# BIODIVERSITY BASELINE AND IMPACT ASSESSMENT FOR THE PROPOSED KLAWER 22KV POWERLINE

## Klawer, Western Cape, South Africa

June 2021

**CLIENT**


**Prepared by:**

**The Biodiversity Company**

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

| | |
|---|---|
| Report Name | **BIODIVERSITY BASELINE AND IMPACT ASSESSMENT FOR THE PROPOSED KLAWER 22KV POWERLINE** |
| Submitted to | |
| Report Writer | **Marnus Erasmus**  |
| | Martinus Erasmus obtained his B-Tech degree in Nature Conservation in 2016 at the Tshwane University of Technology. Martinus has been conducting EIAs, basic assessments and assisting specialists in field during his studies since 2015. Martinus is a specialist terrestrial ecologist and botanist which conducts floral surveys faunal surveys which include mammals, birds, amphibians and reptiles. |
| Report Writer | **Lindi Steyn**  |
| | 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 / Reviewer | **Andrew Husted**  |
| | Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant. |
| Declaration | The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science. |

## DECLARATION

I, Marnus Erasmus, 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.

Marnus Erasmus

Biodiversity Specialist

The Biodiversity Company

June 2021

## DECLARATION

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

June 2021

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# 1 Introduction

## 1.1 Background

The Biodiversity Company was commissioned to conduct a terrestrial assessment for the proposed 22kV overhead powerline (OHL) to connect the proposed Klawer Wind Energy Facility to the national grid via the existing Eskom Klawer substation. The powerline is approximately 8 km long and the servitude width of the powerline is 9 m on either side (18 m width in total).

This study approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 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, when applying for Environmental Authorisation”. The National Web based Environmental Screening Tool has characterised the terrestrial sensitivity of the project area as “very high”. The approach also takes cognisance of the Performance Standard 6 (PS6; IFC 2019) and the associated Guidance Note 6 (GN6; IFC 2019).

The purpose of the specialist studies is to provide relevant input into the Basic Assessment (BA) process and to provide a report for the proposed activities associated with the project. 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 Area

The extent of the Project Area of Influence (POAI) comprised a 100 m corridor width, also referred to as the study area. The priority for the assessment was afforded the powerline servitude width of 18 m, which is the approved servitude for consideration. Areas identified at a desktop level as ecologically important features were further investigated during the site assessment.

## 1.3 Project Description

The project is situated southwest of the town of Klawer in the Matzikama Local Municipality, Western Cape Province. The 22kV grid connection crosses the following properties: Portion 99 of Farm Birdfield 306; Portion 100 of Farm Birdfield 306; Remainder of Farm Birdfield 307; Farm 472; Remainder of Farm Carlton Hill 307.

The OHL will be a 22kV wood pole structure with chickadee conductor. Standard overhead line construction methodology will be employed – drill holes, plant poles, string conductor.

The surrounding land uses include, natural areas, agriculture, national road, and a water canal.


***Figure 1-1 The project area in proximity to the nearby features***

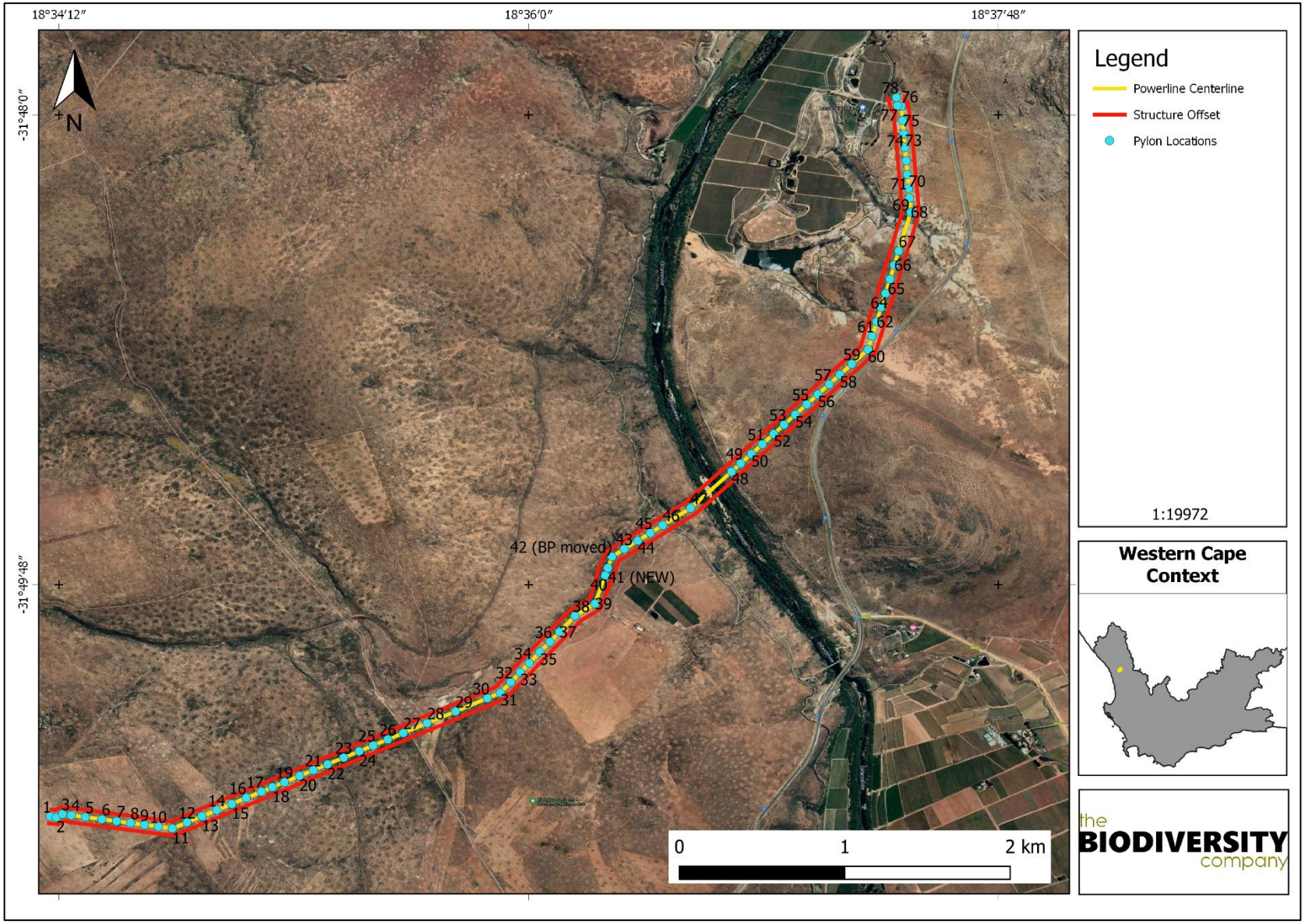


***Figure 1-2 The entirety of the proposed activities***

## 1.4 Scope of Work

The proposed methodology includes both a desktop review and a field work component. A desktop review of distribution lists (including Red Data Listed (RDL) species) and available literature will be conducted to guide the field work component. 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 proposed development area and surrounding landscape;
- Desktop assessment to compile an expected species list and possible threatened flora and fauna species that occur within the proposed landscape;
- Field survey to ascertain the species composition of the present flora and fauna community within the proposed development area;
- Delineate and map the habitats and their respective sensitivities that occur within the proposed development area;
- Identify the manner that the proposed development 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 project area and infrastructure provided by the client and any alterations to the route would have affected the area surveyed;
- The project area was only surveyed during a single site visit and therefore, this assessment does not consider temporal trends;
- The field assessment was conducted outside of the main flowering season, the vegetation was dry and most plants had already lost the green flush. Also, the spring dominant non-succulent annuals were not detectable; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m.

## 1.6 Key Legislative Requirements

The legislation, policies and guidelines 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 Western Cape***

| Region | Legislation |
|---|---|
| International | Convention on Biological Diversity (CBD, 1993) |
| | The Convention on Wetlands (RAMSAR Convention, 1971) |
| | The United Nations Framework Convention on Climate Change (UNFCC,1994) |

| | |
|---|---|
| | The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973) |
| | The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979) |
| **National** | Constitution of the Republic of South Africa (Act No. 108 of 2006) |
| | 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) |
| | The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 42946 (January 2020) |
| | The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 43110 (March 2020) |
| | The National Environmental Management: Waste Act, 2008 (Act 59 of 2008); |
| | The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations |
| | National Protected Areas Expansion Strategy (NPAES) |
| | Natural Scientific Professions Act (Act No. 27 of 2003) |
| | National Biodiversity Framework (NBF, 2009) |
| | National Forest Act (Act No. 84 of 1998) |
| | National Veld and Forest Fire Act (101 of 1998) |
| | National Water Act (NWA, 1998) |
| | National Spatial Biodiversity Assessment (NSBA) |
| | World Heritage Convention Act (Act No. 49 of 1999) |
| | Municipal Systems Act (Act No. 32 of 2000) |
| | Alien and Invasive Species Regulations, 2014 |
| | South Africa's National Biodiversity Strategy and Action Plan (NBSAP) |
| | Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) |
| | Sustainable Utilisation of Agricultural Resources (Draft Legislation). |
| | White Paper on Biodiversity |
| **Provincial** | Western Cape Biodiversity Sector Plan 2017 |
| | Draft Western Cape Biodiversity Bill, 2019 |

# 2 Methods

## 2.1 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets in order 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 development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (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. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
    - South Africa Protected Areas Database (SAPAD) (DEA, 2020) – The South African Protected Areas Database (SAPAD) contains spatial data for the conservation of South Africa. 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, 2010) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are

large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- The Western Cape Biodiversity Spatial Plan (WCBSP) was updated in 2017. It classifies areas into Critical Biodiversity Area (CBA1), CBA2, Ecological Support Area (ESA1), ESA2, Other Natural Areas (ONA) and Protected Areas (PA).

- Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (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 South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.

### 2.1.2 Desktop Flora Assessment

The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) was used in order 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 proposed development area and surrounding landscape (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.

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

- Field Guide to Fynbos (Manning,2018);
- Wild Flowers of Namaqualand (le Roux,2015);
- Field Guide to the Wild Flowers of the Highveld (Van Wyk & Malan, 1997);
- A field guide to Wild flowers (Pooley, 1998);
- Guide to Grasses of Southern Africa (Van Oudtshoorn, 1999);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Mesembs of the World (Smith *et al.,* 1998);
- Medicinal Plants of South Africa (Van Wyk *et al.,* 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016); and
- Identification guide to southern African grasses. An identification manual with keys, descriptions and distributions (Fish *et al.,* 2015).

Additional information regarding ecosystems, vegetation types, and Species of Conservation Concern (SCC) included the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2012); and
- Red List of South African Plants (Raimondo *et al.,* 2009; SANBI, 2016).

The field work methodology included the following survey techniques:

- Timed meanders;
- Sensitivity analysis based on structural and species diversity; and
- Identification of floral red-data species.

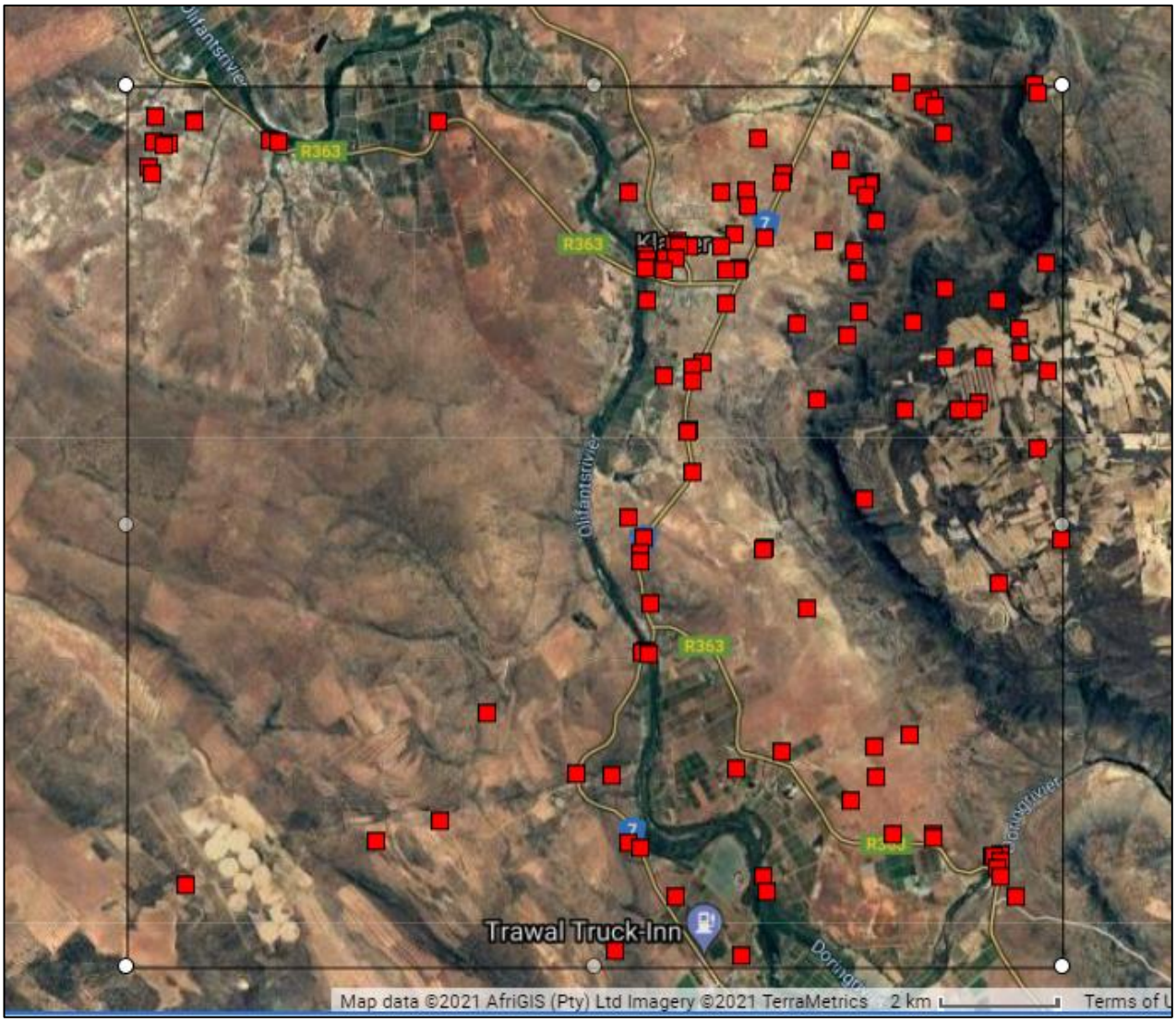


***Figure 2-1 Map illustrating extent of area used to obtain the expected flora species list from the Plants of South Africa (POSA) database. The red squares are cluster markers of botanical records as per POSA data.***

### 2.1.3 Faunal Assessment

The faunal desktop assessment comprised of the following:

- Compilation of expected species lists;

- Identification of any Red Data or Species of Conservation Concern (SCC) potentially occurring in the area; and
- Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance.

Mammal distribution data were obtained from the following information sources:

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Bats of Southern and Central Africa (Monadjem *et al.,* 2010);
- The 2016 Red List of Mammals of South Africa, Lesotho and Swaziland (www.ewt.org.za) (EWT, 2016); and
- Animal Demography Unit (ADU) - MammalMap Category (MammalMap, 2019) (mammalmap.adu.org.za).

While the Avifauna distribution and other pertinent data was obtained from:

- Southern African Bird Atlas Project 2 (SABAP2, 2019);
- Birdlife South Africa (2015);
- Birdlife. (2017). Important Bird Areas Factsheets;
- Checklist of the Birds of the World (Del Hoyo *et al.,* 1996);
- Book of birds of South Africa, Lesotho and Swaziland (Taylor *et al.,* 2015); and
- Roberts – Birds of Southern Africa (Hockey *et al.,* 2005).

A herpetofauna desktop assessment of the possible species in the area was undertaken and attention was paid to the SCCs, sources used included the IUCN (2017) and ADU (2019). Herpetofauna distributional data was obtained from the following information sources:

- South African Reptile Conservation Assessment (SARCA) (sarca.adu.org);
- A Guide to the Reptiles of Southern Africa (Alexander & Marais, 2007);
- Field guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- Atlas and Red list of Reptiles of South Africa, Lesotho and Swaziland (Bates *et al.,* 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez & Carruthers, 2009);
- Animal Demography Unit (ADU) - FrogMAP (frogmap.adu.org.za);
- Atlas and Red Data Book of Frogs of South Africa, Lesotho and Swaziland (Mintner *et al.,* 2004); and
- Ensuring a future for South Africa's frogs (Measey, 2011).

## 2.2 Biodiversity Field Assessment

A single field survey was undertaken in May 2021, to determine the presence of Species of Conservation Concern (SCC). Effort was made to cover all the different habitat types within the limits

of time and access, focus being placed on areas where proposed infrastructure was going to be placed (Figure 2-2).

### 2.2.1 Site Coverage

The project area coverage and sample locations by the specialists, as evaluated from some of their GPS tracks, is shown in Figure 2-2. This includes the twenty (20) avifauna sampling sites, two camera traps and the location of the species of interest.

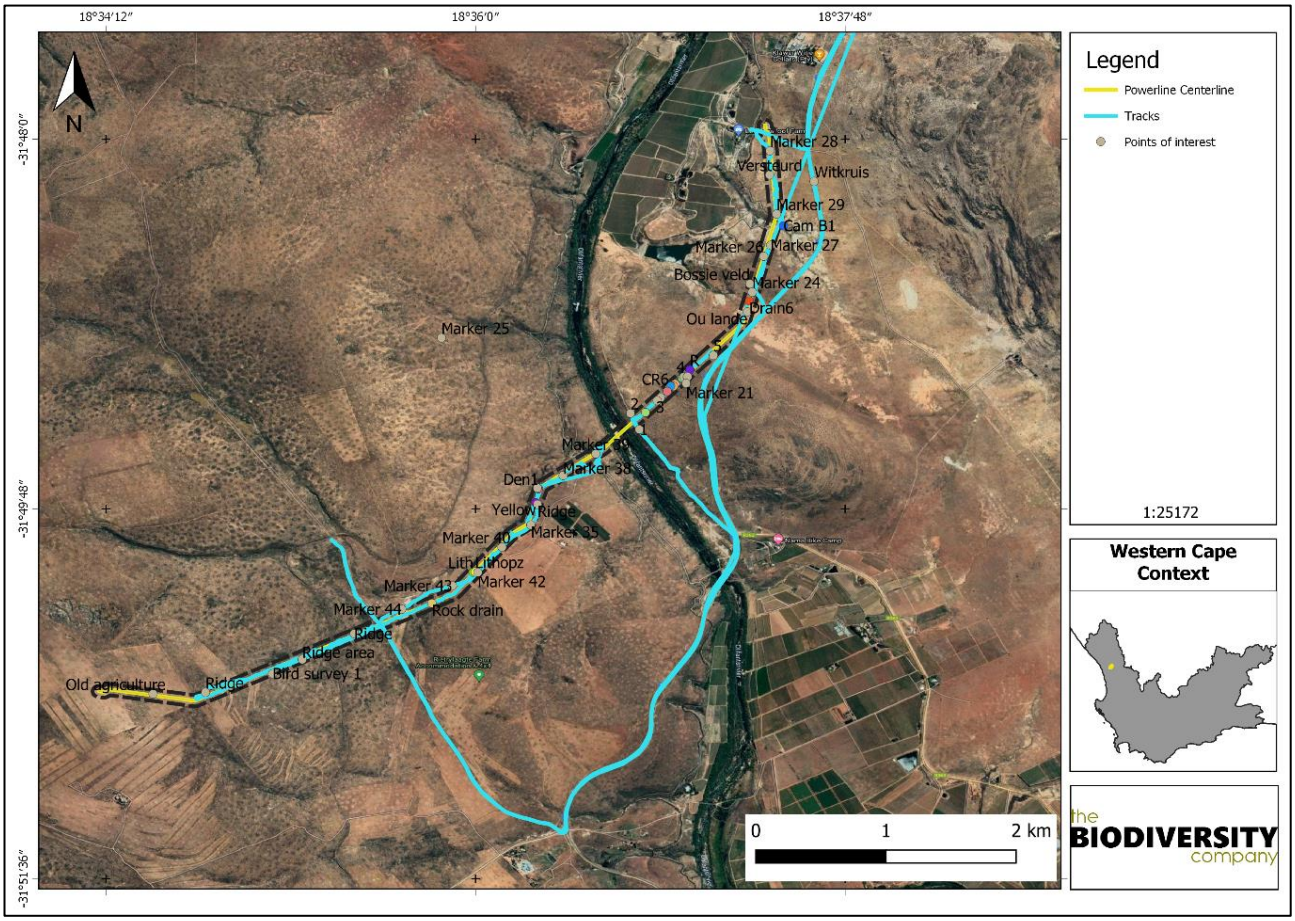


***Figure 2-2 The specialist site coverage for the project area***

### 2.2.2 Flora Survey

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

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

The timed random meander method is a highly efficient method 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 was performed based on the original technique described by Goff *et al.* (1982). Suitable habitat for SCC were identified according to Raimondo *et al.* (2009) and targeted as part of the timed meanders.

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

### 2.2.3 Fauna Survey

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

- Visual and auditory searches - This typically comprised of meandering and using binoculars to view species from a distance without them being disturbed as well as listening to species calls;
- Identification of tracks and signs;
- Utilization of local knowledge; and
- Two (2) camera traps were deployed for 48 hours.

Site selection for trapping focussed on the representative habitats within the project area. Sites were selected on the basis of GIS mapping and Google Earth imagery and then final selection was confirmed through ground truthing during the surveys. Habitat types sampled included pristine, disturbed and semi-disturbed zones, drainage lines and wetlands.

The herpetofauna field assessment was conducted in each habitat or vegetation type within the project area, as identified from the desktop assessment, with a focus on those areas which will be most impacted by the proposed development (i.e. the infrastructure development and waste dumping areas). The herpetological field survey comprised the following techniques:

- Hand searching is used for reptile species that shelter in or under particular habitats. Visual searches, typically undertaken for species which activities occur on surfaces or for species that are difficult to detect by hand-searches or trap sampling. Active hand-searches - are used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.).

## 2.3 Terrestrial Site Ecological Importance (SEI)

The different habitat types within the assessment area were delineated and identified based on observations during the field assessment as well as available satellite imagery. These habitat types were 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 CR, EN, VU or Extremely Rare or Critically Rare species that have a global 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 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.<br>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.<br>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 Resource 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 remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of 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 remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of 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 remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of 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 remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of 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 remain at a site even when a disturbance or impact is occurring, or species that are unlikely to 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 (SEI) from Receptor Resilience (RR) and Biodiversity Importance (BI)***

| Site Ecological Importance (SEI) | | 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 development activities is provided in Table 2-6.

***Table 2-6 Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities***

| Site Ecological Importance (SEI) | 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 Assessment

### 3.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed development to ecologically important landscape features are 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 CR and LC ecosystem. | 3.1.1.1 |
| Ecosystem Protection Level | Relevant – Overlaps mainly with a Poorly Protected Ecosystem. | 3.1.1.2 |
| SAIIAE | Relevant – Critically Endangered wetland systems and river within the project area. | 3.1.1.3 |
| Protected Areas | Relevant – Located 20 km from the Op de Berg Private Nature Reserve. | 3.1.1.4 |
| National Protected Areas Expansion Strategy | Irrelevant – 4.8 km for the closest NPAES Knersvlakte Hantam | - |
| Conservation Plan | Relevant – Intersects:<br>• Critical Biodiversity Area 1 (CBA1);<br>• Ecological Support Area 1 (ESA1);<br>• Ecological Support Area 2 (ESA2). | 3.1.1.5 |
| Important Bird and Biodiversity Areas | Irrelevant -7.8 km from the closest IBA (Cederberg- Koue Bokkeveld IBA). | - |
| Strategic Water Source Areas | Irrelevant – 38+ km to the closest SWSA. | - |
| Succulent Karoo Ecosystem Programme | Near to an Amphibian and a Mammal endemic area | 3.1.1.6 |

#### 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 development overlaps with a CR and LC ecosystem (Figure 3-1).


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

### 3.1.1.2 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. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems. The proposed development overlaps mainly with a NP ecosystem, while smaller portions falls on WP and PP areas (Figure 3-2).

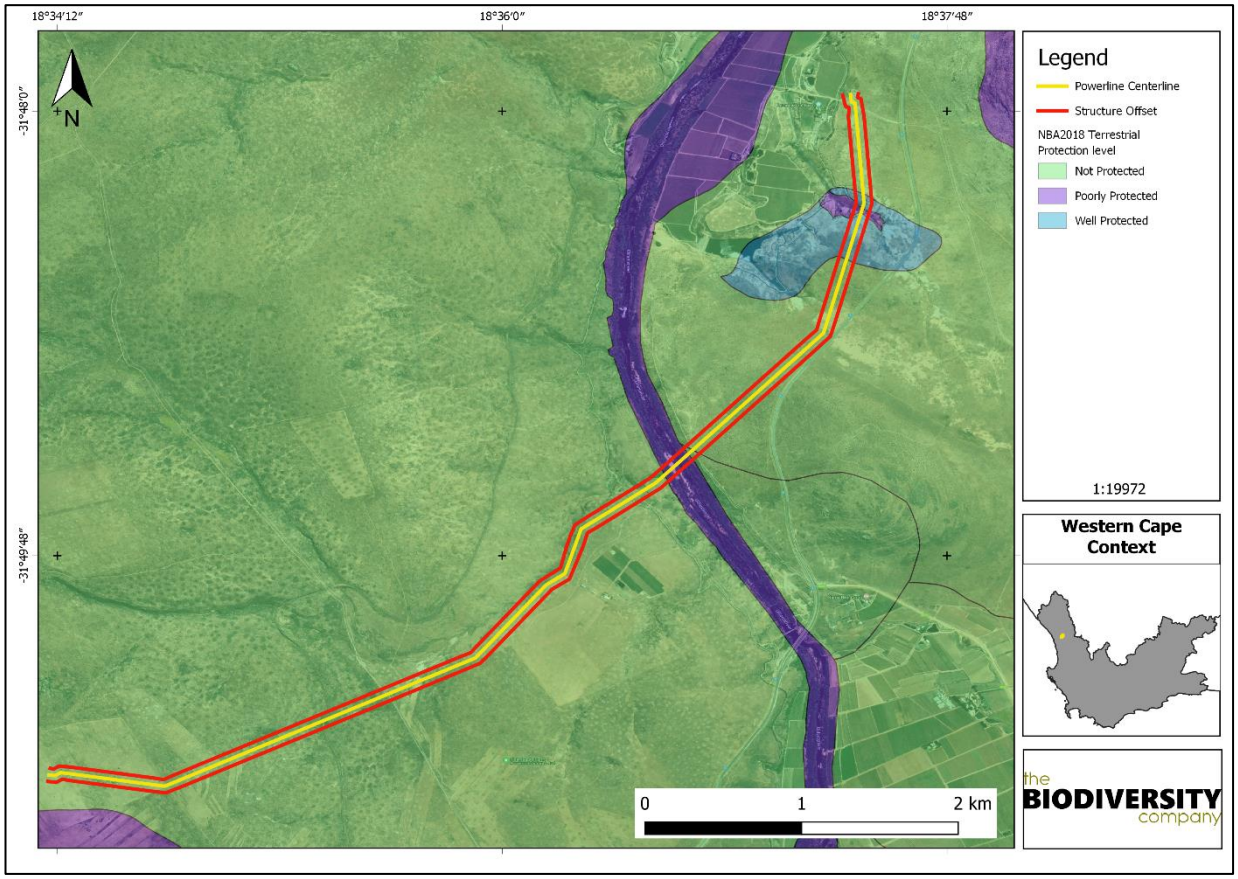


***Figure 3-2 Map illustrating the ecosystem protection level associated with the proposed project area.***

### 3.1.1.3 Wetland National Biodiversity Assessment

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018.

Ecosystem threat status (ETS) of river ecosystem types is 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 LC, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al*., 2019).

Figure 3-3 shows that the wetlands and river associated with the project area are classified as CR.

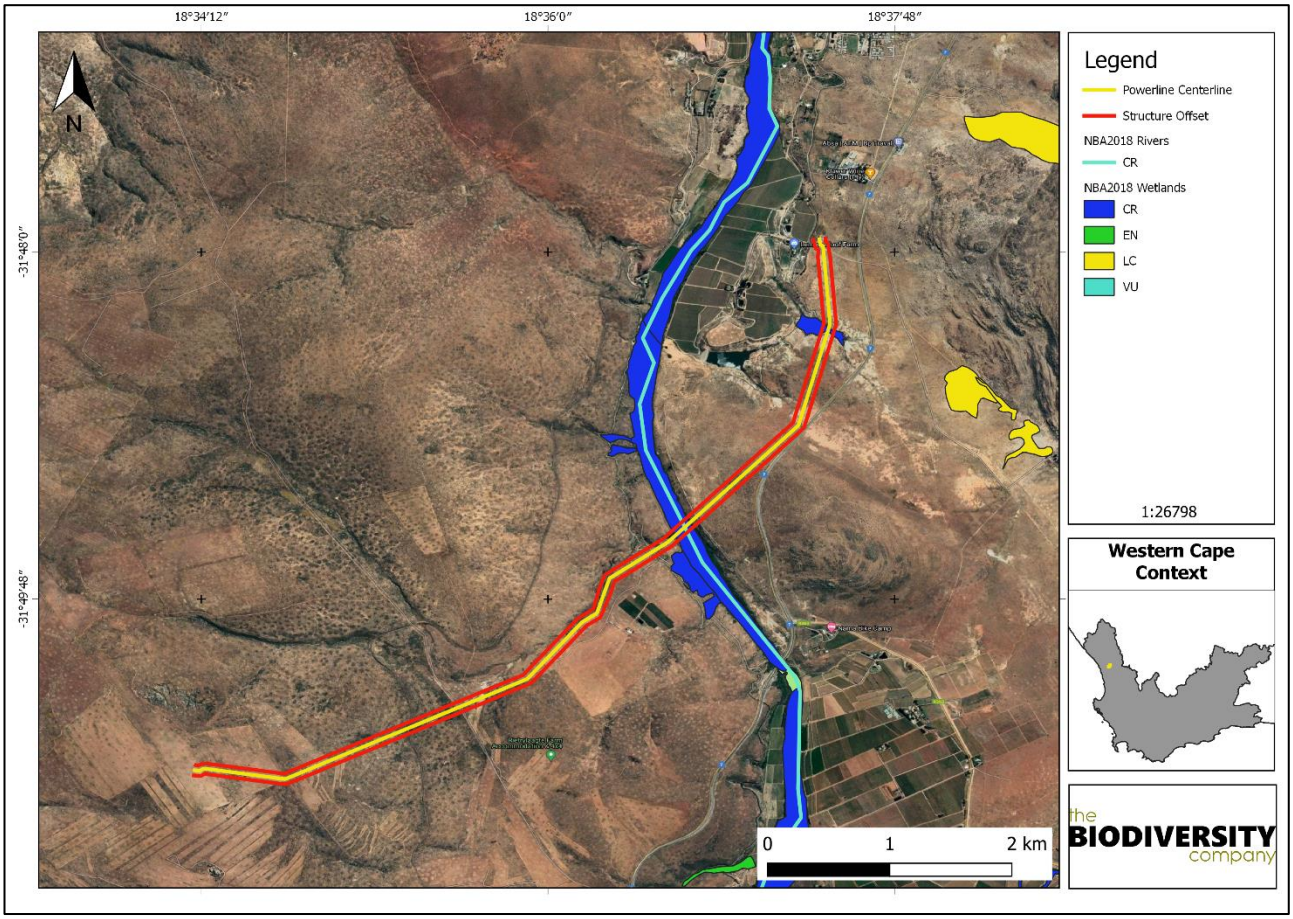


***Figure 3-3 Map illustrating the ecosystem threat status associated with the proposed project area.***

### 3.1.1.4 Protected Areas

According to the protected area spatial dataset from SAPAD (2020), the proposed development does not occur within any protected area (Figure 3-4). Nor does it overlap with any protected area buffers. The closest protected area is the Op de Berg Private Nature Reserve that can be found ~20 km from the project area.

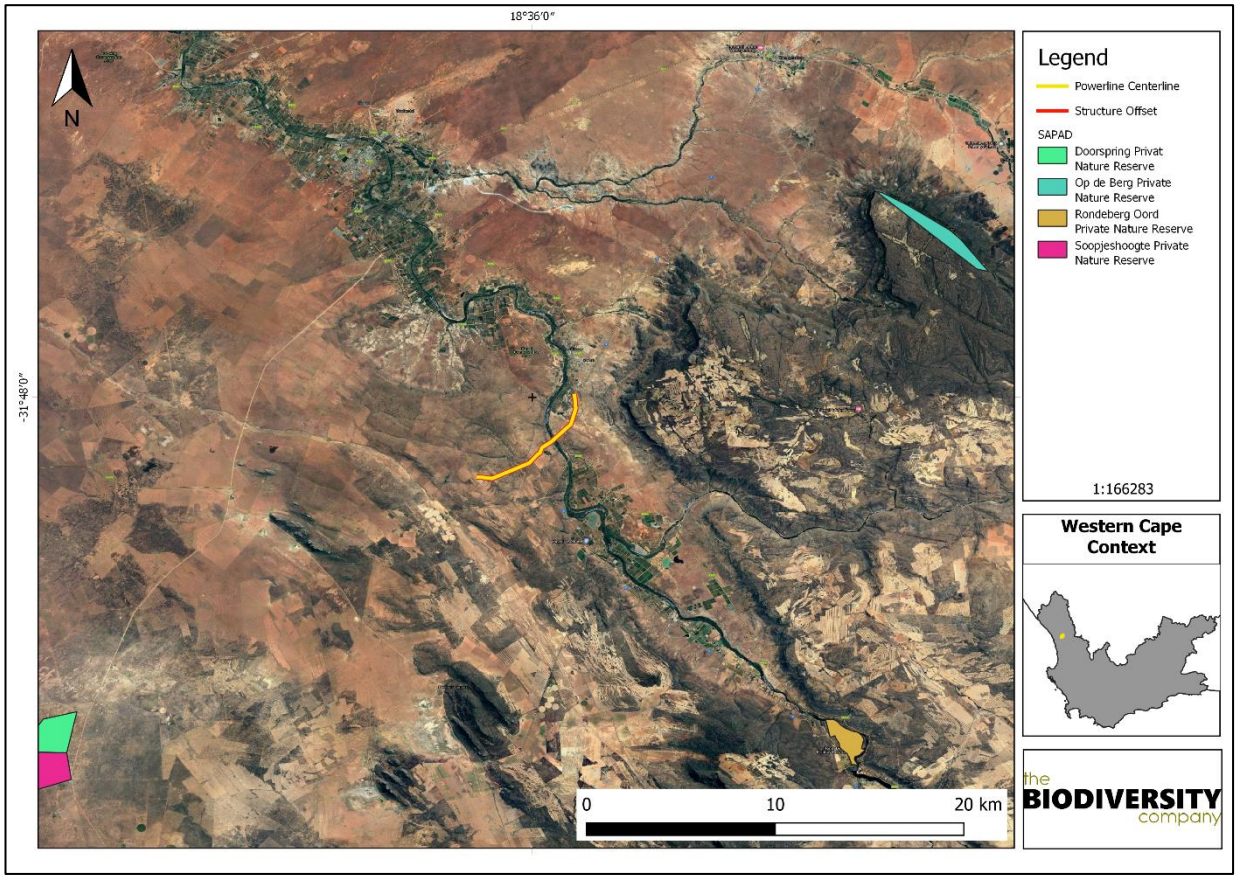


***Figure 3-4 Map illustrating the location of protected areas proximal to the proposed project area.***

### 3.1.1.5 Critical Biodiversity Areas and Ecological Support Areas

The Western Cape Biodiversity Spatial Plan (WCBSP) was updated in 2017. It classifies areas into Critical Biodiversity Area (CBA1), CBA2, Ecological Support Area (ESA1), ESA2, Other Natural Areas (ONA) and Protected Areas (PA). *Figure 3-5* shows the various categories and what their main features are. Figure 3-6 shows that the project area overlaps with areas classified as:

- CBA1;
- ESA1; and
- ESA2.

| MAP CATEGORY | DEFINITION | DESIRED MANAGEMENT OBJECTIVE | SUB-CATEGORY |
|---|---|---|---|
| Protected Area | Areas that are proclaimed as protected areas under national or provincial legislation. | Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity. A benchmark for biodiversity. | n/a |
| Critical Biodiversity Area 1 | Areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. | Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate. | CBA: River<br>CBA: Estuary<br>CBA: Wetland<br>CBA: Forest<br>CBA: Terrestrial |
| Critical Biodiversity Area 2 | Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. | Maintain in a functional, natural or near-natural state, with no further loss of natural habitat. These areas should be rehabilitated. | CBA: Degraded |
| Ecological Support Area 1 | Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. | Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised. | ESA: Foredune<br>ESA: Forest<br>ESA: Climate Adaptation Corridor<br>ESA: Coastal Resource Protection<br>ESA: Endangered Ecosystem<br>ESA: River<br>ESA: Estuary<br>ESA: Wetland<br>ESA: Watercourse Protection<br>ESA: Water Source Protection<br>ESA: Water Recharge Protection |
| Ecological Support Area 2 | Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. | Restore and/or manage to minimise impact on ecological infrastructure functioning, especially soil and water-related services. | ESA: Restore from NN |
| ONA: Natural to Near-Natural | Areas that have not been identified as a priority in the current systematic biodiversity plan, but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem. | Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses. | ONA: Natural to Near-Natural<br>ONA: Degraded |
| No Natural Remaining | Areas that have been modified by human activity to the extent that they are no longer natural, and do not contribute to biodiversity targets. These areas may still provide limited biodiversity and ecological infrastructure functions, even if they are never prioritised for conservation action. | Manage in a biodiversity-sensitive manner, aiming to maximise ecological functionality. Offers the most flexibility regarding potential land uses, but some authorisation may still be required for high-impact land uses. | No Natural Remaining |

***Figure 3-5 Western Cape Biodiversity Spatial Plan categories (WCBSP, 2017)***

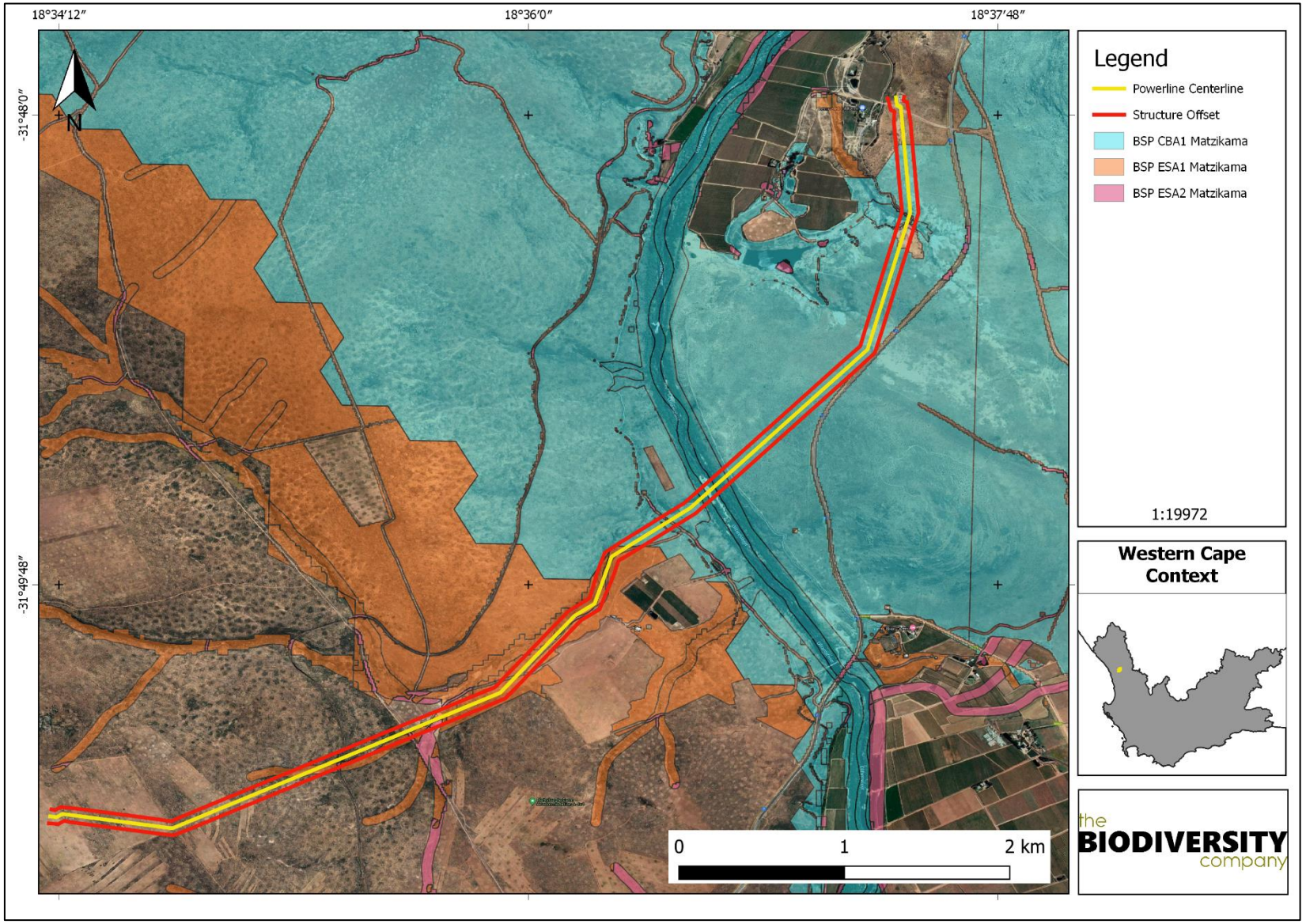


***Figure 3-6 Map illustrating the locations of Critical Biodiversity Areas proximal to the proposed project area.***

### 3.1.1.6 Succulent Karoo Ecosystem Programme (SKEP)

Succulent Karoo Ecosystem Programme (SKEP) is a long term bioregional conservation programme, with the aim to conserve ecosystems and to develop conservation as a land-use rather than instead of land-use (SANBI, 2021). Their focal areas are:

- Increasing local, national and international awareness of the unique biodiversity of the Succulent Karoo;
- Expanding protected areas and improving conservation management, particularly through the expansion of public-private-communal-corporate partnerships;
- Support the creation of a matrix of harmonious land uses; and
- Improve institutional co-ordination to generate momentum and focus on priorities, maximise opportunities for partnerships, and ensure sustainability.

The areas of SKEP endemism for mammals, amphibians, reptiles and birds were assessed in relation to the project area, it was found that the project area is in close proximity to areas of mammal endemism and Amphibian endemism (Figure 3-7).

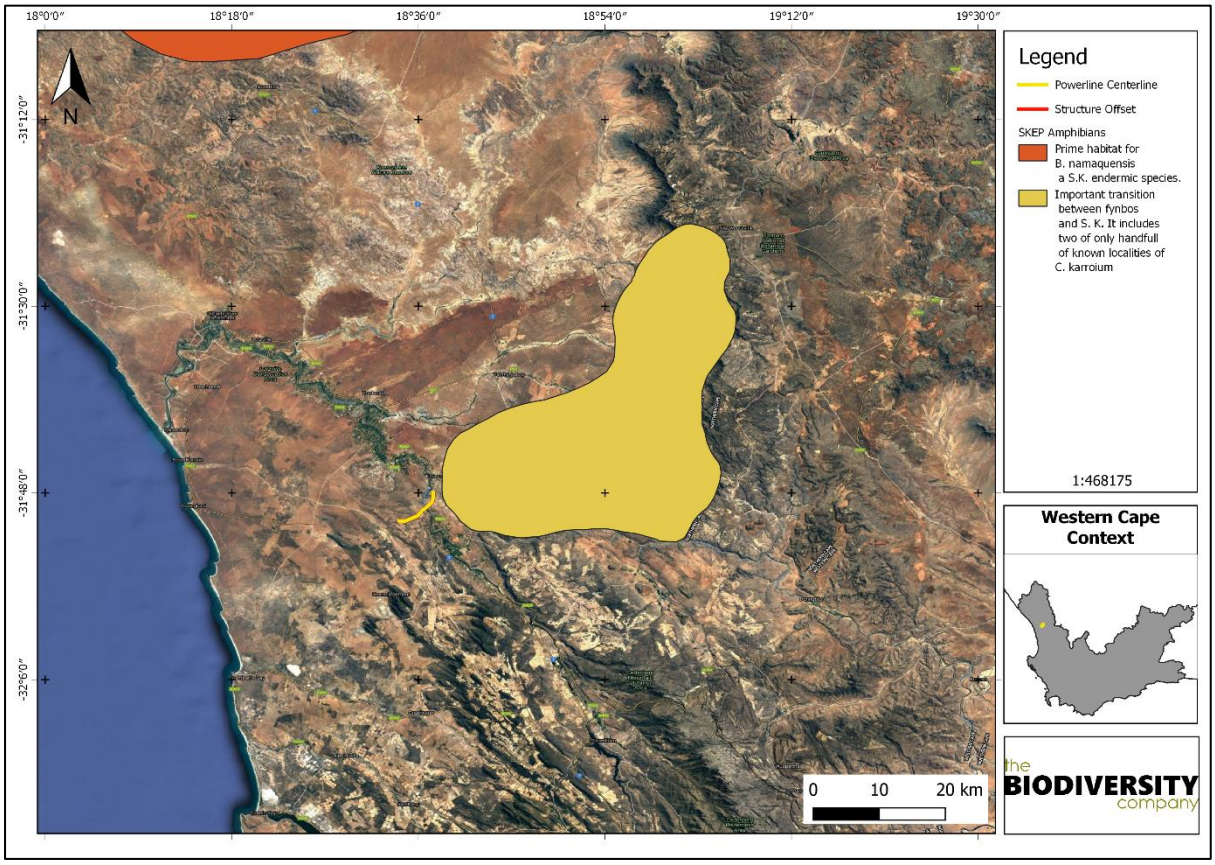


***Figure 3-7 The project area in relation to Succulent Karoo Ecosystem Programme (SKEP) areas of interest for Amphibians***

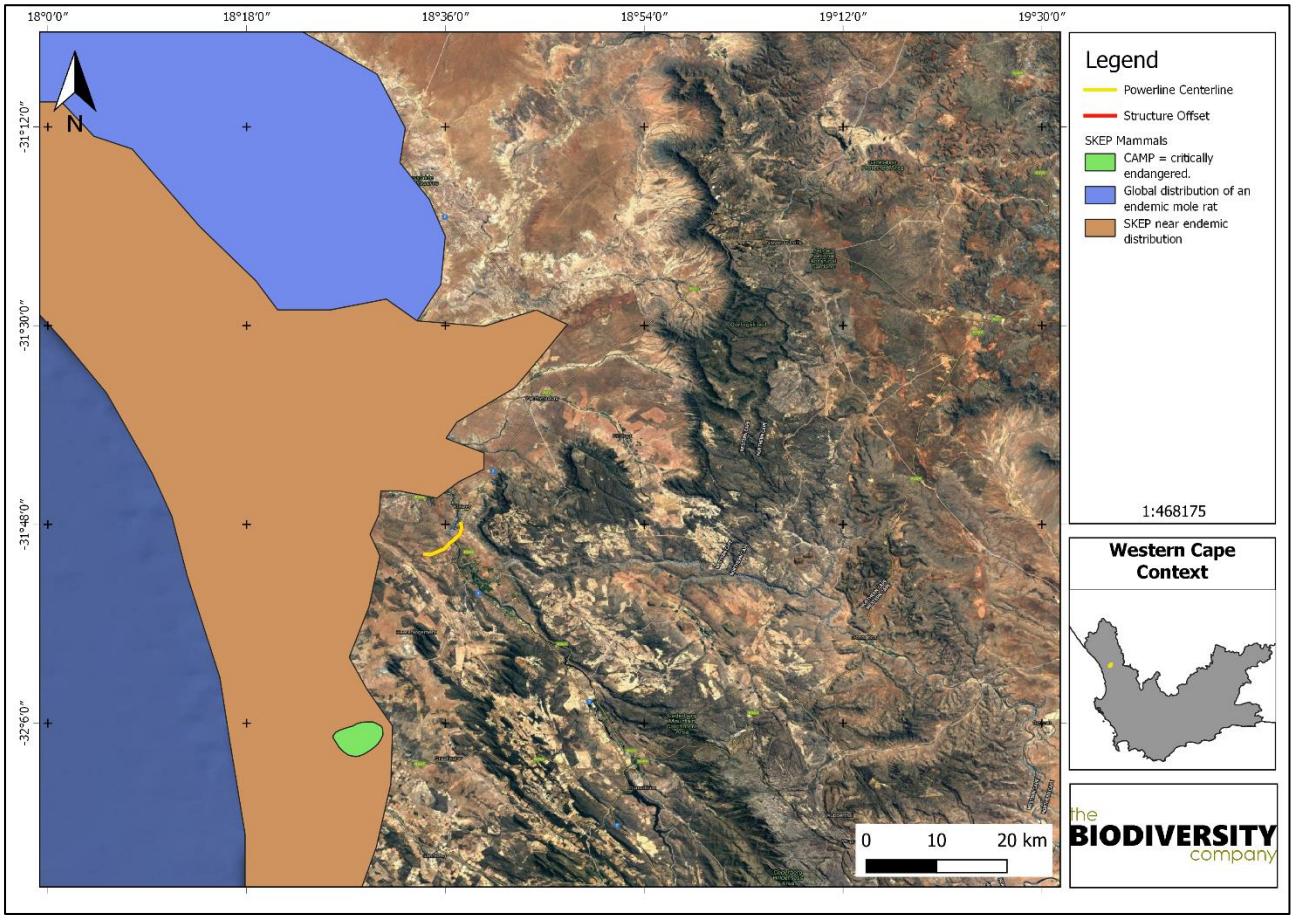


***Figure 3-8 The project area in relation to Succulent Karoo Ecosystem Programme areas of interest for Mammals***

### 3.1.2 Flora Assessment

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

#### 3.1.2.1 Vegetation Type

The project area is situated within the Succulent Karroo and Azonal Vegetation Biomes.

**Succulent Karoo biome**

Most of the biome covers a flat to gently undulating plain, with some hilly and "broken" veld, mostly situated to the west and south of the escarpment, and north of the Cape Fold Belt. The altitude is mostly below 800 m, but in the east, it may reach 1 500 m (SANBI, 2019).

The Succulent Karoo Biome is primarily determined by the presence of low winter rainfall and extreme summer aridity. Rainfall varies between 20 and 290 mm per year. Because the rains are cyclonic, and not due to thunderstorms, the erosive power is far less than of the summer rainfall biomes. During summer, temperatures in excess of 40°C are common, while fog is common nearer to the coast (SANBI, 2019).

The vegetation is dominated by dwarf, succulent shrubs, of which the Vygies (Mesembryanthemaceae) and Stonecrops (Crassulaceae) are particularly prominent. Mass flowering displays of annuals (mainly Daisies Asteraceae) occur in spring, often on degraded or fallow lands. Grasses are rare, except in some sandy areas, and are of the C3 type. The

number of plant species mostly succulents - is very high and unparalleled elsewhere in the world for an arid area of this size (SANBI, 2019).

**Azonal vegetation**

This habitat is formed in and around flowing and stagnant freshwater bodies. Habitats with high levels of salt concentration form a highly stressed environment for most plants and often markedly affect the composition of plant communities. Invariably, both waterlogged and salt-laden habitats appear as 'special', deviating strongly from the typical surrounding zonal vegetation. They are considered to be of azonal character (SANBI, 2019).

On a fine-scale vegetation type, the project area overlaps with four vegetation types: the Doringrivier Quartzite Karoo, Knersvlakte Quartz Vygieveld, Namaqualand Riviere, and Klawer Sandy Shrubland (Figure 3-9).


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

### 3.1.2.1.1 Doringrivier Quartzite Karoo

This vegetation type is found in the western cape where it occurs on slopes of low mountains and of deep river canyons as well as on table lands.

**Important Taxa**

Succulent Shrubs: *Euphorbia mauritanica, Ruschia brevibracteata, Didelta spinosa, Euphorbia burmannii, Tetragonia arbuscula, T. fruticosa, T. spicata, Tylecodon paniculatus, T. wallichii subsp. wallichii.*

Tall Shrubs: *Diospyros ramulosa, Montinia caryophyllacea, Rhus undulata, Wiborgia obcordata.*

Low Shrubs: *Berkheya fruticosa, Galenia africana, Eriocephalus africanus, Galenia fruticosa, Helichrysum hebelepis, Hermannia trifurca, Pteronia ovalifolia, Tripteris sinuata.*

Woody Climber: *Cissampelos capensis.*

Herb: *Lessertia pauciflora.*

Geophytic Herb: *Chlorophytum lewisiae.*

Graminoids: *Ehrharta villosa var. villosa, E. calycina, E. thunbergii, Pentaschistis airoides*.

**Conservation Status of the Vegetation Type**

The national conservation target is 19%, with no statutory conservation areas. Only 2% has been transformed (cultivation). The conservation status of this vegetation community was listed by SANBI 2019 as Least Threatened.

#### 3.1.2.1.2 Namaqualand Riviere

Mucina and Rutherford (2006) describes this vegetation type as alluvial shrubland and patches of tussock graminoids occupying riverbeds and banks of intermittent rivers. It occurs in the Northern and Western Cape along riverbeds throughout the Namaqualand.

**Important Plant Taxa**

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

**Riparian thickets**

Small Tree: *Acacia karroo*.

Tall Shrubs: *Melianthus pectinatus*, *Rhus burchellii*, *Tamarix usneoides*.

Low Shrub: *Ballota africana*.

Semiparasitic Epiphytic Shrub: *Viscum capense*.

**Dry river bottoms**

Tall Shrub: *Lebeckia sericea*.

Low Shrubs: *Galenia africana*, *Gomphocarpus fruticosus*, *Hermannia disermifolia*, *Jamesbrittenia fruticosa*, *Salvia dentata*.

Succulent Shrubs: *Suaeda fruticosa*, *Zygophyllum morgsana*, *Atriplex cinerea* subsp. *bolusii*, *Didelta carnosa* var. *carnosa*, *Lycium horridum*, *Salsola tuberculata*, *Tetragonia fruticosa*, *T. pillansii*, *Zygophyllum retrofractum*.

Herbaceous Climber: *Didymodoxa capensis*.

Graminoids: *Cynodon dactylon*, *Odyssea paucinervis*, *Cyperus marginatus*, *Diplachne fusca*, *Ehrharta longiflora*, *Isolepis antarctica*, *Scirpus nodosus*.

Herbs: *Limonium dregeanum*, *Arctotheca calendula*, *Cotula coronopifolia*, *Galium tomentosum*.

Geophytic Herb: *Crinum variabile*.

Succulent Herbs: *Conicosia elongata*, *Mesembryanthemum guerichianum*.

**Endemic Taxon**

**Dry river bottoms**

Succulent Shrub: *Sarcocornia terminalis*

**Conservation Status of the Vegetation Type**

The vegetation type is listed as Least Threatened (SANBI, 2018). The conservation target is at 24%. However, only small patches are statutorily conserved. Approximately 20% has already been *transformed for cultivation* (Mucina & Rutherford, 2006).

### 3.1.2.1.3 Knersvlakte Quartz Vygieveld

Knersvlakte Quartz Vygieveld occurs on slightly undulating landscape with slopes and broad ridges covered by prominent though very patchy white layer of quartzite.

**Important Taxa**

Succulent Shrubs: *Didelta carnosa* var. *carnosa*, *Drosanthemum diversifolium*, *Ruschia burtoniae*, *Antimima watermeyeri*, *Euphorbia mauritanica*, *E. muricata*, *Galenia sarcophylla*, *Pelargonium crithmifolium*, *Prenia tetragona*, *Ruschia cymosa*, *R. leucosperma*, *R. patulifolia*, *Salsola aphylla*, *S. namibica*, *Senecio aloides*, *Tetragonia verrucosa*, *Tylecodon reticulatus*, *T. ventricosus*, *Zygophyllum cordifolium*.

Low Shrubs: *Berkheya fruticosa*, *Galenia fruticosa*, *Hirpicium alienatum*, *Pteronia ciliata*, *P. heterocarpa*, *Tripteris sinuata*, *Zygophyllum retrofractum*. Semiparasitic Shrub: *Thesium lineatum*.

Herbs: *Amellus microglossus*, *Dimorphotheca sinuata*, *Oncosiphon suffruticosum*, *Lasiopogon glomerulatus*, *Nemesia anisocarpa*, *Oncosiphon piluliferum*, *Osteospermum pinnatum*, *Rhynchopsidium pumilum*.

Geophytic Herbs: *Drimia intricata*, *Oxalis annae*, *O. obtusa*, *O. pes-caprae*, *O. purpurea*.

Succulent Herbs: *Tetragonia echinata*, *Aloe variegata*, *Crassula columnaris* subsp. *prolifera*, *C. deceptor*, *C. expansa* subsp. *expansa*, *C. muscosa*, *C. subaphylla*, *Mesembryanthemum fastigiatum*, *M. nodiflorum*, *Psilocaulon dinteri*.

Graminoids: *Ehrharta delicatula*, *Karroochloa tenella*, *Schismus barbatus*.

**Biogeographically Important Taxa** ( [NQ]Namaqualand endemic, [K]Knersvlakte endemic) Succulent Shrubs: *Malephora purpureo-crocea* [NQ], *Euphorbia schoenlandii*[K], *Tylecodon pearsonii* [NQ]. Succulent Herbs: *Brownanthus corallinus* [NQ], *Crassula elegans* subsp. *elegans* [NQ], *C. expansa* subsp. *pyrifolia* [NQ].

**Endemic Taxa**

Succulent Shrubs: *Argyroderma crateriforme*, *A. delaetii*, *A. fissum*, *A. patens*, *A. pearsonii*, *Cephalophyllum spissum*, *Dactylopsis digitata*, *Dicrocaulon brevifolium*, *D. nodosum*, *Dicrocaulon* sp. nov. (‘*longifolium*’), *Dicrocaulon* sp. nov. (‘*pseudonodosum*’), *Monilaria chrysoleuca*, *M. moniliformis*, *M. pisiformis*, *Oophytum nanum*, *O. oviforme*, *Afrolimon*

*teretifolium*, *Antimima dualis*, *Argyroderma congregatum*, *A. framesii* subsp. *framesii*, *A. framesii* subsp. *hallii*, *A. ringens*, *A. subalbum*, *A. testiculare*, *Cephalophyllum staminodiosum*, *Dactylopsis littlewoodii*, *Dicrocaulon grandiflorum*, *D. humile*, *D. microstigma*, *Dicrocaulon* sp. nov. ('*nanum*'), *D.* sp. nov. ('*neglectum*'), *Dicrocaulon sp.* nov. ('*prostratum*'), *Diplosoma luckhoffii*, *Ruschia firma*, *Salsola* sp. nov. ('*quartzicola*'), *Sarcocornia xerophila*, *Tylecodon occultans*, *T. peculiaris*, *T. pygmaeus*, *Zygophyllum teretifolium*.

Low Shrub: *Pentzia pedunculares*.

Geophytic Herbs: *Bulbine wiesei*, *Lachenalia barkeriana*, *Moraea deserticola*, *Ornithogalum knersvlaktense*, *Pelargonium caroli-henrici*, *P. quarciticola*, *Romulea maculata*.

Succulent Herbs: *Conophytum acutum*, *C. calculus* subsp. *calculus*, *C. minutum* var. *minutum*, *C. minutum* var. *pearsonii*, *C. subfenestratum*, *Othonna intermedia*, *Phyllobolus abbreviatus*.

**Conservation Status**

According to SANBI 2018 this vegetation type is classified as Least threatened. The national target for conservation protection is 25%, but only about 5% is statutorily conserved mainly in the Moedverloren Nature Reserve. The area is disturbed by prospecting for diamonds (ceased) in the past and gypsum mining, leaving behind mine spoil heaps in places.

### 3.1.2.1.4 Klawer Sandy Shrubland

This vegetation type is found in the western cape in close surrounds to Klawer. It occurs on Slightly undulating landscape and foothills covered with medium dense, tall shrubland with *Montinia caryophyllacea* and understorey with prominent sand-loving spinifex-like grass *Cladoraphis spinosa*.

**Important Taxa** Succulent Shrubs: *Othonna cylindrica*, *Antimima dasyphylla*, *Delosperma crassum*, *Euphorbia mauritanica*, *E. tuberculata* var. *macowani*, *Manochlamys albicans*, *Prenia pallens* subsp. *lutea*, *Tetragonia fruticosa*, *Tylecodon paniculatus*, *T. wallichii* subsp. *wallichii*, *Zygophyllum morgsana*.

Tall Shrubs: *Montinia caryophyllacea*, *Wiborgia obcordata*.

Low Shrubs: *Lebeckia halenbergensis*, *Aizoon paniculatum*, *Aspalathus biflora* subsp. *biflora*, *Asparagus juniperoides*, *Eriocephalus brevifolius*, *Euryops namaquensis*, *Galenia africana*, *Hermannia cuneifolia*, *H. procumbens*, *Hoplophyllum spinosum*, *Justicia cuneata* subsp. *cuneata*, *J. orchioides* subsp. *glabrata*, *Limeum africanum*, *Pharnaceum incanum*, *Pteronia divaricata*, *P. glabrata*, *P. paniculata*, *Tripteris oppositifolia*, *Wiborgia fusca* subsp. *fusca*, *W. sericea*.

Herbs: *Dimorphotheca pluvialis*, *Oncosiphon grandiflorum*, *Adenogramma glomerata*, *Amellus strigosus* subsp. *pseudoscabridus*, *Cotula microglossa*, *Dischisma spicatum*, *Emex australis*, *Felicia bergeriana*, *Foveolina tenella*, *Grielum humifusum*, *Helichrysum moeserianum*, *H. tinctum*, *Hemimeris racemosa*, *Leysera gnaphalodes*, *Nemesia bicornis*, *N. ligulata*, *Phyllopodium caespitosum*, *P. cephalophorum*, *Plantago cafra*, *Silene clandestina*, *Tripteris clandestina*, *Ursinia anthemoides* subsp. *versicolor*, *Wahlenbergia annularis*, *W. asperifolia*, *Zaluzianskya benthamiana*, *Z. villosa*.

Geophytic Herbs: *Moraea collina*, *Ammocharis longifolia, Brunsvigia orientalis, Chlorophytum undulatum*, *Drimia intricata*, *Lachenalia ventricosa*, *Lapeirousia jacquinii*, *Moraea fugax*,

*Ornithogalum maculatum*, *Oxalis annae*, *O. pes-caprae*, *O. purpurea*, *Trachyandra jacquiniana*, *T. scabra*, *Walleria gracilis*.

Succulent Herbs: *Apatesia sabulosa*, *Conicosia pugioniformis* subsp. *pugioniformis*, *Tetragonia microptera*.

Graminoids: *Cladoraphis spinosa*, *Stipa capensis*, *Chaetobromus involucratus* subsp. *dregeanus*, *Cynodon dactylon*, *Ehrharta barbinodis*, *E. brevifolia*, *E. calycina*, *Ficinia argyropa*, *Karroochloa schismoides*, *Pentaschistis capillaris*, *Tribolium pusillum*.

**Biogeographically Important Taxa** ( [NQ]Namaqualand endemic, [K]Knersvlakte endemic, [S]Southern distribution limit, [W]Western distribution limit)

Herbs: *Crotalaria effusa* [S], *Helichrysum marmarolepis*[NQ], *Steirodiscus capillaceus* [W].

Geophytic Herbs: *Ornithogalum pruinosum* [NQ], *Trachyandra zebrina* [S].

**Endemic Taxa**

Herb: *Vellereophyton pulvinatum*.

Geophytic Herb: *Haemanthus pubescens* subsp. *leipoldtii*.

**Conservation status**

It is classified as LT by SANB 2018. The national conservation target of this vegetation type is 29%, of which none is currently statutory conserved. About 6% has already been transformed by cultivation and road construction.

### 3.1.2.2 Expected Flora Species

The POSA database indicates that 796 species of indigenous plants are expected to occur within the assessment area and immediate landscape. Appendix A provides the list of species and their respective conservation status and endemism. Twenty-nine (29) SCC based on their conservation status could be expected to occur within the assessment area and are provided in Table 3-2 below.

***Table 3-2 Threatened flora species that may occur within the assessment area associated with proposed project area. CR=Critically Endangered, EN=Endangered, VU = Vulnerable, and NT = Near Threatened***

| Family | Taxon | Author | IUCN | Ecology |
|---|---|---|---|---|
| **Fabaceae** | *Aspalathus obtusata* | Thunb. | VU | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus pinguis subsp. occidentalis* | Thunb. | VU | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus recurva* | Benth. | VU | Indigenous; Endemic |
| **Iridaceae** | *Babiana mucronata subsp. minor* | (Jacq.) Ker Gawl. | EN | Indigenous; Endemic |
| **Iridaceae** | *Babiana toximontana* | J.C.Manning & Goldblatt | EN | Indigenous; Endemic |
| **Iridaceae** | *Babiana vanzijliae* | L.Bolus | NT | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia ellaphieae* | K.E.Steiner | EN | Indigenous; Endemic |
| **Orchidaceae** | *Disa flexuosa* | (L.) Sw. | NT | Indigenous; Endemic |
| **Scrophulariaceae** | *Dischisma squarrosum* | Schltr. | EN | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia quartzicola* | Muasya & Helme | VU | Indigenous; Endemic |

| | | | | |
|---|---|---|---|---|
| **Amaryllidaceae** | *Gethyllis ciliaris subsp. ciliaris* | (Thunb.) Thunb. | NT | Indigenous; Endemic |
| **Amaryllidaceae** | *Haemanthus pubescens subsp. leipoldtii* | L.f. | VU | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum jubilatum* | Hilliard | EN | Indigenous; Endemic |
| **Iridaceae** | *Hesperantha erecta* | (Baker) Benth. ex Baker | NT | Indigenous; Endemic |
| **Aizoaceae** | *Lampranthus glaucus* | (L.) N.E.Br. | VU | Indigenous; Endemic |
| **Fabaceae** | *Lebeckia plukenetiana* | E.Mey. | EN | Indigenous; Endemic |
| **Fabaceae** | *Lessertia argentea* | Harv. | EN | Indigenous; Endemic |
| **Proteaceae** | *Leucadendron loranthifolium* | (Salisb. ex Knight) I.Williams | NT | Indigenous; Endemic |
| **Proteaceae** | *Leucospermum praemorsum* | (Meisn.) E.Phillips | VU | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea ramulosa* | Hilliard | CR | Indigenous; Endemic |
| **Asteraceae** | *Metalasia seriphiifolia* | DC. | VU | Indigenous; Endemic |
| **Asteraceae** | *Othonna petiolaris* | DC. | EN | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium crassipes* | Harv. | EN | Indigenous; Endemic |
| **Proteaceae** | *Protea angustata* | R.Br. | EN | Indigenous; Endemic |
| **Scrophulariaceae** | *Selago inaequifolia* | Hilliard | EN | Indigenous; Endemic |
| **Proteaceae** | *Serruria millefolia* | Salisb. ex Knight | VU | Indigenous; Endemic |
| **Iridaceae** | *Sparaxis galeata* | Ker Gawl. | NT | Indigenous; Endemic |
| **Asteraceae** | *Steirodiscus linearilobus* | DC. | CR | Indigenous; Endemic |
| **Tecophilaeaceae** | *Walleria gracilis* | (Salisb.) S.Carter | VU | Indigenous |

#### 3.1.2.3 Review of previous studies

In 2011, Simon Todd conducted the Fauna and Flora assessment for the associated windfarm (G7 renewable energies Klawer wind farm: Ecological and Biodiversity Assessment: Terrestrial Vertebrate Fauna & Botanical Specialist Study). During this study 168 plant species were identified. In the Quartzide substrate a species of conservation concern *Pelargonium crassipes* was found, of this Endangered species, hundreds of specimens were recorded. The Leipoldtville Sandy Fynbos found in the southern portion of their project area, had a high level of endemic species including two SCCs *Muraltia obovata* and *Ischyrolepis duthieae (Restio duthieae (new name))*, both of which are classified as Vulnerable. Based on the number of species and the importance of some species recorded, the high biodiversity importance of the area was highlighted throughout the report.

### 3.1.3 Faunal Assessment

Most of the project area has been historically occupied by communities and thus many the expected faunal species has a low likelihood of occurrence due to persecution and lack of habitats arising from anthropogenic impacts.

#### 3.1.3.1 Amphibians

Based on the IUCN Red List Spatial Data and AmphibianMap, 13 amphibian species are expected to occur within the area (Appendix B). None of these species are threatened.

### 3.1.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 69 reptile species are expected to occur within the area (Appendix C). Four (4) are regarded as threatened (Table 3-3).

***Table 3-3 Threatened reptile species that are expected to occur within the proposed project area. EN=Endangered, VU = Vulnerable, and NT = Near Threatened, LC=Least Concern.***

| Species | Common Name | Conservation Status | | Likelihood of Occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2021) | |
| ***Chersobius signatus*** | Speckled Dwarf Tortoise | EN | EN | **High** |
| ***Goggia matzikamaensis*** | Matzikama Gecko | NT | LC | **High** |
| ***Psammophis leightoni*** | Cape Sand Snake | VU | VU | **High** |
| ***Scelotes gronovii*** | Gronovi's Dwarf Burrowing Skink | NT | LC | **Moderate** |

*Chersobius signatus* (Speckled Cape Tortoise) is categorised as EN both locally and internationally. This species is naturally restricted to the little Namaqualand, where it lives on rocky outcrops and forages on succulent plants. A number of suitable food sources were observed as such the species have a high likelihood of occurrence.

*Goggia matzikamaensis* (Matzikama Gecko) is NT on a regional scale. This species rock cracks in Succulent Karoo**.** Suitable habitat can be found in the project area, as such the species were given a high likelihood of occurrence.

*Psammophis leightoni* (Cape Sand Snake) is categorised as VU internationally and locally. Endemic to the western regions of the Western Cape, South Africa. Threatened primarily by habitat loss associated with agriculture and development of human settlements throughout its range. The likelihood of finding the species in the project area is high.

*Scelotes gronovii* (Gronovi's Dwarf Burrowing Skink) is NT on both a regional and global scale. They inhabit sparsely-vegetated coastal dunes and strandveld, chiefly at elevations below 100 m. As their ideal habitat is not found in the project area but some sandy areas still being present, this species were given a moderate likelihood of occurrence.

### 3.1.3.3 Mammals

The IUCN Red List Spatial Data lists 64 mammal species that could be expected to occur within the area (Appendix D). This list excludes large mammal species that are limited to protected areas. Eleven (11) of these expected species are regarded as threatened (Table 3-4), four of these have a low likelihood of occurrence based on the lack of suitable habitat in the project area.

***Table 3-4 Threatened mammal species that are expected to occur within proposed project area. CR=Critically Endangered, EN=Endangered, VU = Vulnerable, and NT = Near Threatened, LC=Least Concern.***

| Species | Common Name | Conservation Status | | Likelihood of Occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2021) | |
| ***Aonyx capensis*** | Cape Clawless Otter | NT | NT | **High** |
| ***Cryptochloris zyli*** | Van Zyl's Golden Mole | EN | EN | **Moderate** |

| | | | | |
|---|---|---|---|---|
| ***Eremitalpa granti*** | Grant's Golden Mole | VU | Unlisted | **Moderate** |
| ***Felis nigripes*** | Black-footed Cat | VU | VU | **High** |
| ***Graphiurus ocularis*** | Spectacular Dormouse | NT | LC | **Low** |
| ***Leptailurus serval*** | Serval | NT | LC | **High** |
| ***Mystromys albicaudatus*** | White-tailed Rat | VU | EN | **Low** |
| ***Panthera pardus*** | Leopard | VU | VU | **Low** |
| ***Parotomys littledalei*** | Littledale's Whistling Rat | NT | LC | **Low** |
| ***Pelea capreolus*** | Grey Rhebok | NT | NT | **Moderate** |
| ***Poecilogale albinucha*** | African Striped Weasel | NT | LC | **High** |

*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. The presence of a perennial river within the project area increases the likelihood of occurence, and therefore it was rated as high.

*Cryptochloris zyli* (Van Zyls Golden Mole) occurs in the coastal dune belt and adjacent sandy areas in Strandveld Succulent Karoo (Succulent Karoo biome) of the Namaqua coastal plain. It is known to occur just west of Vredendal, the project area was just outside of its known range but the likelihood of occurrence cannot be discounted as such it was rated as moderate.

*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. Given that the highest densities of this species have been recorded in the more arid Karoo region of South Africa. The habitat in the project area is regarded as suitable for the species as such the likelihood of occurrence is rated as high.

*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. The habitat surrounding the Olifants river can be regarded as suitable, as such the species has a high likelihood of occurrence.

*Pelea capreolus* (Grey Rhebok) is endemic to a small region in southern Africa, inhabiting montane and plateau grasslands of South Africa, Swaziland, and Lesotho. In South Africa, their distribution is irregular and patchy, and they no longer occur north of the Orange River in the Northern Cape, or in parts of the North-West Province (IUCN, 2017). Grey Rhebok can be found in suitable habitat which has rocky hills, grassy mountain slopes, and montane and plateau grasslands in southern Africa. They are predominantly browsers, and largely water independent, obtaining most of their water requirements from their food. In the central part of the project area, mountainous habitat can be found that could b suitable. This species were given a moderate likelihood of occurrence.

*Poecilogale albinucha* (African Striped Weasel) is usually associated with savanna habitats, although it probably has a wider habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is sufficient habitat for this

species in the project area and the likelihood of occurrence of this species is therefore considered to be high.

#### 3.1.3.4 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 167 bird species have the potential to occur in the vicinity of the project area. The full list of potential bird species is provided in Appendix E. Of the potential bird species, seven (7) species are listed as SCC either on a regional or global scale.

***Table 3-5 List of bird species of regional or global conservation importance that are expected to occur in the project area. CR=Critically Endangered, EN=Endangered, VU = Vulnerable, and NT = Near Threatened, LC=Least Concern.***

| Species | Common Name | Conservation Status | | Likelihood of occurrence |
|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2021) | |
| ***Afrotis afra*** | Korhaan, Southern Black | VU | VU | High |
| ***Anthropoides paradiseus*** | Crane, Blue | NT | VU | High |
| ***Aquila verreauxii*** | Eagle, Verreaux's | VU | LC | Observed |
| ***Circus maurus*** | Harrier, Black | EN | VU | High |
| ***Falco biarmicus*** | Falcon, Lanner | VU | LC | High |
| ***Neotis ludwigii*** | Bustard, Ludwig's | EN | EN | High |
| ***Polemaetus bellicosus*** | Eagle, Martial | EN | VU | High |

*Afrotis afra* (Southern Black Korhaan) is listed as VU on a regional and global scale (IUCN, 2017). They are endemic to the South-Western side of South Africa. Their habitat varies from non-grassy areas to the Fynbos biome, Karoo biome and the western coastline of South Africa. The main threat to them is habitat loss, in an eight year span they loss 80% of their range due to agricultural developments. Their diet consists of insects, small reptiles and plant material, including seeds and green shoots (Hockey *et al.* 2005). The habitat in the project area is highly suitable for this species thus a high likelihood of occurrence were allocated.

*Anthropoides paradiseus* (Blue Crane) is listed as NT on a regional scale and as VU on a global scale. This species has declined, largely owing to direct poisoning, power-line collisions and loss of its grassland breeding habitat owing to afforestation, mining, agriculture and development (IUCN, 2017). This species breeds in natural grass- and sedge-dominated habitats, preferring secluded grasslands at high elevations where the vegetation is thick and short. This species were observed in the general vicinity of the project area as such they have a high likelihood of occurrence.

*Aquila verreauxii* (Verreaux's Eagle) is listed as VU on a regional scale and LC on a global scale. This species is locally persecuted in southern Africa where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined (IUCN, 2017). This species were recorded in the project area.

*Circus maurus* (Black Harrier) is listed as EN on a local basis and is restricted to southern Africa, where it is mainly found in the fynbos and Karoo of the Western and Eastern Cape. It is also found in the grasslands of Free State, Lesotho and KwaZulu-Natal. Harriers breed close to coastal and upland marshes, damp sites, near vleis or streams with tall shrubs or reeds. South-facing slopes are preferred in mountain areas where temperatures are cooler,

and vegetation is taller (IUCN, 2017). During the non-breeding season, they will also be found in dry grassland areas further north and they also visit coastal river floodplains in Namibia. The likelihood of occurrence is rated as high.

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

*Neotis ludwigii* (Ludwig's Bustard) is listed as EN both locally and internationally. This species is found in the desert, grassland and shrubland specifically in rocky areas such as mountains and cliffs. The main reason for the decline in the numbers are ascribed to the collisions with powerlines. The habitat is optimal for this species as such a high likelihood of occurrence were allocated.

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

#### 3.1.3.5 Review of previous reports

In 2011, Simon Todd conducted the Fauna and Flora assessment for the associated windfarm, he found that 50 mammal species have a likelihood of occurring, of which only a limited number of species were observed including Steenbok, Grey Duiker and Gerbils. During the study one reptile SCC were observed namely the Armadillo Girdled Lizard (*Cordylus cataphractus),* a number of this species were found in the rocky outcrops. Another reptile species that were found in high abundance was the Angulate Tortoises (*Chersina angulata*). No amphibians were recorded during the study.

Natural Scientific Services compiled the Bat specialist report in 2011. Indicated in their report is the likely occurrence of nine bat species. Five of these species; Geoffroy's horseshoe bat (*Rhinolophus clivosus*), Cape horseshoe bat (*Rhinolophus capensis*), Egyptian free-tailed bat (*Tadarida aegyptiaca*), Cape serotine bat (*Neoromicia capensis*) and Egyptian slit-faced bat (*Nycteris thebaica*) were given a high likelihood of occurrence. One of the species the Cape Serotine Bat were recorded on site. They regarded the rocky areas as very important habitat due to the high likelihood of it being roosting areas.

Avisense Consulting performed the avifauna assessment for the windfarm development. This study was conducted in 2011. During their September 2010 survey, 65 species were recorded. Ludwig's Bustards (*Neotis ludwigii)* was recorded in three sightings, six raptor species were also recorded in and around the project area. They were: Verreaux's Eagle (*Aquila verreauxii),* Peregrine Falcon *(Falco peregrinus),* Lanner Falcon *(Falco biarmicus),* Booted Eagle *Aquila pennatus,* Black Harrier *(Circus maurus)* and Martial Eagle *(Polemaetus bellicosus).*

In July and October 2020 Birds and Bats Unlimited Environmental Consultants provided an updated Avifauna survey. This study surveyed the windfarm footprint as well as the footprint

of the proposed powerline. This long-term monitoring study found that nine collision prone species were recorded on site. The following table were taken from Birds and Bats Unlimited Environmental Consultants (2020), to provide an overview of the presence of the species prone to collisions.

***Table 3-6 Avifauna species prone to collisions recorded during the long term monitoring (Birds and Bats Unlimited Environmental Consultants, 2020)***

| Species | Sep 2010 | Jun 2011 | Sep 2011 | Dec 2011 | Mar 2012 | July 2016 | July 2020 |
|---|---|---|---|---|---|---|---|
| Ludwig's Bustard | X | | | | X | X | X |
| Blue Crane | | | X | X | | | X |
| Black Harrier | X | | X | X | | | X |
| Verreaux's Eagle | X | X | X | X | X | X | X |
| Booted Eagle | X | X | X | X | X | X | |
| Martial Eagle | | | | X | | | |
| Secretarybird | | | | X | | | X |
| Lanner Falcon | X | X | X | | | | X |
| Peregrine Falcon | X | | X | | | | X |
| African Harrier Hawk | | | | | | | X |
| Greater Kestrel | | | | | | | X |
| Steppe Buzzard | | | | | | | X |

## 3.2 Field Assessment

The following sections provides the results from the field survey for the proposed development that was undertaken during May 2021.

### 3.2.1 Flora Assessment

#### 3.2.1.1 Overview

A total of 78 plant species were observed during the survey (Table 3-7). Plants were recorded across 31 families, with 50% of the plants recorded, being endemic to South Africa. Plants listed as Category 1 alien or invasive species under the National Environmental Management: Biodiversity Act (NEMBA) appear in green text.The list of plant species recorded to date is by no means comprehensive, and repeated surveys during phenological periods not covered, may likely yield up to 40% additional flora species for the project area.

***Table 3-7 Trees, shrubs, and herbs recorded at the proposed project area.***

| Family | Scientific Name | Common Name | IUCN | Ecology |
|---|---|---|---|---|
| **Aizoaceae** | *Antimima compacta* | (L.Bolus) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Aizoaceae** | *Antimima klaverensis* | (L.Bolus) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Aizoaceae** | *Argyroderma fissum* | (Haw.) L.Bolus | LC | Indigenous; Endemic |
| **Aizoaceae** | *Conicosia pugioniformis* | Varkslaai | LC | Indigenous; Endemic |
| **Aizoaceae** | *Conophytum obcordellum* | (Haw.) N.E.Br. | | Indigenous; Endemic |
| **Aizoaceae** | *Galenia africana* | L. | LC | Indigenous |
| **Aizoaceae** | *Mesembryanthemum crystallinum* | Brakslaai | LC | Indigenous |
| **Aizoaceae** | *Mesembryanthemum guerichianum* | Soutslaai | LC | Indigenous |
| **Aizoaceae** | *Ruschia dichroa* | (Rolfe) L.Bolus | LC | Indigenous; Endemic |
| **Aizoaceae** | *Ruschia sp.* | | | Indigenous |
| **Aizoaceae** | *Tetragonia hirsuta* | L.f. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Tetragonia spicata* | L.f. | LC | Indigenous |
| **Amaranthaceae** | *Atriplex muelleri* | | | Not indigenous; Naturalised |
| **Amaryllidaceae** | *Crossyne flava* | (W.F.Barker ex Snijman) D.Mull.-Doblies & U.Mull.-Doblies | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Haemanthus sp* | | | Indigenous |
| **Amaryllidaceae** | *Strumaria sp* | | | Indigenous |
| **Anacardiaceae** | *Heeria argentea* | (Thunb.) Meisn. | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Searsia dissecta* | (Thunb.) Moffett | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Searsia glauca* | Blue Kuni-bush | LC | Indigenous; Endemic |
| **Apocynaceae** | *Microloma sagittatum* | (L.) R.Br. | LC | Indigenous; Endemic |
| **Apocynaceae** | *Quaqua mammillaris* | (L.) Bruyns | LC | Indigenous |
| **Asparagaceae** | *Asparagus capensis var. capensis* | L. | LC | Indigenous |
| **Asphodelaceae** | *Aloe cf glauca* | Mill. | LC | Indigenous; Endemic |

| | | | | |
|---|---|---|---|---|
| **Asphodelaceae** | *Aloe sp* | | | Indigenous |
| **Asphodelaceae** | *Bulbinella punctulata* | Zahlbr. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra adamsonii* | (Compton) Oberm. | LC | Indigenous |
| **Asphodelaceae** | *Trachyandra falcata* | (L.f.) Kunth | LC | Indigenous |
| **Asteraceae** | *Athanasia cf. trifurca* | Kallersjo | LC | Indigenous; Endemic |
| **Asteraceae** | *Berkheya fruticosa* | (L.) Ehrh. | LC | Indigenous; Endemic |
| **Asteraceae** | *Crassothonna cylindrica* | (Lam.) B.Nord. | LC | Indigenous |
| **Asteraceae** | *Euryops speciosissimus* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Euryops tenuissimus subsp. tenuissimus* | (L.) DC. | LC | Indigenous |
| **Asteraceae** | *Helichrysum moeserianum* | Thell. | LC | Indigenous; Endemic |
| **Asteraceae** | *Hymenolepis crithmifolia* | (L.) Greuter, M.V.Agab. & Wagenitz | LC | Indigenous; Endemic |
| **Asteraceae** | *Oncosiphon suffruticosum* | Stinkkruid | LC | Indigenous |
| **Asteraceae** | *Osteospermum incanum* | Grysbietou | LC | Indigenous |
| **Asteraceae** | *Osteospermum moniliferum* | Bietou | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio aloides* | Grootdikblaar | LC | Indigenous |
| **Asteraceae** | *Steirodiscus linearilobus* | DC. | CR | Indigenous; Endemic |
| **Asteraceae** | *Ursinia anthemoides* | (L.) Poir. | LC | Indigenous; Endemic |
| **Colchicaceae** | *Ornithoglossum parviflorum var. parviflorum* | B.Nord. | NE | Indigenous |
| **Crassulaceae** | *Crassula expansa* | | LC | Indigenous |
| **Crassulaceae** | *Tylecodon paniculatus* | Botterboom | LC | Indigenous |
| **Cyperaceae** | *Ficinia indica* | (Lam.) H.Pfeiff. | LC | Indigenous; Endemic |
| **Ebenaceae** | *Euclea tomentosa* | E.Mey. ex A.DC. | LC | Indigenous; Endemic |
| **Euphorbiaceae** | *Euphorbia burmannii* | Steenbokmelkbos | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia caput-medusae* | L. | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia loricata* | Lam. | LC | Indigenous; Endemic |

| | | | | |
|---|---|---|---|---|
| **Euphorbiaceae** | *Euphorbia tuberosa* | L. | LC | Indigenous; Endemic |
| **Fabaceae** | *Acacia saligna* | | | NEMBA 1b |
| **Fabaceae** | *Wiborgia* | (L.f.) Druce | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium fulgidum* | (L.) L'Her. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia punctata* | Jacq. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Massonia depressa* | Houtt. | LC | Indigenous; Endemic |
| **Hypoxidaceae** | *Empodium namaquensis* | (Baker) M.F.Thomps. | LC | Indigenous; Endemic |
| **Iridaceae** | *Ferraria ferrariola* | (Jacq.) Willd. | LC | Indigenous; Endemic |
| **Malvaceae** | *Malva parviflora* | L. | NE | Not indigenous; Naturalised; Invasive |
| **Montiniaceae** | *Montinia caryophyllacea* | Thunb. | LC | Indigenous |
| **Moraceae** | *Ficus cordata subsp. cordata* | Thunb. | LC | Indigenous |
| **Orchidaceae** | *Holothrix aspera* | (Lindl.) Rchb.f. | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis ambigua* | Jacq. | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis flava* | L. | LC | Indigenous; Endemic |
| **Poaceae** | *Avena fatua* | Common Wild Oats | | Naturalized exotic |
| **Poaceae** | *Bromus diandrus* | Langnaaldbromus | | Naturalized exotic |
| **Poaceae** | *Bromus diandrus* | Roth | NE | Not indigenous; Naturalised; Invasive |
| **Poaceae** | *Bromus pectinatus* | Japanese Brome | LC | Indigenous |
| **Poaceae** | *Cynodon dactylon* | Couch Quick | LC | Indigenous |
| **Poaceae** | *Ehrharta calycina* | Polgras | LC | Indigenous |
| **Poaceae** | *Ehrharta villosa* | Pipe Grass | LC | Indigenous; Endemic |
| **Poaceae** | *Vulpia bromoides* | (L.) Gray | NE | Not indigenous; Naturalised; Invasive |
| **Polygalaceae** | *Muraltia spinosa* | | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica oleifolia* | Vent. | LC | Indigenous; Endemic |
| **Rutaceae** | *Agathosma capensis* | (L.) Dummer | LC | Indigenous |

| | | | | |
|---|---|---|---|---|
| **Sapindaceae** | *Dodonaea viscosa var. angustifolia* | Jacq. | LC | Indigenous |
| **Thymelaeaceae** | *Struthiola leptantha* | Bolus | LC | Indigenous; Endemic |
| **Typhaceae** | *Typha capensis* | (Rohrb.) N.E.Br. | LC | Indigenous |
| **Zygophyllaceae** | *Roepera cordifolia* | (L.f.) Beier & Thulin | | Indigenous |
| **Zygophyllaceae** | *Roepera foetida* | (Schrad. & J.C.Wendl.) Beier & Thulin | | Indigenous |

#### 3.2.1.2 Alien and/or invasive plant species

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.

The National Environmental Management: Biodiversity Act (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 National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). 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 alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), 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 National Environmental Management: Biodiversity Act (Act 10 of 2004) (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 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 Act;
    - The relevant invasive species management programme developed in terms of regulation 4; and

- Any directive issued in terms of section 73(3) of the Act.

One (1) NEMBA IAP species was recorded within the assessment area. These species are listed under the Alien and Invasive Species List 2016, Government Gazette No. 40166 as Category 1b. These IAP species must be controlled by implementing an Invasive Alien Plant Management Programme in compliance of section 75 of the Act as stated above.

#### 3.2.1.3 Species of Concervation Concern

##### 3.2.1.3.1 Red data plants

In 2011, Simon Todd conducted the Fauna and Flora assessment for the associated windfarm and in the Quartzide substrate a species of conservation concern *Pelargonium crassipes* was found, of this Endangered species, hundreds of specimens were recorded. The Leipoldtville Sandy Fynbos found in the southern portion of their project area, had a high level of endemic species including two SCCs *Muraltia obovata* and *Ischyrolepis duthieae* (*Restio duthieae* (new name)), both of which are classified as Vulnerable. Although none of these species were recorded during the field assessment, they are expected to occur in the area due to the intact state of these habitats still, and have thus been considered in the overall habitat sensitivity.

*Steirodiscus linearilobus* which is CR, is a very rare and localized species, known historically from five locations, but is thought of remaining at only one due to habitat loss to agricultural expansion. The population consists of less than 200 plants within an area of about one hectare. An observation of the species was made last in September 2015, as observable on iNaturalist. This unique habitat is associated with a stretch of the proposed project area; Klawer Sandy Shrubland which was confirmed intact and has great potential in supporting this species. During the field assessment (May 2021), no induvial could be confirmed as the correct time to identify this species is in August/September as they only flower and exist (annual plant) during that time. Thus based on the intact condition of the habitat, the likelihood of occurrence is high and is considered present unless unconfirmed in the correct season.

#### 3.2.1.4 Critical Habitat Assessment for Flora

Performance Standard 6 (PS6; IFC 2019) and the associated Guidance Note 6 (GN6; IFC 2019) focuses on the protection and conservation of biodiversity. In most cases, the required conservation outcome under PS6 is no-net-loss of biodiversity value achieved using the “like-for-like” or better principle of biodiversity offsets. However, when a project occurs in critical habitat (CH) supporting exceptional biodiversity value, a net gain in biodiversity value is required.

CH identification is required by PS6 to manage risks and avoid, mitigate and offset impacts to areas with high biodiversity value including: 1) habitat of significant importance to Critically Endangered (CR) and/or Endangered (EN) species; 2) habitat of significant importance to endemic and/or restricted-range species; 3) habitat supporting significant global concentrations of migratory species and/or congregator species; 4) highly threatened and/or unique ecosystems; and/or 5) areas associated with key evolutionary processes. CH exists independent of a project and can be identified without reference to a project; a project may be proposed in CH, but the CH is present under baseline conditions and is not defined by the size of the project footprint, or other project effects. CH should be determined on a case-by-case basis according to the concepts of irreplaceability and vulnerability. The CH assessment for

vegetation is shown in Table 3-8. Based on this, CH was identified for this component of the project.

***Table 3-8 Critical habitat assessment of flora.***

| Criterion | Description | Flora |
|---|---|---|
| **1** | The occurrence of critically endangered or endangered species. | Tier 1 critical habitat is considered as *Steirodiscus linearilobus* and *Pelargonium crassipes* is expected to occur in the Klawer Sandy Shrubland (Rocky) and Rocky habitats. |
| **2** | Habitat types sustain any endemic species with >95% or ≥1% but <95% of its global population restricted to this habitat. And/or, taxa are restricted-range species with an extent of occurrence of 50,000km² or less. | A large part of the of the floral taxa in the project area are endemic to SA and some endemic to the Cape floral Kingdom. |
| **3** | Migratory or congregator species are present on the site, with abundance values exceeding 1% of the global population size. | N/A |
| **4** | This criterion has relevance to highly threatened or unique ecosystems containing unique assemblages of species, including concentrations of biome-restricted species. | The proposed development is unlikely to remove a significant portion of this habitat directly, it is the direct impact that the roads associated with the construction and operation that may have on this habitat. |
| **5** | This criterion has relevance to areas associated with key evolutionary processes (i.e. important landscape level features, which allow for key evolutionary processes to take place). | Perennial river habitat is considered under Criterion 5, but no key evolutionary processes were identified. |

### 3.2.2 Faunal Assessment

#### 3.2.2.1 Avifauna

During the survey, a combination of point counts (n=20) and incidental observations yielded a total of 60 species within the project area. The full list of species observed is shown in Appendix F. Overall a moderate to high density small to medium sized birds can be found in the project area mainly comprised of seed and insect eating species. Raptors detected on site were Verreaux's Eagle (*Aquila verreauxii*) (n=1) and Rock Kestrel (*Falco rupicolus*) (n=2). Analysis of the major avifaunal trophic guilds (González-Salazar *et al.,* 2014 (Figure 3-10) reveals that the species composition is dominated by omnivores (OMD), insectivores (IGD) and granivores (GGD). Lower than expected water birds were observed (CWD, HWD and IWD), especially with the project area overlapping with the Olifants river. The reason for these lower number could possibly be because of the time of the survey, with the water levels being low, species might have moved to other areas.

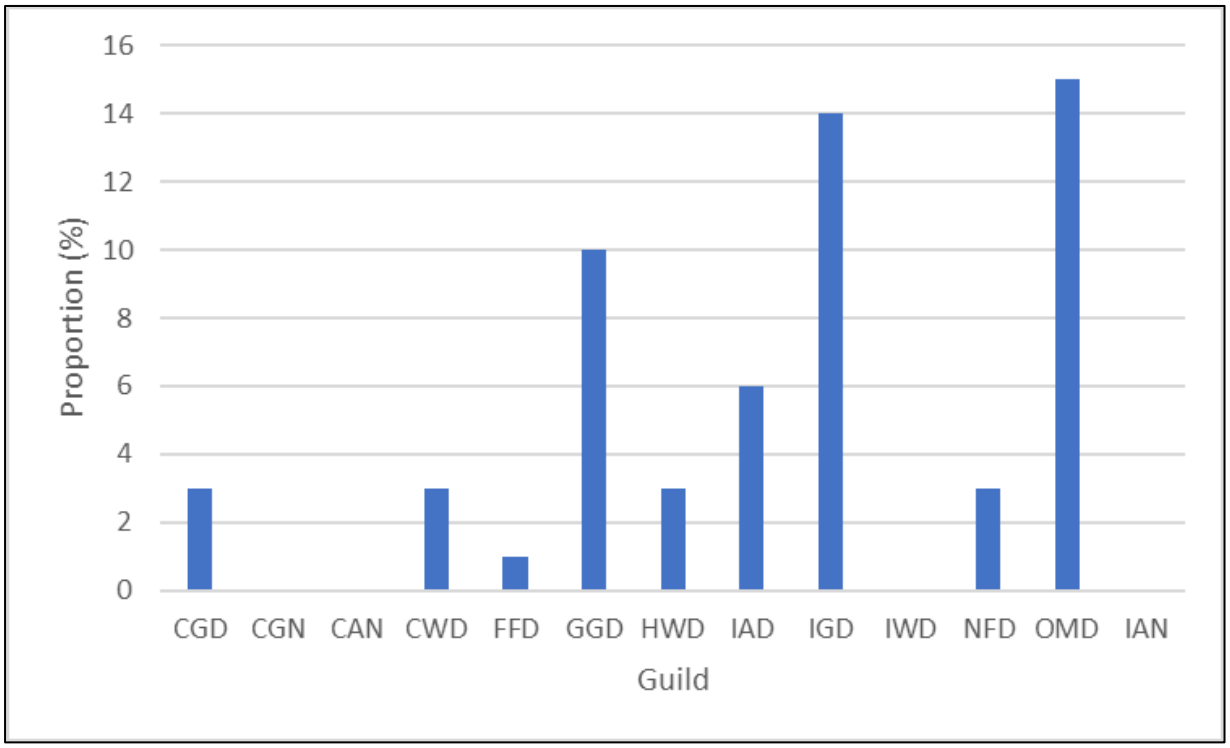


***Figure 3-10 Avifaunal trophic guilds. CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal, CAN, carnivore air nocturnal, CWD, carnivore water diurnal; FFD, frugivore foliage diurnal; GCD, granivore ground diurnal; HWD, herbivore water diurnal; IAD, insectivore air diurnal; IGD, insectivore ground diurnal; IWD, insectivore water diurnal; NFD, nectivore foliage diurnal; OMD, omnivore multiple diurnal; IAN, Insectivore air nocturnal.***

Table 3-9 provides a list of the dominant species for the project area together with the frequency with which each species appeared in the point count samples. The frequency with which a species was recorded provides an overview of the spread of the species in the project area. Twelve (12) species were recorded in more than one habitat. Species with a high frequency includes: African, Red-eyed Bulbul, Karoo Scrub Robin, Spotted flycatcher, Karoo Prinia and Cape Bunting. Photographs of some of the bird species observed during the field survey can be seen in Figure 3-11.

*Table 3-9* ***Dominant avifaunal species within the project area shown alongside the frequency with which a species was detected among point counts.***

| Species | Common Name | Relative abundance | Frequency (%) |
|---|---|---|---|
| ***Onychognathus morio*** | Starling, Red-winged | 0,317 | 10,53 |
| ***Pternistis capensis*** | Spurfowl, Cape | 0,317 | 10,53 |
| ***Pycnonotus nigricans*** | Bulbul, African Red-eyed | 0,300 | 47,37 |
| ***Spreo bicolor*** | Starling, Pied | 0,250 | 10,53 |
| ***Cercotrichas coryphoeus*** | Scrub-robin, Karoo | 0,233 | 47,37 |
| ***Estrilda astrild*** | Waxbill, Common | 0,167 | 15,79 |
| ***Cinnyris fuscus*** | Sunbird, Dusky | 0,150 | 15,79 |
| ***Emberiza capensis*** | Bunting, Cape | 0,117 | 21,05 |
| ***Muscicapa striata*** | Flycatcher, Spotted | 0,117 | 26,32 |
| ***Streptopelia senegalensis*** | Dove, Laughing | 0,117 | 15,79 |

*Figure 3-11* ***Rock Kestrel (Falco rupicolus) and Cape Bunting (Emberiza capensis) observed in the project area.***

### 3.2.2.1.1 Species of Conservation Concern

One species of conservation concern were observed in the project area (Figure 3-12). The Verreaux's Eagle is listed as VU on a regional scale. One adult was observed soaring in the area of the Klawer power station. The cliffs found just on the opposite side of the N4 is regarded as a highly suitable nesting sites. This eagle is territorial and therefore the development of additional powerlines especially in rocky areas where their primary food source Rock Hyraxes occur is of great concern. Studies amongst which Birdlife (2017) has shown that the Verreauxs Eagle is sensitive to both collisions and electrocutions.

***Figure 3-12 Verreaux Eagle observed in the project area.***

### 3.2.2.1.2 Species with a Collision and Electrocution Risk

Birds prone to collisions can be divided into five categories; 1) large species with high body weight ratio to wing span resulting in low manoeuvrability, 2) species that are distracted in flight this include predatory birds and smaller species with areal displays, 3) species flying at high speeds, 4) crepuscular species that are active in low light conditions, and 5) species with limited narrow forward vision (Jenkins *et al.,* 2010; Noguera *et al.,* 2010). Species that tend to fly in flocks also may be influenced more by collisions as the birds flying in the rear will not be able to detect the powerlines.

Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires or earthed devices are simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties. Winds parallel or diagonal to cross-arms are the most detrimental, due to exacerbating the difficulty in manoeuvrability during landing or take-off.

Eight of the species observed are at risk for collisions, electrocutions or habitat loss (Table 3-10). This list is per the guidelines provided by EWT (2017). Some of the bird species commonly impacted by powerlines are shown in Appendix G.

***Table 3-10 Species observed in the study at risk for collisions, electrocutions and habitat loss.***

| Species | Common Name | Conservation Status | | Risk posed by | | |
|---|---|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) | Collisions | Electrocutions | Habitat loss/disturbance |
| ***Alopochen aegyptiacus*** | Goose, Egyptian | Unlisted | LC | X | X | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Anhinga rufa*** | Darter, African | Unlisted | LC | | | |
| ***Aquila verreauxii*** | Eagle, Verreaux's | VU | LC | X | X | X |
| ***Corvus albus*** | Crow, Pied | Unlisted | LC | | X | |
| ***Falco rupicolus*** | Kestrel, Rock | Unlisted | LC | X | X | X |
| ***Phalacrocorax africanus*** | Cormorant, Reed | Unlisted | LC | X | X | |
| ***Plectropterus gambensis*** | Goose, Spur-winged | Unlisted | LC | X | X | |
| ***Threskiornis aethiopicus*** | Ibis, African Sacred | Unlisted | LC | | X | |

### 3.2.2.1.3 Fine Scale Habitat Use

Fine-scale habitats within the landscape are important in supporting a diverse avifauna community as they provide differing nesting, foraging and reproductive opportunities. The assessment area overlaps with four avifaunal fine-scale habitats, namely Riparian (Ephemeral and perennial rivers as well as wetlands), Karoo Shrubland and Transformed. Rocky areas were not separated from the Karoo Shrubland habitats as these smaller areas would not support a different avifauna assemblage.

The Karoo Shrubland makes up majority of the project area, this habitat is dominated by shrubs and forbs that are at a maximum 1 m high. This habitat type supported a large number of insectivorous and granivorous ground dwelling species such as Red-capped Lark (*Calandrella cinerea*), Karoo Scrub Robin (*Cercotrichas coryphoeus*), Zitting Cisticola (*Cisticola juncidis*), Cape Bunting (*Emberiza capensis*), Cape Clapper Lark (*Mirafra apiata*). The priority species, Verreaux Eagle was found in this habitat type, this is also the habitat in which a number of Rock Hyraxes, its main pray species, were observed.

In the drainage feature habitat consisted of the Olifants river, dry drainage lines and a wetland areas. Species that were found here included: Egyptian Goose (*Alopochen aegyptiacus*), Red Knobbed Coot (*Fulica cristata*), Reed Cormorant (*Phalacrocorax africanus*), Southern Red Bishop (*Euplectes orix*), White Faced Whistling Duck (*Dendrocygna viduata*) and African Darter (*Anhinga rufa*). Brown-Throated Martins (*Riparia paludicola*) and Rock Martins (*Hirundo fuligula*) were seen flying above the Olifant river on all three days of the survey. This habitat play an important role in the ecosystem as a water source as well as a corridor along which species will move.

The transformed areas consisted of the a borrow pit area, areas transformed by a water canal, agricultural areas and areas associated with the railway track. Although these areas are disturbed, they do still support some generalist avifauna species. One the existing powerline two Pied Crow nests were observed (*Corvus albus*). Flying over the area of the borrow pit were a number of Brown Throated Martins (*Riparia paludicola*). The densities of common species such as Cape Turtle Doves (*Streptopelia capicola*) and Laughing Doves (*Streptopelia senegalensis*) in this area were high, this increases the likelihood of raptor species being found here.

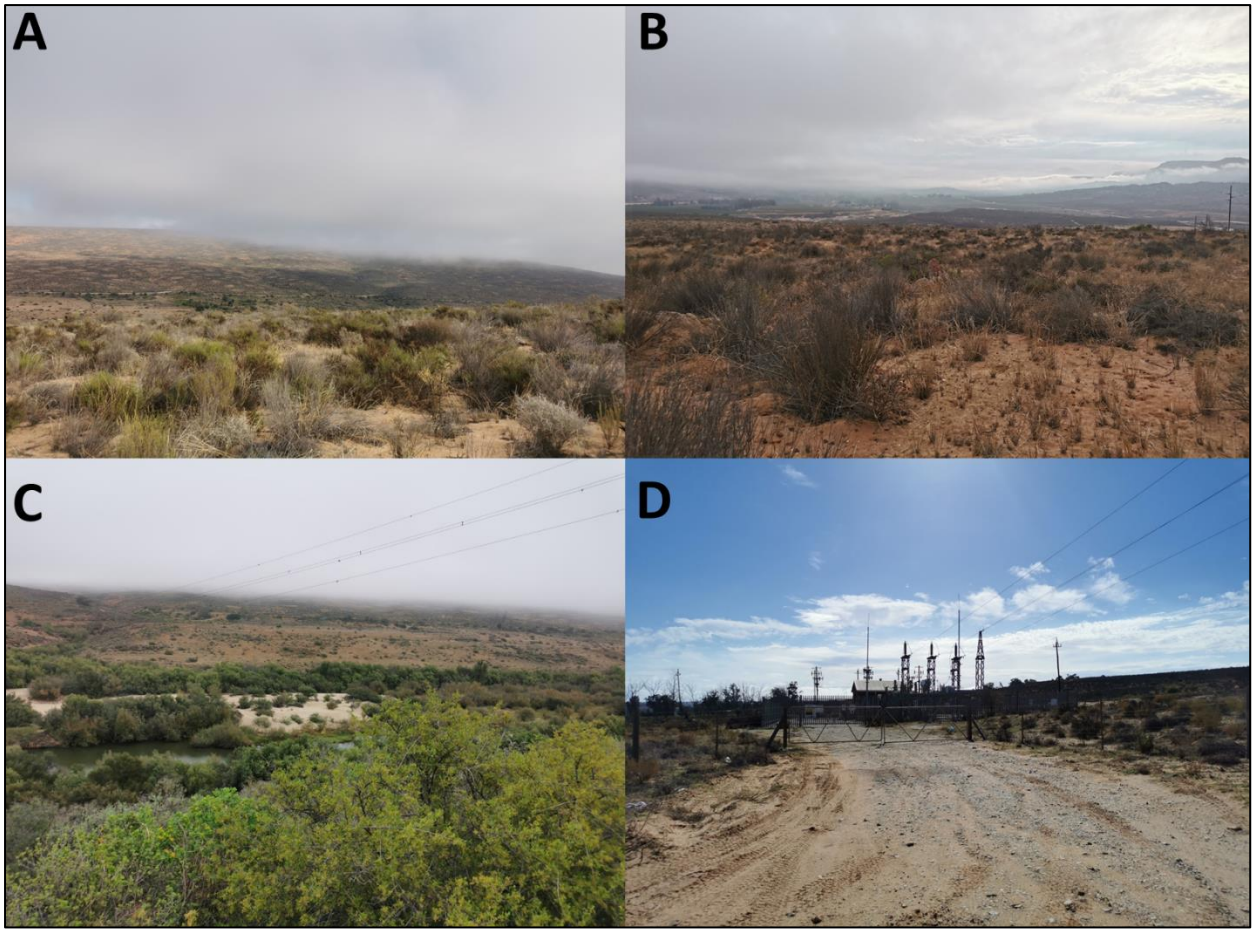


***Figure 3-13 Examples of the four avifaunal habitats identified in the project area: A & B) Shrubland Karoo, C) Drainage features, Rivers and Riparian areas, and D) Transformed Habitat***

### 3.2.2.1.4 Critical Habitat Assessment for Avifauna

The critical habitat assessment for avifauna is shown in Table 3-11. The Karoo Shrubland and Drainage feature habitats are important for avifauna. Results of the avifaunal survey highlight the Riparian habitat as supporting a unique assemblage of avifauna. Additionally, the habitat provides an important movement corridor for the region's birdlife. The Shrubland habitat with the ridges also support diverse assemblages of species including the Verreaux Eagle.

***Table 3-11 Critical habitat assessment of avifauna***

| Criterion | Description | Avifauna |
|---|---|---|
| 1 | The occurrence of critically endangered or endangered species. | No IUCN listed critically endangered or endangered species were observed within the project area in this assessment. However, based on previous studies the Ludwigs Bustard (EN), Martial Eagle (EN) and Black Harrier (EN) have been recorded in the area.<br>One VU avifauna species Verreaux Eagle (*Aquila verreauxii*) was recorded in the project area during this assessment. |
| 2 | Habitat types sustain any endemic species with >95% or ≥1% but <95% of its global population restricted to this habitat. And/or, taxa are restricted-range species with an extent of occurrence of 50,000km² or less. | One biome restricted bird species (Karoo Lark, *Calendulauda albescens*) were observed within the project area that has an extent of occurrence of 50,000km² or less. It could however not be said to occupy significant proportion of their global population. |

| | | |
|---|---|---|
| **3** | Congregatory species present on the site, with abundance values exceeding 1% of the global population size. | No globally significant congregations of local or migratory waterfowl were observed within the project area. |
| **4** | This criterion has relevance to highly threatened or unique ecosystems containing unique assemblages of species, including concentrations of biome-restricted species. | Results of the avifaunal survey highlight the Riparian habitat as supporting a unique assemblage of avifauna. Additionally, the habitat provides an important movement corridor for the region's birdlife. The Shrubland habitat with the ridges also support diverse assemblages of species including the Verreaux Eagle. |
| **5** | This criterion has relevance to areas associated with key evolutionary processes (i.e. important landscape level features, which allow for key evolutionary processes to take place). | The project area does not support landscape features which could be considered important in driving avifaunal speciation. The ridges in the project area are not large enough to be geographical barrier for avifauna species. |

### 3.2.2.2 Amphibians and Reptiles

Relatively few species of herpetofauna were recorded within the assessment area, with eight of the 69 expected species observed during the survey period (Table 3-12; Figure 3-14). The species recorded comprised of two (2) amphibian and six (6) reptile species, respectively. The relatively low richness of amphibians was likely due to the lack of recent precipitation, while the low number of reptiles was as a result of the seasonality of the survey.

***Table 3-12 Herpetofauna species recorded within the assessment area associated with the project area***

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| | | **Reptiles** | |
| ***Chersina angulata*** | Angulate Tortoise | Protected species by the Nature Conservation Ordinance No. 19 of 1974 (as amended in 2000), CITES Appendix II | LC |
| ***Gerrhosaurus typicus*** | Karoo plated lizard | Unlisted | Unlisted |
| ***Pedioplanis lineoocellata pulchella*** | Common sand lizard | LC | LC |
| ***Psammophis crucifer*** | Cross-marked Grass Snake | LC | LC |
| ***Trachylepis variegata*** | Variegated Skink | LC | Unlisted |
| ***Cordylus cordylus*** | Cape Girdles Lizard | CITES Appendix II | LC |
| | | **Amphibians** | |
| ***Strongylopus grayii*** | Clicking Stream Frog | LC | LC |
| ***Sclerophrys capensis*** | Raucous Toad | LC | LC |


***Figure 3-14 Photographs illustrating a portion of the herpetofauna observed within the assessment area; A) Cape Girdled Lizard (Cordylus cordylus), B) Angulate Tortoise (Chersina angulata), C) Raucous Toad (Sclerophrys capensis), D and F) Cross-marked Grass Snake (Psammophis crucifer), E) Common Sand Lizard (Pedioplanis lineoocellata pulchella)***

### 3.2.2.2.1 Herpetofauna Habitat Associations

The section below describes herpetofauna habitat associations within the assessment area.

**Karoo Shrubland**

This habitat was made up of small shrubs with some open patches of sandy areas. The shrubs provide coverage for both protection from predators and allows for successful camouflage for species such as the Cross-marked Grass snake (*Psammophis crucifer*). This predator mainly feed on smaller lizards and could feed on species such as the Common Sand Lizard

(*Pedioplanis lineoocellata pulchella*). A high number of the Common Sand Lizard were observed in the sandier areas where small scattered rocks were present to allow this species to evade predation. This species perform an important role in the ecosystem by controlling insects, especially in an area where insects, if not naturally managed, can lead to the death of a large number of flora species. Some termite mounds were observed in this habitat type, they are regarded as important ecological features. Apart from maintaining soil processes, termites provide a food source for an array of herpetofauna species and the mounds provide a stable micro-habitat (Duleba & Ferreira, 2014).

**Rocky outcrops**

These rocky outcrops were scatted in the karoo Shrubland, with it forming ridges in some areas stretching about 1 km. These rocky areas processed a number of grasses, annuals and succulent plants, which is the food source of the protected Angulate Tortoise (*Chersina angulata*). This species was regarded as common in these areas and the surrounding Shrublands. It is listed as a CITES Appendix II species as a result of the pet trade, furthermore it is classified as a protected species by the Nature Conservation Ordinance No. 19 of 1974 (as amended in 2000) and it may not be collected, transported, or possessed in, or imported into or exported from, the Western Cape Province without special permission in the form of a permit from the relevant conservation authorities (SANBI, 2021). Also found in this habitat were the Cape Girdles Lizards (*Cordylus cordylus*) (CITES Appendix II), this species evade predators by wedging themselves firmly in rock cracks. Three individuals of this species were noted. The rocky outcrop habitat type was regarded as possessing high sensitivity due to its physiognomy. This is because the consolidated material provided cavities for herpetofauna, and concomitantly, suitably sized boulders permitted a higher soil moisture content allowing for a greater abundance of invertebrate prey species than the surrounding shrubland. These rocky outcrops are deemed to be highly sensitive as they represent suitable habitat for several listed reptile species expected to occur.

**Drainage features, Rivers and Riparian areas**

This habitat consisted of the Olifants river, dried river beds and wetland. Included in this habitat is the vegetation found on the edges of the river and wetland. This habitat supported both amphibian species recorded in the assessment; Clicking Stream Frog (*Strongylopus grayii*) and Raucous Toad (*Sclerophrys capensis*). In an area where the average annual precipitation is 269 mm (Climate-data, 2021) this habitat would be essential for amphibians. The moist habitat would prevent desiccation of the species and also play a crucial role in their lifecycle with their larval stages requiring water.

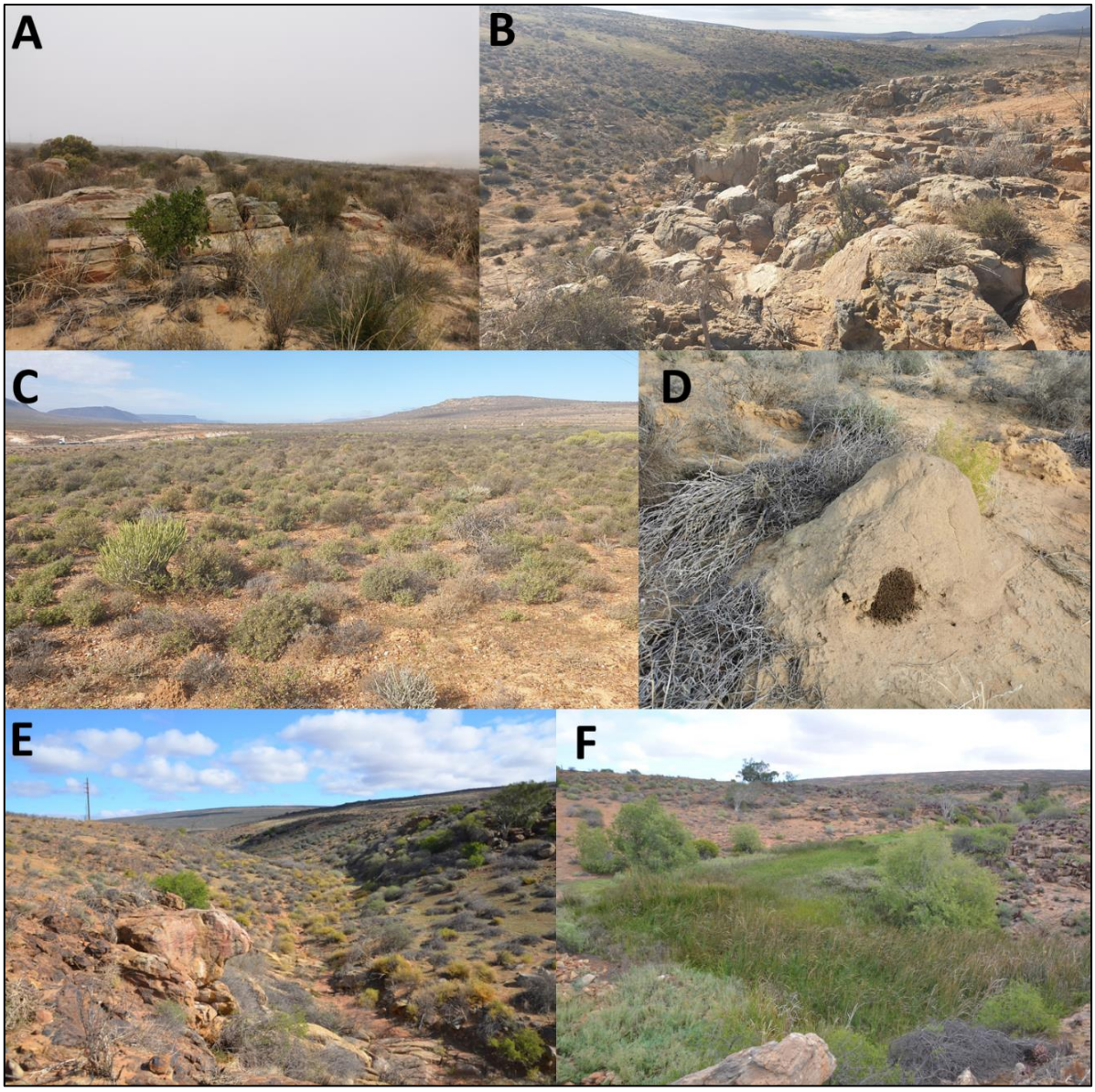


***Figure 3-15 Examples of the herpetofauna habitats and habitat features identified in the project area: A and B) Rocky outcrops, C) Karoo Shrubland, D) Termite mount found in the Shrubland habitat, and E & F) Dried riverbed and wetland habitat.***

### 3.2.2.2.2 Critical Habitat Assessment for Herpetofauna

The critical habitat assessment for herpetofauna is shown in Table 3-13 below. Based on these criteria, no critical habitat was identified for the herpetofauna component of the project.

***Table 3-13 Critical habitat assessment of herpetofauna for the Klawer powerline project***

| Criterion | Description | Herpetofauna |
|---|---|---|
| 1 | The occurrence of critically endangered or endangered species. | No IUCN listed critically endangered or endangered species were observed. |
| 2 | Habitat types sustain any endemic species with >95% or ≥1% but <95% of its global population restricted to this habitat. And/or, taxa are restricted-range species with an extent of occurrence of 50 000km² or less. | Three of the species found were restricted range species. Cape Girdled Lizard (*Cordylus cordylus*), Angulate Tortoise (*Chersina angulata*) and Karroo Plated Lizard (*Gerrhosaurus typicus*). |

| | | |
|---|---|---|
| 3 | Migratory or congregatory species are present on the site, with abundance values exceeding 1% of the global population size. | None of the herpetofauna taxa are believed to have abundance values in the project area that exceed 1% of their global population size and/ or exceeds 1% of the global population size within a definitive project area. Furthermore, there are no terrestrial migratory herpetofauna in this region and the only congregatory herpetofauna are amphibians which congregate in aquatic habitats to breed. However, these congregations are localized and are not likely to be impacted by the proposed activities. No specific congregation of a single herpetofauna species is known to occur within the project area that would fulfil this criterion. |
| 4 | This criterion has relevance to highly threatened or unique ecosystems containing unique assemblages of species, including concentrations of biome-restricted species. | None of the habitat types supported assemblages of species that are considered to be unique. |
| 5 | This criterion has relevance to areas associated with key evolutionary processes (i.e. important landscape level features, which allow for key evolutionary processes to take place). | In general, large rivers are usually associated with key evolutionary processes as they often divide landscapes and therefore promote speciation by preventing gene flow across the river. However, no herpetofauna populations are divided by the river or has this river created a particular habitat exploited by only a single range restricted species. |

### 3.2.2.3 Mammals

A total of thirteen (13) mammal species were either directly observed or deduced to be present in the project area based on visual cues (tracks, scat etc.) during the surveys (Table 3-14). This represents 20.03% of the 64 species expected (Appendix D). As the survey was conducted over a short time frame, it is believed that should a longer study be performed, more species would be identified.

A selection of photographs of mammal species observed during the survey are provided in Figure 3-16, while the full list of species recorded are listed in Table 3-14.

***Table 3-14 Mammal species observed, or deduced to be present in the project area based on visual signs (tracks, scats etc.) within the proposed project area during the survey.***

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Atilax paludinosus*** | Water Mongoose | LC | LC |
| ***Canis mesomelas*** | Black-backed Jackal | LC | LC |
| ***Cynictis penicillata*** | Yellow Mongoose | LC | LC |
| ***Felis silvestris*** | African Wildcat | LC | LC |
| ***Gerbil sp.*** | | | |
| ***Rattus rattus*** | House Rat | Exotic (Not listed) | LC |
| ***Hystrix africaeaustralis*** | Cape Porcupine | LC | LC |
| ***Lepus capensis*** | Cape Hare | LC | LC |
| ***Otocyon megalotis*** | Bat-eared Fox | LC | LC |
| ***Parahyaena brunnea*** | Brown Hyaena | NT | NT |
| ***Procavia capensis*** | Rock Hyrax | LC | LC |
| ***Raphicerus campestris*** | Steenbok | LC | LC |
| ***Sylvicapra grimmia*** | Common Duiker | LC | LC |


***Figure 3-16 A selection of mammal species observed within the proposed project area: A) Cape Porcupine (Hystrix africaeaustralis) quill, B) Bat-eared Fox (Otocyon megalotis), C) Rock Hyrax (Procavia capensis), D) Brown Hyaena (Parahyaena brunnea) den, E) Steenbok (Raphicerus campestris) remains F) Common Duiker (Sylvicapra grimmia) tracks.***

### 3.2.2.3.1 Species of Conservation Concern

A den of a Brown Hyena was in the centre of the powerline along the rocky areas, it was unclear if the den was active or not. Therefore, the powerline construction must be approached with care. This South African endemic species is classified as NT both locally and internationally. The distribution of the Brown Hyena is mostly outside of this region, however EWT has shown some recordings in the general vicinity pre-2000; iNaturalist (2021) have recorded some in the area and on the GBIF (2021) some scattered records have been

recorded in the area. Based on the location of the den it is unlikely that the hyena would be one that escaped from a nearby reserve based on the proximity to the closes game reserve and is more likely to be one that are free-roaming. The property was used as a sheep farm but has recently been sold. It is unclear what the new owner will be cultivating or farming. A number of cage traps were seen on the same property, it is assumed it was placed there by the previous owner for the capturing of caracal and Brown Hyena (Figure 3-17). The Brown Hyena is a scavenger that play a crucial role in the ecosystem by cleaning up carrion. This service prevents the spread of disease.


***Figure 3-17 A, B and C) Bones scattered outside of the Brown Hyena den, and D) Cage trap recorded on site.***

### 3.2.2.3.2 Species Habitat Association

Three mammal habitats were identified in the project area. They were Karoo Shrubland, Drainage features, Rivers and Riparian areas and Transformed.

**Karroo Shrubland**

This habitat were made up of open Shrublands with areas of rocky outcrops and sandveld patches. The species that would be found here would utilise a combination of these habitat features and could forage in the one and nest in the other. All the mammal species were observed in this habitat with the exception of the Water Mongoose. A large number of gerbil holes were observed in the sandveld, with areas where they were opened most likely by Black-backed Jackal attempting to prey on them. The density of the Cape Porcupine (*Hystrix africaeaustralis*) was high especially in the central part of the powerline. The mostly natural state of this habitat increases its importance in supporting several mammal species. Some of the impacts noted here were road killings, cage traps, and persecution. Both a Bat-eared Fox (*Otocyon megalotis*) and a Steenbok (*Raphicerus campestris*) found dead adjacent to roads.

**Drainage features, Rivers and Riparian areas**

This habitat is important as a source of food and refugia, several species also utilise the area as a movement corridor. The arid nature of the region emphasizes the role the habitat due to the source of water, as well as a diversity of flora and fauna creates an ecosystem that is vital for the lifecycle of al the organisms present.

The perennial river habitat supports the Water Mongoose (*Atilax paludinosus*) and has a high likelihood of supporting the expected *Aonyx capensis* (Cape Clawless Otter).

**Transformed**

Mammals are greatly impacted by degradation of their habitats. The disturbed nature of these areas and their associated risks i.e. hunting, vehicles, poison etc is only likely to support invasive and pest species. Fauna that may occur within the modified habitats are regarded as incidental or opportunistic due to the animal moving through the area to more natural areas or the congregation or attraction due to an anthropogenic source of food or refugia.

One species House Rat (*Rattus rattus)* were observed in this area, this pest species can easily adapt to areas of disturbance.

### 3.2.2.3.3 Critical Habitat Assessment for Mammals

The critical habitat assessment for mammals is shown in Table 3-15. Based on this, no CH were identified for mammals on site.

***Table 3-15 Critical habitat assessment of mammals***

| Criterion | Description | Mammals |
|---|---|---|
| 1 | The occurrence of critically endangered or endangered species. | No CR or EN mammal species were recorded to be present in the project area.<br>The Van Jyl's Golden Mole (*Cryptochloris zyli*) (EN) has a moderate chance of occurring in the project area. |
| 2 | Habitat types sustain any endemic species with >95% or ≥1% but <95% of its global population restricted to this habitat. And/or, taxa are restricted-range species with an extent of occurrence of 50,000km² or less. | No endemic / range restricted mammal species were recorded in the project area.<br>The Brown Hyena (VU) is a Southern African Endemic, but their home range does not adhere to the restrictions provided. |
| 3 | Migratory or congregator species are present on the site, with abundance values exceeding 1% of the global population size. | There are no migratory mammal species that occur in the area that would fulfil the quantitative threshold for Critical Habitat under Criterion 3. |
| 4 | This criterion has relevance to highly threatened or unique ecosystems containing unique assemblages of species, including concentrations of biome-restricted species. | No habitat specialists or biome restricted species were observed in the project area. The ecosystem is unique with reference to flora but this does not influence the assemblage of mammal species recorded. |
| 5 | This criterion has relevance to areas associated with key evolutionary processes (i.e. important landscape level features, which allow for key evolutionary processes to take place). | Whilst the river system separate habitat features and ecosystems, no mammal populations are divided by the river system and this river has not created a particular habitat exploited by only a single range restricted species. |

# 4 Habitats and Site Ecological Importance

### 4.1.1.1 Habitats

Six main preliminary habitat types were delineated for the project footprint. These habitats are shown in Figure 4-1 and Figure 4-2, and are briefly discussed below.

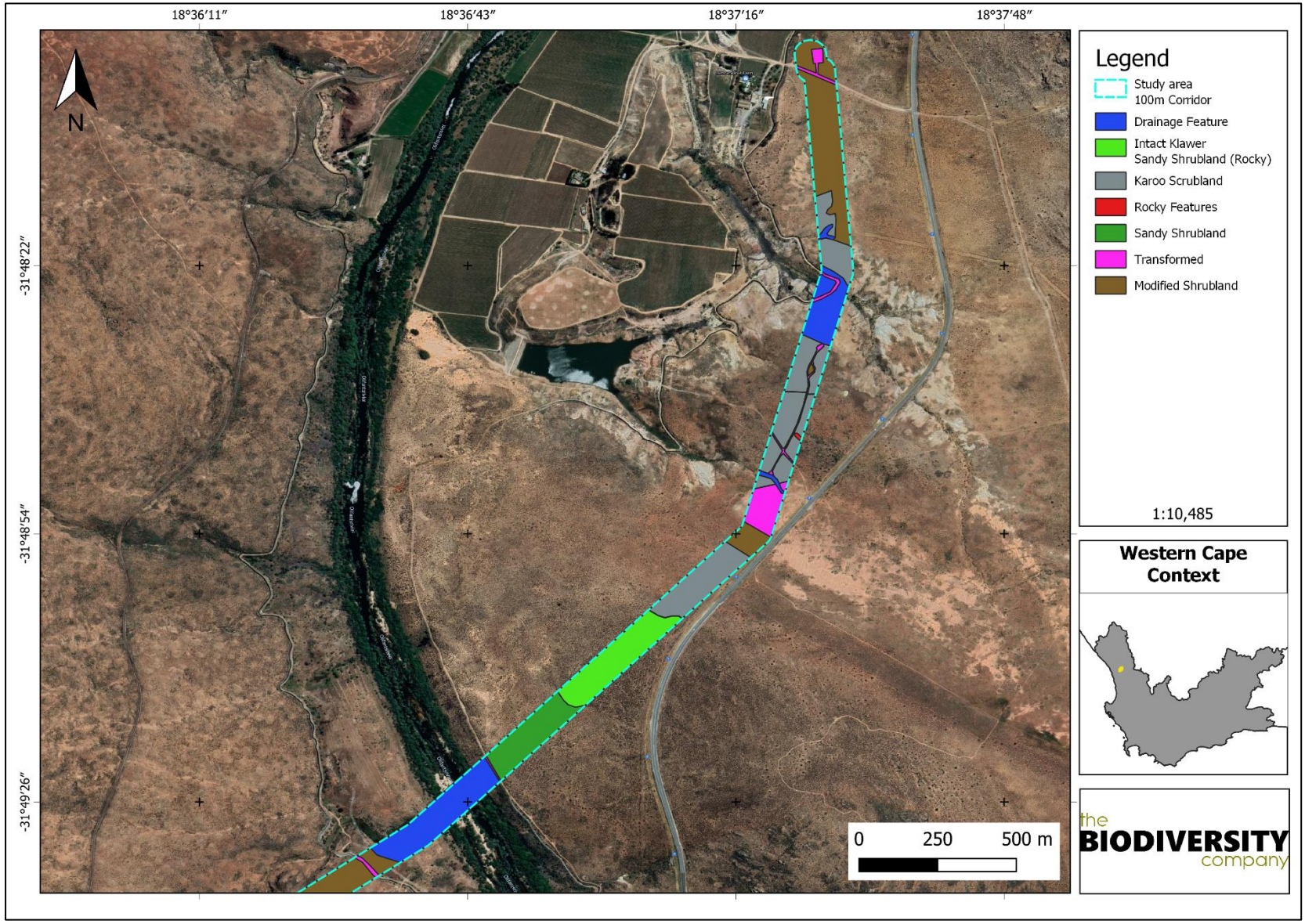


***Figure 4-1 Habitats delineated for the project area.***

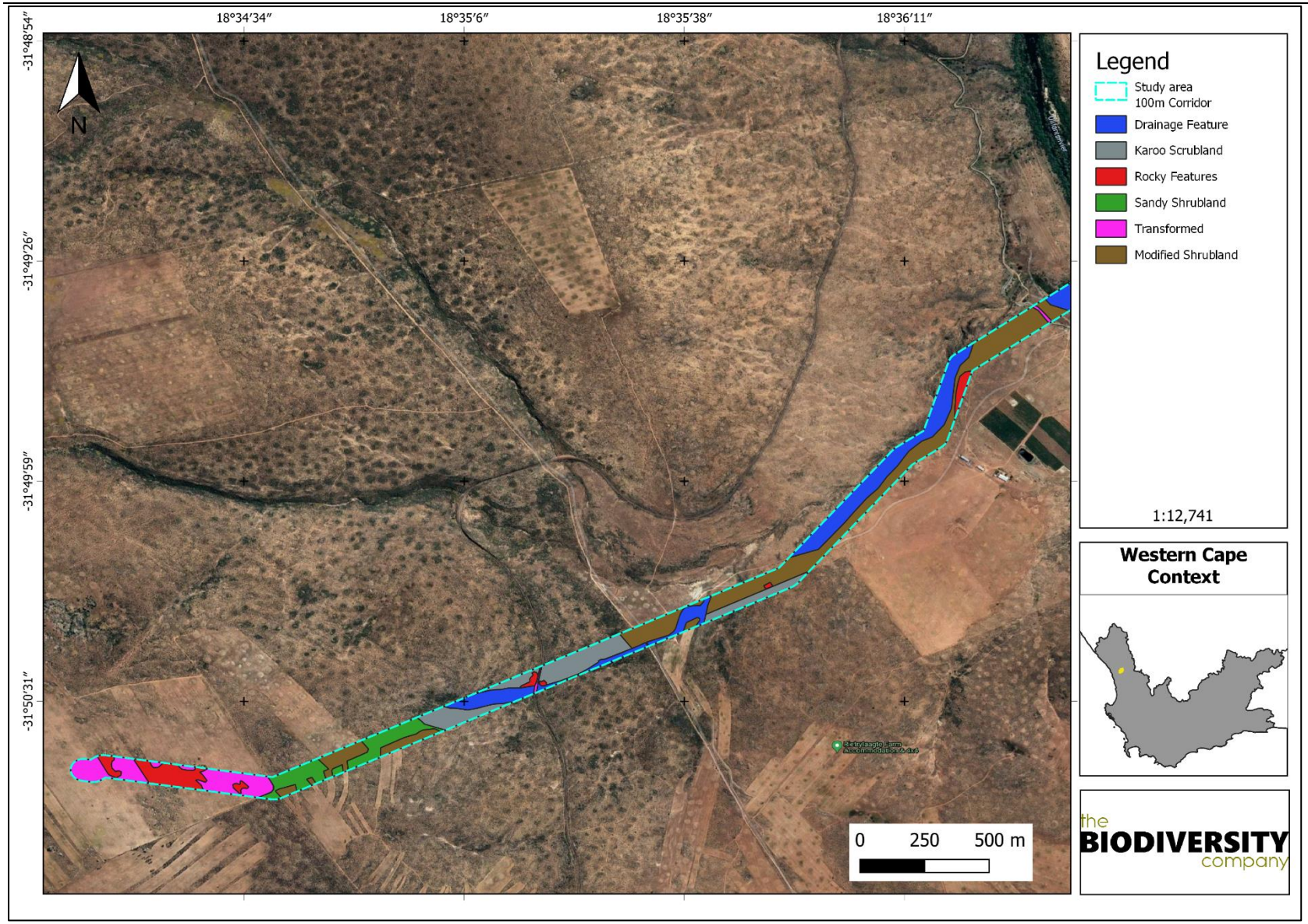


***Figure 4-2 Habitats delineated for the project area***

#### 4.1.1.1.1 Drainage features, Rivers and Riparian areas

This habitat unit includes the perennial river (Olifants River) habitat was found within the lower lying areas of the project area and includes flowing open water habitats with exposed protruding bedrock and low riverine fringe vegetation (Figure 4-3 and Figure 4-4).

The ephemeral watercourses found on site are regarded as streams that flow only briefly during and following a period of rainfall in the immediate locality, which is common within an arid region. These seasonal streams create an ecological link between the stream and its surrounding terrestrial landscape.

The watercourses within the project area are vast and form a network of “highways” throughout the area. Unfortunately, the watercourses close to the transformed and modified habitats have been degraded due to them being used as secondary roads, pathways and movement corridors for the humans and livestock present. However, the drainage features are essential for the flora and fauna present, especially when water is present.

This habitat, even though somewhat degraded, is still important as a movement corridor for several faunal species, especially birds and mammals, and plays a vital role as a water resource not only for the biodiversity but also the local community. This habitat unit can be regarded as highly important, not only within the local landscape, but also regionally.

***Figure 4-3 An example of a drainage feature from the project area with the associated rocks.***

***Figure 4-4 An example of a drainage feature from the project area , the Olifants River.***

#### 4.1.1.1.2 Shrubland (Karoo, Sandy and Rocky)

This habitat is the remainder of the shrubveld that has not been as disturbed severely by the historic grazing and impacts (Figure 4-5 and Figure 4-6). This habitat type is regarded as semi-natural shrubland, but slightly disturbed due to some grazing by livestock, mismanagement and also human infringement. The current ecological condition of this habitat with regard to the main driving forces, are intact, which is evident in the amount of, and importance of the species recorded in the flora and faunal assessment, and also to 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 modified shrubland is the extent of the disturbance, especially grazing, in the modified shrubland being more severe.

The unit acts as remaining greenlands which supports viable plant species populations and is also used for foraging by fauna. The unit also serves as a movement corridor for fauna within a landscape fragmented.

The Klawer Sandy Shrubland with rocks, which is known to and occurs adjacent to the area that supports *Steirodiscus linearilobus*, is part of this habitat, but delineated separately.

In addition, the large fragment of Leipoldtville Sand Fynbos along the southern boundary of the site constitutes a unique environment within the site and contains an abundance of species not found elsewhere, including the species found by Todd in 2015.

*Figure 4-5 An example of a shrubland from the project area, Klawer Sandy Shrubland with rocks, expected to support Steirodiscus linearilobus.*

*Figure 4-6 An example of a shrubland from the project area.*

#### 4.1.1.1.3 Rocky Areas

This habitat includes areas that are rocky outcrops, stony and rocky slopes, bedrock protruding from the soil layer with the associated boulders and large rocks that occurs within the shrubland habitat (Figure 4-7 and Figure 4-8). The habitat is used by faunal species as fine-scale habitats and is important to consider for mitigation actions when an area is cleared for placement of the infrastructure. These habitats can be considered as hotspots being an important habitat for Fauna and flora, especially plants as well as reptiles. The habitat has

been infringed upon by livestock, which has had an impact on this habitat, although minor. This habitat type has undergone impacts associated with human activity especially due to the use of the area for grazing. This habitat forms part of a unique habitat within the region that plays a role within the faunal species makeup within the area by providing refugia, food and a more natural environment.

A high likelihood of supporting IUCN Red-listed plant and reptile species is expected within this unit.

***Figure 4-7 An example of a rocky habitat from the project area.***

***Figure 4-8 An example of a rocky habitat from the project area.***

#### 4.1.1.1.4 Transformed

This habitat is characterised by areas cleared of natural vegetation mainly for agriculture and also comprised of roads (Figure 4-9). Most of the alien and/or invasive plant species occurred within this habitat due to the continuous impact, garden plants as well fact that many of the species are used for crops.

***Figure 4-9 An example of a transformed habitat from the project area.***

#### 4.1.1.1.5 Modified Karoo Shrubland

This habitat is regarded as areas that have been impacted more by historic overgrazing, mismanagement and land use (Figure 4-10and Figure 4-11). These habitats aren't entirely transformed but in a constant disturbed state as it can't recover to a more natural state due to ongoing disturbances and impacts it receives from grazing and mismanagement. This habitat can be found in different conditions of disturbance, but in many cases has large portions of bare areas. These areas are considered to have a low sensitivity due to the fact that these areas may be used as a movement corridor and in many cases form a barrier between the more degraded shrubland and the transformed areas. In terms of the current condition of the vegetation of the site, certain parts can be considered to be quite severely impacted by overgrazing.

*Figure 4-10 An example of a modified habitat from the project area.*

*Figure 4-11 An example of a modified habitat from the project area.*

## 4.2 Site Ecological Importance

The biodiversity theme sensitivity as indicated in the screening report was derived to be Very High, mainly due to the area being CBA and ESA ( Figure 4-12), while the animal (Figure 4-13) and plant species (Figure 4-14) theme sensitivity shows that majority of the area is classified as High and Very High sensitivity.

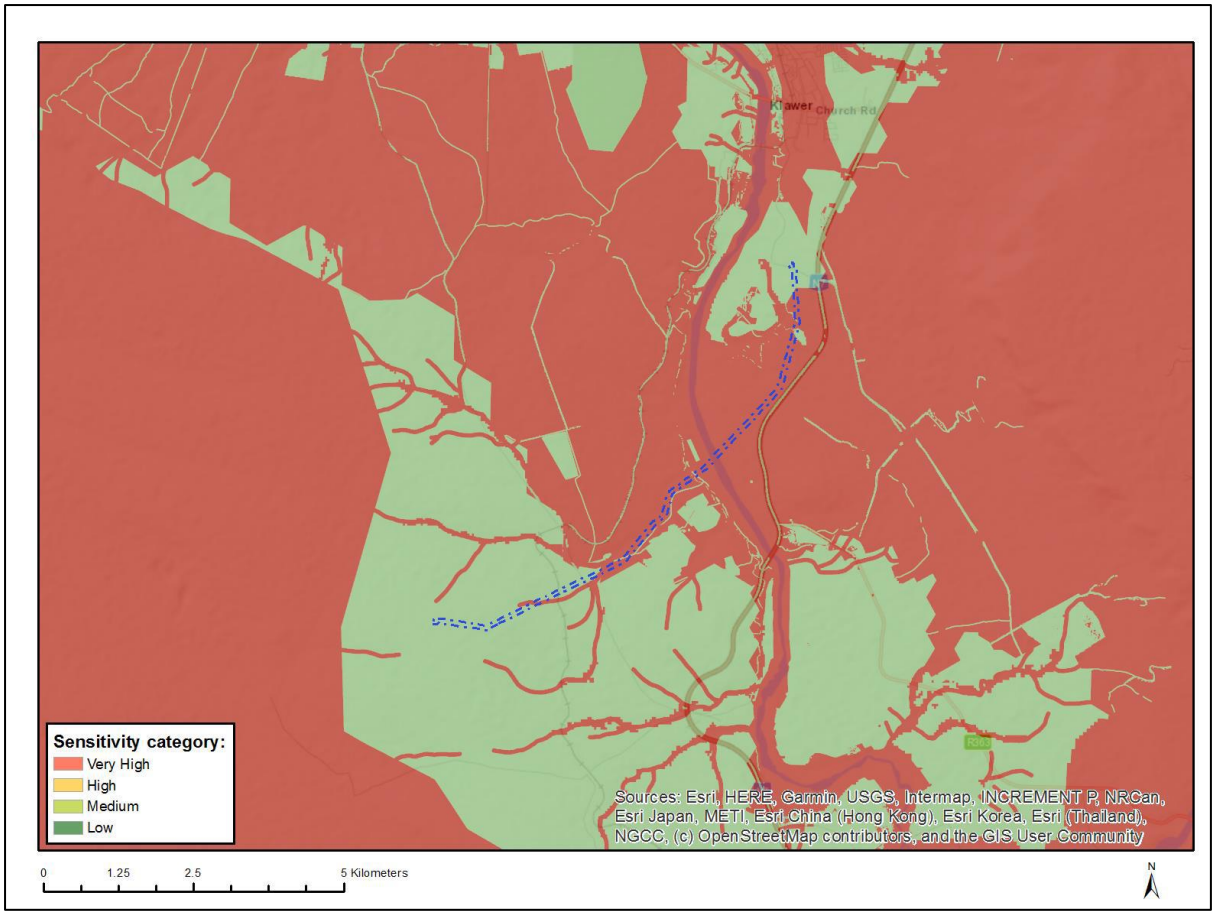


***Figure 4-12 Terrestrial Biodiversity Theme Sensitivity, DEA Screening Report***

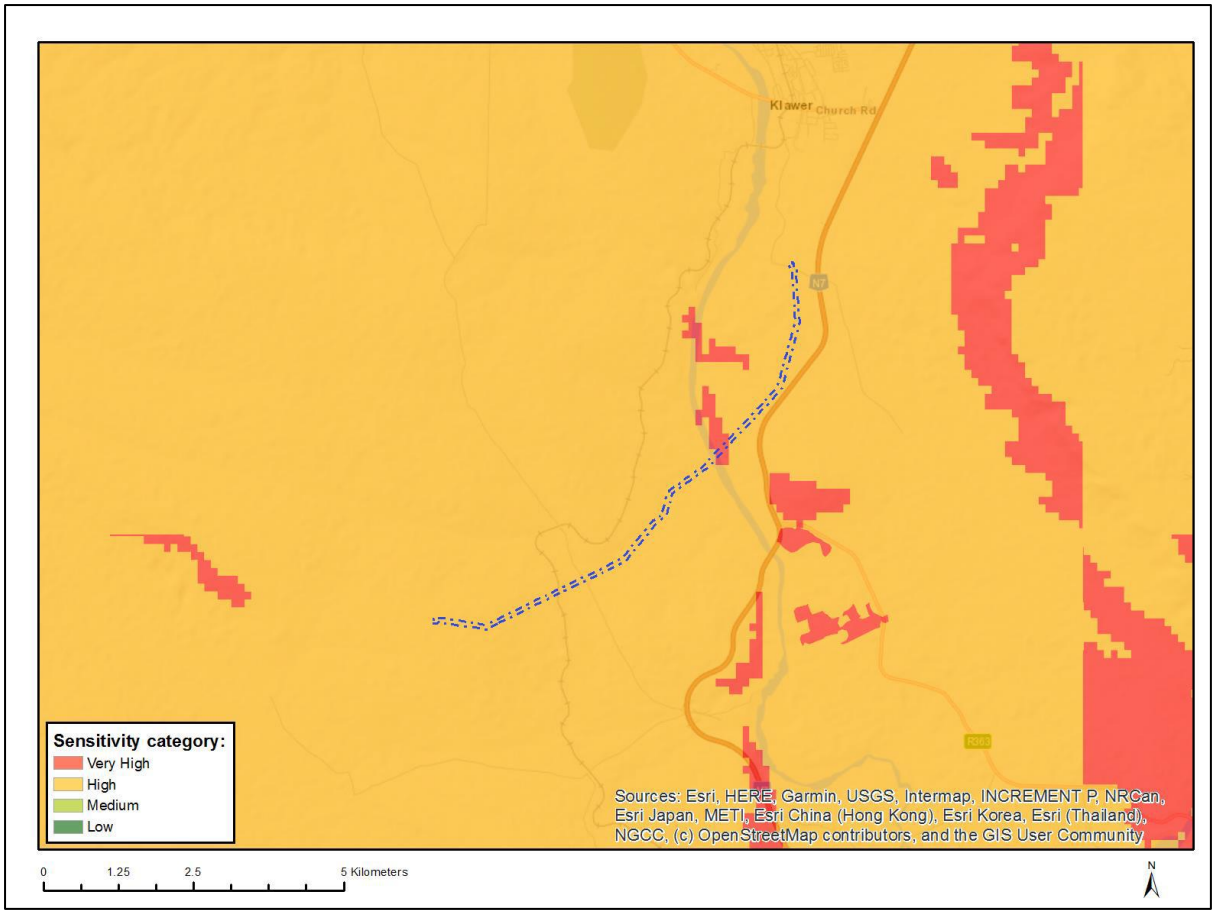


***Figure 4-13 Animal sensitivity (DEA screening tool, 2021)***

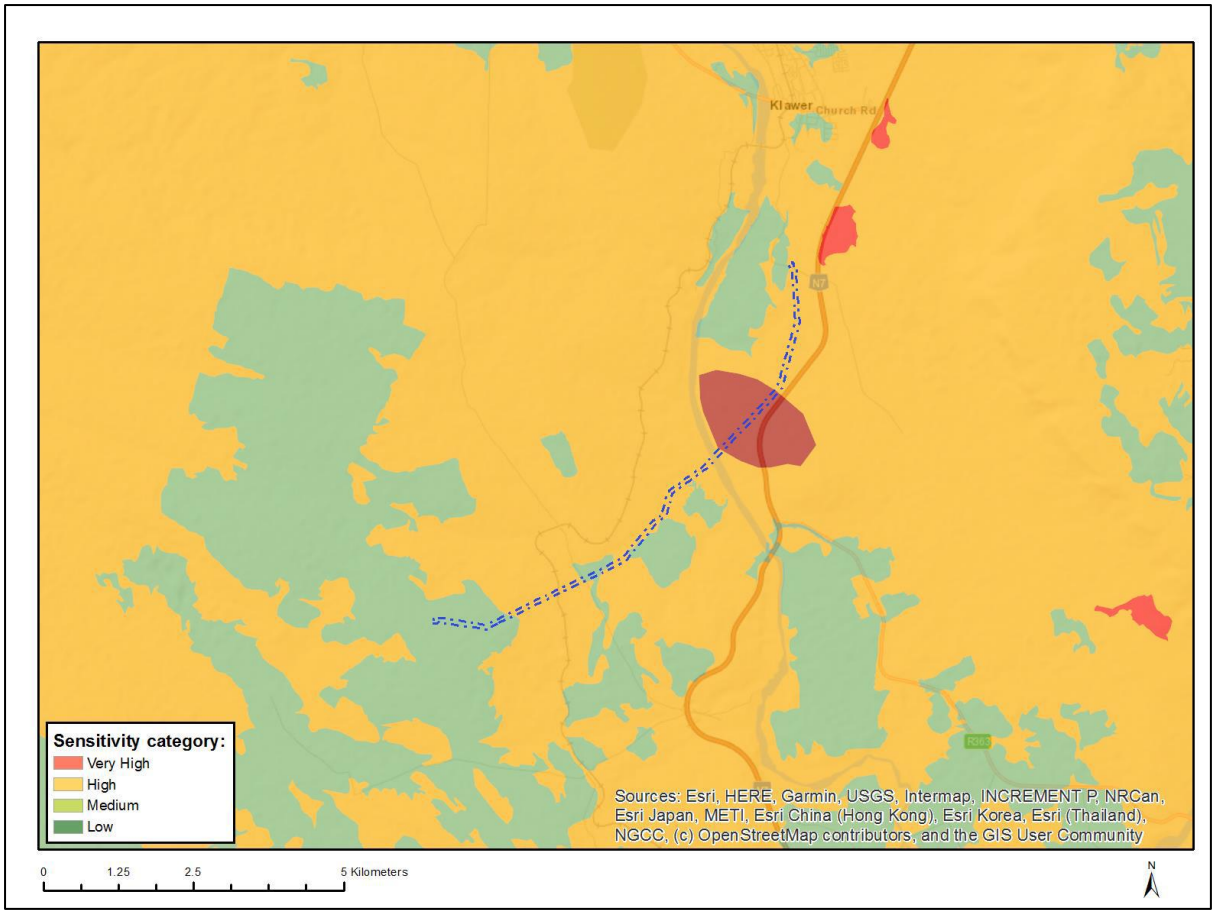


***Figure 4-14 Flora sensitivity (DEA Screening Tool, 2021***

The different terrestrial habitat types that were delineated within the project area, can be seen in (Table 4-1). Based on the criteria provided in Section 2.3 of this report, all habitats within the assessment area of the proposed development were allocated a sensitivity category. The sensitivities of the habitat types delineated are illustrated in Figure 4-15 and Figure 4-16 , and the sensitivities in relation to the expected pole infrastructure in Figure 4-17 and Figure 4-18.

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

| Habitat (Area) | Conservation Importance | Functional Integrity | Biodiversity Importance | Receptor Resilience | Site Ecological Importance |
|---|---|---|---|---|---|
| Transformed | Very Low | Very Low | Very Low | Very Low | Very Low |
| Modified Karoo Shrubland | Low | Low | Low | Medium | Low |
| Karoo Shrubland (General and Sandy) | Medium | Medium | Medium | Medium | Medium |
| Rocky | High | Medium | High | Low | High |
| Drainage features, | High | Medium | Medium | Low | High |
| Klawer Sandy Shrubland (Rocky) | Very High | High | Very High | Medium | Very High |

Interpretation of the SEI in the context of the proposed development activities is provided in Table 4-2

***Table 4-2 Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities***

| Site Ecological Importance (SEI) | 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. |

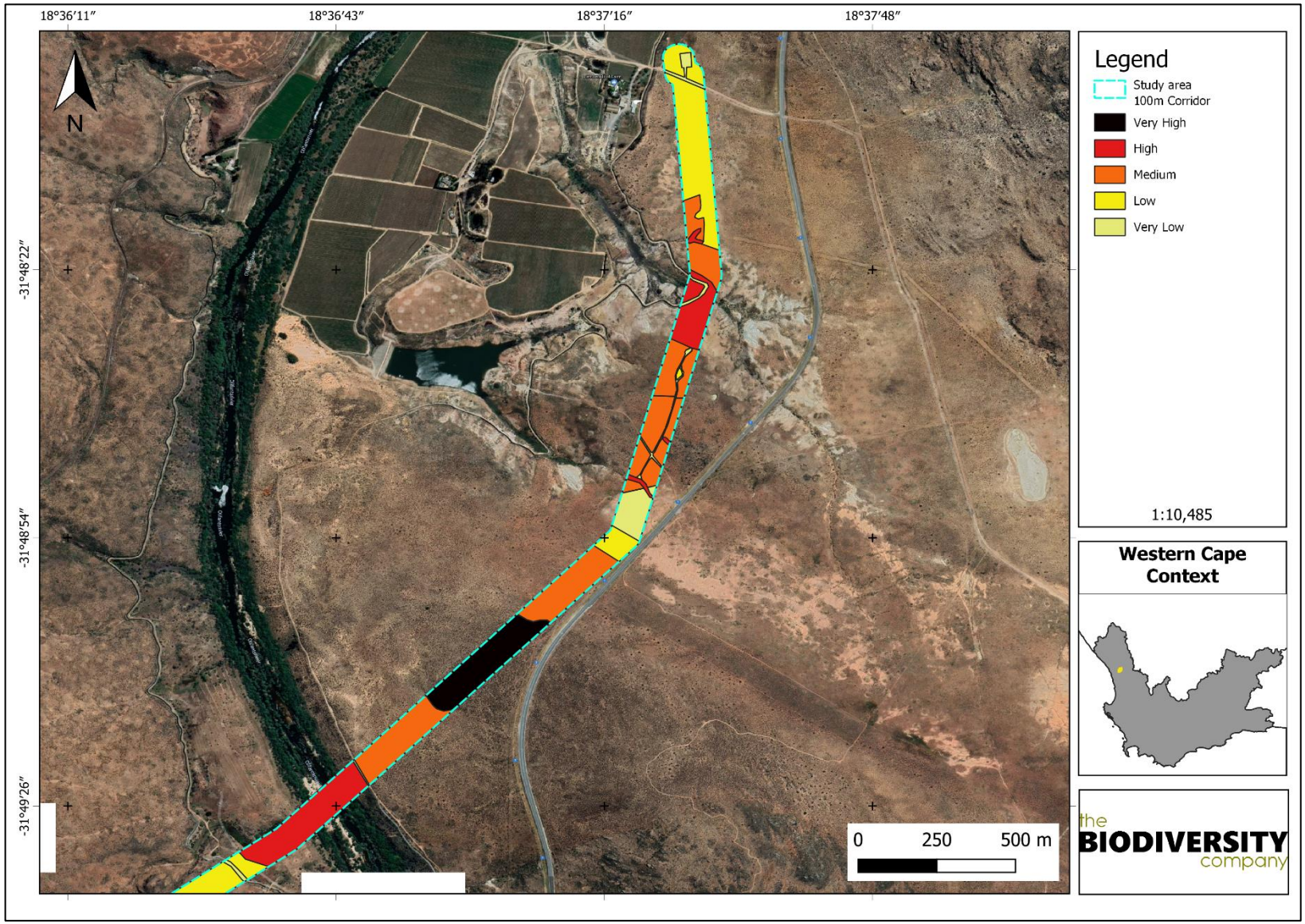


***Figure 4-15 Sensitivity of the project area in relation to the 100 study area***

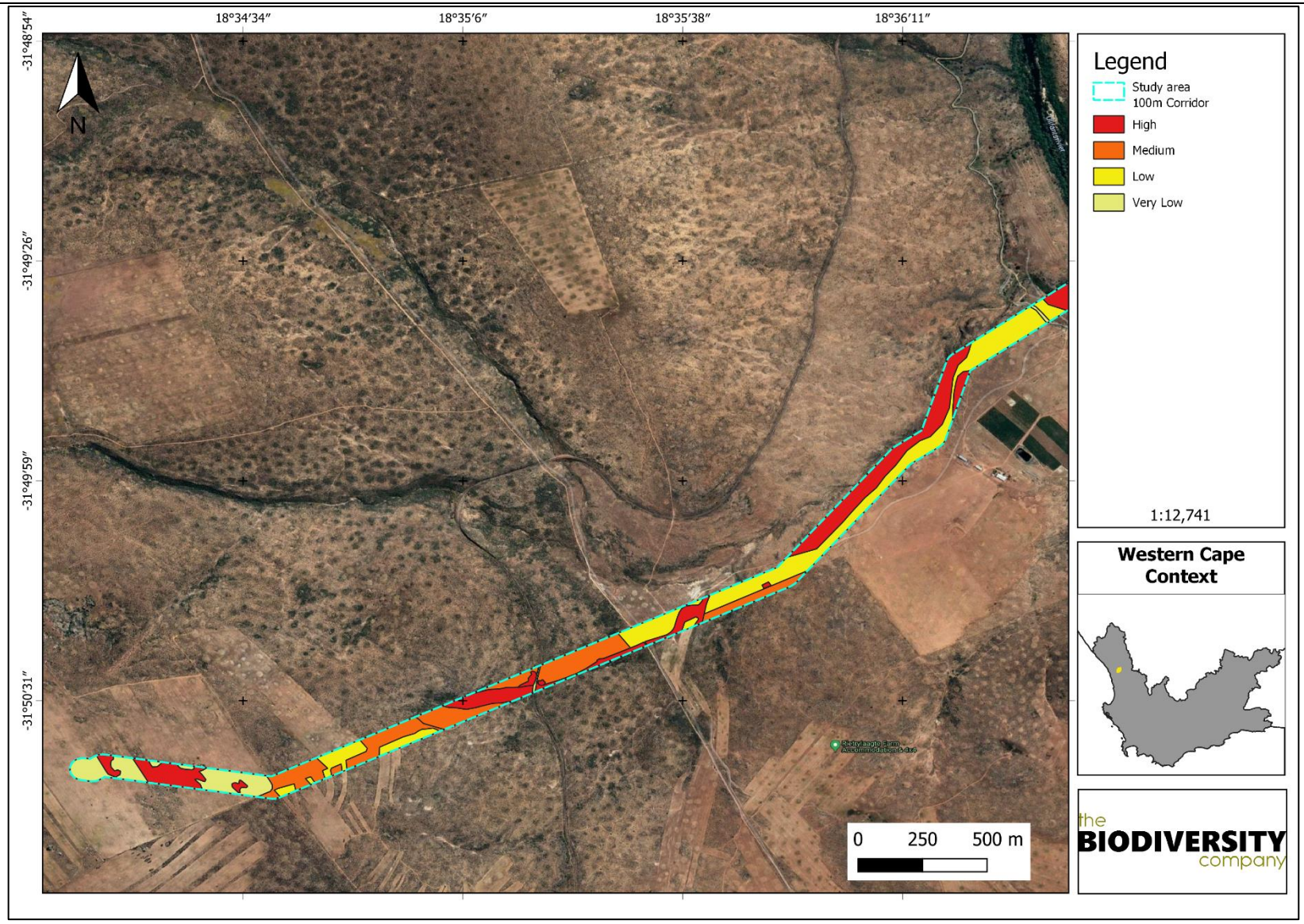


***Figure 4-16 Sensitivity of the project area in relation to the 100 study area***

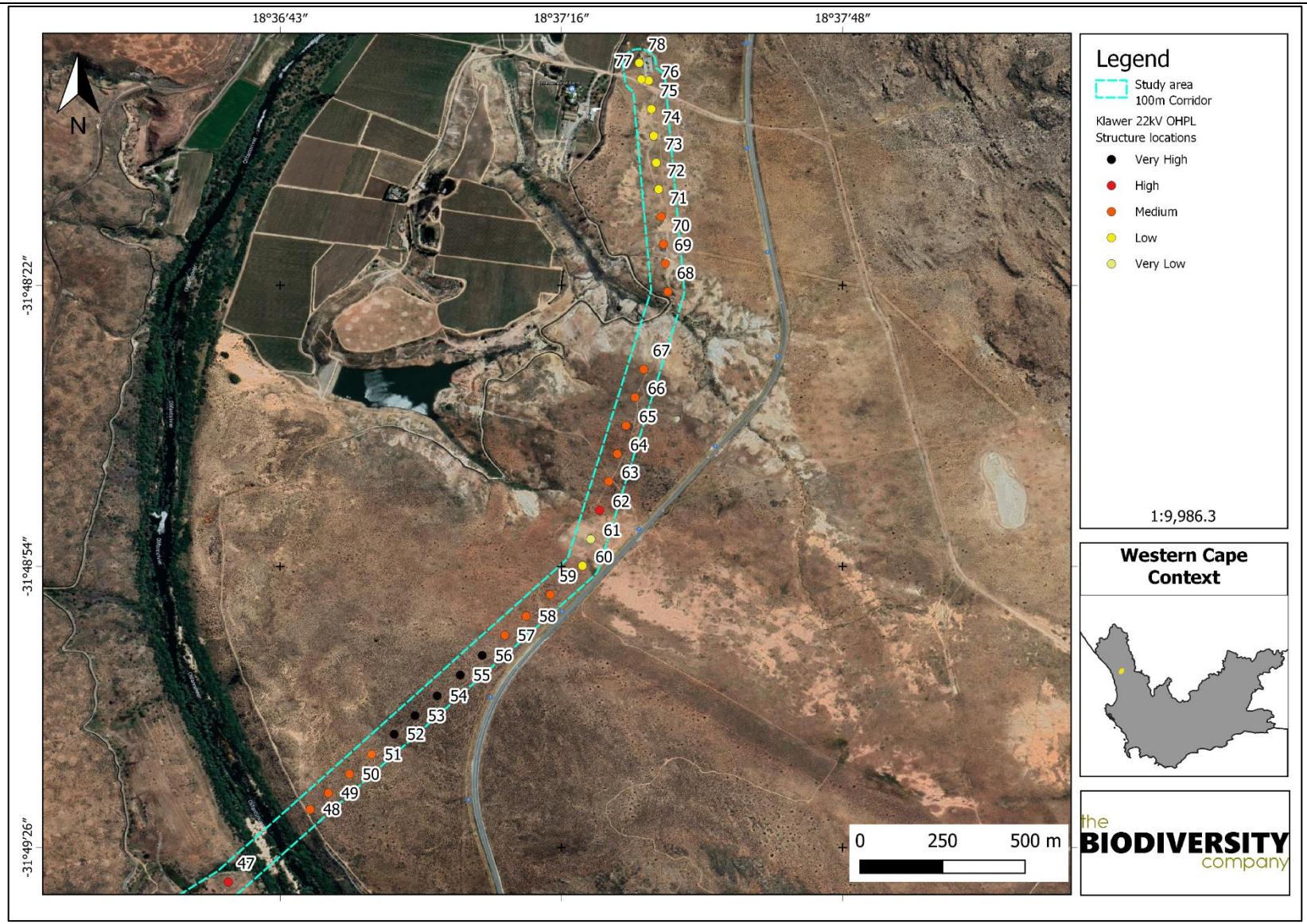


***Figure 4-17 Sensitivity of the project area in relation to the proposed poles.***

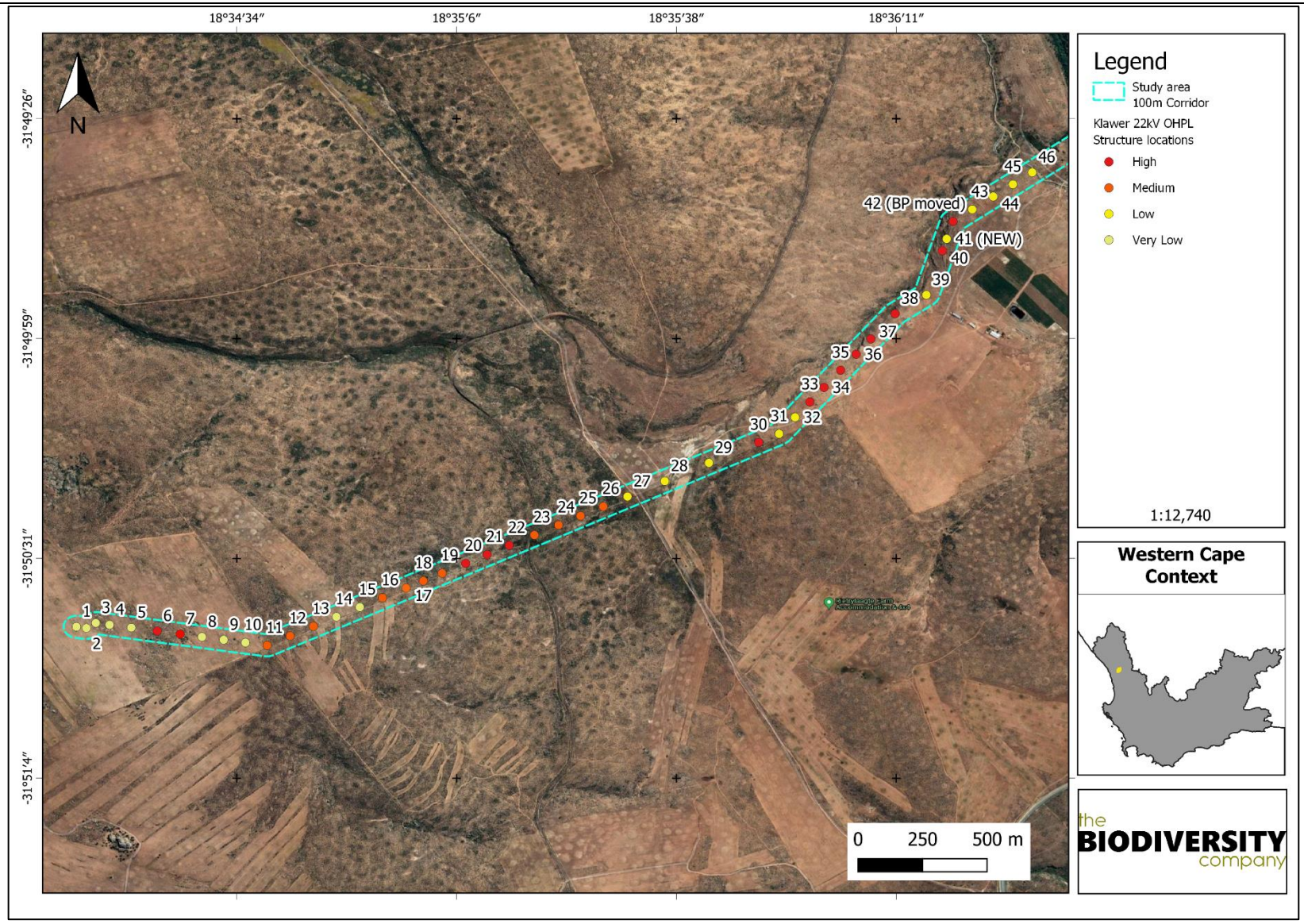


***Figure 4-18 Sensitivity of the project area in relation to the proposed poles***

# 5 Impact Assessment

## 5.1 Risk Assessment Methodology

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3] as well as cumulative[4] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in Table 5-1.

***Table 5-1 Impact Assessment Criteria and Scoring System***

| CRITERIA | SCORE 1 | SCORE 2 | SCORE 3 | SCORE 4 | SCORE 5 |
|---|---|---|---|---|---|
| **Impact Magnitude (M) The degree of alteration of the affected environmental receptor** | Very low: No impact on processes | Low: Slight impact on processes | Medium: Processes continue but in a modified way | High: Processes temporarily cease | Very High: Permanent cessation of processes |
| **Impact Extent (E) The geographical extent of the impact on a given environmental receptor** | Site: Site only | Local: Inside activity area | Regional: Outside activity area | National: National scope or level | International: Across borders or boundaries |
| **Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change** | Reversible: Recovery without rehabilitation | | Recoverable: Recovery with rehabilitation | | Irreversible: Not possible despite action |
| **Impact Duration (D) The length of permanence of the impact on the environmental receptor** | Immediate: On impact | Short term: 0-5 years | Medium term: 5-15 years | Long term: Project life | Permanent: Indefinite |
| **Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation** | Improbable | Low Probability | Probable | Highly Probability | Definite |
| **Significance (S) is determined by combining the above criteria in the following formula:** | $[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$ | | | | |
| **IMPACT SIGNIFICANCE RATING** | | | | | |

[1] Impacts that arise directly from activities that form an integral part of the Project.
[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[3] Secondary or induced impacts caused by a change in the Project environment.
[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

| | | | |
|---|---|---|---|
| **Total Score** | 0 – 30 | 31 to 60 | 61 – 100 |
| **Environmental Significance Rating (Negative (-))** | **Low (-)** | **Moderate (-)** | **High (-)** |
| **Environmental Significance Rating (Positive (+))** | **Low (+)** | **Moderate (+)** | **High (+)** |

### 5.1.1 Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in Figure 5-1 below.

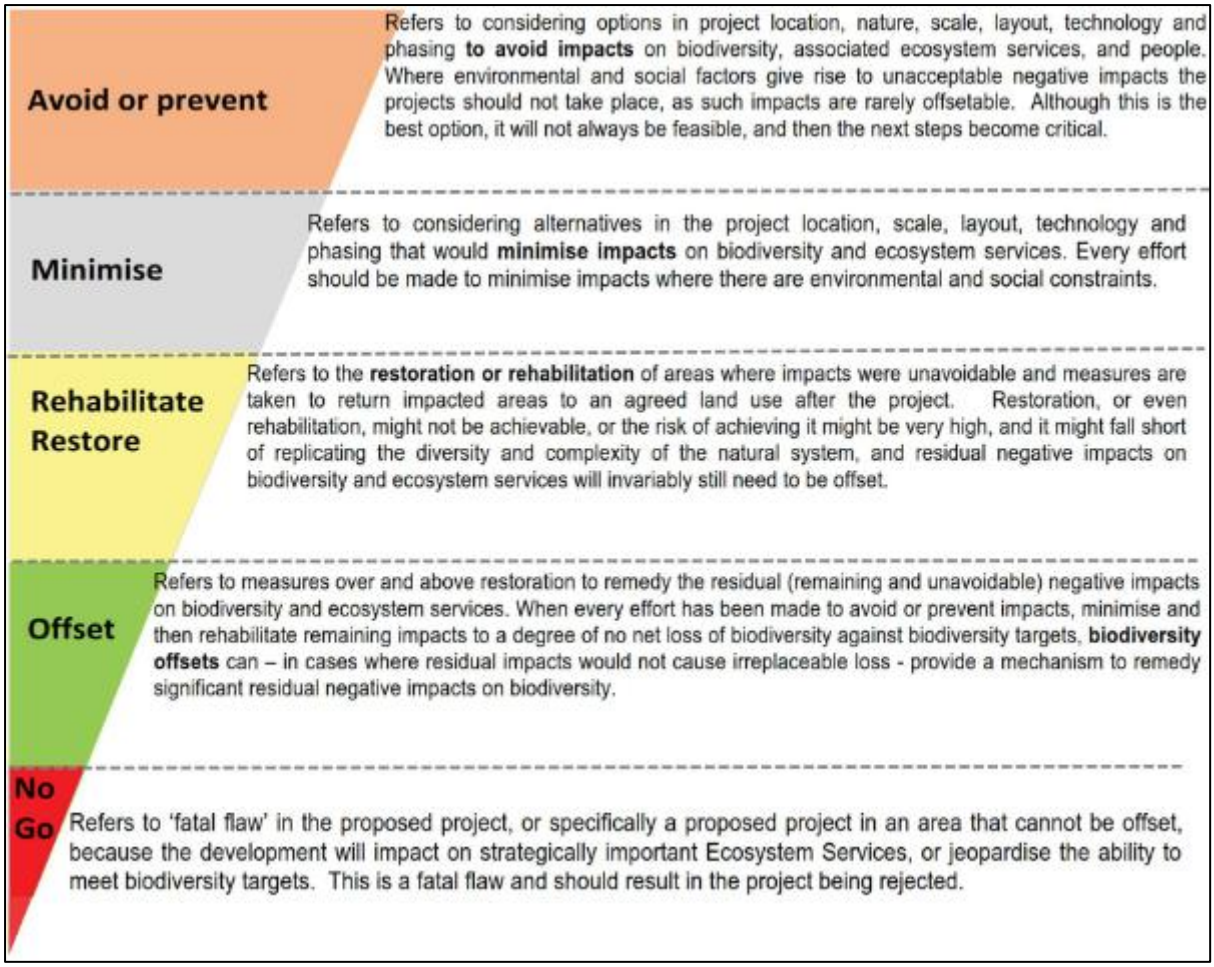


***Figure 5-1 Mitigation Sequence/Hierarchy***

## 5.2 Present Impacts to Biodiversity

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

- Present energy distribution infrastructure, including powerlines;
- Historical sheep grazing land-use;
- Agriculture;
- Invasive species;
- Roads and associated vehicle traffic and road kills; and
- Fences.

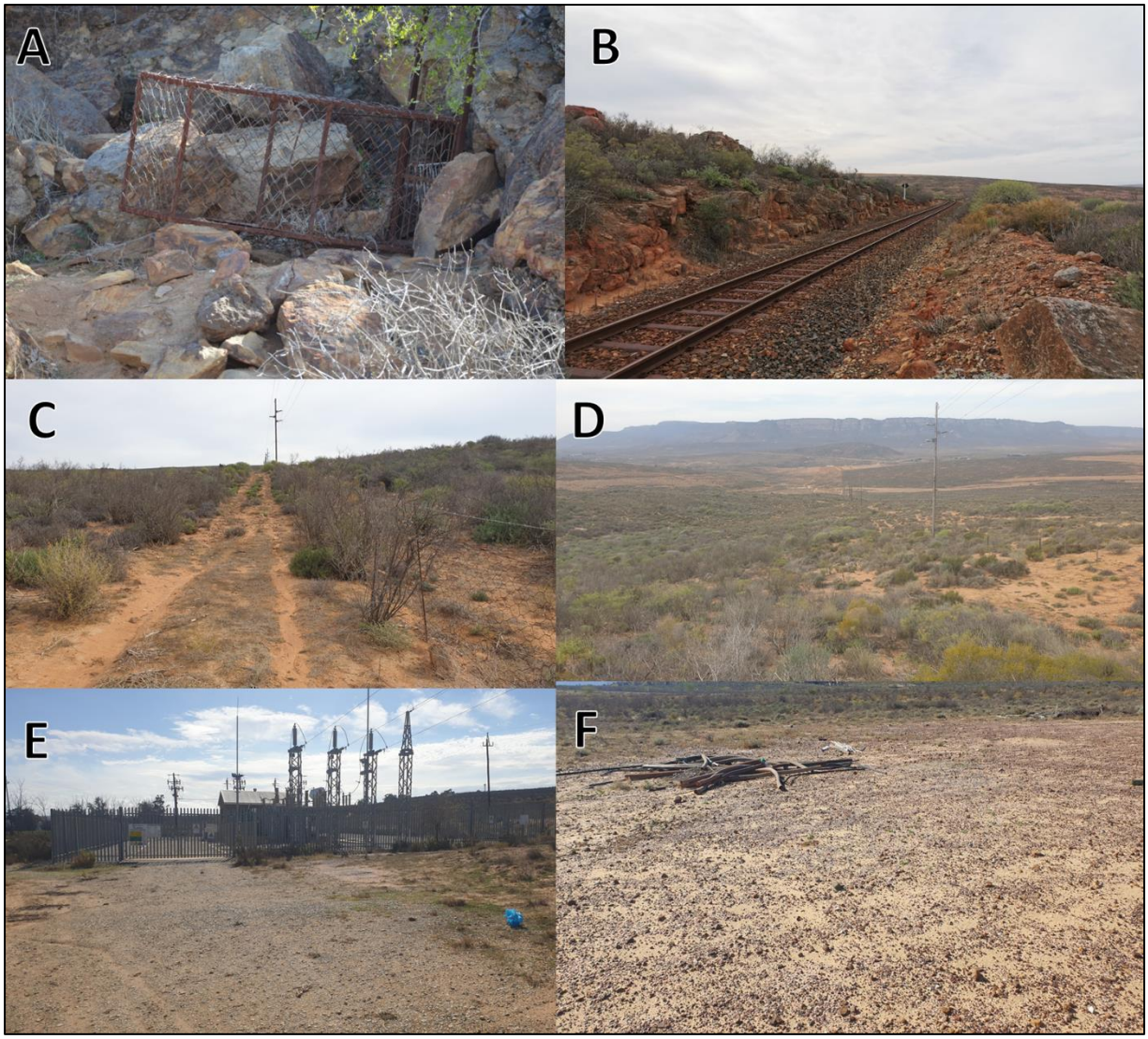


***Figure 5-2 Photographs illustrating impacts to biodiversity A) Cage trap, B) Rail line, C) gravel roads with fencing adjacent to it, D) Existing powerline, E) Existing power station and E) dumping of solid waste***

## 5.3 Initial Impact – No-go Scenario

It is the specialist's opinion that if none of the proposed activities be considered, that sensitive receptors will remain in intact in most of the areas if no unlawful anthropogenic developments, takes place. The current ecological state of the area holistically, is in a intact, which will degrade taking into consideration the proposed activities.

The larger project area could improve naturally over time, especially with the reduction of sheep, and will improve significantly with rehabilitation, if managed. The reality of the area being managed is however, very unlikely. To summarise, the no-go option will result in zero additional impacts and could result in the improvement of the area as a whole, especially the water resource systems which, in an environmental aspect, will be the suitable option.

## 5.4 Alternatives considered

No alternatives were considered.

## 5.5 Identification of Additional Potential Impacts

The potential impacts during the construction and operation phases of the proposed development are presented in Table 5-2.

***Table 5-2 Potential impacts to biodiversity associated with the proposed activity.***

| **Main Impact** | **Project activities that can cause loss of habitat (especially with regard to the construction):** | **Secondary impacts anticipated** |
|---|---|---|
| **1. Destruction, fragmentation and degradation of habitats and ecosystems** | Physical removal of vegetation, including protected and threatened species (Expected CR,EN and VU plants) | Displacement/loss of flora & fauna (including possible SCC)<br>Increased potential for soil erosion<br>Habitat fragmentation<br>Increased potential for establishment of alien & invasive vegetation |
| | Soil dust precipitation | |
| | Water leakages | |
| | Dumping of waste products | |
| | Random events such as fire (cooking fires or cigarettes) | |
| **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 potential SCC)<br>Spreading of potentially dangerous diseases due to invasive and pest species<br>Alteration of fauna assemblages due to habitat modification |
| | Vehicles potentially spreading seed | |
| | Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents | |
| | Creation of infrastructure suitable for breeding activities of alien and/or invasive birds | |
| **Main Impact** | **Project activities that can cause the Direct mortality of fauna** | **Secondary impacts anticipated** |
| **3. Direct mortality of fauna** | Project activities that can cause direct mortality of fauna | Loss of ecosystem services<br>Increase in rodent populations and associated disease risk |
| | Clearing of vegetation | |
| | Roadkill due to vehicle collision | |
| | Pollution of water resources due to dust effects, chemical spills, etc. | |
| | Intentional killing of fauna for food (hunting)<br>Bird collisions with powerlines | |
| **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 | Loss of ecosystem services<br>Reduced plant seed dispersal |
| | Compacted roads | |
| | Removal of vegetation | |
| | Light, noise and dust disturbance | |
| | Powerlines | |
| **Main Impact** | **Project activities that can cause pollution in water courses and the surrounding environment** | **Secondary impacts anticipated** |
| **5. Environmental pollution due to water/ mine drainage runoff** | Chemical (organic/inorganic) spills | Faunal mortality (direct and indirectly)<br>Groundwater pollution<br>Loss of ecosystem services |
| | Erosion | |
| **Main Impact** | **Project activities that can cause disruption/alteration of ecological life cycles due to sensory disturbance and dust.** | **Secondary impacts anticipated** |
| **6.Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and light pollution.** | Operation of machinery (Large earth moving machinery, generators) | Loss of ecosystem services |
| | Vehicles | |
| | Outside lighting | |

| 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 | Harm to fauna and/or staff |

## 5.6 Assessment of Impact Significance

The assessment of impact significance considers pre-mitigation as well as implemented of post-mitigation scenarios. The mitigation actions required to lower the risk of the impact are provided in Section 5.6.6 of this report.

Due to the nature of the project, the actual footprint of the pole/pylon infrastructure has a small localised, impact. It is also understood that no new access/service roads will be constructed, and existing routes will be used. The method of connection and spanning of the powerlines between poles have also not been received and thus no impact regarding that can be conducted.

### 5.6.1 Construction Phase

The following potential impacts were considered on terrestrial communities. This phase refers to the period when construction of the proposed infrastructure is built/installed. This phase usually has the largest direct impact on biodiversity:

#### 5.6.1.1 Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community;

The proposed vegetation clearance for the pylon footprint and the associated potential widening of existing roads/servitudes will physically remove vegetation as well as remove and fragment communities/ ecosystems for terrestrial plant species. This will result in direct and indirect erosion due to the loss of vegetation cover. This will increase the potential for the establishment of alien and invasive vegetation; disruption in natural areas of phytomass, disturbance of soil and introduction by humans due to human movements will increase the potential and likelihood of establishment of alien and invasive vegetation. Destruction, further loss and fragmentation of the vegetation community/ ecosystems.

The impact of the construction phase on the impact on flora is shown in Table 5-3 below.

***Table 5-3 Assessment of significance of potential impacts on the terrestrial flora associated with the construction phase of the project.***

| **Potential Impact:** <br> **Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community** | **Magnitude** | **Extent** | **Reversibility** | **Duration** | **Probability** | **Significance** | | **Character** | **Confidence** |
|---|---|---|---|---|---|---|---|---|---|
| **Without Mitigation** | 4 | 2 | 4 | 5 | 4 | **60** | **Moderate** | (-) | High |
| **With Mitigation** | 2 | 2 | 3 | 2 | 3 | **27** | **Low** | (-) | High |
| **Mitigation and Management Measures** <br> **See sections 5.6.6** | | | | | | | | | |

### 5.6.1.2 Introduction of alien species, especially plants

Clearance of vegetation and movement between areas will increase the potential for the establishment of alien and invasive vegetation. The proposed vegetation clearance for the pylon footprint as well as potential widening of existing roads/servitudes will physically remove indigenous vegetation and potentially create an environment where alien species can be introduced.

The impact of the construction phase on the impact on fauna is shown in Table 5-4 below.

***Table 5-4 Assessment of significance of potential impacts on the terrestrial biodiversity associated with the construction phase of the project.***

| Potential Impact: Introduction of alien species, especially plants | Magnitude | Extent | Reversibility | Duration | Probability | Significance | | Character | Confidence |
|---|---|---|---|---|---|---|---|---|---|
| **Without Mitigation** | 4 | 3 | 3 | 3 | 4 | **52** | **Moderate** | (-) | High |
| **With Mitigation** | 3 | 2 | 2 | 2 | 2 | **18** | **Low** | (-) | High |
| **Mitigation and Management Measures See sections 5.6.6** | | | | | | | | | |

### 5.6.1.3 Destruction of threatened plant species.

The proposed vegetation clearance for the pylon footprint and the associated potential widening of existing roads/servitudes will physically remove vegetation This will result in direct and indirect erosion due to the loss of vegetation cover. This will increase the potential for the establishment of alien and invasive vegetation; disruption in natural areas of phytomass, disturbance of soil and introduction by humans due to human movements will increase the potential and likelihood of establishment of alien and invasive vegetation. Destruction, further loss and fragmentation of the vegetation community/ ecosystems, including potential SCC individuals. This impact is considered not only due to the potential occurrence of *Steirodiscus linearilobus*, but also the 3 threatened plants recorded by Todd in 2011.

The impact of the construction phase on the impact on fauna is shown in Table 5-5 below.

***Table 5-5 Assessment of significance of potential impacts on the terrestrial flora associated with the construction phase of the project.***

| Potential Impact: Destruction of threatened plant species. | Magnitude | Extent | Reversibility | Duration | Probability | Significance | | Character | Confidence |
|---|---|---|---|---|---|---|---|---|---|
| **Without Mitigation** | 5 | 3 | 5 | 5 | 4 | **76** | **High** | (-) | High |
| **With Mitigation** | 3 | 2 | 4 | 3 | 3 | **36** | **Moderate** | (-) | High |
| **Mitigation and Management Measures See sections 5.6.6** | | | | | | | | | |

#### 5.6.1.4 Displacement and fragmentation of the faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration)

Due to the removal of vegetation will result in the direct loss of habitat forcing fauna species (including potential IUCN listed species) to move into new areas where more challenges may be present. Disruption of faunal populations by interfering with their movements and/or breeding activities. Direct mortalities from earth moving or transport vehicles and increased traffic due to construction work and the transportation of staff/materials. The unregulated movement of local people will also increase the likelihood of poaching of species in what was previously seen as secluded habitat for fauna species. The unregulated movement of local people could lead to introduction of diseases and feral species such as cats and dogs.

The impact of the construction phase on the impact on fauna is shown in Table 5-6 below.

***Table 5-6 Assessment of significance of potential impacts on the terrestrial fauna associated with the construction phase of the project.***

| Potential Impact: Displacement and fragmentation of the faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration) | Magnitude | Extent | Reversibility | Duration | Probability | Significance | | Character | Confidence |
|---|---|---|---|---|---|---|---|---|---|
| **Without Mitigation** | 4 | 3 | 3 | 4 | 4 | **56** | **Moderate** | (-) | High |
| **With Mitigation** | 3 | 2 | 3 | 2 | 2 | **20** | **Low** | (-) | High |
| **Mitigation and Management Measures**<br>**See sections 5.6.6** | | | | | | | | | |

### 5.6.2 Operational Phase

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase. This phase refers to when construction has been completed and the proposed infrastructure has been built and is functional:

#### 5.6.2.1 Continued disturbance of vegetation communities, especially threatened species, and encroachment by alien invasive plant species.

Due to the vegetation communities that were cleared within the footprint area during the construction phase, being entirely transformed, indirect impacts to the surrounding vegetation communities and ecosystems are the main impact considered. The edges of the access and service roads will likely be degraded by impacts such as dust (reduces the effectiveness of photosynthesis and pollination), livestock and alien vegetation will become a concern in these disturbed areas. The unregulated movement of local people into the areas surrounding the footprint will likely result in plant poaching.

The impact of the construction phase on the impact on fauna is shown in Table 5-7 below.

***Table 5-7 Assessment of significance of potential impacts on the terrestrial flora associated with the operational phase of the project.***

| Potential Impact: | Magnitude | Extent | Reversibility | Duration | Probability | Significance | Character | Confidence |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Continued disturbance of vegetation communities, especially threatened species, and encroachment by alien invasive plant species** | | | | | | | | | |
| **Without Mitigation** | 4 | 2 | 3 | 2 | 4 | **44** | **Moderate** | (-) | High |
| **With Mitigation** | 3 | 1 | 2 | 1 | 2 | **14** | **Low** | (-) | High |
| **Mitigation and Management Measures**<br>**See sections 5.6.6** | | | | | | | | | |

### 5.6.2.2 Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the system).

Ongoing displacement due to sensory disturbance during operation (noise, light, dust, pollution and vibrations) from the service vehicles. The footprint area will likely be impacted by poaching, litter, roadkill and most importantly electrocutions due to the presence of the powerline and the increase in human presence as the operations continue.

The powerline is anticipated to have a noteworthy impact during operation as during this time the powerline will pose a threat to avifauna, especially sensitive species which are expected to occur in the area. If mitigation measures are followed this impact can be reduced as depicted in the tables below.

The impact of the construction phase on the impact on fauna is shown in Table 5-8 below.

***Table 5-8 Assessment of significance of potential impacts on the terrestrial fauna associated with the operational phase of the project.***

| **Potential Impact:**<br>**Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the system).** | **Magnitude** | **Extent** | **Reversibility** | **Duration** | **Probability** | **Significance** | | **Character** | **Confidence** |
|---|---|---|---|---|---|---|---|---|---|
| **Without Mitigation** | 4 | 2 | 3 | 2 | 4 | **44** | **Moderate** | (-) | High |
| **With Mitigation** | 3 | 2 | 2 | 1 | 3 | **24** | **Low** | (-) | High |
| **Mitigation and Management Measures**<br>**See sections 5.6.6** | | | | | | | | | |

### 5.6.3 Cumulative Impacts

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

These are the assumed cumulative impacts that may result from the activities in the immediate vicinity of the project area. Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers (such as other powerlines and the associated roads and within the area). These include dust deposition, noise and vibration, disruption of wildlife corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

In the light of all above, the expected cumulative impact is expected to be low to moderately detrimental.

### 5.6.4 Irreplaceable Loss

The current proposed layout of the surface infrastructure and the associated impacts will result in the irreplaceable loss of; and

- Potential threatened and endemic plant with a restricted range; and
- CBA 1 and ESA.

### 5.6.5 Unplanned Events

The planned activities will have known impacts as discussed above; however, unplanned events may occur on any project and may have potential impacts which will need mitigation and management.

Table 5-9 is a summary of the findings of an unplanned event assessment from a terrestrial ecology perspective. Note, not all potential unplanned events may be captured herein, and this must therefore be managed throughout all phases according to recorded events.

***Table 5-9 Summary of unplanned events for terrestrial biodiversity***

| Unplanned Event | Potential Impact | Mitigation |
|---|---|---|
| **Hydrocarbon spills into the surrounding environment** | Contamination of habitat as well as water resources associated with spillage. | A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations. |
| **Fire** | Uncontrolled/unmanaged fire that spreads to the surrounding natural grassland and wetlands | Appropriate/Adequate fire management plan need to be implemented. |

### 5.6.6 Biodiversity Management Outcomes

The aim of the management outcomes is to present the mitigations in such a way that the can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. Table 5-10 presents the recommended mitigation measures and the respective timeframes, targets and performance indicators for the biodiversity study.

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

- Prevent the further loss and fragmentation of vegetation communities and the CBA 1 and CBA 2 areas in the vicinity of the project area (including water resource areas);
- As far as possible, reduce the negative fragmentation effects of the development and enable safe movement of faunal species; and
- Prevent the direct and indirect loss and disturbance of faunal species and community (including occurring and potentially occurring species of conservation concern).

***Table 5-10 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** | | | | |
| All Very High sensitivity areas must be avoided (as much is feasible) and declared "No-go" areas. The areas to be developed must be specifically demarcated to prevent movement into highly sensitive surrounding environments. The infrastructure outlines must be realigned within very low/ low and medium sensitivity areas. | Life of operation | Project manager, Environmental Officer | Infrastructure Footprint | From design to installation |
| Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. | Life of operation | Project manager, Environmental Officer | Areas of indigenous vegetation (All Very high and High sensitivity areas) | From design to installation |
| Existing access routes and walking paths must be made use of, and the development of new routes avoided. Unless realigned within very low/ low and medium sensitivity areas. | Construction/Operational Phase | Environmental Officer & Design Engineer | Roads and paths used | Where applicable |
| All laydown, chemical toilets etc. should be restricted to 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. The storage of the transmission towers to be installed are not to be stored for extended periods of time and storage areas must be placed in low sensitivity areas. | Construction/Operational Phase | Environmental Officer & Design Engineer | Laydown areas and material storage & placement. | Where applicable |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. | Construction Phase | Environmental Officer & Contractor | Assess the state of rehabilitation and encroachment of alien vegetation | During Phase, with one wet season follow-up inspection |
| All structure footprints to be rehabilitated and landscaped after installation is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. | Construction Phase | Environmental Officer & Contractor | Footprint rehabilitation | During Phase |
| Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. | Construction Phase | Environmental Officer & Contractor | Footprint rehabilitation | 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 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. | Where applicable |
| Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. | Life of operation | Environmental Officer & Contractor | Leaks and spills | Where applicable |
| 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 | Where applicable |
| Any topsoil that is removed during construction must be appropriately removed and stored according to the national and provincial guidelines. This includes on-going maintenance of such topsoil piles so that they can be utilised during decommissioning phases and re-vegetation. All removed soil and material must not be stockpiled within the wetland/watercourse and buffer as well as the Mesic Grassland habitat. Stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. | Construction/Operational Phase | Project manager, Environmental Officer | Topsoil removal and storage | Where applicable |
| Enforcing of speed limits. Reducing the dust generated by the listed activities above, putting up signs to enforce speed limit in access roads. | Life of operation | Project manager, Environmental Officer | Speed limit of vehicles | Ongoing |
| **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 very high and high sensitive areas and the surrounding environments. | Construction/Operational Phase | Project manager, Environmental Officer | Infringement into these areas | Ongoing |
| No trapping, killing, or poisoning of any wildlife is to be allowed. | Life of operation | Environmental Officer | Evidence of trapping etc | Ongoing |
| All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply | Life of operation | Health and Safety Officer | Compliance to the training. | Ongoing |

| | | | | |
|---|---|---|---|---|
| with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited. | | | | |
| Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons.<br>• Driving on access roads close to very high and highly sensitive areas at night should be prevented in order to reduce or prevent wildlife road mortalities which occur more frequently during this period; | Life of operation | Project manager, Environmental Officer & Design Engineer | Activities should take place during the day in the case. | Ongoing |
| All areas to be developed must be walked through prior to any activity to ensure no nests or birds area found in the area. Should any Species of Conservation Concern not move out of the area or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken. | Planning and Construction | Project manager, Environmental Officer | Presence of Nests | From design to installation |
| For transmission towers in high to very high sensitivity locations, it is recommended to install bird guard/spike structures (close to or along drainage features) to prevent birds from landing on and/or nesting on the towers. This has been linked with increases in corvid populations which can impact local reptile and avifauna species. Poles: The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators. | Construction Phase | Project manager, Environmental Officer | Installation of bird mitigation | From design to installation |
| Appropriate bird mitigation measures should be put in place to avoid bird collisions and direct impacts to the infrastructure, as the likelihood of SCC being present in the area is moderate to high. These mitigation measures should entail the installation of 'bird-flappers' and bird-friendly powerline structures. This is particularly relevant to the portions of the proposed powerline which crosses the river as well as the drainage feature areas. Powerline: The span that crosses major drainage lines should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white; | Construction Phase | Project manager, Environmental Officer | Installation of bird mitigation | From design to installation |
| The appropriate bird mitigation measures structures need to be monitored and serviced and should be made a top priority for the duration of the project. | Life of operation | Project manager, Environmental Officer | Presence and condition of mitigation structures | Ongoing |
| **Management outcome: Alien species** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| Compilation of and implementation of an alien vegetation management plan. | Construction Phase | Project manager, Environmental Officer & Contractor | Assess presence and encroachment of alien vegetation | Where applicable |

| | | | | |
|---|---|---|---|---|
| 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 Phase | Project manager, Environmental Officer & Contractor | Footprint Area | From design to installation |
| 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 immediately to prevent rodents and pests entering the site. | Construction Phase | Environmental Officer & Health and Safety Officer | Presence of waste | Where applicable |
| **Management outcome: Dust** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes not conducting activities on windy days which will increase the likelihood of dust being generated. | Construction Phase | Contractor | Dustfall | As per the air quality report and the dust monitoring program. |
| **Management outcome: Waste management** | | | | |
| **Impact Management Actions** | **Implementation** | | **Monitoring** | |
| | Phase | Responsible Party | Aspect | Frequency |
| Waste management must be a priority and all waste must be collected and stored effectively. | Construction Phase | Environmental Officer & Contractor | Waste Removal | Where applicable |
| Litter, spills, fuels, chemicals and human waste in and around the project area. | Construction Phase | Environmental Officer & Health and Safety Officer | Presence of Waste | Where applicable |
| A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. | Construction Phase | Environmental Officer & Health and Safety Officer | Number of toilets per staff member. Waste levels | Where applicable |
| 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 | Construction Phase | Environmental Officer & Health and Safety Officer | Availability of bins and the collection of the waste. | Where applicable |
| Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site | Construction Phase | Environmental Officer, Contractor & Health and Safety Officer | Collection/handling of the waste. | Where applicable |
| 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 | Where applicable |
| **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, biology, habitat requirements and management requirements the Environmental Authorisation and within the 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 |
| Enforcing of speed limits, if this does not already exist;<br>• Reducing the dust generated by the listed activities above, putting up signs to enforce speed limit;<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, and the development of new routes limited. | 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. | Life of operation | Project manager, Environmental Officer | Re-establishment of indigenous vegetation | Where applicable |
| A storm water management plan must be compiled and implemented. | Life of operation | Project manager, Environmental Officer | Management plan | Where applicable |

# 6 Recommendations

The following further recommendations are provided:

- The infrastructure layout for use of existing roads need to be provided in order to assess the impact more accurately, potentially reducing the current high post-mitigation risk;
- A survey in the correct season to confirm the presence/absence of the red data plants expected, especially *Steirodiscus linearilobus.* This will may require an amendment to the impact assessment. This can be achieved as a walkdown for the powerline and associated access route;
- Potential design alternatives regarding the placement of poles in high to very high sensitivity area to reduce the number of poles required;
- A vegetation alien invasive management plan should be implemented from the onset of the construction phase of the project; and
- A rehabilitation plan needs to be implemented in the disturbed areas.

# 7 Conclusion and Impact Statement

## 7.1 Conclusion

Regarding the current layout, several of the infrastructure locations fall within sensitive vegetation types, sensitive habitats and other areas of high biodiversity potential. The current layout as well as the use of existing service roads of the development would be considered to have a significant and moderate-high negative impact as it would directly affect a nationally listed threatened ecosystem as well as the habitat of several plant species. Further negative effects would also extend to the expected listed reptiles that use these ecosystems. There may be other species of conservation concern present which were not encountered during the site visit, due to the seasonality constraints, especially the range restricted, and CR threatened *Steirodiscus linearilobus,* and other geophytes. The expected presence of *Steirodiscus linearilobus* and *Pelargonium crassipes* indicates the presence of Critical Habitat for the Klawer Sandy Shrubland (Rocky) and Rocky habitats.

The present land use had a direct impact on both the fauna and the flora in the area, which is evident in the extent of modified and transformed habitats. Historically, overgrazing from sheep and mismanagement has led to the deterioration of these habits. However, the very high and high sensitivity areas can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging, water resource and movement corridors for fauna within a landscape fragmented by development. The habitat existence and importance of these habitats is regarded as crucial, due to the species recorded as well as the role of this intact unique habitat to biodiversity within a very fragmented disturbed local landscape, not to mention the sensitivity according to various ecological datasets.

The very high and sensitivity terrestrial areas still:

- Serve as and represent CBA and ESA as per the Conservation Plan;

- Function as CR rivers and terrestrial ecosystems as identified by the NBA;
- Supports and protects threatened fauna and flora; and
- Support various organisms and may play a more 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.

Any development on the very high and high sensitivity areas will lead the direct destruction and loss of portions of functional CBA/ESA, and also the floral and faunal species that are expected to utilise this habitat. Thus, if these areas are not maintained in a natural or near natural state, destroyed or fragmented, then meeting targets for biodiversity features will not be achieved. The mitigations, management and associated monitoring regarding these operational impacts will be the most important factor of this project and must be considered by the issuing authority.

That being said, the majority of the proposed infrastructure does occur within very low, low and medium sensitivity areas and is not expected to have a significant impact. Special consideration needs to be taken regarding the construction and operational phase impacts of the access and service road infrastructure, as they could result in large scale detrimental impacts if not planned, managed and monitored appropriately.

## 7.2 Impact Statement

No fatal flaws are evident for the proposed project, and it is preferred that the very high and high sensitivity areas be avoided. It is the opinions of the specialists that the project may be favourably considered, on condition all prescribed mitigation measures and supporting recommendations are implemented. Implementation of the mitigation measures as well as recommendations as described in this report will reduce the significance of the risk to an acceptable level.

# 8 References

ADU (Animal Demography Unit). (2021). Virtual Museum. (Accessed: June 2021).

Avisense Consulting (2011). Klawer renewable energy facility: Bird impact assessment.

Alexander, G. & Marais, J. (2007). A guide to the Reptiles of Southern Africa. Struik, Cape Town.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). (2014). Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland. Suricata 1. South African Biodiversity Institute, Pretoria.

BGIS (Biodiversity GIS). (2018). http://bgis.sanbi.org/ (Accessed: June 2021).

Birds and Bats Unlimited Environmental Consultants (2020). Final re-assessment Report for Avian impact at the Klawer Wind Farm July and October 2020.

Birdlife (2017). Verreauxs' Eagle and Wind Farms Guidelines for impact assessment, monitoring, and mitigation.

Branch, W.R. (1998). Field Guide to Snakes and Other Reptiles of Southern Africa. Struik, Cape Town.

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). (1973). www.cites.org. (Accessed: June 2021).

Climate-data (2021). https://en.climate-data.org/klawer/SouthAfrica (Accessed: June 2021).

Driver, A., Nel, J.L., Snaddon, K., Murray, K., Roux, D.J., Hill, L., Swartz, E.R., Manuel, J. & Funke, N. (2011). Implementation Manual for Freshwater Ecosystem Priority Areas. Report to the Water Research Commission, Pretoria.

Duleba, S., & Ferreira, V. L. (2014). Herpetofauna associated with termite mounds in a pasture, Mato Grosso do Sul State, Brazil. Herpetological Bulletin, (127), 10–16.

Du Preez, L. & Carruthers, V. (2009). A Complete Guide to the Frogs of Southern Africa. Struik Nature, Cape Town.

EWT. (2016). Mammal Red List 2016. www.ewt.org.za (Accessed: June 2021).

EWT (Endangered Wildlife Trust). (2017). Threatened Amphibian Programme. (2015). The Southern African Frog Atlas Project https://www.ewt.org.za/TAP/refrence.html (SAFAP, now FrogMAP). http://vmus.adu.org.za (Accessed: June 2020).

Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. (2015). Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions. SANBI, Pretoria.

GBIF (2021). Hyaena brunnea https://www.gbif.org/search?q=Hyaena%20brunnea. (Accessed: June 2021).

Goff, F., Dawson, G., & Rochow, J. (1982). Site examination for threatened and endangered plant species. *Environmental Management, 6*(4), 307-316.

González-Salazar, C., Martínez-Meyer, E. and López-Santiago, G. 2014. A hierarchical classification of trophic guilds for North American birds and mammals. Revista Mexicana de Biodiversidad 85: 931-941.

Griffiths, C., Day, J. & Picker, M. (2016). Freshwater Life: A Field Guide to the Plants and Animals of Southern Africa. Struik Nature, Cape Town.

Hockey, P.A.R., Dean, W.R.J. & Ryan, P.G. (Eds). (2005). Roberts – Birds of Southern Africa, VIIth ed. The Trustees of the John Voelcker Bird Book Fund, Cape Town.

iNaturalist (2021). Hyaena brunnea. https://www.inaturalist.org/observations?taxon_id=57558

IUCN. (2017). The IUCN Red List of Threatened Species. www.iucnredlist.org (Accessed: June 2021).

Jenkins, A.R., Smallie, J.J. & Diamond, M. 2010. Avian collisions with powerlines: a global review of causes and mitigation with a South African perspective. *Bird Conservation International* 20: 263-278.

Johnson, S. & Bytebier, B. (2015). Orchids of South Africa: A Field Guide. Struik publishers, Cape Town.

Le Roux, A. (2015). Wild Flowers of Namaqualand, Penguin Random House,South Africa.

Manning,J. (2018). Field Guide to Fynbos. Struik Nature, Cape Town

MammalMap. (2017). http://mammalmap.adu.org.za/ (Accessed: June 2021).

Measey, G.J. (2011). Ensuring a Future for South Africa's Frogs: A Strategy for Conservation Research. South African National Biodiversity Institute, Pretoria.

Minter, L., Burger, M., Harrison, J.A. & Kloepfer, D. (2004). Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland. Smithsonian Institute Avian Demography Unit, Washington; Cape Town.

Monadjem, A., Taylor, P.J., Coterrill, F.D.P. & Schoeman, C. (2010). Bats of southern and central Africa: a biogeographic and taxonomic synthesis. Wits University Press, Johannesburg.

Mucina, L. & Rutherford, M.C. (Eds.). (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

Natural Scientific Services (2011). Bat assessment for proposed wind farm development Klawer. Reference Number: 1510, draft 3.

Noguera, J.C. Perez, I., Minguez, E. (2010). Impacts of terrestrial wind farms on diurnal raptors: developing a spatial vulnerability index and potential vulnerability maps. Ardeola 57: 41-53.

NBA. (2018). Terrestrial Ecosystem Threat Status 2018. http://bgis.sanbi.org/. (Accessed: June 2021).

Nel, J. L., Driver, A., Strydom, W. F., Maherry, A. M., Petersen, C. P., Hill, L., Roux, D. J., Nienaber, S., van Deventer, H., Swartz, E. R. & Smith-Adao, L. B. (2011). Atlas of Freshwater

Ecosystem Priority Areas in South Africa: Maps to support sustainable development of water resources, WRC Report No. TT 500/11. Water Research Commission, Pretoria.

NPAES. (2011). National Protected Areas Expansion Strategy. www.environment.gov.za (Accessed: June 2021).

Pooley, E. (1998). A Field Guide to Wild Flowers: KwaZulu-Natal and Eastern Region. The Flora Publications Trust; ABC Bookshop, Durban.

Raimonde, D. (2009). Red list of South African Plants. SANBI, Pretoria.

SACAD (South Africa Conservation Areas Database) and SADAP (South Africa Protected Areas Database) (2019). http://egis.environment.gov.za

SANBI. (2016). Red List of South African Plants version 2017.1. Redlist.sanbi.org (Accessed: June 2020).

SANBI. (2017). Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning. Driver, A., Holness, S. & Daniels, F. (Eds). 1st Edition. South African National Biodiversity Institute, Pretoria.

Simon Todd Consulting (2011). G7 Renewable energies Klawer wind farm: Ecological and Biodiversity Assessment: Terrestrial Vertebrate Fauna & Botanical Specialist Study.

Skinner, J.D. & Chimimba, C.T. (2005). The Mammals of the Southern African Subregion (New Edition). Cambridge University Press, South Africa.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). (2019). South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

Smith, G.F., Chesselet, P., van Jaarsveld, E.J., Hartmann, H., Hammer, S., van Wyk, B., Burgoyne, P., Klak, C. & Kurzweil, H. (1998). Mesembs of the world. Briza Publishers, Pretoria.

Van Oudtshoorn, F. (2004). Guide to the Grasses of Southern Africa. Second Edition. Briza Publikasies, Pretoria.

Van Wyk, B. & Van Wyk, P. (1997). Field guide to trees of Southern Africa. Struik Publishers, Cape Town.

Van Wyk, B. & Malan, S. (1997). Field Guide to the Wild Flowers of the Highveld: Also Useful in Adjacent Grassland and Bushveld, Struik Publishers, Cape Town.

Van Wyk, B-E., Van Oudtshoorn, B. & Gericke, N. (2013). Medicinal Plants of South Africa. Briza Publications, Pretoria.

# 9 Appendix Items

## 9.1 Appendix A – Flora species expected to occur in the project area.

| Family | Taxon | Author | IUCN | Ecology |
|---|---|---|---|---|
| **Fabaceae** | *Acacia saligna* | (Labill.) H.L.Wendl. | NE | Not indigenous; Naturalised; Invasive |
| **Asteraceae** | *Achyranthemum paniculatum* | (L.) N.G.Bergh | | Indigenous; Endemic |
| **Crassulaceae** | *Adromischus filicaulis subsp. filicaulis* | (Eckl. & Zeyh.) C.A.Sm. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Adromischus marianiae var. immaculatus* | (Marloth) A.Berger | NE | Indigenous; Endemic |
| **Crassulaceae** | *Adromischus marianiae var. marianiae* | (Marloth) A.Berger | NE | Indigenous; Endemic |
| **Crassulaceae** | *Adromischus roaneanus* | Uitewaal | LC | Indigenous; Endemic |
| **Rutaceae** | *Agathosma bisulca* | (Thunb.) Bartl. & H.L.Wendl. | LC | Indigenous; Endemic |
| **Rutaceae** | *Agathosma dregeana* | Sond. | EN | Indigenous; Endemic |
| **Rutaceae** | *Agathosma giftbergensis* | E.Phillips | LC | Indigenous; Endemic |
| **Poaceae** | *Aira cupaniana* | Guss. | NE | Not indigenous; Naturalised |
| **Hyacinthaceae** | *Albuca canadensis* | (L.) F.M.Leight. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Albuca decipiens* | U.Mull.-Doblies | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Albuca secunda* | (Jacq.) J.C.Manning & Goldblatt | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Albuca suaveolens* | (Jacq.) J.C.Manning & Goldblatt | LC | Indigenous |
| **Asphodelaceae** | *Aloe glauca* | Mill. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Aloe mitriformis* | Mill. | | Indigenous; Endemic |
| **Asteraceae** | *Amellus alternifolius subsp. angustissimus* | Roth | LC | Indigenous; Endemic |
| **Asteraceae** | *Amellus microglossus* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Amellus tenuifolius* | Burm. | LC | Indigenous; Endemic |
| **Asteraceae** | *Amellus tridactylus subsp. olivaceus* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Amphiglossa foliosa* | J.C.Manning & Helme | | Indigenous; Endemic |
| **Asteraceae** | *Amphiglossa grisea* | Koekemoer | LC | Indigenous; Endemic |
| **Asteraceae** | *Amphiglossa tomentosa* | (Thunb.) Harv. | LC | Indigenous |
| **Fabaceae** | *Amphithalea ericifolia subsp. ericifolia* | (L.) Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Apiaceae** | *Anginon difforme* | (L.) B.L.Burtt | LC | Indigenous; Endemic |
| **Apiaceae** | *Anginon ternatum* | I.Allison & B.-E.van Wyk | LC | Indigenous; Endemic |
| **Apiaceae** | *Annesorhiza sp.* | | | |
| **Rubiaceae** | *Anthospermum aethiopicum* | L. | LC | Indigenous |
| **Rubiaceae** | *Anthospermum dregei subsp. dregei* | Sond. | LC | Indigenous |
| **Rubiaceae** | *Anthospermum rigidum subsp. rigidum* | Eckl. & Zeyh. | LC | Indigenous |
| **Poaceae** | *Anthoxanthum tongo* | (Trin.) Stapf | LC | Indigenous; Endemic |
| **Aizoaceae** | *Antimima compacta* | (L.Bolus) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Aizoaceae** | *Antimima dasyphylla* | (Schltr.) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Aizoaceae** | *Antimima klaverensis* | (L.Bolus) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Aizoaceae** | *Antimima ventricosa* | (L.Bolus) H.E.K.Hartmann | LC | Indigenous; Endemic |

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| **Asteraceae** | *Arctotheca calendula* | (L.) Levyns | LC | Indigenous |
| **Asteraceae** | *Arctotis auriculata* | Jacq. | LC | Indigenous |
| **Asteraceae** | *Arctotis breviscapa* | Thunb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Arctotis fastuosa* | Jacq. | LC | Indigenous |
| **Asteraceae** | *Arctotis flaccida* | Jacq. | LC | Indigenous; Endemic |
| **Asteraceae** | *Arctotis hirsuta* | (Harv.) Beauverd | LC | Indigenous; Endemic |
| **Asteraceae** | *Arctotis laciniata* | Lam. | | Indigenous; Endemic |
| **Asteraceae** | *Arctotis revoluta* | Jacq. | LC | Indigenous; Endemic |
| **Asteraceae** | *Arctotis spinulosa* | Jacq. | | Indigenous; Endemic |
| **Papaveraceae** | *Argemone ochroleuca subsp. ochroleuca* | Sweet | | Not indigenous; Naturalised; Invasive |
| **Iridaceae** | *Aristea africana* | (L.) Hoffmanns. | LC | Indigenous; Endemic |
| **Iridaceae** | *Aristea bakeri* | Klatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Aristea bracteata* | Pers. | LC | Indigenous; Endemic |
| **Poaceae** | *Aristida meridionalis* | Henrard | LC | Indigenous |
| **Poaceae** | *Aristida sp.* | | | |
| **Poaceae** | *Aristida vestita* | Thunb. | LC | Indigenous |
| **Apocynaceae** | *Asclepias crispa* | P.J.Bergius | | Indigenous |
| **Fabaceae** | *Aspalathus acicularis subsp. acicularis* | E.Mey. | LC | Indigenous |
| **Fabaceae** | *Aspalathus altissima* | R.Dahlgren | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus dianthopora* | E.Phillips | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus divaricata subsp. divaricata* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus flexuosa* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus hirta subsp. hirta* | E.Mey. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus linearis* | (Burm.f.) R.Dahlgren | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus obtusata* | Thunb. | VU | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus pinguis subsp. occidentalis* | Thunb. | VU | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus quinquefolia subsp. virgata* | L. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus recurva* | Benth. | VU | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus spicata* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus spinescens subsp. lepida* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Aspalathus spinosissima subsp. tenuiflora* | R.Dahlgren | LC | Indigenous; Endemic |
| **Asparagaceae** | *Asparagus aethiopicus* | L. | LC | Indigenous |
| **Asparagaceae** | *Asparagus alopecurus* | (Oberm.) Malcomber & Sebsebe | LC | Indigenous; Endemic |
| **Asparagaceae** | *Asparagus asparagoides* | (L.) W.Wight | LC | Indigenous |
| **Asparagaceae** | *Asparagus capensis var. capensis* | L. | LC | Indigenous |
| **Asparagaceae** | *Asparagus exuvialis forma ecklonii* | Burch. | NE | Indigenous |
| **Asparagaceae** | *Asparagus multituberosus* | R.A.Dyer | LC | Indigenous; Endemic |
| **Aspleniaceae** | *Asplenium cordatum* | (Thunb.) Sw. | LC | Indigenous |
| **Apocynaceae** | *Astephanus triflorus* | (L.f.) Schult. | LC | Indigenous; Endemic |

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| **Aytoniaceae** | *Asterella marginata* | (Nees) S.W.Arnell | | Indigenous; Endemic |
| **Asteraceae** | *Athanasia flexuosa* | Thunb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Athanasia leptocephala* | Kallersjo | LC | Indigenous; Endemic |
| **Asteraceae** | *Athanasia sp.* | | | |
| **Asteraceae** | *Athanasia trifurcata* | (L.) L. | LC | Indigenous; Endemic |
| **Amaranthaceae** | *Atriplex sp.* | I.Verd. | | |
| **Poaceae** | *Avena barbata* | Pott ex Link | NE | Not indigenous; Naturalised; Invasive |
| **Iridaceae** | *Babiana ambigua* | (Roem. & Schult.) G.J.Lewis | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana ecklonii* | Klatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana fimbriata* | (Klatt) Baker | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana lineolata* | Klatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana mucronata subsp. minor* | (Jacq.) Ker Gawl. | EN | Indigenous; Endemic |
| **Iridaceae** | *Babiana sambucina subsp. sambucina* | (Jacq.) Ker Gawl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana sinuata* | G.J.Lewis | LC | Indigenous; Endemic |
| **Iridaceae** | *Babiana toximontana* | J.C.Manning & Goldblatt | EN | Indigenous; Endemic |
| **Iridaceae** | *Babiana vanzijliae* | L.Bolus | NT | Indigenous; Endemic |
| **Asteraceae** | *Berkheya fruticosa* | (L.) Ehrh. | LC | Indigenous; Endemic |
| **Bruniaceae** | *Berzelia lanuginosa* | (L.) Brongn. | LC | Indigenous; Endemic |
| **Poaceae** | *Brachypodium distachyon* | (L.) P.Beauv. | NE | Not indigenous; Naturalised |
| **Aizoaceae** | *Braunsia maximiliani* | (Schltr. & A.Berger) Schwantes | LC | Indigenous; Endemic |
| **Poaceae** | *Bromus diandrus* | Roth | NE | Not indigenous; Naturalised; Invasive |
| **Poaceae** | *Bromus pectinatus* | Thunb. | LC | Indigenous |
| **Amaryllidaceae** | *Brunsvigia bosmaniae* | F.M.Leight. | LC | Indigenous |
| **Amaryllidaceae** | *Brunsvigia striata* | (Jacq.) W.T.Aiton | LC | Indigenous; Endemic |
| **Bryaceae** | *Bryum canariense* | Brid. | | Indigenous |
| **Asphodelaceae** | *Bulbine alooides* | (L.) Willd. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbine mesembryanthoides subsp. mesembryanthoides* | Haw. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbine minima* | Baker | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbine praemorsa* | (Jacq.) Spreng. | LC | Indigenous |
| **Asphodelaceae** | *Bulbine torta* | N.E.Br. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbinella graminifolia* | P.L.Perry | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbinella punctulata* | Zahlbr. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Bulbinella triquetra* | (L.f.) Kunth | LC | Indigenous; Endemic |
| **Fabaceae** | *Calobota angustifolia* | (E.Mey.) Boatwr. & B.-E.van Wyk | LC | Indigenous |
| **Fabaceae** | *Calobota cinerea* | (E.Mey.) Boatwr. & B.-E.van Wyk | LC | Indigenous |
| **Fabaceae** | *Calobota cytisoides* | (Berg.) Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Fabaceae** | *Calobota sericea* | (Thunb.) Boatwr. & B.-E.van Wyk | LC | Indigenous; Endemic |
| **Restionaceae** | *Cannomois parviflora* | (Thunb.) Pillans | LC | Indigenous; Endemic |
| **Restionaceae** | *Cannomois robusta* | (Kunth) H.P.Linder | LC | Indigenous; Endemic |

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| **Restionaceae** | *Cannomois virgata* | (Rottb.) Steud. | LC | Indigenous; Endemic |
| **Poaceae** | *Capeochloa arundinacea* | (P.J.Bergius) N.P.Barker & H.P.Linder | LC | Indigenous |
| **Celastraceae** | *Cassine peragua subsp. affinis* | L. | LC | Indigenous; Endemic |
| **Lauraceae** | *Cassytha filiformis* | L. | NE | Indigenous |
| **Asteraceae** | *Centaurea melitensis* | L. | | Not indigenous; Naturalised |
| **Apiaceae** | *Centella cochlearia* | (Domin) Adamson | LC | Indigenous; Endemic |
| **Apiaceae** | *Centella fusca* | (Eckl. & Zeyh.) Adamson | LC | Indigenous; Endemic |
| **Apiaceae** | *Centella sp.* | | | |
| **Aizoaceae** | *Cephalophyllum loreum* | (L.) Schwantes | LC | Indigenous; Endemic |
| **Aizoaceae** | *Cephalophyllum pillansii* | L.Bolus | LC | Indigenous; Endemic |
| **Aizoaceae** | *Cephalophyllum tricolorum* | (Haw.) N.E.Br. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Chaenostoma caeruleum* | (L.f.) Kornhall | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Chaenostoma decipiens* | (Hilliard) Kornhall | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Chaenostoma uncinatum* | (Desr.) Kornhall | LC | Indigenous; Endemic |
| **Poaceae** | *Chaetobromus involucratus subsp. dregeanus* | (Schrad.) Nees | LC | Indigenous; Endemic |
| **Brassicaceae** | *Chamira circaeoides* | (L.f.) Zahlbr. | LC | Indigenous; Endemic |
| **Iridaceae** | *Chasmanthe floribunda* | (Salisb.) N.E.Br. | LC | Indigenous; Endemic |
| **Pteridaceae** | *Cheilanthes contracta* | (Kunze) Mett. ex Kuhn | LC | Indigenous; Endemic |
| **Pteridaceae** | *Cheilanthes multifida var. multifida* | (Sw.) Sw. | LC | Indigenous |
| **Aizoaceae** | *Cheiridopsis namaquensis* | (Sond.) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Chenopodiopsis hirta* | (L.f.) Hilliard | LC | Indigenous; Endemic |
| **Gentianaceae** | *Chironia linoides subsp. linoides* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Chrysocoma ciliata* | L. | LC | Indigenous |
| **Asteraceae** | *Chrysocoma oblongifolia* | DC. | LC | Indigenous; Endemic |
| **Poaceae** | *Cladoraphis spinosa* | (L.f.) S.M.Phillips | LC | Indigenous |
| **Aizoaceae** | *Cleretum bellidiforme* | (Burm.f.) G.D.Rowley | LC | Indigenous; Endemic |
| **Aizoaceae** | *Cleretum rourkei* | (L.Bolus) Klak | LC | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia amplexistipula* | Schltr. | LC | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia baccans* | Harv. | LC | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia erectisepala* | Weim. | LC | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia juniperina var. juniperina* | L.f. | | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia ruscifolia var. ruscifolia* | L. | LC | Indigenous; Endemic |
| **Rosaceae** | *Cliffortia teretifolia* | L.f. | LC | Indigenous; Endemic |
| **Peraceae** | *Clutia polifolia* | Jacq. | LC | Indigenous; Endemic |
| **Peraceae** | *Clutia pubescens* | Thunb. | LC | Indigenous; Endemic |
| **Peraceae** | *Clutia sp.* | | | |
| **Colchicaceae** | *Colchicum capense subsp. ciliolatum* | (L.) J.C.Manning & Vinn. | LC | Indigenous; Endemic |
| **Rutaceae** | *Coleonema juniperinum* | Sond. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Conicosia pugioniformis* | (L.) N.E.Br. | | Indigenous; Endemic |
| **Aizoaceae** | *Conicosia pugioniformis subsp. pugioniformis* | (L.) N.E.Br. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Conophytum minusculum* | (N.E.Br.) N.E.Br. | | Indigenous; Endemic |

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| **Aizoaceae** | *Conophytum obcordellum* | (Haw.) N.E.Br. | | Indigenous; Endemic |
| **Aizoaceae** | *Conophytum sp.* | | | |
| **Aizoaceae** | *Conophytum truncatum subsp. viridicatum* | (Thunb.) N.E.Br. | LC | Indigenous; Endemic |
| **Convolvulaceae** | *Convolvulus capensis* | Burm.f. | LC | Indigenous; Endemic |
| **Asteraceae** | *Cotula barbata* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Cotula microglossa* | (DC.) O.Hoffm. & Kuntze ex Kuntze | LC | Indigenous; Endemic |
| **Asteraceae** | *Cotula pedicellata* | Compton | LC | Indigenous; Endemic |
| **Asteraceae** | *Cotula sp.* | | | |
| **Asteraceae** | *Cotula thunbergii* | Harv. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Cotyledon orbiculata var. orbiculata* | L. | LC | Indigenous |
| **Asteraceae** | *Crassothonna cylindrica* | (Lam.) B.Nord. | LC | Indigenous |
| **Asteraceae** | *Crassothonna floribunda* | (Schltr.) B.Nord. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Crassula atropurpurea var. watermeyeri* | (Haw.) D.Dietr. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Crassula dichotoma* | L. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Crassula expansa subsp. expansa* | Aiton | LC | Indigenous |
| **Crassulaceae** | *Crassula fascicularis* | Lam. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Crassula muscosa var. muscosa* | L. | NE | Indigenous |
| **Crassulaceae** | *Crassula muscosa var. obtusifolia* | L. | NE | Indigenous |
| **Amaryllidaceae** | *Crossyne flava* | (W.F.Barker ex Snijman) D.Mull.-Doblies & U.Mull.-Doblies | LC | Indigenous; Endemic |
| **Asteraceae** | *Cullumia bisulca* | (Thunb.) Less. | LC | Indigenous; Endemic |
| **Tecophilaeaceae** | *Cyanella hyacinthoides* | Royen ex L. | LC | Indigenous; Endemic |
| **Tecophilaeaceae** | *Cyanella orchidiformis* | Jacq. | LC | Indigenous; Endemic |
| **Apocynaceae** | *Cynanchum africanum* | (L.) Hoffmanns. | LC | Indigenous; Endemic |
| **Poaceae** | *Cynodon dactylon* | (L.) Pers. | LC | Indigenous |
| **Cyperaceae** | *Cyperus longus var. tenuiflorus* | L. | NE | Indigenous |
| **Lobeliaceae** | *Cyphia schlechteri* | E.Phillips | LC | Indigenous; Endemic |
| **Lobeliaceae** | *Cyphia sylvatica* | Eckl. & Zeyh. | | Indigenous; Endemic |
| **Apiaceae** | *Dasispermum hispidum* | (Thunb.) Magee & B.-E.van Wyk | LC | Indigenous; Endemic |
| **Aizoaceae** | *Delosperma crassum* | L.Bolus | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia ellaphieae* | K.E.Steiner | EN | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia elongata* | Benth. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia longicornis* | (Thunb.) Druce | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia sacculata* | Benth. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Diascia sp.* | | | |
| **Asteraceae** | *Didelta carnosa var. carnosa* | (L.f.) Aiton | LC | Indigenous |
| **Asteraceae** | *Didelta spinosa* | (L.f.) Aiton | LC | Indigenous |
| **Asteraceae** | *Dimorphotheca pinnata* | (Thunb.) Harv. | | Indigenous |
| **Asteraceae** | *Dimorphotheca pluvialis* | (L.) Moench | LC | Indigenous |
| **Asteraceae** | *Dimorphotheca sinuata* | DC. | LC | Indigenous |

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| **Rutaceae** | *Diosma acmaeophylla* | Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Ebenaceae** | *Diospyros austroafricana var. austroafricana* | De Winter | LC | Indigenous; Endemic |
| **Ebenaceae** | *Diospyros austroafricana var. rugosa* | De Winter | LC | Indigenous; Endemic |
| **Ebenaceae** | *Diospyros glabra* | (L.) De Winter | LC | Indigenous; Endemic |
| **Ebenaceae** | *Diospyros sp.* | | | |
| **Hyacinthaceae** | *Dipcadi brevifolium* | (Thunb.) Fourc. | LC | Indigenous |
| **Orchidaceae** | *Disa flexuosa* | (L.) Sw. | NT | Indigenous; Endemic |
| **Orchidaceae** | *Disa racemosa* | L.f. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Dischisma capitatum* | (Thunb.) Choisy | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Dischisma spicatum* | (Thunb.) Choisy | LC | Indigenous |
| **Scrophulariaceae** | *Dischisma squarrosum* | Schltr. | EN | Indigenous; Endemic |
| **Orchidaceae** | *Disperis circumflexa subsp. aemula* | (L.) T.Durand & Schinz | LC | Indigenous; Endemic |
| **Sapindaceae** | *Dodonaea viscosa var. angustifolia* | Jacq. | LC | Indigenous |
| **Hyacinthaceae** | *Drimia convallarioides* | (L.f.) J.C.Manning & Goldblatt | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Drimia fragrans* | (Jacq.) J.C.Manning & Goldblatt | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Drimia vermiformis* | J.C.Manning & Goldblatt | LC | Indigenous |
| **Aizoaceae** | *Drosanthemopsis diversifolia* | (L.Bolus) Klak | | Indigenous; Endemic |
| **Aizoaceae** | *Drosanthemum sp.* | | | |
| **Droseraceae** | *Drosera alba* | E.Phillips | LC | Indigenous; Endemic |
| **Droseraceae** | *Drosera cistiflora* | L. | LC | Indigenous; Endemic |
| **Droseraceae** | *Drosera pauciflora* | Banks ex DC. | LC | Indigenous; Endemic |
| **Putranjivaceae** | *Drypetes arguta* | (Mull.Arg.) Hutch. | LC | Indigenous |
| **Poaceae** | *Ehrharta calycina* | Sm. | LC | Indigenous |
| **Poaceae** | *Ehrharta capensis* | Thunb. | LC | Indigenous; Endemic |
| **Poaceae** | *Ehrharta delicatula* | Stapf | LC | Indigenous |
| **Poaceae** | *Ehrharta longiflora* | Sm. | LC | Indigenous |
| **Poaceae** | *Ehrharta ramosa subsp. aphylla* | (Thunb.) Thunb. | LC | Indigenous; Endemic |
| **Poaceae** | *Ehrharta ramosa subsp. ramosa* | (Thunb.) Thunb. | LC | Indigenous; Endemic |
| **Poaceae** | *Ehrharta sp.* | | | |
| **Poaceae** | *Ehrharta thunbergii* | Gibbs Russ. | LC | Indigenous |
| **Poaceae** | *Ehrharta villosa var. villosa* | Schult.f. | LC | Indigenous; Endemic |
| **Asteraceae** | *Elytropappus hispidus* | (L.f.) Druce | LC | Indigenous; Endemic |
| **Asteraceae** | *Elytropappus sp.* | | | |
| **Polygonaceae** | *Emex australis* | Steinh. | LC | Indigenous |
| **Hypoxidaceae** | *Empodium flexile* | (Nel) M.F.Thomps. ex Snijman | LC | Indigenous; Endemic |
| **Hypoxidaceae** | *Empodium namaquensis* | (Baker) M.F.Thomps. | LC | Indigenous; Endemic |
| **Poaceae** | *Eragrostis curvula* | (Schrad.) Nees | LC | Indigenous |
| **Poaceae** | *Eragrostis sarmentosa* | (Thunb.) Trin. | LC | Indigenous |

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| **Ericaceae** | *Erica bruniades* | L. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica caffra var. caffra* | L. | LC | Indigenous |
| **Ericaceae** | *Erica coccinea subsp. coccinea* | L. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica cristiflora var. cristiflora* | Salisb. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica daphniflora var. daphniflora* | Salisb. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica florifera* | (Compton) E.G.H.Oliv. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica imbricata* | L. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica inaequalis* | (Klotzsch) E.G.H.Oliv. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica muscosa* | (Aiton) E.G.H.Oliv. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica plukenetii subsp. plukenetii* | L. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica plumosa* | Thunb. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica quadrangularis* | Salisb. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica totta* | Thunb. | LC | Indigenous; Endemic |
| **Ericaceae** | *Erica verecunda* | Salisb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Eriocephalus africanus var. paniculatus* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Eriocephalus punctulatus* | DC. | LC | Indigenous |
| **Asteraceae** | *Eriocephalus racemosus var. affinis* | L. | LC | Indigenous; Endemic |
| **Ruscaceae** | *Eriospermum aphyllum* | Marloth | LC | Indigenous; Endemic |
| **Ruscaceae** | *Eriospermum paradoxum* | (Jacq.) Ker Gawl. | LC | Indigenous; Endemic |
| **Ebenaceae** | *Euclea acutifolia* | E.Mey. ex A.DC. | LC | Indigenous; Endemic |
| **Ebenaceae** | *Euclea linearis* | Zeyh. ex Hiern | LC | Indigenous |
| **Ebenaceae** | *Euclea natalensis subsp. capensis* | A.DC. | LC | Indigenous; Endemic |
| **Ebenaceae** | *Euclea tomentosa* | E.Mey. ex A.DC. | LC | Indigenous; Endemic |
| **Euphorbiaceae** | *Euphorbia burmannii* | (Klotzsch ex Garcke) E.Mey. ex Boiss. | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia caput-medusae* | L. | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia hamata* | (Haw.) Sweet | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia loricata* | Lam. | LC | Indigenous; Endemic |
| **Euphorbiaceae** | *Euphorbia rhombifolia* | Boiss. | LC | Indigenous |
| **Euphorbiaceae** | *Euphorbia sp.* | | | |
| **Euphorbiaceae** | *Euphorbia tenax* | Burch. | LC | Indigenous; Endemic |
| **Euphorbiaceae** | *Euphorbia tuberosa* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Euryops multifidus* | (Thunb.) DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Euryops speciosissimus* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Euryops tenuissimus subsp. tenuissimus* | (L.) DC. | LC | Indigenous |
| **Asteraceae** | *Euryops tenuissimus subsp. trifurcatus* | (L.) DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Euryops thunbergii* | B.Nord. | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia australis* | (Alston) E.Phillips | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia dregei* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia dubia* | Cass. | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia fruticosa subsp. fruticosa* | (L.) G.Nicholson | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia heterophylla* | (Cass.) Grau | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia hirta* | (Thunb.) Grau | LC | Indigenous; Endemic |

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| **Asteraceae** | *Felicia minima* | (Hutch.) Grau | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia puberula* | Grau | LC | Indigenous; Endemic |
| **Asteraceae** | *Felicia tenella subsp. pusilla* | (L.) Nees | LC | Indigenous; Endemic |
| **Iridaceae** | *Ferraria ferrariola* | (Jacq.) Willd. | LC | Indigenous; Endemic |
| **Iridaceae** | *Ferraria variabilis* | Goldblatt & J.C.Manning | LC | Indigenous; Endemic |
| **Poaceae** | *Festuca scabra* | Vahl | LC | Indigenous |
| **Cyperaceae** | *Ficinia argyropa* | Nees | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia bulbosa* | (L.) Nees | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia deusta* | (P.J.Bergius) Levyns | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia indica* | (Lam.) H.Pfeiff. | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia laevis* | (Vahl) Nees | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia nigrescens* | (Schrad.) J.Raynal | LC | Indigenous |
| **Cyperaceae** | *Ficinia quartzicola* | Muasya & Helme | VU | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia secunda* | (Vahl) Kunth | LC | Indigenous; Endemic |
| **Cyperaceae** | *Ficinia sp.* | | | |
| **Poaceae** | *Fingerhuthia africana* | Lehm. | LC | Indigenous |
| **Fissidentaceae** | *Fissidens ovatus* | Brid. | | Indigenous |
| **Fissidentaceae** | *Fissidens plumosus* | Hornsch. | | Indigenous |
| **Fissidentaceae** | *Fissidens rufescens* | Hornsch. | | Indigenous |
| **Fossombroniaceae** | *Fossombronia crispa* | Nees | | Indigenous |
| **Fossombroniaceae** | *Fossombronia hyalorhiza* | Perold | | Indigenous; Endemic |
| **Fossombroniaceae** | *Fossombronia monticola* | Perold | | Indigenous; Endemic |
| **Asteraceae** | *Foveolina dichotoma* | (DC.) Kallersjo | LC | Indigenous |
| **Iridaceae** | *Freesia viridis* | (Aiton) Goldblatt & J.C.Manning | | Indigenous |
| **Iridaceae** | *Freesia viridis subsp. crispifolia* | (Aiton) Goldblatt & J.C.Manning | LC | Indigenous |
| **Cyperaceae** | *Fuirena hirsuta* | (P.J.Bergius) P.L.Forbes | LC | Indigenous |
| **Aizoaceae** | *Galenia africana* | L. | LC | Indigenous |
| **Aizoaceae** | *Galenia fruticosa* | (L.f.) Sond. | LC | Indigenous |
| **Asteraceae** | *Gazania krebsiana subsp. krebsiana* | Less. | LC | Indigenous |
| **Asteraceae** | *Gazania serrata* | DC. | LC | Indigenous; Endemic |
| **Iridaceae** | *Geissorhiza aspera* | Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Geissorhiza longifolia* | (G.J.Lewis) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Geissorhiza ornithogaloides subsp. marlothii* | Klatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Geissorhiza scillaris* | A.Dietr. | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis barkerae subsp. barkerae* | D.Mull.-Doblies | DD | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis britteniana subsp. britteniana* | Baker | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis ciliaris subsp. ciliaris* | (Thunb.) Thunb. | NT | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis linearis* | L.Bolus | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis marginata* | D.Mull.-Doblies | | Indigenous; Endemic |
| **Amaryllidaceae** | *Gethyllis sp.* | | | |

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| **Amaryllidaceae** | *Gethyllis undulata* | Herb. | | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus alatus* | L. | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus carinatus* | Aiton | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus caryophyllaceus* | (Burm.f.) Poir. | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus guthriei* | F.Bolus | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus pulcherrimus* | (G.J.Lewis) Goldblatt & J.C.Manning | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus scullyi* | Baker | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus venustus* | G.J.Lewis | LC | Indigenous; Endemic |
| **Iridaceae** | *Gladiolus viridiflorus* | G.J.Lewis | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Globulariopsis tephrodes* | (E.Mey.) Hilliard | LC | Indigenous; Endemic |
| **Thymelaeaceae** | *Gnidia clavata* | Schinz | LC | Indigenous; Endemic |
| **Apocynaceae** | *Gomphocarpus fruticosus subsp. fruticosus* | (L.) W.T.Aiton | LC | Indigenous |
| **Arnelliacea e** | *Gongylanthus scariosus* | (Lehm.) Steph. | | Indigenous |
| **Arnelliacea e** | *Gongylanthus sp.* | | | |
| **Neuradacea e** | *Grielum humifusum* | Thunb. | | Indigenous |
| **Neuradacea e** | *Grielum humifusum var. humifusum* | Thunb. | LC | Indigenous |
| **Grimmiacea e** | *Grimmia laevigata* | (Brid.) Brid. | | Indigenous |
| **Asteraceae** | *Gymnodiscus capillaris* | (L.f.) DC. | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Haemanthus crispus* | Snijman | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Haemanthus pubescens subsp. leipoldtii* | L.f. | VU | Indigenous; Endemic |
| **Amaryllidaceae** | *Haemanthus sanguineus* | Jacq. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Haworthia nortieri var. nortieri* | G.G.Sm. | NE | Indigenous; Endemic |
| **Scrophulariaceae** | *Hebenstretia lanceolata* | (E.Mey.) Rolfe | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Hebenstretia repens* | Jaroscz | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Heeria argentea* | (Thunb.) Meisn. | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum cylindriflorum* | (L.) Hilliard & B.L.Burtt | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum dasyanthum* | (Willd.) Sweet | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum jubilatum* | Hilliard | EN | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum lambertianum* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum leontonyx* | DC. | LC | Indigenous |
| **Asteraceae** | *Helichrysum moeserianum* | Thell. | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum scabrum* | (Thunb.) Less. | LC | Indigenous; Endemic |
| **Asteraceae** | *Helichrysum sp.* | | | |
| **Asteraceae** | *Helichrysum zeyheri* | Less. | LC | Indigenous |
| **Brassicaceae** | *Heliophila amplexicaulis* | L.f. | LC | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila arenaria var. arenaria* | Sond. | LC | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila coronopifolia* | L. | LC | Indigenous |
| **Brassicaceae** | *Heliophila crithmifolia* | Willd. | LC | Indigenous |

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| **Brassicaceae** | *Heliophila digitata* | L.f. | LC | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila elata var. elata* | Sond. | NE | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila juncea* | (P.J.Bergius) Druce | LC | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila monosperma* | Al-Shehbaz & Mumm. | LC | Indigenous; Endemic |
| **Brassicaceae** | *Heliophila variabilis* | Burch. ex DC. | LC | Indigenous |
| **Boraginaceae** | *Heliotropium curassavicum* | L. | | Not indigenous; Naturalised |
| **Boraginaceae** | *Heliotropium supinum* | L. | | Not indigenous; Naturalised |
| **Scrophulariaceae** | *Hemimeris racemosa* | (Houtt.) Merr. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia aspera* | J.C.Wendl. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia cuneifolia var. cuneifolia* | Jacq. | LC | Indigenous |
| **Malvaceae** | *Hermannia heterophylla* | (Cav.) Thunb. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia modesta* | (Ehrenb.) Mast. | LC | Indigenous |
| **Malvaceae** | *Hermannia multiflora* | Jacq. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia prismatocarpa* | E.Mey. ex Harv. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia sisymbriifolia* | (Turcz.) Hochr. | LC | Indigenous; Endemic |
| **Malvaceae** | *Hermannia sp.* | | | |
| **Malvaceae** | *Hermannia trifurca* | L. | LC | Indigenous |
| **Amaranthaceae** | *Hermbstaedtia odorata var. odorata* | (Burch.) T.Cooke | NE | Indigenous |
| **Iridaceae** | *Hesperantha bachmannii* | Baker | LC | Indigenous; Endemic |
| **Iridaceae** | *Hesperantha erecta* | (Baker) Benth. ex Baker | NT | Indigenous; Endemic |
| **Iridaceae** | *Hesperantha falcata* | (L.f.) Ker Gawl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Hesperantha radiata* | (Jacq.) Ker Gawl. | LC | Indigenous |
| **Amaryllidaceae** | *Hessea stellaris* | (Jacq.) Herb. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Holothrix aspera* | (Lindl.) Rchb.f. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Holothrix secunda* | (Thunb.) Rchb.f. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Holothrix villosa var. villosa* | Lindl. | LC | Indigenous; Endemic |
| **Asteraceae** | *Hoplophyllum spinosum* | DC. | LC | Indigenous; Endemic |
| **Poaceae** | *Hordeum murinum subsp. glaucum* | L. | NE | Not indigenous; Naturalised |
| **Picrodendraceae** | *Hyaenanche globosa* | (Gaertn.) Lamb. & Vahl | LC | Indigenous; Endemic |
| **Asteraceae** | *Hymenolepis crithmifolia* | (L.) Greuter, M.V.Agab. & Wagenitz | LC | Indigenous; Endemic |
| **Orobanchaceae** | *Hyobanche sanguinea* | L. | LC | Indigenous |
| **Poaceae** | *Hyparrhenia hirta* | (L.) Stapf | LC | Indigenous |
| **Fabaceae** | *Indigofera alternans* | DC. | | Indigenous |
| **Fabaceae** | *Indigofera amoena* | Aiton | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera dillwynioides* | Benth. ex Harv. | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera filicaulis* | Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera frutescens* | L.f. | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera gifbergensis* | C.H.Stirt. & Jarvie | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera procumbens* | L. | LC | Indigenous; Endemic |
| **Fabaceae** | *Indigofera sp.* | | | |

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| **Cyperaceae** | *Isolepis incomtula* | Nees | LC | Indigenous; Endemic |
| **Iridaceae** | *Ixia namaquana* | L.Bolus | LC | Indigenous; Endemic |
| **Iridaceae** | *Ixia paniculata* | D.Delaroche | LC | Indigenous; Endemic |
| **Iridaceae** | *Ixia scillaris* | L. | | Indigenous; Endemic |
| **Iridaceae** | *Ixia scillaris subsp. toximontana* | L. | LC | Indigenous; Endemic |
| **Acanthaceae** | *Justicia cuneata* | Vahl | | Indigenous |
| **Acanthaceae** | *Justicia cuneata subsp. latifolia* | Vahl | LC | Indigenous; Endemic |
| **Campanulaceae** | *Kericodon crispus* | (L'Her.) Cupido | | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia mutabilis* | Lodd. ex Sweet | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia patula* | Jacq. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia pusilla* | Jacq. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia sp.* | | | |
| **Hyacinthaceae** | *Lachenalia splendida* | Diels | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia suaveolens* | (W.F.Barker) G.D.Duncan | | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia undulata* | Masson ex Baker | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia ventricosa* | Schltr. ex W.F.Barker | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Lachenalia violacea* | Jacq. | | Indigenous; Endemic |
| **Santalaceae** | *Lacomucinaea lineata* | (L.f.) Nickrent & M.A.Garcia | | Indigenous |
| **Aizoaceae** | *Lampranthus glaucus* | (L.) N.E.Br. | VU | Indigenous; Endemic |
| **Aizoaceae** | *Lampranthus haworthii* | (Haw.) N.E.Br. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Lampranthus pakhuisensis* | (L.Bolus) L.Bolus | DD | Indigenous; Endemic |
| **Aizoaceae** | *Lampranthus vanputtenii* | (L.Bolus) N.E.Br. | DD | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia anceps* | (L.f.) Ker Gawl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia angustifolia* | Schltr. | | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia divaricata* | Baker | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia fabricii* | (D.Delaroche) Ker Gawl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia fabricii subsp. fabricii* | (D.Delaroche) Ker Gawl. | | Indigenous |
| **Iridaceae** | *Lapeirousia jacquinii* | N.E.Br. | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia pyramidalis subsp. pyramidalis* | (Lam.) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia pyramidalis subsp. regalis* | (Lam.) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Lapeirousia sp.* | | | |
| **Fabaceae** | *Lebeckia ambigua* | E.Mey. | LC | Indigenous; Endemic |
| **Fabaceae** | *Lebeckia plukenetiana* | E.Mey. | EN | Indigenous; Endemic |
| **Fabaceae** | *Leobordea pentaphylla* | (E.Mey.) B.-E.van Wyk & Boatwr. | LC | Indigenous; Endemic |
| **Brassicaceae** | *Lepidium pinnatum* | Thunb. | LC | Indigenous; Endemic |
| **Poaceae** | *Leptochloa fusca* | (L.) Kunth | LC | Indigenous |
| **Fabaceae** | *Lessertia argentea* | Harv. | EN | Indigenous; Endemic |
| **Fabaceae** | *Lessertia frutescens subsp. frutescens* | (L.) Goldblatt & J.C.Manning | LC | Indigenous |
| **Fabaceae** | *Lessertia frutescens subsp. microphylla* | (L.) Goldblatt & J.C.Manning | LC | Indigenous |

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| **Fabaceae** | *Lessertia rigida* | E.Mey. | LC | Indigenous; Endemic |
| **Fabaceae** | *Lessertia sp.* | | | |
| **Proteaceae** | *Leucadendron loranthifolium* | (Salisb. ex Knight) I.Williams | NT | Indigenous; Endemic |
| **Proteaceae** | *Leucadendron pubescens* | R.Br. | LC | Indigenous; Endemic |
| **Proteaceae** | *Leucadendron rubrum* | Burm.f. | LC | Indigenous; Endemic |
| **Proteaceae** | *Leucadendron salignum* | P.J.Bergius | LC | Indigenous; Endemic |
| **Asteraceae** | *Leucoptera subcarnosa* | B.Nord. | LC | Indigenous; Endemic |
| **Proteaceae** | *Leucospermum calligerum* | (Salisb. ex Knight) Rourke | LC | Indigenous; Endemic |
| **Proteaceae** | *Leucospermum praemorsum* | (Meisn.) E.Phillips | VU | Indigenous; Endemic |
| **Asteraceae** | *Leysera gnaphalodes* | (L.) L. | LC | Indigenous |
| **Limeaceae** | *Limeum aethiopicum var. aethiopicum* | Burm.f. | NE | Indigenous; Endemic |
| **Limeaceae** | *Limeum africanum* | L. | | Indigenous |
| **Limeaceae** | *Limeum africanum subsp. africanum* | L. | LC | Indigenous; Endemic |
| **Limeaceae** | *Limeum africanum subsp. canescens* | L. | LC | Indigenous; Endemic |
| **Lobeliaceae** | *Lobelia erinus* | L. | LC | Indigenous |
| **Lobeliaceae** | *Lobelia linearis* | Thunb. | LC | Indigenous; Endemic |
| **Lobeliaceae** | *Lobelia sp.* | | | |
| **Boraginaceae** | *Lobostemon cinereus* | DC. & A.DC. | | Indigenous; Endemic |
| **Boraginaceae** | *Lobostemon glaucophyllus* | (Jacq.) H.Buek | LC | Indigenous; Endemic |
| **Boraginaceae** | *Lobostemon trichotomus* | (Thunb.) DC. | LC | Indigenous; Endemic |
| **Fabaceae** | *Lotononis leptoloba* | Bolus | LC | Indigenous; Endemic |
| **Fabaceae** | *Lotononis parviflora* | (P.J.Bergius) D.Dietr. | LC | Indigenous; Endemic |
| **Fabaceae** | *Lotononis sabulosa* | T.M.Salter | LC | Indigenous; Endemic |
| **Fabaceae** | *Lotononis stenophylla* | (Eckl. & Zeyh.) B.-E.van Wyk | LC | Indigenous; Endemic |
| **Fabaceae** | *Lupinus angustifolius* | L. | NE | Not indigenous; Naturalised |
| **Solanaceae** | *Lycium sp.* | | | |
| **Scrophulariaceae** | *Lyperia tristis* | (L.f.) Benth. | LC | Indigenous |
| **Aizoaceae** | *Malephora framesii* | (L.Bolus) H.Jacobsen & Schwantes | LC | Indigenous; Endemic |
| **Aizoaceae** | *Malephora purpureocrocea* | (Haw.) Schwantes | LC | Indigenous; Endemic |
| **Amaranthaceae** | *Manochlamys albicans* | (Aiton) Aellen | LC | Indigenous |
| **Scrophulariaceae** | *Manulea altissima subsp. altissima* | L.f. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea altissima subsp. longifolia* | L.f. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea cheiranthus* | (L.) L. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea decipiens* | Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea laxa* | Schltr. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea ramulosa* | Hilliard | CR | Indigenous; Endemic |
| **Scrophulariaceae** | *Manulea sp.* | | | |
| **Hyacinthaceae** | *Massonia depressa* | Houtt. | LC | Indigenous; Endemic |
| **Fabaceae** | *Medicago sativa* | L. | NE | Not indigenous; Cultivated; Naturalised; Invasive |

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| **Iridaceae** | *Melasphaerula graminea* | (L.f.) Ker Gawl. | LC | Indigenous |
| **Melianthaceae** | *Melianthus elongatus* | Wijnands | LC | Indigenous; Endemic |
| **Melianthaceae** | *Melianthus pectinatus subsp. gariepinus* | Harv. | LC | Indigenous |
| **Fabaceae** | *Melilotus indicus* | (L.) All. | NE | Not indigenous; Naturalised; Invasive |
| **Poaceae** | *Melinis repens subsp. repens* | (Willd.) Zizka | LC | Indigenous |
| **Fabaceae** | *Melolobium aethiopicum* | (L.) Druce | LC | Indigenous; Endemic |
| **Lamiaceae** | *Mentha longifolia subsp. capensis* | (L.) Huds. | LC | Indigenous |
| **Aizoaceae** | *Mesembryanthemum brevicarpum* | (L.Bolus) Klak | | Indigenous |
| **Aizoaceae** | *Mesembryanthemum dinteri* | Engl. | | Indigenous |
| **Aizoaceae** | *Mesembryanthemum junceum* | Haw. | | Indigenous; Endemic |
| **Aizoaceae** | *Mesembryanthemum noctiflorum subsp. defoliatum* | L. | | Indigenous; Endemic |
| **Aizoaceae** | *Mesembryanthemum noctiflorum subsp. noctiflorum* | L. | | Indigenous |
| **Aizoaceae** | *Mesembryanthemum nodiflorum* | L. | LC | Indigenous |
| **Aizoaceae** | *Mesembryanthemum pallens subsp. lanceum* | Aiton | | Indigenous; Endemic |
| **Aizoaceae** | *Mesembryanthemum pallens subsp. pallens* | Aiton | | Indigenous; Endemic |
| **Aizoaceae** | *Mesembryanthemum sp.* | | | |
| **Aizoaceae** | *Mesembryanthemum spinuliferum* | Haw. | | Indigenous; Endemic |
| **Asteraceae** | *Metalasia fastigiata* | (Thunb.) D.Don | LC | Indigenous; Endemic |
| **Asteraceae** | *Metalasia seriphiifolia* | DC. | VU | Indigenous; Endemic |
| **Myrtaceae** | *Metrosideros angustifolia* | (L.) Sm. | LC | Indigenous; Endemic |
| **Iridaceae** | *Micranthus plantagineus* | (Aiton) Eckl. | | Indigenous; Endemic |
| **Scrophulariaceae** | *Microdon dubius* | (L.) Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Microdon polygaloides* | (L.f.) Druce | LC | Indigenous; Endemic |
| **Apocynaceae** | *Microloma sagittatum* | (L.) R.Br. | LC | Indigenous; Endemic |
| **Lobeliaceae** | *Monopsis debilis var. depressa* | (L.f.) C.Presl | NE | Indigenous; Endemic |
| **Montiniaceae** | *Montinia caryophyllacea* | Thunb. | LC | Indigenous |
| **Iridaceae** | *Moraea amabilis* | Diels | LC | Indigenous |
| **Iridaceae** | *Moraea brachygyne* | (Schltr.) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea ciliata* | (L.f.) Ker Gawl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea demissa* | Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea flaccida* | (Sweet) Steud. | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea flavescens* | (Goldblatt) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea fugax* | (D.Delaroche) Jacq. | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea galaxia* | (L.f.) Goldblatt & J.C.Manning | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea lewisiae subsp. lewisiae* | (Goldblatt) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea lewisiae subsp. secunda* | (Goldblatt) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea luteoalba* | (Goldblatt) Goldblatt | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea miniata* | Andrews | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea minor* | Eckl. | LC | Indigenous; Endemic |
| **Iridaceae** | *Moraea serpentina* | Baker | LC | Indigenous; Endemic |
| **Polygalaceae** | *Muraltia alopecuroides* | (L.) DC. | LC | Indigenous; Endemic |

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| **Polygalaceae** | *Muraltia divaricata* | Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Polygalaceae** | *Muraltia heisteria* | (L.) DC. | LC | Indigenous; Endemic |
| **Polygalaceae** | *Muraltia parvifolia* | N.E.Br. | LC | Indigenous; Endemic |
| **Polygalaceae** | *Muraltia spinosa* | (L.) F.Forest & J.C.Manning | LC | Indigenous; Endemic |
| **Asteraceae** | *Myrovernix glandulosus* | Koekemoer | | Indigenous; Endemic |
| **Scrophulariaceae** | *Nemesia anisocarpa* | E.Mey. ex Benth. | LC | Indigenous |
| **Scrophulariaceae** | *Nemesia bicornis* | (L.) Pers. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Nemesia cheiranthus* | E.Mey. ex Benth. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Nemesia ligulata* | E.Mey. ex Benth. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Nemesia macroceras var. macroceras* | Schltr. | NE | Indigenous; Endemic |
| **Scrophulariaceae** | *Nemesia pulchella* | Schltr. ex Hiern | LC | Indigenous; Endemic |
| **Rubiaceae** | *Nenax arenicola* | Puff | LC | Indigenous; Endemic |
| **Rubiaceae** | *Nenax divaricata* | T.M.Salter | LC | Indigenous; Endemic |
| **Asteraceae** | *Oedera genistifolia* | (L.) Anderb. & K.Bremer | LC | Indigenous; Endemic |
| **Asteraceae** | *Oedera sedifolia* | (DC.) Anderb. & K.Bremer | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Oftia africana* | (L.) Bocq. | LC | Indigenous; Endemic |
| **Asteraceae** | *Oncosiphon grandiflorus* | (Thunb.) Kallersjo | LC | Indigenous |
| **Asteraceae** | *Oncosiphon suffruticosus* | (L.) Kallersjo | LC | Indigenous |
| **Hyacinthaceae** | *Ornithogalum dubium* | Houtt. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Ornithogalum hispidum subsp. hispidum* | Hornem. | LC | Indigenous |
| **Hyacinthaceae** | *Ornithogalum maculatum* | Jacq. | LC | Indigenous; Endemic |
| **Hyacinthaceae** | *Ornithogalum pruinosum* | F.M.Leight. | LC | Indigenous |
| **Colchicaceae** | *Ornithoglossum parviflorum var. parviflorum* | B.Nord. | NE | Indigenous |
| **Orobanchaceae** | *Orobanche ramosa* | L. | NE | Not indigenous; Naturalised; Invasive |
| **Aizoaceae** | *Oscularia lunata* | (Willd.) H.E.K.Hartmann | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum bidens* | Thunb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum grandiflorum* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum hyoseroides* | (DC.) Norl. | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum incanum subsp. incanum* | Burm.f. | LC | Indigenous |
| **Asteraceae** | *Osteospermum leptolobum* | (Harv.) Norl. | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum oppositifolium* | (Aiton) Norl. | LC | Indigenous |
| **Asteraceae** | *Osteospermum rigidum var. elegans* | Aiton | LC | Indigenous; Endemic |
| **Asteraceae** | *Osteospermum sinuatum var. sinuatum* | (DC.) Norl. | LC | Indigenous |
| **Asteraceae** | *Othonna cuneata* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Othonna hederifolia* | B.Nord. | LC | Indigenous; Endemic |
| **Asteraceae** | *Othonna parviflora* | P.J.Bergius | LC | Indigenous; Endemic |
| **Asteraceae** | *Othonna perfoliata* | (L.f.) Jacq. | LC | Indigenous |
| **Asteraceae** | *Othonna petiolaris* | DC. | EN | Indigenous; Endemic |

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| **Asteraceae** | *Othonna quinquedentata* | Thunb. | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis ambigua* | Jacq. | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis obtusa* | Jacq. | LC | Indigenous |
| **Oxalidaceae** | *Oxalis oligophylla* | T.M.Salter | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis pillansiana* | T.M.Salter & Exell | DD | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis purpurea* | L. | LC | Indigenous |
| **Oxalidaceae** | *Oxalis tenella* | Jacq. | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis tenuis* | T.M.Salter | LC | Indigenous; Endemic |
| **Oxalidaceae** | *Oxalis viscosa* | E.Mey. ex Sond. | LC | Indigenous; Endemic |
| **Proteaceae** | *Paranomus bracteolaris* | Salisb. ex Knight | LC | Indigenous; Endemic |
| **Thymelaeaceae** | *Passerina truncata subsp. truncata* | (Meisn.) Bredenk. & A.E.van Wyk | LC | Indigenous; Endemic |
| **Hypoxidaceae** | *Pauridia gracilipes subsp. gracilipes* | (Schltr.) Snijman & Kocyan | | Indigenous; Endemic |
| **Hypoxidaceae** | *Pauridia pusilla* | (Snijman) Snijman & Kocyan | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium alchemilloides* | (L.) L'Her. | LC | Indigenous |
| **Geraniaceae** | *Pelargonium alternans subsp. alternans* | J.C.Wendl. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium anethifolium* | (Eckl. & Zeyh.) Steud. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium carnosum subsp. carnosum* | (L.) L'Her. | LC | Indigenous |
| **Geraniaceae** | *Pelargonium crassipes* | Harv. | EN | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium fulgidum* | (L.) L'Her. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium longiflorum* | Jacq. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium longifolium* | (Burm.f.) Jacq. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium nanum* | L'Her. | LC | Indigenous |
| **Geraniaceae** | *Pelargonium oenothera* | (L.f.) Jacq. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium polycephalum* | (Harv.) E.Mey. ex R.Knuth | LC | Indigenous |
| **Geraniaceae** | *Pelargonium praemorsum subsp. praemorsum* | (Andrews) F.Dietr. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium radulifolium* | (Eckl. & Zeyh.) Steud. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium scabrum* | (L.) L'Her. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium senecioides* | L'Her. | LC | Indigenous; Endemic |
| **Geraniaceae** | *Pelargonium triste* | (L.) L'Her. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Peliostomum virgatum* | E.Mey. ex Benth. | LC | Indigenous |
| **Pteridaceae** | *Pellaea pteroides* | (L.) Prantl | LC | Indigenous; Endemic |
| **Poaceae** | *Pentameris airoides subsp. airoides* | Nees | LC | Indigenous |
| **Poaceae** | *Pentameris aristidoides* | (Thunb.) Galley & H.P.Linder | LC | Indigenous |
| **Poaceae** | *Pentameris capillaris* | (Thunb.) Galley & H.P.Linder | LC | Indigenous |
| **Poaceae** | *Pentameris curvifolia* | (Schrad.) Nees | LC | Indigenous |
| **Poaceae** | *Pentameris eriostoma* | (Nees) Steud. | LC | Indigenous |
| **Poaceae** | *Pentameris glandulosa* | (Schrad.) Steud. | LC | Indigenous |
| **Poaceae** | *Pentameris pallida* | (Thunb.) Galley & H.P.Linder | LC | Indigenous |

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| **Poaceae** | *Pentameris patula* | (Nees) Steud. | LC | Indigenous |
| **Asteraceae** | *Pentzia incana* | (Thunb.) Kuntze | LC | Indigenous |
| **Asteraceae** | *Perdicium leiocarpum* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Petalacte coronata* | (L.) D.Don | LC | Indigenous; Endemic |
| **Poaceae** | *Phalaris minor* | Retz. | NE | Not indigenous; Naturalised |
| **Molluginaceae** | *Pharnaceum croceum* | E.Mey. ex Fenzl | LC | Indigenous |
| **Molluginaceae** | *Pharnaceum lanatum* | Bartl. | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica cryptandroides* | Sond. | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica oleifolia* | Vent. | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica pustulata* | E.Phillips | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica rigidifolia* | Sond. | LC | Indigenous; Endemic |
| **Rhamnaceae** | *Phylica sp.* | | | |
| **Scrophulariaceae** | *Phyllopodium cephalophorum* | (Thunb.) Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Phyllopodium phyllopodioides* | (Schltr.) Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Phyllopodium sp.* | | | |
| **Funariaceae** | *Physcomitrium spathulatum var. spathulatum* | Mull.Hal. | | Indigenous |
| **Plantaginaceae** | *Plantago cafra* | Decne. | LC | Indigenous |
| **Scrophulariaceae** | *Polycarena formosa* | Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Polycarena sp.* | | | |
| **Scrophulariaceae** | *Polycarena tenella* | Hiern | LC | Indigenous; Endemic |
| **Polygalaceae** | *Polygala bracteolata* | L. | LC | Indigenous; Endemic |
| **Polygalaceae** | *Polygala myrtifolia var. myrtifolia* | L. | LC | Indigenous |
| **Polygalaceae** | *Polygala virgata var. virgata* | Thunb. | LC | Indigenous |
| **Poaceae** | *Polypogon monspeliensis* | (L.) Desf. | NE | Not indigenous; Naturalised |
| **Potamogetonaceae** | *Potamogeton pusillus* | L. | LC | Indigenous |
| **Asteraceae** | *Printzia polifolia* | (L.) Hutch. | LC | Indigenous; Endemic |
| **Proteaceae** | *Protea angustata* | R.Br. | EN | Indigenous; Endemic |
| **Proteaceae** | *Protea glabra* | Thunb. | LC | Indigenous; Endemic |
| **Proteaceae** | *Protea laurifolia* | Thunb. | LC | Indigenous; Endemic |
| **Proteaceae** | *Protea nitida* | Mill. | LC | Indigenous; Endemic |
| **Pottiaceae** | *Pseudocrossidium crinitum* | (Schultz) R.H.Zander | | Indigenous |
| **Scrophulariaceae** | *Pseudoselago arguta* | (E.Mey.) Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Pseudoselago gracilis* | Hilliard | LC | Indigenous; Endemic |
| **Fabaceae** | *Psoralea tenuifolia* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Pteronia cinerea* | L.f. | LC | Indigenous; Endemic |
| **Asteraceae** | *Pteronia divaricata* | (P.J.Bergius) Less. | LC | Indigenous |
| **Asteraceae** | *Pteronia glabrata* | L.f. | LC | Indigenous |

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| **Asteraceae** | *Pteronia ovalifolia* | DC. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Pterygodium alatum* | (Thunb.) Sw. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Pterygodium catholicum* | (L.) Sw. | LC | Indigenous; Endemic |
| **Apocynaceae** | *Quaqua incarnata subsp. incarnata* | (L.f.) Bruyns | LC | Indigenous; Endemic |
| **Apocynaceae** | *Quaqua mammillaris* | (L.) Bruyns | LC | Indigenous |
| **Fabaceae** | *Rafnia amplexicaulis* | (L.) Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Rafnia angulata subsp. angulata* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Rafnia capensis subsp. dichotoma* | (L.) Schinz | LC | Indigenous; Endemic |
| **Fabaceae** | *Rafnia diffusa* | Thunb. | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio filiformis* | Poir. | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio gaudichaudianus* | Kunth | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio longiaristatus* | (Pillans ex H.P.Linder) H.P.Linder & C.R.Hardy | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio marlothii* | Pillans | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio monanthos* | Mast. | LC | Indigenous; Endemic |
| **Restionaceae** | *Restio vimineus* | Rottb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Rhynchopsidium pumilum* | (L.f.) DC. | LC | Indigenous; Endemic |
| **Ricciaceae** | *Riccia bullosa* | Link ex Lindenb. | | Indigenous |
| **Ricciaceae** | *Riccia concava* | Bisch. | | Indigenous; Endemic |
| **Ricciaceae** | *Riccia crozalsii* | Levier | | Indigenous |
| **Ricciaceae** | *Riccia cupulifera* | A.V.Duthie | | Indigenous; Endemic |
| **Ricciaceae** | *Riccia garsidei* | Sim | | Indigenous; Endemic |
| **Ricciaceae** | *Riccia limbata* | Bisch. | | Indigenous; Endemic |
| **Ricciaceae** | *Riccia nigrella* | DC. | | Indigenous |
| **Ricciaceae** | *Riccia purpurascens* | Lehm. | | Indigenous; Endemic |
| **Ricciaceae** | *Riccia villosa* | Steph. | | Indigenous; Endemic |
| **Zygophyllaceae** | *Roepera cordifolia* | (L.f.) Beier & Thulin | | Indigenous |
| **Zygophyllaceae** | *Roepera foetida* | (Schrad. & J.C.Wendl.) Beier & Thulin | | Indigenous |
| **Iridaceae** | *Romulea atrandra var. esterhuyseniae* | G.J.Lewis | LC | Indigenous; Endemic |
| **Iridaceae** | *Romulea flava var. minor* | (Lam.) M.P.de Vos | LC | Indigenous; Endemic |
| **Iridaceae** | *Romulea hirta* | Schltr. | LC | Indigenous; Endemic |
| **Iridaceae** | *Romulea leipoldtii* | Marais | LC | Indigenous; Endemic |
| **Polygonaceae** | *Rumex cordatus* | Desf. ex Poir. | LC | Indigenous |
| **Polygonaceae** | *Rumex lativalvis* | Meisn. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Ruschia copiosa* | L.Bolus | DD | Indigenous; Endemic |
| **Aizoaceae** | *Ruschia rigidicaulis* | (Haw.) Schwantes | LC | Indigenous; Endemic |
| **Aizoaceae** | *Ruschia sp.* | | | |
| **Salicaceae** | *Salix mucronata subsp. hirsuta* | Thunb. | LC | Indigenous; Endemic |
| **Amaranthaceae** | *Salsola kali* | L. | | Not indigenous; Naturalised; Invasive |
| **Lamiaceae** | *Salvia africana* | L. | | Indigenous; Endemic |
| **Lamiaceae** | *Salvia disermas* | L. | LC | Indigenous |

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| **Lamiaceae** | *Salvia lanceolata* | Lam. | LC | Indigenous |
| **Orchidaceae** | *Satyrium bicorne* | (L.) Thunb. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Satyrium erectum* | Sw. | LC | Indigenous; Endemic |
| **Orchidaceae** | *Satyrium pumilum* | Thunb. | LC | Indigenous; Endemic |
| **Dipsacaceae** | *Scabiosa columbaria* | L. | LC | Indigenous |
| **Poaceae** | *Schismus barbatus* | (Loefl. ex L.) Thell. | LC | Indigenous |
| **Poaceae** | *Schismus schismoides* | (Stapf ex Conert) Verboom & H.P.Linder | LC | Indigenous |
| **Aizoaceae** | *Scopelogena bruynsii* | Klak | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Searsia dissecta* | (Thunb.) Moffett | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Searsia rigida var. rigida* | (Mill.) F.A.Barkley | LC | Indigenous; Endemic |
| **Anacardiaceae** | *Searsia sp.* | | | |
| **Gentianaceae** | *Sebaea exacoides* | (L.) Schinz | LC | Indigenous; Endemic |
| **Zygophyllaceae** | *Seetzenia lanata* | (Willd.) Bullock | LC | Indigenous |
| **Scrophulariaceae** | *Selago capituliflora* | Rolfe | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Selago inaequifolia* | Hilliard | EN | Indigenous; Endemic |
| **Scrophulariaceae** | *Selago stenostachya* | Hilliard | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio abruptus* | Thunb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio bulbinifolius* | DC. | LC | Indigenous |
| **Asteraceae** | *Senecio cardaminifolius* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio cinerascens* | Aiton | LC | Indigenous |
| **Asteraceae** | *Senecio elegans* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio paniculatus* | P.J.Bergius | LC | Indigenous |
| **Asteraceae** | *Senecio piptocoma* | O.Hoffm. | LC | Indigenous |
| **Asteraceae** | *Senecio rosmarinifolius* | L.f. | LC | Indigenous; Endemic |
| **Asteraceae** | *Senecio sp.* | | | |
| **Asteraceae** | *Senecio tortuosus* | DC. | LC | Indigenous; Endemic |
| **Proteaceae** | *Serruria cygnea* | R.Br. | LC | Indigenous; Endemic |
| **Proteaceae** | *Serruria millefolia* | Salisb. ex Knight | VU | Indigenous; Endemic |
| **Solanaceae** | *Solanum humile* | Lam. | | Indigenous |
| **Iridaceae** | *Sparaxis galeata* | Ker Gawl. | NT | Indigenous; Endemic |
| **Iridaceae** | *Sparaxis variegata* | (Sweet) Goldblatt | LC | Indigenous; Endemic |
| **Caryophyllaceae** | *Spergularia media* | (L.) C.Presl | | Not indigenous; Naturalised |
| **Sphagnaceae** | *Sphagnum truncatum* | Hornsch. | | Indigenous |
| **Lamiaceae** | *Stachys rugosa* | Aiton | LC | Indigenous |
| **Apocynaceae** | *Stapelia erectiflora var. prostratiflora* | N.E.Br. | | Indigenous; Endemic |
| **Asteraceae** | *Steirodiscus capillaceus* | (Thunb.) Less. | LC | Indigenous; Endemic |
| **Asteraceae** | *Steirodiscus linearilobus* | DC. | CR | Indigenous; Endemic |
| **Asteraceae** | *Steirodiscus schlechteri* | Bolus ex Schltr. | | Indigenous; Endemic |
| **Asteraceae** | *Steirodiscus sp.* | | | |
| **Poaceae** | *Stipa capensis* | Thunb. | LC | Indigenous |

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| **Poaceae** | *Stipagrostis ciliata var. capensis* | (Desf.) De Winter | LC | Indigenous |
| **Poaceae** | *Stipagrostis namaquensis* | (Nees) De Winter | LC | Indigenous |
| **Poaceae** | *Stipagrostis obtusa* | (Delile) Nees | LC | Indigenous |
| **Poaceae** | *Stipagrostis zeyheri* | (Nees) De Winter | | Indigenous |
| **Poaceae** | *Stipagrostis zeyheri subsp. macropus* | (Nees) De Winter | LC | Indigenous |
| **Asteraceae** | *Stoebe aethiopica* | L. | LC | Indigenous; Endemic |
| **Asteraceae** | *Stoebe fusca* | (L.) Thunb. | LC | Indigenous; Endemic |
| **Asteraceae** | *Stoebe muricata* | Spreng. | | Indigenous; Endemic |
| **Amaryllidaceae** | *Strumaria discifera subsp. discifera* | Marloth ex Snijman | LC | Indigenous; Endemic |
| **Amaryllidaceae** | *Strumaria truncata* | Jacq. | LC | Indigenous; Endemic |
| **Thymelaeaceae** | *Struthiola leptantha* | Bolus | LC | Indigenous; Endemic |
| **Thymelaeaceae** | *Struthiola myrsinites* | Lam. | LC | Indigenous; Endemic |
| **Pallaviciniaceae** | *Symphyogyna brasiliensis* | Nees & Mont. | | Indigenous |
| **Iridaceae** | *Syringodea longituba subsp. longituba* | (Klatt) Kuntze | LC | Indigenous; Endemic |
| **Targioniaceae** | *Targionia hypophylla* | L. | | Indigenous |
| **Poaceae** | *Tenaxia stricta* | (Schrad.) N.P.Barker & H.P.Linder | LC | Indigenous |
| **Aizoaceae** | *Tetragonia calycina* | Fenzl | LC | Indigenous |
| **Aizoaceae** | *Tetragonia glauca* | Fenzl | LC | Indigenous; Endemic |
| **Aizoaceae** | *Tetragonia hirsuta* | L.f. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Tetragonia nigrescens* | Eckl. & Zeyh. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Tetragonia rosea* | Schltr. | LC | Indigenous; Endemic |
| **Aizoaceae** | *Tetragonia sp.* | | | |
| **Aizoaceae** | *Tetragonia spicata* | L.f. | LC | Indigenous |
| **Aizoaceae** | *Tetragonia virgata* | Schltr. | LC | Indigenous; Endemic |
| **Restionaceae** | *Thamnochortus platypteris* | Kunth | LC | Indigenous; Endemic |
| **Poaceae** | *Themeda triandra* | Forssk. | LC | Indigenous |
| **Santalaceae** | *Thesium aggregatum* | A.W.Hill | LC | Indigenous; Endemic |
| **Santalaceae** | *Thesium gnidiaceum var. gnidiaceum* | A.DC. | LC | Indigenous; Endemic |
| **Santalaceae** | *Thesium nudicaule* | A.W.Hill | LC | Indigenous; Endemic |
| **Santalaceae** | *Thesium strictum* | P.J.Bergius | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra adamsonii* | (Compton) Oberm. | LC | Indigenous |
| **Asphodelaceae** | *Trachyandra arenicola* | J.C.Manning & Goldblatt | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra ciliata* | (L.f.) Kunth | LC | Indigenous |
| **Asphodelaceae** | *Trachyandra dissecta* | Oberm. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra falcata* | (L.f.) Kunth | LC | Indigenous |
| **Asphodelaceae** | *Trachyandra flexifolia* | (L.f.) Kunth | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra gracilenta* | Oberm. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra jacquiniana* | (Schult. & Schult.f.) Oberm. | LC | Indigenous; Endemic |

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| **Asphodelaceae** | *Trachyandra muricata* | (L.f.) Kunth | LC | Indigenous |
| **Asphodelaceae** | *Trachyandra paniculata* | Oberm. | LC | Indigenous; Endemic |
| **Asphodelaceae** | *Trachyandra revoluta* | (L.) Kunth | LC | Indigenous |
| **Poaceae** | *Tribolium echinatum* | (Thunb.) Renvoize | LC | Indigenous; Endemic |
| **Poaceae** | *Tribolium hispidum* | (Thunb.) Desv. | LC | Indigenous; Endemic |
| **Poaceae** | *Tribolium pusillum* | (Nees) H.P.Linder & Davidse | LC | Indigenous; Endemic |
| **Poaceae** | *Tribolium uniolae* | (L.f.) Renvoize | LC | Indigenous; Endemic |
| **Fumariaceae** | *Trigonocapnos lichtensteinii* | (Cham. & Schltdl.) Liden | LC | Indigenous; Endemic |
| **Iridaceae** | *Tritonia undulata* | (Burm.f.) Baker | LC | Indigenous; Endemic |
| **Iridaceae** | *Tritoniopsis antholyza* | (Poir.) Goldblatt | LC | Indigenous; Endemic |
| **Alliaceae** | *Tulbaghia alliacea* | L.f. | LC | Indigenous; Endemic |
| **Crassulaceae** | *Tylecodon paniculatus* | (L.f.) Toelken | LC | Indigenous |
| **Crassulaceae** | *Tylecodon reticulatus subsp. reticulatus* | (L.f.) Toelken | LC | Indigenous |
| **Crassulaceae** | *Tylecodon striatus* | (Hutchison) Toelken | LC | Indigenous; Endemic |
| **Crassulaceae** | *Tylecodon ventricosus* | (Burm.f.) Toelken | LC | Indigenous; Endemic |
| **Asteraceae** | *Ursinia anthemoides subsp. versicolor* | (L.) Poir. | LC | Indigenous |
| **Asteraceae** | *Ursinia cakilefolia* | DC. | LC | Indigenous; Endemic |
| **Asteraceae** | *Ursinia chrysanthemoides* | (Less.) Harv. | LC | Indigenous; Endemic |
| **Asteraceae** | *Ursinia macropoda* | (DC.) N.E.Br. | LC | Indigenous; Endemic |
| **Asteraceae** | *Ursinia pinnata* | (Thunb.) Prassler | LC | Indigenous; Endemic |
| **Asteraceae** | *Ursinia speciosa* | DC. | LC | Indigenous |
| **Asteraceae** | *Vellereophyton pulvinatum* | Hilliard | DD | Indigenous; Endemic |
| **Santalaceae** | *Viscum pauciflorum* | L.f. | LC | Indigenous; Endemic |
| **Poaceae** | *Vulpia bromoides* | (L.) Gray | NE | Not indigenous; Naturalised; Invasive |
| **Poaceae** | *Vulpia muralis* | (Kunth) Nees | NE | Not indigenous; Naturalised; Invasive |
| **Haemodoraceae** | *Wachendorfia paniculata* | Burm. | LC | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia androsacea* | A.DC. | LC | Indigenous |
| **Campanulaceae** | *Wahlenbergia annularis* | A.DC. | LC | Indigenous |
| **Campanulaceae** | *Wahlenbergia decipiens* | A.DC. | LC | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia longisepala* | Brehmer | DD | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia macrostachys* | (A.DC.) Lammers | LC | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia meyeri* | A.DC. | LC | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia oxyphylla* | A.DC. | LC | Indigenous |
| **Campanulaceae** | *Wahlenbergia polyclada* | A.DC. | DD | Indigenous; Endemic |
| **Campanulaceae** | *Wahlenbergia sp.* | | | |
| **Tecophilaeaceae** | *Walleria gracilis* | (Salisb.) S.Carter | VU | Indigenous |
| **Iridaceae** | *Watsonia meriana var. meriana* | (L.) Mill. | LC | Indigenous; Endemic |

| | | | | |
|---|---|---|---|---|
| **Iridaceae** | *Watsonia vanderspuyiae* | L.Bolus | LC | Indigenous; Endemic |
| **Fabaceae** | *Wiborgia fusca subsp. fusca* | Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Wiborgia monoptera* | E.Mey. | LC | Indigenous; Endemic |
| **Fabaceae** | *Wiborgia mucronata* | (L.f.) Druce | LC | Indigenous; Endemic |
| **Fabaceae** | *Wiborgia obcordata* | (P.J.Bergius) Thunb. | LC | Indigenous; Endemic |
| **Fabaceae** | *Wiborgia sericea* | Thunb. | LC | Indigenous; Endemic |
| **Restionaceae** | *Willdenowia arescens* | Kunth | LC | Indigenous; Endemic |
| **Restionaceae** | *Willdenowia glomerata* | (Thunb.) H.P.Linder | LC | Indigenous; Endemic |
| **Restionaceae** | *Willdenowia incurvata* | (Thunb.) H.P.Linder | LC | Indigenous; Endemic |
| **Restionaceae** | *Willdenowia teres* | Thunb. | LC | Indigenous; Endemic |
| **Lobeliaceae** | *Wimmerella arabidea* | (C.Presl) Serra, M.B.Crespo & Lammers | LC | Indigenous; Endemic |
| **Colchicaceae** | *Wurmbea spicata var. spicata* | (Burm.f.) T.Durand & Schinz | NE | Indigenous; Endemic |
| **Scrophulariaceae** | *Zaluzianskya affinis* | Hilliard | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Zaluzianskya benthamiana* | Walp. | LC | Indigenous |
| **Scrophulariaceae** | *Zaluzianskya peduncularis* | (Benth.) Walp. | LC | Indigenous |
| **Scrophulariaceae** | *Zaluzianskya pumila* | (Benth.) Walp. | LC | Indigenous; Endemic |
| **Scrophulariaceae** | *Zaluzianskya pusilla* | (Benth.) Walp. | LC | Indigenous; Endemic |

## 9.2 Appendix B – Amphibian species expected to occur in the project area

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Amietia fuscigula*** | Common River Frog | LC | LC |
| ***Breviceps montanus*** | Cape Mountain Rain Frog | LC | LC |
| ***Breviceps namaquensis*** | Namaqua Rain Frog | LC | LC |
| ***Cacosternum karooicum*** | Karoo Caco | DD | LC |
| ***Cacosternum namaquense*** | Namaqua Caco | LC | LC |
| ***Capensibufo tradouwi*** | Tradouw Mountain Toad | LC | LC |
| ***Sclerophrys capensis*** | Raucous Toad | LC | LC |
| ***Strongylopus grayii*** | Clicking Stream Frog | LC | LC |
| ***Tomopterna delalandii*** | Cape Sand Frog | LC | LC |
| ***Vandijkophrynus angusticeps*** | Sand Toad | LC | LC |
| ***Vandijkophrynus gariepensis gariepensis*** | Karoo Toad | Not listed | Not listed |
| ***Vandijkophrynus robinsoni*** | Paradise toad | LC | LC |
| ***Xenopus laevis*** | Common Platanna | LC | LC |

## 9.3 Appendix C – Reptile species expected to occur in the project area

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Acontias grayi*** | Gray's Dwarf Legless Skink | LC | LC |
| ***Acontias lineatus*** | Striped Dwarf Legless Skink | LC | LC |
| ***Acontias litoralis*** | Coastal Dwarf Legless Skink | LC | LC |
| ***Acontias meleagris*** | Cape Legless Skink | LC | LC |
| ***Agama aculeata aculeata*** | Western Ground Agama | LC | Unlisted |
| ***Agama atra*** | Southern Rock Agama | LC | LC |
| ***Agama hispida*** | Southern Spiny Agama | LC | LC |
| ***Aspidelaps lubricus lubricus*** | Cape coral snake | LC | LC |
| ***Bitis arietans arietans*** | Puff Adder | LC | Unlisted |
| ***Boaedon capensis*** | Brown House Snake | LC | LC |
| ***Bradypodion occidentale*** | Western Dwarf Chameleon | LC | LC |
| ***Chamaeleo namaquensis*** | Namaqua Chameleon | LC | LC |
| ***Chersina angulata*** | Angulate Tortoise | LC | LC |
| ***Chersobius signatus*** | Speckled Dwarf Tortoise | EN | EN |
| ***Chondrodactylus angulifer*** | Common Giant Gecko | LC | LC |
| ***Chondrodactylus bibronii*** | Bibron's Gecko | LC | Unlisted |
| ***Cordylosaurus subtessellatus*** | Dwarf Plated Lizard | LC | LC |
| ***Cordylus cordylus*** | Cape Girdles Lizard | LC | LC |
| ***Cordylus mclachlani*** | Mclachlan's Girdled Lizard | LC | LC |
| ***Crotaphopeltis hotamboeia*** | Red-lipped Snake | LC | Unlisted |
| ***Dasypeltis scabra*** | Rhombic Egg-eater | LC | LC |
| ***Dipsina multimaculata*** | Dwarf Beaked Snake | LC | Unlisted |
| ***Dispholidus typus*** | Boomslang | LC | Unlisted |
| ***Gerrhosaurus typicus*** | Karoo plated lizard | Unlisted | Unlisted |
| ***Goggia hexapora*** | Cederberg Pygmy Gecko | LC | LC |
| ***Goggia incognita*** | Striped Pygmy Gecko | LC | LC |
| ***Goggia matzikamaensis*** | Matzikama Gecko | NT | LC |
| ***Hemachatus haemachatus*** | Rinkhals | LC | LC |
| ***Hemicordylus capensis*** | Cape Cliff Lizard | LC | LC |
| ***Hemidactylus mabouia*** | Common Tropical House Gecko | LC | Unlisted |
| ***Homoroselaps lacteus*** | Spotted Harlequin Snake | LC | LC |
| ***Karusasaurus polyzonus*** | Southern Karusa Lizard | LC | LC |
| ***Lamprophis guttatus*** | Spotted Rock Snake | LC | LC |
| ***Lygodactylus capensis*** | Cape dwarf gecko | LC | LC |
| ***Meroles knoxii*** | Knox's Desert Lizard | LC | LC |
| ***Naja nigricincta woodi*** | Black Spitting Cobra | LC | Unlisted |
| ***Naja nivea*** | Cape Cobra | LC | Unlisted |
| ***Namazonurus peersi*** | Peer's Nama Lizard | LC | LC |
| ***Namibiana gracilior*** | Slender Thread Snake | LC | LC |
| ***Nucras tessellata*** | Western Sandveld Lizard | LC | Unlisted |
| ***Pachydactylus austeni*** | Austen's Thick-toed Gecko | Unlisted | LC |
| ***Pachydactylus capensis*** | Cape Gecko | LC | Unlisted |
| ***Pachydactylus formosus*** | Southern Rough Gecko | LC | LC |

| | | | |
|---|---|---|---|
| ***Pachydactylus geitje*** | Ocellated Gecko | LC | LC |
| ***Pachydactylus labialis*** | Western Cape Gecko | LC | LC |
| ***Pachydactylus mariquensis*** | Common Banded Gecko | LC | LC |
| ***Pachydactylus purcelli*** | Purcell's Gecko | LC | Unlisted |
| ***Pachydactylus weberi*** | Weber's Gecko | LC | LC |
| ***Pedioplanis laticeps*** | Karoo Sand Lizard | LC | LC |
| ***Pedioplanis lineoocellata pulchella*** | Common sand lizard | LC | LC |
| ***Pedioplanis namaquensis*** | Namaqua Sand Lizard | LC | Unlisted |
| ***Prosymna sundevallii*** | Sundevall's Shovel-snout | LC | LC |
| ***Psammobates tentorius*** | Tent Tortoise | LC | LC |
| ***Psammophis crucifer*** | Cross-marked Grass Snake | LC | LC |
| ***Psammophis leightoni*** | Cape Sand Snake | VU | VU |
| ***Psammophis namibensis*** | Namib Sand Snake | LC | Unlisted |
| ***Psammophis notostictus*** | Karoo Sand Snake | LC | Unlisted |
| ***Psammophylax rhombeatus*** | Spotted Grass Snake | LC | Unlisted |
| ***Pseudaspis cana*** | Mole Snake | LC | Unlisted |
| ***Ptenopus garrulus maculatus*** | Spotted Barking Gecko | LC | Unlisted |
| ***Rhinotyphlops lalandei*** | Delalande's Beaked Blind Snake | LC | Unlisted |
| ***Scelotes caffer*** | Cape Dwarf Burrowing Skink | LC | LC |
| ***Scelotes gronovii*** | Gronovi's Dwarf Burrowing Skink | NT | NT |
| ***Scelotes sexlineatus*** | Striped Dwarf Burrowing Skink | LC | LC |
| ***Telescopus beetzii*** | Beetz's Tiger Snake | LC | Unlisted |
| ***Trachylepis capensis*** | Cape Skink | LC | Unlisted |
| ***Trachylepis sulcata sulcata*** | Westren Rock Skink | LC | Unlisted |
| ***Trachylepis variegata*** | Variegated Skink | LC | Unlisted |
| ***Typhlosaurus caecus*** | Southern Blind Legless Skink | LC | LC |

## 9.4 Appendix D – Mammal species expected to occur within the project area

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Aethomys namaquensis*** | Namaqua rock rat | LC | LC |
| ***Aonyx capensis*** | Cape Clawless Otter | NT | NT |
| ***Atilax paludinosus*** | Water Mongoose | LC | LC |
| ***Canis mesomelas*** | Black-backed Jackal | LC | LC |
| ***Caracal caracal*** | Caracal | LC | LC |
| ***Chrysochloris asiatica*** | Cape Golden Mole | LC | LC |
| ***Crocidura cyanea*** | Reddish-grey Musk Shrew | LC | LC |
| ***Crocidura flavescens*** | Greater Red Musk Shrew | LC | LC |
| ***Cryptochloris zyli*** | Van Zyl's Golden Mole | EN | CR |
| ***Cryptomys hottentotus*** | Common Mole-rat | LC | LC |
| ***Cynictis penicillata*** | Yellow Mongoose | LC | LC |
| ***Dendromus melanotis*** | Grey Climbing Mouse | LC | LC |
| ***Desmodillus auricularis*** | Short-tailed Gerbil | LC | LC |
| ***Eptesicus hottentotus*** | Long-tailed Serotine Bat | LC | LC |
| ***Eremitalpa granti*** | Grant's Golden Mole | VU | Unlisted |
| ***Felis nigripes*** | Black-footed Cat | VU | VU |
| ***Felis silvestris*** | African Wildcat | LC | LC |
| ***Genetta genetta*** | Small-spotted Genet | LC | LC |
| ***Gerbilliscus afra*** | Cape Gerbil | LC | LC |
| ***Gerbillurus paeba*** | Hairy-footed Gerbil | LC | LC |
| ***Graphiurus ocularis*** | Spectacular Dormouse | NT | LC |
| ***Herpestes ichneumon*** | Large Grey Mongoose | LC | LC |
| ***Herpestes pulverulentus*** | Cape Grey Mongoose | LC | LC |
| ***Hystrix africaeaustralis*** | Cape Porcupine | LC | LC |
| ***Ictonyx striatus*** | Striped Polecat | LC | LC |
| ***Leptailurus serval*** | Serval | NT | LC |
| ***Lepus capensis*** | Cape Hare | LC | LC |
| ***Lepus saxatilis*** | Scrub Hare | LC | LC |
| ***Macroscelides proboscideus*** | Karoo Round-eared Sengi | LC | LC |
| ***Malacothrix typica*** | Gerbil Mouse | LC | LC |
| ***Mellivora capensis*** | Honey Badger | LC | LC |
| ***Mus minutoides*** | Pygmy Mouse | LC | LC |
| ***Mus musculus*** | House Mouse | Unlisted | LC |
| ***Myomyscus verreauxii*** | Verreaux's white-footed rat | LC | LC |
| ***Myosorex varius*** | Forest Shrew | LC | LC |
| ***Mystromys albicaudatus*** | White-tailed Rat | VU | EN |
| ***Neoromicia capensis*** | Cape Serotine Bat | LC | LC |
| ***Nycteris thebaica*** | Egyptian Slit-faced Bat | LC | LC |
| ***Oreotragus oreotragus*** | Klipspringer | LC | LC |
| ***Orycteropus afer*** | Aardvark | LC | LC |
| ***Otocyon megalotis*** | Bat-eared Fox | LC | LC |
| ***Otomys saundersiae*** | Saunder's vlei rat | LC | LC |
| ***Otomys unisulcatus*** | Karoo Bush Rat | LC | LC |

| | | | |
|---|---|---|---|
| ***Panthera pardus*** | Leopard | VU | VU |
| ***Papio ursinus*** | Chacma Baboon | LC | LC |
| ***Parotomys brantsii*** | Brants' Whistling Rat | LC | LC |
| ***Parotomys littledalei*** | Littledale's Whistling Rat | NT | LC |
| ***Pelea capreolus*** | Grey Rhebok | NT | NT |
| ***Petromyscus barbouri*** | Barbour's Rock Mouse | LC | LC |
| ***Poecilogale albinucha*** | African Striped Weasel | NT | LC |
| ***Procavia capensis*** | Rock Hyrax | LC | LC |
| ***Proteles cristata*** | Aardwolf | LC | LC |
| ***Raphicerus campestris*** | Steenbok | LC | LC |
| ***Raphicerus melanotis*** | Southern grysbok | LC | LC |
| ***Rattus rattus*** | House Rat | Exotic (Not listed) | LC |
| ***Rhabdomys pumilio*** | Xeric Four-striped Mouse | LC | LC |
| ***Rhinolophus capensis*** | Cape Horseshoe Bat | LC | LC |
| ***Rhinolophus clivosus*** | Geoffroy's Horseshoe Bat | LC | LC |
| ***Steatomys krebsii*** | Krebs's Fat Mouse | LC | LC |
| ***Suncus varilla*** | Lesser Dwarf Shrew | LC | LC |
| ***Suricata suricatta*** | Suricate | LC | LC |
| ***Sylvicapra grimmia*** | Common Duiker | LC | LC |
| ***Tadarida aegyptiaca*** | Egyptian Free-tailed Bat | LC | LC |
| ***Vulpes chama*** | Cape Fox | LC | LC |

## 9.5 Appendix E – Avifaunal species expected to occur within the project area

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) |
| ***Acrocephalus baeticatus*** | Reed-warbler, African | Unlisted | Unlisted |
| ***Acrocephalus gracilirostris*** | Swamp-warbler, Lesser | Unlisted | LC |
| ***Afrotis afra*** | Korhaan, Southern Black | VU | VU |
| ***Alcedo cristata*** | Kingfisher, Malachite | Unlisted | Unlisted |
| ***Alopochen aegyptiacus*** | Goose, Egyptian | Unlisted | LC |
| ***Amaurornis flavirostris*** | Crake, Black | Unlisted | LC |
| ***Anas smithii*** | Shoveler, Cape | Unlisted | LC |
| ***Anas sparsa*** | Duck, African Black | Unlisted | LC |
| ***Anas undulata*** | Duck, Yellow-billed | Unlisted | LC |
| ***Anhinga rufa*** | Darter, African | Unlisted | LC |
| ***Anthoscopus minutus*** | Penduline-tit, Cape | Unlisted | LC |
| ***Anthropoides paradiseus*** | Crane, Blue | NT | VU |
| ***Anthus cinnamomeus*** | Pipit, African | Unlisted | LC |
| ***Apus affinis*** | Swift, Little | Unlisted | LC |
| ***Apus barbatus*** | Swift, African Black | Unlisted | LC |
| ***Apus caffer*** | Swift, White-rumped | Unlisted | LC |
| ***Aquila pennatus*** | Eagle, Booted | Unlisted | LC |
| ***Aquila verreauxii*** | Eagle, Verreaux's | VU | LC |
| ***Ardea cinerea*** | Heron, Grey | Unlisted | LC |
| ***Ardea melanocephala*** | Heron, Black-headed | Unlisted | LC |
| ***Ardea purpurea*** | Heron, Purple | Unlisted | LC |
| ***Batis capensis*** | Batis, Cape | Unlisted | LC |
| ***Batis pririt*** | Batis, Pririt | Unlisted | LC |
| ***Bostrychia hagedash*** | Ibis, Hadeda | Unlisted | LC |
| ***Bradornis infuscatus*** | Flycatcher, Chat | Unlisted | LC |
| ***Bradypterus baboecala*** | Rush-warbler, Little | Unlisted | LC |
| ***Bubo africanus*** | Eagle-owl, Spotted | Unlisted | LC |
| ***Bubulcus ibis*** | Egret, Cattle | Unlisted | LC |
| ***Burhinus capensis*** | Thick-knee, Spotted | Unlisted | LC |
| ***Buteo rufofuscus*** | Buzzard, Jackal | Unlisted | LC |
| ***Buteo vulpinus*** | Buzzard, Common | Unlisted | Unlisted |
| ***Calandrella cinerea*** | Lark, Red-capped | Unlisted | LC |
| ***Calendulauda albescens*** | Lark, Karoo | Unlisted | LC |
| ***Caprimulgus pectoralis*** | Nightjar, Fiery-necked | Unlisted | LC |
| ***Caprimulgus tristigma*** | Nightjar, Freckled | Unlisted | LC |
| ***Cercomela familiaris*** | Chat, Familiar | Unlisted | LC |
| ***Cercomela schlegelii*** | Chat, Karoo | Unlisted | LC |
| ***Cercomela sinuata*** | Chat, Sickle-winged | Unlisted | LC |
| ***Cercotrichas coryphoeus*** | Scrub-robin, Karoo | Unlisted | LC |
| ***Certhilauda curvirostris*** | Lark, Cape Long-billed | Unlisted | LC |
| ***Certhilauda subcoronata*** | Lark, Karoo Long-billed | Unlisted | LC |
| ***Ceryle rudis*** | Kingfisher, Pied | Unlisted | LC |
| ***Charadrius pecuarius*** | Plover, Kittlitz's | Unlisted | LC |

| | | | |
|---|---|---|---|
| ***Charadrius tricollaris*** | Plover, Three-banded | Unlisted | LC |
| ***Chersomanes albofasciata*** | Lark, Spike-heeled | Unlisted | LC |
| ***Chrysococcyx caprius*** | Cuckoo, Diderick | Unlisted | LC |
| ***Chrysococcyx klaas*** | Cuckoo, Klaas's | Unlisted | LC |
| ***Cinnyris chalybeus*** | Sunbird, Southern Double-collared | Unlisted | LC |
| ***Cinnyris fuscus*** | Sunbird, Dusky | Unlisted | LC |
| ***Circus maurus*** | Harrier, Black | EN | VU |
| ***Cisticola juncidis*** | Cisticola, Zitting | Unlisted | LC |
| ***Cisticola subruficapilla*** | Cisticola, Grey-backed | Unlisted | LC |
| ***Cisticola tinniens*** | Cisticola, Levaillant's | Unlisted | LC |
| ***Colius colius*** | Mousebird, White-backed | Unlisted | LC |
| ***Colius striatus*** | Mousebird, Speckled | Unlisted | LC |
| ***Columba guinea*** | Pigeon, Speckled | Unlisted | LC |
| ***Columba livia*** | Dove, Rock | Unlisted | LC |
| ***Corvus albicollis*** | Raven, White-necked | Unlisted | LC |
| ***Corvus albus*** | Crow, Pied | Unlisted | LC |
| ***Corvus capensis*** | Crow, Cape | Unlisted | LC |
| ***Cossypha caffra*** | Robin-chat, Cape | Unlisted | LC |
| ***Coturnix coturnix*** | Quail, Common | Unlisted | LC |
| ***Creatophora cinerea*** | Starling, Wattled | Unlisted | LC |
| ***Crithagra albogularis*** | White-throated Canary | LC | LC |
| ***Crithagra flaviventris*** | Canary, Yellow | Unlisted | LC |
| ***Crithagra gularis*** | Seedeater, Streaky-headed | Unlisted | LC |
| ***Crithagra totta*** | Siskin, Cape | Unlisted | LC |
| ***Egretta intermedia*** | Egret, Yellow-billed | Unlisted | LC |
| ***Elanus caeruleus*** | Kite, Black-shouldered | Unlisted | LC |
| ***Emberiza capensis*** | Bunting, Cape | Unlisted | LC |
| ***Emberiza impetuani*** | Bunting, Lark-like | Unlisted | LC |
| ***Eremomela icteropygialis*** | Eremomela, Yellow-bellied | Unlisted | LC |
| ***Eremopterix verticalis*** | Sparrowlark, Grey-backed | Unlisted | LC |
| ***Estrilda astrild*** | Waxbill, Common | Unlisted | LC |
| ***Euplectes capensis*** | Bishop, Yellow | Unlisted | LC |
| ***Euplectes orix*** | Bishop, Southern Red | Unlisted | LC |
| ***Falco biarmicus*** | Falcon, Lanner | VU | LC |
| ***Falco naumanni*** | Kestrel, Lesser | Unlisted | LC |
| ***Falco peregrinus*** | Falcon, Peregrine | Unlisted | LC |
| ***Falco rupicoloides*** | Kestrel, Greater | Unlisted | LC |
| ***Falco rupicolus*** | Kestrel, Rock | Unlisted | LC |
| ***Fulica cristata*** | Coot, Red-knobbed | Unlisted | LC |
| ***Galerida magnirostris*** | Lark, Large-billed | Unlisted | LC |
| ***Gallinula chloropus*** | Moorhen, Common | Unlisted | LC |
| ***Haliaeetus vocifer*** | Fish-eagle, African | Unlisted | LC |
| ***Himantopus himantopus*** | Stilt, Black-winged | Unlisted | LC |
| ***Hirundo albigularis*** | Swallow, White-throated | Unlisted | LC |
| ***Hirundo cucullata*** | Swallow, Greater Striped | Unlisted | LC |
| ***Hirundo dimidiata*** | Swallow, Pearl-breasted | Unlisted | LC |

| | | | |
|---|---|---|---|
| ***Hirundo fuligula*** | Martin, Rock | Unlisted | Unlisted |
| ***Hirundo rustica*** | Swallow, Barn | Unlisted | LC |
| ***Indicator indicator*** | Honeyguide, Greater | Unlisted | LC |
| ***Lanius collaris*** | Fiscal, Common (Southern) | Unlisted | LC |
| ***Macronyx capensis*** | Longclaw, Cape | Unlisted | LC |
| ***Malcorus pectoralis*** | Warbler, Rufous-eared | Unlisted | LC |
| ***Megaceryle maximus*** | Kingfisher, Giant | Unlisted | Unlisted |
| ***Melierax canorus*** | Goshawk, Southern Pale Chanting | Unlisted | LC |
| ***Merops apiaster*** | Bee-eater, European | Unlisted | LC |
| ***Mirafra apiata*** | Lark, Cape Clapper | Unlisted | LC |
| ***Monticola rupestris*** | Rock-thrush, Cape | Unlisted | LC |
| ***Motacilla capensis*** | Wagtail, Cape | Unlisted | LC |
| ***Muscicapa striata*** | Flycatcher, Spotted | Unlisted | LC |
| ***Myrmecocichla formicivora*** | Chat, Anteating | Unlisted | LC |
| ***Nectarinia famosa*** | Sunbird, Malachite | Unlisted | LC |
| ***Neotis ludwigii*** | Bustard, Ludwig's | EN | EN |
| ***Numida meleagris*** | Guineafowl, Helmeted | Unlisted | LC |
| ***Nycticorax nycticorax*** | Night-Heron, Black-crowned | Unlisted | LC |
| ***Oena capensis*** | Dove, Namaqua | Unlisted | LC |
| ***Oenanthe monticola*** | Wheatear, Mountain | Unlisted | LC |
| ***Oenanthe pileata*** | Wheatear, Capped | Unlisted | LC |
| ***Onychognathus morio*** | Starling, Red-winged | Unlisted | LC |
| ***Onychognathus nabouroup*** | Starling, Pale-winged | Unlisted | LC |
| ***Pandion haliaetus*** | Osprey, Osprey | Unlisted | LC |
| ***Parisoma subcaeruleum*** | Tit-babbler, Chestnut-vented | Unlisted | Unlisted |
| ***Parus afer*** | Tit, Grey | Unlisted | Unlisted |
| ***Passer diffusus*** | Sparrow, Southern Grey-headed | Unlisted | LC |
| ***Passer domesticus*** | Sparrow, House | Unlisted | LC |
| ***Passer melanurus*** | Sparrow, Cape | Unlisted | LC |
| ***Pavo cristatus*** | Peacock, Common | Unlisted | LC |
| ***Phalacrocorax africanus*** | Cormorant, Reed | Unlisted | LC |
| ***Phalacrocorax carbo*** | Cormorant, White-breasted | LC | LC |
| ***Phragmacia substriata*** | Warbler, Namaqua | Unlisted | Unlisted |
| ***Platalea alba*** | Spoonbill, African | Unlisted | LC |
| ***Plectropterus gambensis*** | Goose, Spur-winged | Unlisted | LC |
| ***Ploceus capensis*** | Weaver, Cape | Unlisted | LC |
| ***Ploceus velatus*** | Masked-weaver, Southern | Unlisted | LC |
| ***Polemaetus bellicosus*** | Eagle, Martial | EN | VU |
| ***Polyboroides typus*** | Harrier-Hawk, African | Unlisted | LC |
| ***Prinia maculosa*** | Prinia, Karoo | Unlisted | LC |
| ***Promerops cafer*** | Sugarbird, Cape | Unlisted | LC |
| ***Pternistis capensis*** | Spurfowl, Cape | Unlisted | LC |
| ***Pterocles namaqua*** | Sandgrouse, Namaqua | Unlisted | LC |
| ***Pycnonotus capensis*** | Bulbul, Cape | Unlisted | LC |
| ***Pycnonotus nigricans*** | Bulbul, African Red-eyed | Unlisted | LC |
| ***Rallus caerulescens*** | Rail, African | Unlisted | LC |

| | | | |
|---|---|---|---|
| ***Riparia cincta*** | Martin, Banded | Unlisted | LC |
| ***Riparia paludicola*** | Martin, Brown-throated | Unlisted | LC |
| ***Saxicola torquatus*** | Stonechat, African | Unlisted | LC |
| ***Scleroptila africanus*** | Francolin, Grey-winged | Unlisted | LC |
| ***Scopus umbretta*** | Hamerkop, Hamerkop | Unlisted | LC |
| ***Serinus alario*** | Canary, Black-headed | Unlisted | LC |
| ***Serinus canicollis*** | Canary, Cape | Unlisted | LC |
| ***Sigelus silens*** | Flycatcher, Fiscal | Unlisted | LC |
| ***Spreo bicolor*** | Starling, Pied | Unlisted | LC |
| ***Stenostira scita*** | Flycatcher, Fairy | Unlisted | LC |
| ***Streptopelia capicola*** | Turtle-dove, Cape | Unlisted | LC |
| ***Streptopelia semitorquata*** | Dove, Red-eyed | Unlisted | LC |
| ***Streptopelia senegalensis*** | Dove, Laughing | Unlisted | LC |
| ***Struthio camelus*** | Ostrich, Common | Unlisted | LC |
| ***Sturnus vulgaris*** | Starling, Common | Unlisted | LC |
| ***Sylvietta rufescens*** | Crombec, Long-billed | Unlisted | LC |
| ***Tachybaptus ruficollis*** | Grebe, Little | Unlisted | LC |
| ***Tachymarptis melba*** | Swift, Alpine | Unlisted | LC |
| ***Tadorna cana*** | Shelduck, South African | Unlisted | LC |
| ***Telophorus zeylonus*** | Bokmakierie, Bokmakierie | Unlisted | LC |
| ***Threskiornis aethiopicus*** | Ibis, African Sacred | Unlisted | LC |
| ***Tricholaema leucomelas*** | Barbet, Acacia Pied | Unlisted | LC |
| ***Turdus olivaceus*** | Thrush, Olive | Unlisted | LC |
| ***Turdus smithi*** | Thrush, Karoo | Unlisted | LC |
| ***Tyto alba*** | Owl, Barn | Unlisted | LC |
| ***Upupa africana*** | Hoopoe, African | Unlisted | LC |
| ***Urocolius indicus*** | Mousebird, Red-faced | Unlisted | LC |
| ***Vanellus armatus*** | Lapwing, Blacksmith | Unlisted | LC |
| ***Vanellus coronatus*** | Lapwing, Crowned | Unlisted | LC |
| ***Vidua macroura*** | Whydah, Pin-tailed | Unlisted | LC |
| ***Zosterops pallidus*** | White-eye, Orange River | Unlisted | LC |
| ***Zosterops virens*** | White-eye, Cape | Unlisted | LC |

## 9.6 Appendix F – Avifauna observed in the project area

| Species | Common Name | Conservation Status | | Guild code | Relative abundance | Frequency |
|---|---|---|---|---|---|---|
| | | Regional (SANBI, 2016) | IUCN (2017) | | | |
| ***Pycnonotus nigricans*** | Bulbul, African Red-eyed | Unlisted | LC | OMD | 0,300 | 47,37 |
| ***Cercotrichas coryphoeus*** | Scrub-robin, Karoo | Unlisted | LC | IGD | 0,233 | 47,37 |
| ***Muscicapa striata*** | Flycatcher, Spotted | Unlisted | LC | IAD | 0,117 | 26,32 |
| ***Prinia maculosa*** | Prinia, Karoo | Unlisted | LC | IGD | 0,083 | 26,32 |
| ***Emberiza capensis*** | Bunting, Cape | Unlisted | LC | OMD | 0,117 | 21,05 |
| ***Corvus albus*** | Crow, Pied | Unlisted | LC | OMD | 0,083 | 21,05 |
| ***Estrilda astrild*** | Waxbill, Common | Unlisted | LC | GGD | 0,167 | 15,79 |
| ***Cinnyris fuscus*** | Sunbird, Dusky | Unlisted | LC | NFD | 0,150 | 15,79 |
| ***Streptopelia senegalensis*** | Dove, Laughing | Unlisted | LC | GGD | 0,117 | 15,79 |
| ***Alopochen aegyptiacus*** | Goose, Egyptian | Unlisted | LC | HWD | 0,100 | 15,79 |
| ***Passer melanurus*** | Sparrow, Cape | Unlisted | LC | GGD | 0,083 | 15,79 |
| ***Streptopelia capicola*** | Turtle-dove, Cape | Unlisted | LC | GGD | 0,083 | 15,79 |
| ***Anthus cinnamomeus*** | Pipit, African | Unlisted | LC | IGD | 0,050 | 15,79 |
| ***Telophorus zeylonus*** | Bokmakierie, Bokmakierie | Unlisted | LC | OMD | 0,050 | 15,79 |
| ***Onychognathus morio*** | Starling, Red-winged | Unlisted | LC | IGD | 0,317 | 10,53 |
| ***Pternistis capensis*** | Spurfowl, Cape | Unlisted | LC | OMD | 0,317 | 10,53 |
| ***Spreo bicolor*** | Starling, Pied | Unlisted | LC | OMD | 0,250 | 10,53 |
| ***Cisticola juncidis*** | Cisticola, Zitting | Unlisted | LC | IGD | 0,083 | 10,53 |
| ***Nectarinia famosa*** | Sunbird, Malachite | Unlisted | LC | NFD | 0,083 | 10,53 |
| ***Riparia paludicola*** | Martin, Brown-throated | Unlisted | LC | IAD | 0,083 | 10,53 |
| ***Cercomela sinuata*** | Chat, Sickle-winged | Unlisted | LC | IGD | 0,067 | 10,53 |
| ***Mirafra apiata*** | Lark, Cape Clapper | Unlisted | LC | OMG | 0,050 | 10,53 |
| ***Crithagra flaviventris*** | Canary, Yellow | Unlisted | LC | GGD | 0,033 | 10,53 |
| ***Falco rupicolus*** | Kestrel, Rock | Unlisted | LC | CGD | 0,033 | 10,53 |
| ***Fulica cristata*** | Coot, Red-knobbed | Unlisted | LC | HWD | 0,033 | 10,53 |
| ***Phalacrocorax africanus*** | Cormorant, Reed | Unlisted | LC | CWD | 0,033 | 10,53 |
| ***Cercomela familiaris*** | Chat, Familiar | Unlisted | LC | IGD | 0,083 | 5,26 |
| ***Euplectes orix*** | Bishop, Southern Red | Unlisted | LC | GGD | 0,083 | 5,26 |
| ***Ploceus velatus*** | Masked-weaver, Southern | Unlisted | LC | GGD | 0,083 | 5,26 |
| ***Zosterops virens*** | White-eye, Cape | Unlisted | LC | OMD | 0,083 | 5,26 |
| ***Colius striatus*** | Mousebird, Speckled | Unlisted | LC | FFD | 0,067 | 5,26 |
| ***Hirundo fuligula*** | Martin, Rock | Unlisted | Unlisted | IAD | 0,067 | 5,26 |
| ***Threskiornis aethiopicus*** | Ibis, African Sacred | Unlisted | LC | CDG | 0,067 | 5,26 |
| ***Bradornis infuscatus*** | Flycatcher, Chat | Unlisted | LC | IGD | 0,033 | 5,26 |
| ***Calandrella cinerea*** | Lark, Red-capped | Unlisted | LC | OMD | 0,033 | 5,26 |
| ***Dendrocygna viduata*** | Duck, White-faced Whistling | Unlisted | LC | HWD | 0,033 | 5,26 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Eremomela icteropygialis*** | Eremomela, Yellow-bellied | Unlisted | LC | IGD | 0,033 | 5,26 |
| ***Passer diffusus*** | Sparrow, Southern Grey-headed | Unlisted | LC | GGD | 0,033 | 5,26 |
| ***Anhinga rufa*** | Darter, African | Unlisted | LC | CWD | 0,017 | 5,26 |
| ***Apus caffer*** | Swift, White-rumped | Unlisted | LC | IAD | 0,017 | 5,26 |
| ***Aquila verreauxii*** | Eagle, Verreaux's | VU | LC | CGD | 0,017 | 5,26 |
| ***Batis pririt*** | Batis, Pririt | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Calendulauda albescens*** | Lark, Karoo | Unlisted | LC | OMD | 0,017 | 5,26 |
| ***Cinnyris chalybeus*** | Sunbird, Southern Double-collared | Unlisted | LC | NFD | 0,017 | 5,26 |
| ***Cossypha caffra*** | Robin-chat, Cape | Unlisted | LC | OMD | 0,017 | 5,26 |
| ***Laniarius ferrugineus*** | Boubou, Southern | Unlisted | LC | IAD | 0,017 | 5,26 |
| ***Lanius collaris*** | Fiscal, Common (Southern) | Unlisted | LC | IAD | 0,017 | 5,26 |
| ***Malcorus pectoralis*** | Warbler, Rufous-eared | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Megaceryle maximus*** | Kingfisher, Giant | Unlisted | Unlisted | CWD | 0,017 | 5,26 |
| ***Oenanthe monticola*** | Wheatear, Mountain | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Oenanthe pileata*** | Wheatear, Capped | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Parisoma subcaeruleum*** | Tit-babbler, Chestnut-vented | Unlisted | Unlisted | IGD | 0,017 | 5,26 |
| ***Parus afer*** | Tit, Grey | Unlisted | Unlisted | OMD | 0,017 | 5,26 |
| ***Phylloscopus trochilus*** | Warbler, Willow | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Plectropterus gambensis*** | Goose, Spur-winged | Unlisted | LC | OMD | 0,017 | 5,26 |
| ***Saxicola torquatus*** | Stonechat, African | Unlisted | LC | IGD | 0,017 | 5,26 |
| ***Serinus alario*** | Canary, Black-headed | Unlisted | LC | GGD | 0,017 | 5,26 |
| ***Sigelus silens*** | Flycatcher, Fiscal | Unlisted | LC | OMD | 0,017 | 5,26 |
| ***Tricholaema leucomelas*** | Barbet, Acacia Pied | Unlisted | LC | OMD | 0,017 | 5,26 |

## 9.7 Appendix G – Birds and Powerlines