PAOI to these aquatic systems means that it is likely that a number of habitat-specialist fauna species will regularly forage throughout the area, and unique flora species may occur.

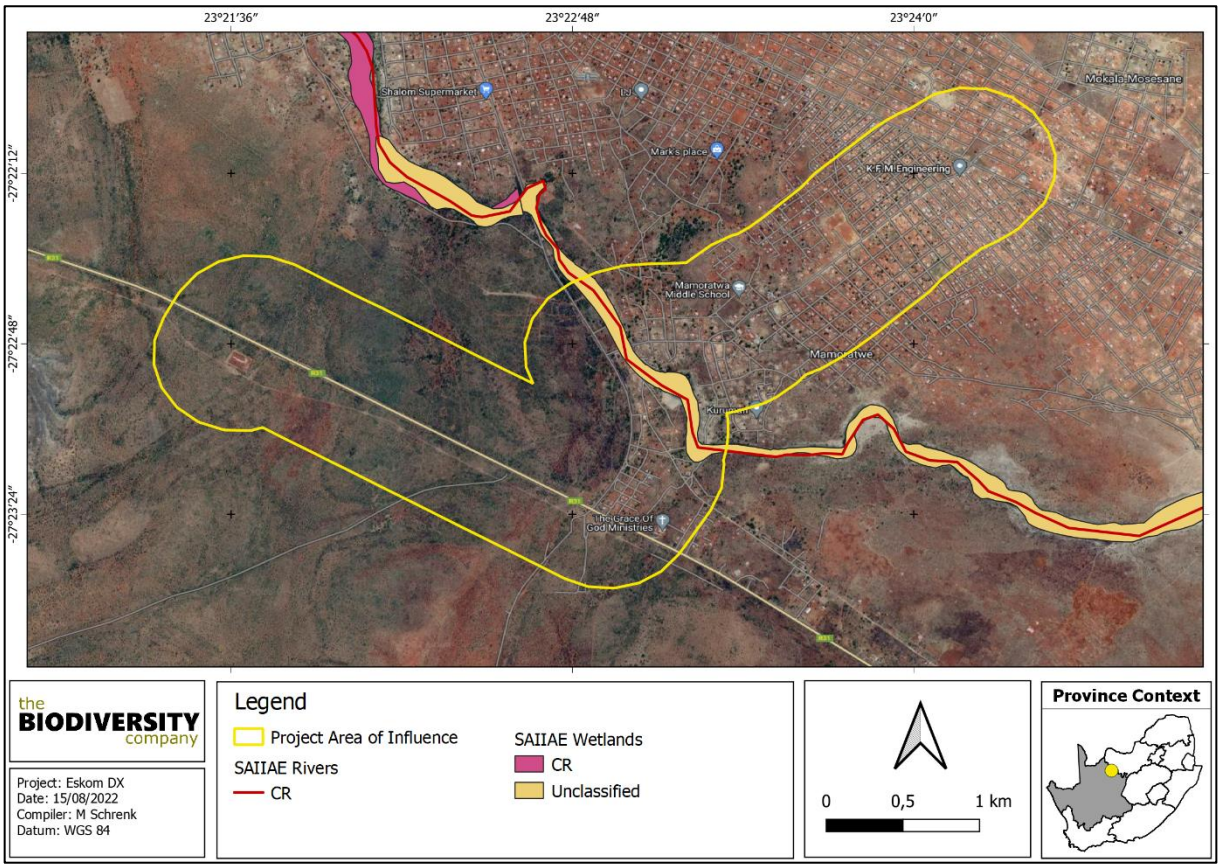


Figure 5-5 Map illustrating the PAOI location in relation to the SAIIAE dataset

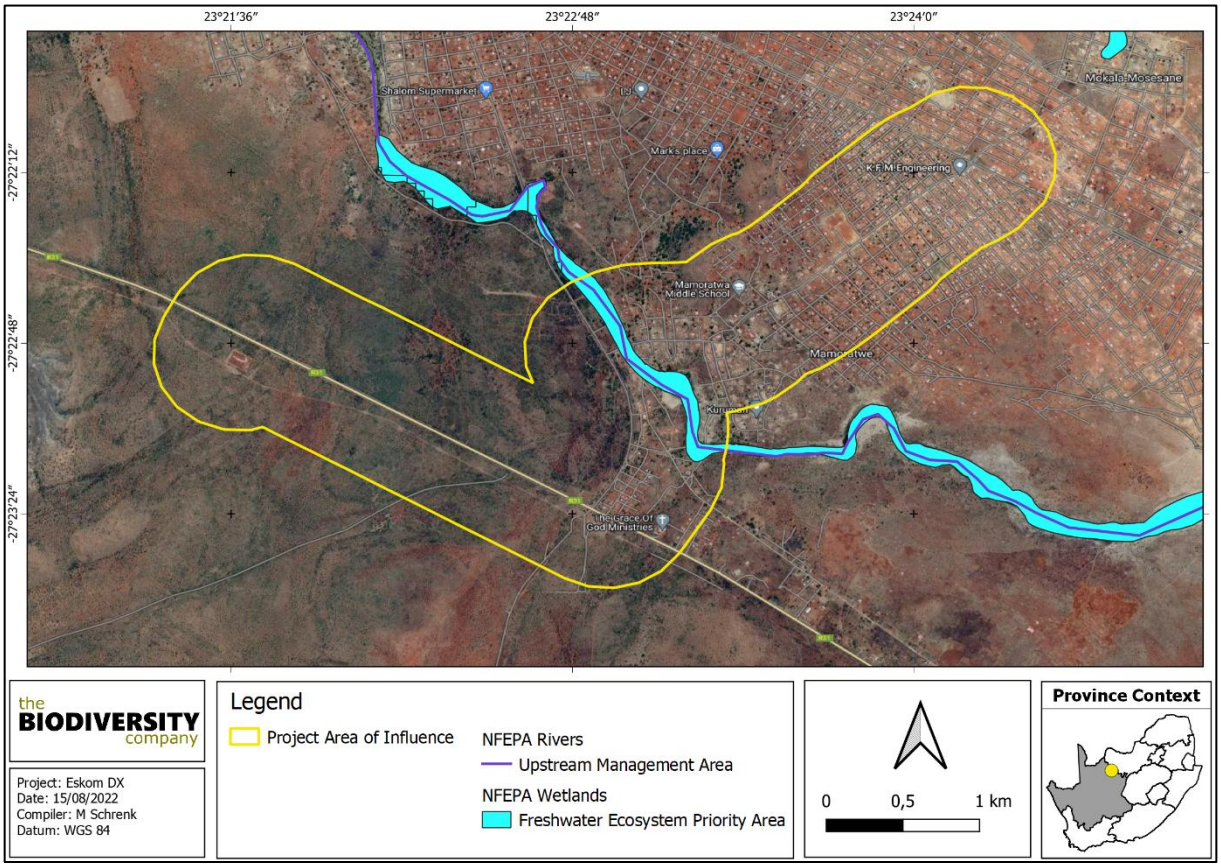


Figure 5-6 Map illustrating the PAOI location in relation to the NFEPA dataset

5.1.2 Flora Assessment

This section is divided into a description of the local vegetation type that would be expected under natural conditions, and the expected flora species.

5.1.2.1 Vegetation Type

The PAOI is situated within the savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- Seasonal precipitation; and
- A (Sub) tropical thermal regime with no or usually a low incidence of frost (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the eastern and north-eastern areas of the country. Savannas are characterised by dominant grass layers, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Vachellia* and *Albizia*) and a generally dense herbaceous layer.

The savanna biome is comprised of 6 parent bioregions and a total of 87 different vegetation types. The PAOI is situated within the Kuruman Thornveld of the Eastern Kalahari Bushveld Bioregion (Figure 5-7). It is noted that the Kuruman Mountain Bushveld habitat occurs just west of the PAOI.

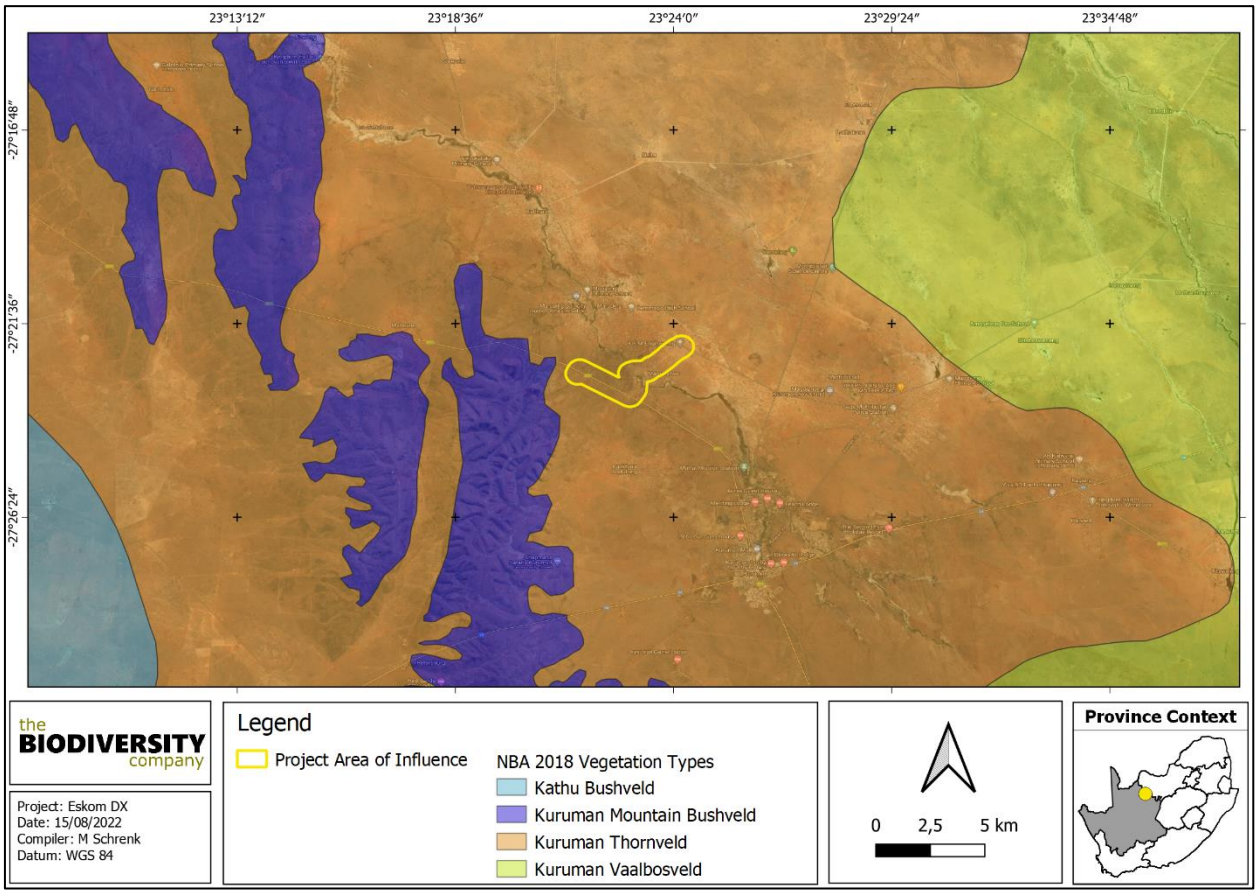


Figure 5-7 Map illustrating the vegetation types associated with the region

5.1.2.1.1 Kuruman Thornveld

This vegetation type occurs in the North-West and Northern Cape Provinces and generally on flats from the vicinity of Postmasburg and Danielskuil (here west of the Kuruman Hills) in the south extending via Kuruman to Tsineng and Dewar in the north. Kuruman Thornveld occurs on flat rocky plains and over some sloping hills and contains a very well-developed, closed shrub layer and well-developed open tree stratum consisting of the protected *Vachellia erioloba* (Mucina & Rutherford, 2006).

Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence, or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are considered important in the Kuruman Thornveld vegetation type (d = dominant):

Tall Tree: *Vachellia erioloba (d).*

Small Trees: *Senegalia mellifera subsp. detinens (d), Boscia albitrunca (d).*

Tall Shrubs: *Grewia flava (d), Lycium hirsutum (d), Tarchonanthus camphoratus (d), Gymnosporia buxifolia.*

Low Shrubs: *Vachellia hebeclada subsp. hebeclada (d), Monechma divaricatum (d), Gnidia polycephala, Helichrysum zeyheri, Hermannia comosa, Pentzia calcarea, Plinthus sericeus.*

Geoxylic Suffrutex: *Elephantorrhiza elephantina.*

Graminoids: *Aristida meridionalis (d), A. stipitata subsp. stipitata (d), Eragrostis lehmanniana (d), E. echinochlo-idea, Melinis repens.*

Herbs: *Dicoma schinzii, Gisekia africana, Harpagophytum procumbens subsp. procumbens, Indigofera daleoides, Limeum fenestratum, Nolletia ciliaris, Seddera capensis, Tripteris aghillana, Vahlia capensis subsp. vulgaris.*

Biogeographically Important Taxa: Small Trees: *Vachellia luederitzii var. luederitzii, Terminalia sericea.* Tall Shrub: *Vachellia haematoxylon*. Low Shrub: *Blepharis marginata*. Graminoid: *Digitaria polyphylla.* Herb: *Corchorus pinnatipartitus.*

Endemic Taxon: Herb: *Gnaphalium englerianum.*

Conservation Status of the Vegetation Type

According to Mucina and Rutherford (2006) this vegetation type is classified as ‘Least Threatened’, with the national target for conservation protection being 16%.

None of the vegetation type is conserved in statutory conservation areas and only 2% is transformed (Mucina and Rutherford, 2006).

5.1.2.2 Expected Flora Species

The POSA database indicates that over 650 species of plants could be expected to occur within and around the PAOI. Two (2) of the expected species are classified as SCC, based on their conservation statuses (Table 5-2). Refer to Appendix B for the full list of species, and their respective conservation statuses and endemism.

Table 5-2 SCC flora species that may occur within the Project Area of Influence

Family	Species	Author	SANBI Red-List Status	Ecology
Acanthaceae	*Barleria media*	C.B. Clarke	VU	Indigenous; Endemic
Cleomaceae	*Cleome conrathii*	Burtt Davy	NT	Indigenous

5.1.3 Fauna Assessment

This section of the report details the lists of expected SCC fauna species that may occur within the PAOI, where the fauna species considered include avifauna, mammals, reptiles, and amphibians. Where the likelihood of a particular species occurring within the Project Area of Influence is rated by the specialist as being either moderate or high, based on the known habitat and prey/forage preferences of a particular species (linked with the field survey data obtained), the relevant species is then further discussed below a given table.

5.1.3.1 Avifauna

The SABAP2 database lists over 180 avifauna species that could be expected to occur within and around the area (Appendix C). Of these species, four (4) are regarded as SCC and these are presented in Table 5-3. Three (3) of the avifaunal SCC have a moderate or high likelihood of project area occurrence based on their respective habitat and/or prey preferences and the correlation of these to the particular local habitat present.

Table 5-3 SCC avifauna species that may occur within the Project Area of Influence

Likelihood of Occurrence	Species	Common Name	Conservation Status	
			SANBI (2022)	IUCN (2021)
High	***Polemaetus bellicosus***	Eagle, Martial	EN	EN
Moderate	***Aquila verreauxii***	Eagle, Verreaux's	VU	LC
Moderate	***Falco biarmicus***	Falcon, Lanner	VU	LC
Low	***Ardeotis kori***	Bustard, Kori	NT	NT

Polemaetus bellicosus (Martial Eagle) is listed as EN on both a regional and global scale. This species has an extensive range across much of sub-Saharan Africa, but populations are declining due to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution, and collisions with power lines (IUCN, 2017). It inhabits open woodland, wooded savanna, bushy grassland, thornbush and, in southern Africa, more open country and even sub-desert (IUCN, 2017). With the presence of good savannah habitat in the area and large trees for roosting and nesting there is a high chance of this species occurring.

Aquila verreauxii (Verreaux's Eagle) is listed as VU on a regional scale and LC on a global scale. This species is locally persecuted in southern Africa where it coincides with livestock farms, but because the species does not take carrion it is not threatened by poisoned carcasses as vulture species are. Where hyraxes are hunted for food and skins, eagle populations have declined (IUCN, 2017). Based on the available habitat, the close proximity of mountains and the availability of prey species, the likelihood of occurrence of this species occurring at the project site is rated as moderate.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals but have also been observed solitarily. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of incidental records of this species in the area is rated as moderate due to the presence of bird species on which Lanner Falcons may predate.

Ardeotis kori (Kori Bustard) is listed as NT both on a regional and global scale. It occurs in flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also within modified habitats such as wheat fields and firebreaks. Collisions with high voltage power lines are a major threat to this species in the Karoo region of South Africa (IUCN, 2007). The habitat at the project site is not considered typical of this species and therefore it's likelihood of occurrence is rated as low.

5.1.3.2 Mammals

The IUCN Red List spatial database, in addition to the MammalMap database, lists over 70 mammal species that could be expected to occur within and around the PAOI (Appendix D). This excludes medium-large mammal species that are typically limited to reserves and/or protected areas. Ten (10) of these expected species are regarded as SCC (Table 5-4), and of these SCC two (2) have a moderate likelihood of occurrence based on the presence of suitable habitat and food sources in the area.

Table 5-4 SCC mammal species that may occur within the Project Area of Influence

Likelihood of Occurrence	Species	Common Name	Conservation Status	
			SANBI (2022)	IUCN (2021)
Moderate	***Otomys auratus***	Vlei Rat (Grassland type)	NT	NT
Moderate	***Poecilogale albinucha***	African Striped Weasel	NT	LC
Low	***Aonyx capensis***	Cape Clawless Otter	NT	NT
Low	***Atelerix frontalis***	South Africa Hedgehog	NT	LC
Low	***Felis nigripes***	Black-footed Cat	VU	VU
Low	***Miniopterus schreibersii***	Schreiber's Bent-winged Bat		VU
Low	***Panthera pardus***	Leopard	VU	VU
Low	***Parahyaena brunnea***	Brown Hyaena	NT	NT
Low	***Rhinolophus denti***	Dent's Horseshoe Bat	NT	LC
Low	***Smutsia temminckii***	Temminck's Ground Pangolin	VU	VU

Otomys auratus (Vlei Rat) is categorised as NT on both a regional and an international scale. This near-endemic grassland species is becoming increasingly threatened by grassland contraction and wetland loss, with niche modelling showing that it will undergo a 47-61% reduction in suitable habitat between 1975 and 2050 from climate change. The likelihood of finding this species in the project area is rated as moderate due to the presence of some riverine habitat in the area.

Poecilogale albinucha (African Striped Weasel) is usually associated with savanna habitats, although it probably has a wider habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is some sufficient habitat for this species in the area and the likelihood of occurrence of this species is therefore considered to be moderate.

5.1.3.3 Reptiles

Based on the IUCN Red List spatial database and ReptileMap, over 40 reptile species may be expected to occur within and nearby to the PAOI (Appendix E). None of these expected species are regarded as SCC, according to their latest national and global conservation status'.

5.1.3.4 Amphibians

Based on the IUCN Red List spatial database and FrogMap, over 10 amphibian species may be expected to occur within and nearby to the PAOI (Appendix F). One (1) of these is regarded as an SCC and it is assigned a low likelihood of occurrence due to the lack of suitable wetland habitat (Table 5-5).

Table 5-5 SCC amphibian species that may occur within the Project Area of Influence

Likelihood of Occurrence	Species	Common Name	Conservation Status	
			SANBI (2022)	IUCN (2021)
Low	*Pyxicephalus adspersus*	Giant Bull Frog	NT	LC

5.2 Biodiversity Field Survey

The following sections discuss the flora and fauna findings from the field survey that was conducted for the proposed project, which was undertaken on the 10th and 11th of August 2022.

5.2.1 Flora Survey

This section is further divided into two subsections: Indigenous flora recorded; and Invasive Alien Plants (IAPs) of the project area.

5.2.1.1 Indigenous Flora

The indigenous vegetation community was largely limited to the west of the PAOI, where habitats are less affected by the dense township development. A good diversity of tree, shrub, and grass species were recorded in these areas – representing many species typical of the regional historical vegetation type as classified by Mucina & Rutherford (2006). The most prominent vegetation included extensive and dense stands of small *Senegalia mellifera* subsp. *detinens* thorn trees, mixed with small *Tarchonanthus camphoratus, Searsia burchellii* and *Euclea undulata* trees. Overall, 45 flora species were recorded which included 40 indigenous species and 5 naturalised exotics (including 2 listed invasive species). Table 5-6 presents the list of observed flora species, whereby the invasive species are highlighted in dark red.

Approximately 130 protected *Vachellia erioloba* (Camel Thorn) trees were observed along or nearby to the proposed powerline routes within the PAOI (highlighted in green below). These species are nationally protected trees as per the National Forests Act (No. 30 of 1998) and may not be disturbed in any manner without the appropriate permit. Refer to the map in Figure 5-10 below for the logged GPS pin locations of observed *V. erioloba* trees.

A number of provincially protected plants were also recoded during the survey, including a single Schedule 1 and six Schedule 2 protected species. These plants are protected in line with the Northern Cape Nature Conservation Act (No. 9 of 2009). According to the act the plants may not be disturbed in any manner without the appropriate permit, subject to certain provisions within the act. Schedule 1 plants (Specially protected plants) are highlighted in dark blue below and Schedule 2 plants (Protected plants) are highlighted in light blue below.

No flora SCC were recorded during the survey. Refer to Figure 5-8 and Figure 5-9 for photographs of some of the observed indigenous flora species, including the protected tree and plants. Note: The list below must only be taken as a representative sample flora list for the PAOI. More flora species will occur throughout the area, but due to seasonal restrictions and the fact that representative sampling was completed, not all species present may have been logged.

Table 5-6 Flora species observed within the Project Area of Influence

Family	Species	Author	SANBI Red-List Status	Ecology
Asparagaceae	*Agave americana*	L.		Naturalized exotic
Asphodelaceae	***Aloe hereroensis***	**Engl.**	**LC**	**Indigenous, protected plant**
Poaceae	*Aristida congesta subsp. congesta*	Roem. & Schult.	LC	Indigenous
Poaceae	*Aristida meridionalis*	Henrard	LC	Indigenous
Asparagaceae	*Asparagus laricinus*	Burch.	LC	Indigenous
Asteraceae	*Bidens pilosa*	L.		Indigenous
Asphodelaceae	***Bulbine abyssinica***	**A.Rich.**	**LC**	**Indigenous, protected plant**
Cyperaceae	*Cyperus eragrostis*	Lam.		Naturalized exotic
Poaceae	*Enneapogon scoparius*	Stapf	LC	Indigenous

Poaceae	*Eragrostis chloromelas*	Steud.	LC	Indigenous
Poaceae	*Eragrostis curvula*	(Schrad.) Nees	LC	Indigenous
Poaceae	*Eragrostis lehmanniana*	Nees	LC	Indigenous
Poaceae	*Eragrostis echinochloidea*	Stapf	LC	Indigenous
Ebenaceae	*Euclea undulata*	Thunb.	LC	Indigenous
Asteraceae	*Felicia filifolia*	(Vent.) Burtt Davy	LC	Indigeneous, Endemic
Asteraceae	*Geigeria ornativa*	O.Hoffm.	LC	Indigenous
Apocynaceae	***Gomphocarpus tomentosus subsp. tomentosus***	**Burch.**	**LC**	**Indigenous, protected plant**
Malvaceae	*Grewia flava*	DC.	LC	Indigenous
Celastraceae	***Gymnosporia buxifolia***	**(L.) Szyszyl.**	**LC**	**Indigenous, protected plant**
Malvaceae	*Hermannia comosa*	Burch. ex DC.	LC	Indigenous
Poaceae	*Hyparrhenia hirta*	(L.) Stapf	LC	Indigenous
Acanthaceae	*Justicia divaricata*	Licht. ex Roem. & Schult.	LC	Indigenous
Thymelaeaceae	*Lasiosiphon polycephalus*	(E.Mey. ex Meisn.) H.Pearson	LC	Indigenous
Fabaceae	***Lessertia frutescens subsp. frutescens***	**(L.) Goldblatt & J.C.Manning**	**LC**	**Indigenous, protected plant**
Solanaceae	*Lycium hirsutum*	Dunal	LC	Indigenous
Meliaceae	***Melia azedarach***	**L.**		**Invasive, NEMBA Category 1b**
Poaceae	*Melinis nerviglumis*	(Franch.) Zizka	LC	Indigenous
Acanthaceae	*Monechma divaricatum*	(Nees) C.B.Clarke	LC	Indigenous
Iridaceae	***Moraea polystachya***	**(Thunb.) Ker Gawl.**	**LC**	**Indigenous, protected plant**
Asteraceae	*Nolletia ciliaris*	(DC.) Steetz	LC	Indigenous
Cactaceae	***Opuntia ficus-indica***	**(L.) Mill.**		**Invasive, NEMBA Category 1b**
Asteraceae	*Pentzia calcarea*	Kies	LC	Indigenous
Poaceae	*Pogonarthria squarrosa*	(Roem. & Schult.) Pilg.	LC	Indigenous
Apocynaceae	***Raphionacme velutina***	**Schltr.**	**LC**	**Indigenous, protected plant**
Bignoniaceae	*Rhigozum trichotomum*	Burch.	LC	Indigenous
Anacardiaceae	*Searsia burchellii*	(Sond. ex Engl.) Moffett	LC	Indigenous
Anacardiaceae	*Searsia lancea*	(L.f.) F.A.Barkley	LC	Indigenous
Scrophulariaceae	*Selago densiflora*	Rolfe	LC	Indigenous
Fabaceae	*Senegalia mellifera subsp. detinens*	(Vahl) Seigler & Ebinger (Burch.) Kyal. & Boatwr.	LC	Indigenous
Loranthaceae	*Tapinanthus oleifolius*	(J.C.Wendl.) Danser	LC	Indigenous
Asteraceae	*Tagetes minuta*	L.		Naturalized exotic
Asteraceae	*Tarchonanthus camphoratus*	L.	LC	Indigenous
Typhaceae	*Typha capensis*	(Rohrb.) N.E.Br.	LC	Indigenous
Fabaceae	***Vachellia erioloba***	**(E.Mey.) P.J.H.Hurter**	**LC**	**Indigenous, protected tree**
Fabaceae	*Vachellia karroo*	(Hayne) Banfi & Galasso	LC	Indigenous

Figure 5-8 ***Photographs illustrating some of the protected indigenous flora species recorded – A) Vachellia erioloba; B) Aloe hereroensis; C) Lessertia frutescens subsp. frutescens; and D) Bulbine abyssinica***

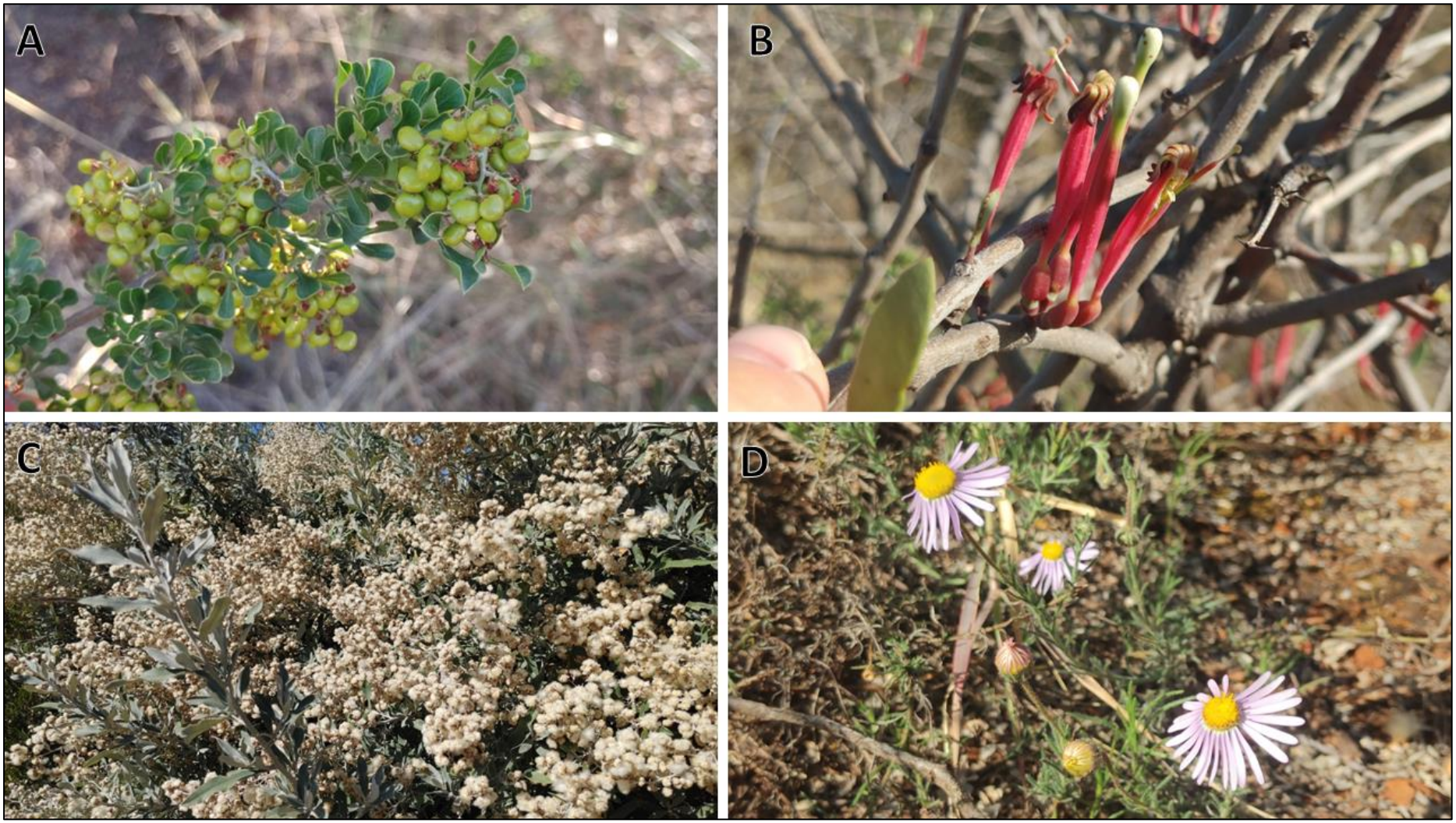


Figure 5-9 ***Photographs illustrating some of the indigenous flora species recorded – A) Searsia burchellii; B) Tapinanthus oleifolius; C) Tarchonanthus camphoratus; and D) Felicia filifolia***

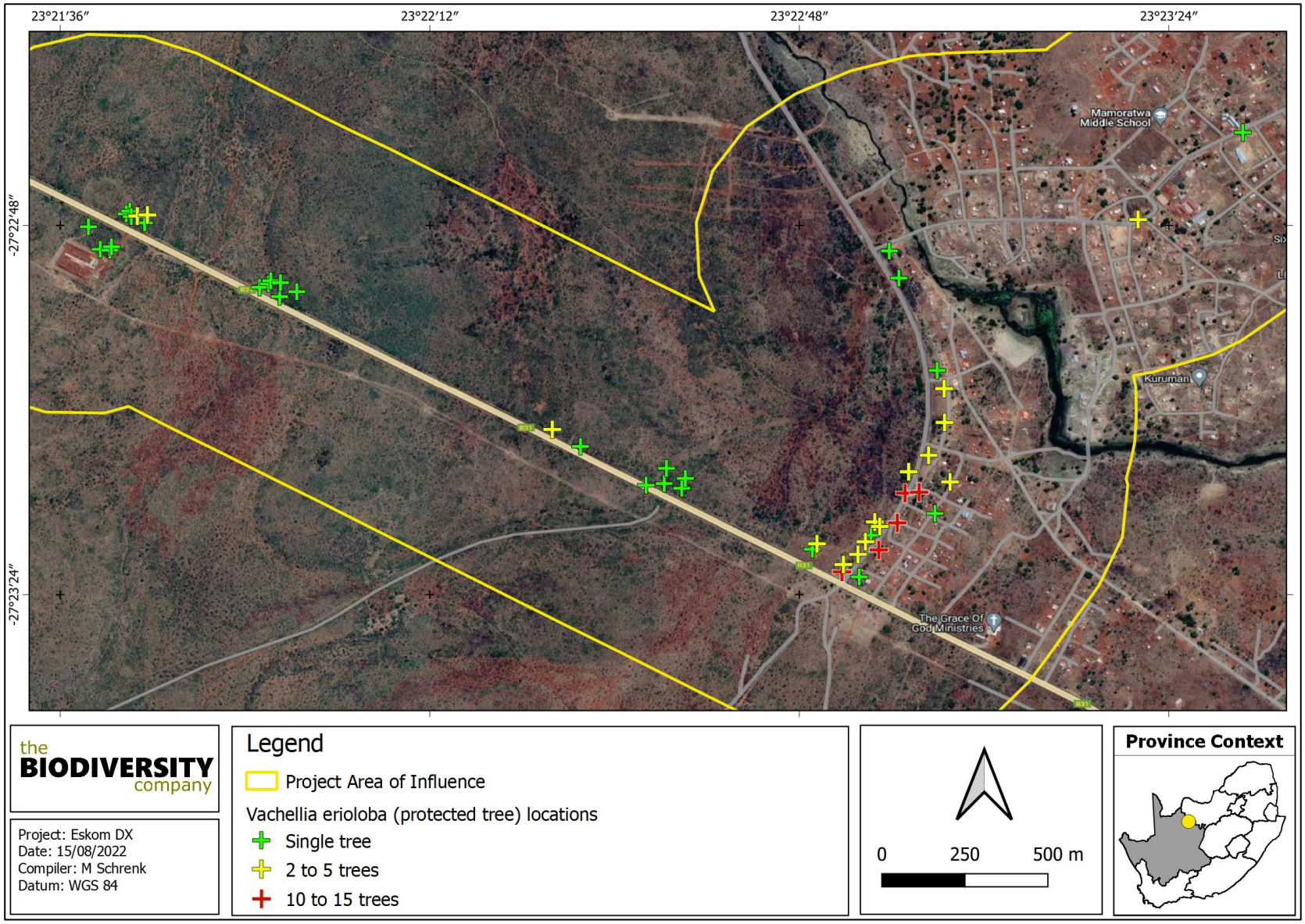


Figure 5-10 Map presenting the GPS pin locations of observed Vachellia erioloba trees (protected)

5.2.1.2 Invasive Alien Plants

The National Environmental Management: Biodiversity Act, Act No. 10 of 2004, (NEM:BA) is the national legislation that incorporates the mandatory regulation of Invasive Alien Plant (IAP) species, and in September 2020 the most current lists of IAP Species were published in terms of NEM:BA (in Government Gazette No. 43726 of 18 September 2020). The Alien and Invasive Species Regulations serve to define and regulate the various categories of Alien and Invasive Species and were recently updated and published in terms of NEM:BA in the Government Gazette No. 43735 of 25 September 2020. The 2020 Alien and Invasive Species Regulations and Lists were recently extended as published in the Government Gazette No. 44182, 24th of February 2021.

Legislation calls for the removal and control of Category 1 IAP species. In addition, unless authorised thereto in terms of the National Water Act, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEM:BA:

- **Category 1a:** Invasive species requiring compulsory eradication. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- **Category 1b:** Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- **Category 2:** Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones. Species existing outside of a regulated area shall be classified as category 1b.
- **Category 3:** Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities: import, possess, grow, breed, move, sell, buy or accept as a gift - involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones as these will be classified as category 1b species.

Note that according to the regulations, any person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing;
- Take steps to manage the listed invasive species in compliance with:
    - Section 75 of the NEM:BA;
    - The relevant local invasive species management programme developed in terms of regulation 4, and any directive issued in terms of section 73(3) of the NEMBA.

Only 2 prominent IAP species were recorded within the PAOI, namely *Melia azedarach* and *Opuntia ficus-indica*, which are both listed as Category 1b invasive species and thus must be controlled according to a project specific IAP management plan (*Melia azedarach* is listed as a Category 3 species in urban areas). It is noted that the species were not considered to be dominant within the landscape, and the *Melia azedarach* trees were generally limited to the eastern portions of the PAOI, within the township area and surrounds, and the *Opuntia ficus-indica* cacti were mostly found sparsely scattered across the western portions.

Photographs of the observed IAP species are presented in Figure 5-11 below.

Figure 5-11 Photographs illustrating the IAP flora species recorded within the Project Area of Influence - Opuntia ficus-indica (left) and Melia azedarach (right)

5.2.2 Fauna Survey

5.2.2.1 Avifauna

A total of 51 avifauna species were observed during the field survey, with the majority of the species recorded foraging, perching, or flying along the Kuruman river. No SCC were observed; however, it is noted that most bird species are provincially protected according to Schedules 1 and 2 of the Northern Cape Nature Conservation Act (No. 9 of 2009). Refer to Table 5-7 for the list of recorded avifauna species and Figure 5-12 below for photographs of some of the observed species.

This list is considered to only represent a small sample of the possible avifauna species that are likely to be found within the PAOI and long-term multi-season surveys would yield a much higher bird count.

Table 5-7 Avifauna species recorded within the Project Area of Influence

Species	Common Name	Conservation Status	
		SANBI (2022)	IUCN (2021)
Acridotheres tristis	Myna, Common	LC	LC
Anas capensis	Teal, Cape	LC	LC
Anas platyrhynchos	Duck, Mallard	LC	LC
Anas undulata	Duck, Yellow-billed	LC	LC
Anthus cinnamomeus	Pipit, African	LC	LC
Anthus leucophrys	Pipit, Plain-backed	LC	LC
Batis pririt	Batis, Pririt	LC	LC
Bostrychia hagedash	Ibis, Hadeda	LC	LC
Bradornis infuscatus	Flycatcher, Chat	LC	LC
Bubulcus ibis	Egret, Cattle	LC	LC
Calandrella cinerea	Lark, Red-capped	LC	LC
Campephaga flava	Cuckooshrike, Black	LC	LC
Cercotrichas paena	Scrub-robin, Kalahari	LC	LC
Cinnyris fuscus	Sunbird, Dusky	LC	LC
Cinnyris mariquensis	Sunbird, Marico	LC	LC
Colius colius	Mousebird, White-backed	LC	LC
Columba guinea	Pigeon, Speckled	LC	LC
Coracias caudatus	Roller, Lilac-breasted	LC	LC
Coracias naevius	Roller, Purple	LC	LC
Corvus albus	Crow, Pied	LC	LC
Cossypha caffra	Robin-chat, Cape	LC	LC
Crithagra flaviventris	Canary, Yellow	LC	LC
Dendrocygna viduata	Duck, White-faced Whistling	LC	LC
Dicrurus adsimilis	Drongo, Fork-tailed	LC	LC
Falco rupicolus	Kestrel, Rock	LC	LC
Fulica cristata	Coot, Red-knobbed	LC	LC
Gallinula chloropus	Moorhen, Common	LC	LC
Hirundo rustica	Swallow, Barn	LC	LC

Lamprotornis nitens	Starling, Cape Glossy	LC	LC
Lanius collaris	Fiscal, Common (Southern)	LC	LC
Microcarbo africanus	Cormorant, Reed	LC	LC
Mirafra africana	Lark, Rufous-naped	LC	LC
Oenanthe familiaris	Chat, Familiar	LC	LC
Passer domesticus	Sparrow, House	LC	LC
Passer melanurus	Sparrow, Cape	LC	LC
Phalacrocorax lucidus	Cormorant, White-breasted	LC	LC
Prinia flavicans	Prinia, Black-chested	LC	LC
Prinia maculosa	Prinia, Karoo	LC	LC
Pycnonotus nigricans	Bulbul, African Red-eyed	LC	LC
Sigelus silens	Flycatcher, Fiscal	LC	LC
Sporopipes squamifrons	Weaver, Scaly	LC	LC
Streptopelia semitorquata	Dove, Red-eyed	LC	LC
Streptopelia senegalensis	Dove, Laughing	LC	LC
Sylvia subcaerulea	Warbler, Chestnut-vented	LC	Unlisted
Threskiornis aethiopicus	Ibis, African Sacred	LC	LC
Tockus leucomelas	Hornbill, Southern Yellow-billed	LC	LC
Trachyphonus vaillantii	Barbet, Crested	LC	LC
Upupa africana	Hoopoe, African	LC	LC
Urocolius indicus	Mousebird, Red-faced	LC	LC
Vanellus armatus	Lapwing, Blacksmith	LC	LC
Vanellus coronatus	Lapwing, Crowned	LC	LC

5.2.2.2 Mammals and Herpetofauna

Mammal and herpetofauna activity was low during the survey, likely due to the proximity of major roads and sprawling township development, as well as the dry-season restrictions. Only 4 mammal species were recorded (Table 5-8) and no herpetofauna species were observed during the survey. Refer to Figure 5-13 below for photographs of two of the observed mammal species.

No fauna SCC were recorded, however a larger number of mammal and herpetofauna species are expected to occur in the area and longer-term multi-season surveys would be required in order to ensure sufficient sampling.

Table 5-8 Mammal species recorded within the Project Area of Influence

Species	Common Name	Conservation Status	
		SANBI (2022)	IUCN (2021)
Cynictis penicillata	Yellow Mongoose	LC	LC
Herpestes sanguineus	Slender Mongoose	LC	LC
Lepus capensis	Cape Hare	LC	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC

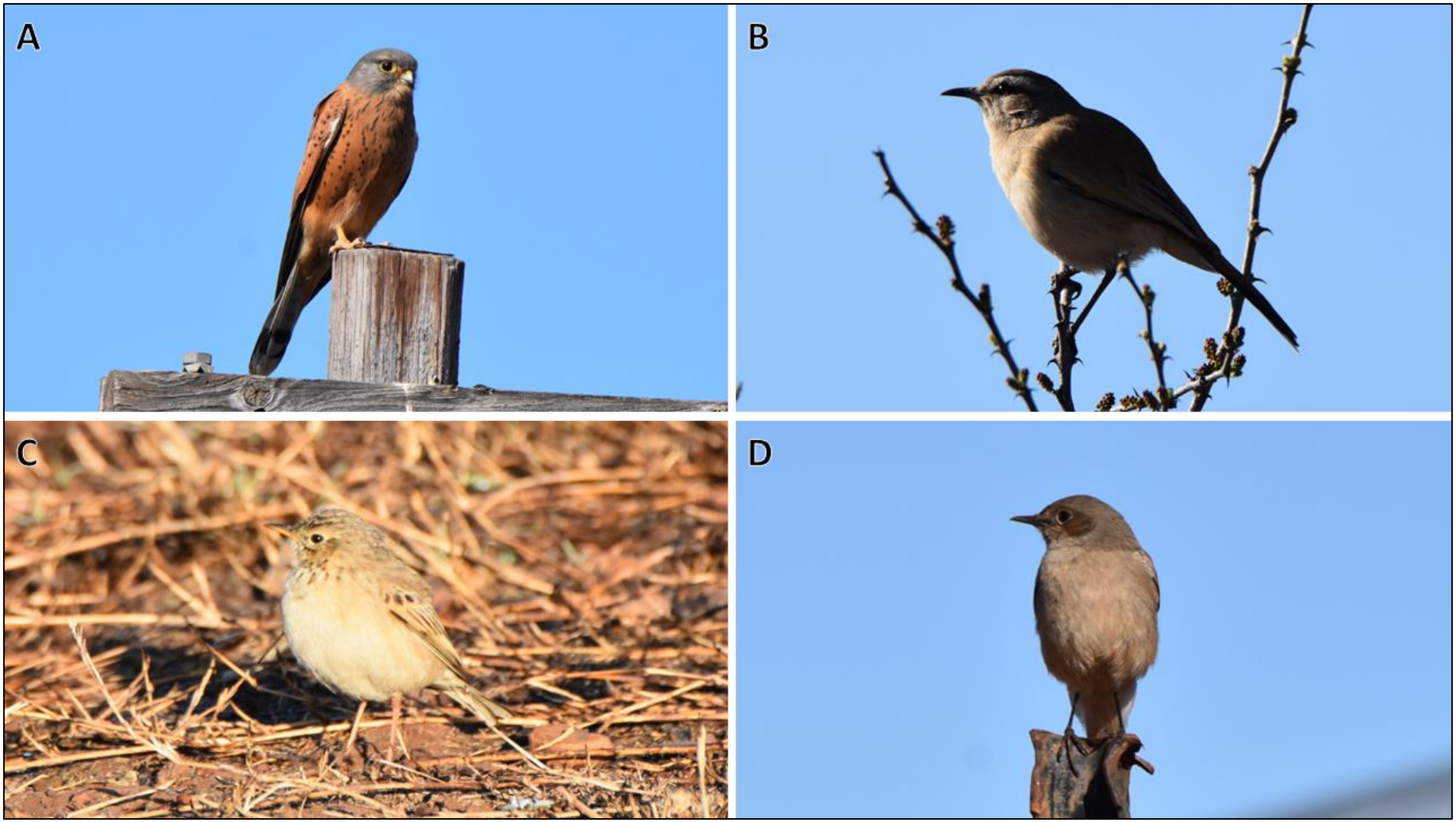


Figure 5-12 ***Photographs: Avifauna species recorded within the Project Area of Influence – A) Falco rupicolus (Kestrel, Rock); B) Cercotrichas paena (Scrub-robin, Kalahari); C) Anthus cinnamomeus (Pipit, African); D) Oenanthe familiaris (Chat, Familiar)***

Figure 5-13 Photographs: Mammal species recorded within the Project Area of Influence - Rhabdomys pumilio (Xeric Four-striped Mouse) (top); Cynictis penicillata (Yellow Mongoose) (bottom)

5.3 Freshwater Assessment

5.3.1 Delineation & Characterisation

Three (3) natural wetland units were identified and delineated for the project. The channeled valley bottom wetland and the unchanneled valley bottom wetlands will be traversed by the powerline. The depression wetland is not in a position in the landscape to be adversely affected by the project, and no functional assessment has been completed for this system. A network of drainage channels was also identified and delineated for the area. These channels have been classified as A Section channels. According to the DWAF (2005) guidelines 'A' Section channels convey surface runoff immediately after a storm event and are not associated with a riparian zone. The ecological functional assessment has only been completed for the wetland unit. Figure 5-15 shows the identified water resources, natural and artificial.

Photographs of the identified resources are presented in Figure 5-14. The level 1-4 classification for the HGM unit as per the national wetland classification system (Ollis *et al.,* 2013) is presented in (Table 5-9).

Table 5-9 Wetland classification as per SANBI guideline (Ollis et al. 2013)

Wetland System	Level 1	Level 2		Level 3	Level 4		
	System	DWS Ecoregion/s	NFEPA Wet Veg Group/s	Landscape Unit	4A (HGM)	4B	4C
HGM 1	Inland	Southern Kalahari	Eastern Kalahari Bushveld Group 3	Valley Floor	Channeled valley bottom	N/A	N/A
HGM 2	Inland	Southern Kalahari	Eastern Kalahari Bushveld Group 3	Valley Floor	Unchanneled valley bottom	N/A	N/A
HGM 3	Inland	Southern Kalahari	Eastern Kalahari Bushveld Group 3	Bench	Depression	Without outflow	N/A

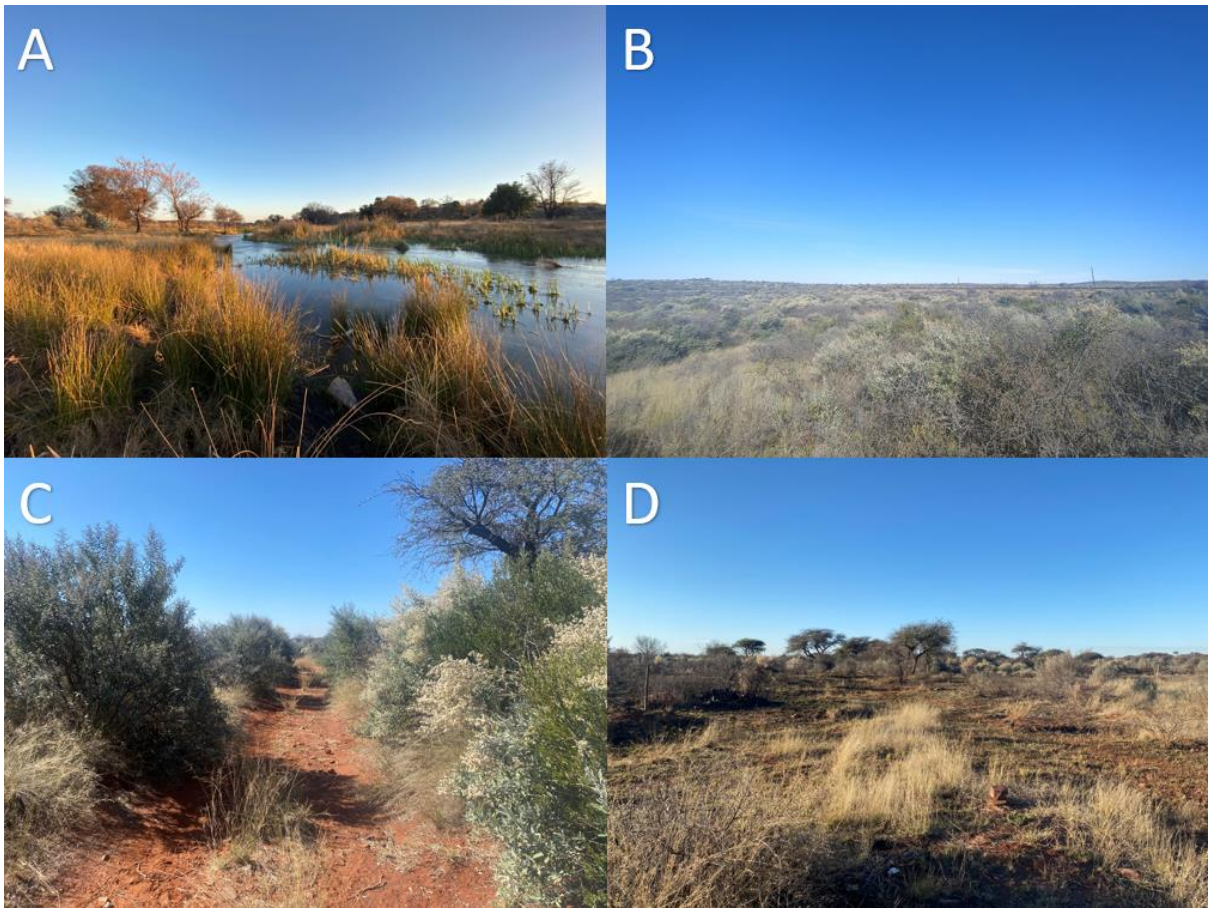


Figure 5-14 Photographs of the delineated resources A) Channeled valley bottom, B) Unchanneled valley bottom, C & D) Drainage features

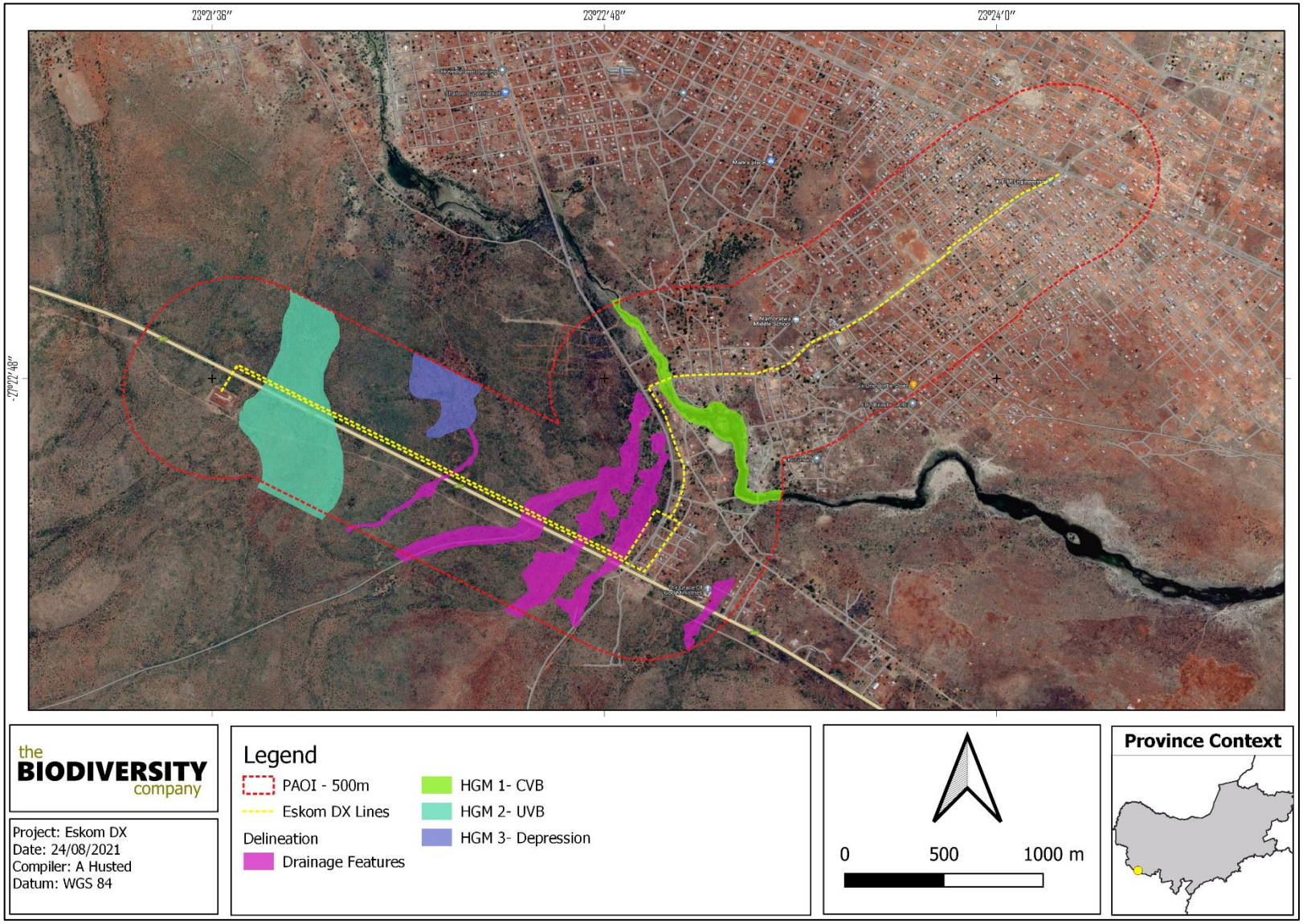


Figure 5-15 The wetlands delineated within the PAOI

5.3.2 Ecosystem Services

The ecosystem services provided by the wetlands identified within the project area were assessed and rated using the WET-EcoServices method (Kotze *et al*. 2008) (Table 5-10). The overall goods and services provided by the wetland units was determined to be moderately low.

Despite the decreased ecological integrity of the wetland systems, the valley bottom systems still provides a moderately high level of indirect benefits (ecological services) such as assimilation of nitrates, phosphates and toxicants. Ecoservices such as biodiversity maintenance, erosion control and carbon storage are provided by the wetland at an intermediate level. The wetlands are not considered important in terms of their direct provisioning

Table 5-10 Summary of the ecosystem services scores

Wetland Unit				HGM 1	HGM 2
Ecosystem Services Supplied by Wetlands	Indirect Benefits	Regulating and supporting benefits	Flood attenuation	0.9	1.2
			Streamflow regulation	0.7	0.9
			Water Quality enhancement benefits: Sediment trapping	2.2	2.0
			Water Quality enhancement benefits: Phosphate assimilation	2.1	1.7
			Water Quality enhancement benefits: Nitrate assimilation	1.9	1.5
			Water Quality enhancement benefits: Toxicant assimilation	1.9	1.6
			Water Quality enhancement benefits: Erosion control	2.1	2.5
			Carbon storage	0.8	1.6
	Direct Benefits	Biodiversity maintenance		3.0	2.0
		Provisioning benefits	Provisioning of water for human use	0.0	0.5
			Provisioning of harvestable resources	0.0	0.2
			Provisioning of cultivated foods	0.0	0.0
		Cultural benefits	Cultural heritage	0.0	0.0
			Tourism and recreation	0.2	0.2
			Education and research	0.3	0.3
Overall				**16.2**	**14.4**
Average				**1.1**	**1.0**

5.3.3 Ecological State

The present ecological state (PES) of the wetland identified within the project area is provided below. The integrity of the systems ranges from Moderately Modified (class C) to Largely Modified (class D). The land uses and expansion of developments in the area has required the traversing of watercourses, and also the placement of infrastructure proximal to wetland systems. Development of the area has also altered (or reduced) the catchment area, and this has also contributed to changes in topography and surface flows. Areas have been cleared to accommodate development of the area, and these disturbances have also contributed to the infestation of alien vegetation to the area. Considering the anthropogenic activities and influences within the landscape, several negative impacts to wetlands are expected for the area. these include:

- Encroachment of line infrastructure across watercourse, contributing to concentrated flows beneath infrastructure, causing erosion and channel straightening;
- Proximity of human activities / developments to wetlands, likely contributing to impaired water quality;

- The fragmentation of watercourse reaches and reduced connectivity caused by infrastructure; and
- Loss of catchment area and also surface runoff due to the development of the area.

Table 5-11 Summary of the scores for the wetland PES

Wetland	Hydrology	Geomorphology	Vegetation	Overall
HGM 1	C: Moderately Modified (3.5)	D: Largely Modified (4.0)	C: Moderately Modified (2.7)	C: Moderately Modified (3.4)
HGM 2	D: Largely Modified (4.0)	D: Largely Modified (4.4)	D: Largely Modified (4.0)	D: Largely Modified (4.1)

5.3.4 Ecological Importance and Sensitivity

The results of the ecological importance and sensitivity (IS) assessment are shown in Table 5-12. The ecological importance and sensitivity have been scored "High" and "Moderate" for HGM 1 and HGM 2 respectively. At a regional scale the NFEPA Wetveg database recognises valley bottom wetland types within the Eastern Kalahari Bushveld Group 3 as Least Threatened and Not Protected (Nel and Driver, 2012). The following was also considered:

- The project area is not located in a Strategic Water Source Area;
- The system is in proximity to a Critical Biodiversity Areas, namely CBA 2;
- The project area does overlap an Ecological Support Area; and
- The vegetation type is classified as Least Threatened.

Table 5-12 The ecological Importance and Sensitivity results for the wetland areas

HGM Type	Wet Veg			NBA Wetlands			SWSA (Y/N)	Calculated IS
	Type	Ecosystem Threat Status	Ecosystem Protection Level	Wetland Condition	Ecosystem Threat Status 2018	Ecosystem Protection Level		
HGM 1	Eastern Kalahari Bushveld Group 3	Least Threatened	Not Protected	C (Moderately Modified)	Critical	Not Protected	N	High
HGM 2		Least Threatened	Not Protected	D (Largely Modified)	Unclassified	Not Protected	N	Moderate

5.3.5 Buffer Analysis

The "*Buffer zone guidelines for wetlands, rivers and estuaries*" (Macfarlane *et al.,* 2014) was used to determine the appropriate wetland buffer zone for the proposed development.

Buffer zones have been used in land-use planning to protect natural resources and limit the impact of one land-use on another. A buffer zone has been prescribed for this project to serve as a "barrier" between the proposed development and the wetland systems. This buffer area would only be applicable to wetland areas that will not be lost as a result of the project.

The wetland buffer zone tool was used to calculate the appropriate buffer required for the proposed linear infrastructure (e.g. powerlines). The model shows that the largest risk posed by the project during the construction phase is that of "increased sediment inputs and turbidity". During the operational phase, the flow patterns being altered (increase flood peaks); increased sediment inputs; and altered water quality are high risks. These risks are based on what could threaten the wetland and what buffer would be required at a desktop level. A buffer zone was suggested of 20 m (Table 5-13), this buffer is calculated assuming no mitigation measures are applied. A post-mitigation buffer of 20 m is recommended for all linear infrastructure.

Table 5-13 Post-mitigation buffer requirement

Required Buffer after mitigation measures have been applied	
Linear infrastructure	**20 m**

5.3.6 Regulatory Zone

The following regulatory zones are applicable, and pertains to the project area being within 500 m from the delineated wetland systems, and 100 m from the drainage features (Table 5-14).

Table 5-14 The zone of regulation for the project

Regulatory authorisation required	Zone of applicability
Water Use License Application in terms of the National Water Act, 1998 (Act No. 36 of 1998). Department of Water and Sanitation (DWS)	Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) in accordance with GN509 of 2016 as it relates to the National Water Act, 1998 (Act 36 of 1998), a regulated area of a watercourse in terms of water uses as listed in Section 21c and 21i is defined as: • the outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; • in the absence of a determined 1 in 100 year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or • a 500m radius from the delineated boundary (extent) of any wetland or pan in terms of this regulation.

5.4 Habitat Assessment

The main habitat types identified across the Project Area of Influence were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Three habitats (one of which includes three wetland types) were delineated in total, and these are mapped in Figure 5-16 below.

Emphasis was placed on limiting timed meander searches to within the most functional habitats, and therefore habitats with a higher potential of hosting SCC. It is noted that one of the habitats observed coincides closely with the regional historical vegetation type as described by Mucina & Rutherford (2006) – that being the Modified Thornveld habitat.

The three habitats are briefly discussed in the sub-sections that follow, and a summary of the habitat types delineated within the Project Area of Influence can be seen in Table 5-15. It is noted that the wetland habitat unit is sub-divided into three wetland types – and this is especially relevant when assigning terrestrial sensitivities.

Table 5-15 Summary of habitat types delineated within the Project Area of Influence

Habitat Type	Description	Dominant Flora	Habitat Sensitivity
Transformed	Partially functional habitat that has been transformed by development and related edge effects, or other forms of significant disturbance activities.	Exotic weeds and IAP species such as *Melia azedarach.*	Low
Modified Thornveld	Dense thornveld habitat of a functionality that has been partially impacted by nearby development and associated activities.	Small trees such as *Senegalia mellifera* subsp. *detinens*, *Euclea undulata, Searsia burchellii,* and *Tarchonanthus camphoratus*. Large *Vachellia erioloba* (protected) trees were common in certain areas.	Medium

Wetland	Comprised of three wetland types, namely Channelled valley bottom, Unchanneled valley bottom, and Depression wetlands. These areas have been confirmed as permanently or seasonally wet and are considered to play an important functional role in this typically dry region.	The Channelled valley bottom wetland was the only wetland type to show a clear difference in its vegetation profile, as it is associated with the permanent Kuruman river. Common species included *Typha capensis* and *Cyperus* spp.	Medium - High

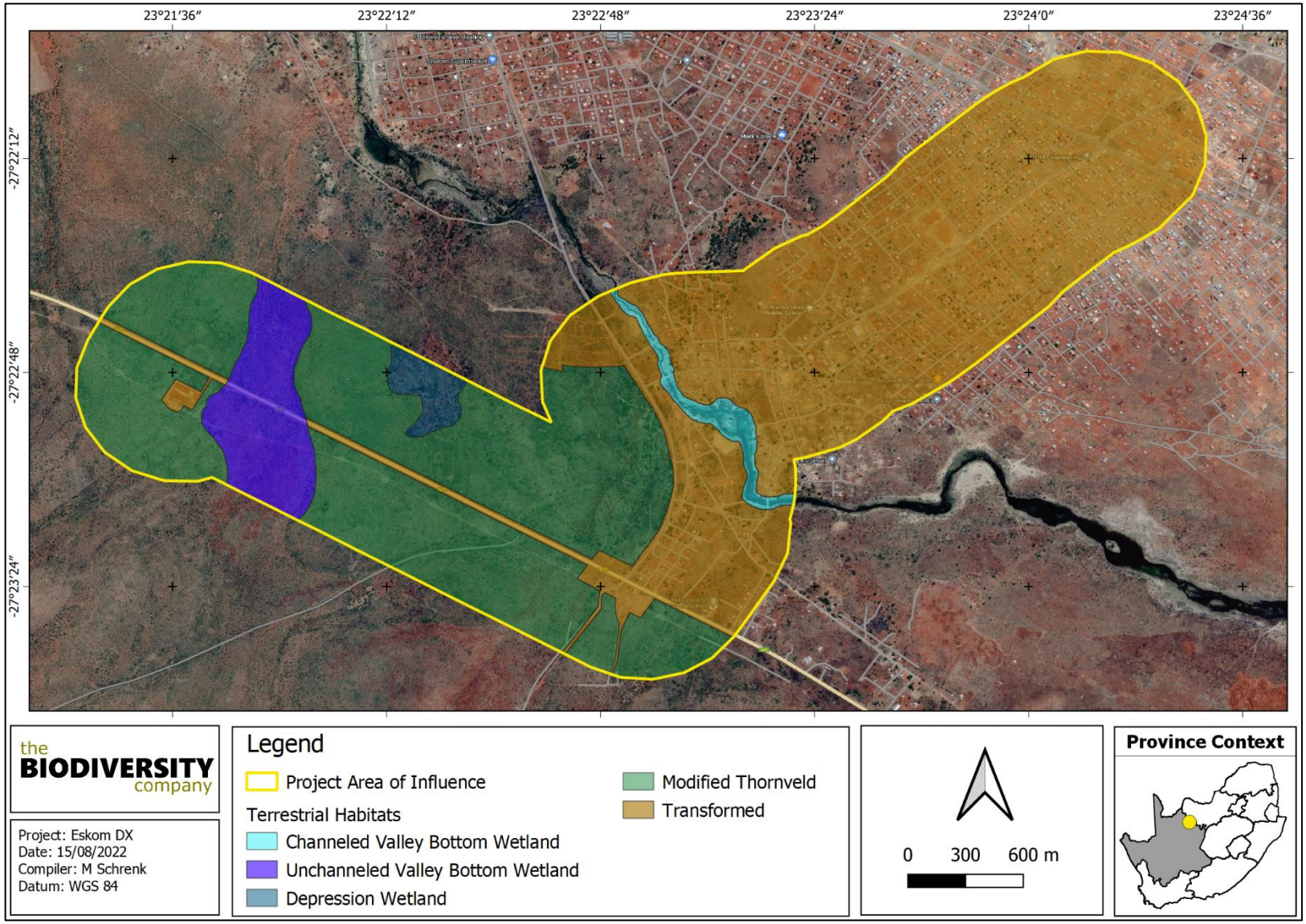


Figure 5-16 Map illustrating the habitats identified in the Project Area of Influence

5.4.1 Transformed Habitat

This habitat unit represents those areas of the PAOI that are considered to have only a low level of functionality from a terrestrial ecology perspective. Vegetation is almost entirely limited to exotic flora and IAPs, and no SCC fauna are likely to nest or regularly forage in these areas. Transformed portions represent just over 50% of the total habitat of the PAOI, and the most common features include township housing developments, roads, and cleared land.

The ecological services provided by this habitat are limited due to the extensive cover of impermeable surfaces and the large amount of bare land. Locally common bird species will forage and nest in the larger trees, however the area may not be considered a functional movement corridor.

Figure 5-17 presents a representative photograph of this habitat type.

Figure 5-17 A representative photograph of the Transformed habitat (agriculture)

5.4.2 Modified Thornveld Habitat

Modified Thornveld is the second largest habitat unit within the PAOI, only marginally smaller than the Transformed unit, and is limited to the western sections. The habitat closely represents the historical regional vegetation type as the most dominant species are as characterised by Mucina & Rutherford (2006), however, the edge effects of major roadways and the adjacent township development have resulted in the partial degradation of this habitats functionality (there are signs of regular human and domestic animal ingress).

This habitat provides important ecological services to the surrounding region, including runoff and erosion control enabling rainwater percolation, nutrient cycling within the topsoil layers supporting the healthy functioning of indigenous flora and re-seeding processes, carbon sequestration, and foraging and nesting resources for livestock and local indigenous fauna species (including occasional SCC). The wood from local trees serves as an important local resource to communities, and the seed pods of the protected *Vachellia erioloba* are noted as being a valuable fodder source for mammals and have a wide variety of traditional uses for local communities. The thornveld is also considered an important movement corridor, particularly along the Kuruman river and the nearby mountain range. Figure 5-18 presents a photograph of the Modified Thornveld habitat type.

Figure 5-18 A representative photograph of the Modified Thornveld habitat

5.4.3 Wetland Habitat

The wetland areas include those portions of land which have been confirmed as permanently or seasonally/temporarily wet, such as unchanneled and channelled valley bottom wetlands and wetland depressions. These areas, and particularly the channelled valley bottom wetland, serve as an important foraging and possible nesting resource for local fauna (including occasional SCC). The channelled valley bottom wetland runs through the bottom of the township development and is thus considered to be heavily impacted by related edge effects, such as dumping, human and domestic animal ingress, IAP invasion, and bare land. The wetlands provide critical ecological services in the form of water filtration and flood control, and they represent commonly used and important wildlife movement corridors. Figure 5-19 presents a representative photograph of the wetland habitat unit.

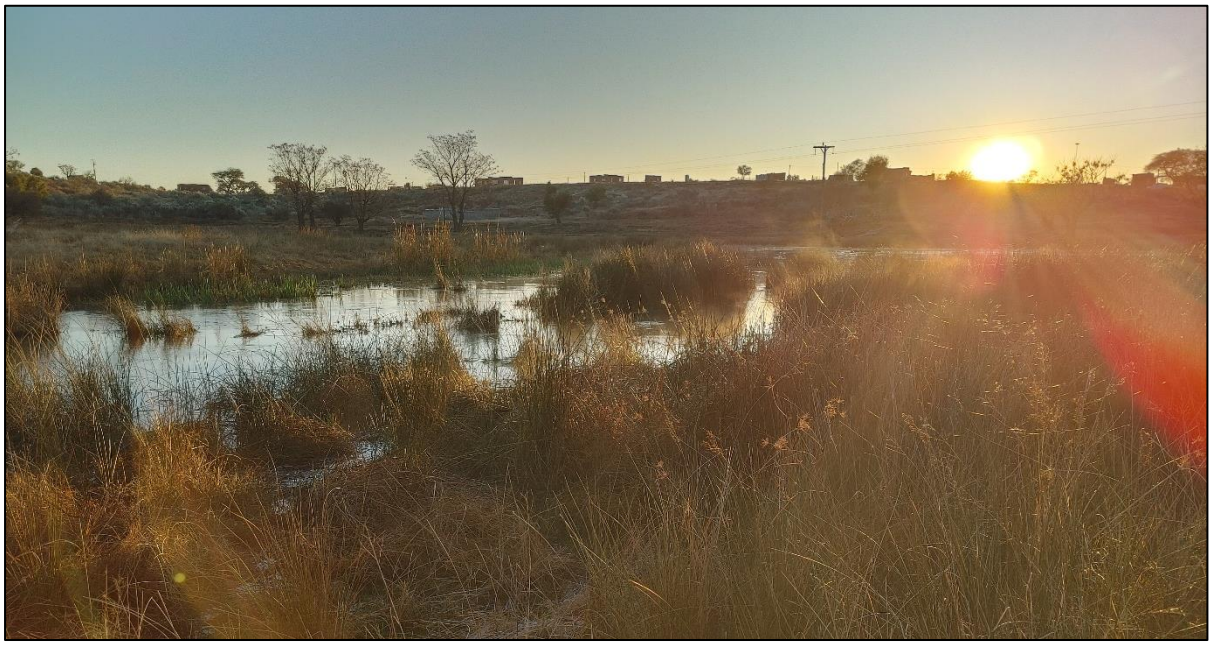


Figure 5-19 A representative photograph of the wetland habitat (channelled valley bottom)

5.5 Site Ecological Importance

Based on the criteria provided in section 4.3 of this report, the three delineated habitat types have each been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 5-16 below. In order to identify and spatially present sensitive features in terms of the relevant specialist discipline, the sensitivities of each of the habitat types delineated within the PAOI are mapped in Figure 5-20 below.

It is important to note that this map does not replace any local, provincial, or national government legislation relating to these areas or the land use capabilities or sensitivities of these environments.

Table 5-16 Sensitivity summary of the habitat types delineated within the Project Area of Influence

Habitat		Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Transformed		Medium	Medium	Medium	High	**Low**
Modified Thornveld		Medium	High	Medium	Medium	**Medium**
Wetlands	**Channelled valley bottom**	High	Medium	Medium	Low	**High**
	Unchanneled valley bottom	Medium	Medium	Medium	Medium	**Medium**
	Depression	Medium	Medium	Medium	Medium	**Medium**

Consider the following guidelines when interpreting SEI in the context of any proposed development or disturbance activities (noted in conjunction with provincial guidelines pertaining to CBA and ESA areas):

- Low: Minimisation and restoration mitigation – Development activities of medium to high impact acceptable followed by appropriate restoration activities.
- Medium: Minimisation and restoration mitigation – Development activities of medium impact acceptable followed by appropriate restoration activities.
- High: Avoidance mitigation wherever possible.
    - Minimisation mitigation – changes made to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.

Note: The Channelled valley bottom wetland is assigned a ‘High’ sensitivity rating largely because it is associated with the Kuruman river, which is listed as a ‘Critically Endangered’ system according to the NBA (2018) dataset. Additionally, in this arid region wetland systems such as these serve as important movement and foraging corridors for regional fauna, which includes any local SCC avifauna that are likely to occur.

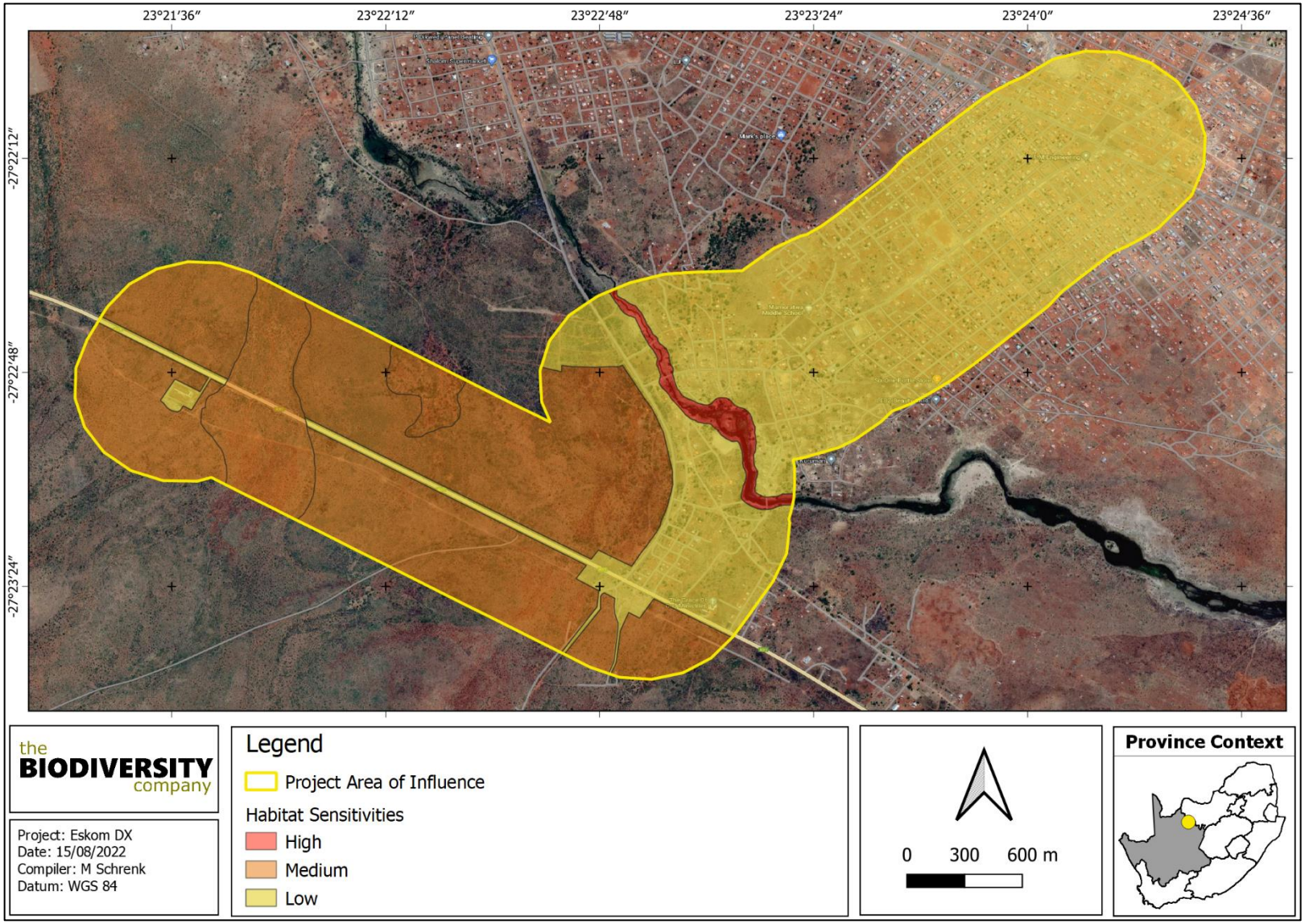
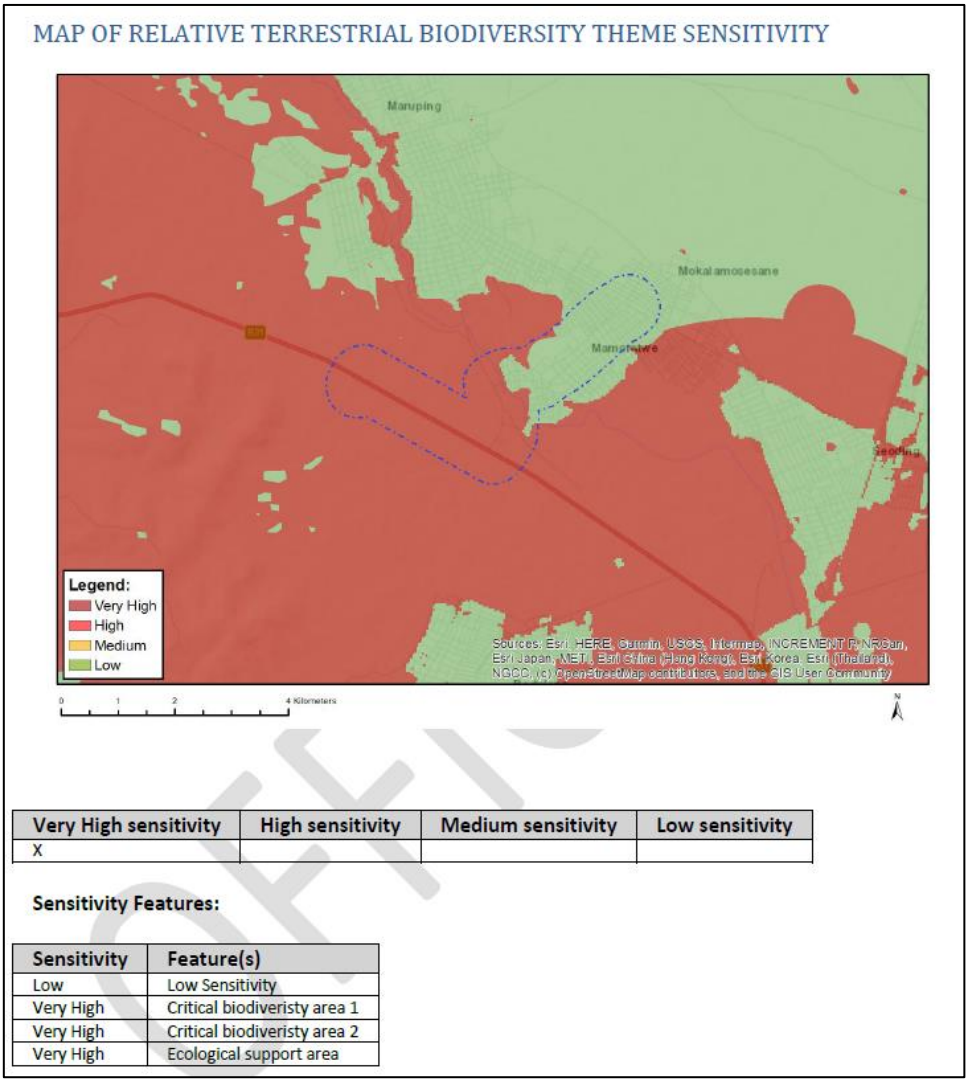


Figure 5-20 Map illustrating the sensitivities of the habitats delineated within the overall Project Area of Influence

5.5.1 Screening Tool Comparison

The terrestrial biodiversity theme sensitivity as indicated by the screening tool report for the PAOI was derived to be 'Very High' (Figure 5-21), due to the CBA status of some of the areas.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical biodiveristy area 1
Very High	Critical biodiveristy area 2
Very High	Ecological support area

Figure 5-21 Terrestrial Biodiversity Theme Sensitivity for the Project Area of Influence (National Environmental Screening Tool, 2022)

The completion of the terrestrial desktop and field studies partly disputes the 'Very High' sensitivity presented by the screening report. As discussed above, most of the area represents either Transformed or Modified Thornveld habitat – both of which have been exposed to varying levels of historical disturbance. The transformed habitat unit is considered to be significantly disturbed and as such is assigned a 'Low' sensitivity, and the Modified Thornveld areas maintain a good level of functionality and are thus assigned a 'Medium' sensitivity. A small portion of land within the PAOI, namely the Channelled valley bottom wetland habitat, is part of a 'Critically Endangered' system and maintains significant ecological value – and it is therefore assigned a 'High' sensitivity.

The screening report classified both the animal and plant species themes as being of a 'Medium' sensitivity, and the avian species theme was assigned a 'Low' sensitivity. Following the findings of the field survey, the animal, plant, and avian species themes should all be assigned a sensitivity of 'Medium', based on the fact that fauna SCC will occasionally forage along the river and certain species may nest in the larger trees. The presence of a large number of protected trees and provincially protected plants increases the plant species theme sensitivity for the area.

6 Impact Assessment and Management Plan

The sections below serve to outline and summarise the types of perceived impacts from the proposed activities on the terrestrial biodiversity and ecology of the Project Area of Influence. The associated significance of each impact is evaluated as relevant to the local biodiversity and the likely project activities.

6.1 Biodiversity Risk Assessment

6.1.1 Impact Assessment Considerations and Procedure

The project activities will have a negative effect on the natural environment of the area. Anthropogenic activities drive habitat destruction leading to the displacement of fauna and flora and possibly causing direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, foraging and nesting sites, and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation is likely to reduce the habitat available for all types of fauna species and hence reduce animal populations and species compositions within the area.

Potential impacts were evaluated against the data captured during the desktop assessment and field survey to identify associated relevance to the habitats within the PAOI. The impacts associated with the proposed activities were then subjected to a prescribed impact assessment methodology, which is available on request. The planning, decommissioning and/or rehabilitation phases were not considered based on the nature of the likely activities and the associated negatable impacts expected during these phases. Refer to section 6.2 below for the full quantitative impact assessment.

6.1.2 Present Impacts to Biodiversity

Considering the fact that anthropogenic activities have historically taken place throughout most of the region, and continue to do so, several significantly negative impacts to biodiversity were observed within and adjacent to the PAOI. These include:

- Historic land modification largely in the form of building, road and powerline infrastructure, and the associated land clearing and edge effects;
- Air, dust, water, and noise pollution;
- Major national roads (and associated heavy vehicle traffic and the possibility of wildlife road mortalities);
- Invasive Alien Plants and weeds;
- Livestock grazing;
- Human and vehicle ingress, and dumping;
- Bare land and the corresponding high erosion potential; and
- Fencing, including barbed wire and electric fencing.

As illustrated in Figure 6-1 and Figure 6-2, powerline infrastructure as well as human and vehicle ingress, and the associated extensive dumping of litter and rubble throughout many areas within the PAOI, are considered to be some of the most significant negative impacts to the remaining portions of functional habitat.

Figure 6-1 Photograph: Powerlines, and the associated infrastructure, have historically impacted the area

Figure 6-2 Photograph: Ingress (and the associated dumping) is one of the most significant negative impacts to the remaining functional portions of the PAOI

6.1.3 Loss of Irreplaceable Resources

The proposed activities are likely to be of a medium impact and relatively large linear footprint, and the careful placement of certain developments and activities is therefore important so as to minimise the damage to natural resources.

The proposed activities will be conducted over 'Least Concern' Kuruman Thornveld vegetation, and largely within the Transformed and Modified Thornveld habitat units. It is noted that portions of the affected PAOI are comprised of important wetland areas and functional thornveld, and these sections encompass indigenous vegetation and water resources that may be considered sensitive in nature. Thus, any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- Critical Biodiversity Areas and functional Ecosystem Support Areas;
- 'Critically Endangered' wetland and river areas providing valuable foraging and nesting resources;
- Important ecological corridors (including foraging and traversing routes, and/or nesting sites); and
- SCC fauna species (through direct mortality during clearing and construction activities, or through indirect mortality via the inappropriate control of waste material).

The loss of these resources would be considered significant. Therefore, mitigations must be put in place and implemented to prevent the total and widespread destruction of functional natural resources (see section 6.4).

6.1.4 Anticipated Impacts

The project activities will lead to several significant impacts to terrestrial biodiversity, which are presented as an overview in Table 6-1 below. It is important to predict and quantify these impacts so as to assess the magnitude and effect that each may have on the local terrestrial biodiversity and ecology.

The impacts described are to be used as a guideline for the main impact assessment procedure that is to be followed.

Table 6-1 Anticipated impacts for the proposed activities on terrestrial biodiversity

Main Impact	Project activities that are likely to cause the impact	Secondary impacts anticipated
Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation, including protected species	• Displacement/loss of flora & fauna (including possible SCC); • Loss of protected species; • Increased potential for soil erosion; • Habitat fragmentation; • Increased potential for the establishment of IAP vegetation; and • Erosion
	Development of access roads and servitudes	
	Soil dust precipitation	
	Dumping of waste products	
	Random events such as fire (cooking fires or cigarettes)	
	Walking and driving outside of demarcated routes (roads and paths)	
Spread and/or establishment of Invasive Alien Plants	The removal of indigenous vegetation	• Habitat loss for native flora & fauna (including SCC); • Spreading of potentially dangerous diseases due to invasive and pest species; • Alteration of fauna assemblages due to habitat modification; and • Displacement of indigenous bird species
	Vehicles and people spreading seed	
	Unsanitary conditions surrounding infrastructure, promoting the establishment of alien and/or invasive rodents	
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	

Direct mortality of fauna	Clearing of vegetation and the mass dumping of earth waste Roadkill due to vehicle collision (non-compliance with speed limits etc.) Pollution of water resources due to dust effects, chemical spills, etc. Intentional killing of fauna for food or sale	• Loss of habitat; • Loss of ecosystem services; • Increase in rodent populations and associated disease risk; and • Deterioration of local ecology
Reduced dispersal/migration of fauna	Activities causing significant noise (heavy machinery) Construction of linear infrastructure (large roads and powerlines) Compacted roads Removal of vegetation	• Loss of landscape used as a corridor; • Reduced dispersal/migration of fauna; • Loss of ecosystem services; and • Reduced plant seed dispersal
Environmental pollution due to water runoff, spills from vehicles and erosion	Chemical (organic/inorganic) spills Erosion Poor maintenance and control of vehicles and machinery Pipe leaks (poor maintenance)	• Faunal mortality (direct and indirect – such as through poisoning); • Groundwater pollution; • Pollution of watercourses and the surrounding environment; and • Loss of ecosystem services
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, and light pollution	Operation of machinery (Large earth moving machinery, vehicles) Vehicle traffic	• Disruption/alteration of ecological life cycles due to noise; • Loss of ecosystem services; and • Loss of local faunal community
Loss of SCCs and/or protected species	All unregulated/unsupervised activities outdoors Poaching and trapping Staff and others interacting directly with fauna (potentially dangerous), or flora	• Loss of SCCs; and • Harm to people (dangerous fauna)

6.1.5 Unplanned Events

The planned activities will have anticipated impacts as discussed above; however, unplanned events may occur on any project, and these could lead to potential impacts which will require appropriate management and response.

Table 6-2 is a summary of the findings of an unplanned event assessment conducted from a terrestrial ecology perspective. Note that not all potential unplanned events may be captured herein, and this process must therefore be managed throughout all phases and according to events that take place or have a high likelihood of taking place.

Table 6-2 Summary of unplanned events, potential impacts and mitigations

Unplanned Event	Potential Impact	Mitigation
Spills into the surrounding environment	Contamination of habitat as well as water resources associated with a spillage.	A spill response kit must be available at all times. The incident must be reported on, and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.
Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland.	An appropriate fire management plan needs to be compiled and implemented.
Erosion caused by water runoff from the surface	Erosion on the side of the roads and cleared areas.	A storm water management plan must be compiled and implemented.

6.1.6 Alternatives considered

Two alternative powerline routes were presented by the client for consideration, 'Preferred Route Section 1' and 'Alternative Route Section 1'. Following the findings of the sensitivity assessment it is noted that 'Preferred Route Section 1' is considered optimal, as this route avoids some 'Medium' sensitivity areas and is closer to the roadway (where the edge effects of the road on the thornveld habitat are more pronounced). The final preferred route option will be discussed following the findings of the impact assessment below.

6.2 Quantitative Biodiversity Impact Assessment

6.2.1 Overview: Assessment of Impact Significance

The assessment of impact significance considers both pre-mitigation as well as post-mitigation scenarios as relevant to each potential impact. Construction phase, operational phase, and cumulative impacts are discussed and assessed below, and the project specific mitigation actions required to lower the risks of the impacts are provided in section 6.4 of this report. No planning or decommissioning/rehabilitation phases were considered based on the nature of the activities.

Certain details have been provided with regards to the nature of the intended development activities, and these have been used as part of the assessment process to aid in the estimation of the likely significance ratings for each predicted impact type.

Two alternative routes were provided, and thus each impact presented below is assessed according to each route option, as relevant to both phases (construction and operational). Refer to Figure 6-3 below for an outline and description of the final impact rating scores as assigned.

6.2.2 Construction Phase Impacts

Four main impacts on the terrestrial biodiversity and ecology of the PAOI were considered for the construction phase of the proposed activities (based on the framework discussed above). This phase refers to the period during site preparation, clearing and construction and is considered to have the largest short-term and direct impact on biodiversity - partly as a result of the high levels of regular activity, and the extensive clearing that usually takes place. The following potential impacts to terrestrial biodiversity were considered, and these are each assessed for their significance in Table 6-3 and

Table 6-4 that follows below:

- Destruction, loss and fragmentation of habitats (including wetlands), functional ecosystems and the vegetation community (including protected flora);
- Introduction of IAP species and invasive fauna;
- Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching); and
- Spilling of hazardous chemicals into the receiving environment, and the penetrating of these into sensitive habitats.

All likely impacts are rated as medium to highly negative pre-mitigation but may be reduced to low significance through the proper implementation of effective mitigation measures. The most important mitigation measures for this phase are as follows:

- Ensure that the site footprint is as small as possible and responsibly positioned;
- No workers or machinery is to be allowed outside of the construction areas, especially where these occur adjacent to high-sensitivity wetland habitat;

- New powerlines must make use of existing supportive infrastructure as far as possible (i.e., bridges and cleared areas);
- Cement and oil spills and leaks must be prevented, and an emergency response plan must be in place to deal with unplanned events;
- All activities should be restricted to the 'Low' sensitivity areas as far as possible and laydown areas must be restricted to the 'Low' sensitivity areas;
- Any land clearing must be minimised and performed over at least two days - conducted linearly and successively; and
- No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard.

6.2.3 Operational Phase Impacts

The impacts of daily activities associated with the operational phase of the project are anticipated to further spread the IAP species, and lead to the further deterioration of habitats due to the continuing presence of dust and other edge effect impacts. Dust inhibits the ability of plants to photosynthesize and thus leads to the degradation of surrounding natural areas. Additionally, moving maintenance vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but will also lead to displacement and direct faunal mortalities due to collisions.

The operational phase is often the longest phase of a project and as such the effects from impacts have the opportunity to cumulate over long periods of time and cause significant cumulative damage to the environment. It is important to actively and continuously implement and update the relevant mitigation measures for this phase so as to effectively reduce this compounding effect.

The following potential impacts were considered for this phase of the project, and these are each assessed for their significance in Table 6-3 and

Table 6-4 below:

- Continued fragmentation and degradation of functional habitats and ecosystems (including that caused by spill events);
- Continuing spread of IAP and weed species;
- Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.);
- Increased erosion (high velocity surface run-off due to an increase in impervious surfaces, and the presence of bare land); and
- Bird collisions and electrocutions with newly established powerlines.

All potential impacts may be reduced from a significance rating of medium to highly negative down to low to medium negative with the proper implementation of ongoing mitigation measures. The most important mitigation measures to implement during this phase include:

- The development and rapid implementation of an emergency response plan, particularly related to spills into the wetland areas;
- The monitoring of, and enforcement against, illegal hunting, poaching, and/or trapping activities;
- An IAP management and habitat rehabilitation plan must be implemented and updated annually – this especially pertains to the highly sensitive wetland areas; and

- Powerline design and construction must consider and implement the following Mitigation actions and Bird sensitive designs (specifically pages 5 and 6 of the document).

Table 6-3 Construction and Operational phase Impact Assessment – Preferred Route Section 1

Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Cumulative Impact	Irreplaceable loss	Final score
Destruction, loss and fragmentation of habitats (including wetlands), functional ecosystems and the vegetation community (including protected flora)	Construction	-17	-6,75	1	1	**-6,75**
Introduction of IAP species and invasive fauna	Construction	-14	-7,5	2	1	**-8,4375**
Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching)	Construction	-12,75	-6,5	1	2	**-7,3125**
Spilling of hazardous chemicals into the receiving environment, and the penetrating of these into sensitive habitats	Construction	-18	-5,5	1	2	**-6,1875**
Continued fragmentation and degradation of functional habitats and ecosystems (including that caused by spill events)	Operation	-19	-6	2	2	**-7,5**
Continuing spread of IAP and weed species	Operation	-10,5	-6	1	1	**-6**
Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc)	Operation	-12	-6	1	2	**-6,75**
Increased erosion (high velocity surface run-off due to an increase in impervious surfaces, and the presence of bare land)	Operation	-13	-5	1	1	**-5**
Bird collisions and electrocutions with newly established powerlines	Operation	-20	-9,75	2	3	**-13,40625**

Table 6-4 Construction and Operational phase Impact Assessment – Alternative Route Section 1

Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Cumulative Impact	Irreplaceable loss	Final score
Destruction, loss and fragmentation of habitats (including wetlands), functional ecosystems and the vegetation community (including protected flora)	Construction	-18	-7,5	1	1	**-7,5**
Introduction of IAP species and invasive fauna	Construction	-14	-7,5	2	1	**-8,4375**
Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching)	Construction	-12,75	-6,5	1	2	**-7,3125**
Spilling of hazardous chemicals into the receiving environment, and the penetrating of these into sensitive habitats	Construction	-18	-5,5	1	2	**-6,1875**
Continued fragmentation and degradation of functional habitats and ecosystems (including that caused by spill events)	Operation	-19	-9	2	2	**-11,25**
Continuing spread of IAP and weed species	Operation	-10,5	-6	1	1	**-6**
Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc)	Operation	-12	-6	1	2	**-6,75**
Increased erosion (high velocity surface run-off due to an increase in impervious surfaces, and the presence of bare land)	Operation	-13	-5	1	1	**-5**
Bird collisions and electrocutions with newly established powerlines	Operation	-20	-9,75	2	3	**-13,40625**

Significance Rating	Description
<-17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
≥-17, ≤-9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
>-9, < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
>17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

Figure 6-3 Description of the final impact score ratings (EIMS, 2021)

6.2.4 Cumulative Impacts

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts pre-existing in an area or region, it is appropriate to consider the cumulative effects of development or disturbance activities. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a specific point in time may actually represent a significant change from the original state of the system. This section describes the potential cumulative impacts of the project on local fauna and flora specifically.

Cumulative impacts are assessed within the context of the extent of the proposed PAOI, other similar developments and activities in the area (existing and in-process), and general habitat loss and transformation resulting from any other activities in the area. Localised cumulative impacts include those from operations that are close enough (generally within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors. Relevant impacts include the overall reduction of foraging and nesting habitat, dust deposition, noise and vibration, disruption of functional corridors of habitat important for movement and migration, disruption of waterways, groundwater drawdown, and groundwater and surface water quality depletion.

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including functional habitat and unique vegetation types, and these impacts can even lead to the degradation of conserved areas such as nearby reserves.

6.2.4.1 Cumulative Impact Assessment

The overall cumulative impact assessment is presented in Table 6-5 below. Note that this also accounts for the relative importance of the habitats within and adjacent to the PAOI, in the context of the value of the regional habitat.

The spatial loss of ground-based habitat as a result of the linear 22 KV powerline would be considered relatively negligible, and the main cumulative loss considered would be the loss of undisturbed flyways in the region due to powerline development – and the resulting increase in bird mortalities. Few medium to high voltage powerline routes were noted in the area, and a low number of large wing-span SCC birds are expected, thus the cumulative effect of the proposed project is rated as low.

Table 6-5 Cumulative Impact Assessment

Impact	Project in isolation						Cumulative effects					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
	3	2	2	3	3		3	3	2	3	3	
Loss of regional flyways, functional habitat corridors and wetland habitat connectivity.	One year to five years: Medium Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	**Low**	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	**Low**

6.3 No-Go Scenario

The current land use of the more functional areas (wetland and thornveld habitats) is largely related to the supply of valuable ecological services, which includes the provision of foraging and nesting resources and important habitat corridors. The no-go scenario is therefore ultimately preferred from an ecological perspective. However, should the development proceed, taking into account all of the mitigation measures provided herein, the loss of some of these resources/functions would not be considered significant.

6.4 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 6-6 presents the recommended mitigation measures and the respective timeframes, targets, and performance indicators relative to the terrestrial assessment.

The focus of mitigation measures is to reduce the significance of the likely impacts associated with the development, and thereby to:

- Prevent the significant loss and fragmentation of vegetation communities within the CBA and ‘Critically Endangered’ wetland areas in the PAOI;
- Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities, including SCC; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the Project Area of Influence (see Table 4-6).

Special attention must be paid to the ‘Vegetation and Habitats’ and ‘Fauna’ sections below as these sections provide recommended and important mitigation measures pertaining to the protected species present, and the possible presence of SCC.

Table 6-6 Project specific mitigation measures including requirements for timeframes, roles and responsibilities

Management outcome: Vegetation and Habitats				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
All protected flora must be clearly demarcated prior to the commencement of site clearing. If construction activities are likely to affect any protected plants, these individuals should be relocated as part of a plant search and rescue plan and a permit must be obtained before doing so.	Planning Phase	Environmental Officer	Protected plants	During phase
All high sensitivity areas should be avoided, and these areas should be clearly demarcated by non-hazardous/dangerous fencing or temporary tape. Powerline support poles must not be planted within high sensitivity areas.	Construction Phase	Project manager & Environmental Officer	Development footprint	Ongoing
Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to the 'Low' sensitivity areas.	Construction Phase	Project manager, Environmental Officer	Development footprint	Ongoing
The clearing of vegetation must be minimized where possible. All activities must be restricted to within the authorised areas. It is recommended that areas to be developed be specifically and responsibly demarcated so that during the construction phase only the demarcated areas be impacted upon.	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
No workers or machinery is to be allowed outside of the construction areas, especially where these occur adjacent to high-sensitivity wetland habitat.	Construction Phase	Environmental Officer and Contractor	Development footprint	During phase
Regular powerline checking and maintenance must be conducted.	Operational Phase	Environmental Officer and inspection/maintenance team	Routine checking	Ongoing
Existing access routes, especially roads, must be made use of.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.	Construction and Operational Phase	Environmental Officer, Design Engineer, and Contractor	Laydown areas	Ongoing

Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by invasive alien plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. • **Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.** • **No servicing of equipment on site unless necessary.** • **All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.** • **Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.** • **Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.** • **All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.**	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing
It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
A fire management plan needs to be complied and implemented to restrict the impact fire would have on the surrounding areas.	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
All construction waste must be removed from site at the closure of the construction phase.	Construction phase	Environmental Officer & Contractor	Construction waste	During Phase
New powerlines must make use of existing supportive infrastructure (i.e., bridges and cleared areas).	Construction phase	Environmental Officer & Contractor	Use existing infrastructure	During Phase

Pipeline and oil spills and leaks must be prevented, and an emergency response plan must be in place to deal with unplanned events. Cement mixing may not be conducted within 50 m of any wetland areas.	Construction phase	Environmental Officer & Contractor	Pipeline leaks	During Phase
Management outcome: Fauna				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Powerline construction must follow the guidelines as set out in this document**.**	Operational Phase	Environmental Officer, Contractor	Bird collisions and electrocution	Ongoing
A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SCC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal SCC	During phase
Clearing and disturbance activities must be conducted in a progressive linear manner and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.	Construction Phase	Environmental Officer & Contractor	Progressive land clearing operations and the movement of fauna	Ongoing
The areas to be disturbed should be specifically and responsibly temporarily demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
The duration of the activities should be minimized to as short a term as possible, to reduce the period of disturbance on fauna.	Construction	Project manager, Environmental Officer & Design Engineer	Construction/Closure Phase	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to reptile species and nocturnal mammals.	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed and Signs must be put up to enforce this. Monitoring must take place in this regard.	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing

All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training	Ongoing
Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.	Life of operation	Project manager, Environmental Officer & Design Engineer	Activities should take place during the day	Ongoing
Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in, and subsequently inspected prior to backfilling.	Planning and Construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
Use environmentally friendly cleaning and dust suppressant products.	Construction and operation	Environmental Officer & Contractor, Engineer	Presence of chemicals in and around the project area	Ongoing
Management outcome: Alien species				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
An Invasive Alien Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual change in IAP composition.	Life of operation	Project manager, Environmental Officer & Contractor	Manage and assess presence and encroachment of alien vegetation	Twice a year
The footprint area of the construction should be kept to a minimum. The footprint area should be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas.	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
Management outcome: Dust				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency

Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. **No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.**	Construction phase	Contractor	Dustfall	Dust monitoring program.
Management outcome: Waste management				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible.	Life of operation	Environmental Officer & Contractor	Waste Removal	Weekly
Litter, spills, fuels, chemical and human waste in and around the project area must be minimised and controlled according to the waste management plan.	Construction/Closure Phase	Environmental Officer & Health and Safety Officer	Presence of Waste	Daily
A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Life of operation	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.	Life of operation	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste	Ongoing
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Collection/handling of the waste	Ongoing
Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.	Life of operation	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing, every 10 days
Management outcome: Environmental awareness training				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency

All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. **Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of sensitive habitat types and fauna species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. Contractors and employees must all undergo the induction and must be made aware of the sensitive wetland areas to be avoided.**	Pre-construction phase	Health and Safety Officer, Environmental Officer	Compliance to the training	Ongoing

Management outcome: Erosion				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage to nearby wetlands as a result of excessive erosion.	Operational Phase and Closure	Project manager, Environmental Officer, Contractor	Rehabilitation	During Phase
Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Only existing access routes and walking paths may be made use of.	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

6.5 Risk Assessment

A risk assessment was conducted in line with Section 21 (c) and (i) of the National Water Act, 1998, (Act 36 of 1998) to investigate the level of risk posed by proposed project, namely the installation of the distribution line. The risks posed by the proposed development to wetlands within the project area are provided in Table 6-7 for scenarios with and without mitigation. The proposed location for the towers is unknown, but it has been assumed that avoidance of the wetland area is feasible. It is possible that some of the towers will encroach into the recommended buffer areas. The key consideration for the risk assessment will be the placement of the towers.

During construction (and without mitigation) the clearing and preparation of the distribution line route and storage of equipment may lead to the disturbance and degradation of wetland vegetation (in non-cultivated areas), increased bare surfaces, runoff and potential for erosion. Additionally, the excavation, levelling and installation of distribution towers may lead to increased sediment loads and contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles as well as contamination and eutrophication of wetland systems with human sewerage and litter.

Once constructed the routine operation and maintenance of powerline route will invariably result in the degradation of vegetation due to mandatory and routine clearing of vegetation within the powerline servitude. This would not be required for cultivated areas (for example), whereby the existing servitude is likely to be used. The route together with any residual disturbances from construction may facilitate proliferation of alien and invasive species, if not managed appropriately. Risks associated with decommissioning the powerline infrastructure centre on vegetation degradation from vehicle access and increased bare surfaces, runoff and potential for erosion from the removal of the tower infrastructure. A number of mitigation measures are provided in Table 6-7 which would, if implemented effectively, reduce the significance of all anticipated impacts to Low.

Overall, all anticipated risks are considered to have a Low impact significance provided that the mitigation measures presented in Table 6-7 are effectively implemented. Under this assumption, it is the opinion of the specialist that the proposed development should not warrant any more than a General Authorisation in terms of water use licensing.

Table 6-7 DWS Risk Impact Matrix for the proposed project (Andrew Husted Pr Sci Nat 400213/11)

Activity	Aspect	Impact	Mitigation Scenario	Severity: Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
Construction																			
Clearing and preparation of powerline route including storage of equipment	Wetland vegetation deterioration and soil exposure.	Disturbance and degradation of wetland vegetation	Without	1	1	3	3	2	1	3	6	2	2	5	1	10	60	M	• Restrict the disturbance and clearance footprint to within 15 m on either side of the proposed powerline route. • Try avoid wetlands and buffers where feasible. Implement a rehabilitation plan. Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas. • Although the prescribed post-mitigation buffer as per the national buffer determination tool is 20 m attempt wherever possible to maintain a 30 m buffer on the delineated wetlands to lower the potential for bird collisions which are highest near water resources. • Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the identified drainage lines. • Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas.
			With	1	1	1	1	1	1	3	5	2	1	5	1	9	45	L	
		Increased bare surfaces, runoff and potential for erosion	Without	2	2	2	2	2	2	2	6	3	3	1	1	8	48	L	• Keep tower hole excavation and soil heaps neat and tidy. • Limit construction activities to the dry season when storms are least likely to wash concrete and sand into wetlands. This is only where towers are within wetlands and buffer areas. • Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. • Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished. • Limit the placement of towers within wetlands and buffer areas where feasible. • Do not situate any of the construction material laydown areas within any wetland or buffer area. Try adhere to a 20 m buffer in these instances. • No machinery should be allowed to parked in any wetlands or buffer areas.
			With	1	1	1	1	1	2	2	5	3	1	1	1	6	30	L	

Activity	Aspect	Impact	Mitigation Scenario	Severity: Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
		Introduction and spread of alien and invasive vegetation	Without	1	1	3	3	2	1	2	5	3	3	5	1	12	60	M	• Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. • Limit soil disturbance
			With	1	1	2	1	1.25	1	2	4.25	3	1	1	1	6	26	L	• The use of herbicides is not recommended in or near wetlands (opt for mechanical removal). • Appropriately stockpile topsoil cleared from the distribution line footprint. • Clearly demarcate distribution line construction footprint, and limit all activities to within this area. • Minimize unnecessary clearing of vegetation beyond the tower footprints and distribution line corridors. • Lightly till any disturbed soil around the tower footprint to avoid compaction.
Excavation, levelling and installation of distribution towers.	Soil disturbance, sedimentation	Increased sediment loads to downstream reaches	Without	2	2	2	2	2	2	2	6	3	3	1	1	8	48	L	• See mitigation for increased bare surfaces, runoff and potential for erosion
			With	1	1	1	1	1	1	2	4	3	1	1	1	6	24	L	• Re-instate topsoil and lightly till distribution tower disturbance footprint.
		Contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles as well as Contamination and eutrophication of wetland systems with human sewerage and litter.	Without	2	3	2	2	2.25	2	2	6.25	3	3	1	1	8	50	L	• Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.
			With	1	3	1	1	1.5	2	2	5.5	3	1	1	1	6	33	L	• Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering wetland or buffer areas. • Mixing of concrete must under no circumstances take place within the wetland or buffer areas. • Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter. • Provide appropriate sanitation facilities for workers during construction and service them regularly. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility; • The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site;

Activity	Aspect	Impact	Mitigation Scenario	Severity: Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
																			• Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility.
Operation																			
Routine operation and maintenance of powerline route	Clearing of wetland vegetation beneath powerline	Degradation of wetland vegetation wetland vegetation.	Without	1	1	1	3	1.5	2	1	4.5	3	1	5	1	10	45	L	• Clear vegetation in line with the 2010 Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead powerline servitudes". • Avoid the use of herbicides and diesel to treat stumps within the wetland areas. • Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas.
			With	1	1	1	23	6.5	2	1	9.5	3	1	5	1	10	95	L	
	Alien and Invasive species	Proliferation of alien and invasive species	Without	1	1	3	4	2.25	2	2	6.25	3	1	5	1	10	63	M	• In line with the 2010 Eskom Environmental Procedure Document entitled "*Procedure for vegetation clearance and maintenance within overhead powerline servitudes*" all alien vegetation along the transmission servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. By this Eskom is obliged to control category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas.
			With	1	1	1	4	1.75	2	1	4.75	3	1	5	1	10	48	L	
Decommissioning																			
Removal of distribution towers and lines	Vehicle access	Degradation of wetland vegetation and proliferation of alien and invasive species	Without	2	2	2	3	2.25	1	2	5.25	3	1	5	1	10	53	L	• See mitigation for the impacts on direct loss, disturbance and degradation of wetlands and spread of alien and invasive plants. • Control should continue for a minimum of three years following decommissioning.
			With	1	1	2	3	1.75	1	2	4.75	3	1	5	1	10	48	L	

				Severity															
Activity	Aspect	Impact	Mitigation Scenario	Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
	Re-excavation of distribution Towers	Increased bare surfaces, runoff and potential for erosion	Without	2	2	2	2	2	2	2	6	3	3	1	1	8	48	L	• See mitigation for increased bare surfaces, runoff and potential for erosion and increased sediment loads during construction
			With	1	1	1	1	1	2	2	5	3	1	1	1	6	30	L	

7 Conclusion and Impact Statement

Functional CBA and ESA areas occur within the PAOI, and a 'Critically Endangered' river system crosses through the area. The CBA area coincides with the river system and associated Channelled valley bottom wetland, and the ESA areas coincide with the larger Modified Thornveld areas to the west of the PAOI. According to SANBI (2017), CBAs need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems, and ESAs should be maintained in at least a fair ecological condition. To ensure this it is important that the management outcomes presented above be adhered to, to properly mitigate the negative environmental impacts that will stem from the project activities.

Fauna SCC, such as *Polemaetus bellicosus* (Martial Eagle), are expected to occasionally occur within the PAOI due to its proximity to a protected area, important perennial wetland systems, and a large mountain range. No flora SCC were recorded, however a large number of protected *Vachellia erioloba* (Camel Thorn) trees and several provincially protected plant species were observed. Permits must be obtained prior to any protected flora being disturbed as a result of project activities.

Completion of the terrestrial biodiversity assessment led to an overall disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The majority of the PAOI is instead assigned a sensitivity 'Low' to 'Medium' apart from the Channelled valley bottom wetland area which is assigned a sensitivity of 'High' - based on the presence of a 'Critically Endangered' ecosystem and the valuable ecosystem services it provides.

Three (3) natural wetland units were identified and delineated for the project. The channeled valley bottom wetland and the unchanneled valley bottom wetlands will be traversed by the powerline. The depression wetland is not in a position in the landscape to be adversely affected by the project. The integrity of the systems ranged from Moderately Modified (class C) to Largely Modified (class D), with the overall goods and services provided by the wetland units determined to be moderately low. The ecological importance and sensitivity have been scored "High" and "Moderate" for HGM 1 and HGM 2 respectively. A post-mitigation buffer of 20 m is recommended for all linear infrastructure.

7.1 Impact Statement

The main impacts that may be expected to occur, as a result of the proposed activities, include the following:

- Direct habitat loss and fragmentation (including the loss of CBA areas and a 'Critically Endangered' wetland ecosystem) and the degradation of surrounding habitat;
- Spills into important aquatic habitat and increased erosion;
- Disturbance and displacement of SCC fauna (including direct mortality of fauna and bird collisions due to the construction of new powerlines); and
- Introduction and further spreading of IAP and weed species.

All mitigation measures as described in this report must be implemented so as to reduce the significance of all anticipated impacts to an acceptable level (from 'High' - 'Medium' to 'Medium' - 'Low'). The cumulative impact of the project, taking into account the transformation of surrounding land, is rated as 'Low' due to the fact that the powerline footprint is relatively small when compared to the remaining extent of open local habitat and flyways.

Considering the assessment findings, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project may be favourably considered, on condition that all prescribed mitigation measures are implemented.

All anticipated risks are considered to have a Low residual impact significance provided that the mitigation measures are effectively implemented. Under this assumption, it is the opinion of the specialist that the proposed development should not warrant any more than a General Authorisation in terms of water use licensing.

7.2 Specialist Recommendations

The channeled valley bottom wetland portion in the central section of the PAOI is assigned a 'High' sensitivity rating and as such development in this area must be limited where possible and special precautions must be taken to avoid causing significant damage to the wetland environment. An IAP management plan must be implemented for the project, with special provisions for the 'High' and 'Medium' sensitivity areas.

Two alternative routes were provided by the client for consideration and following the findings of this report the specialist notes that the 'Preferred Route Section 1' is the most preferred powerline route from and ecological perspective. This option avoids portions of more sensitive habitat and ultimately results in lower post-mitigation impacts.

A plant search and rescue plan is recommended for the proposed project due to the high number of protected species confirmed to occur throughout the PAOI.

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9 Appendix Items

9.1 Appendix A – Specialist Declarations

DECLARATION

I, Michael Schrenk, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Michael Schrenk

Environmental Consultant

The Biodiversity Company

August 2022

DECLARATION

I, Andrew Husted, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Andrew Husted

Terrestrial Ecologist

The Biodiversity Company

August 2022

9.2 Appendix B – Flora Species Expected to Occur Within or Nearby to the Project Area of Influence

Family	Taxon	Author	SANBI Status	Ecology
Malvaceae	*Abutilon austro-africanum*	Hochr.	LC	Indigenous
Malvaceae	*Abutilon dinteri*	Ulbr.	LC	Indigenous
Malvaceae	*Abutilon rehmannii*	Baker f.	LC	Indigenous
Cucurbitaceae	*Acanthosicyos naudinianus*	(Sond.) C.Jeffrey	LC	Indigenous
Amaranthaceae	*Achyranthes aspera var. aspera*	L.		Not indigenous; Naturalised
Amaranthaceae	*Achyranthes aspera var. pubescens*	L. (Moq.) C.C.Towns.		Indigenous
Lamiaceae	*Acrotome inflata*	Benth.	LC	Indigenous
Pteridaceae	*Actiniopteris radiata*	(J.Koenig ex Sw.) Link	LC	Indigenous
Passifloraceae	*Adenia repanda*	(Burch.) Engl.	LC	Indigenous
Amaranthaceae	*Aerva leucura*	Moq.	LC	Indigenous
Apiaceae	*Afrosciadium magalismontanum*	(Sond.) P.J.D.Winter	LC	Indigenous
Cyperaceae	*Afroscirpoides dioeca*	(Kunth) Garcia-Madr.		Indigenous
Iridaceae	*Afrosolen sandersonii*	(Baker) Goldblatt & J.C.Manning		Indigenous
Iridaceae	*Afrosolen sandersonii subsp. sandersonii*	(Baker) Goldblatt & J.C.Manning		Indigenous
Poaceae	*Agrostis lachnantha var. lachnantha*	Nees	LC	Indigenous
Hyacinthaceae	*Albuca seineri*	(Engl. & K.Krause) J.C.Manning & Goldblatt	LC	Indigenous
Hyacinthaceae	*Albuca sp.*			
Hyacinthaceae	*Albuca tortuosa*	Baker	LC	Indigenous; Endemic
Orobanchaceae	*Alectra pumila*	Benth.	LC	Indigenous
Asphodelaceae	*Aloe bergeriana*	(Dinter) Boatwr. & J.C.Manning	DD	Indigenous
Asphodelaceae	*Aloe claviflora*	Burch.	LC	Indigenous
Asphodelaceae	*Aloe grandidentata*	Salm-Dyck	LC	Indigenous
Amaranthaceae	*Alternanthera pungens*	Kunth		Not indigenous; Naturalised
Amaranthaceae	*Amaranthus hybridus subsp. var. hybridus hybridus*	L.		Not indigenous; Naturalised
Amaranthaceae	*Amaranthus thunbergii*	Moq.	LC	Indigenous
Asteraceae	*Amellus tridactylus subsp. arenarius*	DC. (S.Moore) Rommel	LC	Indigenous
Asteraceae	*Amphiglossa triflora*	DC.	LC	Indigenous
Anacampserotaceae	*Anacampseros albissima*	Marloth	LC	Indigenous
Anacampserotaceae	*Anacampseros filamentosa subsp. filamentosa*	(Haw.) Sims		Indigenous; Endemic
Boraginaceae	*Anchusa riparia*	A.DC.	LC	Indigenous
Poaceae	*Andropogon chinensis*	(Nees) Merr.	LC	Indigenous
Poaceae	*Andropogon eucomus*	Nees	LC	Indigenous
Poaceae	*Andropogon schirensis*	Hochst. ex A.Rich.	LC	Indigenous
Poaceae	*Anthephora argentea*	Gooss.	LC	Indigenous

Poaceae	*Anthephora pubescens*	Nees	LC	Indigenous
Rubiaceae	*Anthospermum rigidum subsp. pumilum*	Eckl. & Zeyh. (Sond.) Puff	LC	Indigenous
Rubiaceae	*Anthospermum rigidum subsp. rigidum*	Eckl. & Zeyh.	LC	Indigenous
Menispermaceae	*Antizoma angustifolia*	(Burch.) Miers ex Harv.	LC	Indigenous
Scrophulariaceae	*Aptosimum albomarginatum*	Marloth & Engl.	LC	Indigenous
Scrophulariaceae	*Aptosimum elongatum*	(Hiern) Engl.	LC	Indigenous
Scrophulariaceae	*Aptosimum indivisum*	Burch. ex Benth.	LC	Indigenous
Scrophulariaceae	*Aptosimum marlothii*	(Engl.) Hiern	LC	Indigenous
Asteraceae	*Arctotis leiocarpa*	Harv.	LC	Indigenous
Asteraceae	*Arctotis venusta*	Norl.	LC	Indigenous
Papaveraceae	*Argemone ochroleuca subsp. ochroleuca*	Sweet		Not indigenous; Naturalised; Invasive
Fabaceae	*Argyrolobium incanum*	Eckl. & Zeyh.	LC	Indigenous; Endemic
Fabaceae	*Argyrolobium sp.*			
Poaceae	*Aristida adscensionis*	L.	LC	Indigenous
Poaceae	*Aristida congesta subsp. barbicollis*	Roem. & Schult. (Trin. & Rupr.) De Winter	LC	Indigenous
Poaceae	*Aristida congesta subsp. congesta*	Roem. & Schult.	LC	Indigenous
Poaceae	*Aristida diffusa subsp. burkei*	Trin. (Stapf) Melderis	LC	Indigenous
Poaceae	*Aristida engleri var. ramosissima*	Mez De Winter	LC	Indigenous
Poaceae	*Aristida meridionalis*	Henrard	LC	Indigenous
Poaceae	*Aristida mollissima subsp. mollissima*	Pilg.	LC	Indigenous
Poaceae	*Aristida sp.*			
Poaceae	*Aristida stipitata subsp. graciliflora*	Hack. (Pilg.) Melderis	LC	Indigenous
Poaceae	*Aristida stipitata subsp. spicata*	Hack. (De Winter) Melderis	LC	Indigenous
Poaceae	*Aristida stipitata subsp. stipitata*	Hack.	LC	Indigenous
Poaceae	*Aristida vestita*	Thunb.	LC	Indigenous
Asparagaceae	*Asparagus cooperi*	Baker	LC	Indigenous
Asparagaceae	*Asparagus exuvialis forma exuvialis*	Burch.	NE	Indigenous
Asparagaceae	*Asparagus laricinus*	Burch.	LC	Indigenous
Asparagaceae	*Asparagus nelsii*	Schinz	LC	Indigenous
Asparagaceae	*Asparagus retrofractus*	L.	LC	Indigenous
Asparagaceae	*Asparagus sp.*			
Asparagaceae	*Asparagus suaveolens*	Burch.	LC	Indigenous
Aspleniaceae	*Asplenium adiantum-nigrum var. adiantum-nigrum*	L.	LC	Indigenous
Aspleniaceae	*Asplenium cordatum*	(Thunb.) Sw.	LC	Indigenous
Asteraceae	*Athrixia phylicoides*	DC.	LC	Indigenous
Amaranthaceae	*Atriplex semibaccata*	R.Br.		Not indigenous; Naturalised; Invasive
Iridaceae	*Babiana bainesii*	Baker	LC	Indigenous

Iridaceae	*Babiana hypogaea*	Burch.	LC	Indigenous
Asteraceae	*Baccharoides adoensis*	(Sch.Bip. ex Walp.) H.Rob.		Indigenous
Acanthaceae	*Barleria bechuanensis*	C.B.Clarke	LC	Indigenous; Endemic
Acanthaceae	*Barleria irritans*	Nees	LC	Indigenous; Endemic
Acanthaceae	*Barleria lichtensteiniana*	Nees	LC	Indigenous
Acanthaceae	*Barleria macrostegia*	Nees	LC	Indigenous
Acanthaceae	*Barleria media*	C.B.Clarke	VU	Indigenous; Endemic
Acanthaceae	*Barleria rigida var. rigida*	Willd. ex Nees		Indigenous
Elatinaceae	*Bergia anagalloides*	(E.Mey. ex Fenzl) Walp.	LC	Indigenous
Elatinaceae	*Bergia pentheriana*	Keissl.	LC	Indigenous
Elatinaceae	*Bergia sp.*			
Apiaceae	*Berula thunbergii*	(DC.) H.Wolff	LC	Indigenous
Asteraceae	*Bidens pilosa*	L.		Not indigenous; Naturalised
Acanthaceae	*Blepharis integrifolia var. integrifolia*	(L.f.) E.Mey. ex Schinz	LC	Indigenous
Acanthaceae	*Blepharis marginata*	(Nees) C.B.Clarke	LC	Indigenous; Endemic
Acanthaceae	*Blepharis sp.*			
Cyperaceae	*Bolboschoenus maritimus*	(L.) Palla	LC	Indigenous
Fabaceae	*Bolusia acuminata*	(DC.) Polhill	LC	Indigenous
Capparaceae	*Boscia sp.*			
Poaceae	*Brachiaria brizantha*	(A.Rich.) Stapf	LC	Indigenous
Poaceae	*Brachiaria marlothii*	(Hack.) Stent	LC	Indigenous
Poaceae	*Brachiaria nigropedata*	(Ficalho & Hiern) Stapf	LC	Indigenous
Poaceae	*Brachiaria serrata*	(Thunb.) Stapf	LC	Indigenous
Brassicaceae	*Brassica tournefortii*	Gouan		Not indigenous; Naturalised; Invasive
Poaceae	*Bromus pectinatus*	Thunb.	LC	Indigenous
Amaryllidaceae	*Brunsvigia radulosa*	Herb.	LC	Indigenous
Bryaceae	*Bryum apiculatum*	Schwagr.		Indigenous
Scrophulariaceae	*Buddleja saligna*	Willd.	LC	Indigenous
Asphodelaceae	*Bulbine abyssinica*	A.Rich.	LC	Indigenous
Asphodelaceae	*Bulbine frutescens*	(L.) Willd.	LC	Indigenous
Cyperaceae	*Bulbostylis burchellii*	(Ficalho & Hiern) C.B.Clarke	LC	Indigenous
Cyperaceae	*Bulbostylis hispidula subsp. pyriformis*	(Vahl) R.W.Haines (Lye) R.W.Haines	LC	Indigenous
Cyperaceae	*Bulbostylis humilis*	(Kunth) C.B.Clarke	LC	Indigenous
Fabaceae	*Calobota cuspidosa*	(Burch.) Boatwr. & B.-E.van Wyk	LC	Indigenous
Fabaceae	*Calobota sericea*	(Thunb.) Boatwr. & B.-E.van Wyk	LC	Indigenous; Endemic
Cyperaceae	*Carex burchelliana*	Boeckeler	LC	Indigenous; Endemic
Bignoniaceae	*Catophractes alexandri*	D.Don	LC	Indigenous
Poaceae	*Cenchrus ciliaris*	L.	LC	Indigenous

Pedaliaceae	*Ceratotheca triloba*	(Bernh.) Hook.f.	LC	Indigenous
Apocynaceae	*Ceropegia circinata*	(E.Mey.) Bruyns		Indigenous
Apocynaceae	*Ceropegia cupulata*	(R.A.Dyer) Bruyns		Indigenous
Scrophulariaceae	*Chaenostoma halimifolium*	Benth.	LC	Indigenous
Scrophulariaceae	*Chaenostoma patrioticum*	(Hiern) Kornhall	LC	Indigenous
Fabaceae	*Chamaecrista biensis*	(Steyaert) Lock	LC	Indigenous
Fabaceae	*Chamaecrista mimosoides*	(L.) Greene	LC	Indigenous
Verbenaceae	*Chascanum adenostachyum*	(Schauer) Moldenke	LC	Indigenous
Verbenaceae	*Chascanum hederaceum var. hederaceum*	(Sond.) Moldenke	LC	Indigenous
Verbenaceae	*Chascanum pinnatifidum var. pinnatifidum*	(L.f.) E.Mey.	LC	Indigenous
Verbenaceae	*Chascanum schlechteri*	(Gurke) Moldenke	LC	Indigenous
Pteridaceae	*Cheilanthes eckloniana*	(Kunze) Mett.	LC	Indigenous
Pteridaceae	*Cheilanthes hirta var. forma brevipilosa brevipilosa*	Sw. W.Jacobsen & N.H.G.Jacobsen	LC	Indigenous
Pteridaceae	*Cheilanthes multifida var. multifida*	(Sw.) Sw.	LC	Indigenous
Amaranthaceae	*Chenopodium hederiforme var. undulatum*	(Murr) Aellen Aellen	LC	Indigenous
Gentianaceae	*Chironia palustris subsp. palustris*	Burch.	LC	Indigenous
Agavaceae	*Chlorophytum fasciculatum*	(Baker) Kativu	LC	Indigenous
Asteraceae	*Chrysocoma ciliata*	L.	LC	Indigenous
Asteraceae	*Chrysocoma sp.*			
Poaceae	*Chrysopogon serrulatus*	Trin.	LC	Indigenous
Asteraceae	*Cineraria vallis-pacis*	Dinter ex Merxm.	LC	Indigenous
Cucurbitaceae	*Citrullus lanatus*	(Thunb.) Matsum. & Nakai	LC	Indigenous
Cyperaceae	*Cladium mariscus subsp. jamaicense*	(L.) Pohl (Crantz) Kuk.	LC	Indigenous
Ranunculaceae	*Clematis brachiata*	Thunb.	LC	Indigenous
Cleomaceae	*Cleome angustifolia subsp. diandra*	Forssk. (Burch.) Kers	LC	Indigenous
Cleomaceae	*Cleome conrathii*	Burtt Davy	NT	Indigenous
Cleomaceae	*Cleome kalachariensis*	(Schinz) Gilg & Gilg-Ben.	LC	Indigenous
Cleomaceae	*Cleome oxyphylla var. oxyphylla*	Burch.	LC	Indigenous
Cleomaceae	*Cleome rubella*	Burch.	LC	Indigenous
Cucurbitaceae	*Coccinia rehmannii*	Cogn.	LC	Indigenous
Cucurbitaceae	*Coccinia sessilifolia*	(Sond.) Cogn.	LC	Indigenous
Poaceae	*Coelachyrum yemenicum*	(Schweinf.) S.M.Phillips	LC	Indigenous
Commelinaceae	*Commelina africana var. barberae*	L. (C.B.Clarke) C.B.Clarke	LC	Indigenous
Commelinaceae	*Commelina africana var. krebsiana*	L. (Kunth) C.B.Clarke	LC	Indigenous
Commelinaceae	*Commelina africana var. lancispatha*	L. C.B.Clarke	LC	Indigenous
Commelinaceae	*Commelina livingstonii*	C.B.Clarke	LC	Indigenous
Commelinaceae	*Commelina modesta*	Oberm.	LC	Indigenous

Convolvulaceae	*Convolvulus multifidus*	Thunb.	LC	Indigenous; Endemic
Convolvulaceae	*Convolvulus ocellatus var. ocellatus*	Hook.	LC	Indigenous
Cucurbitaceae	*Corallocarpus triangularis*	Cogn.	LC	Indigenous
Malvaceae	*Corchorus aspleniifolius*	Burch.	LC	Indigenous
Malvaceae	*Corchorus pinnatipartitus*	Wild	LC	Indigenous
Crassulaceae	*Crassula capitella subsp. nodulosa*	Thunb. (Schonland) Toelken	LC	Indigenous
Crassulaceae	*Crassula lanceolata subsp. transvaalensis*	(Eckl. & Zeyh.) Endl. ex Walp. (Kuntze) Toelken	LC	Indigenous
Crassulaceae	*Crassula subaphylla var. subaphylla*	(Eckl. & Zeyh.) Harv.	LC	Indigenous
Fabaceae	*Crotalaria griquensis*	L.Bolus	LC	Indigenous
Fabaceae	*Crotalaria orientalis subsp. orientalis*	Burtt Davy ex I.Verd.	LC	Indigenous
Fabaceae	*Crotalaria podocarpa*	DC.	LC	Indigenous
Fabaceae	*Crotalaria sp.*			
Fabaceae	*Crotalaria spartioides*	DC.	LC	Indigenous
Fabaceae	*Crotalaria sphaerocarpa subsp. sphaerocarpa*	Perr. ex DC.	LC	Indigenous
Fabaceae	*Crotalaria virgultalis*	Burch. ex DC.	LC	Indigenous
Euphorbiaceae	*Croton gratissimus var. gratissimus*	Burch.	LC	Indigenous
Cucurbitaceae	*Cucumis africanus*	L.f.	LC	Indigenous
Cucurbitaceae	*Cucumis heptadactylus*	Naudin	LC	Indigenous; Endemic
Cucurbitaceae	*Cucumis myriocarpus subsp. myriocarpus*	Naudin	LC	Indigenous
Fabaceae	*Cyamopsis serrata*	Schinz	LC	Indigenous
Tecophilaeaceae	*Cyanella lutea*	L.f.		Indigenous
Poaceae	*Cymbopogon caesius*	(Hook. & Arn.) Stapf	LC	Indigenous
Poaceae	*Cymbopogon pospischilii*	(K.Schum.) C.E.Hubb.	NE	Indigenous
Apocynaceae	*Cynanchum viminale subsp. viminale*	(L.) L.		Indigenous
Poaceae	*Cynodon dactylon*	(L.) Pers.	LC	Indigenous
Poaceae	*Cynodon incompletus*	Nees	LC	Indigenous; Endemic
Cyperaceae	*Cyperus bellus*	Kunth	LC	Indigenous
Cyperaceae	*Cyperus capensis*	(Steud.) Endl.	LC	Indigenous; Endemic
Cyperaceae	*Cyperus decurvatus*	(C.B.Clarke) C.Archer & Goetgh.	LC	Indigenous
Cyperaceae	*Cyperus fulgens*	C.B.Clarke	LC	Indigenous
Cyperaceae	*Cyperus longus var. tenuiflorus*	L. (Rottb.) Boeckeler	NE	Indigenous
Cyperaceae	*Cyperus margaritaceus var. margaritaceus*	Vahl	LC	Indigenous
Cyperaceae	*Cyperus marginatus*	Thunb.	LC	Indigenous
Cyperaceae	*Cyperus marlothii*	Boeckeler	LC	Indigenous
Cyperaceae	*Cyperus sphaerospermus*	Schrad.	LC	Indigenous
Amaranthaceae	*Cyphocarpa angustifolia*	(Moq.) Lopr.	LC	Indigenous
Solanaceae	*Datura stramonium*	L.		Not indigenous; Naturalised; Invasive

Apiaceae	*Deverra burchellii*	(DC.) Eckl. & Zeyh.	LC	Indigenous
Apiaceae	*Deverra sp.*			
Caryophyllaceae	*Dianthus namaensis var. dinteri*	Schinz (Schinz) S.S.Hooper	LC	Indigenous
Asteraceae	*Dicoma anomala subsp. gerrardii*	Sond. (Harv. ex F.C.Wilson) S.Ortiz & Rodr.Oubina	LC	Indigenous
Asteraceae	*Dicoma kurumanii*	S.Ortiz & Netnou	LC	Indigenous; Endemic
Asteraceae	*Dicoma macrocephala*	DC.	LC	Indigenous
Asteraceae	*Dicoma schinzii*	O.Hoffm.	LC	Indigenous
Poaceae	*Digitaria eriantha*	Steud.	LC	Indigenous
Poaceae	*Digitaria polyphylla*	Henrard	LC	Indigenous
Poaceae	*Digitaria sanguinalis*	(L.) Scop.	NE	Not indigenous; Naturalised
Poaceae	*Digitaria seriata*	Stapf	LC	Indigenous
Poaceae	*Diheteropogon amplectens var. amplectens*	(Nees) Clayton	LC	Indigenous
Asteraceae	*Dimorphotheca cuneata*	(Thunb.) Less.	LC	Indigenous
Ebenaceae	*Diospyros austroafricana var. microphylla*	De Winter (Burch.) De Winter	LC	Indigenous
Ebenaceae	*Diospyros lycioides subsp. lycioides*	Desf.	LC	Indigenous
Hyacinthaceae	*Dipcadi marlothii*	Engl.	LC	Indigenous
Hyacinthaceae	*Dipcadi viride*	(L.) Moench	LC	Indigenous
Acanthaceae	*Dyschoriste transvaalensis*	C.B.Clarke	LC	Indigenous
Amaranthaceae	*Dysphania ambrosioides*	(L.) Mosyakin & Clemants		Not indigenous; Naturalised; Invasive
Amaranthaceae	*Dysphania cristata*	(F.Muell.) Mosyakin & Clemants		Not indigenous; Naturalised; Invasive
Boraginaceae	*Ehretia alba*	Retief & A.E.van Wyk	LC	Indigenous
Fabaceae	*Elephantorrhiza elephantina*	(Burch.) Skeels	LC	Indigenous
Poaceae	*Eleusine coracana subsp. africana*	(L.) Gaertn. (Kenn.-O'Byrne) Hilu & de Wet	LC	Indigenous
Poaceae	*Elionurus muticus*	(Spreng.) Kunth	LC	Indigenous
Polygonaceae	*Emex australis*	Steinh.	LC	Indigenous
Poaceae	*Enneapogon cenchroides*	(Licht. ex Roem. & Schult.) C.E.Hubb.	LC	Indigenous
Poaceae	*Enneapogon desvauxii*	P.Beauv.	LC	Indigenous
Poaceae	*Enneapogon scoparius*	Stapf	LC	Indigenous
Equisetaceae	*Equisetum ramosissimum subsp. ramosissimum*	Desf.	LC	Indigenous
Poaceae	*Eragrostis amabilis*	(L.) Hook. & Arn.	LC	Indigenous
Poaceae	*Eragrostis barrelieri*	Daveau	NE	Not indigenous; Naturalised
Poaceae	*Eragrostis biflora*	Hack. ex Schinz	LC	Indigenous
Poaceae	*Eragrostis capensis*	(Thunb.) Trin.	LC	Indigenous
Poaceae	*Eragrostis chloromelas*	Steud.	LC	Indigenous
Poaceae	*Eragrostis curvula*	(Schrad.) Nees	LC	Indigenous
Poaceae	*Eragrostis echinochloidea*	Stapf	LC	Indigenous
Poaceae	*Eragrostis gummiflua*	Nees	LC	Indigenous

Poaceae	*Eragrostis homomalla*	Nees	LC	Indigenous
Poaceae	*Eragrostis inamoena*	K.Schum.	LC	Indigenous
Poaceae	*Eragrostis lehmanniana var. lehmanniana*	Nees	LC	Indigenous
Poaceae	*Eragrostis mexicana subsp. virescens*	(Hornem.) Link (J.Presl) S.D.Koch & Sanchez Vega	NE	Not indigenous; Naturalised
Poaceae	*Eragrostis micrantha*	Hack.	LC	Indigenous
Poaceae	*Eragrostis nindensis*	Ficalho & Hiern	LC	Indigenous
Poaceae	*Eragrostis obtusa*	Munro ex Ficalho & Hiern	LC	Indigenous
Poaceae	*Eragrostis pallens*	Hack.	LC	Indigenous
Poaceae	*Eragrostis procumbens*	Nees	LC	Indigenous
Poaceae	*Eragrostis pseudobtusa*	De Winter	NE	Indigenous; Endemic
Poaceae	*Eragrostis rigidior*	Pilg.	LC	Indigenous
Poaceae	*Eragrostis sp.*			
Poaceae	*Eragrostis trichophora*	Coss. & Durieu	LC	Indigenous
Poaceae	*Eragrostis truncata*	Hack.	LC	Indigenous
Poaceae	*Eragrostis viscosa*	(Retz.) Trin.	LC	Indigenous
Ericaceae	*Erica flanaganii*	Bolus	LC	Indigenous
Asteraceae	*Eriocephalus glandulosus*	M.A.N.Mull.	LC	Indigenous; Endemic
Ruscaceae	*Eriospermum corymbosum*	Baker	LC	Indigenous
Asteraceae	*Erlangea misera*	(Oliv. & Hiern) S.Moore	LC	Indigenous
Brassicaceae	*Erucastrum strigosum*	(Thunb.) O.E.Schulz	LC	Indigenous
Fabaceae	*Erythrostemon gilliesii*	(Hook.) Klotzsch		Not indigenous; Naturalised; Invasive
Ebenaceae	*Euclea crispa subsp. ovata*	(Thunb.) Gurke (Burch.) F.White	LC	Indigenous
Ebenaceae	*Euclea sp.*			
Ebenaceae	*Euclea undulata*	Thunb.	LC	Indigenous
Myrtaceae	*Eugenia sp.*			
Euphorbiaceae	*Euphorbia crassipes*	Marloth	LC	Indigenous
Euphorbiaceae	*Euphorbia duseimata*	R.A.Dyer	LC	Indigenous
Euphorbiaceae	*Euphorbia inaequilatera*	Sond.	LC	Indigenous
Euphorbiaceae	*Euphorbia inaequilatera var. inaequilatera*	Sond.	NE	Indigenous
Euphorbiaceae	*Euphorbia juttae*	Dinter	LC	Indigenous
Euphorbiaceae	*Euphorbia mauritanica*	L.	LC	Indigenous
Euphorbiaceae	*Euphorbia patula subsp. wilmaniae*	Mill. (Marloth) Bruyns		Indigenous; Endemic
Euphorbiaceae	*Euphorbia peplus*	L.	NE	Not indigenous; Naturalised
Euphorbiaceae	*Euphorbia pseudotuberosa*	Pax	LC	Indigenous
Euphorbiaceae	*Euphorbia rhombifolia*	Boiss.	LC	Indigenous
Euphorbiaceae	*Euphorbia spartaria*	N.E.Br.	LC	Indigenous
Poaceae	*Eustachys paspaloides*	(Vahl) Lanza & Mattei	LC	Indigenous
Convolvulaceae	*Evolvulus alsinoides*	(L.) L.	LC	Indigenous

Asteraceae	*Felicia clavipilosa subsp. clavipilosa*	Grau	LC	Indigenous
Asteraceae	*Felicia fascicularis*	DC.	LC	Indigenous
Asteraceae	*Felicia filifolia subsp. filifolia*	(Vent.) Burtt Davy	LC	Indigenous
Asteraceae	*Felicia muricata subsp. cinerascens*	(Thunb.) Nees Grau	LC	Indigenous
Asteraceae	*Felicia muricata subsp. muricata*	(Thunb.) Nees	LC	Indigenous
Asteraceae	*Felicia namaquana*	(Harv.) Merxm.	LC	Indigenous
Iridaceae	*Ferraria glutinosa*	(Baker) Rendle	LC	Indigenous
Poaceae	*Fingerhuthia africana*	Lehm.	LC	Indigenous
Fissidentaceae	*Fissidens erosulus*	(Mull.Hal.) Paris		Indigenous
Asteraceae	*Foveolina dichotoma*	(DC.) Kallersjo	LC	Indigenous
Aizoaceae	*Galenia meziana*	K.Mull.	LC	Indigenous
Rubiaceae	*Galium capense subsp. capense*	Thunb.	LC	Indigenous
Asteraceae	*Gazania krebsiana subsp. arctotoides*	Less. (Less.) Roessler	LC	Indigenous
Asteraceae	*Gazania krebsiana subsp. serrulata*	Less. (DC.) Roessler	LC	Indigenous
Asteraceae	*Geigeria brevifolia*	(DC.) Harv.	LC	Indigenous
Asteraceae	*Geigeria filifolia*	Mattf.	LC	Indigenous
Asteraceae	*Geigeria ornativa subsp. ornativa*	O.Hoffm.	LC	Indigenous
Gisekiaceae	*Gisekia africana var. africana*	(Lour.) Kuntze	LC	Indigenous
Gisekiaceae	*Gisekia africana var. pedunculata*	(Lour.) Kuntze (Oliv.) Brenan		Indigenous
Gisekiaceae	*Gisekia pharnaceoides*	L.		Indigenous
Gisekiaceae	*Gisekia pharnaceoides var. pharnaceoides*	L.	LC	Indigenous
Iridaceae	*Gladiolus permeabilis subsp. edulis*	D.Delaroche (Burch. ex Ker Gawl.) Oberm.	LC	Indigenous
Acanthaceae	*Glossochilus burchellii*	Nees	LC	Indigenous
Asteraceae	*Gnaphalium englerianum*	(O.Hoffm.) Hilliard & B.L.Burtt	LC	Indigenous; Endemic
Asteraceae	*Gnaphalium filagopsis*	Hilliard & B.L.Burtt	LC	Indigenous
Apocynaceae	*Gomphocarpus fruticosus subsp. fruticosus*	(L.) W.T.Aiton	LC	Indigenous
Apocynaceae	*Gomphocarpus tomentosus subsp. tomentosus*	Burch.	LC	Indigenous
Amaranthaceae	*Gomphrena celosioides*	Mart.		Not indigenous; Naturalised
Malvaceae	*Grewia flava*	DC.	LC	Indigenous
Celastraceae	*Gymnosporia buxifolia*	(L.) Szyszyl.	LC	Indigenous
Pedaliaceae	*Harpagophytum procumbens subsp. procumbens*	(Burch.) DC. ex Meisn.	NE	Indigenous
Asphodelaceae	*Haworthiopsis tessellata var. tessellata*	(Haw.) G.D.Rowley		Indigenous
Asteraceae	*Helichrysum argyrosphaerum*	DC.	LC	Indigenous
Asteraceae	*Helichrysum caespititium*	(DC.) Harv.	LC	Indigenous
Asteraceae	*Helichrysum cerastioides var. cerastioides*	DC.	LC	Indigenous
Asteraceae	*Helichrysum lineare*	DC.	LC	Indigenous

Asteraceae	*Helichrysum nudifolium var. nudifolium*	(L.) Less.	LC	Indigenous
Asteraceae	*Helichrysum spiciforme*	DC.	LC	Indigenous
Asteraceae	*Helichrysum zeyheri*	Less.	LC	Indigenous
Rhamnaceae	*Helinus spartioides*	(Engl.) Schinz ex Engl.	LC	Indigenous
Brassicaceae	*Heliophila suavissima*	Burch. ex DC.	LC	Indigenous
Boraginaceae	*Heliotropium ciliatum*	Kaplan	LC	Indigenous
Boraginaceae	*Heliotropium nelsonii*	C.H.Wright	LC	Indigenous
Boraginaceae	*Heliotropium ovalifolium*	Forssk.	LC	Indigenous
Boraginaceae	*Heliotropium strigosum*	Willd.	LC	Indigenous
Poaceae	*Hemarthria altissima*	(Poir.) Stapf & C.E.Hubb.	LC	Indigenous
Malvaceae	*Hermannia bicolor*	Engl. & Dinter	LC	Indigenous
Malvaceae	*Hermannia burchellii*	(Sweet) I.Verd.	LC	Indigenous
Malvaceae	*Hermannia comosa*	Burch. ex DC.	LC	Indigenous
Malvaceae	*Hermannia erodioides*	(Burch. ex DC.) Kuntze	LC	Indigenous
Malvaceae	*Hermannia geniculata*	Eckl. & Zeyh.	LC	Indigenous
Malvaceae	*Hermannia linearifolia*	Harv.	LC	Indigenous; Endemic
Malvaceae	*Hermannia linnaeoides*	(Burch.) K.Schum.	LC	Indigenous
Malvaceae	*Hermannia modesta*	(Ehrenb.) Mast.	LC	Indigenous
Malvaceae	*Hermannia pulverata*	Andrews	LC	Indigenous; Endemic
Malvaceae	*Hermannia quartiniana*	A.Rich.	LC	Indigenous
Malvaceae	*Hermannia sp.*			
Malvaceae	*Hermannia stellulata*	(Harv.) K.Schum.	LC	Indigenous
Malvaceae	*Hermannia tomentosa*	(Turcz.) Schinz ex Engl.	LC	Indigenous
Amaranthaceae	*Hermbstaedtia fleckii*	(Schinz) Baker & C.B.Clarke	LC	Indigenous
Amaranthaceae	*Hermbstaedtia odorata var. albi-rosea*	(Burch.) T.Cooke Suess.	NE	Indigenous
Amaranthaceae	*Hermbstaedtia odorata var. aurantiaca*	(Burch.) T.Cooke (Suess.) C.C.Towns.	NE	Indigenous
Amaranthaceae	*Hermbstaedtia odorata var. odorata*	(Burch.) T.Cooke	NE	Indigenous
Amaranthaceae	*Hermbstaedtia sp.*			
Poaceae	*Heteropogon contortus*	(L.) Roem. & Schult.	LC	Indigenous
Malvaceae	*Hibiscus engleri*	K.Schum.	LC	Indigenous
Malvaceae	*Hibiscus fleckii*	Gurke	LC	Indigenous
Malvaceae	*Hibiscus ludwigii*	Eckl. & Zeyh.	LC	Indigenous
Malvaceae	*Hibiscus marlothianus*	K.Schum.	LC	Indigenous; Endemic
Malvaceae	*Hibiscus micranthus var. micranthus*	L.f.	LC	Indigenous
Malvaceae	*Hibiscus pusillus*	Thunb.	LC	Indigenous
Asteraceae	*Hilliardiella elaeagnoides*	(DC.) Swelank. & J.C.Manning		Indigenous
Asteraceae	*Hirpicium bechuanense*	(S.Moore) Roessler	LC	Indigenous
Asteraceae	*Hirpicium echinus*	Less.	LC	Indigenous

Araliaceae	*Hydrocotyle verticillata*	Thunb.	LC	Indigenous
Poaceae	*Hyparrhenia anamesa*	Clayton	LC	Indigenous
Poaceae	*Hyparrhenia hirta*	(L.) Stapf	LC	Indigenous
Acanthaceae	*Hypoestes forskaolii*	(Vahl) R.Br.	LC	Indigenous
Hypoxidaceae	*Hypoxis longifolia*	Baker	LC	Indigenous; Endemic
Poaceae	*Imperata cylindrica*	(L.) P.Beauv.		Indigenous
Fabaceae	*Indigastrum costatum subsp. macrum*	(Guill. & Perr.) Schrire (E.Mey.) Schrire	LC	Indigenous
Fabaceae	*Indigastrum niveum*	(Willd. ex Spreng.) Schrire & Callm.		Indigenous
Fabaceae	*Indigofera alternans var. alternans*	DC.	LC	Indigenous
Fabaceae	*Indigofera comosa*	N.E.Br.	LC	Indigenous
Fabaceae	*Indigofera daleoides var. daleoides*	Benth. ex Harv.	NE	Indigenous
Fabaceae	*Indigofera flavicans*	Baker	LC	Indigenous
Fabaceae	*Indigofera hololeuca*	Benth. ex Harv.	LC	Indigenous
Fabaceae	*Indigofera holubii*	N.E.Br.	LC	Indigenous
Fabaceae	*Indigofera melanadenia*	Benth. ex Harv.	LC	Indigenous
Fabaceae	*Indigofera sessilifolia*	DC.	LC	Indigenous
Fabaceae	*Indigofera sp.*			
Fabaceae	*Indigofera vicioides subsp. vicioides*	Jaub. & Spach	LC	Indigenous
Convolvulaceae	*Ipomoea obscura var. obscura*	(L.) Ker Gawl.	LC	Indigenous
Convolvulaceae	*Ipomoea suffruticosa*	Burch.	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia atropurpurea subsp. atropurpurea*	(Benth.) Hilliard	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia atropurpurea subsp. pubescens*	(Benth.) Hilliard Hilliard	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia aurantiaca*	(Burch.) Hilliard	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia integerrima*	(Benth.) Hilliard	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia sp.*			
Juncaceae	*Juncus exsertus*	Buchenau	LC	Indigenous
Juncaceae	*Juncus rigidus*	Desf.	LC	Indigenous
Acanthaceae	*Justicia australis*	(P.G.Mey.) Vollesen		Indigenous
Acanthaceae	*Justicia divaricata*	Licht. ex Roem. & Schult.		Indigenous
Acanthaceae	*Justicia incana*	(Nees) T.Anderson		Indigenous
Acanthaceae	*Justicia puberula*	Immelman	LC	Indigenous; Endemic
Acanthaceae	*Justicia spartioides*	T.Anderson		Indigenous
Crassulaceae	*Kalanchoe brachyloba*	Welw. ex Britten	LC	Indigenous
Crassulaceae	*Kalanchoe lanceolata*	(Forssk.) Pers.	LC	Indigenous
Crassulaceae	*Kalanchoe rotundifolia*	(Haw.) Haw.	LC	Indigenous
Cucurbitaceae	*Kedrostis africana*	(L.) Cogn.	LC	Indigenous
Cucurbitaceae	*Kedrostis crassirostrata*	Bremek.	LC	Indigenous

Asteraceae	*Kleinia longiflora*	DC.	LC	Indigenous
Rubiaceae	*Kohautia caespitosa subsp. brachyloba*	Schnizl. (Sond.) D.Mantell	LC	Indigenous
Cyperaceae	*Kyllinga alba*	Nees	LC	Indigenous
Poaceae	*Lamarckia aurea*	(L.) Moench	NE	Not indigenous; Naturalised; Invasive
Verbenaceae	*Lantana rugosa*	Thunb.	LC	Indigenous
Iridaceae	*Lapeirousia littoralis*	Baker		Indigenous
Thymelaeaceae	*Lasiosiphon burchellii*	Meisn.	LC	Indigenous
Thymelaeaceae	*Lasiosiphon polycephalus*	(E.Mey. ex Meisn.) H.Pearson	LC	Indigenous
Hyacinthaceae	*Ledebouria apertiflora*	(Baker) Jessop	LC	Indigenous
Hyacinthaceae	*Ledebouria sp.*			
Fabaceae	*Leobordea divaricata*	Eckl. & Zeyh.	LC	Indigenous
Lamiaceae	*Leonotis pentadentata*	J.C.Manning & Goldblatt	LC	Indigenous
Poaceae	*Leptochloa fusca*	(L.) Kunth	LC	Indigenous
Fabaceae	*Lessertia frutescens subsp. frutescens*	(L.) Goldblatt & J.C.Manning	LC	Indigenous
Fabaceae	*Lessertia pauciflora var. pauciflora*	Harv.	LC	Indigenous
Asteraceae	*Leysera tenella*	DC.	LC	Indigenous
Limeaceae	*Limeum aethiopicum*	Burm.f.	LC	Indigenous
Limeaceae	*Limeum aethiopicum var. aethiopicum*	Burm.f.	NE	Indigenous; Endemic
Limeaceae	*Limeum aethiopicum var. intermedium*	Burm.f. Friedrich	NE	Indigenous; Endemic
Limeaceae	*Limeum arenicolum*	G.Schellenb.	LC	Indigenous
Limeaceae	*Limeum fenestratum var. fenestratum*	(Fenzl) Heimerl	LC	Indigenous
Limeaceae	*Limeum sulcatum var. sulcatum*	(Klotzsch) Hutch.	LC	Indigenous
Limeaceae	*Limeum viscosum subsp. transvaalense*	(J.Gay) Fenzl Friedrich	LC	Indigenous; Endemic
Limeaceae	*Limeum viscosum subsp. var. viscosum glomeratum*	(J.Gay) Fenzl (Eckl. & Zeyh.) Friedrich	NE	Indigenous
Verbenaceae	*Lippia scaberrima*	Sond.	LC	Indigenous
Lobeliaceae	*Lobelia erinus*	L.	LC	Indigenous
Lobeliaceae	*Lobelia thermalis*	Thunb.	LC	Indigenous
Lophiocarpaceae	*Lophiocarpus polystachyus*	Turcz.	LC	Indigenous
Fabaceae	*Lotononis crumanina*	Burch. ex Benth.	LC	Indigenous
Fabaceae	*Lotononis divaricata*	(Eckl. & Zeyh.) Benth.	NE	Indigenous
Fabaceae	*Lotononis laxa*	Eckl. & Zeyh.	LC	Indigenous
Fabaceae	*Lotononis sp.*			
Solanaceae	*Lycium cinereum*	Thunb.	LC	Indigenous
Solanaceae	*Lycium hirsutum*	Dunal	LC	Indigenous
Solanaceae	*Lycium pilifolium*	C.H.Wright	LC	Indigenous
Solanaceae	*Lycium schizocalyx*	C.H.Wright	LC	Indigenous
Fabaceae	*Medicago laciniata var. laciniata*	(L.) Mill.	NE	Not indigenous; Naturalised

Poaceae	*Megaloprotachne albescens*	C.E.Hubb.	LC	Indigenous
Malvaceae	*Melhania acuminata var. acuminata*	Mast.	LC	Indigenous
Malvaceae	*Melhania burchellii*	DC.	LC	Indigenous
Malvaceae	*Melhania prostrata*	DC.	LC	Indigenous
Malvaceae	*Melhania virescens*	(K.Schum.) K.Schum.	LC	Indigenous
Fabaceae	*Melilotus albus*	Medik.	NE	Not indigenous; Naturalised; Invasive
Poaceae	*Melinis nerviglumis*	(Franch.) Zizka	LC	Indigenous
Poaceae	*Melinis repens subsp. grandiflora*	(Willd.) Zizka (Hochst.) Zizka	LC	Indigenous
Poaceae	*Melinis repens subsp. repens*	(Willd.) Zizka	LC	Indigenous
Fabaceae	*Melolobium calycinum*	Benth.	LC	Indigenous
Fabaceae	*Melolobium candicans*	(E.Mey.) Eckl. & Zeyh.	LC	Indigenous
Fabaceae	*Melolobium canescens*	Benth.	LC	Indigenous
Fabaceae	*Melolobium exudans*	Harv.	LC	Indigenous; Endemic
Fabaceae	*Melolobium macrocalyx var. macrocalyx*	Dummer	LC	Indigenous
Fabaceae	*Melolobium microphyllum*	(L.f.) Eckl. & Zeyh.	LC	Indigenous
Lamiaceae	*Mentha aquatica*	L.	LC	Indigenous
Convolvulaceae	*Merremia verecunda*	Rendle	LC	Indigenous
Apocynaceae	*Microloma armatum var. burchellii*	(Thunb.) Schltr. (N.E.Br.) Bruyns	LC	Indigenous
Acanthaceae	*Monechma sp.*			
Geraniaceae	*Monsonia angustifolia*	E.Mey. ex A.Rich.	LC	Indigenous
Geraniaceae	*Monsonia burkeana*	Planch. ex Harv.	LC	Indigenous
Geraniaceae	*Monsonia salmoniflora*	(Moffett) F.Albers	LC	Indigenous
Montiniaceae	*Montinia caryophyllacea*	Thunb.	LC	Indigenous
Iridaceae	*Moraea polystachya*	(Thunb.) Ker Gawl.	LC	Indigenous
Iridaceae	*Moraea sp.*			
Polygalaceae	*Muraltia dumosa*	(Poir.) DC.	LC	Indigenous; Endemic
Aizoaceae	*Nananthus aloides*	(Haw.) Schwantes	LC	Indigenous
Amaryllidaceae	*Nerine laticoma*	(Ker Gawl.) T.Durand & Schinz	LC	Indigenous
Solanaceae	*Nicotiana sp.*			
Asteraceae	*Nidorella hottentotica*	DC.	LC	Indigenous
Asteraceae	*Nolletia ciliaris*	(DC.) Steetz	LC	Indigenous
Meliaceae	*Nymania capensis*	(Thunb.) Lindb.	LC	Indigenous
Nymphaeaceae	*Nymphaea nouchali var. caerulea*	Burm.f. (Savigny) Verdc.	LC	Indigenous
Lamiaceae	*Ocimum americanum var. americanum*	L.	LC	Indigenous
Lamiaceae	*Ocimum filamentosum*	Forssk.	LC	Indigenous
Asteraceae	*Oedera humilis*	(Less.) N.G.Bergh		Indigenous
Oleaceae	*Olea europaea subsp. cuspidata*	L. (Wall. ex G.Don) Cif.		Indigenous
Apocynaceae	*Orbea lutea subsp. lutea*	(N.E.Br.) Bruyns	LC	Indigenous

Colchicaceae	*Ornithoglossum vulgare*	B.Nord.	LC	Indigenous
Poaceae	*Oropetium capense*	Stapf	LC	Indigenous
Apocynaceae	*Orthanthera jasminiflora*	(Decne.) Schinz	LC	Indigenous
Asteraceae	*Osteospermum leptolobum*	(Harv.) Norl.	LC	Indigenous; Endemic
Asteraceae	*Osteospermum microphyllum*	DC.	LC	Indigenous
Asteraceae	*Osteospermum muricatum subsp. muricatum*	E.Mey. ex DC.	LC	Indigenous
Asteraceae	*Osteospermum scariosum var. scariosum*	DC.	NE	Indigenous
Fabaceae	*Otoptera burchellii*	DC.	LC	Indigenous
Oxalidaceae	*Oxalis corniculata*	L.		Not indigenous; Naturalised; Invasive
Oxalidaceae	*Oxalis depressa*	Eckl. & Zeyh.	LC	Indigenous
Oxalidaceae	*Oxalis lawsonii*	F.Bolus	LC	Indigenous
Polygonaceae	*Oxygonum alatum var. alatum*	Burch.	LC	Indigenous
Polygonaceae	*Oxygonum delagoense*	Kuntze	LC	Indigenous
Polygonaceae	*Oxygonum dregeanum subsp. var. canescens canescens*	Meisn. (Sond.) Germish.	NE	Indigenous
Poaceae	*Panicum coloratum*	L.	LC	Indigenous
Poaceae	*Panicum kalaharense*	Mez	LC	Indigenous
Poaceae	*Panicum maximum*	Jacq.	LC	Indigenous
Poaceae	*Panicum stapfianum*	Fourc.	LC	Indigenous
Fabaceae	*Parkinsonia africana*	Sond.	LC	Indigenous
Poaceae	*Paspalum dilatatum*	Poir.	NE	Not indigenous; Naturalised; Invasive
Malvaceae	*Pavonia burchellii*	(DC.) R.A.Dyer	LC	Indigenous
Asteraceae	*Pegolettia retrofracta*	(Thunb.) Kies	LC	Indigenous
Geraniaceae	*Pelargonium myrrhifolium var. myrrhifolium*	(L.) L'Her.	LC	Indigenous; Endemic
Scrophulariaceae	*Peliostomum junceum*	(Hiern) Kolberg & Van Slageren		Indigenous
Scrophulariaceae	*Peliostomum leucorrhizum*	E.Mey. ex Benth.	LC	Indigenous
Pteridaceae	*Pellaea calomelanos var. calomelanos*	(Sw.) Link	LC	Indigenous
Apocynaceae	*Pentarrhinum insipidum*	E.Mey.	LC	Indigenous
Asteraceae	*Pentzia argentea*	Hutch.	LC	Indigenous
Asteraceae	*Pentzia calcarea*	Kies	LC	Indigenous
Asteraceae	*Pentzia quinquefida*	(Thunb.) Less.	LC	Indigenous; Endemic
Apocynaceae	*Pergularia daemia subsp. daemia*	(Forssk.) Chiov.	LC	Indigenous
Polygonaceae	*Persicaria lapathifolia*	(L.) Delarbre		Not indigenous; Naturalised; Invasive
Nyctaginaceae	*Phaeoptilum spinosum*	Radlk.	LC	Indigenous
Phyllanthaceae	*Phyllanthus incurvus*	Thunb.	LC	Indigenous
Phyllanthaceae	*Phyllanthus loandensis*	Welw. ex Mull.Arg.	LC	Indigenous
Phyllanthaceae	*Phyllanthus maderaspatensis*	L.	LC	Indigenous
Phyllanthaceae	*Phyllanthus parvulus var. garipensis*	Sond. (E.Mey. ex Drege) Radcl.-Sm.	LC	Indigenous

Phyllanthaceae	*Phyllanthus parvulus var. parvulus*	Sond.	LC	Indigenous
Phyllanthaceae	*Phyllanthus pentandrus*	Schumach. & Thonn.	LC	Indigenous
Apocynaceae	*Piaranthus decipiens*	(N.E.Br.) Bruyns	LC	Indigenous
Aytoniaceae	*Plagiochasma rupestre var. rupestre*	(J.R.Forst. & G.Forst.) Steph.		Indigenous
Aizoaceae	*Plinthus karooicus*	I.Verd.	LC	Indigenous
Aizoaceae	*Plinthus sericeus*	Pax	LC	Indigenous
Euphorbiaceae	*Plukenetia africana*	Sond.		Indigenous
Poaceae	*Pogonarthria squarrosa*	(Roem. & Schult.) Pilg.	LC	Indigenous
Caryophyllaceae	*Pollichia campestris*	Aiton	LC	Indigenous
Polygalaceae	*Polygala leptophylla var. armata*	Burch. (Chodat) Paiva	LC	Indigenous
Polygalaceae	*Polygala leptophylla var. leptophylla*	Burch.	LC	Indigenous
Poaceae	*Polypogon monspeliensis*	(L.) Desf.	NE	Not indigenous; Naturalised
Fabaceae	*Pomaria lactea*	(Schinz) B.B.Simpson & G.P.Lewis	LC	Indigenous
Portulacaceae	*Portulaca hereroensis*	Schinz	LC	Indigenous
Portulacaceae	*Portulaca kermesina*	N.E.Br.	LC	Indigenous
Portulacaceae	*Portulaca quadrifida*	L.	LC	Indigenous
Aizoaceae	*Prepodesma orpenii*	(N.E.Br.) N.E.Br.	LC	Indigenous; Endemic
Asteraceae	*Pseudognaphalium luteoalbum*	(L.) Hilliard & B.L.Burtt	LC	Cryptogenic
Asteraceae	*Pteronia glauca*	Thunb.	LC	Indigenous
Asteraceae	*Pteronia mucronata*	DC.	LC	Indigenous
Fabaceae	*Ptycholobium biflorum subsp. biflorum*	(E.Mey.) Brummitt	LC	Indigenous
Asteraceae	*Pulicaria scabra*	(Thunb.) Druce	LC	Indigenous
Amaranthaceae	*Pupalia lappacea var. lappacea*	(L.) A.Juss.	LC	Indigenous
Celastraceae	*Putterlickia pyracantha*	(L.) Endl.	LC	Indigenous; Endemic
Celastraceae	*Putterlickia saxatilis*	(Burch.) Jordaan	LC	Indigenous; Endemic
Celastraceae	*Putterlickia sp.*			
Apocynaceae	*Raphionacme velutina*	Schltr.	LC	Indigenous
Fabaceae	*Requienia pseudosphaerosperma*	(Schinz) Brummitt	LC	Indigenous
Fabaceae	*Requienia sphaerosperma*	DC.	LC	Indigenous
Stilbaceae	*Retzia sp.*			
Bignoniaceae	*Rhigozum obovatum*	Burch.	LC	Indigenous
Bignoniaceae	*Rhigozum trichotomum*	Burch.	LC	Indigenous
Fabaceae	*Rhynchosia confusa*	Burtt Davy	NE	Indigenous
Fabaceae	*Rhynchosia holosericea*	Schinz	LC	Indigenous
Fabaceae	*Rhynchosia sp.*			
Fabaceae	*Rhynchosia totta var. longicalyx*	(Thunb.) DC. Moteetee & M.M.le Roux		Indigenous
Fabaceae	*Rhynchosia totta var. rigidula*	(Thunb.) DC. (DC.) Moteetee & M.M.le Roux		Indigenous
Fabaceae	*Rhynchosia totta var. totta*	(Thunb.) DC.	LC	Indigenous

Fabaceae	*Rhynchosia totta var. venulosa*	(Thunb.) DC. (Hiern) Verdc.		Indigenous
Ricciaceae	*Riccia albolimbata*	S.W.Arnell		Indigenous
Ricciaceae	*Riccia okahandjana*	S.W.Arnell		Indigenous
Zygophyllaceae	*Roepera lichtensteiniana*	(Cham.) Beier & Thulin		Indigenous
Zygophyllaceae	*Roepera pubescens*	(Schinz) Beier & Thulin		Indigenous
Bryaceae	*Rosulabryum capillare*	(Hedw.) J.R.Spence		Indigenous
Rosaceae	*Rubus rosifolius*	Sm.		Not indigenous; Cultivated; Naturalised; Invasive
Polygonaceae	*Rumex crispus*	L.		Not indigenous; Naturalised; Invasive
Polygonaceae	*Rumex lanceolatus*	Thunb.	LC	Indigenous
Aizoaceae	*Ruschia calcarea*	L.Bolus	DD	Indigenous; Endemic
Aizoaceae	*Ruschia sp.*			
Amaranthaceae	*Salsola rabieana*	I.Verd.	LC	Indigenous
Amaranthaceae	*Salsola tuberculata*	(Moq.) Fenzl	LC	Indigenous
Lamiaceae	*Salvia disermas*	L.	LC	Indigenous
Lamiaceae	*Salvia stenophylla*	Burch. ex Benth.		Indigenous
Theophrastaceae	*Samolus valerandi*	L.	LC	Indigenous
Dipsacaceae	*Scabiosa columbaria*	L.	LC	Indigenous
Poaceae	*Schizachyrium sanguineum*	(Retz.) Alston	LC	Indigenous
Poaceae	*Schmidtia pappophoroides*	Steud.	LC	Indigenous
Cyperaceae	*Schoenus nigricans*	L.	LC	Indigenous
Cyperaceae	*Scleria dregeana*	Kunth	LC	Indigenous
Anacardiaceae	*Searsia burchellii*	(Sond. ex Engl.) Moffett	LC	Indigenous
Anacardiaceae	*Searsia ciliata*	(Licht. ex Schult.) A.J.Mill.	LC	Indigenous
Anacardiaceae	*Searsia dregeana*	(Sond.) Moffett	LC	Indigenous
Anacardiaceae	*Searsia lancea*	(L.f.) F.A.Barkley	LC	Indigenous
Anacardiaceae	*Searsia tenuinervis*	(Engl.) Moffett	LC	Indigenous
Anacardiaceae	*Searsia tridactyla*	(Burch.) Moffett	LC	Indigenous; Endemic
Convolvulaceae	*Seddera capensis*	(E.Mey. ex Choisy) Hallier f.	LC	Indigenous
Convolvulaceae	*Seddera suffruticosa*	(Schinz) Hallier f.	LC	Indigenous
Euphorbiaceae	*Seidelia triandra*	(E.Mey.) Pax	LC	Indigenous
Scrophulariaceae	*Selago mixta*	Hilliard	LC	Indigenous; Endemic
Scrophulariaceae	*Selago sp.*			
Scrophulariaceae	*Selago welwitschii var. australis*	Rolfe Hilliard	LC	Indigenous
Asteraceae	*Senecio burchellii*	DC.	LC	Indigenous; Endemic
Asteraceae	*Senecio consanguineus*	DC.	LC	Indigenous
Asteraceae	*Senecio inaequidens*	DC.	LC	Indigenous
Fabaceae	*Senegalia hereroensis*	(Engl.) Kyal. & Boatwr.	LC	Indigenous

Fabaceae	*Senegalia mellifera subsp. detinens*	(Vahl) Seigler & Ebinger (Burch.) Kyal. & Boatwr.	LC	Indigenous
Fabaceae	*Senna italica subsp. arachoides*	Mill. (Burch.) Lock	LC	Indigenous
Loranthaceae	*Septulina ovalis*	(E.Mey. ex Harv.) Tiegh.	LC	Indigenous
Amaranthaceae	*Sericorema remotiflora*	(Hook.f.) Lopr.	LC	Indigenous
Amaranthaceae	*Sericorema sericea*	(Schinz) Lopr.	LC	Indigenous
Pedaliaceae	*Sesamum capense*	Burm.f.	LC	Indigenous
Pedaliaceae	*Sesamum sp.*			
Poaceae	*Setaria sphacelata var. sphacelata*	(Schumach.) Stapf & C.E.Hubb. ex M.B.Moss	LC	Indigenous
Poaceae	*Setaria sphacelata var. torta*	(Schumach.) Stapf & C.E.Hubb. ex M.B.Moss (Stapf) Clayton	LC	Indigenous
Poaceae	*Setaria verticillata*	(L.) P.Beauv.	LC	Indigenous
Malvaceae	*Sida chrysantha*	Ulbr.	LC	Indigenous
Malvaceae	*Sida cordifolia subsp. cordifolia*	L.	LC	Indigenous
Malvaceae	*Sida ovata*	Forssk.	LC	Indigenous
Malvaceae	*Sida sp.*			
Solanaceae	*Solanum burchellii*	Dunal	LC	Indigenous
Solanaceae	*Solanum campylacanthum*	Hochst. ex A.Rich.		Indigenous
Solanaceae	*Solanum catombelense*	Peyr.	LC	Indigenous
Solanaceae	*Solanum lichtensteinii*	Willd.	LC	Indigenous
Solanaceae	*Solanum nigrum*	L.		Not indigenous; Naturalised
Solanaceae	*Solanum retroflexum*	Dunal	LC	Indigenous
Asteraceae	*Sonchus oleraceus*	L.		Not indigenous; Naturalised; Invasive
Caryophyllaceae	*Spergularia media*	(L.) C.Presl		Not indigenous; Naturalised
Rubiaceae	*Spermacoce deserti*	N.E.Br.	LC	Indigenous; Endemic
Malpighiaceae	*Sphedamnocarpus pruriens subsp. pruriens*	(A.Juss.) Szyszyl.	LC	Indigenous
Poaceae	*Sporobolus acinifolius*	Stapf	LC	Indigenous
Poaceae	*Sporobolus fimbriatus*	(Trin.) Nees	LC	Indigenous
Poaceae	*Sporobolus ioclados*	(Trin.) Nees	LC	Indigenous
Poaceae	*Sporobolus sp.*			
Lamiaceae	*Stachys burchelliana*	Launert	LC	Indigenous
Lamiaceae	*Stachys spathulata*	Burch. ex Benth.	LC	Indigenous
Poaceae	*Stipagrostis amabilis*	(Schweick.) De Winter	LC	Indigenous
Poaceae	*Stipagrostis hirtigluma subsp. patula*	(Steud.) De Winter (Hack.) De Winter	LC	Indigenous
Poaceae	*Stipagrostis obtusa*	(Delile) Nees	LC	Indigenous
Poaceae	*Stipagrostis uniplumis var. neesii*	(Licht.) De Winter (Trin. & Rupr.) De Winter	LC	Indigenous
Poaceae	*Stipagrostis uniplumis var. uniplumis*	(Licht.) De Winter	LC	Indigenous
Gesneriaceae	*Streptocarpus meyeri*	B.L.Burtt	LC	Indigenous; Endemic
Orobanchaceae	*Striga bilabiata subsp. bilabiata*	(Thunb.) Kuntze	LC	Indigenous

Orobanchaceae	*Striga elegans*	Benth.	LC	Indigenous
Orobanchaceae	*Striga gesnerioides*	(Willd.) Vatke	LC	Indigenous
Molluginaceae	*Suessenguthiella scleranthoides*	(Sond.) Friedrich	LC	Indigenous
Scrophulariaceae	*Sutera griquensis*	Hiern	LC	Indigenous; Endemic
Asteraceae	*Symphyotrichum squamatum*	(Spreng.) G.L.Nesom		Not indigenous; Naturalised; Invasive
Lamiaceae	*Syncolostemon linearis*	(Benth.) D.F.Otieno	LC	Indigenous
Pottiaceae	*Syntrichia ammonsiana*	(H.A.Crum & L.E.Anderson) Ochyra		Indigenous
Loranthaceae	*Tapinanthus oleifolius*	(J.C.Wendl.) Danser	LC	Indigenous
Asteraceae	*Taraxacum bessarabicum*	(Hornem.) Hand.-Mazz.		Not indigenous; Naturalised
Asteraceae	*Tarchonanthus camphoratus*	L.	LC	Indigenous
Asteraceae	*Tarchonanthus obovatus*	DC.	LC	Indigenous; Endemic
Fabaceae	*Tephrosia burchellii*	Burtt Davy	LC	Indigenous
Fabaceae	*Tephrosia lupinifolia*	DC.	LC	Indigenous
Fabaceae	*Tephrosia purpurea subsp. var. leptostachya leptostachya*	(L.) Pers. (DC.) Brummitt	NE	Indigenous
Combretaceae	*Terminalia sericea*	Burch. ex DC.	LC	Indigenous
Aizoaceae	*Tetragonia calycina*	Fenzl	LC	Indigenous
Poaceae	*Themeda triandra*	Forssk.	LC	Indigenous
Santalaceae	*Thesium albomontanum*	Compton	LC	Indigenous; Endemic
Santalaceae	*Thesium hystricoides*	A.W.Hill	LC	Indigenous
Santalaceae	*Thesium hystrix*	A.W.Hill	LC	Indigenous
Santalaceae	*Thesium resedoides*	A.W.Hill	LC	Indigenous
Asteraceae	*Tolpis capensis*	(L.) Sch.Bip.	LC	Indigenous
Asphodelaceae	*Trachyandra laxa var. laxa*	(N.E.Br.) Oberm.	LC	Indigenous
Euphorbiaceae	*Tragia dioica*	Sond.	LC	Indigenous
Poaceae	*Tragus berteronianus*	Schult.	LC	Indigenous
Poaceae	*Tragus koelerioides*	Asch.	LC	Indigenous
Poaceae	*Tragus racemosus*	(L.) All.	LC	Indigenous
Aizoaceae	*Trianthema parvifolia var. parvifolia*	E.Mey. ex Sond.	LC	Indigenous
Malpighiaceae	*Triaspis hypericoides subsp. hypericoides*	(DC.) Burch.	LC	Indigenous
Zygophyllaceae	*Tribulus terrestris*	L.	LC	Indigenous
Zygophyllaceae	*Tribulus zeyheri subsp. zeyheri*	Sond.	LC	Indigenous
Aizoaceae	*Trichodiadema pomeridianum*	L.Bolus	LC	Indigenous
Poaceae	*Tricholaena monachne*	(Trin.) Stapf & C.E.Hubb.	LC	Indigenous
Poaceae	*Trichoneura grandiglumis*	(Nees) Ekman	LC	Indigenous
Poaceae	*Triraphis andropogonoides*	(Steud.) E.Phillips	LC	Indigenous
Poaceae	*Triraphis schinzii*	Hack.	LC	Indigenous
Cucurbitaceae	*Trochomeria debilis*	(Sond.) Hook.f.	LC	Indigenous
Poaceae	*Urelytrum agropyroides*	(Hack.) Hack.	LC	Indigenous

Poaceae	*Urochloa panicoides*	P.Beauv.	LC	Indigenous
Poaceae	*Urochloa stolonifera*	(Gooss.) Chippind.	LC	Indigenous
Asteraceae	*Ursinia nana subsp. nana*	DC.	LC	Indigenous
Lentibulariaceae	*Utricularia gibba*	L.	LC	Indigenous
Fabaceae	*Vachellia erioloba*	(E.Mey.) P.J.H.Hurter	LC	Indigenous
Fabaceae	*Vachellia haematoxylon*	(Willd.) Seigler & Ebinger	LC	Indigenous
Fabaceae	*Vachellia hebeclada subsp. hebeclada*	(DC.) Kyal. & Boatwr.	LC	Indigenous
Fabaceae	*Vachellia karroo*	(Hayne) Banfi & Galasso	LC	Indigenous
Vahliaceae	*Vahlia capensis subsp. var. vulgaris linearis*	(L.f.) Thunb. Bridson E.Mey. ex Bridson	NE	Indigenous
Rubiaceae	*Vangueria infausta subsp. infausta*	Burch.	LC	Indigenous
Rubiaceae	*Vangueria macrocalyx*	Sond.	LC	Indigenous
Verbenaceae	*Verbena brasiliensis*	Vell.		Not indigenous; Naturalised; Invasive
Asteraceae	*Verbesina encelioides subsp. encelioides*	(Cav.) Benth. & Hook.f. ex A.Gray		Not indigenous; Naturalised; Invasive
Plantaginaceae	*Veronica anagallis-aquatica*	L.	LC	Indigenous
Fabaceae	*Vigna unguiculata subsp. var. unguiculata unguiculata*	(L.) Walp.	NE	Indigenous
Santalaceae	*Viscum rotundifolium*	L.f.	LC	Indigenous
Campanulaceae	*Wahlenbergia androsacea*	A.DC.	LC	Indigenous
Campanulaceae	*Wahlenbergia denticulata var. transvaalensis*	(Burch.) A.DC. (Adamson) Welman	LC	Indigenous; Endemic
Campanulaceae	*Wahlenbergia nodosa*	(H.Buek) Lammers	LC	Indigenous; Endemic
Campanulaceae	*Wahlenbergia undulata*	(L.f.) A.DC.	LC	Indigenous
Malvaceae	*Waltheria indica*	L.	LC	Indigenous
Solanaceae	*Withania somnifera*	(L.) Dunal	LC	Indigenous
Convolvulaceae	*Xenostegia tridentata subsp. angustifolia*	(L.) D.F.Austin & Staples (Jacq.) Lejoly & Lisowski	LC	Indigenous
Asteraceae	*Zinnia peruviana*	(L.) L.		Not indigenous; Naturalised; Invasive

9.3 Appendix C – Avifauna Species Expected to Occur Within or Nearby to the Project Area of Influence

Species	Common Name	Conservation Status	
		Regional (SANBI, 2022)	IUCN (2021)
Acridotheres tristis	Myna, Common	Unlisted	LC
Acrocephalus baeticatus	Reed-warbler, African	Unlisted	Unlisted
Acrocephalus gracilirostris	Swamp-warbler, Lesser	Unlisted	LC
Afrotis afraoides	Korhaan, Northern Black	Unlisted	LC
Alopochen aegyptiaca	Egyptian goose	LC	LC
Amadina erythrocephala	Finch, Red-headed	Unlisted	LC
Anas erythrorhyncha	Teal, Red-billed	Unlisted	LC
Anas hottentota	Teal, Hottentot	Unlisted	LC
Anas platyrhynchos	Duck, Mallard	Unlisted	LC
Anas smithii	Shoveler, Cape	Unlisted	LC
Anas undulata	Duck, Yellow-billed	Unlisted	LC
Anthoscopus minutus	Penduline-tit, Cape	Unlisted	LC
Anthus cinnamomeus	Pipit, African	Unlisted	LC
Anthus leucophrys	Pipit, Plain-backed	Unlisted	LC
Anthus nicholsoni	Nicholson's Pipit		
Anthus vaalensis	Pipit, Buffy	Unlisted	LC
Apus affinis	Swift, Little	Unlisted	LC
Apus apus	Swift, Common	Unlisted	LC
Apus bradfieldi	Swift, Bradfield's	Unlisted	LC
Apus caffer	Swift, White-rumped	Unlisted	LC
Aquila verreauxii	Eagle, Verreaux's	VU	LC
Ardea cinerea	Heron, Grey	Unlisted	LC
Ardea melanocephala	Heron, Black-headed	Unlisted	LC
Ardea purpurea	Heron, Purple	Unlisted	LC
Ardeotis kori	Bustard, Kori	NT	NT
Batis pririt	Batis, Pririt	Unlisted	LC
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC
Bradornis infuscatus	Flycatcher, Chat	Unlisted	LC
Bradornis mariquensis	Flycatcher, Marico	Unlisted	LC
Bubalornis niger	Buffalo-weaver, Red-billed	Unlisted	LC
Bubo africanus	Eagle-owl, Spotted	Unlisted	LC
Bubulcus ibis	Egret, Cattle	Unlisted	LC
Burhinus capensis	Thick-knee, Spotted	Unlisted	LC
Buteo buteo	Buzzard, Common (Steppe)	Unlisted	LC
Buteo rufofuscus	Buzzard, Jackal	Unlisted	LC

Calamonastes fasciolatus	Wren-warbler, Barred	Unlisted	LC
Calandrella cinerea	Lark, Red-capped	Unlisted	LC
Calendulauda africanoides	Lark, Fawn-coloured	Unlisted	LC
Calendulauda sabota	Lark, Sabota	Unlisted	LC
Campethera abingoni	Woodpecker, Golden-tailed	Unlisted	LC
Caprimulgus rufigena	Nightjar, Rufous-cheeked	Unlisted	LC
Cecropis cucullata	Swallow, Greater Striped	Unlisted	LC
Cecropis semirufa	Swallow, Red-breasted	Unlisted	LC
Centropus burchellii	Coucal, Burchell's	Unlisted	Unlisted
Cercomela familiaris	Familiar Chat	Unlisted	LC
Cercotrichas coryphoeus	Scrub-robin, Karoo	Unlisted	LC
Cercotrichas paena	Scrub-robin, Kalahari	Unlisted	LC
Certhilauda subcoronata	Lark, Karoo Long-billed	Unlisted	LC
Charadrius tricollaris	Plover, Three-banded	Unlisted	LC
Chersomanes albofasciata	Lark, Spike-heeled	Unlisted	LC
Chrysococcyx caprius	Cuckoo, Diderick	Unlisted	LC
Cinnyris fuscus	Sunbird, Dusky	Unlisted	LC
Cinnyris mariquensis	Sunbird, Marico	Unlisted	LC
Cinnyris talatala	Sunbird, White-bellied	Unlisted	LC
Circaetus pectoralis	Snake-eagle, Black-chested	Unlisted	LC
Cisticola aridulus	Cisticola, Desert	Unlisted	LC
Cisticola chiniana	Cisticola, Rattling	Unlisted	LC
Cisticola fulvicapilla	Neddicky, Neddicky	Unlisted	LC
Cisticola juncidis	Cisticola, Zitting	Unlisted	LC
Cisticola rufilatus	Cisticola, Tinkling	Unlisted	LC
Cisticola subruficapilla	Cisticola, Grey-backed	Unlisted	LC
Cisticola tinniens	Cisticola, Levaillant's	Unlisted	LC
Clamator jacobinus	Cuckoo, Jacobin	Unlisted	LC
Colius colius	Mousebird, White-backed	Unlisted	LC
Colius striatus	Mousebird, Speckled	Unlisted	LC
Columba guinea	Pigeon, Speckled	Unlisted	LC
Columba livia	Dove, Rock	Unlisted	LC
Coracias caudatus	Roller, Lilac-breasted	Unlisted	LC
Corvus albus	Crow, Pied	Unlisted	LC
Corvus capensis	Crow, Cape	Unlisted	LC
Cossypha caffra	Robin-chat, Cape	Unlisted	LC
Creatophora cinerea	Starling, Wattled	Unlisted	LC
Crithagra albogularis	White-throated Canary	LC	LC
Crithagra atrogularis	Canary, Black-throated	Unlisted	LC

Crithagra flaviventris	Canary, Yellow	Unlisted	LC
Cuculus clamosus	Cuckoo, Black	Unlisted	LC
Cuculus gularis	Cuckoo, African	Unlisted	LC
Cypsiurus parvus	Palm-swift, African	Unlisted	LC
Dendropicos fuscescens	Woodpecker, Cardinal	Unlisted	LC
Dendropicos namaquus	Woodpecker, Bearded	Unlisted	LC
Dicrurus adsimilis	Drongo, Fork-tailed	Unlisted	LC
Emberiza capensis	Bunting, Cape	Unlisted	LC
Emberiza flaviventris	Bunting, Golden-breasted	Unlisted	LC
Emberiza impetuani	Bunting, Lark-like	Unlisted	LC
Emberiza tahapisi	Bunting, Cinnamon-breasted	Unlisted	LC
Eremomela icteropygialis	Eremomela, Yellow-bellied	Unlisted	LC
Estrilda astrild	Waxbill, Common	Unlisted	LC
Estrilda erythronotos	Waxbill, Black-faced	Unlisted	LC
Euplectes orix	Bishop, Southern Red	Unlisted	LC
Falco biarmicus	Falcon, Lanner	VU	LC
Falco rupicoloides	Kestrel, Greater	Unlisted	LC
Falco rupicolus	Kestrel, Rock	Unlisted	LC
Fulica cristata	Coot, Red-knobbed	Unlisted	LC
Gallinula chloropus	Moorhen, Common	Unlisted	LC
Glaucidium perlatum	Owlet, Pearl-spotted	Unlisted	LC
Granatina granatina	Waxbill, Violet-eared	Unlisted	LC
Halcyon albiventris	Kingfisher, Brown-hooded	Unlisted	LC
Himantopus himantopus	Stilt, Black-winged	Unlisted	LC
Hirundo fuligula	Martin, Rock	Unlisted	Unlisted
Hirundo rustica	Swallow, Barn	Unlisted	LC
Indicator indicator	Honeyguide, Greater	Unlisted	LC
Lagonosticta senegala	Firefinch, Red-billed	Unlisted	LC
Lamprotornis bicolor	Starling, Pied	Unlisted	LC
Lamprotornis nitens	Starling, Cape Glossy	Unlisted	LC
Laniarius atrococcineus	Shrike, Crimson-breasted	Unlisted	LC
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC
Lanius collurio	Shrike, Red-backed	Unlisted	LC
Lanius minor	Shrike, Lesser Grey	Unlisted	LC
Lophotis ruficrista	Korhaan, Red-crested	Unlisted	LC
Lybius torquatus	Barbet, Black-collared	Unlisted	LC
Malcorus pectoralis	Warbler, Rufous-eared	Unlisted	LC
Melierax canorus	Goshawk, Southern Pale Chanting	Unlisted	LC
Melierax gabar	Goshawk, Gabar	Unlisted	LC

Merops apiaster	Bee-eater, European	Unlisted	LC
Merops bullockoides	Bee-eater, White-fronted	Unlisted	LC
Merops hirundineus	Bee-eater, Swallow-tailed	Unlisted	LC
Microcarbo africanus	Cormorant, Reed	Unlisted	LC
Mirafra fasciolata	Lark, Eastern Clapper	Unlisted	LC
Monticola brevipes	Rock-thrush, Short-toed	Unlisted	LC
Motacilla capensis	Wagtail, Cape	Unlisted	LC
Muscicapa striata	Flycatcher, Spotted	Unlisted	LC
Myrmecocichla formicivora	Chat, Anteating	Unlisted	LC
Nilaus afer	Brubru	Unlisted	LC
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC
Nycticorax nycticorax	Night-Heron, Black-crowned	Unlisted	LC
Oena capensis	Dove, Namaqua	Unlisted	LC
Oenanthe monticola	Wheatear, Mountain	Unlisted	LC
Onychognathus nabouroup	Starling, Pale-winged	Unlisted	LC
Ortygospiza atricollis	Quailfinch, African	Unlisted	LC
Parus cinerascens	Tit, Ashy	Unlisted	LC
Passer diffusus	Sparrow, Southern Grey-headed	Unlisted	LC
Passer domesticus	Sparrow, House	Unlisted	LC
Passer melanurus	Sparrow, Cape	Unlisted	LC
Passer motitensis	Sparrow, Great	Unlisted	LC
Philetairus socius	Weaver, Sociable	Unlisted	LC
Phoeniculus purpureus	Wood-hoopoe, Green	Unlisted	LC
Phylloscopus trochilus	Warbler, Willow	Unlisted	LC
Plegadis falcinellus	Ibis, Glossy	Unlisted	LC
Plocepasser mahali	Sparrow-weaver, White-browed	Unlisted	LC
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC
Polemaetus bellicosus	Eagle, Martial	EN	EN
Porphyrio madagascariensis	Swamphen, African Purple	Unlisted	Unlisted
Prinia flavicans	Prinia, Black-chested	Unlisted	LC
Pternistis adspersus	Spurfowl, Red-billed	Unlisted	LC
Pterocles burchelli	Sandgrouse, Burchell's	Unlisted	LC
Pterocles namaqua	Sandgrouse, Namaqua	Unlisted	LC
Pycnonotus nigricans	Bulbul, African Red-eyed	Unlisted	LC
Pytilia melba	Pytilia, Green-winged	Unlisted	LC
Quelea quelea	Quelea, Red-billed	Unlisted	LC
Rhinopomastus cyanomelas	Scimitarbill, Common	Unlisted	LC
Riparia cincta	Martin, Banded	Unlisted	LC
Riparia paludicola	Martin, Brown-throated	Unlisted	LC

Saxicola torquatus	Stonechat, African	Unlisted	LC
Scleroptila gutturalis	Francolin, Orange River	Unlisted	LC
Sigelus silens	Flycatcher, Fiscal	Unlisted	LC
Spizocorys conirostris	Lark, Pink-billed	Unlisted	LC
Sporopipes squamifrons	Finch, Scaly-feathered	Unlisted	LC
Stenostira scita	Flycatcher, Fairy	Unlisted	LC
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC
Streptopelia senegalensis	Dove, Laughing	Unlisted	LC
Struthio camelus	Ostrich, Common	Unlisted	LC
Sylvia layardi	Tit-Babbler, Layard's	Unlisted	LC
Sylvia subcaerulea	Tit-Babbler, Chestnut-vented	Unlisted	Unlisted
Sylvietta rufescens	Crombec, Long-billed	Unlisted	LC
Tachybaptus ruficollis	Grebe, Little	Unlisted	LC
Tachymarptis melba	Swift, Alpine	Unlisted	LC
Tadorna cana	Shelduck, South African	Unlisted	LC
Tchagra australis	Tchagra, Brown-crowned	Unlisted	LC
Telophorus zeylonus	Bokmakierie, Bokmakierie	Unlisted	LC
Terpsiphone viridis	Paradise-flycatcher, African	Unlisted	LC
Threskiornis aethiopicus	Ibis, African Sacred	Unlisted	LC
Tockus leucomelas	Hornbill, Southern Yellow-billed	Unlisted	LC
Tockus nasutus	Hornbill, African Grey	Unlisted	LC
Trachyphonus vaillantii	Barbet, Crested	Unlisted	LC
Tricholaema leucomelas	Barbet, Acacia Pied	Unlisted	LC
Turdoides bicolor	Babbler, Southern Pied	Unlisted	LC
Turdus litsitsirupa	Thrush, Groundscraper	Unlisted	Unlisted
Turdus smithi	Thrush, Karoo	Unlisted	LC
Turnix sylvaticus	Buttonquail, Kurrichane	Unlisted	LC
Tyto alba	Owl, Barn	Unlisted	LC
Upupa africana	Hoopoe, African	Unlisted	LC
Uraeginthus angolensis	Waxbill, Blue	Unlisted	LC
Urocolius indicus	Mousebird, Red-faced	Unlisted	LC
Vanellus armatus	Lapwing, Blacksmith	Unlisted	LC
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC
Vidua regia	Whydah, Shaft-tailed	Unlisted	LC
Zosterops pallidus	White-eye, Orange River	Unlisted	LC

9.4 Appendix D – Mammal Species Expected to Occur Within or Nearby to the Project Area of Influence

Species	Common Name	Conservation Status	
		Regional (SANBI, 2022)	IUCN (2021)
Aethomys chrysophilus	Red Veld Rat	LC	LC
Aethomys ineptus	Tete Veld Rat	LC	LC
Aethomys namaquensis	Namaqua rock rat	LC	LC
Antidorcas marsupialis	Springbok	LC	LC
Aonyx capensis	Cape Clawless Otter	NT	NT
Atelerix frontalis	South Africa Hedgehog	NT	LC
Canis mesomelas	Black-backed Jackal	LC	LC
Caracal caracal	Caracal	LC	LC
Crocidura cyanea	Reddish-grey Musk Shrew	LC	LC
Crocidura hirta	Lesser Red Musk Shrew	LC	LC
Cryptomys hottentotus	Common Mole-rat	LC	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Dendromus melanotis	Grey Climbing Mouse	LC	LC
Desmodillus auricularis	Short-tailed Gerbil	LC	LC
Elephantulus myurus	Eastern Rock Sengi	LC	LC
Elephantulus rupestris	Western Rock Shrew	LC	LC
Eptesicus hottentotus	Long-tailed Serotine Bat	LC	LC
Felis nigripes	Black-footed Cat	VU	VU
Felis silvestris	African Wildcat	LC	LC
Fukomys damarensis	Damaraland Mole-rat	LC	LC
Genetta genetta	Small-spotted Genet	LC	LC
Genetta tigrina	Cape Genet	LC	LC
Gerbilliscus brantsii	Highveld Gerbil	LC	LC
Gerbilliscus leucogaster	Bushveld Gerbil	LC	LC
Gerbillurus paeba	Hairy-footed Gerbil	LC	LC
Herpestes sanguineus	Slender Mongoose	LC	LC
Hystrix africaeaustralis	Cape Porcupine	LC	LC
Ictonyx striatus	Striped Polecat	LC	LC
Lepus capensis	Cape Hare	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Macroscelides proboscideus	Karoo Round Eared Sengi	LC	LC
Malacothrix typica	Gerbil Mouse	LC	LC
Mastomys coucha	Multimammate Mouse	LC	LC
Mastomys natalensis	Natal Multimammate Mouse	LC	LC
Mellivora capensis	Honey Badger	LC	LC

Miniopterus natalensis	Natal Long-fingered Bat	LC	LC
Miniopterus schreibersii	Schreiber's Bent-winged Bat		VU
Mus minutoides	Pygmy Mouse	LC	LC
Mus musculus	House Mouse	Unlisted	LC
Neoromicia capensis	Cape Serotine Bat	LC	LC
Nycteris thebaica	Egyptian Slit-faced Bat	LC	LC
Orycteropus afer	Aardvark	LC	LC
Otocyon megalotis	Bat-eared Fox	LC	LC
Otomys auratus	Vlei Rat (Grassland type)	NT	NT
Panthera pardus	Leopard	VU	VU
Papio ursinus	Chacma Baboon	LC	LC
Parahyaena brunnea	Brown Hyaena	NT	NT
Parotomys brantsii	Brants' Whistling Rat	LC	LC
Pedetes capensis	Springhare	LC	LC
Phacochoerus africanus	Common Warthog	LC	LC
Poecilogale albinucha	African Striped Weasel	NT	LC
Procavia capensis	Rock Hyrax	LC	LC
Pronolagus rupestris	Smiths Red Rock Hare	LC	LC
Proteles cristata	Aardwolf	LC	LC
Raphicerus campestris	Steenbok	LC	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	LC	LC
Rhinolophus damarensis	Damara Horseshoe Bat	LC	LC
Rhinolophus denti	Dent's Horseshoe Bat	NT	LC
Saccostomus campestris	Pouched Mouse	LC	LC
Smutsia temminckii	Temminck's Ground Pangolin	VU	VU
Steatomys krebsii	Krebs's Fat Mouse	LC	LC
Suncus varilla	Lesser Dwarf Shrew	LC	LC
Suricata suricatta	Suricate	LC	LC
Sylvicapra grimmia	Common Duiker	LC	LC
Tadarida aegyptiaca	Egyptian Free-tailed Bat	LC	LC
Thallomys nigricauda	Black-tailed Tree Rat	LC	LC
Thallomys paedulcus	Tree Rat	LC	LC
Vulpes chama	Cape Fox	LC	LC
Xerus inauris	Cape Ground Squirrel	LC	LC
Zelotomys woosnami	Woosnam's Desert Rat	LC	LC

9.5 Appendix E – Reptile Species Expected to Occur Within or Nearby to the Project Area of Influence

Species	Common Name	Conservation Status	
		Regional (SANBI, 2022)	IUCN (2021)
Acontias gracilicauda	Thin-tailed Legless Skink	LC	LC
Afrotyphlops bibronii	Bibron's Blind Snake	LC	LC
Agama aculeata aculeata	Western Ground Agama	LC	Unlisted
Agama atra	Southern Rock Agama	LC	LC
Aparallactus capensis	Black-headed Centipede-eater	LC	LC
Aspidelaps scutatus scutatus	Common Shield Snake	LC	Unlisted
Atractaspis bibronii	Bibron's Stiletto Snake	LC	Unlisted
Atractaspis duerdeni	Duerden's Stilleto Snake	LC	Unlisted
Bitis arietans arietans	Puff Adder	LC	Unlisted
Boaedon capensis	Brown House Snake	LC	LC
Chamaeleo dilepis	Common Flap-neck Chameleon	LC	LC
Chamaeleo namaquensis	Namaqua Chameleon	LC	LC
Chondrodactylus angulifer	Common Giant Gecko	LC	LC
Dasypeltis scabra	Rhombic Egg-eater	LC	LC
Dispholidus typus	Boomslang	LC	Unlisted
Gerrhosaurus flavigularis	Yellow-throated Plated Lizard	LC	Unlisted
Heliobolus lugubris	Bushveld Lizard	LC	Unlisted
Karusasaurus polyzonus	Southern Karusa Lizard	LC	LC
Leptotyphlops scutifrons scutifrons	Peters' Thread Snake	LC	Unlisted
Lycophidion capense capense	Cape Wolf Snake	LC	Unlisted
Lygodactylus capensis capensis	Common Dwarf Gecko	LC	Unlisted
Meroles squamulosus	Common Rough-scaled Lizard	LC	Unlisted
Monopeltis infuscata	Dusky Worm Lizard	LC	Unlisted
Naja nivea	Cape Cobra	LC	Unlisted
Nucras intertexta	Spotted Sandveld Lizard	LC	Unlisted
Pachydactylus capensis	Cape Gecko	LC	Unlisted
Panaspis wahlbergi	Wahlberg's Snake-eyed Skink	LC	Unlisted
Pedioplanis inornata	Plain Sand Lizard	LC	Unlisted
Pedioplanis lineoocellata lineoocellata	Spotted Sand Lizard	LC	Unlisted
Pedioplanis namaquensis	Namaqua Sand Lizard	LC	Unlisted
Pelomedusa galeata	South African Marsh Terrapin	Not evaluated	Unlisted
Psammobates oculifer	Serrated Tent Tortoise	LC	Unlisted
Psammophis brevirostris	Short-snouted Grass Snake	LC	Unlisted
Psammophis leightoni	Cape Sand Snake	LC	LC
Psammophylax tritaeniatus	Striped Grass Snake	LC	LC

Pseudaspis cana	Mole Snake	LC	Unlisted
Python natalensis	Southern African Python	LC	Unlisted
Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	LC	Unlisted
Stigmochelys pardalis	Leopard Tortoise	LC	LC
Telescopus semiannulatus semiannulatus	Eastern Tiger Snake	LC	Unlisted
Trachylepis capensis	Cape Skink	LC	Unlisted
Trachylepis punctatissima	Speckled Rock Skink	LC	LC
Trachylepis spilogaster	Kalahari Tree Skink	LC	Unlisted
Trachylepis sulcata sulcata	Westren Rock Skink	LC	Unlisted
Trachylepis variegata	Variegated Skink	LC	Unlisted
Varanus albigularis albigularis	Southern Rock Monitor	LC	Unlisted
Zygaspis quadrifrons	Kalahari Dwarf Worm Lizard	LC	Unlisted

9.6 Appendix F – Amphibian Species Expected to Occur Within or Nearby to the Project Area of Influence

Species	Common Name	Conservation Status	
		Regional (SANBI, 2022)	IUCN (2021)
Amietia angolensis	Angolan River Frog	LC	LC
Amietia delalandii	Delalande's River Frog	LC	Unlisted
Amietia poyntoni	Poynton's River Frog	LC	LC
Breviceps adspersus	Bushveld Rain Frog	LC	LC
Cacosternum boettgeri	Common Caco	LC	LC
Kassina senegalensis	Bubbling Kassina	LC	LC
Pyxicephalus adspersus	Giant Bullfrog	NT	LC
Sclerophrys garmani	Olive Toad	LC	LC
Sclerophrys gutturalis	Guttural Toad	LC	LC
Sclerophrys poweri	Power's Toad	LC	LC
Tomopterna cryptotis	Tremelo Sand Frog	LC	LC
Tomopterna tandyi	Tandy's Sand Frog	LC	LC
Vandijkophrynus gariepensis gariepensis	Karoo Toad	Not listed	Not listed
Xenopus laevis	Common Platanna	LC	LC