# TERRESTRIAL ECOLOGY BASLINE & IMPACT ASSESSMENT FOR THE PROPOSED SCSC SOLAR FACILITY

## Northam, Limpopo & North West Provinces

May 2022

**CLIENT**


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# 1 Introduction

## 1.1 Background

The Biodiversity Company was appointed to undertake a biodiversity impact assessment for the proposed SCSC Solar Facility for Siyanda Bakgatla Platinum Mine in Northam, Limpopo Province. The project infrastructure is located in both the Limpopo and also North West provinces. The project is located 6.5 km west from Northam. The Northam focus area has been identified by the potential development area for the construction and operation of solar and battery facilities consisting of 273 Ha (Figure 1-2).

The approach was informed by the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices 320 (20 March 2020) in terms of NEMA, dated 20 March: "*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*" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the terrestrial sensitivity of the project area as "Very High".

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed project.

## 1.2 Project Description

### 1.2.1 SCSC PV RE project

Main Street 1887 Proprietary Limited proposes the development of the Solar Photovoltaic (PV) facility and associated infrastructure on a site bordering the eastern end of the Siyanda Bakgatla Platinum Mine area near Northam. The solar PV facility will comprise several arrays of PV panels, a Battery Energy Storage System (BESS), and associated infrastructure with a contracted capacity of up to 100MW.

The purpose of the proposed project is to generate electricity for exclusive use by the Siyanda Mine, following which any excess power produced will be distributed to the national grid, if applicable. The construction of the PV facility aims to reduce the Siyanda Mine's dependency on direct supply from Eskom's national grid for operation activities, while simultaneously decreasing the mine's carbon footprint.

A preferred project site with an extent of ~1138ha and a development area of 564 has been identified by Main Street 1887 Proprietary Limited as a technically suitable area for the development of the Solar PV Facility with a contracted capacity of up to 100MW. The project area is located on Portion 3 of Farm Grootkuil 409. The project site falls within the Thabazimbi Local Municipality within the Waterberg District Municipality in the Limpopo Province. The site is located ~6.5km west of the town of Northam and is accessible via the Swartklip Road which branches off the R510 provincial route.

Infrastructure associated with the solar PV facility will include:

- 100MW Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Cabling between the project components.
- Battery Energy Storage System (BESS).
- On-site facility substation between the solar PV facility and the Eskom substation.
- Site offices, Security office, operations and control, and maintenance and storage laydown areas.
- Access roads, internal distribution roads.

**Grid connection solution.**

To evacuate the generated power to the Siyanda Mine, the grid connection solution consisting of the following is proposed:

The power generated by the solar PV facility will be transferred to the three step up transformers at the on-site/plant substation. Power will then be delivered from each step-up transformer as follows:

- Two 6.6 km, 33 kV transmission lines to the Mortimer substation with four step down transformers (33/6.6 kV; 10 MVA).
- Two 4.7 km, 33 kV transmission lines to the Fridge substation with two step down transformers (33/6.6 kV; 10 MVA).
- Two 2.9 km, 33 kV transmission lines to the Ivan substation with three step down transformers (33/11 kV; 10 MVA).
- One 132kV transmission line to the south west area of the project site where a new substation (to be assessed through separate Environmental Impact Assessment (EIA) processes) for the furnace is proposed to be built.

The grid connection is proposed on the following properties:

- Portion 3 of Farm Grootkuil 409.
- Portion 4 of Farm Grootkuil 409.
- Portion 5 of Farm Grootkuil 409.

The development area of 574 ha is larger than the area needed for the construction of a 100MW PV facility and will provide the opportunity for the optimal placement of the infrastructure, ensuring avoidance of major identified environmental sensitivities by the development footprint of ~ 240ha[1].

[1] The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Solar PV will be planned to be constructed. This will be the actual footprint of the facility, and the area which would be disturbed. The extent of the development footprint will be determined in the EIA Phase.

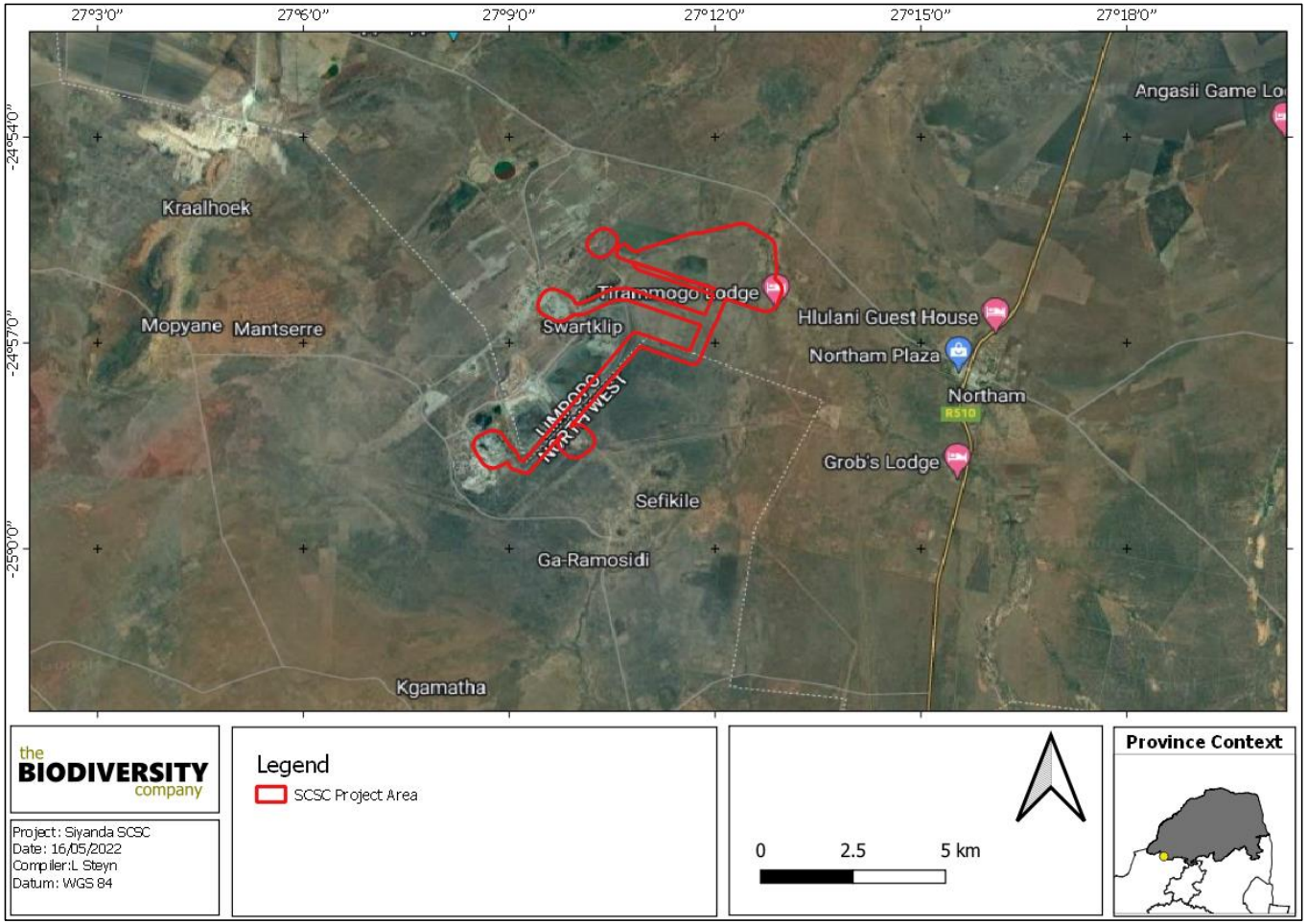


***Figure 1-1 Proposed location of the project area in relation to the nearby towns***

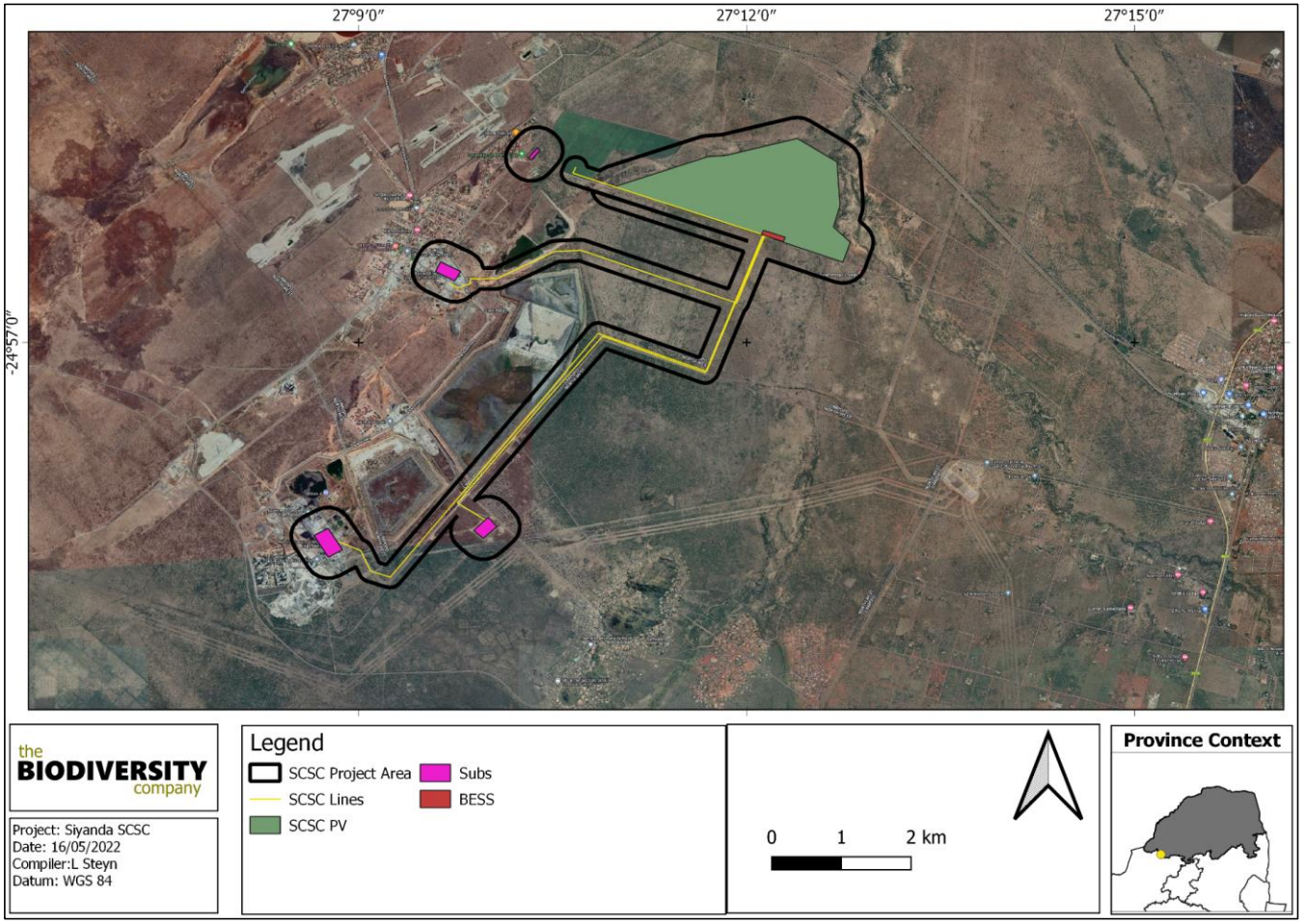


***Figure 1-2 The various components of the project***

## 1.3 Specialist Details

| | |
|---|---|
| Report Name | **TERRESTRIAL ECOLOGY BASLINE & IMPACT ASSESSMENT FOR THE PROPOSED SCSC SOLAR FACILITY** |
| Reference | **Siyanda PV** |
| Submitted to | savannah environmental |
| Report Writer<br>Desktop | **Lindi Steyn**  <br>Dr Lindi Steyn has completed her PhD in Biodiversity and Conservation from the University of Johannesburg. Lindi is a terrestrial ecologist with a special interest in ornithology. She has completed numerous studies ranging from basic Assessments to Environmental Impact Assessments following IFC standards. |
| Report Writer (Screening) and Fieldwork | **Lusanda Matee**  <br>Lusanda Matee is a registered scientist (119257/2018) in the fields of Biological Science ( Pr.Sci Nat.) and Ecological Science (Cand Nat.). He is a specialist terrestrial ecologist and botanist who conducts floral surveys faunal surveys which include mammals, birds, amphibians, and reptiles. He has 4 years of experience in environmental consulting. He received a Bachelor of Science, Honours, and MSc in Biological Sciences from the University of KwaZulu-Natal. |
| Report Writer and Fieldwork | **Marnus Erasmus**  <br>Martinus Erasmus obtained his B-Tech degree in Nature Conservation in 2016 at the Tshwane University of Technology. Martinus has been conducting EIAs, IFC standard surveys, basic assessments and assisting specialists in field during his studies since 2015. Martinus is Cand. Sci. Nat. registered (118630) is a specialist terrestrial ecologist and botanist which conducts floral surveys faunal surveys which include mammals, birds, amphibians and reptiles. |
| Reviewer | **Andrew Husted**  <br>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 Terms of Reference

The principle aim of the assessment was to provide information to guide the risk of the proposed activity to the flora and fauna communities of the associated ecosystems within the project area/corridor. This was achieved through the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the project area;
- Desktop assessment to compile an expected species list and possible threatened flora and fauna species that occur within the project area;
- Field survey to ascertain the species composition of the present flora and fauna community within the project area;
- Delineate and map the habitats and their respective sensitivities that occur within the project area;
- Identify the manner that the proposed project impacts the flora and fauna community and evaluate the level of risk of these potential impacts; and
- The prescription of mitigation measures and recommendations for identified risks.

## 1.5 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment area was based on the area provided by the client and any alterations to the footprint and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The species likelihood of occurrence is based on desktop information and might be changed after the assessment;
- The impact assessment included is preliminary and is solely based on the screening survey and desktop information; and
- No decommissioning phase impacts have been considered for this project. The life of operation is unknown and expected for perpetuity.

## 1.6 Key Legislative Requirements

The legislation listed below in Table 1-1 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 1-1 A list of key legislative requirements relevant to biodiversity and conservation in the Limpopo and North West Provinces***

| 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: Protected Areas Act (Act No. 57 of 2003) |
| | The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations |
| | 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, GNR 320 of Government Gazette 43310 (March 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, GNR 1150 of Government Gazette 43855 (October 2020) |
| | The National Environmental Management: Waste Act, 2008 (Act 59 of 2008); |
| | National Forest Act (Act No. 84 of 1998) |

| | |
|---|---|
| | National Veld and Forest Fire Act (101 of 1998) |
| | National Water Act (NWA) (Act No. 36 of 1998) |
| | Alien and Invasive Species Regulations and, Alien and Invasive Species List 20142020, published under NEMBA |
| | Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA) |
| **Provincial** | Limpopo Conservation Plan (2018) |
| | Limpopo Environmental Management Act (2003) |
| | North-West Biodiversity Sector Plan of 2015 (READ, 2015). |
| | The North West Biodiversity Management Amendment Bill, 2017 |

# 2 Methods

## 2.1 Desktop Baseline

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 date of publishing are provided below.

### 2.1.1 Ecologically Important Landscape Features

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

- National Biodiversity Assessment 2018 (Skowno et al, 2019) (NBA) - The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species, and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
    - *Ecosystem Threat Status* – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.
    - *Ecosystem Protection Level* – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2021) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms 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.
- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2016) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:

The **Limpopo Conservation Plan** was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet *et al.,* 2013). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e., map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration, and requirement for meeting targets for both biodiversity pattern and ecological processes:

  - Critical Biodiversity Area 1 (CBA1);
  - Critical Biodiversity Area 2 (CBA2);
  - Ecological Support Area 1 (ESA1);
  - Ecological Support Area 2 (ESA2);
  - Other Natural Area (ONA);
  - Protected Area (PA); and
  - No Natural Remaining (NNR).

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).

Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services (SANBI, 2017). Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.

Other Natural Areas (ONAs) consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (Driver *et al.,* 2017).

Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver *et al.,* 2017).

The **North-West Department of Rural, Environment, and Agricultural Development (READ),** as custodian of the environment in the North West, is the primary implementing agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines (READ, 2015).

- Important Bird and Biodiversity Areas (IBAs) (BirdLife South Africa, 2015) – IBAs constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites

of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.,* 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and pressures on these systems.

### 2.1.2 Desktop Flora Baseline

The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) and SANBI (2019) was used to identify the vegetation type that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA) database was accessed to compile a list of expected flora species within the project area (Figure 2-1). The Red List of South African Plants (Raimondo *et al.,* 2009; SANBI, 2020) was utilized to provide the most current national conservation status of flora species.

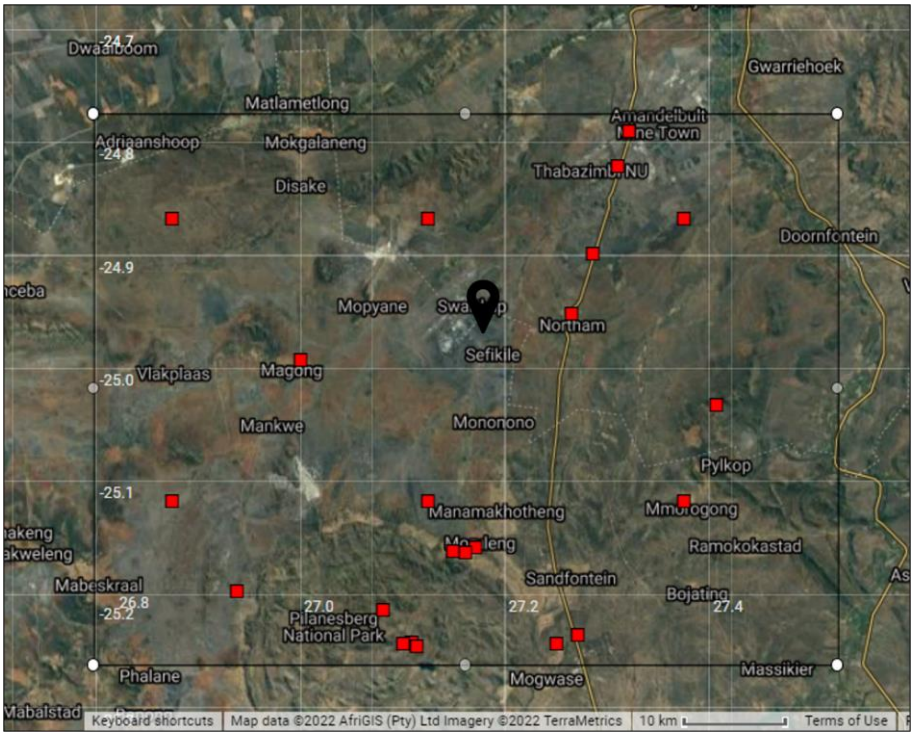


***Figure 2-1 Map illustrating extent of area used to obtain the expected flora species list from the Plants of South Africa (POSA) database. Yellow dot indicates approximate location of the project area. The red squares are cluster markers of botanical records as per POSA data***

### 2.1.3 Desktop Faunal Baseline

The faunal desktop assessment comprised of the following, compiling an expected:

- Amphibian list, generated from the IUCN spatial dataset (2017) and AmphibianMap database (Fitzpatrick Institute of African Ornithology, 2021a), using the 2427 quarter degree square;

- Reptile list, generated from the IUCN spatial dataset (2017) and ReptileMap database (Fitzpatrick Institute of African Ornithology, 2021b), using the 2427 quarter degree square;
- Avifauna list, generated from the SABAP2 dataset by looking at pentads 2450_2700; 2450_2705; 2455_2700; 2455_2700; 2455_2705; 2455_2710; 2500_2700_2500_2705); and
- Mammal list from the IUCN spatial dataset (2017).

## 2.2 Biodiversity Field Assessment

The following methodologies will be implemented for the baseline assessment (phase) of the project.

### 2.2.1 Flora Survey

The fieldwork and sample sites will be 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 will included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork will therefore be to maximise coverage and navigate to each target site in the field, to perform a rapid vegetation and ecological assessment at each sample site. Emphasis will be placed on sensitive habitats, especially those overlapping with the proposed project area.

Homogenous vegetation units will be subjectively identified using satellite imagery and existing land cover maps. The floristic diversity and search for flora SCC will be conducted through timed meanders within representative habitat units delineated during the fieldwork. Emphasis will be placed mostly on sensitive habitats overlapping with the proposed project areas.

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

At each sample site notes will be made regarding current impacts (e.g., livestock grazing, erosion etc.), subjective recording of dominant vegetation species, and any sensitive features (e.g., wetlands, outcrops etc.). In addition, opportunistic observations will be made while navigating through the project area.

### 2.2.2 Fauna Survey

The faunal assessment within this report pertains to herpetofauna (amphibians and reptiles), avifauna and mammals. The faunal field survey will be comprised of the following techniques:

- Visual and auditory searches - This typically comprises of meandering and using binoculars to view species from a distance without them being disturbed; and listening to species calls;
- 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.)
- Camera trapping;
- Point counts for the avifauna; and
- Utilization of local knowledge.

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

- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates *et al,* 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Smithers' Mammals of Southern Africa (Apps, 2000);

- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000);
- Book of birds of South Africa, Lesotho and Swaziland (Taylor *et al.,* 2015); and
- Roberts – Birds of Southern Africa (Hockey *et al.,* 2005).

### 2.3 Terrestrial Site Ecological Importance

The different habitat types within the project area will be delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types will be assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern 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 on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

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

***Table 2-1 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$^2$.<br>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.<br>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.<br>If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.<br>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.<br>Presence of Rare species.<br>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.<br>Any area of natural habitat of threatened ecosystem type with status of VU.<br>Presence of range-restricted species.<br>> 50% of receptor contains natural habitat with potential to support SCC. |
| **Low** | No confirmed or highly likely populations of SCC.<br>No confirmed or highly likely populations of range-restricted species.<br>< 50% of receptor contains natural habitat with limited potential to support SCC. |
| **Very Low** | No confirmed and highly unlikely populations of SCC.<br>No confirmed and highly unlikely populations of range-restricted species.<br>No natural habitat remaining. |

***Table 2-2 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.<br>High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.<br>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.<br>Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches.<br>Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation 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.<br>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.<br>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.<br>Low rehabilitation potential.<br>Several minor and major current negative ecological impacts. |
| **Very Low** | Very small (< 1 ha) area.<br>No habitat connectivity except for flying species or flora with wind-dispersed seeds.<br>Several major current negative ecological impacts. |

BI can be derived from a simple matrix of CI and FI as provided in Table 2-3.

***Table 2-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)***

| Biodiversity Importance (BI) | | Conservation Importance (CI) | | | | |
|---|---|---|---|---|---|---|
| | | **Very high** | **High** | **Medium** | **Low** | **Very low** |
| **Functional Integrity (FI)** | **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 2-4.

***Table 2-4 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. |

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-5.

***Table 2-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)***

| Site Ecological Importance | | Biodiversity Importance (BI) | | | | |
|---|---|---|---|---|---|---|
| | | Very high | High | Medium | Low | Very low |
| Receptor Resilience (RR) | 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 2-6.

***Table 2-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed development 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.

# 3 Results & Discussion

## 3.1 Desktop Baseline

### 3.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features is summarised in Table 3-1.

***Table 3-1 Summary of relevance of the proposed project to ecologically important landscape features***

| Desktop Information Considered | Relevant/Irrelevant | Section |
|---|---|---|
| Ecosystem Threat Status | Relevant – Overlaps with a Least Concern ecosystem | 3.1.1.1 |
| Ecosystem Protection Level | Relevant – Overlaps with a Moderately Protected Ecosystem | 3.1.1.2 |
| Critical Biodiversity Area | Relevant – The project area overlaps with CBA2, ESA1, NNR and ONA classified areas | 3.1.1.3 |
| Protected Areas | Relevant – The project area overlaps with the Rustenburg Platinum Mines (Union Section) Private Nature Reserve | 3.1.1.4 |
| National Protected Areas Expansion Strategy | Relevant – The project area overlaps with a NPAES protected area | 3.1.1.5 |
| South African Inventory of Inland Aquatic Ecosystems | Relevant - The project area overlaps with two CR wetlands and is adjacent to 1 CR wetland | 3.1.1.5 |
| National Freshwater Priority Area | Relevant – The project area overlaps with an unclassified FEPA wetland and an unclassified FEPA river | 3.1.1.6 |
| Strategic Water Source Areas | Irrelevant- The project area is 57 km from the closest SWSA | - |
| Renewable Energy Development Zones | Irrelevant - The project area is 167 km for the closest REDZ | - |
| Powerline Corridor | Irrelevant- The project area falls 88km from the Northern Corridor | - |

#### 3.1.1.1 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed project overlaps with a LC ecosystem (Figure 3-1).

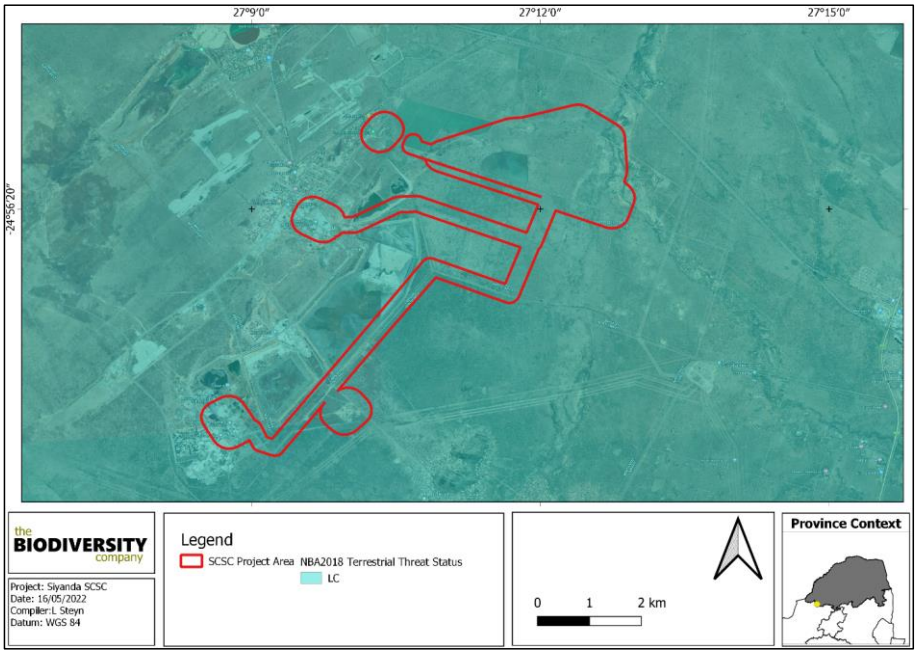


***Figure 3-1 Map illustrating the ecosystem threat status associated with the project area.***

#### 3.1.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with a MP ecosystem (Figure 3-2).

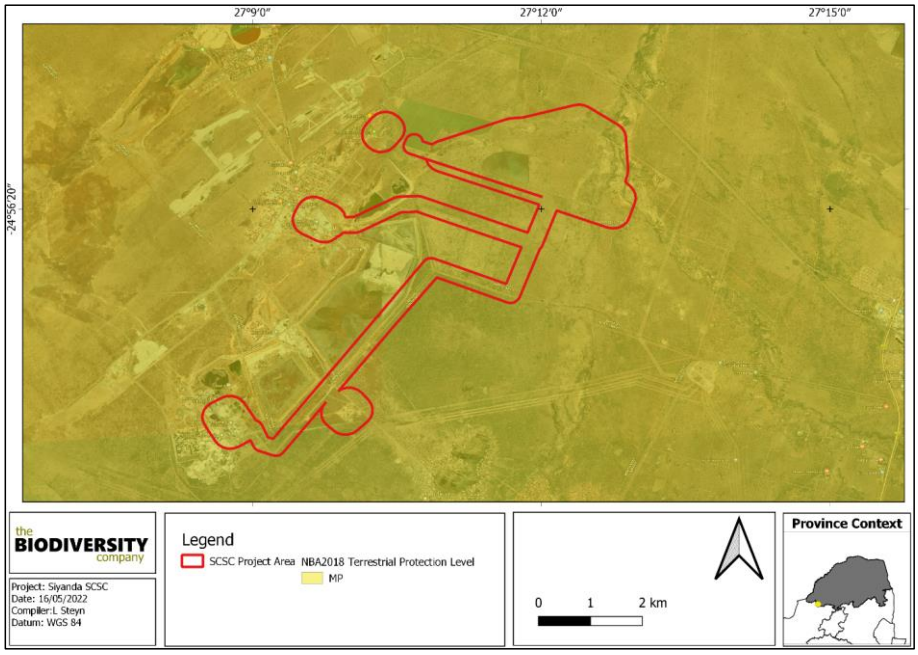


***Figure 3-2 Map illustrating the ecosystem protection level associated with the project area***

#### 3.1.1.3 Critical Biodiversity Areas and Ecological Support Areas

The conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

The provincial CBA spatial data for the North West province indicates that both feasibility areas don't traverse any CBA nor Ecological Support Areas (ESAs) and Other Natural Areas (ONAs). Based on the Limpopo Conservation Plan the SCSC feasibility area traverses ESA1 and NNR areas, whereas the SBPM feasibility area traverses ESA1, NNR and ONA area.

The purpose of the Limpopo C-Plan (2018) is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

Figure 3-3 shows the project area superimposed on the Terrestrial CBA maps. The project area overlaps with CBA2, ESA1, NNR and ONA classified areas. Development in these areas is feasible, but developments other than the preferred biodiversity-compatible land-uses should be investigated in detail and the mitigation hierarchy applied.

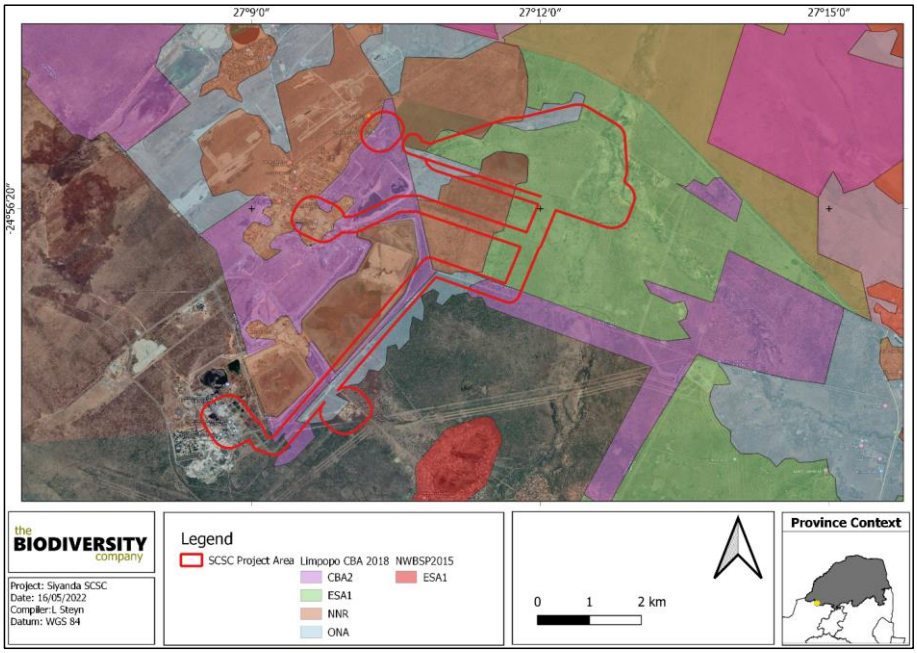


***Figure 3-3 Map illustrating the locations of CBAs in the project area***

#### 3.1.1.4 Protected areas

According to the protected area spatial datasets from SAPAD (2021), the project area overlaps with the Rustenburg Platinum Mines (Union Section) Private Nature Reserve (Figure 3-4). From the imagery, and confirmed by the site visit, the portion of the reserve in which the project area is located is comprised of an old tailings dam in various stages of rehabilitation and is therefore not considered ecologically sensitive. Several additional private nature reserves are in close proximity to the project area. These are the Leopard Hills, Animalia, Youngs and Leeuwkopje private nature reserves. All of these reserves are within 5km of the project area which means that the project area is within the buffer zone of the nature reserves.

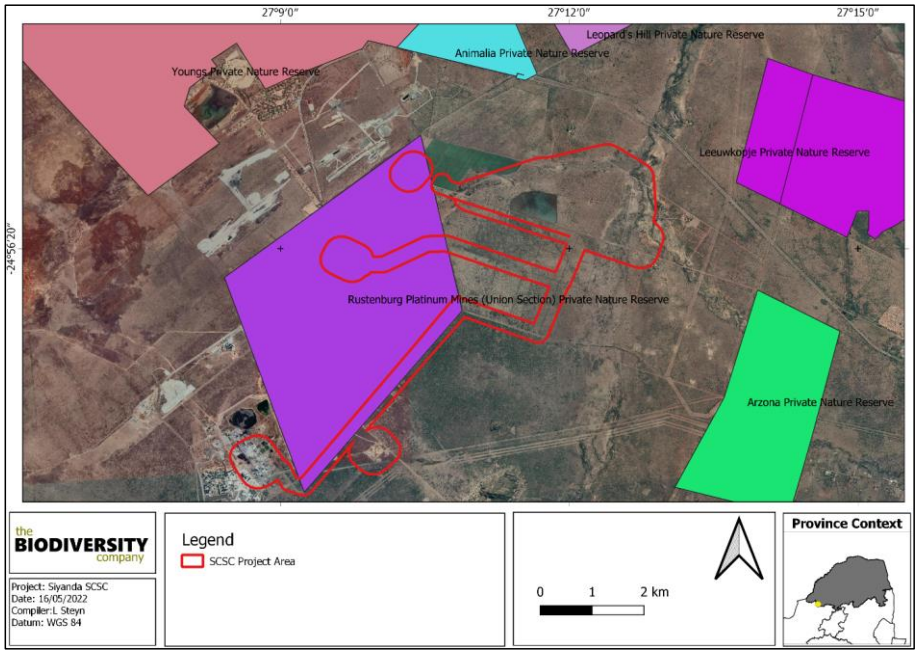


***Figure 3-4 The project area in relation to the protected areas***

#### 3.1.1.5 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2016 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for finescale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016). The project area overlaps with an NPAES protected area as can be seen in Figure 3-5.However as mentioned above the portion of the protected area in which the project area is located is comprised of an old tailings dam in various stages of rehabilitation and is therefore not considered ecologically sensitive.

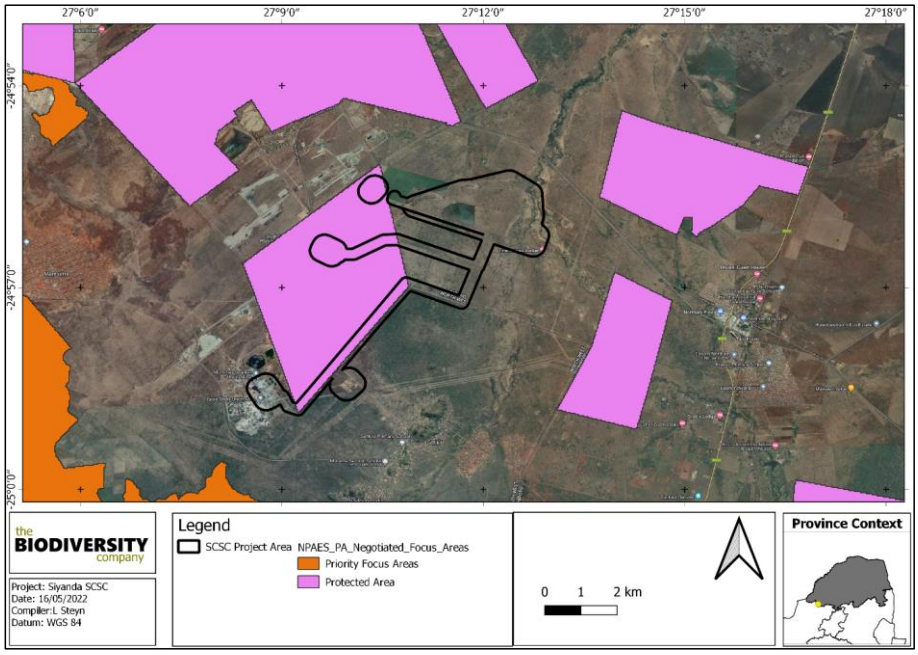


***Figure 3-5 The project area in relation to the National Protected Area Expansion Strategy***

#### 3.1.1.6 Hydrological Setting

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al.,* 2019). The project area overlaps with CR NBA rivers and borders on a CR wetland (Figure 3-6). The reach of the Sefathlane River proximal to the area is regarded as CR.

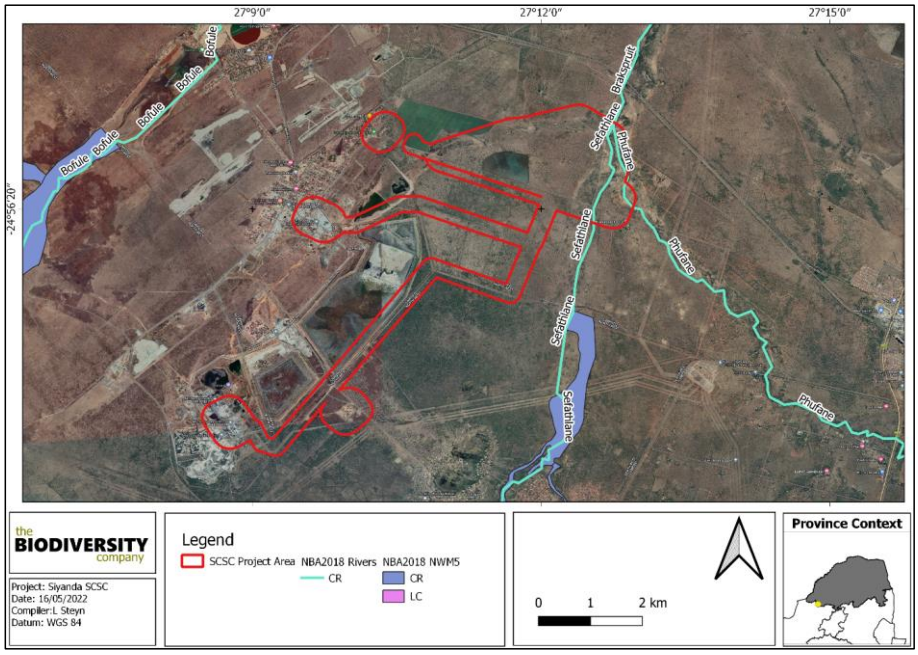


***Figure 3-6 Map illustrating ecosystem threat status of rivers and wetland ecosystems in the project area***

#### 3.1.1.7 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river 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) (Driver *et al.,* 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al.,* 2011).

Figure 3-7 shows the project area overlaps with unclassified FEPA wetlands and unclassified FEPA rivers.

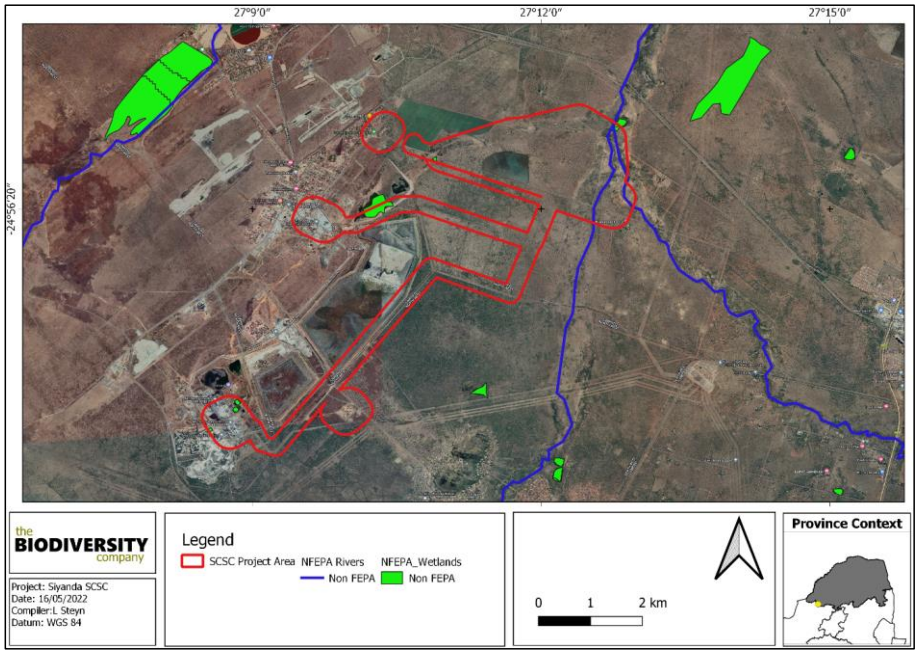


***Figure 3-7 The project area in relation to the National Freshwater Ecosystem Priority Areas.***

#### 3.1.1.8 Renewable Energy Database

The Renewable Energy Database (http://egis.environment.gov.za/), shows that there are limited other projects in the near vicinity (Figure 3-8). This reduces the overall impact on the habitats in the area.

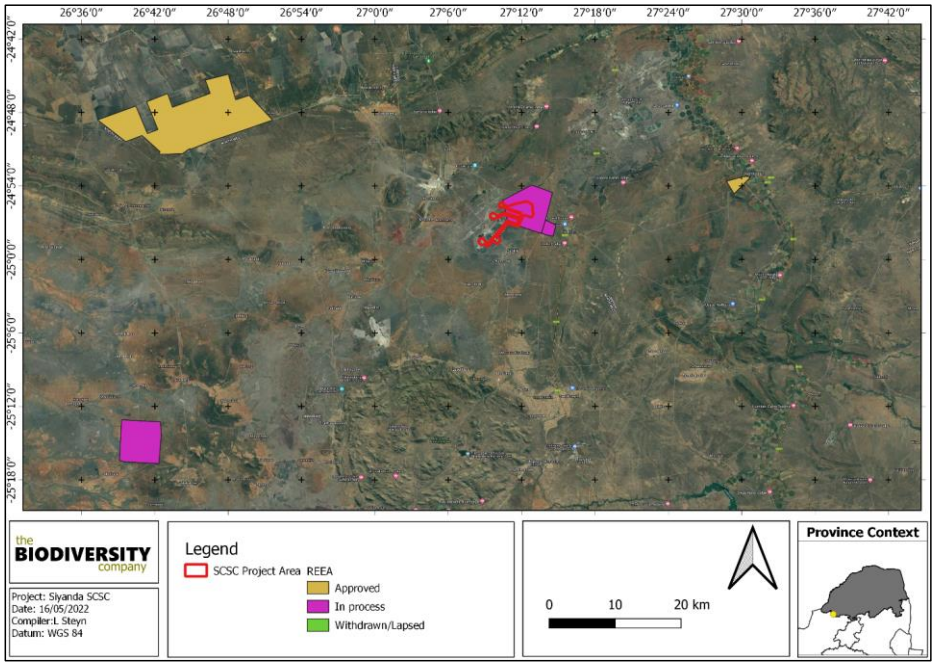


***Figure 3-8 The project area in relation to the renewable energy database projects in the area.***

### 3.1.2 Flora Assessment

This section is divided into a description of the vegetation type expected to occur under natural conditions and the expected flora species.

#### 3.1.2.1 Vegetation Type

The project area is situated in 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:

a) Seasonal precipitation; and

b) (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, 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 *Acacia and Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

On a fine-scale vegetation type, the project area overlaps with the Dwaalboom Thornveld vegetation type (Figure 3-9).

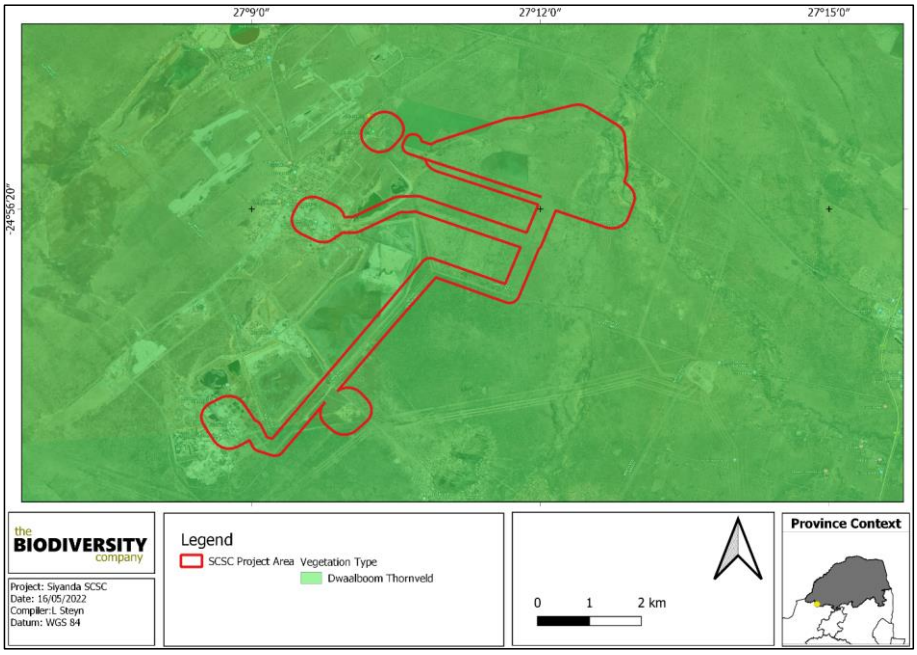


***Figure 3-9 Map illustrating the vegetation type associated with the project area***

#### 3.1.2.1.1 Dwaalboom Thornveld

Dwaalboom Thornveld is restricted to, and is distributed in, the Limpopo and North-West Provinces within flats north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area but including a patch around Sentrum. South of the ridges it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area at an altitude range of between 900 and 1,200m AMSL. Its main vegetation and landscape features include plains with a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species. There is almost a continuous herbaceous layer dominated by grass species.

**Important Plant Taxa in Dwaalboom Thornveld**

Based on Mucina and Rutherford's (2006) vegetation classification, important plant taxa are those species that have a high abundance, a frequent occurrence (not being particularly abundant) or are prominent in the landscape within a particular vegetation type. They note the following species are important taxa in the Dwaalboom Thornveld vegetation type:

**Trees:** *Vachellia erioloba*, *Vachellia erubescens*, *Vachellia nilotica*, *Vachellia tortilis* subsp *heteracantha, Senegalia fleckii, Senegalia burkei, Searsia lancea* (Mucina & Rutherford, 2006).

**Shrubs:** *Diospyros lycioides* subsp. *lycioides, Grewia flava, Mystroxylon aethiopicum* subsp. *burkenum, Agathisanthemum bojeri* (Mucina & Rutherford, 2006).

**Graminoids:** *Aristida bipartite, Bothriochloa insculpta, Digitaria eriantha* subsp *eriantha, Ischaemum afrum, Panicum maximum* and *Cymbopogon pospischilii* (Mucina & Rutherford, 2006).

**Conservation Status**

According to Mucina and Rutherford (2006) Dwaalboom Thornveld is classified as Least Threatened. Although the target for conservation is 19%, only 6%of this vegetation type is currently under statutory

conservation in reserves such as the Madikwe Game Reserve (approximately 150km west of the project area). Cultivation and to a lesser extend urbanisation have resulted in the transformation of approximately 14% of Dwaalboom Thornveld and exotic invasive plants are present. Incidences of erosion are low to very low (Mucina & Rutherford, 2006).

#### 3.1.2.2 Expected Flora Species

The POSA database indicates that 428 species of indigenous plants are expected to occur within the project area (The full list of species will be provided in the final report). One (1) SCC based on their conservation status could be expected to occur within the project area and are provided in Table 3-2 below. It is believed that additional SCC will be recorded in the assessment. During the screening assessment a number of protected *Vachellia erioloba* (Camel thorn) trees were recorded within the SCSC feasibility area. This is a nationally protected tree.

***Table 3-2 Threatened flora species that may occur within the project area.***

| Family | Taxon | Author | IUCN | Ecology |
|---|---|---|---|---|
| **Apocynaceae** | *Stenostelma umbelluliferum* | (Schltr.) Bester & Nicholas | NT | Indigenous; Endemic |

### 3.1.3 Faunal Assessment

#### 3.1.3.1 Amphibians

Based on the IUCN Red List Spatial Data and AmphibianMap, 30 amphibian species are expected to occur within the area (The full list will be provided in the final assessment). One (1) are regarded as threatened (Table 3-3).

***Table 3-3 Threatened amphibian species that are expected to occur within the project area***

| Species | Common Name | Conservation Status | | Likelihood of occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2021) | |
| ***Pyxicephalus adspersus*** | Giant Bullfrog | NT | LC | Moderate |

Giant Bull Frog (*Pyxicephalus adspersus*) is a species of conservation concern that will possibly occur in the project area, especially in the area with the wetlands. The Giant Bull Frog is listed as near threatened on a regional scale. It is a species of drier savannas where it is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rains, and breed in shallow, temporary waters in pools, pans and ditches (IUCN, 2017).

#### 3.1.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 91 reptile species are expected to occur within the area (The full list will be provided in the final assessment). Three (3) are regarded as threatened, all having a low likelihood of occurence (Table 3-4).

***Table 3-4 Threatened reptile species that are expected to occur within the project area***

| Species | Common Name | Conservation Status | | Likelihood of Occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2022) | |
| ***Crocodylus niloticus*** | Nile Crocodile | VU | VU | Low |
| ***Lygodactylus waterbergensis*** | Waterberg Dwarf Gecko | NT | NT | Low |
| ***Pseudocordylus transvaalensis*** | Northern Crag Lizard | NT | NT | Low |

#### 3.1.3.3 Mammals

The IUCN Red List Spatial Data lists 85 mammal species that could be expected to occur within the area (The full list will be provided in the final assessment). This list includes large mammal species that are normally restricted to protected areas, as these were observed during the screening assessment. Twelve (12) (smaller non protected area restricted species) of these expected species are regarded as threatened

(Table 3-5), five of these have a low likelihood of occurrence based on the lack of suitable habitat and food sources in the project area.

***Table 3-5 Threatened mammal species that are expected to occur within the project area.***

| Species | Common Name | Conservation Status | | Likelihood of occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2022) | |
| ***Aonyx capensis*** | Cape Clawless Otter | NT | NT | Moderate |
| ***Atelerix frontalis*** | South Africa Hedgehog | NT | LC | Moderate |
| ***Cloeotis percivali*** | Short-eared Trident Bat | EN | LC | Moderate |
| ***Crocidura mariquensis*** | Swamp Musk Shrew | NT | LC | Moderate |
| ***Crocuta crocuta*** | Spotted Hyaena | NT | LC | Low |
| ***Felis nigripes*** | Black-footed Cat | VU | VU | Moderate |
| ***Leptailurus serval*** | Serval | NT | LC | Confirmed |
| ***Panthera pardus*** | Leopard | VU | VU | Low |
| ***Parahyaena brunnea*** | Brown Hyaena | NT | NT | Confirmed |
| ***Poecilogale albinucha*** | African Striped Weasel | NT | LC | Low |
| ***Redunca fulvorufula*** | Mountain Reedbuck | EN | LC | Low |
| ***Smutsia temminckii*** | Temminck's Ground Pangolin | VU | VU | Low |

*Aonyx capensis* (Cape Clawless Otter) is the most widely distributed otter species in Africa (IUCN, 2017). This species is predominantly aquatic, and it is seldom found far from water. This species has a moderate likelihood of occurrence based on the rivers in the project area.

*Atelerix frontalis* (South African Hedgehog) has a tolerance to a degree for habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), A. frontalis populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Suitable grasslands occur in the project area, although somewhat disturbed, that can function as habitat for this species, as such the likelihood of occurrence is rated as moderate.

*Cloeotis percivali* (Short-eared Trident Bat) occurs in savanna areas where there is sufficient cover in the form of caves and mine tunnels for day roosting (IUCN, 2017). It feeds exclusively on moths and appears to be very sensitive to disturbance. Suitable habitat and roosting area can be found around the project area and therefore the likelihood of finding this species is rated as moderate

*Crocidura maquassiensis* (Maquassie Musk Shrew) is listed as VU on a regional basis and is known to be found in rocky, mountain habitats. It may tolerate a wider range of habitats and individuals have been collected in Kwa-Zulu Natal from a garden, and in mixed bracken and grassland alongside a river at 1,500 m (IUCN, 2017). This species has a moderate likelihood of occurring based on the rocky habitat found in the project area.

*Felis nigripes* (Black-footed cat) is endemic to the arid regions of southern Africa. This species is naturally rare, has cryptic colouring, is small in size and is nocturnal. These factors have contributed to a lack of information on this species. The highest densities of this species have been recorded in the more arid Karoo region of South Africa. The habitat in the project area can be considered to be somewhat suitable for the species and the likelihood of occurrence is therefore rated as moderate.

*Leptailurus serval* (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other

riparian vegetation types. Suitable habitat is present for this species in the project area, as such the likelihood of occurrence is rated as high. This species was confirmed during the field assessment.

*Parahyaena brunnea* (Brown Hyaena) is endemic to southern Africa. This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna. Given its known ability to persist outside of formally protected areas the likelihood of occurrence of this species in the project area is moderate to good. This species was confirmed during the screening assessment.

### 3.1.4 Literature Review

ENVASS conducted an updated biodiversity assessment for the Siyanda Bakgatla development that were conducted in 2020 is based on a 2006 baseline study conducted by Engelbrecht and Grosel (2006). It was reported that since 2006;

- Two Nationally Protected tree species were recorded, *Boscia albitrunca* (Shepard's Tree) and *Vachellia erioloba (Camelthorn)* with 4 Provincially Protected Species (NW);
- 35 mammal species were recorded in and around their project area specifically in the game farm and watercourse habitats. Of the 35 species that have been recorded, six (6) sighted are provincially protected within the North West and four (4) are considered SCC under the IUCN Red List, namely Cape Clawless Otter (*Aonyx capensis*) (NT), South Africa Hedgehog (*Atelerix frontalis*) (NT), Brown Hyaena (*Parahyaena brunnea*) (NT) as well as Plains Zebra (*Equus zebra*)(NT) however considered a captive species;
- Ten of the expected 20 reptile species was sighted within the area, three of these species said to be nationally protected, namely: *Python natalensis* (African Python), *Varanus albigularis* (Rock Monitor) and *Varanus niloticus* (Water Monitor); and
- Eleven of the expected 23 amphibian species was sighted within the area, with one considered SCC, namely *Pyxicephalus adspersus* (Giant Bullfrog) which is NT.

The Ecological Sensitivity Assessment was conducted using the same method as in section 2.3 of this report, it was determined that the habitats identified by the author (Mixed Bushveld, Watercourses and Vachellia Thornveld habitat unit units) were determined to be of a high sensitivity in the broader environment (Figure 3-10).

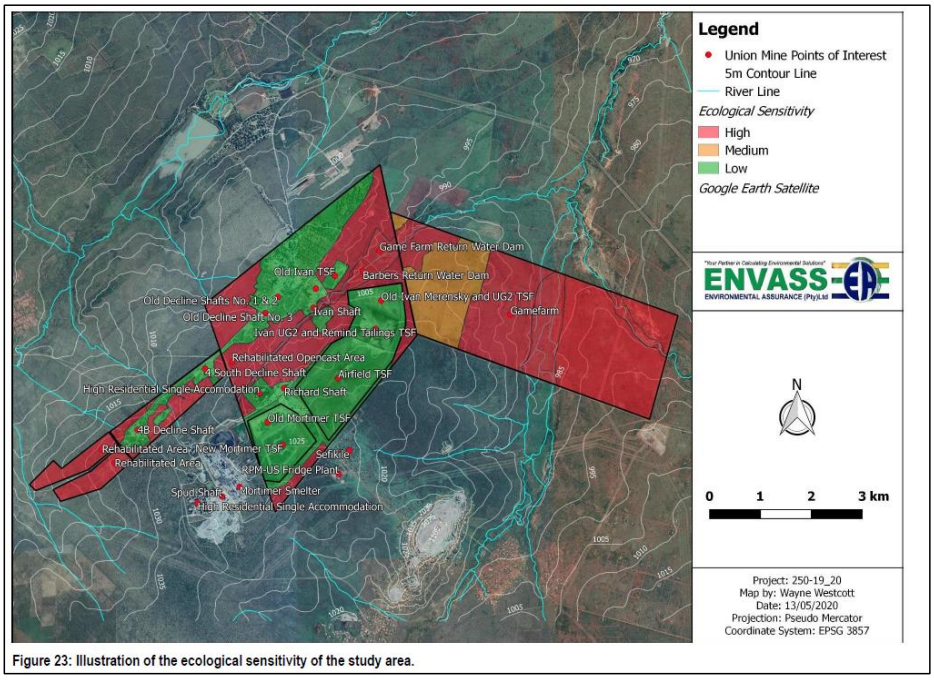


***Figure 3-10 Map illustrating ecological sensitivity according to the literature review***

## 3.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken from the 4th till the 7th of April 2022.

### 3.2.1 Flora Assessment

This section is divided into two sections:

- Indigenous flora; and
- Invasive Alien Plants (IAPs).

#### 3.2.1.1 Indigenous flora

The vegetation assessment was conducted throughout the extent of the project area. A total of 84 tree, shrub and herbaceous plant species were recorded in the project area during the field assessment (Table 3-6). Plants listed as Category 1 alien or invasive species under the NEMBA appear in green text. Plants listed in Category 2 or as 'not indigenous' or 'naturalised' according to NEMBA, appear in blue text. Some of the plant species recorded can be seen in Figure 3-11.

***Table 3-6 Trees, shrub and herbaceous plant species recorded in the project area.***

| Family | Scientific Name | Threat Status (SANBI, 2017) | SA Endemic | NEMBA Category |
|---|---|---|---|---|
| **Acanthaceae** | *Crabbea angustifolia* | LC | Yes | |
| **Amaranthaceae** | *Achyranthes aspera* | | | Naturalized exotic weed |
| **Amaranthaceae** | *Alternanthera pungens* | LC | Not Endemic | |
| **Amaranthaceae** | *Pupalia lappacea* | LC | No | |
| **Amaranthaceae** | *Hermbstaedtia odorata* | LC | No | |
| **Amaryllidaceae** | *Crinum crassicaule* | LC | No | |
| **Amaryllidaceae** | Ammocharis coranica | LC | Not Endemic | |
| **Anacardiaceae** | *Searsia lancea* | LC | No | |
| ***Anacardiaceae*** | Searsia pyroides var. pyroides | LC | No | |
| **Apocynaceae** | *Pentarrhinum insipidum* | LC | No | |
| **Asparagaceae** | *Asparagus cooperi* | LC | No | |
| **Asparagaceae** | *Asparagus laricinus* | LC | No | |
| **Asteraceae** | *Bidens pilosa* | | | Naturalized exotic weed |
| **Asteraceae** | *Conyza bonariensis* | | | Naturalized exotic weed |
| **Asteraceae** | *Flaveria bidentis* | | | NEMBA Category 1B |
| **Asteraceae** | *Hilliardiella elaeagnoides* | LC | Not Endemic | |
| **Asteraceae** | *Nidorella resedifolia* | LC | No | |
| **Asteraceae** | *Schkuhria pinnata* | | | Naturalized exotic weed |
| **Asteraceae** | *Tagetes minuta* | | | Naturalized exotic weed |
| **Asteraceae** | *Tithonia diversifolia* | | | NEMBA Category 1B |
| **Asteraceae** | *Xanthium spinosum* | | | NEMBA Category 1B |
| **Asteraceae** | *Zinnia peruviana* | | | Naturalized exotic weed |
| **Asteraceae** | Argemone ochroleuca | | | NEMBA Category 1b. |
| **Asteraceae** | Cirsium vulgare | | | NEMBA Category 1b. |

| | | | | |
|---|---|---|---|---|
| **Asteraceae** | *Verbena bonariensis* | | | NEMBA Category 1b. |
| **Boraginaceae** | *Ehretia rigida* | LC | Yes | |
| **Boraginaceae** | *Heliotropium amplexicaule* | | | Naturalized exotic weed |
| **Cactaceae** | *Opuntia ficus-indica* | | | NEMBA Category 1B |
| **Celastraceae** | *Gymnosporia buxifolia* | LC | No | |
| **Combretaceae** | *Combretum erythrophyllum* | LC | No | |
| **Commelinaceae** | *Commelina africana var. barberae* | LC | No | |
| **Commelinaceae** | *Commelina africana var. barberae* | LC | Not Endemic | |
| **Commelinaceae** | *Commelina erecta* | LC | No | |
| **Commelinaceae** | *Commelina livingstonii* | LC | Not Endemic | |
| **Convolvulaceae** | *Cuscuta campestris* | | | Naturalized exotic weed |
| **Convolvulaceae** | *Evolvulus alsinoides* | LC | Not Endemic | |
| **Convolvulaceae** | *Seddera capensis* | LC | No | |
| **Cucurbitaceae** | *Cucumis zeyheri* | LC | No | |
| **Ebenaceae** | *Diospyros lycioides subsp. lycioides* | LC | No | |
| **Fabaceae** | *Dichrostachys cinerea* | LC | No | |
| **Fabaceae** | *Elephantorrhiza elephantina* | LC | Not Endemic | |
| **Fabaceae** | *Peltophorum africanum* | LC | No | |
| **Fabaceae** | *Senegalia mellifera* | LC | No | |
| **Fabaceae** | *Sesbania bispinosa* | | | Naturalized exotic weed |
| **Fabaceae** | *Vachellia erioloba* | LC-Nationally Protected Tree | No | |
| **Fabaceae** | *Vachellia gerrardii subsp. gerrardii* | LC | No | |
| **Fabaceae** | *Vachellia hebeclada subsp. hebeclada* | LC | No | |
| **Fabaceae** | *Vachellia karoo* | LC | No | |
| **Fabaceae** | *Vachellia nilotica* | LC | No | |
| **Fabaceae** | *Vachellia tortilis* | LC | No | |
| **Fabaceae** | *Vachellia tenuispina* | LC | No | |
| **Iridaceae** | *Gladiolus elliotii* | LC | No | |
| **Iridaceae** | *Gladiolus sericeovillosus subsp. calvatus* | LC | Not Endemic | |
| **Lamiaceae** | *Leonotis schinzii* | LC | No | |
| **Malvaceae** | *Abutilon austro-africanum* | LC | No | |
| **Malvaceae** | *Grewia flava* | LC | No | |
| **Malvaceae** | *Grewia flavescens* | LC | No | |
| **Malvaceae** | *Hibiscus pusillus* | LC | Not Endemic | |
| **Malvaceae** | *Hibiscus trionum* | | | Naturalized exotic weed |
| **Malvaceae** | *Sida dregei* | LC | Not Endemic | |
| **Nymphaeaceae** | *Nymphaea lotus* | LC | Not Endemic | |
| **Orobanchaceae** | *Striga asiatica* | LC | No | |
| **Pedaliaceae** | *Ceratotheca triloba* | LC | No | |

| | | | | |
|---|---|---|---|---|
| **Pedaliaceae** | *Dicerocaryum senecioides* | LC | Not Endemic | |
| **Poaceae** | *Arundo donax* | | | NEMBA Category 1B |
| **Poaceae** | *Bothriochloa insculpta* | LC | No | |
| **Poaceae** | *Brachiaria xantholeuca* | LC | Not Endemic | |
| **Poaceae** | *Cenchrus ciliaris* | LC | No | |
| **Poaceae** | *Chloris virgata* | LC | No | |
| **Poaceae** | *Cymbopogon caesius* | LC | No | |
| **Poaceae** | *Cynodon dactylon* | LC | No | |
| **Poaceae** | *Dichanthium annulatum var. papillosum* | LC | Not Endemic | |
| **Poaceae** | *Digitaria eriantha* | LC | No | |
| **Poaceae** | *Diheteropogon amplectens* | LC | No | |
| **Poaceae** | *Dinebra retroflexa var. condensata* | LC | Not Endemic | |
| **Poaceae** | *Enneapogon cenchroides* | LC | No | |
| **Poaceae** | *Eragrostis rigidior* | LC | No | |
| **Poaceae** | *Fingerhuthia africana* | LC | No | |
| **Poaceae** | *Heteropogon contortus* | LC | No | |
| **Poaceae** | *Ischaemum afrum* | LC | No | |
| **Poaceae** | *Melinis repens* | LC | No | |
| **Poaceae** | *Panicum maximum* | LC | No | |
| **Poaceae** | *Panicum maximum* | LC | Not Endemic | |
| **Poaceae** | *Perotis patens* | LC | Not Endemic | |
| **Poaceae** | *Phragmites australis* | LC | Not Endemic | |
| **Poaceae** | *Setaria sphacelata var sphacelata* | LC | No | |
| **Poaceae** | *Setaria verticillata* | LC | No | |
| **Poaceae** | *Sorghum versicolor* | LC | No | |
| **Poaceae** | *Themeda triandra* | LC | Not Endemic | |
| **Poaceae** | *Tragus berteronianus* | | | Naturalized exotic weed |
| **Poaceae** | *Tragus berteronianus* | | | Naturalized exotic weed |
| **Poaceae** | *Urochloa mosambicensis* | LC | No | |
| **Poaceae** | Hyparrhenia hirta | LC | Not Endemic | |
| **Rhamnaceae** | *Ziziphus mucronata* | LC | No | |
| **Rubiaceae** | *Kohautia amatymbica* | LC | Not Endemic | |
| **Sapindaceae** | *Pappea capensis* | LC | No | |
| **Solanaceae** | *Datura ferox* | | | NEMBA Category 1B |
| **Solanaceae** | *Lycium horridum* | LC | No | |
| **Solanaceae** | *Solanum campylacanthum* | LC | No | |
| **Zygophyllaceae** | *Tribulus terrestris* | LC | No | |

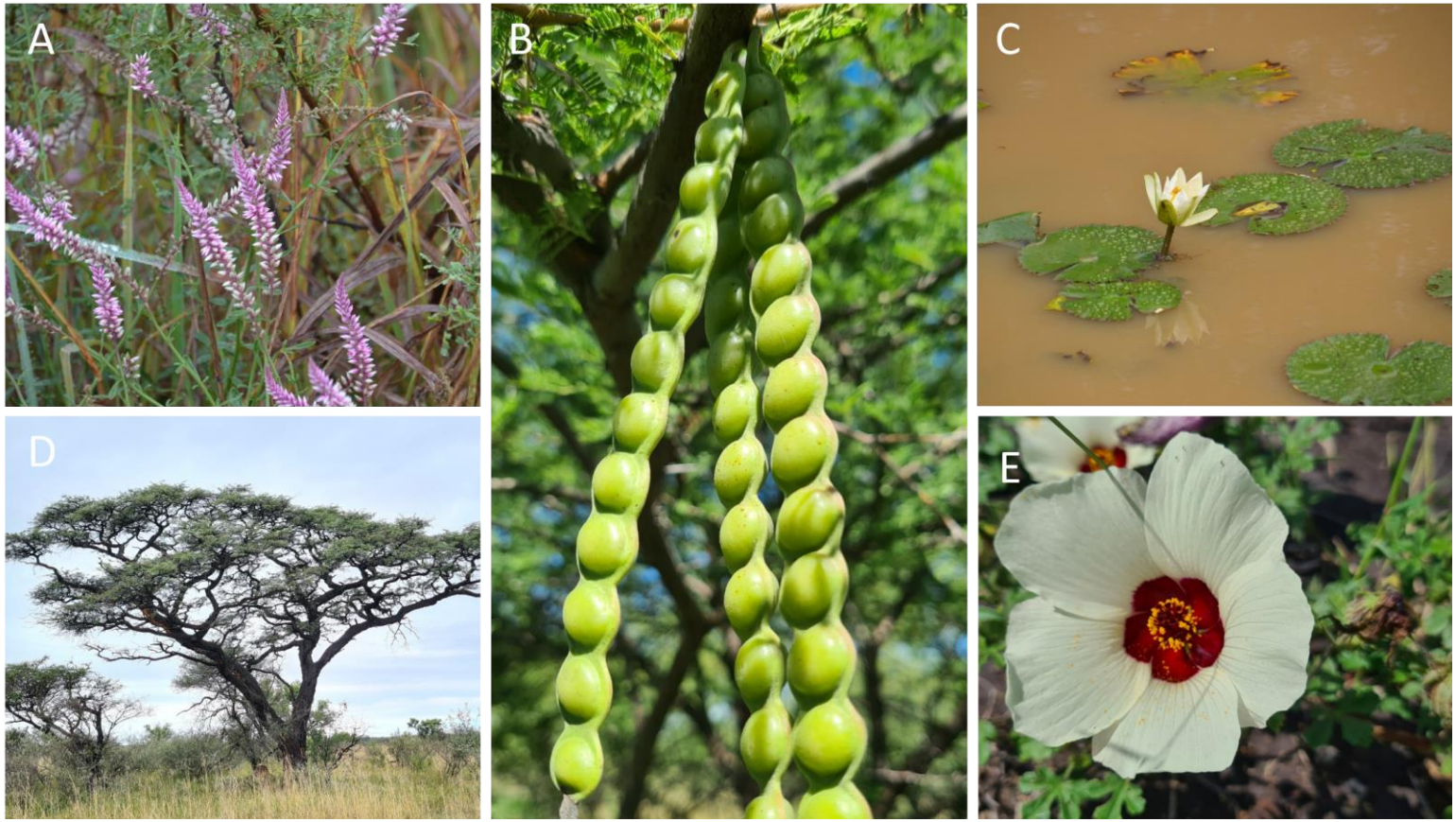


***Figure 3-11 Photographs illustrating some of the flora recorded within the assessment area. A) Hermbstaedtia odorata, B) Vachellia nilotica, C) Nymphaea lotus, D) Vachellia erioloba (protected) and E) Hibiscus pusillus***

#### 3.2.1.2 Invasive Alien Plants

Invasive Alien Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, 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 NEMBA:

- *Category 1a*: Invasive species requiring compulsory control. 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.
- *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.

Note that according to the Alien and Invasive Species Regulations, a 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 NEMBA;
    - The relevant invasive species management programme developed in terms of regulation 4; and
    - Any directive issued in terms of section 73(3) of the NEMBA.

Four (4) IAP species were recorded within the project area. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b. These IAP species must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA, as stated above.

#### 3.2.1.3 Protected Trees

During the field assessment 1 species of protected trees were observed: *Vachellia erioloba* (Camelthorn). The protected trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). In terms of the NFA, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence. The locations of the trees recorded in the project area can be seen in Figure 3-12. The trees were mainly found within the expected PV area.

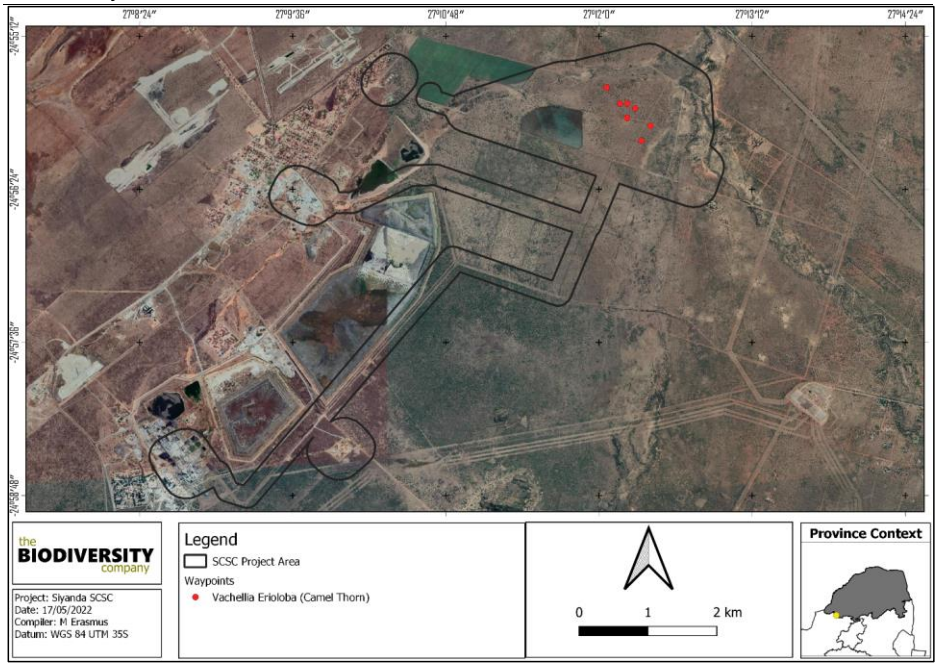


***Figure 3-12 Location of protected flora species.***

### 3.2.2 Faunal Assessment

Herpetofauna and mammal observations and recordings fall under this section. A separate avifaunal report was compiled for this project.

#### 3.2.2.1 Amphibians and Reptiles

Four (4) species of reptile and one species were recorded within the project area during the survey period (Table 3-7, Figure 3-13). However, there is the possibility of more species being present, as certain reptile species are secretive and require long-term surveys to ensure capture. None of the species recorded are regarded as threatened, albeit all are protected under provincial legislation.

***Table 3-7 Summary of herpetofauna species recorded within the project area.***

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | Global (IUCN, 2022) |
| **Reptiles** | | | |
| ***Acanthocercus atricollis*** | Tree agama | LC | LC |
| ***Lygodactylus capensis*** | Cape dwarf gecko | LC | LC |
| ***Stigmochelys pardalis*** | Leopard Tortoise | LC | LC |
| ***Trachylepis punctatissima*** | Speckled Rock Skink | LC | Unlisted |
| ***Trachylepis varia*** | Variable Skink | LC | LC |
| ***Varanus niloticus*** | Water Monitor | LC | Unlisted |
| **Amphibians** | | | |
| ***Cacosternum boettgeri*** | Common Caco | LC | LC |
| ***Tomopterna cryptotis*** | Tremelo Sand Frog | LC | LC |

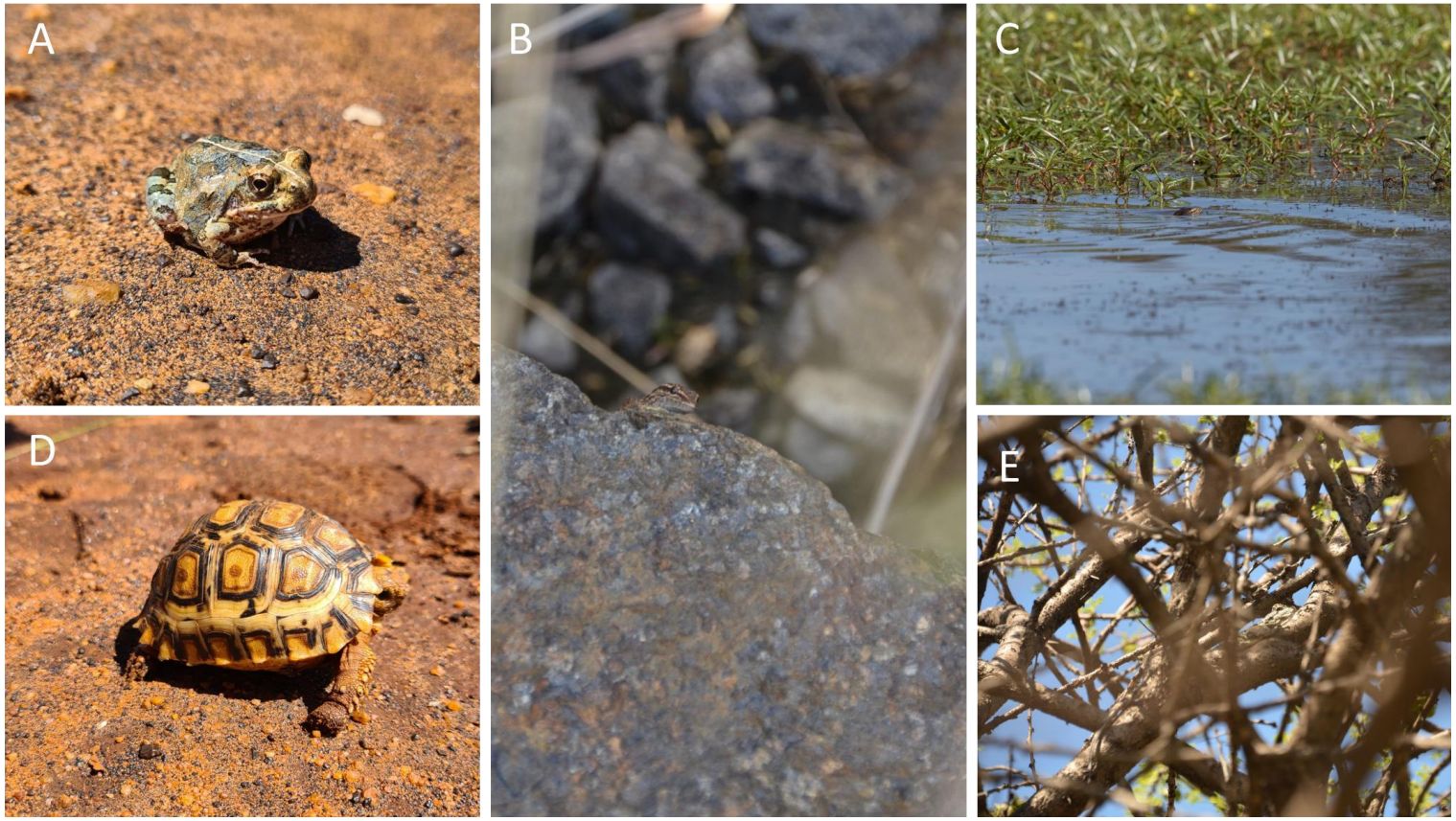


***Figure 3-13*** ***Photographs illustrating the reptile species recorded within the assessment area associated with the project area during the survey period. A) Tomopterna cryptotis, B) Lygodactylus capensis, and C) Varanus niloticus, D) Stigmochelys pardalis and E) Acanthocercus atricollis.***

#### 3.2.2.2 Mammals

Twenty-one (21) mammal species were observed in total based on either direct observation or the presence of visual tracks and signs. Fourteen of these species could naturally occur outside of protected areas/game farms, while six species are considered mainly found restricted to protected areas/game farms as 'captive' species (Table 3-8) (Figure 3-14). Four SCC were observed, were two of the SCC are regarded as threatened species that could occur naturally (Figure 3-15).

***Table 3-8 Summary of mammal species recorded within the project area. Mammal species are considered 'captive' species as these were only present within the game farm areas, marked in green text***

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Aepyceros melampus*** | Impala | LC | LC |
| ***Alcelaphus buselaphus*** | Hartebeest | LC | LC |
| ***Canis mesomelas*** | Black-backed Jackal | LC | LC |
| ***Chlorocebus pygerythrus*** | Vervet Monkey | LC | LC |
| ***Connochaetes taurinus*** | Blue Wildebeest | LC | LC |
| ***Damaliscus pygargus phillipsi*** | Bleskbok | LC | LC |
| ***Equus quagga*** | Plains Zebra | LC | NT |
| ***Genetta genetta*** | Small-spotted Genet | LC | LC |
| ***Giraffa camelopardalis*** | Giraffe | LC | VU |
| ***Herpestes sanguineus*** | Slender Mongoose | LC | LC |
| ***Hystrix africaeaustralis*** | Cape Porcupine | LC | LC |
| ***Kobus ellipsiprymnus*** | Common Waterbuck | LC | LC |
| ***Leptailurus serval*** | Serval | NT | LC |
| ***Lepus saxatilis*** | Scrub Hare | LC | LC |
| ***Mungos mungo*** | Banded Mongoose | LC | LC |
| ***Papio ursinus*** | Chacma Baboon | LC | LC |
| ***Paraxerus cepapi*** | Tree Squirrel | LC | LC |
| ***Parahyaena brunnea*** | Brown Hyaena | NT | NT |
| ***Phacochoerus africanus*** | Common Warthog | LC | LC |
| ***Raphicerus campestris*** | Steenbok | LC | LC |
| ***Tragelaphus strepsiceros*** | Greater Kudu | LC | LC |

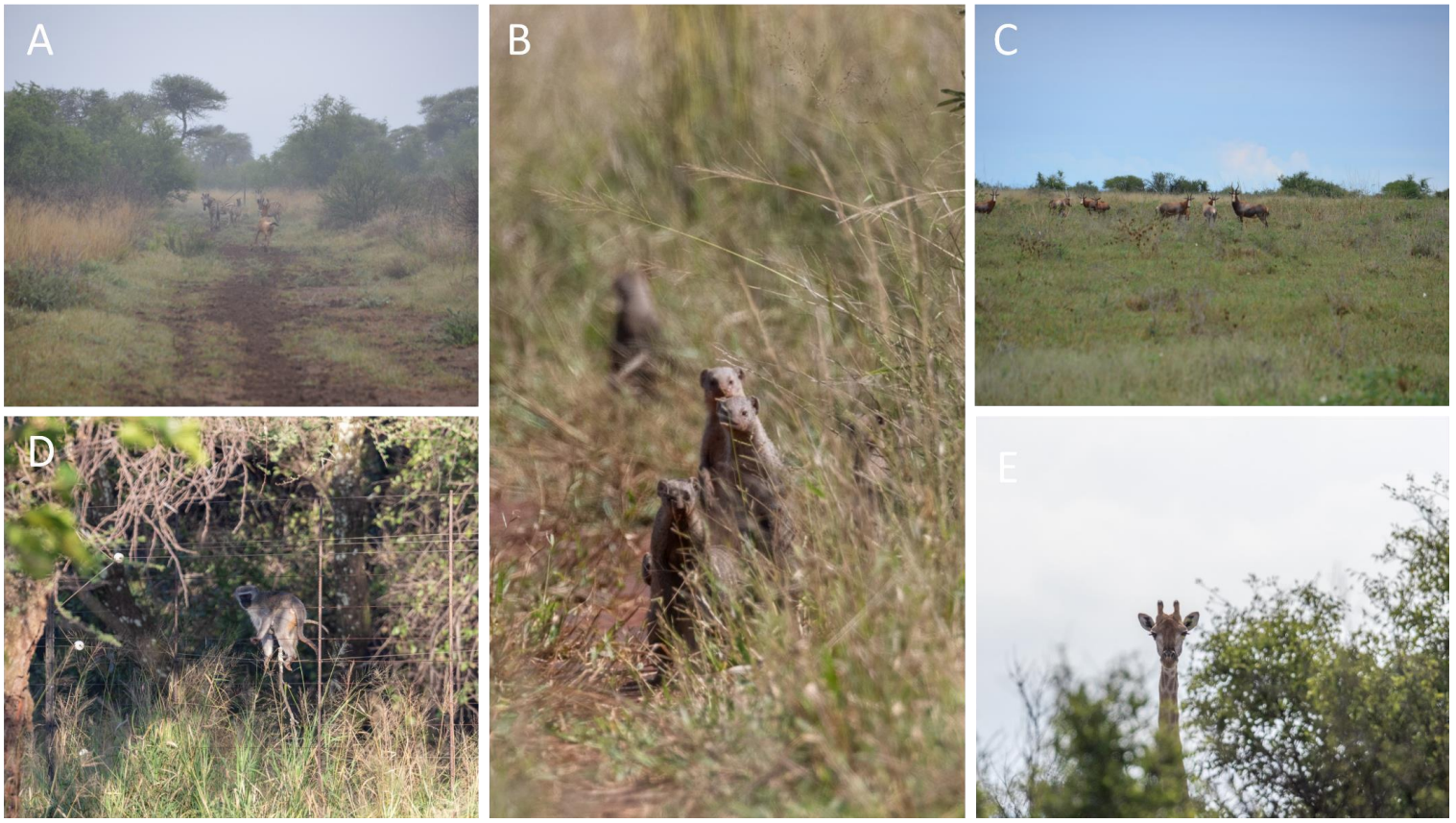


***Figure 3-14*** ***Photographs illustrating the mammal species recorded within the project area during the survey period. A) Equus quagga and Alcelaphus buselaphus, B) Mungos mungo, C) Damaliscus pygargus phillipsi, D) Chlorocebus pygerythrus and E) Giraffa camelopardalis***


***Figure 3-15 Photographs illustrating a mammal SCC recorded within the project area during the survey period: Leptailurus serval***

# 4 Habitat Assessment and Site Ecological Importance

## 4.1 Habitat Assessment

The main habitat types identified across the project area were initially identified largely based on aerial imagery. These main habitat types were refined based on the field coverage and data collected during the survey; the delineated habitats can be seen in Figure 4-1. Emphasis was placed on limiting timed meander searches within the natural habitats and therefore habitats with a higher potential of hosting SCC. Five habitats were identified in the project area, each of the habitats identified are discussed in the sub-sections below.

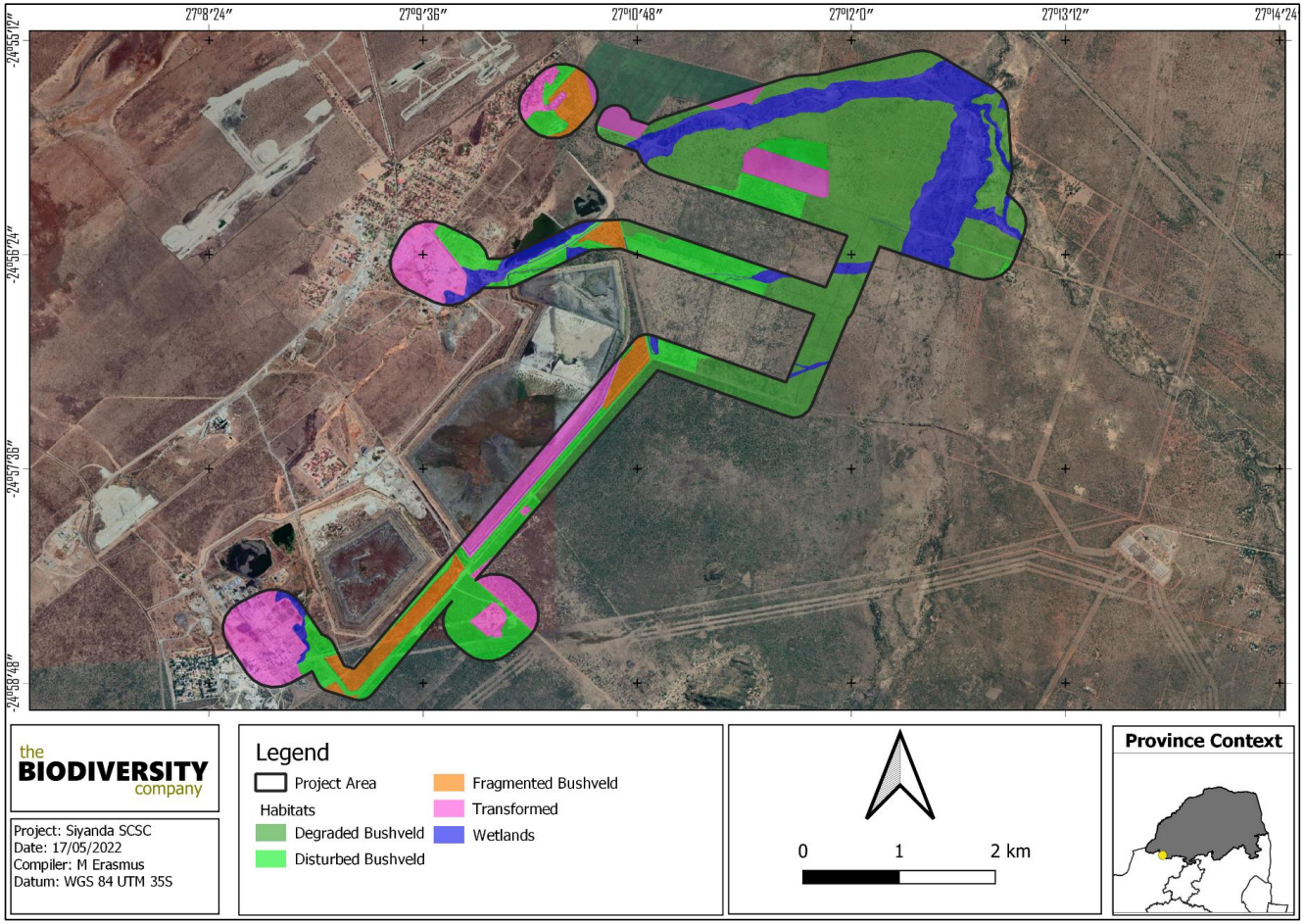


***Figure 4-1 Habitats identified in the project area.***

**Degraded Bushveld**

This habitat type is regarded as semi-natural bushveld, but slightly disturbed due adjacent land use, mismanagement (overgrazing) and also human infringement as it is being used as a game farm (Figure 4-2 and Figure 4-3). This habitat represents typical bushveld, with rocky extrusions in certain areas. The current ecological condition of this habitat regarding the main driving forces, are intact, which is evident in the amount and importance of the species recorded in the faunal assessment; and the high species diversity and number of plant species recorded. Current human infringement still occurs throughout, especially in areas close to roads. The difference between this habitat and the disturbed bushveld is the extent of the disturbance in the disturbed bushveld being more severe. Portions of this bushveld has been fragmented by linear infrastructure such as powerlines and fences and are conspired fragmented bushveld.

This habitat unit can be regarded as important, not only within the local landscape, but also regionally. The unit functions as remaining greenlands which supports viable plant species populations and is also used for foraging. The unit also serves as a movement corridor for fauna within a landscape fragmented. The habitat sensitivity is regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area being more fragmented locally, which is supported by the various ecological datasets. This habitat functions as the CBA 2 it is classified as and portions classified as ESA, may be be considered just as important.

***Figure 4-2 A typical example of degraded Bushveld habitat from the project area.***

***Figure 4-3 A typical example of fragmented Bushveld habitat from the project area.***

**Disturbed Bushveld**

This habitat is regarded as areas that have been impacted more by historic grazing, mismanagement and land use (Figure 4-4). Historical vegetation clearing for cultivation has led to localised bush encroachment and the presence of alien floral species within this habitat unit, with current grazing activities by livestock also taking place within this area. These habitats aren't entirely transformed but in a constant disturbed state, as they can't recover to a more natural state due to ongoing disturbances and impacts received from grazing and mismanagement. This habitat can be found in different conditions of disturbance, but in many cases has either been encroached on by *Dichrostachys cinerea*, *Vachellia tenuispina* or *Senegalia mellifera.* These areas are considered to have a low sensitivity, as they may be used as a movement corridor and in many cases form a barrier between the more degraded bushveld and the transformed areas.

***Figure 4-4 A typical example of disturbed Bushveld habitat from the project area.***

**Transformed**

This habitat unit represents all areas of urban area, agriculture, mining areas as well as the associated secondary roads (Figure 4-5 and Figure 4-6). The transformed areas have little to no remaining natural vegetation due to land transformation by urban and mining infrastructure, agriculture as well as informal homesteads. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives.

***Figure 4-5 Illustration of transformed habitat from the project area.***

***Figure 4-6 Illustration of transformed habitat from the project area.***

**Wetlands**

Wetlands are identified in the wetland report (TBC, 2022). Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and an important habitat for various fauna and flora, including the SCC recorded (Figure 4-7and Figure 4-8). The preservation of this system, which includes the CR Sefathlane River is the most important aspect to consider for the proposed project. This habitat needs to be protected and improved due to the role of this habitat as a water resource.

***Figure 4-7 Illustration of wetland habitat from the project area (Sefathlane River)***

***Figure 4-8 Illustration of wetland habitat from the project area***

## 4.2 Site Ecological Importance (SEI)

The biodiversity theme sensitivity, as indicated in the screening report, was derived to be Very High, mainly due to the project area being with an CBA 2 and ESA 1 (Figure 4-9), while the animal and plant species theme sensitivity shows that majority of the area is classified as medium and low sensitivity respectively.

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|---|---|---|---|
| X | | | |

**Sensitivity Features:**

| Sensitivity | Feature(s) |
|---|---|
| Low | Low Sensitivity |
| Very High | Critical biodiveristy area 2 |
| Very High | Ecological support area 1 |
| Very High | Rustenburg Platinum Mines (Union Section) Private Nature Reserve |

***Figure 4-9 Terrestrial Biodiversity Theme Sensitivity, TBC Screening Report***

Four (4) different terrestrial habitat types were delineated within the project area, and one set of wetland habitats as a whole. Based on the criteria provided in Section 2.3 of this report, all habitats within the assessment area of the proposed project were allocated a sensitivity category Table 4-1. The sensitivities of the habitat types delineated are illustrated in Figure 4-10.

***Table 4-1 Summary of habitat types delineated within the project area***

| Habitat (Area) | Conservation Importance | Functional Integrity | Biodiversity Importance | Receptor Resilience | Site Ecological Importance |
|---|---|---|---|---|---|
| Degraded Bushveld | Medium | High | Medium | Low | High |
| Wetlands | Medium | Medium | Medium | Low | High |
| Fragmented Bushveld | Medium | Low | Medium | Low | Medium |

| | | | | | |
|---|---|---|---|---|---|
| Disturbed Bushveld | Low | Low | Low | Medium | Low |
| Transformed | Very Low | Very Low | Very Low | Low | Very Low |

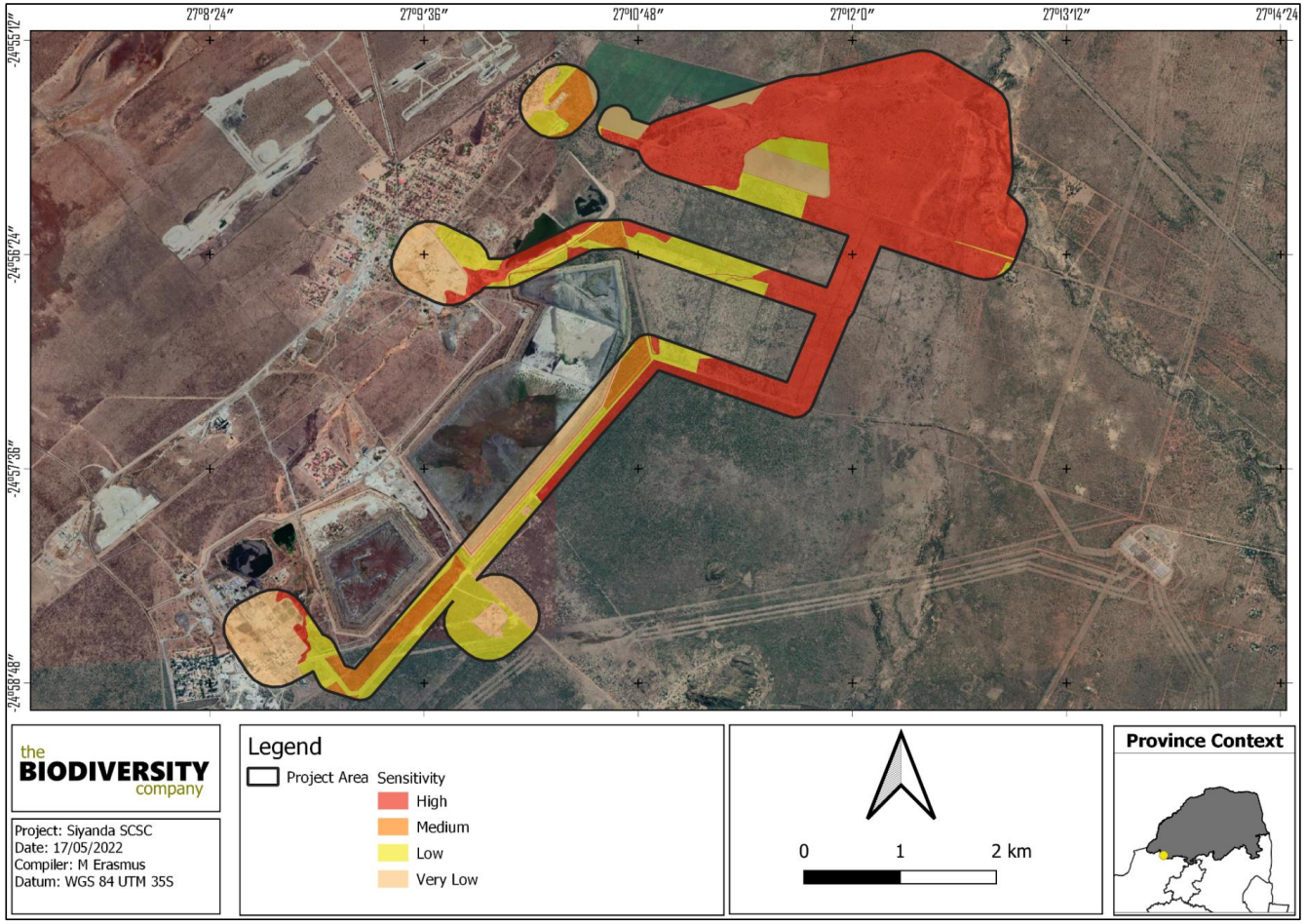


***Figure 4-10*** ***Sensitivity of the project area***

**Commented [NM1]:** It is recommended at the end of the report that activities within high sensitivity areas be avoided, but majority of the site is classified to have high sensitivity

# 5 Impact Risk Assessment

## 5.1 Biodiversity: Risk Assessment Method

The assessment of the significance of direct, indirect and cumulative impacts was undertaken using the method as developed by Savannah. The assessment of the impact considers the following, the:

- Nature of the impact, which shall include a description of what causes the effect, what will be affected, and how it will be affected;
- Extent of the impact, indicating whether the impact will be local or regional;
- Duration of the impact, very short-term duration (0-1 year), short-term duration (2-5 years), medium-term (5-15 years), long-term (> 15 years) or permanent;
- Probability of the impact, describing the likelihood of the impact actually occurring, indicated as improbable, probable, highly probable or definite;
- Severity/beneficial scale, indicating whether the impact will be very severe/beneficial (a permanent change which cannot be mitigated/permanent and significant benefit with no real alternative to achieving this benefit); severe/beneficial (long-term impact that could be mitigated/long-term benefit); moderately severe/beneficial (medium- to long-term impact that could be mitigated/ medium- to long-term benefit); slight; or have no effect;
- Significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low medium or high;
- Status, which will be described as either positive, negative or neutral;
- Degree to which the impact can be reversed;
- Degree to which the impact may cause irreplaceable loss of resources; and
- Degree to which the impact can be mitigated.

### 5.1.1 Present Impacts to Biodiversity

Considering the anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the project area. These include:

- Mining activities;
- Present energy distribution infrastructure, including powerlines;
- Wood harvesting;
- Historical cattle grazing land-use;
- Invasive species;
- Roads and associated vehicle traffic and road kills; and
- Fences.

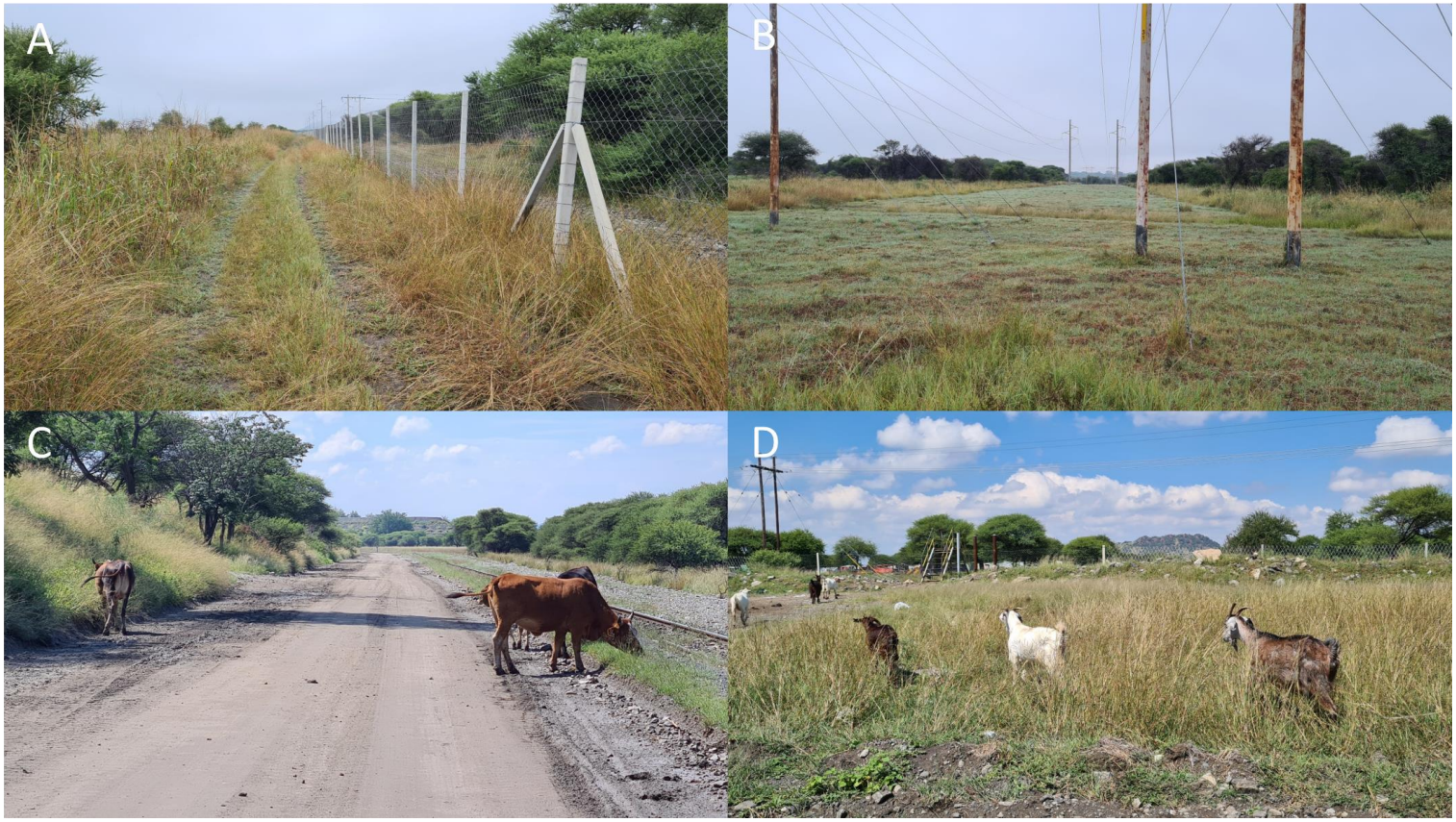


***Figure 5-1*** ***Photographs illustrating impacts to biodiversity A) Roads and fencing), B) Powerlines and associated servitude C) Wood harvesting D) Livestock, roads and railway and E) Livestock and litter***

### 5.1.2 Identification of Additional Potential Impacts

The potential impacts during the construction and operation phases of the project are presented in Table 5-1, and the infrastructure in relation to the SEI can be seen in Figure 5-2.

***Table 5-1 Potential impacts to biodiversity associated with the proposed activity***

| Main Impact | Project activities that can cause loss/impacts to habitat (especially with regard to the proposed infrastructure areas): | Secondary impacts anticipated |
|---|---|---|
| **1. Destruction, fragmentation and degradation of habitats and ecosystems** | Physical removal of vegetation, including protected species. | Displacement/loss of flora & fauna (including possible SCC) |
| | Access roads and servitudes | Increased potential for soil erosion |
| | Soil dust precipitation | Habitat fragmentation |
| | Dumping of waste products | Increased potential for establishment of alien & invasive vegetation |
| | Random events such as fire (cooking fires or cigarettes) | Erosion |
| **Main Impact** | **Project activities that can cause the spread and/or establishment of alien and/or invasive species** | **Secondary impacts anticipated** |
| **2. Spread and/or establishment of alien and/or invasive species** | Vegetation removal | Habitat loss for native flora & fauna (including SCC) |
| | Vehicles potentially spreading seed | Spreading of potentially dangerous diseases due to invasive and pest species |
| | Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents | Alteration of fauna assemblages due to habitat modification |
| | Creation of infrastructure suitable for breeding activities of alien and/or invasive birds | |
| **Main Impact** | **Project activities that can cause direct mortality of fauna** | **Secondary impacts anticipated** |
| **3. Direct mortality of fauna** | Clearing of vegetation | Loss of habitat |
| | | Loss of ecosystem services |
| | Roadkill due to vehicle collision | |
| | Pollution of water resources due to dust effects, chemical spills, etc. | Increase in rodent populations and associated disease risk |
| | Intentional killing of fauna for food (hunting) | |
| **Main Impact** | **Project activities that can cause reduced dispersal/migration of fauna** | **Secondary impacts anticipated** |
| **4. Reduced dispersal/migration of fauna** | Loss of landscape used as corridor | Reduced dispersal/migration of fauna |
| | | Loss of ecosystem services |
| | Compacted roads | Reduced plant seed dispersal |
| | Removal of vegetation | |
| **Main Impact** | **Project activities that can cause pollution in watercourses and the surrounding environment** | **Secondary impacts anticipated** |
| **5. Environmental pollution due to water runoff, spills from vehicles and erosion** | Chemical (organic/inorganic) spills | Pollution in watercourses and the surrounding environment |
| | Erosion | Faunal mortality (direct and indirectly) |
| | | Groundwater pollution |
| | | Loss of ecosystem services |
| **Main Impact** | **Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance.** | **Secondary impacts anticipated** |
| **6.Disruption/alteration of ecological life cycles (breeding,** | Operation of machinery (Large earth moving machinery, vehicles) | Disruption/alteration of ecological life cycles due to noise |

| | | |
|---|---|---|
| **migration, feeding) due to noise, dust and light pollution.** | | Loss of ecosystem services |
| | Project activities that can cause disruption/alteration of ecological life cycles due to dust | Secondary impacts associated with disruption/alteration of ecological life cycles due to dust |
| | Vehicles | Loss of ecosystem services |
| **Main Impact** | **Project activities that can cause staff to interact directly with potentially dangerous fauna** | **Secondary impacts anticipated** |
| **8. Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals** | All unregulated/supervised activities outdoors | Loss of SCCs |

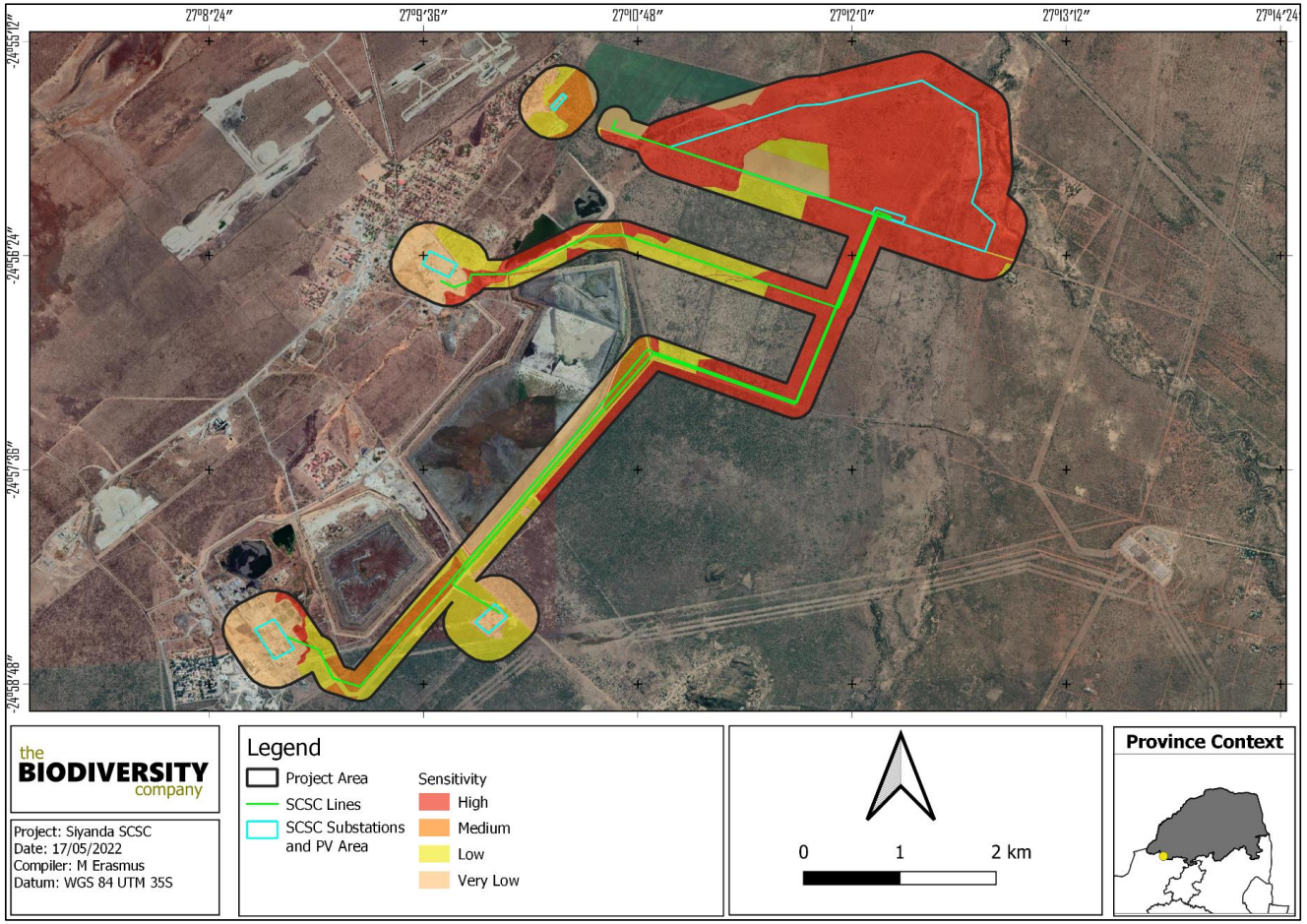


***Figure 5-2 Proposed infrastructure layout overlaid with the SEI.***

### 5.1.3 Assessment of Impact Significance

The assessment of impact significance was undertaken in accordance with the method developed by Savannah. The various identified impacts are assessed below for the different phases of the development. The impacts assessed may be re-assessed if an exact infrastructure layout has been provided

#### 5.1.3.1 Construction Phase

The following potential main impacts on the biodiversity (based on the framework above) were considered for the construction phase of the proposed development. This phase refers to the period during construction when the proposed features are constructed; and is considered to have the largest direct impact on biodiversity. The actual footprint of the pole/pylon infrastructure has a small localised, impact. It is the clearance for the PV and substation areas as well as creation off access and service roads that is a more important aspect to consider and will be considered in relation to the powerlines. The following potential impacts to terrestrial biodiversity were considered:

- Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community (Table 5-2),
- Introduction of alien species, especially plants (Table 5-3);
- Destruction of protected plant species (Table 5-4); and
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching) (Table 5-5).

***Table 5-2 Impacts to biodiversity associated with the proposed construction phase.***

| **Impact Nature: Loss of vegetation within development footprint** | | |
|---|---|---|
| Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community | | |
| | **Without mitigation** | **With mitigation** |
| ***Extent*** | High (4) | Moderate (3) |
| ***Duration*** | Permanent (5) | Moderate term (3) |
| ***Magnitude*** | High (8) | Moderate (6) |
| ***Probability*** | Highly probable (4) | Probable (3) |
| ***Significance*** | **High** | **Medium** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Moderate | High |
| ***Irreplaceable loss of resources?*** | No | No |
| **Can impacts be mitigated?** | Yes, although this impact cannot be well mitigated as the loss of vegetation/habitat is unavoidable. | |
| **Mitigation:** | | |
| See Biodiversity Management Outcomes | | |
| **Residual Impacts:** | | |
| The loss of currently intact vegetation is an unavoidable consequence of the project and cannot be entirely mitigated. | | |

***Table 5-3 Impacts to biodiversity associated with the proposed construction phase.***

| **Impact Nature: Introduction of alien species, especially plants** | | |
|---|---|---|
| Degradation and loss of surrounding natural vegetation | | |
| | **Without mitigation** | **With mitigation** |
| **Extent** | High (4) | Low (2) |
| **Duration** | Long term (4) | Short term (2) |
| **Magnitude** | Moderate (6) | Minor (2) |
| **Probability** | Highly probable (4) | Improbable (2) |
| **Significance** | **Medium (56)** | **Low (12)** |
| **Status (positive or negative)** | Negative | Negative |
| **Reversibility** | Moderate | High |
| **Irreplaceable loss of resources?** | No | No |
| **Can impacts be mitigated?** | Yes | |
| **Mitigation:** | | |
| See Biodiversity Management Outcomes | | |
| **Residual Impacts:** | | |
| Long-term broad scale. IAP infestation if not mitigated. | | |

***Table 5-4 Impacts to biodiversity associated with the proposed construction phase.***

| **Impact Nature: Destruction of protected plant species** | | |
|---|---|---|
| Construction activity will likely lead to direct loss of protected tree species | | |
| | **Without mitigation** | **With mitigation** |
| **Extent** | Low (2) | Very low (1) |
| **Duration** | Permanent (5) | Short term (2) |
| **Magnitude** | Moderate (6) | Minor (2) |
| **Probability** | Highly probable (4) | Improbable (2) |
| **Significance** | **Medium (52)** | **Low (10)** |
| **Status (positive or negative)** | Negative | Negative |
| **Reversibility** | Moderate | High |
| **Irreplaceable loss of resources?** | Yes | No |
| **Can impacts be mitigated?** | Yes | |
| **Mitigation:** | | |
| See Biodiversity Management Outcomes | | |
| **Residual Impacts:** | | |
| ***N/A*** | | |

***Table 5-5 Impacts to biodiversity associated with the proposed construction phase.***

| **Impact Nature: Displacement of faunal community due to habitat loss, direct mortalities and disturbance** |
|---|

| Construction activity will likely lead to direct mortality of fauna due to earthworks, vehicle collisions, accidental hazardous chemical spills and persecution. Disturbance due to dust and noise pollution and vibration may disrupt behaviour. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| **Extent** | High (4) | Low (2) |
| **Duration** | Moderate term (3) | Very short term (1) |
| **Magnitude** | High (8) | Low (4) |
| **Probability** | Highly probable (4) | Improbable (2) |
| **Significance** | **Medium** | **Low** |
| **Status (positive or negative)** | Negative | Negative |
| **Reversibility** | Moderate | High |
| **Irreplaceable loss of resources?** | No | No |
| **Can impacts be mitigated?** | Yes, to some extent. Noise and disturbance cannot be well mitigated, impacts on fauna due to human presence, such as vehicle collisions, poaching, and persecution can be mitigated. | |
| **Mitigation:** | | |
| See Biodiversity Management Outcomes | | |
| **Residual Impacts:** | | |
| It is probable that some individuals of susceptible species will be lost to construction-related activities despite mitigation. However, this is not likely to impact the viability of the local population of any fauna species. | | |

#### 5.1.3.2 Operation Phase

The operational phase of the impact of daily activities is anticipated to further spread the IAP, as well as the deterioration of the habitats due to the increase of dust and edge effect impacts. Dust reduces the ability of plants to photosynthesize and thus leads to degradation/retrogression of the veld. Moving maintenance and mining vehicles don't only cause sensory disturbances to fauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions.

The following potential impacts were considered:

- Continued fragmentation and degradation of habitats and ecosystems (Table 5-6);
- Spread of alien and/or invasive species (Table 5-7);
- Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration) (Table 5-8).

***Table 5-6 Impacts to biodiversity associated with the proposed operational phase***

| **Impact Nature: Continued fragmentation and degradation of habitats and ecosystems** | | |
|---|---|---|
| Disturbance created during the construction phase will leave the project area vulnerable to erosion and IAP encroachment. | | |
| | Without Mitigation | With Mitigation |
| ***Extent*** | Moderate (3) | Low (2) |
| ***Duration*** | Permanent (5) | Short term (2) |
| ***Magnitude*** | High (8) | Low (4) |
| ***Probability*** | Highly probable (4) | Improbable (2) |
| ***Significance*** | **High** | **Low** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Moderate | High |
| ***Irreplaceable loss of resources?*** | No | No |

| Impact Nature: Continued fragmentation and degradation of habitats and ecosystems | |
|---|---|
| Disturbance created during the construction phase will leave the project area vulnerable to erosion and IAP encroachment. | |
| **Can impacts be mitigated?** | Yes, with proper management and avoidance, this impact can be mitigated to a low level. |
| **Mitigation:** | |
| See Biodiversity Management Outcomes | |
| **Residual Impacts** | |
| There is still the potential some potential for erosion and IAP encroachment even with the implementation of control measures but would have a low impact. | |

***Table 5-7 Impacts to biodiversity associated with the proposed operational phase.***

| Impact Nature: Spread of alien and/or invasive species | | |
|---|---|---|
| Degradation and loss of surrounding natural vegetation | | |
| | **Without mitigation** | **With mitigation** |
| ***Extent*** | Moderate (3) | Low (2) |
| ***Duration*** | Long term (4) | Short term (2) |
| ***Magnitude*** | Moderate (6) | Mlinor (2) |
| ***Probability*** | Highly probable (4) | Improbable (2) |
| ***Significance*** | **Medium** | **Low** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Moderate | High |
| ***Irreplaceable loss of resources?*** | No | No |
| **Can impacts be mitigated?** | Yes | |
| **Mitigation:** | | |
| See Biodiversity Management Outcomes | | |
| **Residual Impacts:** | | |
| Long term broad scale IAP infestation if not mitigated. | | |

***Table 5-8 Impacts to biodiversity associated with the proposed operational phase***

| Impact Nature: Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration | | |
|---|---|---|
| The operation and maintenance of the proposed development may lead to disturbance or persecution of fauna in the vicinity of the development. | | |
| | **Without Mitigation** | **With Mitigation** |
| ***Extent*** | Moderate (3) | Low (2) |
| ***Duration*** | Long term (4) | Short term (2) |
| ***Magnitude*** | High (8) | Low (4) |
| ***Probability*** | Highly probable (4) | Improbable (2) |
| ***Significance*** | **Medium** | **Low** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Moderate | High |
| ***Irreplaceable loss of resources?*** | No | No |

| Impact Nature: Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration | |
|---|---|
| The operation and maintenance of the proposed development may lead to disturbance or persecution of fauna in the vicinity of the development. | |
| **Can impacts be mitigated?** | Yes |
| **Mitigation:** | |
| See Biodiversity Management Outcomes | |
| **Residual Impacts** | |
| Disturbance from maintenance activities will occur albeit at a low and infrequent level. | |

#### 5.1.3.3 Cumulative Impacts

Cumulative impacts are assessed in context of the extent of the proposed project area; other developments in the area; and general habitat loss and transformation resulting from other activities in the area.

| Impact Nature: Cumulative habitat loss within the region | | |
|---|---|---|
| The development of the proposed infrastructure will contribute to cumulative habitat loss within ESAs and thereby impact the ecological processes in the region. | | |
| | **Overall impact of the proposed development considered in isolation** | **Cumulative impact of the project and other projects in the area** |
| ***Extent*** | Moderate (3) | High (4) |
| ***Duration*** | Moderate term (3) | Long term (4) |
| ***Magnitude*** | Moderate (6) | High (8) |
| ***Probability*** | Probable (3) | Probable (3) |
| ***Significance*** | **Medium (15)** | **Medium (19)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | High | High |
| ***Irreplaceable loss of resources?*** | No | No |
| **Can impacts be mitigated** | To some degree, but most of the impact results from the presence of the various facilities which cannot be well mitigated. | |
| **Mitigation:** | | |
| Ensure that a rehabilitation plan and IAP management plan be compiled for each development and are effectively implemented. | | |

### 5.1.4 Biodiversity Management Outcomes

The purpose of the management outcomes is to allow for the mitigation measures associated with the impact assessment to be incorporated into the EMPr. These are provided in Table 5-9.

***Table 5-9 Mitigation measures including requirements for timeframes, roles and responsibilities for this report***

| Impact Management Actions | Implementation | | Monitoring | |
|---|---|---|---|---|
| | Phase | Responsible Party | Aspect | Frequency |
| **Management outcome: Vegetation and Habitats** | | | | |
| Areas rated as High sensitivity in proximity to the development areas, should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to this area from construction workers, machinery. The infrastructure should be realigned to prioritise development within very low/low sensitivity areas. Mitigated development in Moderate sensitivity areas is permissible. High sensitivity areas are to be avoided. | Life of operation | Project manager, Environmental Officer | Development footprint | Ongoing |
| Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further than that proposed for the project. Clearing of vegetation should be minimized and avoided where possible. | Life of operation | Project manager, Environmental Officer | Areas of indigenous vegetation | Ongoing |
| Where possible, existing access routes and walking paths must be made use of. | Construction/Operational Phase | Environmental Officer & Design Engineer | Roads and paths used | Ongoing |
| All laydown, chemical toilets etc. should be restricted to very low/ low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or equipment will be allowed outside of the designated project areas. | Construction/Operational Phase | Environmental Officer & Design Engineer | Laydown areas | Ongoing |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. | Operational phase | Environmental Officer & Contractor | Assess the state of rehabilitation and encroachment of alien vegetation | Quarterly for up to two years after the closure |
| Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. | Operational and Decommissioning phase | Environmental Officer & Contractor | Woody material under powerline and in SS footprint | During Phase |
| 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 may occur 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 leaking and entering the environment. | Life of operation | Environmental Officer & Contractor | Spill events, Vehicles dripping. | Ongoing |

| | | | | |
|---|---|---|---|---|
| Storm Water run-off & Discharge Water Quality monitoring | Life of operation | Environmental Officer & Design Engineer | Water Quality and presence of erosion | Ongoing |
| It should 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 compiled and implemented to restrict the impact fire might have on the surrounding areas. | Life of operation | Environmental Officer & Contractor | Fire Management | During Phase |
| Protected tree species need either a permit to be destroyed or can be relocated within the area and later used for landscaping by a qualified person. Avoiding the trees is the preferred option. | Construction Phase | Environmental Officer & Contractor | Protected tree species | During Phase |
| **Management outcome: Fauna** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments,<br>• Signs must be put up to enforce this | Construction/Operational Phase | Project manager, Environmental Officer | Infringement into these areas | Ongoing |
| Noise must be kept to an absolute minimum during the evenings and at night, to minimize all possible disturbances to amphibian species and nocturnal mammals | Construction/Operational Phase | Environmental Officer | Noise levels | Ongoing |
| No trapping, killing, or poisoning of any wildlife is to be allowed.<br>• Signs must be put up to enforce this; | Life of operation | Environmental Officer | Evidence of trapping etc | Ongoing |
| Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible. | Construction/Operational Phase | Project manager, Environmental Officer & Design Engineer | Light pollution and period of light. | 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 still 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 in the case. | Ongoing |
| Any excavations or holes must be conducted in a progressive manner.<br>• Should the holes/excavations stay open overnight they must be covered temporarily, to ensure no small fauna species fall in. | Planning and construction | Environmental Officer & Contractor, Engineer | Presence of trapped animals and open holes | Ongoing |
| A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet | Construction Phase | Environmental Officer, Contractor | Presence of any floral or faunal species. | During phase |

| | | | | |
|---|---|---|---|---|
| season and any SSC should be noted. In situations where the threatened and protected plants 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 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 | | | | |
| Heat generated from the substation must be monitored to ensure it does not negatively affect the local fauna | Life of operation | Environmental Officer & Contractor | Heat generated by substations | Ongoing |
| Once the development layout has been confirmed, the open areas must be fenced off appropriately pre-construction in order to allow animals to move or be moved into these areas before breaking ground activities occur. Construction activities must take place systemically, especially in relation to the game farm area. | Planning/Construction Phase | Environmental Officer & Design Engineer | Areas not to be developed and construction direction | Ongoing |
| **Management outcome: Alien Vegetation and fauna** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| Compilation of and implementation of an alien vegetation management plan. | Life of operation | Project manager, Environmental Officer & Contractor | 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 must be clearly demarcated to avoid unnecessary disturbances to adjacent areas | 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 | Life of operation | Environmental Officer & Health and Safety Officer | Presence of waste | Life of operation |
| A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs | Life of operation | Environmental Officer & Health and Safety Officer | Evidence or presence of pests | 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 strictly adhered to. This includes wetting of exposed soft soil surfaces.<br>• No non environmentally friendly suppressants may be used, as this could result in pollution of water sources | Life of operation | 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 adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.<br>• Refuse bins will be emptied and secured;<br>• Temporary storage of domestic waste shall be in covered waste skips; and<br>• Maximum domestic waste storage period will be 10 days. | Construction Phase | Environmental Officer & Health and Safety Officer | Presence of waste | Life of operation |
| Toilets at the recommended Health and Safety standards must be provided. These should be emptied twice a day, to prevent staff from using the surrounding vegetation. | Construction Phase | 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. Under no circumstances may domestic waste be burned on site | Construction Phase | Environmental Officer & Health and Safety Officer | Availability of bins and the collection of the waste. | Ongoing |
| Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days. | Construction Phase | Environmental Officer, Contractor & Health and Safety Officer | Management of bins and collection of waste | Ongoing |
| Suitable temporary solid waste facilities are to be incorporated into the design to prevent unsanitary conditions. These are to be cleared weekly and waste collected by the local waste management department. The residents must be encouraged to recycle. | Operational Phase | Project manager | Management of bins and collection of waste | Ongoing |
| **Management outcome: Environmental awareness training** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance; and biology, habitat requirements and management requirements in the EA and EMPr. The avoidance and protection of the wetland areas must be included into a site induction. Contractors and employees must all undergo the induction and made aware of the "no-go" to be avoided. | Life of operation | Health and Safety Officer | Compliance to the training. | Ongoing |
| **Management outcome: Erosion** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |

| | Phase | Responsible Party | Aspect | Frequency |
|---|---|---|---|---|
| Speed limits must be put in place to reduce erosion.<br>• Reducing the dust generated by the listed activities above, especially the earthmoving machinery, through wetting the soil surface; putting up signs to enforce speed limit; and speed bumps built to force slow speeds;<br>• Signs must be put up to enforce this. | Life of operation | Project manager, Environmental Officer | Water Runoff from road surfaces | Ongoing |
| Where possible, existing access routes and walking paths must 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 and strong winds. | 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 Conclusion and Impact Statement

## 6.1 Conclusion

### 6.1.1 Terrestrial Biodiversity

The project area has been altered both currently and historically. The present land use had a direct impact on both the fauna and the flora in the area, which is evident in the disturbed and transformed habitats. Historically, Cultivation, overgrazing and mismanagement has led to the deterioration of most of the area to a disturbed Bushveld that is either encroached upon or invaded by exotic plant species.

However, the degraded Bushveld habitat and wetlands/watercourses in the wider project area can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by development.

The degraded Bushveld habitat and wetlands/watercourses in the project area have a **High ecological theme sensitivity**.

The habitat sensitivity of the degraded Bushveld and wetland/water resources is regarded as high, due to the species recorded and the role of this intact unique habitat to biodiversity within a very fragmented local landscape, not to mention the sensitivity according to various ecological datasets. The high sensitivity terrestrial areas still:

- Support nearby CBA/ESA's as per the LCP;
- Contains the CR Sefathlane River; and
- Support various organisms (Including SCC) and may play an important role in the ecosystem, if left to recover from the superficial impacts.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas provide a variety of ecological services considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is the most important aspect to consider for the proposed project.

The results of the Ecological Sensitivity Assessment by (ENVASS,2020) and this report are in corroboration.

Any development in high sensitivity areas must be undertaken with the provided mitigation measures. The mitigation measures, management and associated monitoring regarding the expected impacts will be the most important factor of this project and must be considered by the issuing authority.

## 6.2 Impact Statement

The main expected impacts of the proposed infrastructure will include the following:

- Habitat loss and fragmentation;
- Degradation of surrounding habitat;
- Disturbance and displacement caused during the construction and maintenance phases; and
- Direct mortality during the construction phase.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk but there is always possibility of unexpected impacts. Considering that this area that has been identified as being of significance for biodiversity maintenance and ecological processes, development may proceed but with caution and only with the implementation of mitigation measures.

Considering the above-mentioned information, 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 and supporting recommendations are implemented.

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# 8 Appendix Items

## 8.1 Appendix A – Specialist Declaration of Independence

I, Lindi Steyn, 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.

Lindi Steyn

Biodiversity Specialist

The Biodiversity Company

February 2022